

## **Final report**

### **Three years of implementation of the E-PRTR**

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## EXECUTIVE SUMMARY

The E-PRTR Regulation<sup>1</sup> established an integrated pollutant release and transfer register at Community level. Article 17 of the Regulation provides for a review of the information reported by Member States. According to this Article, the Commission shall publish a report every three years based on the information from the last three reporting years. The Commission has contracted Umweltbundesamt GmbH to carry out this work.

The main objectives of the review were to evaluate the Regulation's implementation, to analyse the uses of E-PRTR data and to assess the completeness and representativeness of E-PRTR data for the reporting years 2007 to 2009. In addition, the scope analysis aimed at evaluating whether the target that 90% of the releases/transfers of Annex I facilities are covered by the Regulation has been fulfilled.

The key findings of the review are the following:

- All EU-27 countries plus Norway and Liechtenstein have *successfully implemented the E-PRTR Regulation* at the country level. The main issues identified with the implementation at the country level are the applicability of confidentiality to E-PRTR data and the interpretation of the scope of the E-PRTR Regulation in terms of certain activities and pollutants.
- The number of resubmissions decreased in 2008 and 2009 compared to 2007 which indicates that the quality of submitted E-PRTR datasets improved over time. One main reason for resubmissions was difficulties with interpreting the E-PRTR Regulation.
- Both the E-PRTR *validation tool* and the *informal E-PRTR review* that is carried out by the EEA have contributed to enhancing the quality of E-PRTR data. Further upgrade of both tools and clarification on the specifications for the validation tool might further improve data delivery.
- The analysis of the E-PRTR *website* showed that it fulfils the requirements set out in the E-PRTR Regulation and provides for easy access to information. Based on the website analysis and a survey on the use of E-PRTR data, areas for further improving the website have been identified.
- The *completeness* of E-PRTR data has improved from 2007 to 2009 with 10 % more facilities reporting for 2009 than for 2007.
- To allow for better verification of CO<sub>2</sub> releases and to harmonize with other reporting obligations it is suggested to include *CO<sub>2</sub> excluding biomass* as a mandatory pollutant in Annex II of the E-PRTR Regulation.
- For most pollutants (36) that were reported to *air* the statistical threshold analysis showed that the 90% coverage was reached.
- For some pollutants (NH<sub>3</sub>, As and Cd) the statistical threshold analysis indicated that releases from some activities are complete, but the overall completeness of reporting is below 90%.
- Some pollutants (e.g. HCB, PER, TCBS, Anthracene, Asbestos) to *air* are reported by a few facilities only and the reported releases are close to the threshold. Whilst lowering the current pollutant reporting thresholds may increase reporting this should be considered in the context of the small overall emissions of such pollutants. Other pollutants with limited reporting like pesticides, HCH and Pentachlorobenzene are subject to bans in Europe.
- For pollutant *released to or transferred in water* no change of the thresholds in Annex II is necessary because either the 90% target is reached or the pollutants are banned or under severe restrictions.

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<sup>1</sup> Regulation (EC) No 166/2006 of the European Parliament and of the Council of 18 January 2006 concerning the establishment of a European Pollutant Release and Transfer Register

- No threshold analysis could be performed for *land* because reporting seems to be inconsistent and incomplete. The main barrier for reporting seems to be unclear definitions. Clarifications on definitions and further guidance on reporting releases to land might improve the quality of data delivered.
- The threshold of 2,000 tonnes for reporting *non-hazardous* waste does not allow for reporting of 90% of non-hazardous waste transfers and should thus be reconsidered.
- The threshold of 2 tonnes for *hazardous* waste does not for all activities and countries allow for reporting of 90% of hazardous waste transfers. The threshold should thus be reconsidered in particular with regard to reporting from certain activities.

### **Implementation of the E-PRTR Regulation**

The assessment of implementation of the E-PRTR Regulation at the country level showed that all EU-27 countries plus Norway and Liechtenstein<sup>2</sup> implemented the E-PRTR reporting requirement including sanctions to enforce the requirement. Administrative sanctions are provided for in all countries and range from € 30 to € 500,000 depending on the extent of the infringement.

There are also differences between countries regarding the deadlines for reporting, quality control checks, reporting tools, etc. Most countries have electronic reporting tools in place whereas few countries or regions rely on paper-based reporting. An increasing number of countries are implementing electronic reporting systems.

A number of countries reported difficulties with the interpretation of the scope of the E-PRTR Regulation and the applicability of confidentiality to E-PRTR data. Given these issues it appears further clarification may be required. This could be addressed, for example, through an update of the E-PRTR Guidance Document<sup>3</sup> and/or of the User Manual for the E-PRTR validation tool<sup>4</sup>.

### **PRTR dataflow to EU level**

The number of resubmissions decreased for the reporting years 2008 and 2009, compared to the first reporting year 2007. This indicates that the quality of datasets has improved after countries have gathered experience in the first reporting year.

Some of the reasons for resubmitting were clearly related to difficulties in implementing a new reporting requirement and interpreting the E-PRTR Regulation and its scope. This also relates to the issues identified above concerning the need to clarify the scope of the E-PRTR Regulation.

### **Quality assurance and assessment at the EU level**

The validation tool has been useful to improve the quality of the submitted E-PRTR datasets. However, in some cases it appears that the tool has been a barrier for countries to submit data because of differing interpretations on which E-PRTR data elements may be kept confidential.

The annual informal E-PRTR data review that is carried out by the European Environment Agency (EEA) has proven to be another useful quality assurance and assessment mechanism at EU level. Further improvement of the informal review should be considered.

### **Assessment of the E-PRTR website**

The assessment of the E-PRTR website and its content and design showed that overall the website fulfils the legal requirements and provides easy access to E-PRTR data. Minor deficits and problems with the website have been identified in particular regarding data not provided or not linked to in a certain section, data which are difficult to access or lack information on how to be accessed. Moreover, incomplete explanations (e.g. regarding abbreviations used), inconsistency in

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<sup>2</sup> Iceland did not submit answers to the questionnaire according to Article 16(1) of the E-PRTR Regulation.

<sup>3</sup> Available at <http://prtr.ec.europa.eu/pgDownloadGuidance.aspx>

<sup>4</sup> Available at <http://www.eionet.europa.eu/schemas/eprtr/>

the usage of terms, constraints to download/export data, access to the webpage with various standard internet browsers, language settings, download speed of pages/maps and invalid/broken links were pointed out.

### **Assessment of the use of E-PRTR data**

The contractor assessed the use of E-PRTR data by analysing E-PRTR website user protocols and by carrying out an ad-hoc user survey. The user protocol analysis covered the time period 1 March 2010 to 30 June 2011 (ca. 590 visitors per day) with a particular focus on the 1 March to 30 June 2011 period. In the time period covered, a total of 288,375 visitors accessed the E-PRTR website. The average viewing interval over the 1.5 years period was 4.3 minutes. Access peaked in the week of 25 May to 2 June 2011 after publication of the new E-PRTR data set.

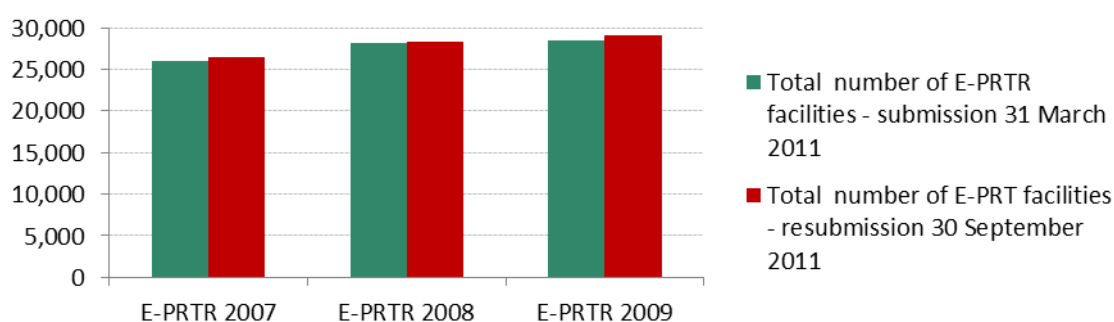
In addition, the contractor carried out an ad-hoc user survey in the form of an online questionnaire in May 2011. Approximately 180 stakeholders were addressed. Forty-nine accessed the questionnaire and 39 had sufficient experience with the E-PRTR website to fill out the questionnaire.

Both the assessment of the E-PRTR website and the analysis of the use of E-PRTR data resulted in a list of issues alongside potential improvements to the E-PRTR website in the short, medium and long term. This covers such matters as the development of the website for multiple-browser usage, the fixing of hyperlinks, a harmonization of terminology with the E-PRTR Regulation and the provision of download facilities for further data processing.

### **Scope analysis of the data reported under the E-PRTR Regulation**

The purpose of the analysis was to check completeness and to evaluate the representativeness of data reported under the E-PRTR Regulation. Furthermore, the threshold analysis aimed at evaluating the scope of the E-PRTR Regulation and at assessing whether the thresholds in Annex II of the E-PRTR Regulation are suitable for achieving the 90 % coverage target. In order to assess the completeness and representativeness of both E-PRTR data and thresholds, a number of comparisons were carried out.

**Figure 1: Total number of E-PRTR facilities in submission by 31 March 2011 compared to the resubmission by 30 September 2011**



Thirty-two countries (EU-27, Iceland, Liechtenstein, Norway, Switzerland and Serbia) reported a total of 28,510 facilities under E-PRTR 2009<sup>5</sup>. The number of releases and transfer reports in E-PRTR 2009 for the media air, water, land and transfer to waste water amounted to 40,198. In total, 16,638 facilities reported domestic transfers of hazardous waste, 9,489 facilities reported transfers of non-hazardous waste and 1,274 facilities reported transboundary transfers of hazardous waste.

The total number of facilities in E-PRTR 2009 is 10 % higher compared to E-PRTR 2007. This change rather reflects incomplete reporting of 2007 data than a real increase in the number of facilities under the E-PRTR Regulation in that period. The differences between 2008 and 2009 data are marginal. The completeness of resubmitted data (resubmission by 30 September 2011) seems to

<sup>5</sup> April 2011 dataset



be higher compared to the data submitted by 31 March 2011, but differences in the total number of E-PRTR facilities and pollutant releases/transfers and waste transfers are minimal.

The present E-PRTR database constitutes a considerable advancement compared to the EPER database and is a comprehensive information source on environmental pollution caused by large and medium-sized facilities.

The statistical analysis (Weibull function) proved useful for assessing whether the releases and transfers of the facilities included in Annex I of the E-PRTR Regulation cover 90% of the total releases and transfers of specific pollutants or waste types by these facilities. In addition, the Weibull approach highlighted potential outliers.

## **Air**

Releases of main (other) pollutants and GHGs to air under E-PRTR show complete and consistent reporting for NO<sub>x</sub>, SO<sub>2</sub> and CO<sub>2</sub> when compared with other international reporting obligations regulated under the CLRTAP and Kyoto Protocol or the EU emissions trading scheme (EU ETS). Other main pollutants which are relevant for industrial sources, such as NMVOC, CO, PM<sub>10</sub>, fluorinated greenhouse gases or N<sub>2</sub>O, are also widely reported but a comparison with CLRTAP and UNFCCC inventories indicates slightly lower consistency. For easier comparison of data with Kyoto Protocol reporting and EU ETS it is suggested to include CO<sub>2</sub> without biomass as a mandatory pollutant in Annex II of the E-PRTR Regulation.

The statistical approach (Weibull analysis) indicates that 90% coverage of the total mass released by industrial installations covered by the Regulation is reached for the majority (36) of the reported air pollutants (NO<sub>x</sub>, SO<sub>x</sub>, CO, NMVOC, PM<sub>10</sub>, most of HMs, PCDD/F, PCBs, CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, HFCs, HCFCs, CFCs, halons, EDC, DCM, TCM, vinylchlorid, benzene, ethylene oxide, HCN, naphthalene<sup>6</sup>, DEHP, fluorine and inorganic compounds). For some pollutants (NH<sub>3</sub>, As and Cd) the Weibull analysis indicated that releases from some activities are complete, but the overall completeness of reporting is below 90%.

Seven other pollutants (hexachlorobenzene (HCB), 1,2,3,4,5,6-hexachlorocyclohexane (HCH), pentachlorobenzene, pentachlorophenol (PCP), 1,1,2,2-tetrachloroethane, anthracene and asbestos) are reported by a few facilities only or even by a single facility for a single year. These pollutants mainly arise from specific processes in the chemical industry rather than during product use. It is assumed that only a few chemical plants constitute potential emission sources. Whilst lowering the current pollutant reporting thresholds may increase reporting this should be considered in the context of the small overall emissions of such pollutants.

Eleven pollutants i.e. hexabromobiphenyl and almost all pesticides (aldrin, chlordane, chlordecone, DDT, dieldrin, endrin, heptachlor, lindane, mirex, and toxaphene) of the 60 referred to in Annex II of the E-PRTR Regulation have not been reported so far for any of the reporting years 2007 to 2009.

For some of the E-PRTR activities only a few pollutants listed in Annex 4 of E-PRTR Guidance Document are reported, which may indicate that the capacity threshold limits reporting or that the activity itself is not relevant for the expected air pollutants.

No reporting or limited reporting might indicate misreporting by countries, a high threshold, that the substances are forbidden or that they only arise from very specific production processes. On the basis of the available information it is not always possible to identify the reason for reporting gaps.

## **Water**

The assessment of water release and transfer data identified the following issues: reporting under activity 1.(c) for releases of benzene, ethylbenzene, toluene, xylenes and naphthalene and reporting under activity 5.(f) for releases of asbestos and inclusion of wastewater amounts in the reporting would improve comparability and enhance data quality assessment of the reported releases.

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<sup>6</sup> Only in 2007 and 2008

In general, the quality of the reporting of releases into water is better than that of the reporting of transfers into water.

Based on the assessment, a revision of the E-PRTR Annex II reporting thresholds for water is not considered necessary. With few exceptions (chlorpyrifos, hexachlorobutadiene and ethylene oxide), all pollutants for which a low number of release reports is available are either banned or subject to severe restrictions on their marketing and use.

For almost all pollutants not reaching 90 % coverage, this failure is due to missing release and transfer reports (incomplete reporting, e.g. asbestos, halogenated organic compounds).

Reporting could be improved by the development and provision of emission factors for releases into water for substances not commonly monitored in discharges from urban wastewater treatment plants. The implementation of the Water Framework Directive (WFD, 2000/60/EC) requires Member States to establish a register on discharges, emissions and losses of priority substances. In this context, a guidance paper is being drafted by the European Commission in cooperation with Member States which strongly recommends the development of emission factors. A strong linkage between E-PRTR and the efforts under the WFD exists because E-PRTR data are an important data source for the WFD register and emission factors developed for reporting to the WFD register will also improve reporting under E-PRTR.

For quality assessment of the reported emissions the amount of wastewater discharged in m<sup>3</sup>/a is a crucial element. Consideration should be given as to whether this parameter should be included for reporting of both releases into water and transfers into water.

## **Land**

Only few countries reported releases to land under E-PRTR. In general, reporting of releases to land is inhomogeneous across activities and countries; therefore, it was not possible to apply threshold analysis.

Releases into land do not seem to be clearly defined. To improve countries' reporting of releases to land (completeness and consistency) under E-PRTR, greater clarity of reporting requirements may be necessary.

## **Waste**

In order to assess the completeness of waste data and the thresholds for waste transfers a number of comparisons were carried out including a comparison with Eurostat data for 2008 according to the EU Waste Statistics Regulation and a comparison for 2009 of the number of landfills and incineration plants with other data sources. In addition, a statistical assessment of the thresholds for waste transfers using the Weibull function was carried out for 2008 and 2009.

Based on the results of the above assessments the following issues were identified:

Concerning non-hazardous waste the assessment indicates that the threshold value of 2,000 tonnes does not allow reporting of 90% of transfers. Consideration should be given to changing the threshold in order to increase the percentages reported for E-PRTR activities in the manufacturing sector (economic sectors code C10 to C33 according to NACE). Alternatively, introduction of a criterion could be considered as follows: If a facility exceeds the 2-tonne threshold for hazardous waste, the facility will also have to report non-hazardous waste, regardless of any thresholds.

Regarding hazardous waste, the results of the assessments indicate a better coverage than for non-hazardous waste. However, the coverage in smaller countries and in certain economic sectors indicates that it may be useful to change the threshold value in order to increase the coverage of reporting from these countries and sectors. This issue is of most relevance for the following activities: 1.(c); 1.(d); 3.(a); 3.(c); 3.(g); 5.(c); 5.(d); 5.(e); 5.(f); 5.(g); 7.(a); 7.(b); 8.(a); 8.(b); 8.(c); 9.(a) and 9.(b).

Concerning the reporting on landfills, the threshold of 2,000 tonnes for non-hazardous waste appears to cause problems in ensuring appropriate levels of reporting for leachate. Furthermore,

there is a lack of clarity concerning the correct way to report leachate at the European level. Regarding the reporting made by incineration plants which form part of large plants that are classified under an activity other than 5.(b) 'incineration plants', further clarity may be needed concerning the correct activity descriptions to be used for reporting purposes. That way, it can be asserted that all incineration plants report under activity 5.(b).

# A INTRODUCTION

## Background

Regulation 166/266/EC of 18 January 2006 constitutes the legal basis for the European Pollutant Release and Transfer Register (E-PRTR). The intention of E-PRTR is to cover 90% of the total mass of releases/transfers for each listed substance that is emitted by industrial activities covered by the E-PRTR Regulation.

The register contains key environmental data from about 28,000 industrial facilities in 65 economic activities in 27 EU Member States and Iceland, Liechtenstein, Norway, Switzerland and Serbia from the year 2007 onwards. Online since November 2009, the E-PRTR website provides the general public and policy makers with access to environmental data on releases to air, water and land and off-site transfers of pollutants in waste water and transfers of waste.

## Main objectives of the project

Article 17 of the E-PRTR Regulation states that the Commission shall review the information provided by the Member States according to Article 7 of the E-PRTR Regulation and shall publish a report every three years based on the information from the last three reporting years. This report shall be submitted to the European Parliament and the Council, together with an assessment of the operation of the European PRTR.

There is thus a legal requirement to carry out a review on E-PRTR on the first three reporting years being 2007, 2008 and 2009 and to assess the operation of the European PRTR. In order to carry out this review the European Commission has contracted Umweltbundesamt GmbH. The present report summarizes the results of the official E-PRTR review. It will be attached to the European Commission's communication to the European Parliament and the Council.

The Article 17 Review involves checking the E-PRTR data for completeness and representativeness over the first three reporting years. The second requirement of Article 17 of the E-PRTR Regulation is that an assessment of the operation of the website of the European PRTR has to be carried out. Furthermore, the project covers an analysis of the scope of the E-PRTR Regulation. The objective of E-PRTR is to cover 90% of the total mass of releases/transfers for each listed substance that is emitted by industrial installations covered by the E-PRTR Regulation. A methodology was developed in order to assess the adequacy of the pollutant release/transfer thresholds in Annex II of the E-PRTR Regulation.

In addition to what is strictly required by Article 17 of the E-PRTR Regulation, the contract also involves an evaluation of the implementation of the Regulation at EU and country level including the dataflow and the quality control activities and an evaluation of the use of the E-PRTR data.

## Article 17 E-PRTR review versus EEA's informal E-PRTR review

This official review of the E-PRTR Regulation according to Article 17 is independent of the EEA's annual informal E-PRTR review. The official Article 17 report covers the reporting years 2007 to 2009 and focuses on aggregated data on E-PRTR, activity and pollutant level. In contrast, the annual EEA's informal E-PRTR review focuses on one year only (the last reporting year) and goes down to the facility level. The objective of the Article 17 E-PRTR review is to inform the European Parliament and the Council on the implementation of the E-PRTR Regulation whereas the objective of the EEA's review is to provide countries with feedback for improving their E-PRTR data.

## **B IMPLEMENTATION OF THE E-PRTR REGULATION**

### **B.1 Implementation of the E-PRTR Regulation at the country level**

#### **B.1.1 Methodology**

The main data sources to assess the implementation of the E-PRTR Regulation at the country level are the Article 16(1) questionnaires<sup>7</sup> and the study on the implementation of penalties<sup>8</sup>. Both sources cover the EU-27 plus Norway, Iceland and Liechtenstein but not Switzerland and Serbia because the latter two countries provide data to E-PRTR only on a voluntary basis. Therefore, the assessment on the implementation of the E-PRTR Regulation at the country level is carried out for the EU-27 plus Norway and Liechtenstein (Iceland did not submit any questionnaire).

A first screening of submitted questionnaires took place to evaluate the completeness and clarity of answers. If needed the Commission went back to countries and asked for missing answers or clarifications. As a second step an in-depth analysis of all submitted questionnaires took place, which involved both quantitative and qualitative analysis. The results of the analysis were then summarized in overview tables where possible or in textual form.

#### **B.1.2 Results**

The implementation at the country level covers a wide range of topics including the legal measures establishing the PRTR system, the PRTR reporting practice and data quality assurance and public access to PRTR data. The full analysis of the implementation of the E-PRTR Regulation at the country level is included in [Appendix 1](#).

##### **B.1.2.1 Legislative, regulatory and other measures establishing the E-PRTR system and E-PRTR reporting obligation**

Several countries indicated that their national PRTR system is based on the EU Regulation 166/2006/EC, which is directly applicable in the EU countries and Norway, Iceland and Liechtenstein. In addition to this common legal basis, all countries except for Liechtenstein reported additional national acts of legislation to implement their national PRTRs. A full list of national legislative and regulatory measures per country is included in Table 7 in [Appendix 1](#).

##### **B.1.2.2 Sanctions**

Some countries have adopted specific national measures to implement sanctions for enforcing the obligations under E-PRTR whilst others have made use of existing legislation. Administrative sanctions are applicable in all countries whereas in eight countries (Belgium, Cyprus, Denmark, Germany, Luxembourg, the Netherlands, Sweden, and the United Kingdom) criminal proceedings can also be initiated to enforce E-PRTR. In addition, some countries have implemented social sanctions such as “naming and shaming”.

Twenty countries have provided information on the level of fines. The fines range from €30 to €500,000 depending on the infringement (see Table 8 in [Appendix 1](#)).

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<sup>7</sup> Article 16(1) of Regulation 166/2006/EC requires Member States to report information on the implementation of E-PRTR every three years.

<sup>8</sup> AEA (2010): Study contract to support the Commission in the development of pollutants description and information pages for the E-PRTR website and analysis of the implementation of Article 20 of the E-PRTR Regulation on penalties based on the information notified by Member States. ED46751, issue number 2.

### **B.1.2.3 Implementation of the reporting requirement**

Only Finland, Norway and Spain reported that they have adopted thresholds that differ from the ones in the E-PRTR Regulation. In Norway, there are no capacity and pollutant thresholds at all and in Spain there are no pollutant thresholds for reporting of pollutants and waste. Finland reported that it has adopted lower activity thresholds to cover a higher number of facilities. Concerning any differences and extensions in the list of pollutants and associated thresholds the Netherlands have added eight additional pollutants to air (see Table 9 in [Appendix 1](#)) in order to ensure that a sufficiently high percentage of industrial emissions is reported. Spain has also added seven additional pollutants to air and some disaggregated information for groups of substances to water/land.

In some countries, the E-PRTR reporting obligation has been integrated into other reporting mechanisms in order to eliminate duplicate reporting by operators. Ireland, the Netherlands, Norway and the United Kingdom reported that they have integrated the E-PRTR reporting system into other reporting mechanisms. Romania and Slovakia plan to implement an integrated reporting system.

### **B.1.2.4 PRTR data flow**

In the PRTR dataflow at the country level there are three possible levels involved: national, regional, and local. Generally speaking, smaller and medium-size countries involve fewer levels in the dataflow than larger countries. In most cases the different levels that are involved in the PRTR data flow also validate the data in some way. In some cases, however, the involved institutions only compile or forward data. A detailed overview of the levels involved in the PRTR dataflow at country level and a list of competent authorities that are designated to collect PRTR data from facilities can be found in Table 11 in [Appendix 1](#).

### **B.1.2.5 Data quality assurance and assessment**

All countries reported that they carry out some type of data quality assurance and assessment. The most common checks are the comparison of PRTR reports with previous years' data and with data from other reporting obligations (e.g. with the EU ETS) and a detailed check of the operator's file including the environmental permit. Several countries have also implemented a series of automatic checks that are carried out when operators enter their PRTR data into the electronic reporting system. Such checks may, for example, include a completeness checks and a comparison with previous years' data. A detailed overview of the checks that are carried out per country is included in Table 12 in [Appendix 1](#).

### **B.1.2.6 PRTR reporting practice**

The deadlines for reporting to the competent authorities differ between the countries for the reporting years 2007-2009 (see Table 13 in [Appendix 1](#)). The majority of countries had one single reporting deadline for all three reporting years. This deadline is mostly 31 March of reporting year + 1. However, in some countries earlier or later deadlines such as 1 March or 30 April are in place.

Seventeen countries (see Table 14 in [Appendix 1](#)) reported that the deadlines for reporting by facilities were generally met in practice whereas twelve countries reported that facilities did not always meet the deadlines. The main reasons given for delays on the part of the operators were technical issues with the electronic tools, unwillingness of operators to report, lacking skills to correctly calculate releases and transfers and unawareness and lack of experience with the new reporting obligation in general. On the part of the competent authorities, lacking human resources and changes to national law resulted in delays.

In general, the main difficulties for operators and for competent authorities regarding reporting of PRTR data were associated with the methodologies for calculation, with the units of measurement, technical difficulties (e.g. problems with reporting systems), E-PRTR classification of the facilities, limited human resources, interpretation of the scope of the E-PRTR Regulation, completeness of data, evaluation of confidentiality and harmonization with other EU legislation.

The percentage of electronic reporting is relatively high with 14 countries stating 100% electronic reporting. However, paper-based reporting is still used in some countries or regions (see Table 15 in [Appendix 1](#)). Nineteen countries (Austria, Czech Republic, Cyprus, Denmark, Estonia, Finland, France, Germany, Ireland, Italy, Latvia, Liechtenstein, the Netherlands, Norway, Poland, Portugal, Spain, Sweden and the United Kingdom) have electronic PRTR reporting tools/systems in place. Romania is currently implementing an electronic reporting platform and Greece is also planning to do so. In general, the electronic reporting systems are web-based and are used by both the competent authorities and operators. In other countries reporting forms (Word, Excel or pdf) can be sent electronically via e-mail or on paper.

#### **B.1.2.7 Public access to PRTR data**

All countries except Finland, Liechtenstein, Luxembourg, Portugal and Slovenia reported the link to their national PRTR website (see Table 16 in [Appendix 1](#)). Liechtenstein, Luxembourg, Portugal and Slovenia referred to the European PRTR website<sup>9</sup> instead in order to provide access to their national PRTR data. However, for some of the provided national PRTR websites it is unclear whether they actually allow for public access to national PRTR data or only inform about the PRTR reporting obligation.

All countries reported that the internet, especially their national websites, is the most important communication medium to inform the public. Nine countries (Austria, Belgium, Finland, Germany, Ireland, Malta, Romania, Slovenia and Sweden) noted that e.g. Internet cafes and libraries with public computer access facilitate access to the registers. Belgium, Bulgaria, Portugal, Spain and the United Kingdom also offer data to the public in an alternative format on request (e.g. in hard copy). Several countries reported that they have established a PRTR helpdesk, hotlines or a contact point for enquiries from the public.

#### **B.1.2.8 Confidentiality of data**

Nine countries (Belgium, Bulgaria, Denmark, Germany, Luxembourg, Netherlands, Romania, Sweden and the United Kingdom) out of 29 claimed confidentiality concerning part of their E-PRTR data. Confidentiality was mostly claimed for information regarding the operator transfers of hazardous and non-hazardous waste. In Germany, confidentiality was also applied to the pollutant. The most common reason for claiming confidentiality was the confidentiality of commercial or industrial information to protect a legitimate economic interest, including tax or statistical secrecy (see Table 19 in [Appendix 1](#)).

#### **B.1.2.9 Public participation, public awareness and capacity building**

As the main tool to foster public participation, public awareness and capacity building, countries reported the national PRTR websites, most of which allow the public to submit feedback. PRTR meetings or workshops were also mentioned.

### **B.1.3 Conclusions**

All 29 countries (EU-27 + Norway and Liechtenstein) that provided an Article 16(1) questionnaire reported that they have implemented the E-PRTR reporting obligation according to the E-PRTR Regulation. However, some countries reported difficulties in terms of interpreting and defining the scope of the E-PRTR Regulation, in particular regarding the new activities. It may be necessary, therefore, to further clarify the scope of the E-PRTR Regulation.

Given the issues identified with regard to confidentiality, further clarification on which E-PRTR data elements can be kept confidential may be necessary in order to avoid the types of issues identified by certain countries that confidentiality checks in the validation tool were a barrier to submitting da-

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<sup>9</sup> <http://prtr.ec.europa.eu/>

ta to the European Commission. Further clarification may also be needed on this matter with regard to the “User manual for the E-PRTR validation tool”.

## **B.2 PRTR Dataflow to the EU level**

### **B.2.1 Methodology**

The following questions were addressed:

- Have countries used the opportunity to correct data through resubmissions?
- What were the reasons for the resubmissions?

In order to assess whether countries have used the opportunity to correct data through resubmissions, the EEA provided the contractor with a table of submissions that were uploaded into the E-PRTR database. The reasons for resubmitting were assessed based on two data sources:

- 1) Explanatory Excel file that countries are supposed to upload on CDR together with every resubmission
- 2) The field “resubmit reason” in the table on submissions that was provided by the EEA. This is the field in which countries may enter a short reason for submitting a new dataset on CDR.

It has to be noted that not all countries have provided the explanatory Excel files or stated the reason for resubmitting. The analysis was therefore based on the available data.

### **B.2.2 Results**

#### **B.2.2.1 Opportunity to correct data**

Thirty countries resubmitted E-PRTR 2007 data in autumn 2009, 27 in spring 2010<sup>10</sup>, 22 in spring 2011 and ten in autumn 2011. Concerning 2008 data 16 countries resubmitted a dataset in autumn 2010, 22 in spring 2011 and 13 in autumn 2011. E-PRTR 2009 data was resubmitted by 20 countries in autumn 2011. Further details on resubmissions by countries can be found in Table 21 in [Appendix 2](#).

#### **B.2.2.2 Reasons for resubmitting**

The following main reasons for resubmissions have been identified:

- Correction of release/transfer reports
- Addition/removal of facilities
- Correction of facility details, e.g. coordinates, name
- New methodology for calculating/estimating releases/transfers
- New data is available (e.g. CO<sub>2</sub> including biomass)
- Change of facility ID
- Change/correction of activity

Other less common reasons for resubmitting data were a change of operator (Hungary) or a change in the address of the competent authority (Spain). A detailed overview of the reasons for resubmissions per country is included in Table 22 in [Appendix 2](#).

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<sup>10</sup> There was no opportunity to resubmit 2007 data in autumn 2010.



### **B.2.3 Conclusions**

The analysis showed a clear tendency that the number of resubmissions decreased for the reporting years 2008 and 2009 compared to the first reporting year 2007. This indicates that the quality of the datasets improved after countries had gathered experience with the first reporting year. Therefore, it can be expected that for later reporting years countries will use the opportunity to correct previous year data less often. However, it is clearly important that the opportunity for countries to resubmit data is retained.

The analysis of the reasons for resubmitting showed that some of the reasons were clearly related to difficulties in implementing a new reporting requirement and interpreting the E-PRTR Regulation and its scope (addition of facilities, correction of activity, adding CO<sub>2</sub> including biomass). Once these issues are resolved they should not lead to further resubmissions in the future. Other reasons (e.g. correction of release/transfer reports) will remain in the future and lead to further resubmissions of E-PRTR data. Further clarification concerning the interpretation of the E-PRTR Regulation and its scope would help avoiding resubmissions due to different interpretations of the E-PRTR Regulation.

## **B.3 Quality assurance and assessment at the EU level**

### **B.3.1 Methodology**

The purpose of this task was to describe the quality assurance and assessment performed at the EU level and to assess whether these quality checks are a barrier for countries to submit data. For this assessment different data sources such as the answers to the Article 16(1) questionnaires and the user manual on the validation tool<sup>11</sup> were used.

### **B.3.2 Results**

#### **B.3.2.1 Validation tool**

The European Commission carries out several quality control activities on the PRTR data that are submitted by countries. The main quality assurance mechanism is the E-PRTR validation tool, which has been used since 2009 when countries submitted their PRTR data for the reporting year 2007 for the first time to the European Commission. The purpose of the E-PRTR validation tool is to allow countries to validate E-PRTR data prior to uploading it to the CDR. For the first years, the automated validation consisted of the xml schema validation, a compliance validation and an additional validation (voluntary data, confidentiality).

In addition to the automated validation checks, the European Commission also carried out some manual checks in 2009 and 2010 when importing data into the E-PRTR database. In 2011, these manual checks were integrated into the automated checks. The following checks were added:

- Coordinates and NUTS check
- Facility ID check
- Confidentiality and completeness
- Outliers Check
- Use of hyphens and zeroes.

Germany reported in its Article 16(1) questionnaire that for some cases in which confidentiality was claimed the validation tool was a barrier for submitting PRTR data to the European Commission.

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<sup>11</sup> Atkins 2010; Bilbomática, Maintrat, 2010

The validation tool, however, reflects the reporting requirements as specified by the European Commission.

### **B.3.2.2 Informal E-PRTR data review**

Another quality control mechanism at the EU-level is the annual informal E-PRTR data review that is carried out by the European Environment Agency (EEA). The review has been carried out for the reporting years 2007, 2008 and 2009 and aims at providing countries with feedback on the quality of their PRTR data. The review is carried out in two stages: stage 1 tests look at E-PRTR data itself whereas stage 2 tests compare E-PRTR data with data provided under other reporting obligations. The results of the informal E-PRTR review are provided to countries in the form of country-specific files with findings, Excel data files and a review report.

The EEA has received feedback from various countries on the usefulness of the informal E-PRTR review. Countries reported, for example, that they were able to correct outliers that were identified during the review.

### **B.3.3 Conclusions**

The validation tool has proven to be a useful tool for both the European Commission and countries to prevent errors in E-PRTR data. The checks should be improved further in the future, for example by optimising the parameters for the outlier check. The specifications for the validation tool need to be clarified where it appears that the validation tool provides a barrier to importing data into the E-PRTR database.

Concerning the informal E-PRTR review, first feedback from countries has shown that the review has been helpful. A more detailed analysis on the usefulness of the informal E-PRTR review and possible improvements for the future may prove helpful.

## **B.4 Assessment of the E-PRTR website**

### **B.4.1 Methodology**

Article 3 of the E-PRTR Regulation on the content of the European PRTR and Article 4 on the design and structure of the E-PRTR lay down the legal requirements for the E-PRTR website. The assessment of the E-PRTR website concentrates especially on elements being new or different compared to the reporting under EPER Decision 2000/479/EC i.e. on issues on waste reporting.

The assessment of the website has been carried out in two steps:

- First, check of the content of the E-PRTR website, especially new elements
- Second, check of the design and structure of the E-PRTR website and how information is presented

#### **The following issues were assessed:**

1. Does the register include information on accidental releases?
2. Does the register include information to measurement methods?
3. How does the register handle issues of confidentiality?
4. How are the data aggregated?
5. Are data presented in aggregated forms comprehensive and easy to access and download?
6. Are data presented in non-aggregated forms comprehensive and easy to access and download?

7. Can the register be searched for off-site transfers of waste and off-site transfers of pollutants in waste water, also considering the destination of transferred wastes?
8. Can the register be searched for releases of pollutants from diffuse sources?
9. Does the design of the E-PRTR allow for easy public access to the data?

## **B.4.2 Results**

### **The assessment of content and design of the E-PRTR website showed that:**

- information about accidental releases is sufficiently provided in most search sections
- information about measurement methods is available in the search section 'facility level'
- information about confidentiality is available in most search sections
- high level of data aggregation is performed
- aggregated and non-aggregated data are in general comprehensive and easy to access
- information on off-site transfers to waste-water of a specific pollutant is available
- information about off-site transfers of waste and off-site transfers to waste-water of a specific pollutant is available in aggregated and non-aggregated form
- information on diffuse sources is sufficiently available in a separate search section
- the webpage is clear, professional and attractive and the design in general provides for easy public access

### **Minor deficits and problems have been identified, in particular regarding:**

- data which are not provided or not linked to in a certain section
- data which are difficult to access or missing information on how to access data
- insufficient explanations (e.g. regarding abbreviations used)
- inconsistency in the usage of terms (compared to the E-PRTR Regulation)
- no possibility to download/export data
- webpage cannot be accessed with all standard internet browsers
- language settings
- slow loading of pages/maps
- invalid/broken links

The complete assessment of the issues/questions listed above is presented in [Appendix 3](#).

## **B.4.3 Conclusions**

### **B.4.3.1 Conclusions regarding accidental releases**

In most search sections, sufficient information on accidental releases is provided. In some search sections minor amendments are required. In the search section 'Area overview', links to the 'Facility level' search or 'Pollutant release' search would be helpful. Besides, the available hyperlinks within the 'Map search' should be checked and fixed or alternatively be removed from the homepage. The last proposal is related to the search section 'Time series/Pollutant release' where access to information should be facilitated with regard to controlled/accidental releases. This could for instance be done by providing a clear graphical differentiation (i.e. applying separate colours for controlled and accidental releases in the bar charts provided. For further information regarding accidental releases see [Appendix 3](#), Question 1.

#### **B.4.3.2 Conclusions regarding information on measurement methods**

Information regarding measurement methods is exclusively available in the search section 'Facility level'. Other search sections provide links to this section. However, the three letter abbreviations used to indicate measurement methods are explained within the FAQs only. Brief descriptions of the abbreviations used or alternatively a clear reference to where explanations for the abbreviations can be found (e.g. hyperlink to FAQ 17) would be helpful in this respect.

With regard to the 'Area overview' it is understandable that indicating the measurement methods is not easy because several methods will be used for measuring for instance the total release of a particular substance. Nevertheless, links to the 'Facility level' where such information can be accessed would be helpful.

The last minor deficit/problem identified during the review is connected to the 'Map search' section. Even though this section is directly connected to the available information on 'Facility level', the hyperlinks provided which should lead to information regarding measurement methods are invalid. It is recommended to either fix the hyperlinks or alternatively remove them from the homepage in order to avoid confusion.

For additional information regarding measurement methods review [Appendix 3](#), Question 2.

#### **B.4.3.3 Conclusions regarding confidentiality issues**

The E-PRTR website includes information on confidentiality issues. It is positive that a hyperlink '⚠ Confidentiality claims may affect the result' appears and alerts the users in case confidentiality claims affect any search results. The assessment showed that in most of the search sections the total number of facilities claiming confidentiality is indicated and that the reason why information has been withheld is further specified. The possibility to search confidential information by choosing 'Confidential in group' within the provided dropdown box is very helpful.

The reason why certain information has been withheld is specified by referring to Articles of Directive 2003/4/EC. However, a brief explanation of the content of relevant Articles is not included. Therefore, it may be helpful to either briefly introduce the Articles to which reference is made, as for instance extensively done within the 'Industrial activity' section, or to provide links to relevant resources elsewhere.

Furthermore, confidentiality information is partly included only in the 'Area overview' section. It is only stated that data might be affected by confidentiality claims. At this point it could be relevant to provide further information related to the data affected. Additional information related to confidentiality issues can be found in [Appendix 2](#), Question 3.

#### **B.4.3.4 Conclusions regarding data aggregation:**

Data are presented in both aggregated and non-aggregated forms, as stipulated by the E-PRTR Regulation. The only minor problem/deficit identified during the assessment is related to the terminology used. In a few cases, different terms are used in the E-PRTR Register and the Regulation. A definition of all technical terms applied would be of great help for users of the E-PRTR website. Further information related to data aggregation is included in [Appendix 3](#), Question 4.

#### **B.4.3.5 Conclusions regarding comprehensiveness, accessibility and ability to download aggregated data**

The data presented in aggregated forms are comprehensive and easy to access by users of the website. The only minor issue in this regard is certain differences in the terminology compared to the E-PRTR Regulation. Besides, it is possible to print but not to download aggregated data, even though in several cases download buttons (i.e. '↓') are in place. The buttons provided do not activate downloads of the selected datasets. Therefore, the option to download data is a point which should be improved in the future. Possibly also the opportunity to export data in an Excel spreadsheet could be considered. For additional information regarding comprehensiveness, accessibility and ability to download aggregated data see [Appendix 3](#), Question 5.

#### **B.4.3.6 Conclusions regarding comprehensiveness, accessibility and ability to download non-aggregated data**

Similarly to the data presented in aggregated forms, the available non-aggregated data (i.e. Facility level) is comprehensive and easy to access. However, even though download buttons (i.e. '↓') are provided at several locations of the website, they do not allow the download of data. The provision of an option to download/export data in an easy and practical way may prove useful. Question 6 within [Appendix 3](#) contains further information regarding comprehensiveness, accessibility and ability to download non-aggregated data.

#### **B.4.3.7 Conclusions regarding off-site transfers of waste and off-site transfers of pollutants in waste water**

Relevant data are available for various pollutant groups and specific pollutants within a particular group. The user can also decide to focus on a particular activity. Within the search section 'time series' additional information regarding off-site transfers of waste and pollutants in waste water can be obtained. However, information regarding the final destination of waste transfers is not included in this search section. Question 7 within [Appendix 3](#) includes additional information on off-site transfers of waste and off-site transfers of pollutants in waste water.

#### **B.4.3.8 Conclusions regarding releases of pollutants from diffuse sources**

Data on diffuse sources can be accessed by using the search section 'Releases diffuse sources', provided in the main menu. For each sector a number of 'Map layers' are available. However, with respect to releases to water, the search section presently covers only a limited set of nutrient loss maps from agriculture to water bodies. Besides, the data reported by countries reflect the use of a number of different calculation methodologies and are typically not directly comparable.

The data on releases of agricultural nutrient stem from a range of different sources and data collection processes. The user can choose between the following layers: nitrogen loss from agriculture per river basin district (RBD) area, nitrogen loss from agriculture per agricultural area, phosphorus loss from agriculture per RBD area and phosphorus loss from agriculture per agricultural area. Similar to the releases to air, the user can enlarge the maps in order to see all the functionalities of the map and its contents. Legends in different colours are dedicated to different amounts of releases to water. Besides, the option to print and download maps (export in pdf or png format) is convenient. Additional information on releases of pollutants from diffuse sources is presented in [Appendix 3](#), Question 8.

#### **B.4.3.9 Conclusions regarding the design of the E-PRTR website for easy public access**

To summarise, the design of the E-PRTR website allows for easy public access to E-PRTR data. Nevertheless, the problems identified should be further considered and appropriate corrective actions taken in the future. This will require some effort, but would significantly improve public access to data (e.g. by fixing broken links, providing print friendly summaries, allowing export of data for further processing, etc.). Further information regarding the design of the E-PRTR for easy public access is included in [Appendix 3](#), Question 9 to this document. Proposals for improvements are also included in Table 1 in C.3.

## **C USE OF E-PRTR DATA**

### **C.1 Methodology used**

#### **C.1.1.1 Analysis of user protocols**

User protocols were analysed with the program WebLog Expert (see: <http://www.weblogexpert.com>) focusing on the time period 1 March 2010 - 30 June 2011 (~1.5 years period), including the publication of two E-PRTR datasets in spring 2010 and spring 2011.

Additional conclusions and comparison on web user behaviour were performed for the period 1 March to 30 June 2011 (four month period), focusing on changes in access and search behaviour before and after publication of new data (as announced in the EEA alert on 2 May 2011) including the new dataset for 2009 and updated information for 2007 and 2008 data.

The assessment showed that there was exceptionally high access to the page in the period 25 May 2011 to 2 June 2011 (“peak week”) after publication of the new E-PRTR dataset. As it is difficult to assess specific developments within shorter time periods with WebLog Expert, additional data from Google Analytics was analysed for the peak period in May/June 2011. However, Google Analytics observed only a part of the E-PRTR website, i.e. the map search website (<http://prtr.ec.europa.eu/MapSearch.aspx>). Nevertheless, Google Analytics data served to draw additional conclusions on web user behaviour within this period.

#### **C.1.1.2 Ad-hoc survey**

The second step included an ad-hoc survey amongst the main users of the website. The survey aimed at getting information about the purpose of the data retrieved and its follow-up use. It was agreed to carry out a survey via electronic questionnaire accompanied if required by telephone interviews.

In order to obtain project specific information a compact and clearly structured questionnaire was developed. The questionnaire was realised as a web-based survey, using the survey platform ‘Survey Monkey’. The platform enables easy access and filling-in of the questionnaire. The survey was announced via an e-mail which included a personalised link to the survey. The questions were presented one after another and discontinuous filling-in by stakeholders was possible.

The questionnaire was sent to approximately 180 stakeholders by 1 May 2011. More than 200 stakeholders were contacted indirectly by asking the European Environmental Bureau to distribute the information on the survey to several working groups. The recipients were invited to provide their feedback by 31 May 2011. A reminder to complete the questionnaire was sent to all stakeholders on 24 May 2011.

Forty-nine stakeholders accessed the survey via the personalised link. Ten recipients indicated that they do not use the E-PRTR website on a regular basis. Consequently, due to the lack of experience as end-users of the E-PRTR website they were not able to complete the questionnaire. However, 39 questionnaires were filled in and formed the basis for the assessment.

### **C.2 Results**

#### **C.2.1.1 Results of the analysis of user protocols**

The following main findings can be summarised:

- In the period from March 2010 to the end of June 2011 (1.5 years period) a total of 288,375 site visits took place (on average about 589 visitors / day).
- 36 % of the visits within the 1.5 years period took place in the last four months of the investigated time period (on average 827 visitors / day).
- Within the 1.5 year time period a total of 2,246,937 pages were viewed; in the four month period about 846,662 pages were viewed.
- The average number of page views was slightly higher in the four month period than in the 1.5 year time period with 8.25 compared to 7.79 page views.
- Around the publication date of the new data in 2011, users were much more active. The highest number of visitors per day was counted on 27 May 2011 (15,497 visitors).
- In the period from March 2010 to the end of June 2011, about 106,285 unique visitors entered the site (visitors counted only once).
- About 65 % of the unique visitors visited the E-PRTR site during the four month period.
- On average, the visitors viewed the website half a minute longer over the period of 1.5 years compared to the shorter four month period (4:21 compared to 3:59 minutes).
- For both time periods the same webpages are among the top five sites accessed by visitors.
- The same pattern which was observed for the parameter 'pages' can be found for 'paths'. Among the top five the same paths occur, but they differ in their order. This is the case for /home.aspx, /MapSearch.aspx and /MapExpanded.aspx.
- The page <http://www.e-prtr.com/DiffuseSourcesAir.aspx> is ranked first in terms of page accessed by visitors, path, entering and exiting page.
- About 37 % of the total hits in the 1.5 year period (23,654,306) were observed in the four month time period (8,805,473).
- The differences between the two time periods of 1.5 years and four months regarding the country specific visitors are not significant
- For both investigated time periods, Error 404 (page not found) was the most occurring error. Out of a total of 348,836 errors, about 32 % occurred in the four month period.
- In the time period of 1.5 years, 348,836 failed requests were recorded. In the time period of four months 85,692 failed requests occurred, which is about 25 % of the total failed requests.
- During the peak week by far the most visits were recorded from Romania (about 18,800 visits in the peak week). The majority of users entered the page as first users and stayed about three minutes.
- For many countries, the vast majority of the visits in the timeframe of May to June 2011 took place in the peak week. Especially Romania, Portugal, Hungary and Austria had a very high share of visits in the peak week.
- The traffic sources were also identified. For Romania, the sources 'stirileprotv', 'euractiv' and 'evz', for Portugal 'tek sapa', for Austria 'derstandard' and for Hungary 'hvg' rank within the top 10. All of these websites from where visitors entered the E-PRTR site are online news or TV sites.

Further information regarding the analysis of user protocols is presented in [Appendix 4](#) to this report.

### **C.2.1.2 Results of the ad-hoc survey**

The results of the assessment of questionnaires can be summarised as follows:

- About half of the users access the website irregularly (2-10 times a year), about 20 % use the site about once a month. The remaining users access the site several times a month.
- Most stakeholders accessed data for comparison between different areas/years or viewed time series; other purposes were also indicated.



- Most respondents indicated that they accessed non-aggregated data at facility level and data aggregated at national level. In addition, data aggregated at regional or river basin district level is regularly used.
- Data are mostly used for benchmarking, national reporting, information on local environmental impacts, planning/future action and to a minor extent for other purposes.
- Almost half of the respondents replied that data are in general well organised; around 30 % chose “very well organised/easily accessible”. Fewer than 10 % of the respondents replied that the data provided are not well organised.
- The vast majority of respondents indicated that the level of data aggregation is sufficient.
- Several stakeholders provided additional comments/critique and proposals for improving the organisation and accessibility of information including issues such as
  - o High complexity of data and expertise knowledge needed to interpret data
  - o Difficulties to access data (i.e. time series, information on confidential data)
  - o Design and navigation of the site (i.e. low speed of loading, large legend of maps, adding queries, no possibility to download data, problems with Access database, missing explanation of EU 27 Member States, misplaced facilities, missing industries, bad translations, necessity to adopt to other browsers, enable print friendly summaries, develop iPhone App for the E-PRTR website)
  - o Comparability of data (i.e. allow comparison with other sources of data at facility level (LCP, ETS and UWWTP), comparability with diffuse sources data, elaborate difference between quantities reported under waste statistics and PRTR, low consistency of reported data amongst EU MS)
  - o Other issues such as the categorisation of certain pollutants to a group, clarification of NUTS region/polygon, missing facilities, enhance data verification procedure

Further information and a detailed overview of all responses received from stakeholders can be found in [Appendix 4](#) to this report.

### C.3 Conclusions

Based on the three assessments<sup>12</sup> for which data are provided in great detail in the Appendices 3 to 6 proposals for improvements were elaborated. Proposals are listed in Table 1. The following categories are used in the table:

1. Proposals regarding
  - o Design and structure of the website
  - o Technical properties
  - o Data management
2. Estimation of time frame for the adoption / implementation of the particular proposal:
  - o Short term (within 1 year)
  - o Mid-term (1 to three years)
  - o Long term (up to 5 years)
3. Priority of the adoption / implementation of the particular proposal:


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<sup>12</sup> Conclusions and recommendations from Chapter B.4 are also included.

- Essentially required for efficient use by experts and interested public (in grey boxes)
- Optional to enhance user friendliness and clearness of data in particular for further use by interested public (in white boxes)

For some proposals two possibilities are presented how to overcome the problem. Those are indicated with 'OR'.

**Table 1: Proposals to improve the E-PRTR website**

|                             | Short term (<1 year)   | Mid-term (1-3 years)   | Long term (3-5 years)   |
|-----------------------------|--|--|---|
| <b>Design / Structure</b>   |  |  |   |
| Navigation                  |  |  | Improve general navigation, e.g. navigation is too slow and partly not intuitive  |
| Public use                  | Spread information of E-PRTR website using internet news/TV pages to reach a greater public audience, e.g. support the publication of links to map search, to regional search etc. |  |   |
| <b>Technical properties</b> |  |  |   |
| Browsers                    |  |  | Develop website for multiple browser usage i.e. for browsers other than Internet Explorer   |
| Languages                   |  | Provide option to at least display the complete content of the E-PRTR homepage in English, without spending time for changing browser settings e.g.  at the top right corner of the webpage | Improve translations into national languages e.g. for the Dutch site  |
| Data loading                |  | Fasten-up loading of pages to avoid freezing and restarting of browser   |   |
| Apps                        |  |  | Develop an iPhone App e.g. for certain information (the US EPA recently developed an App for accessing the US PRTR dataset (e.g. the toxics release inventory TRI dataset)) |
| Search                      |  | Tag each facility so that a Google search will list the E-PRTR record if a user searches for a company using the Google search engine  |   |

|                        | Short term (<1 year)  | Mid-term (1-3 years)  | Long term (3-5 years)  |
|------------------------|---|---|--|
| <b>Data management</b> |   |   |  |
| Links                  | Check and fix hyperlinks<br><b>OR</b><br>Remove links from the homepage<br>e.g. download links and in section 'map search' (i.e. to details, pollutant release, pollutant transfer, waste transfers and confidentiality)  |   |  |
| Accidental releases    | Clear graphical differentiation of accidental releases in search menu 'Time Series/Pollutant Release'<br>e.g. different colours for controlled and accidental releases in bar charts  | Include information on accidental releases in the section 'Area overview'<br><b>OR</b><br>provide links to the 'Facility level' search or 'Pollutant release' search where these data can be obtained |  |
| Measurement methods    | Provide brief explanations for abbreviations of measurement methods<br>e.g. 'PER' (Measurement methodology already prescribed by the competent authority in a licence or an operating permit for that facility)<br><b>OR</b><br>clearly indicate where a complete list of abbreviations can be found<br>e.g. hyperlink to FAQ 17  |   |  |
| Confidentiality        | Include content/brief explanation of the Articles of Directive 2003/4/EC.<br>Reference is made to the articles when justifying confidentiality, but information on content of articles is missing   | Include further clarification on effect of confidentiality claims. At the moment it is only stated that there might be effects, but it is not indicated to what extent.                               |  |
|                        | Include search option for facilities claiming confidentiality in map search. It is currently not possible (no query) to search for confidential data (i.e. numbers, names of facilities or information which data has been kept confidential)<br><b>OR</b><br>apply different colours to indicate facilities which withhold information (of course only in case the location of the facility is not confidential) |   |  |
| Terminology            | Use same terms as in the E-PRTR Regulation, e.g. for soil/land, waste transfers/off-site transfer of waste  |   |  |
| Download               |   | Provide possibility to download/generate/export data for further processing, e.g. export data in an Excel spread sheet  | Provide printer-friendly summaries of data, e.g. facility reports in word/pdf format or by using filters |

|                         | Short term (<1 year)   | Mid-term (1-3 years)   | Long term (3-5 years)  |
|-------------------------|--|--|--|
| Data complexity         |  |  | Provide interpretation for general public on data. Public interpretation may be too difficult as certain degree of expertise is needed for interpretation.   |
| Pollutant groups        | Regroup NMVOC: NMVOC is listed under 'Other gases'. However, it is an organic component and it is therefore better to put it under 'Other organic substances'. | Provide alphabetical list of pollutants in search menu. Currently, users have to know the pollutant group in order to select the pollutant, which can be a hurdle.   |  |
| Time series             |  | Reorganise time series search. The time series search is currently not user friendly because the user has to start the query separately.   |  |
| Maps                    | Improve legends of the map: e.g. maps are too slow / legends too large and not accessible  | Correct maps: Map application only displays the largest industries, several sites are missing or geographically misplaced or in the wrong industrial category.   |  |
| NUTS                    |  | Clarify NUTS: NUTS region/polygon for the off shore sector needs to be clarified (presently the site assumes the off shore NUTS are wrong as they are not land based)  |  |
| Comparability           |  | Allow comparison with other sources at facility level, e.g. LCP, ETS and UWWTP   | Include comparison with diffuse sources: diffuse sources are not compared to the emissions from facilities. Such a comparison would help understand the dimensions of diffuse emissions compared to point sources. |
| Missing / Verified data |  | Include/explain missing data and validate data: e.g. a number of facilities are missing in the reporting, some data reported to national authorities are missing, some figures reported by operators have been published in a different way. | Assess and verify data reported by operators: ensure credibility and confidence in the system through clear, transparent and rigorous assessment and verification procedures                                       |

## D SCOPE ANALYSIS OF THE E-PRTR REGULATION

### D.1 Methodology

#### D.1.1 Evaluation of the completeness, emission levels and representativeness of E-PRTR data

##### D.1.1.1 Reference year

The reporting year 2009 has been selected as reference year because the 2009 dataset proved to be the most solid. The results of the 2011 informal E-PRTR review also indicated that the 2009 E-PRTR dataset is the most complete (ETC ACM 2011).

The water section was complemented by data from the Urban Wastewater Treatment Directive (UWWTD) dataset<sup>13</sup> and State of the Environment (SoE) Reporting<sup>14</sup>. UWWTD data refer to the reporting years 2007 or 2008 and SoE data to the reporting years 2008 and/or 2009. Uncertainties introduced by comparison of emissions data from different years are taken into account in the conclusions drawn.

##### D.1.1.2 Identification of outliers

Potential outliers have not been considered in the threshold analysis. The following approach has been used for the identification of potential outliers:

- 1) Identification of potential outliers by applying defined criteria: a) release/transfer reports amounting to more than 10% of total E-PRTR releases/transfers and b) exceeding 10,000 times the E-PRTR Annex II threshold
- 2) Identification of potential outliers by application of the cumulative Weibull function. The shape parameters of the cumulative Weibull function determined by non-linear regression are used for the identification of potential outliers.

The outliers identified in these two steps were compared and the result completed by expert judgement. For a more detailed description refer to [Appendix 7](#).

##### D.1.1.3 Identification of key activities

This step involves identifying the major sources (E-PRTR Annex I activities) of releases of each E-PRTR Annex II pollutant based on the E-PRTR data for 2007, 2008 and 2009 by evaluating the relative contributions of various Annex I activities to the total release. Key activities have been defined as those activities which together contribute to at least 80% of total E-PRTR releases of a specific pollutant.

It is assumed that key activities do not show high variations between the different reporting years. Key activities can be used for focusing the analysis of time series consistency, cross pollutant checks and statistical correlation of the most important activities of E-PRTR reporting. If the pollutant is also reported under CLRTAP or UNFCCC, a comparison between E-PRTR releases to air and CLRTAP/ UNFCCC is expected to show satisfying coverage and a similar yearly or short term (three years) trend in emissions.

##### D.1.1.4 Analysis of completeness and representativeness

The purpose of this step was to check the completeness of reported releases/transfers and to evaluate the representativeness of reported data. For this analysis, only the regular quantity of re-

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<sup>13</sup> <http://www.eea.europa.eu/data-and-maps/data/waterbase-uwtd-urban-waste-water-treatment-directive>

<sup>14</sup> <http://dd.eionet.europa.eu/>

leases/transfers was considered and accidental releases were excluded. In this step, E-PRTR data were compared to reference documents and data such as information reported under CLRTAP, UNFCCC, ETS, SoE and UWWTD. To assess the completeness and representativeness of E-PRTR data, the following analyses were performed:

- Comparison with Appendix 4 and 5 of the E-PRTR Guidance Document (European Commission, 2006).

Appendix 4 and Appendix 5 of the E-PRTR Guidance Document provide matrixes of activities and pollutants for which a release might be expected. The comparison identified activities and pollutants for which reporting might be expected but did not occur.

- Comparison of the number of E-PRTR facilities with the number of IPPC permits reported by EU-27 Member States (ENTEC, 2009).

The number of IPPC permits<sup>15</sup> is the best data available and most Member States report this figure at detailed activity level. The comparison indicates whether there are any potential gaps in reporting for a specific country and activity and allows for a comparison of the share of IPPC facilities in E-PRTR facilities across countries. However, the comparison is limited by the fact that one E-PRTR facility might include more than one IPPC installation.

- Comparison of air releases with air pollutants reported under CLRTAP and the NEC Directive and with greenhouse gas emissions reported under the UNFCCC (air specific test). Data reported under the CLRTAP and the Kyoto Protocol are regularly reviewed by international experts. It is the most reliable data source for verification of air pollutants and greenhouse gases at country level and therefore used as the most important reference.

For this approach the outcome of the E-PRTR informal review (ETC ACM, 2011) has been analysed and the analysis has been extended to all reporting years.

- Identification of pollutants with limited reporting

Pollutants from E-PRTR Annex II were identified for which only a low number of release/transfer reports are available. All Annex II pollutants for which ten or fewer release/transfer reports are available for the reporting years 2007, 2008 and 2009 were flagged. The result of the assessment was checked against the indicative list of pollutants per sector according to Annex 5 of the E-PRTR Guidance Document. The availability of no or only a small number of release/transfer reports (although releases/transfers of the relevant pollutant/sector combination would be expected according to the indicative list in Annex 4 and 5 of the E-PRTR Guidance Document) may be due to various reasons:

- Due to the banning of a pollutant no (or only a few) releases/transfers are expected but reporting is assumed to be complete.
- The low number of release/transfer reports is due to incomplete reporting.
- The pollutant threshold is too high. This is indicated by the finding that most of the release/transfer quantities are close to the threshold.
- The pollutant may eventually prove not to be typical for a specific sector.

- Correlation of air releases with other statistical data at country level

Where complete and consistent statistical data at country level were available the correlation with air emissions was analysed. This approach is limited to some selected pollutants and activities.

- A cross pollutant analysis of air releases by NACE codes

For some specific combinations of pollutants and technologies a correlation of releases was calculated at country level. Comparable technologies were identified by NACE codes rather than by main activities. Due to different emission limit standards at country level and different emission permits at facility level the variation is expected to be very high and the analysis

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<sup>15</sup> [http://eea.eionet.europa.eu/Public/irc/eionet-circle/reporting/library?l=/ippc/ippc\\_permitting&vm=detailed&sb=Title](http://eea.eionet.europa.eu/Public/irc/eionet-circle/reporting/library?l=/ippc/ippc_permitting&vm=detailed&sb=Title)

thus has its limitations. However, for specific cases potential misreporting may be identified by this approach, e.g. high outliers or gaps in reporting.

- Time series analysis of air emissions at main activity and country level

Time series of 2007 to 2009 at country - and key activity - level were analysed. Large annual changes indicate potential misreporting. Annual changes at country level were compared with annual changes reported under CLRTAP and UNFCCC.

- Facility analysis

When applying the approaches listed above it was sometimes necessary to check data at facility level, especially if few release/transfer reports for a specific pollutant were available or a high outlier or a gap was identified. This analysis can confirm high outliers, highlight further misreporting or confirm that reporting is plausible based on expert judgement.

- Comparison of water emissions with UWWTD reporting data
- Comparison of water emissions with SoE reporting data

For a more detailed description of the methods listed above refer to [Appendix 7](#).

#### **D.1.1.5 General remarks and assumptions**

The number of pollutants relevant for air is very high (61). The availability of consistent information at country level which could be used for validation is limited to: CLRTAP, UNFCCC, ETS and production statistics from e.g. Eurostat or international industry associations. In the case of CLRTAP and UNFCCC data, it is assumed that a comparison with energy/production statistics is part of the regular reviews and therefore these data are consistent with the statistics. It has to be noted that air emissions are under a strong regulatory regime (NEC Directive, EU Monitoring Mechanism Decision) in the EU and in EU Member States and that emission reductions due to measures can be remarkable at industrial plant level and at country level. A decline in total E-PRTR emissions for regulated air pollutants therefore indicates that the regulations in place are effective rather than indicating misreporting.

For releases into land the same pollutants and thresholds as for water are defined in the E-PRTR Regulation. Annexes 4 and 5 of the E-PRTR Guidance Document provide a list of expected pollutants to air and water per activity. No such annex is provided for releases to land. Releases into land are reported but reporting is limited to some pollutants and activities and significantly differs across countries.

The results of the time series analysis for the years 2007-2009 that was performed for air, water and waste under the ETC ACM in 2011 will be summarized in a separate ETC ACM document.

#### **D.1.2 Analysis of E-PRTR Annex II thresholds**

The threshold analysis aims at evaluating the scope of the E-PRTR Regulation and at assessing whether the thresholds in Annex II of the E-PRTR Regulation are suitable for achieving the 90% coverage target. A number of different methodologies were applied to evaluate Annex II thresholds.

##### **D.1.2.1 Weibull function**

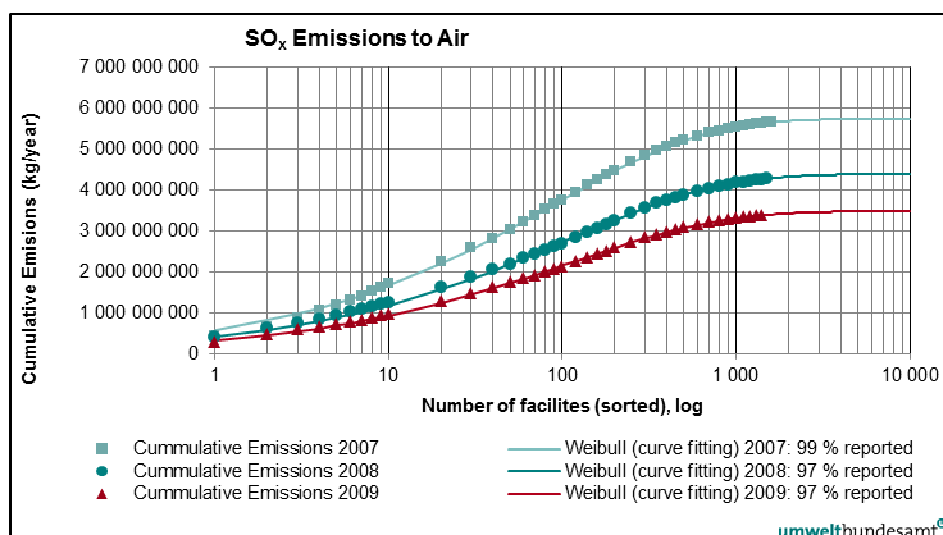
The Weibull function is a statistical approach which was used as the main tool to assess Annex II thresholds. The difficulty in assessing whether 90% of the emissions of a specific E-PRTR Annex II pollutant are covered is the determination of the maximum expected release/transfer quantity because emissions below the E-PRTR reporting thresholds are unknown. Since this information is not available, an extrapolation of the expected total release/transfer quantity has to be carried out by

using indirect methods. The distribution function of emissions of a certain pollutant is estimated and total emissions of the pollutant are derived by integrating this estimated distribution function<sup>16</sup>.

For a specific pollutant, all facility emissions are sorted from largest to smallest and the cumulative emissions are calculated as a function of the number of facilities included, resulting in an observed cumulative frequency distribution curve. The data are fitted to the three-parametric Weibull function by non-linear regression through application of the least squares method. For the calculation the software SigmaPlot<sup>17</sup> was used. Since the function is cumulative, the limit value of this distribution (parameter a) is assumed to represent the total emissions of all facilities. Applicability of the Weibull distribution to the background dataset was assessed by testing whether the data are distributed normally around the fitted regression line. For more details on the cumulative Weibull function applied refer to [Appendix 9](#).

The threshold analysis using the cumulative Weibull distribution was performed for all air and water pollutants and all three reporting years if at least ten / fifteen release/transfer reports were available and reporting had not been found to be incomplete during the completeness assessment (see D.1.1). For the threshold analysis, outliers were removed from the dataset (see Table 96 (air) and Table 72 (water) in [Appendix 8](#)).

**Figure 2: Example of curve fitting - SO<sub>x</sub> emissions to air**



In case the data for a specific pollutant and medium were not distributed normally or the Weibull function resulted in coverage of less than 90%, the data were further analysed at the level of key activities<sup>18</sup>.

For the pollutants for which the statistical approach could not be applied or did not deliver any results, methods other than the Weibull analysis were used (see D.1.2.2 to D.1.2.5).

### D.1.2.2 Specific methodologies for air

In case the statistical approach was not applicable because the number of release reports was too small a check was performed whether all reported quantities were close to the pollutant threshold. If this criterion applied the pollutant threshold was considered to be too high.

<sup>16</sup> The same approach was implemented during first review of EPER data (see Pulles, 2007).

<sup>17</sup> <http://www.sigmaplot.com/products/sigmaplot/sigmaplot-details.php>

<sup>18</sup> The key activities in this report refer to all activities which contribute to at least 80% of the total E-PRTR releases of a selected pollutant.



Secondly, a check was carried out whether the pollutant is banned or controlled under the Montreal Protocol<sup>19</sup> or the Stockholm Convention<sup>20</sup>. In addition, a comparison with UNFCCC and CLRTAP data was carried out if applicable.

In case the Weibull approach showed a satisfactory coverage for the years 2007 and 2008 but not for 2009 and the trend in total releases decreased, it was checked whether this was due to a decrease at facility level of e.g. 20% of the top polluters or due to incomplete reporting. If the decreasing trend was supported by other statistical data, e.g. emissions trends from UNFCCC and CLRTAP inventories, the pollutant threshold was assessed to be adequate. In case incomplete reporting was identified, the respective year was excluded from further threshold analysis.

#### **D.1.2.3 Specific methodologies for water**

Further analysis was required for releases reported by independently operated wastewater treatment plants (IOWWTPs) (E-PRTR main activity 5.(g)). Member States were asked to provide information on IOWWTPs directly discharging into waters with capacities below the E-PRTR Annex I threshold for 2007 on a voluntary basis.

Eight Member States provided data on IOWWTPs concerning treatment capacities and release data. These eight Member States are Belgium, Germany, France, Lithuania, Poland, Romania, Slovakia and the United Kingdom. The data provided by these Member States were assessed individually on a country by country basis.

#### **D.1.2.4 Specific methodology for land**

For releases into land, reporting has been identified to be inconsistent between reporting years, countries and activities and to be incomplete. Furthermore, no other statistics are available which could be used for an evaluation of completeness. As a result, no further analysis was conducted for land.

#### **D.1.2.5 Specific methodologies for waste**

The E-PRTR data include waste transfers related to non-hazardous waste and hazardous waste and information on whether the waste is transferred for recovery or disposal and on whether the hazardous waste is treated inside the country or moved by transboundary shipment.

A waste transfer does not include waste handled at the facility itself. Only transfers larger than 2,000 tonnes of non-hazardous waste and 2 tonnes of hazardous waste must be reported. As a consequence, waste transfers from a facility rarely amount to the overall generation of waste at that facility. However, waste generation is the best approximation to use for comparisons. There are limited options only for using other data sources for comparison with E-PRTR waste data. In order to identify the completeness and potential problems of E-PRTR reporting of waste data the following activities were undertaken:

- Waste transfer data was compared with the generated amounts reported to Eurostat for 2008 according to the EU Waste Statistics Regulation. The waste intensity per sector in the EU and in each country was also compared to waste transfer data. The intensity is defined as waste amount per number of employees and per gross value added.
- In order to evaluate the quality of data on recovery and disposal, the development in each country for each E-PRTR activity was assessed from 2007 to 2009 based on the E-PRTR data. Waste moved by transboundary shipment was compared to 2007, 2008 and 2009 da-

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<sup>19</sup> Montreal Protocol on Substances that Deplete the Ozone Layer

<sup>20</sup> Stockholm Convention on Persistent Organic Pollutants

ta which EU Member States submitted to the Commission in accordance with the EU Waste Shipment Regulation<sup>21</sup>.

- Special focus was put on assessing the quality of reporting from landfills, incineration plants and power stations. The number of reported landfills in each country was compared to the numbers reported for 2009 according to the EU Landfill Directive. The number of landfills reporting waste transfers of leachate was investigated in more detail and the number of incineration plants for 2009 was compared to information obtained from the Confederation of European Waste-to-Energy Plants. Finally, the amount of waste transfer from power stations with a special focus on coal-fired power stations was compared to information from Eurostat and the European Coal Combustion Products Association for the year 2008.

Detailed information on the methodology for the assessment of waste transfers is included in [Appendix 10](#).

## D.2 Results of the scope analysis

### D.2.1 Identification of outliers

The identification of potential outliers (the procedure is described in detail in [Appendix 8](#)) resulted in the identification of:

- Five potential outliers for releases to air (one for the year 2008, four for the year 2009)
- Eight potential outliers for releases to water
- 19 potential outliers for transfers to water

These potential outliers were removed from further analysis. Detailed lists of the potential outliers that were excluded from the statistical analysis are presented in [Appendix 8](#), Table 96 (air) and Table 72 (water).

### D.2.2 Completeness and representativeness

Thirty-two countries (EU-27, Iceland, Liechtenstein, Norway, Switzerland and Serbia) reported a total of 28,510 facilities under E-PRTR 2009<sup>22</sup>. The total number of release and transfer reports in E-PRTR 2009 for the media air, water, land and transfer in water amounted to 40,198. In total, 16,638 facilities reported domestic transfers of hazardous waste, 9,489 facilities reported transfers of non-hazardous waste and 1,274 facilities reported transboundary transfers of hazardous waste.

The total number of E-PRTR facilities increased by 10% between 2007 and 2009. The increase in the number of facilities between 2008 and 2009 was very small (Table 2). The 10% increase rather reflects incomplete reporting of 2007 data than an actual increase in the number of facilities reporting to E-PRTR in 2008 and 2009.

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<sup>21</sup> Regulation (EC) No 1013/2006 of the European Parliament and of the Council of 14 June 2006 on shipments of waste

<sup>22</sup> Data submitted by countries by 31 March 2011

**Table 2: Number of facilities reported under E-PRTR**

|  | E-PRTR 2007 | E-PRTR 2008 | E-PRTR 2009 | difference<br>2009-2007 | difference<br>2009-2008 |
|--|-------------|-------------|-------------|-------------------------|-------------------------|
| Total number of facilities –<br>submission by 31 March 2011        | 26,059      | 28,170      | 28,471      | 9%                      | 1%                      |
| Total number of facilities –<br>submission by 30 September<br>2011 | 26,395      | 28,358      | 29,157      | 10%                     | 3%                      |
| Difference (March submission<br>vs. September submission)          | 1.3%        | 0.7%        | 2.4%        |                         |                         |

In the same period (2007-2009) the total number of release reports to air decreased by 3%, the number of release reports to water increased by 44%, the number of pollutant transfer reports in water decreased by 3 % and the number of release reports to land increased by 27 % (Table 141 to Table 144 in [Appendix 14](#)).

#### D.2.2.1 Comparison of March and September 2011 E-PRTR submission

The completeness of resubmitted data (by 30 September 2011) seems to be slightly higher compared to the E-PRTR dataset based on countries' submissions by 31 March 2011 (Table 1). The differences between the two submissions in the total number of E-PRTR facilities are minimal. A difference of more than 5% in number of facilities was observed for five countries only (Table 140 in [Appendix 14](#)).

The total number of E-PRTR release reports to air reported in March compared to September 2011 did not change by more than 2.1% for any year in the period 2007 to 2009. In four countries only (Austria, Denmark, Hungary, Norway) the number of release reports to air increased by more than 5% in one year (Table 141). These changes do not affect the entire E-PRTR dataset significantly and do not influence the results of the completeness analysis.

The total number of release reports to water increased by more than 10% for all years in the September 2011 dataset, which indicates that completeness of the reported releases to water improved. In Ireland and Hungary, the number of release reports to water decreased in the resubmitted September 2011 dataset (Table 142).

Reporting of pollutant transfers into water followed a different trend: the total number of transfer reports for all years decreased by 3% to 5% in the resubmitted September 2011 dataset (Table 143). This overall decrease is due to a large reduction in the number of release reports to water in absolute and relative numbers in the United Kingdom (approximately minus 40%).

Reporting of releases to land in the resubmitted dataset slightly increased by about 2 to 4% for all years (Table 144) but still seemed to be rather inconsistent and incomplete. Altogether, only eleven countries reported releases to land for at least one reporting year.

The resubmitted E-PRTR dataset of September 2011 did not result in large changes in the overall quantity of releases/transfers of the reported pollutants except for PCDD/PCDF (-34%) and TCB (+84%). These significant changes are due to the resubmissions by France (TCB, PCDD/PCDF) and Poland (PCDD/PCDF).

The updated September E-PRTR dataset for 2009 did not result in large changes in the reported waste quantities. Thus, the results of the waste transfer data assessment, which are based on the March 2011 dataset, were not affected.

### D.2.2.2 Releases to air

#### **Pollutants**

The E-PRTR Regulation defines a threshold for releases into air for 60 pollutants<sup>23</sup>, which indicates that reporting of releases to air might be expected for all these pollutants. However, releases for 49 pollutants only have been reported and reporting cannot be considered to be complete for all of them.

11 pollutants i.e. one chlorinated organic substance (hexabromobiphenyl) and almost all pesticides (aldrin, chlordane, chlordecone, DDT, dieldrin, endrin, heptachlor, lindane, mirex, and toxaphene) have not been reported for any of the reporting years 2007 to 2009. The reasons for non-reporting vary, e.g. production and use of pesticides and chlorinated organic substances is strongly regulated and banned by the Stockholm Convention.

Seven pollutants (Table 3) were reported by a few facilities only or by a single facility for a single year, which indicates misreporting, a high threshold, restricted substances, pollutants which only arise from very specific production processes or a combination of these reasons.

Table 3 lists the E-PRTR Annex I air pollutants with poor consistency in reporting and pollutants for which releases to air are strongly regulated due to their severe impact on humans and the environment. For most of these pollutants the statistical (Weibull) approach could not be applied because the number of releases is too small or values are not normally distributed.

**Table 3: List of air pollutants with low consistency in reporting**

| Pollutant                 | Finding   | Rationale   |
|---------------------------|---|---|
| 1,1,1-trichloroethane     | Mainly reported by landfills in the United Kingdom. A single chemical plant reports 80% of total emissions (all three years). | Solvent that is controlled by the Montreal Protocol (ozone depletor). REACH <sup>24</sup> ANNEX XVII restricts the use but does not completely ban it from the market.  |
| 1,1,2,2-tetrachloroethane | Seven releases only in 2009. One refinery, one chemical plant and some landfills.   | Inhomogeneous reporting indicates high uncertainty. Used as a refrigerant and as a solvent. REACH ANNEX XVII restricts the use but does not completely ban it from the market.  |
| Asbestos                  | Reported by a single waste handling plant in 2008 only (twice the threshold value).   | Indicates that threshold is too high if 90% of emissions from waste handling should be reported. It is assumed that asbestos is no longer used or manufactured within Europe with the exceptions of REACH ANNEX XVII. |
| Halons                    | One chemical plant reports 86% of total releases. Only 14 releases in 2009.   | Except for the chemical plant, all releases are very close to the threshold. Indicates that the threshold is too high. Used as fire extinguisher; ozone depletor. Controlled by the Montreal Protocol.                |

<sup>23</sup> CO<sub>2</sub> not including biomass is reported on a voluntary basis and is thus not included in Annex II of the E-PRTR Regulation.

<sup>24</sup> Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

| Pollutant                              | Finding  | Rationale   |
|--|--|---|
| Hexachlorobenzene (HCB)                | Only three releases reported in 2009. Inhomogeneous reporting.   | All releases are very close to the threshold. Indicates that the threshold is too high. HCB is mainly released by unintentional releases (by-product). The substance is controlled by the Stockholm Convention.         |
| Trichlorobenzenes (TCBs) (all isomers) | Only 21 plants reported in 2009, mostly from landfills in the United Kingdom. All values are close to the threshold. | All reported releases are very close to the threshold. This indicates that the threshold is too high. REACH ANNEX XVII bans use except for closed applications or the use as a by-product.                              |
| Anthracene                             | Only seven plants reported in 2009. Time series consistency of reporting is not given with a few exceptions.         | Two facilities (aluminium production and coke oven) report releases significantly above the threshold. The releases of other five facilities are close to the threshold. This indicates that the threshold is too high. |

To assess the completeness of E-PRTR reporting under the informal review (chapter C.2), E-PRTR releases are compared with national inventory totals without transport reported under CLRTAP/UNFCCC (ETC ACM, 2011).

Only three countries reported higher CO<sub>2</sub> releases under E-PRTR than under the UNFCCC, which is due to the fact that under E-PRTR total CO<sub>2</sub> releases including those from biomass combustion are reported. Currently, reporting of CO<sub>2</sub> emissions without biomass takes place only on a voluntary basis and only a few countries actually report it. CO<sub>2</sub> emissions from biomass combustion are not considered a controlled greenhouse gas under the Kyoto Protocol or the EU ETS but reported for informational purposes only. For reasons of consistency and comparability with UNFCCC and EU ETS data of E-PRTR CO<sub>2</sub> releases it is suggested to include CO<sub>2</sub> without biomass as a mandatory pollutant in Annex II of the E-PRTR Regulation.

The share of **NH<sub>3</sub>** E-PRTR releases from poultry and pig farms of the overall emissions reported under CLRTAP ranges between 0.5% and 85%. Cattle farms, which are the most relevant source for NH<sub>3</sub> emissions under CLRTAP, are not covered by the E-PRTR Regulation.

For **NM VOC** the share of E-PRTR releases from manufacturing industries of the overall CLRTAP emissions ranges between 31% and 102%. However, comparison is limited because solvent use by small companies, which is a key source of NM VOC, is included in CLRTAP but not covered by the E-PRTR Regulation.

For **PM<sub>10</sub>** the share of E-PRTR in CLRTAP is below 90% for almost all countries except Bulgaria, Denmark and Romania. The comparison of E-PRTR data with CLRTAP is limited because fugitive PM<sub>10</sub> emissions (e.g. from mining activities, construction sites) are included in CLRTAP but not covered under E-PRTR. An analysis at facility level showed that countries with a large contribution to total E-PRTR PM<sub>10</sub> releases (Spain, Poland, United Kingdom, Germany) reported significant reductions of PM<sub>10</sub> from 2007 to 2009, especially in the sectors 1.(c) and 2.(b). This is due to significantly lower releases reported by specific facilities and to fewer facilities exceeding the threshold. One explanation is that large coal plants in some countries (e.g. Germany, Poland) have been equipped with abatement technologies during the last few years.

For **dioxins & furans, persistent organic pollutants (POPs) and heavy metals** the share of E-PRTR releases in CLRTAP emissions varies significantly but this may be due to the fact that many national inventories do not consider plant specific data in their estimates. Furthermore, measurements of these pollutants are expensive and are associated with high uncertainty at flue gas con-

centrations close to the detection limit. Thus lowering the reporting thresholds of these pollutants would imply higher uncertainty levels in reported emissions.

**Table 4: Number of E-PRTR facilities reporting releases into air for the year 2009 and number of IPPC installations**

| IPPC activity                               | Number of E-PRTR facilities reporting releases into air (where comparable) | Number of IPPC installations | Share of E-PRTR facilities in IPPC installations |
|---|--|------------------------------|--|
| <b>Total</b>                                | <b>11,662</b>  | <b>43,264</b>                | <b>27%</b>                                       |
| 1. Energy industries                        | 1,526  | 2,755                        | 55%  |
| 2. Ferrous metals                           | 603  | 4,952                        | 12%  |
| 3. Minerals industry                        | 807  | 2,279                        | 35%  |
| 4. Chemicals industry                       | 778  | 4,576                        | 17%  |
| 6. Other activities - 6.6 intensive farming | 3,679  | 11,971                       | 31%  |

Note: The comparison is limited by the fact that one E-PRTR facility may correspond to more than one IPPC facility.

Table 4 compares the number of facilities reporting releases into air to the number of IPPC installations for the EU-27 Member States. For Spain, the number of IPPC installations is not available at sectoral level and therefore not considered in the sectoral figures. The comparison with the number of IPPC installations for the EU-27 Member States shows that for most countries the number of IPPC permits is significantly higher than the number of E-PRTR facilities which report releases into air. At sectoral level it is interesting to note that some smaller countries report fewer IPPC installations than E-PRTR facilities.

### Activities

Countries reported information on releases for 44 out of the 45 E-PRTR main activities. The comparison with the E-PRTR Guidance Document (Appendix 4) shows that for some activities no releases (3.(d)) or limited releases (1.(f), 9.(b) and 9.(e)) of any expected pollutant into air have been reported, especially for:

- 1.(f) Installations for the manufacture of coal products and solid smokeless fuel (16 facilities)
- 3.(d) Installations for the production of asbestos and the manufacture of asbestos-based products (0 facilities)
- 9.(b) Plants for the tanning of hides and skins (19 facilities)
- 9.(e) Installations for the building of, and painting or removal of paint from ships (105 facilities)

Reporting of the following pollutant groups shows discrepancies to Annex 4 of the E-PRTR Guidance Document:

- **Heavy metals:** Some activities are listed as a potential source of most heavy metals but not all of them seem to be relevant.
- **Chlorinated organic substances:** mainly released by unintentional production. In general, poor reporting (low number of reports) that is limited to chemical plants and to reporting from waste landfills/recycling.
- **Pesticides:** banned and therefore not reported.
- **Fluorinated GHGs** (PFCs, HFCs, SF<sub>6</sub>): The pollutant threshold is possibly set too high for most of the activities listed in Annex 4 of the E-PRTR Guidance Document.

For some of the E-PRTR activities (e.g. 1.(e), 4.(f), 6.(c), 8.(a), 8(b), 9.(c)) only a few pollutants listed in Annex 4 of the E-PRTR Guidance Document are reported, which may indicate that the activity itself is not relevant for the expected air pollutants.

### D.2.2.3 Releases to water

For all 71 pollutants included in Annex II of the E-PRTR Regulation with a reporting threshold for releases into water, at least one release report is available.

For 27 pollutants the number of release reports is below ten in at least one of the three reporting years (2007, 2008 and 2009). These 27 pollutants are listed in Table 74 in [Appendix 8](#). Except for three of these 27, all pollutants are strongly regulated. This means that they are either subject to bans, unauthorised plant protection products or biocides or subject to restrictions on their use and placing on the market (Table 74 in [Appendix 8](#)). The absence of release reports can be explained by these restrictions. Nevertheless, a few release reports for these pollutants remain, mainly originating from urban wastewater treatment plants (E-PRTR Annex I activity 5.(f)). Reporting has to be considered to be incomplete due to the fact that more facilities (other than the reporting facilities) are expected to release these pollutants. However, since these pollutants are usually not monitored in urban wastewater treatment plants, operators do not have the necessary information to quantify these releases.

Three substances are not subject to restrictions on marketing and use: chlorpyrifos, hexachlorbutadiene (HCBD) and ethylene oxide:

- **Chlorpyrifos** is an insecticide authorized in 21 Member States in the European Union<sup>25</sup>.
- **Ethylene oxide** is an industrial chemical and according to the European Substance Information System (ESIS)<sup>26</sup> it is a high production volume chemical and 23 producers/importers are listed in ESIS.
- **Hexachlorbutadiene** is an industrial chemical and according to the European Substance Information System (ESIS) it is a low production volume chemical and four producers/importers are listed in ESIS. Hence, for these three substances a higher number of release reports would be expected and reporting for these three substances is regarded to be incomplete.

For the other 44 pollutants listed in Annex II of the E-PRTR Regulation with a threshold for releases to water, more than ten release reports are available for all reporting years. Several pollutants can be linked to one major source activity which contributes more than 80% of the total release. A detailed list of these pollutants is provided in Table 73 in [Appendix 8](#).

For several of these pollutants the available release reports originate from facilities in the United Kingdom. Compared with other data sources (e.g. IPPC permits, total number of facilities reporting for an E-PRTR Annex I activity, UWWTD database) the facilities in the United Kingdom contribute 10 to 15% of the overall number and it is assumed that facilities situated in other countries should also report discharges of these pollutants. Hence, reporting is assessed to be incomplete for these substances.

In the 2011 E-PRTR Informal Review Report (ETC ACM, 2011) covering the 2009 E-PRTR dataset, activity 7(b) intensive aquaculture was investigated. The FAO production statistics were compared to release reports available in E-PRTR. It was observed that no E-PRTR release/transfer reports were available from countries with high production numbers (e.g. France and Greece) highlighting a potential incompleteness of E-PRTR reporting. For further details see ETC ACM (2011).

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<sup>25</sup> [http://ec.europa.eu/sanco\\_pesticides/public/index.cfm?event=activesubstance\\_detail](http://ec.europa.eu/sanco_pesticides/public/index.cfm?event=activesubstance_detail)

<sup>26</sup> <http://esis.jrc.ec.europa.eu/>

### ***Cross pollutant analysis***

Cross pollutant analysis was performed for total nitrogen, total phosphorus, cyanides, chlorides, fluorides, halogenated organic compounds and phenols with TOC as reference parameter. The data of reporting years 2007 to 2009 were combined in order to have a broad dataset available that allows for reliable conclusions. For most activities the calculated ratios vary within one order of magnitude. This shows that the cross pollutant analysis can be used for assessing the completeness of reporting. Potential data gaps indicating potentially missing release reports were identified for total nitrogen, total phosphorus and TOC, whereas for cyanides, fluorides and phenols reporting seems to be more complete. These observations are in line with the results obtained from the threshold analysis. For a detailed description of the results of the various tests performed, including a list of observations, see Table 77 to Table 83 in [Appendix 8](#).

In the 2011 E-PRTR Informal Review Report (ETC ACM, 2011) a cross pollutant check for activity 7(b) intensive aquaculture was performed for the countries that provided data for comparison (Malta, Norway and the United Kingdom). For TOC/total nitrogen and TOC/total phosphorus the results are comparable for the three countries. For TOC/zinc the ratio for Malta is about half compared to the ratio for Norway and the United Kingdom. Whereas for other pollutants the ratios are comparable between in Norway and the United Kingdom, the ratios of TOC/copper differ considerably. For further details see ETC ACM (2011).

### ***Comparison of water emissions to UWWTD reporting data***

The UWWTD database includes 1,344 urban wastewater treatment plants with an incoming load or a treatment capacity of more than 100,000 population equivalents (pe). When comparing the number of E-PRTR facilities under activity 5.(f) to the number of plants in the UWWTD, coverage of more than 70% is reached.

The UWWTD database may also contain information on releases of total nitrogen, total phosphorus and TOC to water but this information is voluntary and provided by a few Member States only. Due to potential inconsistencies in reporting, these data cannot be used to assess whether reporting under E-PRTR is complete and whether the 90% coverage is reached. For more details see [Appendix 8](#).

### ***Comparison of water emissions to SoE reporting data***

SoE data are aggregated at the national level. The reports on releases into water were assessed in terms of consistency between reported releases from the various Annex I activities and Annex II substances because comparable emissions are to be expected within a release category.

The results of this assessment show a heterogeneous picture with SoE / E-PRTR ratios between 28 % (lead in 2007) and 264 % (copper in 2009). The assumption that E-PRTR values should be slightly lower than SoE data was confirmed in some cases only (e.g. nickel). Higher values of E-PRTR discharges indicate possible incomplete reporting for SoE. The informative nature of the comparison of E-PRTR data to SoE data is therefore very limited and not suitable for an assessment of completeness and representativeness of E-PRTR reporting. For more details see [Appendix 8](#).

#### **D.2.2.4 Transfers to water**

For seven of the 71 pollutants listed in Annex II of the E-PRTR Regulation with a threshold for releases to water no transfer report is available. These seven pollutants are chlordecone, chlorpyrifos, isoproturon, mirex, toxaphene, triphenyltin compounds and trifluralin. Except for chlorpyrifos and isoproturon (two herbicides authorised in Europe) all these substances are strongly regulated or banned.

For an additional 36 Annex II pollutants fewer than ten transfer reports are available for one of the three reporting years. These pollutants are listed in Table 74 and Table 76 in [Appendix 8](#).



As already pointed out for releases to water, a low number of transfer reports is justified for pollutants subject to bans or to other severe restrictions. For pollutants for which no such restrictions exist a larger number of transfer reports would be expected and therefore reporting is considered to be incomplete. A reason for this discrepancy between the expectations and the reporting might be that these pollutants are usually not limited in wastewater discharge permits, which usually focus on sum parameters (e.g. COD). Therefore, these parameters are not frequently monitored and hence not reported. The pollutants of concern are chlorpyrifos, hexachlorbutadiene (HCB), isoproturon, ethylene-oxide, tetrachloroethylene (PER), tetrachloromethane (TCM) and trichloroethylene (TRI).

#### **D.2.2.5 Releases to land**

Only a small number of countries reported releases into land. France, Norway, the United Kingdom and Germany reported most of the releases.

The following list shows the main findings of the data analysis:

- Reporting is inhomogeneous throughout activities.
- Most releases to land were reported by France. France reports a high number of releases under activity 5.(f) Urban waste-water treatment plants.
- Norway reports a comparatively high number of releases but only under activity 5.(d) Landfills. No other countries report under this activity.
- Most of the releases are reported under activity 5.(f) Urban waste-water treatment plants.

An analysis of the pollutants shows that 80 % of reporting from France is related to heavy metals. Besides heavy metals, chlorinated organic substances, inorganic chlorinated substances and other inorganic substances were reported (but no other pollutants).

### **D.2.3 Results of the threshold analysis**

#### **D.2.3.1 Results for air**

The statistical approach was applied to all pollutants with more than 15 releases per year and the analysis was carried out for all three reporting years (2007, 2008 and 2009). No significant differences were observed between the individual years ([Appendix 11](#)). For some of the pollutants the Weibull approach was not applicable for all years because values were not normally distributed. Table 5 provides an overview of the results for all relevant pollutants for air. The statistical approach shows that for the majority (36) of the reported air pollutants the 90% coverage is reached.

The seven pollutants listed below for which fewer than 20 release reports were reported were analysed at facility level. Most of them are considered to be reported in a very inconsistent way, which does not allow any assessment of the current thresholds.

- Halons
- Hexachlorobenzene (HCB)
- 1,2,3,4,5,6-hexachlorocyclohexane (HCH)
- Pentachlorobenzene
- Pentachlorophenol (PCP)
- 1,1,2,2-tetrachloroethane
- Anthracene

**Naphtalene** was reported by 81 facilities. However, the Weibull function could not be applied because of inconsistent data across countries.

**Tetrachloroethylene** (PER), which is used as a solvent, is mostly reported from activity 2.(f) installations for surface treatment and from activities from sector 4 Chemical industry (29 facilities in all). The results from the Weibull function for 2009 data indicate that reporting might be incomplete.

For six pollutants (**CO**, **N<sub>2</sub>O**, **NH<sub>3</sub>**, **As**, **Cd**, **Cr**) a sectoral approach was applied (Table 99 in [Appendix 11](#)). The results of the Weibull analysis indicate that reporting of CO, N<sub>2</sub>O and Cr is complete (Table 100 in [Appendix 11](#)).

For two heavy metals (**As**, **Cd**) the 90% coverage is only reached for activity 2.(b) production of pig iron or steel but not for the other activities.

For **NH<sub>3</sub>** coverage of only 47% has been calculated for pig farms while other industrial sources are considered to be complete. Most of the NH<sub>3</sub> releases (55%) reported by pig farms are only twice as high as the threshold and account for 28% of the releases. This indicates that a large number of pig farms are not covered by E-PRTR. A comparison of the number of pig farms per country with animal population statistics shows that the reporting or estimation methods are not homogeneous, e.g. that the average number of pigs per pig farm reporting releases of NH<sub>3</sub> varies from 18,000 (Hungary) to 391,000 (the Netherlands). Since the capacity threshold of pig farms is 2,000 pigs, this indicates that the NH<sub>3</sub> threshold may be too high.

**Table 5: Number of releases for all air pollutants and results from the threshold analysis for the reporting year 2009**

| Pollutant   | Weibull function completeness | Complete ? | Number of releases 2009 | Comment   | Annex II Threshold [kg] | Modification of threshold |
|---|-------------------------------|------------|-------------------------|---|-------------------------|---------------------------|
| Methane (CH <sub>4</sub> )                          | 94%                           | yes        | 1706                    |   | 100,000                 | no                        |
| Carbon monoxide (CO)                                | 98%                           | yes        | 611                     |   | 500,000                 | no                        |
| Carbon dioxide (CO <sub>2</sub> )                   | 94%                           | yes        | 2358                    |   | 100,000,000             | no                        |
| Hydro-fluorocarbons (HFCs)                          | 101%                          | yes        | 229                     |   | 100                     | no                        |
| Nitrous oxide (N <sub>2</sub> O)                    | 100%                          | yes        | 691                     |   | 10,000                  | no                        |
| Ammonia (NH <sub>3</sub> )                          | 41%                           | no         | 5776                    |   | 10,000                  | -                         |
| Of which: 7.(a)                                     | 47%                           | no         | 5366                    | Inconsistent reporting among countries.   | 10,000                  | to be considered          |
| Of which: Other activities                          | 94%                           | yes        | 410                     |   | 10,000                  | no                        |
| Non-methane volatile organic compounds (NMVOC)      | 90%                           | yes        | 1017                    |   | 100,000                 | no                        |
| Nitrogen oxides (NO <sub>x</sub> /NO <sub>2</sub> ) | 93%                           | yes        | 2810                    |   | 100,000                 | no                        |
| Perfluorocarbons (PFCs)                             | 89%                           | yes        | 46                      |   | 100                     | no                        |
| Sulphur hexafluoride (SF <sub>6</sub> )             | 99%                           | yes        | 36                      |   | 50                      | no                        |
| Sulphur oxides (SO <sub>x</sub> /SO <sub>2</sub> )  | 97%                           | yes        | 1488                    |   | 150,000                 | no                        |
| Hydrochlorofluorocarbons (HCFCs)                    | 100%                          | yes        | 748                     |   | 1                       | no                        |
| Chlorofluorocarbons (CFCs)                          | 98%                           | yes        | 290                     |   | 1                       | no                        |
| Halons  | 100%                          | yes        | 14                      | Except for the chemical plant, all releases are very close to the threshold. Indicates that the threshold is too high.<br>Used as fire extinguisher. Ozone depletor. Controlled by the Montreal Protocol. | 1                       | yes                       |
| Arsenic and compounds (as As)                       | 84%                           | no         | 286                     |   | 20                      | -                         |
| of which: 2.(b)                                     | 98%                           | yes        | 24                      |   | 20                      | no                        |

| Pollutant                      | Weibull function completeness | Complete ? | Number of releases 2009 | Comment   | Annex II Threshold [kg] | Modification of threshold |
|--------------------------------|-------------------------------|------------|-------------------------|---|-------------------------|---------------------------|
| of which: Other activities     | 83%                           | no         | 262                     |   | 20                      | to be considered          |
| Cadmium and compounds (as Cd)  | 85%                           | no         | 292                     |   | 10                      | -                         |
| of which: 2.(b)                | 93%                           | yes        | 52                      |   | 10                      | no                        |
| of which: Other activities     | 80%                           | no         | 240                     |   | 10                      | to be considered          |
| Chromium and compounds (as Cr) | 89%                           | yes        | 218                     |   | 100                     | no                        |
| Copper and compounds (as Cu)   | 97%                           | yes        | 225                     |   | 100                     | no                        |
| Mercury and compounds (as Hg)  | 89%                           | yes        | 538                     |   | 10                      | no                        |
| Nickel and compounds (as Ni)   | 98%                           | yes        | 499                     |   | 50                      | no                        |
| Lead and compounds (as Pb)     | 97%                           | yes        | 247                     |   | 200                     | no                        |
| Zinc and compounds (as Zn)     | 97%                           | yes        | 473                     |   | 200                     | no                        |
| Aldrin                         | -                             | NA         | 0                       | Banned by Stockholm convention with exemptions. | 1                       | no                        |
| Chlordane                      | -                             | NA         | 0                       | Banned by Stockholm convention with exemptions. | 1                       | no                        |
| Chlordecone                    | -                             | NA         | 0                       | Banned by Stockholm convention.                 | 1                       | no                        |
| DDT                            | -                             | NA         | 0                       | Restricted by Stockholm convention.             | 1                       | no                        |
| 1,2-dichloroethane (DCE)       | 98%                           | Yes        | 27                      |   | 1,000                   | no                        |
| Dichloromethane (DCM)          | 100%                          | Yes        | 142                     |   | 1,000                   | no                        |
| Dieldrin                       | -                             | NA         | 0                       | Banned by Stockholm convention with exemptions. | 1                       | no                        |
| Endrin                         | -                             | NA         | 0                       | Banned by Stockholm convention.                 | 1                       | no                        |
| Heptachlor                     | -                             | NA         | 0                       | Banned by Stockholm convention with exemptions. | 1                       | no                        |

| Pollutant                               | Weibull function completeness | Complete ? | Number of releases 2009 | Comment   | Annex II Threshold [kg] | Modification of threshold |
|---|-------------------------------|------------|-------------------------|---|-------------------------|---------------------------|
| Hexachlorobenzene (HCB)                 | -                             | NA         | 3                       | Inconsistent reporting. All releases are very close to the threshold. Indicates that the threshold is too high.<br>HCB is mainly released by unintentional releases (by-product). The substance is controlled by the Stockholm Convention | 10                      | yes                       |
| 1,2,3,4,5,6-hexachlorocyclohexane (HCH) | -                             | NA         | 1                       | Alpha and beta-HCH are banned by the Montreal Protocol. Unintentional release as by-product.  | 10                      | no                        |
| Lindane                                 | -                             | NA         | 0                       | Banned by Stockholm convention with exemptions.   | 1                       | no                        |
| Mirex                                   | -                             | NA         | 0                       | Banned by Stockholm convention with exemptions.   | 1                       | no                        |
| PCDD + PCDF (dioxins + furans) (as Teq) | 100%                          | yes        | 243                     |   | 0.0001                  | no                        |
| Pentachlorobenzene                      | -                             | NA         | 3                       | Banned by Stockholm convention. Intermediate product.   | 1                       | no                        |
| Pentachlorophenol (PCP)                 | -                             | NA         | 4                       | Banned pesticide  | 10                      | no                        |
| Polychlorinated biphenyls (PCBs)        | 100%                          | yes        | 66                      | Banned by Stockholm convention with exemptions.   | 0.1                     | no                        |
| Tetrachloroethylene (PER)               | 67%                           | no         | 29                      | Used as solvent (dry cleaning). Reported emissions are expected to originate from unintentional release from production rather than from application.   | 2,000                   | to be considered          |
| Tetrachloromethane (TCM)                | 101%                          | yes        | 15                      |   | 100                     | no                        |
| Trichlorobenzenes (TCBs) (all isomers)  | 60%                           | no         | 21                      | All reported releases are very close to the threshold. This indicates that the threshold is too high.   | 10                      | yes                       |
| 1,1,1-trichloroethane                   | 97%                           | yes        | 23                      | Controlled by Montreal protocol   | 100                     | no                        |
| 1,1,2,2-tetrachloroethane               | -                             |            | 7                       | Inhomogeneous reporting. Restricted by REACH ANNEX XVII.  | 50                      | no                        |

| Pollutant                                 | Weibull function completeness | Complete ? | Number of re-releases 2009 | Comment   | Annex II Threshold [kg] | Modification of threshold |
|---|-------------------------------|------------|----------------------------|---|-------------------------|---------------------------|
| Trichloroethylene                         | 96%                           | yes        | 21                         |   | 2,000                   | no                        |
| Trichloromethane                          | 91%                           | yes        | 33                         |   | 500                     | no                        |
| Toxaphene                                 |                               | -          | 0                          | Banned by Stockholm convention.   | 1                       | no                        |
| Vinyl chloride                            | 94%                           | yes        | 43                         |   | 1,000                   | no                        |
| Anthracene                                | -                             |            | 8                          | Two facilities (aluminium production and coke oven) report releases significantly above the threshold. The releases of other five facilities are close to the threshold. This indicates that the threshold is too high. | 50                      | yes                       |
| Benzene                                   | 97%                           | yes        | 280                        |   | 1,000                   | no                        |
| Ethylene oxide                            | 99%                           | yes        | 12                         |   | 1,000                   | no                        |
| Naphthalene                               | NA                            | NA         | 80                         |   | 100                     | no                        |
| Di-(2-ethyl hexyl) phthalate (DEHP)       | 102%                          | Yes        | 31                         |   | 10                      | no                        |
| Polycyclic aromatic hydrocarbons (PAHs)   | 101%                          | Yes        | 141                        |   | 50                      | no                        |
| Chlorine and inorganic compounds (as HCl) | 93%                           | Yes        | 449                        |   | 10,000                  | no                        |
| Asbestos                                  | -                             | -          | 0                          | Indicates that threshold is too high if 90% of emissions from waste handling should be reported. It is assumed that asbestos is no longer used within Europe.   | 1                       | yes                       |
| Fluorine and inorganic compounds (as HF)  | 97%                           | Yes        | 317                        |   | 5,000                   | no                        |
| Hydrogen cyanide (HCN)                    | 101%                          | Yes        | 70                         |   | 200                     | no                        |
| Particulate matter (PM <sub>10</sub> )    | 88%                           | Yes        | 632                        |   | 50,000                  | no                        |

| Pollutant         | Weibull function completeness | Complete ? | Number of re-releases 2009 | Comment  | Annex II Threshold [kg] | Modification of threshold |
|-------------------|-------------------------------|------------|----------------------------|--|-------------------------|---------------------------|
| Hexabromobiphenyl | -                             | -          | 0                          | Banned by Stockholm Convention. Widely used in electronic devices and textiles as flame retardant. Electronics waste is a probable source. | 0.1                     | no                        |

Notes: For banned pesticides another option would be that any release should be reported (no threshold).

For Cd and Cu lowering the threshold for all activities except 2.(b) could be an option instead of lowering it for all activities.

This table is based on E-PRTR data resubmitted by countries by 30 September 2011.

"NA" indicates that the Weibull approach was not applicable.

For the pollutants listed in Table 6 the share of the released quantities which are not higher than twice the pollutant threshold is more than 50% and the contribution of those small quantities to the total released quantity is more than 50%. For Cd, Cr, NH<sub>3</sub> and PM<sub>10</sub> (2009 only) this also supports the findings of the Weibull function analysis, which shows coverage below 90% for these pollutants.

For Cu and PM<sub>10</sub> the Weibull function shows coverage of at least 88% but this is due to reporting of some very high releases, accounting for a high share of total releases, which indicates that reporting is nevertheless complete.

**Table 6: Pollutants for which more than 50% of reported quantities are not higher than twice the pollutant threshold**

| Pollutant                              | No of quantities <= 2 x threshold | Number of total releases | Share of small quantities |
|--|-----------------------------------|--------------------------|---------------------------|
| Cadmium and compounds (as Cd)          | 160                               | 292                      | 55%                       |
| Chromium and compounds (as Cr)         | 122                               | 218                      | 56%                       |
| Copper and compounds (as Cu)           | 131                               | 225                      | 58%                       |
| Ammonia (NH <sub>3</sub> )             | 3120                              | 5776                     | 54%                       |
| Particulate matter (PM <sub>10</sub> ) | 333                               | 632                      | 53%                       |

### D.2.3.2 Results for water

#### Releases to water

Threshold analysis using the cumulative Weibull distribution function was applied to all E-PRTR Annex II pollutants for which more than ten release reports were available and for which reporting had not been found to be incomplete in the completeness assessment. Thirty-five pollutants were considered.

Reporting is considered to be in line with the requirements of the E-PRTR Regulation if the reported total emissions for a pollutant reach at least 90% of the total extrapolated from the Weibull distribution (parameter a), obtained by non-linear regression. Considering the uncertainty of the method, applied a variation of ±1% is accepted, meaning that calculated coverage between 89% and 101% are regarded as fulfilling the reporting requirements. For most of the 35 pollutants considered in the threshold analysis the calculated coverage was 89-101%, indicating that the objective was reached. Details are presented in Table 102 in [Appendix 12](#).

However, for a few E-PRTR Annex II pollutants the 90% coverage was not reached. These pollutants are:

- Halogenated organic compounds
- Anthracene
- Polycyclic aromatic hydrocarbons
- Chlorides

For these pollutants a sectoral approach was performed and the major contributing activities were identified. The results of the sectoral approach are presented below. For a detailed description see [Appendix 12](#).

**Halogenated organic compounds:** Releases of halogenated organic compounds (AOX) are predominantly reported by facilities from sectors 5 and 6. The major contributing activity is 6.(a) (45% of the total releases), followed by activities 5.(f) (20-27% of the total releases) and 6.(b) (10% of the total releases).

Only for activity 5.(f) coverage does not reach the required threshold. Whereas for the 2007 data the 90% threshold is achieved, the calculated coverage is notably below 90% for 2008 and 2009.



The number of release reports amounts to a few hundred mainly originating from the United Kingdom, whereas 1,344 urban wastewater treatment plants with a capacity of more than 100,000 pe exist in Europe according to the UWWTD dataset.

The reason for not meeting the 90% coverage target is therefore likely to be incomplete reporting of AOX releases from urban wastewater treatment plants (activity 5.(f)).

**Anthracene:** The major source of anthracene are facilities with main activity 1.(c), which contribute more than 70% to the total releases. Only facilities from the United Kingdom reported releases of anthracene into water. Anthracene is not included in the indicative list in Annex 5 of the E-PRTR Guidance Document for activity 1.(c). Considering the reported releases from facilities in the United Kingdom, reporting has to be considered to be incomplete. The result is in line with the observations made in the completeness assessment for other pollutants (e.g. BTEX, naphthalene).

**Polycyclic aromatic hydrocarbons:** Releases of polycyclic aromatic hydrocarbons are predominantly reported by facilities from sectors 2 and 5. The major contributing activity is 2.(e) which contributes approximately 43% (2007) and 61% (2008) to the total releases, followed by activity 5.(f) which contributes approximately 11-17% to the total releases. The 90% coverage is reached for the subsectors investigated.

**Chlorides:** Releases of chlorides are predominantly reported by facilities from sectors 3, 4 and 5. The major contributing activity is 4.(b), which contributes 34-41% to the total releases, followed by activities 3.(a) and 5.(f), which contribute 16-23% and 11-17% to the total releases, respectively. As for halogenated organic compounds, coverage does not reach 90% for activity 5.(f) only in any of the three reporting years. The reason for this is likely to be incomplete reporting by urban wastewater treatment plants.

**Independently operated wastewater treatment plants (IOWWTP):** The assessment of the capacity threshold is based on an evaluation of the voluntarily reported release data from IOWWTPs from 2007 and on a threshold analysis by application of the cumulative Weibull function to release data from E-PRTR facilities reporting for main activity 5.(g). The evaluation of the voluntary data submission for IOWWTPs was performed for those countries providing this information. The conclusion from this assessment is that in the countries analysed, E-PRTR reporting of activity 5.(g) does not reach 90% of the total releases (mandatory plus voluntary data).

The threshold analysis of E-PRTR main activity 5.(g) using the cumulative Weibull function showed a comparable result. More than ten release reports were available for a limited number of pollutants only and the Weibull distribution proved to be applicable to almost all pollutants (except nickel in 2007). The 90% coverage is achieved for a few pollutants only (see Table 70 in Appendix 12).

### ***Transfers to water***

The threshold analysis with the cumulative Weibull distribution function was applied to all E-PRTR Annex II pollutants for which more than ten transfer reports were available and for which reporting had not been found to be incomplete in the completeness assessment. Twenty-nine pollutants were considered.

For most of the 29 pollutants considered in the threshold analysis the calculated coverage was 89-101%, indicating that the 90% target is reached. Details are presented in Table 71 in [Appendix 12](#). However, for several E-PRTR Annex II pollutants the 90% coverage was not reached for any of the three reporting years analysed. These pollutants are:

**Total nitrogen:** Transfers of total nitrogen are predominantly reported by facilities from sectors 4 and 8. For the reporting years 2007 and 2008 a comparable distribution pattern was observed with activity 4.(a) being the dominant activity. For the reporting year 2009, a completely different distribution was observed with activity 8.(a) being the dominant activity. For none of the reporting years the threshold of 90% is reached in the analysed subsectors. In addition, the number of transfer reports is low considering that nitrogen is presumably contained in most wastewater discharged into sewer systems. Consequently, reporting is considered to be incomplete.

**Total phosphorus:** Transfers of total phosphorus are predominantly reported by facilities from sectors 4 and 8. The two dominating activities are activity 4.(a) and activity 8.(c), which contribute 19-30% and 22-30% to total releases, respectively. For the major contributing activity, 4.(a), the 90% threshold is reached for all reporting years. This is not the case for the second dominating activity 8.(c) and neither for the remaining activities, which indicates potentially incomplete reporting.

**Chromium and its compounds:** Transfers of chromium compounds are predominantly reported by facilities from sectors 2 and 9. The major contributing activity is 9.(b), which contributes 28-63% of the total reported transfers into water, followed by activity 2.(f), contributing 20-59% of the total transfers, respectively. The 90% coverage is reached for the major activities and also the other activities.

**Mercury and its compounds:** The major contributing activities are activity 1.(c), activity 2.(e) and activity 5.(d). Due to a low number of release reports from these sectors the assessment was performed for the remaining activities only and the 90% coverage is reached. Based on this observation it is concluded that there are transfer reports missing for mercury compounds into water for one or more of the three major contributing activities. In particular, the number of transfer reports from facilities reporting for main activity 1.(c) decreased notably during the three reporting years.

**Total organic carbon:** Transfers of total organic carbon (TOC) into water are predominantly reported by facilities from sectors 3, 4 and 5. The major contributing activity is 4.(b), which contributes 34-41% to the total releases, followed by activities 3.(a) and 5.(f), which contribute 16-23% and 11-17% to the total releases, respectively. It is concluded that there are potentially missing transfer reports for TOC into water for all three dominating activities.

More details on the results for water are included in [Appendix 12](#).

### **D.2.3.3 Results for land**

Due to inconsistent reporting, the absence of other statistical data and unclear definitions as to what should be reported as a release into land, it was not possible to perform a threshold analysis.

### **D.2.3.4 Results for waste**

#### ***Assessment of waste transfers using Eurostat data and the Weibull function***

#### **Comparison with Eurostat data**

By using the economic activity code information (NACE-code) of the reporting facilities it is possible to compare E-PRTR data to data from Eurostat for 2008 regarding the generation of waste/transfer of waste, waste amount per number of employee and per gross value added. It has to be underlined that E-PRTR does not normally cover all the activities that are covered by Eurostat reporting. Furthermore, Eurostat data cover 100% of waste generation whereas the objective of E-PRTR is to cover 90% of waste transfers by E-PRTR facilities.

#### ***Waste generation***

Taking into account all 16 economic sectors, the total amount of hazardous waste reported to E-PRTR covers 39% of the amount reported to Eurostat. The percentage for non-hazardous waste is 17%. However, there are large differences between the different economic sectors. For all sectors the E-PRTR coverage for hazardous waste is higher than for non-hazardous waste.

- The agriculture, hunting and forestry sectors; the fishing sector and the mining and quarrying sectors all report very low amounts for hazardous and non-hazardous waste, compared to Eurostat data. The values are below 8.1% of the values reported to Eurostat.

- For hazardous waste it seems that especially “Manufacture of wood and wood products” have a low E-PRTR coverage with less than 20%, whereas six sectors have coverage between 20% and 60%.
- For non-hazardous waste four sectors have an E-PRTR coverage of less than 20% (Manufacture of textile products, leather and leather products; Manufacture of wood and wood products; Manufacture of other non-metallic mineral products and Manufacture of furniture; jewellery, musical instruments, toys; repair and installation of machinery and equipment), Five sectors have a coverage of 20% to 60%.
- While E-PRTR activities do not normally include all activities covered by Eurostat data, the comparison of waste generation by NACE activity indicates that E-PRTR coverage is far too low for non-hazardous waste. E-PRTR coverage regarding hazardous waste is better.

#### *Waste intensities related to gross value added and number of employees*

Some sectors have a low waste intensity per gross value added or per employee. Low intensities indicate that whereas the gross value added or the number of employees are reported for certain economic sectors or for certain countries, waste generation is not reported to E-PRTR.

- For hazardous waste intensity related to gross value added, six sectors show a low intensity in many countries (six or more). The waste intensity per employee is low in twelve sectors.
- It appears that in particular smaller countries have low hazardous waste intensity in relation to gross value added in two or more sectors. It is assessed that smaller countries do not have as many large industrial facilities but rather smaller sized facilities, which will not pass the E-PRTR threshold of 2 tonnes. Related to the number of employees, 19 countries including both large and small countries have a low waste intensity in two or more sectors.
- For non-hazardous waste intensity per gross value added two sectors show a low intensity in many countries (six or more). The waste intensity per employee cannot be calculated for many countries due to missing waste data. There is no clear indication that it is either larger or smaller countries which have a low non-hazardous waste intensity per gross value added or per employee. The intensity results indicate that the E-PRTR threshold value of 2,000 tonnes for non-hazardous waste does not allow for reaching the 90% target in most countries and most sectors.

#### **The Weibull function applied to E-PRTR activity codes**

For most of the 45 main E-PRTR activities for which hazardous waste was reported, transfer reports from more than 30 facilities are available, which ensures that sufficient data are available for using the Weibull function. The reliability of the assessment of non-hazardous waste is lower due to the fact that for 15 E-PRTR activities fewer than 30 facilities reported.

- For hazardous waste, reports for all activities cover more than 90% of the total extrapolated using the Weibull distribution for 2009, which indicates good coverage. It also suggests that the threshold value of 2 tonnes is appropriate.
- The Weibull function is calculated based on the number of facilities reporting hazardous waste. However, it is interesting to note that for 17 out of the 45 main E-PRTR activities the percentage of facilities reporting hazardous waste is below 80% if the number of facilities reporting hazardous waste is related to the total number of facilities reporting for a specific activity. This lower coverage for many E-PRTR activities could indicate that even if the Weibull approach results in a high value, coverage could be improved. It is concluded that in particular the following E-PRTR activities would have a better coverage if the threshold value was lower than 2 tonnes hazardous waste: 1.(c); 1.(d); 3.(a); 3.(c); 3.(g); 5.(c); 5.(d); 5.(e); 5.(f); 5.(g); 7.(a); 7.(b); 8.(a); 8.(b); 8.(c); 9.(a) and 9.(b).

- For non-hazardous waste 21 out of the 45 main activities have coverage of less than 90% in 2009. The low coverage for many activities is also supported by the fact that for 42 out of the 45 main E-PRTR activities the percentage of facilities reporting non-hazardous waste is below 80% if the number of reporting facilities is related to the total number of facilities reporting under the activity group concerned. Further consideration of the threshold of 2,000 tonnes appears to be necessary.

### ***Assessment of landfills, incineration plants and power stations***

#### **Landfills**

By comparing the total number of landfills (1,370) reported to E-PRTR for 2009 (releases/transfers to all media) to the total number reported in the questionnaire according to the Landfill Directive (7,592), a coverage of 18% results. The comparison includes landfills for hazardous waste and non-hazardous waste. Landfills for inert waste are not included.

Taking into account the number of landfills (645) that only report waste transfers to E-PRTR, the coverage is 8% of landfills reported in the questionnaire. Thirteen countries out of 26 included in the comparison have coverage lower than 10% and 21 countries have coverage lower than 50%.

The implementation of new technical requirements according to the Landfill Directive implies better greenhouse gas collection and therefore fewer landfills are expected to exceed the E-PRTR threshold values for reporting GHGs. However, the generation of leachate should mean that more landfills are expected to report waste transfer to E-PRTR. Leachate is supposed to be reported as non-hazardous waste. Missing reporting can be explained by 1) issues with the threshold value for non-hazardous waste, 2) some countries reporting leachate as transfer of pollutants in waste water rather than as waste transfer, 3) facilities not reporting leachate at all by mistake. The fact that countries interpret the way to report leachate differently is supported by the distribution of reporting between countries. In six countries more than 80% of landfills reported waste transfers, whereas in eight countries fewer than 20% of landfills did so.

#### **Incineration plants for non-hazardous waste**

For 16 countries the number of incineration plants was compared to the numbers obtained from the Confederation of European Waste-to-Energy Plants (CEWEP). 367 facilities reported to E-PRTR under activity 5.(b) (Installations for the incineration of non-hazardous waste) whereas 410 plants are listed by CEWEP.

For five countries there is a major negative difference when the E-PRTR numbers are compared to the CEWEP numbers. For one country the number of E-PRTR facilities is larger than the number reported by CEWEP.

The threshold value for activity 5.(b) does not seem to be the main reason for missing reporting of incineration plants. It seems more likely that plants have their own disposal sites and therefore do not have to report. Furthermore, it seems that some incinerators are reported under an E-PRTR activity other than 5.(b), e.g. Thermal power stations and other combustion installations 1.(c).

#### **Power stations (and especially coal-fired power plants)**

Application of the Weibull function suggests that completeness of E-PRTR data for 2008 and 2009 under activity 1.(c) (Thermal power stations and other combustion installations) is high for waste transfers of both hazardous waste and non-hazardous waste. However, comparison to Eurostat data of 2008 reveals a different picture. For the economic activity "Energy, gas and water supply" (NACE code 35) the quantities reported under E-PRTR cover only 64% of non-hazardous waste and 22% of hazardous waste according to Eurostat data. Although there are some differences in the activities covered by E-PRTR and Eurostat data, these differences do not conclusively explain the gap in quantities.

The E-PRTR data have therefore also been compared with figures from the European Coal Combustion Products Association (ECOBA) covering the generation of ashes and slags from coal fired power plants. In 2008, the generation of non-hazardous waste from coal fired power plants was approximately 56.4 million in the EU-15 and about 100 million tonnes for the whole EU-27 according to ECOBA. E-PRTR reporting covers a maximum of 53% of what is reported to ECOBA covering the EU-15 and a maximum of 54% at EU-27 level.

It seems that E-PRTR reporting for power stations and especially for coal-fired power stations is not as reliable as indicated by applying the Weibull function. The main reasons are likely to concern the threshold value for non-hazardous waste and the fact that many plants have their own disposal sites and consequently do not report to E-PRTR.

### ***Evaluation of recovery and disposal***

The comparison of waste transfers in 2007 and 2009 in terms of recovery and disposal shows that minor changes took place between the years only. There was a small increase of 5% from 2007 to 2009 in the amount of hazardous waste sent to recovery compared to the amount sent to disposal. For non-hazardous waste the share of recovery increased by 2% from 2007 to 2009. However, the low changes at the total E-PRTR level stand in contrast with some quite diverse trends at the country level. Some countries reported the increase of recovery for a certain E-PRTR activity while others reported a decrease for the same activity. Based on this fact it is very difficult to draw any precise conclusions on the quality of the reported data regarding the treatment of waste.

### ***Transboundary shipments of waste***

E-PRTR reporting of hazardous waste was compared to transboundary shipments of waste reported to the Commission according to the EU Waste Shipment Regulation. The latter covers the total amount of hazardous waste shipped, but it is assumed that E-PRTR activities will constitute the largest part of the transboundary waste shipments. The comparison covered 2007, 2008 and 2009 data.

Overall, it seems that E-PRTR coverage increased from 2007 to 2009. However, the E-PRTR coverage of many countries seems to be too low compared with the amounts reported according to the Waste Shipment Regulation. Under E-PRTR 2009, nine countries reported less than 50% of the amounts under the Waste Shipment Regulation. It seems that the quality of E-PRTR reporting could be improved. Possible explanations for the low coverage are the following:

- Many facilities generate less than 2 tonnes of hazardous waste per year and are therefore not included in E-PRTR.
- Many facilities generating more than 2 tonnes of hazardous waste deliver the waste to a collector or use a dealer and are therefore not always aware of the fact that the hazardous waste is subject to transboundary shipment.

More details on the results for waste transfers are included in [Appendix 13](#).

## **D.3 Conclusions**

### **D.3.1 Completeness of reporting**

#### **D.3.1.1 Releases to air**

Reporting of releases of “main” (other) pollutants and GHGs to air under E-PRTR seems to be complete and consistent for **NO<sub>x</sub>**, **SO<sub>2</sub>** and **CO<sub>2</sub>** when compared to other international reporting obligations such as the CLRTAP, the Kyoto Protocol or the EU emissions trading scheme (ETS). Other main pollutants which are relevant for industrial sources such as **NM VOC**, **CO**, **PM<sub>10</sub>**, **fluorinated greenhouse gases** and **N<sub>2</sub>O** are also extensively reported under E-PRTR but the compari-

son shows that reporting is not fully consistent with national inventories reported under CLRTAP and UNFCCC.

While E-PRTR releases of **NH<sub>3</sub>** from industrial facilities show good coverage, reporting for pig and poultry farms under activity 7.(a) is inconsistent between countries and not complete.

For many activities for which a release of **heavy metals and chlorinated organic substances** into air is expected (Annex 4 to E-PRTR Guidance) the pollutant threshold seems to be too high. For **PFCs, HFCs and SF<sub>6</sub>** the threshold is also considered too high.

**Trichlorobenzenes** (TCB) are commonly used as solvents but the number of release reports is very low and most of them are reported by the United Kingdom from landfills. With the exception of one larger quantity from a chemical plant, none of the quantities exceeds the threshold by a large amount. It seems that releases from the application of these substances are not reported and the threshold may be too high to be considered for this activity. Considering that the United Kingdom is the only country which reports releases from landfills, reporting seems to be quite inconsistent between countries.

**Tetrachloroethylene** (PER) which is e.g. used as a solvent is mostly reported from activity 2.(f) installations for surface treatment and from activities from sector 4 Chemical industry. Since it is uncertain whether reporting is complete (Table 102 in [Appendix 12](#)) it is not clear whether a change in threshold would significantly increase the total reported quantity.

Harmonisation of reporting under different reporting obligations at country level would increase the reliability of data collected under EU legislation including reporting under E-PRTR.

The quality of reporting could be improved by further enhancing automated quality checks such as the outlier check or by introducing a check of reported releases/transfers against the releases/transfers by the same facility in previous years. Furthermore, a revision of the E-PRTR Guidance Document (Annex 4) could be considered, e.g. by updating the information which pollutant is relevant for which activity.

#### **D.3.1.2 Releases to land**

Due to inconsistent reporting and the fact that other data sources which could be used for verification are not publicly available, only very general conclusions on releases to land can be provided.

Reporting of releases into land looks inhomogeneous across countries. The definition of a release into land seems to be unclear. Based on the activities under which releases to land were reported in the years 2007-2009 it can be concluded that releases into land are understood in two ways:

- surface/ground water contamination with toxic substances
- deep soil injection of (industrial) waste water which is contaminated with toxic substances.

In order to improve reporting by countries it is recommended to improve the definitions in the E-PRTR Guidance Document by clarifying what should be reported as a release to land.

#### **D.3.1.3 Releases to water**

For all 71 pollutants listed in Annex II of the E-PRTR Regulation with a release threshold for water, at least one release report is available. For 27 pollutants the number of available release reports is smaller than ten in one of the three reporting years. Twenty-four pollutants are subject to severe restriction (banned according to EC (No) 850/2004, not included in Annex I of Directive 91/414/EC, substances of very high concern according to REACH) and the absence of release reports is explained by these restrictions on marketing and use. However, there are still releases to water especially from urban wastewater treatment plants (activity 5.(f)) and several pollutants are included in the indicative list of Annex 5 of the E-PRTR Guidance Document. Hence, reporting is considered to be incomplete. A revision of the threshold is not regarded suitable for improving the reporting be-

cause most of the pollutants are not regularly monitored in the effluents of urban wastewater treatment plants.

Three compounds (**chlorpyrifos, ethylene oxide and hexachlorobutadiene**) are not regulated and a higher number of release reports would be expected. The release thresholds into water for chlorpyrifos and hexachlorobutadiene amount to 1 kg/year and for ethylene oxide to 10 kg/year. Incomplete reporting is attributed to potentially missing release reports from production sites and from urban wastewater treatment plants. Potentially missing release reports from activity 5.(f) facilities are due to a lack of information because these pollutants are not commonly measured in effluents.

Some pollutants are only reported by facilities from a single Member State (e.g. **asbestos, polychlorinated biphenyls, DEHP**). For these pollutants reporting was found to be incomplete and again the reason for incomplete reporting is not considered to be the Annex II thresholds but rather to the lack of information for assessing these discharges.

Based on the results presented above and in [Appendix 8](#), the following actions for improving the completeness of reporting releases to water should be considered:

- Inclusion of activity 1.(c) for releases of benzene, ethylbenzene, toluene, xylenes and naphthalene in the indicative list in Annex 5 of the E-PRTR Guidance Document
- Inclusion of activity 5.(f) for releases of asbestos in the indicative list in Annex 5 of the E-PRTR Guidance Document
- Development and provision of emission factors for substances not commonly measured in discharges from urban wastewater treatment plants. Activity 5.(f) proved to be the main source for many pollutants. The provision of guidance and of emission factors at least for the pollutants attributed to activity 5.(f) in the indicative list in Annex 5 of the E-PRTR Guidance Document would improve reporting.

In this context, the on-going work under the implementation of the Water Framework Directive (WFD, 2000/60/EC) has to be mentioned. According to Article 5 of the Directive 2008/105/EC on Environmental Quality Standards in the Field of Water Policy, Member States are obliged to establish an inventory of emissions, discharges and losses of all priority substances and pollutants listed in Part A of Annex I to this Directive. For the implementation of the inventory a guidance paper is being drafted by the European Commission in cooperation with Member States in which a tiered approach depending on the availability of data is described. There is a strong linkage between the water data in E-PRTR and this inventory of emissions, discharges and losses because E-PRTR data represent one important input data source for this inventory. In order to fill data gaps and to assure the quality of reported discharged loads from point sources (especially from urban wastewater treatment plants) to surface water bodies, development and application of emission factors is strongly recommended in the draft guidance paper. For harmonisation and consistency of legislation it is recommended that the WFD expert group work with the E-PRTR Art(19) Committee to develop those emission factors. It is expected that the efforts undertaken for the implementation of the WFD will also improve reporting under E-PRTR.

- Inclusion of annually discharged wastewater amounts in m<sup>3</sup> in reporting would improve comparability and facilitate quality assessment of reported releases.

#### **D.3.1.4 Transfers to water**

In general, a lower number of pollutant transfer reports to water than release reports to water are included in E-PRTR. Compared to releases to water the available number of transfer reports is more often lower than ten. For most of these pollutants missing transfer reports may be explained by the fact that these compounds are strongly regulated and subject to bans or restrictions on their marketing and use. However, there are seven pollutants (**chlorpyrifos, hexachlorobutadiene (HCBd), isoproturon, ethylene oxide, and tetrachloroethylene (PER), tetrachloromethane**



**(TCM), trichloroethylene (TRI))** that are commonly used in the European Union. For these pollutants a higher number of transfer reports would be expected and reporting has to be considered to be incomplete.

A few pollutants are predominantly released by specific Annex I activities. The main activity 4.(a) contributes more than 80% to the transfers of benzene, naphthalene and vinyl chloride to water and activity 5.(d) contributes more than 80% to the transfers of arsenic compounds to water.

### D.3.2 Scope analysis

The Weibull approach proved suitable for assessing the coverage of total releases and transfers. It is a statistical approach and regression results are associated with statistical uncertainty. Considering this uncertainty, the objective of 90% coverage is considered fulfilled in cases where the calculated coverage amounts to 89-101%. This is the case for most of the pollutants analysed (releases to air and water).

#### D.3.2.1 Releases to air

A few reported releases were identified as outliers and removed from the dataset before further analysis was performed. These high values would distort the results of any statistical analysis and need to be avoided by e.g. implementation of automated checks when importing E-PRTR datasets.

The statistical approach (Weibull analysis) indicates that the 90% coverage within an uncertainty range between 1% to 2% of the total mass released by industrial installations is reached for the majority (36) of the reported air pollutants (NO<sub>x</sub>, SO<sub>x</sub>, CO, NMVOC, most of HMs, PCDD/F, PCBs, CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, HFCs, HCFCs, CFCs, halons, EDC, DCM, TCM, vinylchlorid, benzene, ethylene oxide, HCN, naphthalene<sup>27</sup>, DEHP, fluorine and inorganic compounds). For some pollutants (CO, N<sub>2</sub>O, ammonia, arsenic, cadmium and chromium) a sectoral approach was applied. The results show that for e.g. NH<sub>3</sub>, As, Cd and partly Cr coverage of more than 90% is reached for some activities only (Table 101 in [Appendix 11](#)).

Pollutants with incomplete reporting:

- Trichlorobenzenes (**TCB**) are commonly used as solvents but the number of releases in the E-PRTR dataset is very low and most are reported from landfills in the United Kingdom. Reporting needs to be further improved.
- Tetrachloroethylene (**PER**) is also used as a solvent and only a few releases are reported.
- The thresholds for **NH<sub>3</sub>** should be reviewed and the methodology for reporting from pig and poultry farms should also be improved and harmonised across different countries.
- As a result of broadly implemented “low emission” technologies, **PM<sub>10</sub>** emissions have been strongly reduced since 2007.

All pollutants for which no releases (or only a very low number of releases) were reported, are either banned or subject to severe restrictions on their marketing and use.

- For the following *seven* pollutants fewer than ten release reports in a year were reported: Asbestos, Anthracene, 1,1,2,2-tetrachloroethane, Pentachlorophenol (PCP), Pentachlorobenzene, 1,2,3,4,5,6- hexachlorocyclohexane (HCH) and Hexachlorobenzene (HCB).
- Although the Weibull function was applicable to **halons** and coverage of more than 98% for all three years was estimated, inconsistency in reporting of halons does not allow any conclusions on the adequacy of the threshold.

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<sup>27</sup> Only in 2007 and 2008



- Eleven pollutants with thresholds set in Annex II were not reported in any year (Table 93 in [Appendix 11](#)).

#### **D.3.2.2 Releases and transfers to water**

The Weibull approach was applied to the majority of pollutants. With a few exceptions (chlorpyrifos, hexachlorobutadiene and ethylene oxide) all pollutants for which a very low number of release reports is available only are either banned or subject to severe restrictions on their marketing and use.

A revision of the E-PRTR Annex II pollutant thresholds for water is not regarded necessary. For almost all pollutants, the failure of achieving the 90% coverage is due to missing release and transfer reports (e.g. asbestos, halogenated organic compounds).

Generally, reporting of releases into water is of better quality than reporting of transfers into water.

For some high production volume chemicals (e.g. 1,2-dichloroethane, trichloromethane) only few transfer reports are available and the Weibull approach cannot be applied. A larger number of transfer reports would be expected for these pollutants. Lowering the pollutant threshold will probably not improve reporting. For most of these pollutants a reporting threshold between 1 and 10 kg/y is considered suitable.

For pollutants with overall coverage of transfers into water below 89% or above 101% the sectoral approach showed that reporting is not complete for one or more of the major contributing activities, whereas in most cases the 90% coverage is reached for the remaining activities.

Activity 5.(f) notably contributes to the total released quantities of most pollutants. The sectoral approach showed that except for activity 5.(f) the 90% coverage is reached for other major contributing activities.

Municipal wastewater contains a mixture of substances used within the catchment area, including banned pollutants and strongly regulated and restricted substances. Urban wastewater treatment plants generally do not monitor those compounds. In addition, calculation of discharges by applying emission factors is not possible because for most pollutants no emission factors are available.

The development of guidance and of emission factors for urban wastewater treatment plants would improve reporting and coverage of most compounds.

The inclusion of treated wastewater amounts in reporting would also improve assessment of the data provided. These data could be used to back-calculate concentrations, which would then allow a comparison of discharges and would also be useful for the development of emission factors.

#### **D.3.2.3 Releases to land**

Inconsistent and limited reporting of releases to land indicates that the E-PRTR Guidance Document does not provide sufficient information and should be updated to assist countries in improving their data.

#### **D.3.2.4 Non-hazardous waste**

Although E-PRTR only includes off-site waste transfers and not waste generation as such, the assessments undertaken indicate that the threshold value of 2,000 tonnes of non-hazardous waste does not allow reporting of 90% of non-hazardous waste transfers. Consideration should be given to changing the threshold in order to increase the percentage reported. A starting point for these considerations could be E-PRTR activities belonging to manufacture production (economic activities from code C10 to code C33 according to NACE) because in these activities the largest differences in coverage between facilities reporting hazardous waste and those reporting non-hazardous waste can be found. Alternatively, instead of having a lower threshold value for manufacturing ac-

tivities, the introduction of a criterion could be considered that if a facility exceeds the 2 tonne threshold for hazardous waste the facility will also have to report non-hazardous waste regardless of any threshold. In this case no new facilities would be added to E-PRTR.

#### **D.3.2.5 Hazardous waste**

The various assessments of hazardous waste indicated a better coverage than for non-hazardous waste. However, waste intensity results indicate that the E-PRTR threshold of 2 tonnes for hazardous waste does not allow reporting of 90% of hazardous waste transfers, in particular in smaller countries and in certain economic sectors. The issue of poor coverage is most relevant for the following activities: 1.(c); 1.(d); 3.(a); 3.(c); 3.(g); 5.(c); 5.(d); 5.(e); 5.(f); 5.(g); 7.(a); 7.(b); 8.(a); 8.(b); 8.(c); 9.(a) and 9.(b).

E-PRTR includes a number of landfills with releases/transfers to the different media. Most landfills are assumed to generate leachate, but the threshold value of 2,000 tonnes for non-hazardous waste appears to cause problems in ensuring appropriate levels of reporting for leachate. However, before lowering the threshold value a clarification is recommended as to whether leachate from landfills really has to be reported as a waste transfer (which is the current legal status), or as transfer of pollutants in water (which would provide more information about pollutants in the leachate). In any case, the issue of the number of landfills reporting to E-PRTR compared to the number stated in the Landfill Directive Questionnaire needs to be further investigated.

The number of dedicated incineration plants for non-hazardous waste included in E-PRTR is reasonable but lower than another data source suggest. There is a need for clarifying how incineration plants belonging to large companies which are classified under another E-PRTR activity code than 5.(b) shall report to E-PRTR.

## UNITS AND ABBREVIATIONS

|                  |  |
|------------------|--|
| As               | arsenic  |
| BOD              | Biochemical Oxygen Demand  |
| Cd               | cadmium  |
| CDR              | central data repository of EEA's Eionet Reportnet  |
| CEIP             | EMEP Centre on Emission Inventories and Projections  |
| CEWEP            | Confederation of European Waste-to-Energy Plants   |
| CH <sub>4</sub>  | methane  |
| CLRTAP           | LRTAP Convention   |
| CO               | carbon monoxide  |
| CO <sub>2</sub>  | carbon dioxide   |
| COD              | Chemical Oxygen Demand   |
| Cr               | chromium   |
| CRF              | UNFCCC common reporting format for greenhouse gases  |
| Cu               | copper   |
| DCM              | dichloromethane  |
| DDT              | dichlorodiphenyltrichloroethane  |
| ECOBA            | European Coal Combustion Products Association  |
| EEA              | European Economic Area   |
| EEA              | European Environment Agency  |
| EFTA             | European Free Trade Association  |
| Eionet           | European Environment Information and Observation Network   |
| EMEP             | Co-operative programme for monitoring and evaluation of the long-range transmissions of air pollutants in Europe |
| EPER             | European Pollutant Emission Register   |
| E-PRTR           | European Pollutant Release and Transfer Register   |
| ETC/ACM          | European Topic Centre on Air and Climate Mitigation  |
| ETS              | Emissions Trading Scheme   |
| EU               | European Union   |
| EWL              | European Waste List  |
| FAO              | Food and Agriculture Organisation  |
| Gg               | 1 gigagram = 10 <sup>9</sup> g = 1 kilotonne (kt)  |
| GHG              | greenhouse gas   |
| GVA              | gross value added  |
| HCB              | hexachloro-benzene   |
| HCFCs            | hydrochlorofluorocarbons   |
| HCH              | 1,2,3,4,5,6-hexachlorocyclohexane  |
| HF               | fluorine and inorganic compounds   |
| HFCs             | hydrofluorocarbons   |
| Hg               | mercury  |
| HMs              | heavy metals   |
| HW               | hazardous waste  |
| HWIC             | hazardous waste (transferred) inside the country   |
| HWOC             | hazardous waste (transferred) outside the country (transboundary waste movement)                                 |
| IOWWTP           | Independently operated waste water treatment plant   |
| IPPC             | Integrated Pollution Prevention and Control  |
| KCA              | key category analysis  |
| kg               | 1 kilogram = 10 <sup>3</sup> g (gram)  |
| LCP              | large combustion plants  |
| LRTAP Convention | UNECE Convention on Long-range Transboundary Air Pollution   |

|                   |  |
|-------------------|--|
| Mg                | 1 megagram = 10 <sup>6</sup> g = 1 tonne (t)   |
| MS                | Member State(s)  |
| N <sub>2</sub> O  | nitrous oxide  |
| NACE              | Nomenclature statistique des activités économiques dans la Communauté européenne - Nomenclature of economic activities |
| NECD              | National Emission Ceilings Directive (2001/81/EC)  |
| NFR               | UNECE nomenclature for reporting of air pollutants   |
| NH <sub>3</sub>   | ammonia  |
| NHW               | non-hazardous waste  |
| Ni                | nickel   |
| NMVOCs            | non-methane volatile organic compounds   |
| No                | number   |
| NO <sub>2</sub>   | nitrogen dioxide   |
| NO <sub>x</sub>   | nitrogen oxides  |
| NP                | nonylphenol  |
| NPEs              | nonylphenol ethoxylates  |
| NUTS              | Nomenclature des unités territoriales statistiques   |
| pe                | population equivalent  |
| PAHs              | polycyclic aromatic hydrocarbons   |
| Pb                | lead   |
| PCB               | polychlorinated biphenyl   |
| PCDD              | polychlorinated dibenzodioxins (PCDDs) - dioxins   |
| PCDF              | polychlorinated dibenzofurans (PCDF) - furans  |
| PCP               | pentachlorophenol  |
| PER               | tetrachloroethylene  |
| PFCs              | perfluorocarbons   |
| PM                | particulate matter   |
| PM <sub>10</sub>  | particles measuring 10 µm or less  |
| PM <sub>2.5</sub> | particles measuring 2.5 µm or less   |
| POPs              | persistent organic pollutants  |
| PRT               | pollutant release and transfer (release into air, water, land and transfer in water)                                   |
| RBD               | river basin district   |
| Se                | selenium   |
| SF <sub>6</sub>   | sulphur hexafluoride   |
| SO <sub>2</sub>   | sulphur dioxide  |
| SoE               | State of the Environment   |
| SO <sub>x</sub>   | sulphur oxides   |
| t                 | 1 tonne (metric) = 1 megagram (Mg) = 10 <sup>6</sup> g   |
| TCBs              | trichlorobenzenes  |
| TCM               | tetrachlormethane  |
| Tg                | 1 teragram = 10 <sup>12</sup> g = 1 megatonne (Mt)   |
| TJ                | 1 terajoule  |
| TOC               | total organic carbon   |
| UNECE             | United Nations Economic Commission for Europe  |
| UNFCCC            | United Nations Framework Convention on Climate Change  |
| UWWTD             | Urban Waste Water Treatment Directive  |
| UWWTP             | urban waste water treatment plant  |
| VOCs              | volatile organic compounds   |
| WFD               | Water Framework Directive  |
| WT                | waste transfer   |
| Zn                | zinc   |

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# APPENDIX 1 - IMPLEMENTATION OF THE E-PRTR REGULATION AT THE COUNTRY LEVEL

## 1. Introduction

The main data sources to assess the implementation of the E-PRTR Regulation at the country level are the Article 16(1) questionnaires and the study on the implementation of penalties. Both sources cover the EU-27 plus Norway, Iceland and Liechtenstein but not Switzerland and Serbia because the latter two countries provide data to E-PRTR only on a voluntary basis. Therefore, the assessment on the implementation of the E-PRTR Regulation at the country level is carried out for the EU-27 plus Norway, Iceland and Liechtenstein. At present, all countries except for Iceland have submitted answers to the Article 16(1) questionnaire.

### Article 16(1) questionnaires

In general, the Article 16(1) questionnaires were prepared by the national Ministries or the Environmental Agencies, often in cooperation, and in some cases with involvement of regional environmental administrations. In Belgium, the environmental responsibilities lie with the regions and each region prepared its response to the questionnaire. Those responses were put together by the Working Group on 'PRTR' (Interregional authority) of the Coordination Committee for International Environmental Policy (CCIEP). In the United Kingdom, the Department for Environment, Food and Rural Affairs coordinated the overall report using information delivered from the appropriate authorities of England plus Wales, Scotland and Northern Ireland.

Out of the countries (5) that provided information on public consultation in compiling the answers to the questionnaire, the United Kingdom is the only country that carried out a specific consultation. The United Kingdom carried out both formal and informal consultation exercises which drew representations from a wide range of stakeholders. Formal consultations followed a brief description of the implementation plan and a question-and-answer format in which consulters gave their opinion on the proposed approach. The results of the exercise were published on the website of the lead department. In Romania, the national PRTR includes a special "Public opinion" page on which the general public can express their views. No views were expressed on the compilation of the Article 16(1) questionnaire.

The seven countries (Bulgaria, Cyprus, Czech Republic, Netherlands, Romania, Slovakia, United Kingdom) that provided information on the sources of information that were used for preparing the report listed a variety of data sources. The sources range from legislation and guidance documents to data from national registers/systems, organizations and national authorities. Cyprus indicated that the know-how gained during the previous reporting cycles and experience with difficulties that operators faced regarding data reporting were used as a source of information.

## 2. Legislative, regulatory and other measures establishing the E-PRTR system and E-PRTR reporting obligation

Several countries indicated that their national PRTR system is based on the EU Regulation 166/2006/EC<sup>28</sup>, which is directly applicable in the EU Countries and Norway, Iceland and Liechtenstein. In addition to this common legal basis, all countries except for Liechtenstein reported additional national acts of legislation to implement their national PRTRs. Concerning the interplay with other reporting obligations, the Netherlands pointed out that a harmonisation of definitions in the context of different legislations and reporting obligations is necessary for example between E-PRTR and ETS.

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<sup>28</sup> Regulation (EC) No 166/2006 of the European Parliament and of the Council of 18 January 2006 concerning the establishment of a European Pollutant Release and Transfer Register and amending Council Directives 91/689/EEC and 96/61/EC

Table 7 presents an overview of the national legal measures per countries establishing the E-PRTR system and the reporting obligation (status March 2011).

**Table 7: Overview on legislative, regulatory and other measures establishing the E-PRTR system and reporting obligation**

| Country        | National legislative, regulatory and other measures establishing the E-PRTR system and reporting obligation  |
|----------------|--|
| Austria        | <ul style="list-style-type: none"> <li>• Accompanying Regulation, E-PRTR-BV, BGBl. II Nr. 380/2007 regulating the national notification process</li> </ul>   |
| Belgium        | <ul style="list-style-type: none"> <li>• Flemish Environmental Decree and the implementing decree – implemented in Vlarem legislation</li> <li>• Flemish Environmental Enforcement Decree</li> <li>• Flemish waste legislation (Vlarea)</li> </ul>   |
|                | <ul style="list-style-type: none"> <li>• Walloon Government Decree of 13 December 2007 on periodical environmental data reporting</li> <li>• Decree of 5 June 2008 on investigating, establishing, prosecuting and punishing breaches and on remedial measures related to environmental regulations</li> </ul>   |
|                | <ul style="list-style-type: none"> <li>• Decree of the Brussels Capital Regional Government of 13 November 2008</li> <li>• Order of 5 June 1997 on environmental permits</li> </ul>  |
| Bulgaria       | <ul style="list-style-type: none"> <li>• Environmental Protection Act (EPA): Articles 125(1)(5) and 125a, Article 22a; Article 226; Article 164(1) and (2)</li> <li>• The Regulation on the organisation of activities relating to the preparation and submission of reports to the Commission of the European Union regarding the implementation of regulatory acts of the European Communities with regard to the environment, adopted by the Council of Ministers' Decree No 116 of 21 May 2007</li> <li>• Order No RD 337/08 June 2007 of the Minister of the Environment and Waters on organising activities to prepare and submit reports to the European Commission on the implementation of environmental regulatory requirements under Community law</li> <li>• Order No RD-806/31 October 2006 of the Minister of the Environment and Water approving Guideline on the Control of IPPC Permits and Format of an Annual Environmental Report</li> </ul> |
| Cyprus         | <ul style="list-style-type: none"> <li>• Laws of 2002 to 2009 on Water Pollution Control</li> <li>• Laws of 2002 to 2009 on Air Pollution Control</li> </ul>   |
| Czech Republic | <ul style="list-style-type: none"> <li>• Act No 76/2002 on integrated pollution prevention and control and on an integrated register of pollution and amending certain acts (the Integrated Prevention Act)</li> <li>• Government Regulation No 368/2003 on the integrated pollution register</li> <li>• Implementing Decree No 572/2004</li> <li>• Government Regulation No 145/2008 establishing a list of pollutants(1) and thresholds and the information required for reporting to the integrated register of environmental pollution</li> </ul>  |
|                | <ul style="list-style-type: none"> <li>• Act No 25/2008 concerning an integrated pollution register and an integrated system for fulfilling environmental reporting obligations (the IRZ Act)</li> </ul>   |
| Denmark        | <ul style="list-style-type: none"> <li>• Order No 132 of 7 February 2007 establishing a Pollutant Release and Transfer Register (PRTR)</li> <li>• Order No 1515 of 14 December 2006 to draw up green accounts or an EMAS report in accordance with the EMAS Regulation</li> <li>• Order No 395 of 25 May 2009 on the Financial Statements Act</li> <li>• Order No 1640 of 13 December 2006 on the certification of listed facilities</li> </ul>  |



|         |   |
|---------|---|
|         | <ul style="list-style-type: none"> <li>• Order No 322 of Government of the Republic of 20 April 2003</li> <li>• Notice (RT II 2009, 22) of Estonian Ministry of Foreign Affairs</li> <li>• Decree No 490 of the Minister for the Environment of 5 April 2010</li> <li>• Waste Act, Section 117. Reporting on waste</li> <li>• Air Protection Act, Section 90. Reporting</li> <li>• Water Act, Section 9. Special water use permit and temporary special water use permit, Section 36. Water resource records</li> <li>• Integrated Pollution Prevention and Control Act, Section 34. Duty to preserve documentation and submit information, Section 36. Supervision</li> </ul>  |
| Estonia |   |
| Finland | <ul style="list-style-type: none"> <li>• Finish Environmental Protection Act (169/2000)</li> </ul>  |
|         | <ul style="list-style-type: none"> <li>• Law of 14 May 2009 authorising the approval of the PRTR protocol; ratification sent to the PRTR committee on 10 July 2009</li> <li>• Decree, Article R 512-46 of the environment code</li> <li>• Order of 31 January 2008 on the register and the annual declaration of polluting emissions and waste materials</li> </ul>   |
| France  |   |
|         | <ul style="list-style-type: none"> <li>• Act implementing the Protocol on the pollutant release and transfer register of 21 May 2003 and Regulation (EC) No 166/2006 of 6 June 2007 (SchadRegProtAG)</li> <li>• The Federal States' Regulations on their powers and responsibilities</li> <li>• The Federal States' Administrative Offences Acts and Administrative Procedures Acts</li> <li>• Code of Criminal Procedure (StPO)</li> <li>• Federal Environmental Information Act (UIG) of 22 December 2004</li> <li>• The Federal States' Environmental Information Acts</li> </ul>  |
| Germany |   |
| Greece  | <ul style="list-style-type: none"> <li>• Secretary General Note for the enforcement of the E-PRTR Regulation</li> <li>• Provisions of environmental permitting and environmental permits</li> </ul>   |
|         | <ul style="list-style-type: none"> <li>• Act LXXXI of 2001 to promulgate the Aarhus Convention</li> <li>• Government decree 219/2004 (VII. 21.) on the protection of subsurface waters</li> <li>• Government decree 220/2004 (VII. 21.) on the protection of surface waters</li> <li>• Government decree 21/2001 (II. 14.) on certain rules for the protection of air quality (as of 15 January 2011: Government decree 306/2011 (I.15.) on the protection of air quality)</li> <li>• Government decree 164/2003 (X. 18.) on the registration and reporting requirements associated with waste</li> <li>• Decree 27/2005 (XII.6.) KvVM concerning detailed rules for controlling the release of used water and waste water</li> <li>• Decree 18/2007 (V. 10.) KvVM on reporting in the environmental register for subsurface waters and land</li> <li>• Decree 25/2007 (VII. 30.) KvVM amending decree 27/2005 (XII.6.) KvVM concerning detailed rules for controlling the release of used water and waste water as well as decree 18/2007 (V. 10.) KvVM on reporting to the environmental register for subsurface waters and land</li> <li>• Decree 10/2001 (IV. 19.) KöM on limiting the emission of volatile organic compounds from certain activities and equipment</li> <li>• Government decree 213/2006 (X. 27.) concerning certain rules for the implementation of Act XV of 2005 on the trading of greenhouse gas emission units</li> <li>• Government decree 314/2005 (XII. 25.) on the environmental impact assessment procedure and the single pollution permit procedure</li> <li>• Government decree 164/2003 (X. 18.) on the registration and reporting requirements associated with waste</li> <li>• Government decree 180/2007 (VII. 3.) on cross-border waste transport</li> </ul> |
| Hungary |   |
| Iceland | Questionnaire has not been submitted.   |
|         | <ul style="list-style-type: none"> <li>• PRTR Regulation 2007, S.I. No. 123 of 2007, which signed into Irish Law the EU E-PRTR Regulation</li> <li>• PRTR Regulations 2011, S.I. No. 649 of 2011, provide a legislative basis for the establishment of national PRTR by the Environmental Protection Agency</li> <li>• EPA licences issued under the EPA Acts 1992 – 2008, the Waste Management Acts 1996 – 2008,</li> </ul>  |
| Ireland |   |

|                 |   |
|-----------------|---|
|                 | the Waste Water Discharge (Authorisation) Regulations S.I. 684 of 2007 and other legislation  |
| Italy           | <ul style="list-style-type: none"> <li>• Draft Decree of the President of the Italian Republic for the provisions of art.5 of the EPRTR Regulation</li> <li>• Annex to the draft national PRTR legislation</li> </ul>   |
| Latvia          | <ul style="list-style-type: none"> <li>• Cabinet Regulation No 1082 of 30 November 2010 on procedures for registering category A, B and C polluting activities and issuing permits for category A and B polluting activities</li> <li>• Latvian Administrative Infringements Code</li> <li>• Latvian Criminal Law</li> <li>• Law on State Statistics (11 June 1997, as amended)</li> <li>• Cabinet Regulation No 1075 of 22 December 2008 on national statistical reports on environmental protection</li> </ul>  |
| Liechtenstein   | No specific national legislation has been reported in addition to the EU E-PRTR Regulation.   |
| Lithuania       | <ul style="list-style-type: none"> <li>• Order No D1-806 of the Minister for the Environment of the Republic of Lithuania of 28 December 2009</li> <li>• Order No 80 of the Minister for the Environment of the Republic of Lithuania of 27 February 2002 on rules governing the granting, renewal and withdrawal of integrated pollution prevention and control permits</li> <li>• Order No D1-631 of the Minister for the Environment of the Republic of Lithuania of 29 December 2009 on the provision of data and information</li> <li>• Order No 408 of the Minister for the Environment of the Republic of Lithuania of 20 December 1999: Procedure for recording the emission of pollutants into the environment</li> <li>• Order No 217 of the Minister for the Environment of the Republic of Lithuania of 14 July 1999: waste management rules</li> </ul> |
| Luxembourg      | <ul style="list-style-type: none"> <li>• Law of 13 March 2009</li> <li>• Grand Ducal Regulation of 13 March 2009</li> </ul>   |
| Malta           | <ul style="list-style-type: none"> <li>• Legal Notice 152 of 2007 which specifies timeframes for reporting by operators (according to Article 5), offences and penalties for non-compliance (according to Article 20)</li> <li>• Government Notice 660 of 13 July 2007</li> </ul>   |
| The Netherlands | <ul style="list-style-type: none"> <li>• The Environmental Management Act</li> <li>• The E-PRTR Implementing Order</li> <li>• The General Administrative Law Act</li> <li>• The Economic Offences Act</li> </ul>  |
| Norway          | <ul style="list-style-type: none"> <li>• The Norwegian Pollution Control Act (1981)</li> <li>• Freedom of information legislation (1970, superseded 2006)</li> </ul>  |
| Poland          | <ul style="list-style-type: none"> <li>• Environmental Protection Law Act of 27 April 2001</li> <li>• Regulation of the Minister for the Environment of 1 October 2007 concerning the model report form for the establishment of a National Pollutant Release and Transfer Register</li> <li>• The Act of 3<sup>rd</sup> October 2008 on access to information on the environment and environmental protection, public participation in environmental protection and environmental impact assessments</li> </ul>  |
| Portugal        | <ul style="list-style-type: none"> <li>• Decree-Law No 127/2008 of 21 July 2008</li> <li>• Decree-Law No 6/2011 of 10 January 2011</li> </ul>   |
| Romania         | <ul style="list-style-type: none"> <li>• Law No 112 of 14 April 2009 ratifying the protocol on the Pollutant Release and Transfer Register</li> <li>• Government Decision No 140 of 6 February 2008 establishing measures for the implementation of the provisions of Regulation (EC) No 166/2006 of the European Parliament and of the Council concerning the establishment of a European Pollutant Release and Transfer Register and amending Council Directives 91/689/EEC and 96/61/EC</li> </ul>   |
| Slovakia        | <ul style="list-style-type: none"> <li>• Act of the Slovak National Government No. 205/2004 Coll. on gathering, holding and dissemination of information on environment</li> <li>• Regulation No. 411/2007 Coll. includes additional details on data reporting</li> </ul>   |
| Slovenia        | <ul style="list-style-type: none"> <li>• Decree on the implementation of Regulation (EC) No 166/2006 of the European Parliament and of the Council concerning the establishment of a European Pollutant Release and Transfer Register and amending Council Directives 91/689/EEC and 96/61/EC</li> <li>• Environmental Protection Act and its implementing regulations</li> </ul>   |

|                |   |
|----------------|---|
| Spain          | <ul style="list-style-type: none"> <li>• Law No 16 of 1 July 2002 on integrated pollution prevention and control; 'Obligation of the installations' owners to inform the competent authorities of the Autonomous Communities every year of the emissions generated by their installations'</li> <li>• Royal Decree 508/2007 of 20 April on the submission of information related to the E-PRTR Regulation and the integrated environmental authorisations. (BOE 96 of 21/04/2007).</li> <li>• Royal Decree 812/2007 of 22 June on ambient air quality assessment and management in relation to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons (BOE 150 of 23/06/07)</li> <li>• Royal Decree 102/2011 of 28 January 2011 on improving air quality , (BOE 25 of 29/01/11), repealing Royal Decree 812/2007 and amendments of Article 3(1) and Annexes II and III including a new Article 4(3) and a new Article 8 of Royal Decree 508/2007</li> </ul> |
| Sweden         | <ul style="list-style-type: none"> <li>• ENVIRONMENTAL CODE, SFS 1998:808</li> <li>• ORDINANCE ON ENVIRONMENTALLY HAZARDOUS ACTIVITIES, SFS 1998:899</li> <li>• REGULATION ON ENVIRONMENTAL REPORTS, NFS 2006:9</li> </ul>  |
| United Kingdom | <ul style="list-style-type: none"> <li>• England and Wales: Regulation 60 of the Environmental Permitting Regulations (EPR 2010)</li> <li>• Scotland: Information Notice under the Pollution Prevention and Control (Scotland) Regulations 2000, the Waste Management Licensing Regulations (Scotland) 1994 and the Water Environment (Controlled Activities) Regulations (Scotland) 2005.</li> <li>• Northern Ireland: Pollution Prevention and Control Regulations (Northern Ireland) 2003</li> </ul>   |

### Additional measures to establish a national PRTR system

Six Countries (Bulgaria, Ireland, the Netherlands, Romania, Slovakia, United Kingdom) provided voluntary information on additional measures to establish a national PRTR system. Ireland sends e-mails to all facilities to remind them of their reporting obligations including their login details. Ireland also offers a dedicated section on the PRTR reporting website with sector-specific and general guidance for licensees and a downloadable licensee-specific Excel workbook and calculation tools for waste water, quarries and intensive agriculture facilities. The Netherlands reported a monitoring and registration system for facilities as additional measure and a national guideline in which additional working arrangements are laid down which are made by relevant ministries, competent authorities and business representatives.

### Implementation of reporting deadline

Article 7(1) of Regulation 166/2006/EC indicates that Countries have to determine a date by which operators shall provide all the data to the competent authority. This provision has been implemented by countries in several ways. Eleven countries (Bulgaria, Cyprus, Finland, Greece, Ireland, Netherlands, Norway, Romania, Slovakia, Spain, United Kingdom) out of 29 provided voluntary information on that issue. Bulgaria, Finland, Germany, the Netherlands and Romania have implemented deadline through their national laws. Ireland incorporated the national PRTR system into the Annual Environmental Reporting system, which provides for a fixed deadline for reporting each year. In Norway, the reporting date is specified in the permits. The United Kingdom issues notices to the operators specifying what information is required, in which format and by which deadlines. Each competent authority specifies a date for the return of information by the operators under its jurisdiction.

### Sanctions

One important aspect of the implementation of the E-PRTR at the national level is the enforcement of sanctions pursuant to Article 20 (1) of the E-PRTR Regulation. Countries have used different approaches. Some have adopted specific national measure to implement sanctions for enforcing the obligations under E-PRTR, others have made use of existing legislation. A distinction can be made between administrative sanctions such as fines and criminal sentences such as imprisonment. In addition, some countries have implemented social sanctions such as "naming and shaming". All countries (29) reported that administrative sanctions can be applied. Eight countries (Belgium, Cyprus, Denmark, Germany, Luxembourg, the Netherlands, Sweden and United Kingdom) reported that criminal proceedings can be initiated to enforce E-PRTR. In Luxemburg, imprisonment of up to six months and

in the United Kingdom of up to two years is possible. In the Brussels region of Belgium convictions to imprisonment between eight and 12 months and in Cyprus between one and three year can be applied. In Spain, the sanctions regime established in its National IPPC Law is applicable for non-compliance under the PRTR legislation.

Some countries have provided the exact level of the applicable administrative fines while others have not done so. Table 8 presents an overview of the level of fines for the countries that have provided this information. The main source of information has been the Article 16(1) questionnaires. If no information has been provided in the questionnaire but in the Study on the implementation of penalties, this information has been added to the table.

**Table 8: Overview on level of penalty**

| Country        | Region   | Level of penalty  | Source                               |
|----------------|----------|---|--------------------------------------|
| Austria        |          | € 2,000 – 4,000, max. € 36,340  | Article 16(1) questionnaire          |
| Belgium        | Flemish  | Max. € 250,000  |                                      |
|                | Walloon  | € 100 to 100,000  | Study on implementation of penalties |
|                | Brussels | €2.50 to 25,000   | Article 16(1) questionnaire          |
| Czech Republic |          | max. ~ € 20,000 (CZK 500,000)   | Article 16(1) questionnaire          |
| Denmark        |          | ~ € 270 (DKK 2,000) per week per director of the facility in case of late reporting   | Article 16(1) questionnaire          |
| Estonia        |          | Air legislation: max. €2,000<br>Waste legislation: max. € 13,000<br>Water legislation: max. € 2,000<br>Breaches of the integrated permit: max. € 3,200                    | Article 16(1) questionnaire          |
| Germany        |          | max. € 10,000   | Study on implementation of penalties |
| Greece         |          | € 50 – 500,000  | Study on implementation of penalties |
| Hungary        |          | Air legislation: ~ € 550 - €1,100 (HUF 150,000 – 300,000)<br>Water legislation: ~ € 180 - € 1,100) HUF 50,000 – 300,000)<br>Waste legislation: max. ~ € 700 (HUF 200,000) | Article 16(1) questionnaire          |
| Ireland        |          | Max. € 3,000  | Study on implementation of penalties |
| Italy          |          | Max. € 200 in case of a violation of a measure legally issued by the authorities  | Study on implementation of penalties |
| Lithuania      |          | €30 - €60 (LTL 100 - LTL 200) for non-disclosure of environmental information<br>€60 - €120 (LTL 200 - LTL 400) for publication of inaccurate information                 | Article 16(1) questionnaire          |
| Luxembourg     |          | € 251 – € 50,000  | Article 16(1) questionnaire          |
| Malta          |          | ~ € 1,655 – ~ € 4,660, max. ~ € 23,300  | Study on implementation of penalties |
| Poland         |          | ~ € 1,250 (PLN 5,000) for data quality not in compliance<br>~ € 2,500 (PLN 10,000) for late reporting   | Article 16(1) questionnaire          |

| Country        | Region | Level of penalty  | Source                               |
|----------------|--------|---|--------------------------------------|
| Portugal       |        | Max. €20,000 for infractions by an individual<br>Max. € 48,000 for infractions by a collective  | Study on implementation of penalties |
| Romania        |        | a) the fine for the operator failure to comply with the reporting obligations stipulated by the Art. 5 (1-5) of the Regulation no 166/2006 is in range of € 4,400 – € 5,800 Euros (RON 15,000 – RON 20,000);<br>b) the fine for the operator failure to comply with Art. 9 (1) provisions regarding the assurance of data quality is in range of € 4,400 - € 5,800 Euros (RON 15,000 – RON 20,000);<br>c) the fine for the operator failure to comply with Art. 3 (1) provisions regarding the report format settled by Annex III is in range of € 2,900 - € 4,400 Euros (RON 10,000 - RON 15,000 RON);<br>These penalties can be applied separately or in combination and may be paid a maximum amount reaching a value of € 16,000. | Article 16(1) questionnaire          |
| Slovakia       |        | € 332 - € 16,597  | Article 16(1) questionnaire          |
| Slovenia       |        | € 4,173 - € 12,519 for legal persons<br>€ 2,086 - € 4,173 for individual persons  | Article 16(1) questionnaire          |
| Spain          |        | Articles 31-36, (infractions and penalties) of IPPC Spanish Law (Ley 16/2002, (BOE 157 of 2/07/02))   | Article 16(1) questionnaire          |
| Sweden         |        | ~ € 110 - ~ € 215 (SEK 1,000 - SEK 2,000)   | Article 16(1) questionnaire          |
| United Kingdom |        | Max. ~ € 6,000 (£ 5,000)  | Article 16(1) questionnaire          |

*Note: This table only includes countries that have provided specific figures on penalties.*

Another important aspect in relation to sanctions to enforce the E-PRTR system is the countries' experience with their application in gathering the data for the first three years of the E-PRTR reporting obligation. Not all countries have provided information on the extent to which penalties have been applied. Ten countries (Denmark, Finland, Hungary, Italy, Latvia, Luxembourg, Malta, Romania, Slovakia, Spain) reported that so far no penalties have been imposed. Five countries (Austria, Netherlands, Poland, Portugal, Sweden) reported that penalties have already been imposed. However, Sweden referred to environmental sanction charges and it is not fully clear whether penalties have been imposed for breaches of E-PRTR obligations. All penalties that were imposed were administrative penalties. No country reported having imposed criminal penalties.

### 3. Implementation of the reporting requirements

Ten countries (Bulgaria, Cyprus, Finland, Ireland, Netherlands, Norway, Romania, Slovakia, Spain, United Kingdom) out of 29 reported whether they apply for their national PRTR the capacity threshold as reporting requirements for PRTR activities or the employee threshold. All of the listed countries except Norway apply the capacity threshold as reporting requirement. Norway applies none of the thresholds because Norwegian facilities have to report any emissions that possibly can cause harm to the environment.

The same countries listed above except for Finland provided information on whether they apply the reporting obligations only to the operator of each individual facility or also to the owner. Bulgaria, Cyprus, Ireland, the Netherlands, Norway, Slovakia and the United Kingdom apply the reporting obligations only to the operator of each individual facility. In Ireland there is an exception for some facilities in

the Intensive Agriculture sector where the owner of the facility is the license holder. In Romania, the individual report for each facility must be approved, signed and stamped by the parent company of the facility concerned. This means that the information reported is also that of the facility owner.

Out of nine countries (Bulgaria, Cyprus, Finland, Ireland, the Netherlands, Norway, Romania, Slovakia and the United Kingdom) that provided information on any differences and extensions in the list of activities or their associated thresholds and on the adoption of lower thresholds only Finland, Norway and Spain reported differences. Finland reported that they have adopted lower capacity thresholds. In principle, 481 facilities fall under the E-PRTR Regulation but the annual reporting requirement covers about 4,500 facilities. In Norway, the facilities have to report any emissions that possibly can cause harm to the environment and there are no activity or pollutant thresholds. In Spain, there are no pollutant thresholds for reporting. Concerning any differences and extensions in the list of pollutants and associated thresholds the Netherlands has added eight additional pollutants to air (see Table 9) in order to ensure that a sufficiently high percentage of industrial emissions is reported. Spain has added additional pollutants to air (TSP, Ta, Sb, V, Co, Mn, TOC) and to water/land (disaggregated information for groups of substances: PAHs, xylenes, DDT, brominated diphenylethers). In Norway, the reasons for having no thresholds are that in principle all pollution is forbidden and the operators have the whole responsibility for their operations.

**Table 9: New substances and substances with lowered thresholds to air in the Netherlands**

| Pollutant   | Threshold to air      |
|---|-----------------------|
| Carbon monoxide (CO)  | 10 000 kg/year        |
| Carbon dioxide (CO <sub>2</sub> )   | 100 000 kg/year       |
| Hydrofluorocarbons (HFCs)   | 1 kg/year             |
| Non-methane volatile organic compounds (NMVOCs)   | 10 000 kg/year        |
| Nitrogen oxides (NO <sub>x</sub> /NO <sub>2</sub> )   | 10 000 kg/year        |
| Perfluorocarbons (PFCs)   | 1 kg/year             |
| Sulphur hexafluoride (SF <sub>6</sub> )   | 10 kg/year            |
| Sulphur oxides (SO <sub>x</sub> /SO <sub>2</sub> )  | 20 000 kg/year        |
| Cadmium and its compounds (as Cd)   | 1 kg/year             |
| Mercury and its compounds (as Hg)   | 1 kg/year             |
| Lead and its compounds (as Pb)  | 50 kg/year            |
| PCDD + PCDF (dioxins + furans) (as Teq)   | 0,00001 kg/year       |
| Benzene   | 500 kg/year           |
| <i>Phenols (as total C)</i>   | <i>100 kg/year</i>    |
| Polycyclic aromatic hydrocarbons (PAHs)   | 1 kg/year             |
| <i>Toluene</i>  | <i>10 000 kg/year</i> |
| Particulate matter (PM <sub>10</sub> )  | 5 000 kg/year         |
| <i>Total dust (total dust has to be reported if the threshold for particulate matter (PM<sub>10</sub>) is exceeded)</i> |                       |
| <i>Acrolein (acrylaldehyde)</i>   | <i>1 kg/year</i>      |
| <i>Acrylonitrile (2-propenenitrile)</i>   | <i>100 kg/year</i>    |
| <i>Ethene</i>   | <i>1 000 kg/year</i>  |
| <i>Formaldehyde (methanal)</i>  | <i>100 kg/year</i>    |
| <i>Styrene</i>  | <i>500 kg/year</i>    |

Note: Substances in italics are additional substances.

## Integration into other reporting mechanisms

In some countries the E-PRTR reporting obligation has been integrated into other reporting mechanisms in order to eliminate duplicative reporting by operators. Bulgaria, Ireland, the Netherlands, Norway, Romania, Slovakia and the United Kingdom reported information on the level of integration of PRTR into other reporting mechanisms. Germany, Ireland, the Netherlands, Norway and the United Kingdom reported that they have integrated the E-PRTR reporting system into other reporting mechanisms. Romania and Slovakia plan to implement an integrated reporting system.

Ireland is currently improving its system with the aim of eliminating duplicate reporting. In Bulgaria, a single portal to the reporting system for PRTR and waste is planned. However, the reporting will stay separate for the different obligations. The United Kingdom, Norway and the Netherlands avoid duplicate reporting by using datasets they receive from the facilities for different reporting obligations.

## 4. PRTR data flow

In the PRTR dataflow at the country level there are three possible levels involved: national, regional, and local. Generally speaking, smaller and medium-sized countries involve fewer levels in the dataflow than larger countries. In most cases the different levels that are involved in the PRTR data flow also validate the data in some way. In some cases, however, the involved institutions only compile or forward data. Table 10 provides an overview of the different levels that are involved in the dataflow in the different countries.

**Table 10: Levels of PRTR dataflow**

| Institutions involved | local, regional and national | regional and national | regional and interregional | local and national | national only  |
|-----------------------|------------------------------|-----------------------|----------------------------|--------------------|----------------|
| <b>Country</b>        | Austria                      | Bulgaria              | Belgium                    | France             | Cyprus         |
|                       | Denmark                      | Finland               |                            | The Netherlands    | Czech Republic |
|                       | Germany                      | Hungary               |                            |                    | Estonia        |
|                       | Italy                        | Latvia                |                            |                    | Greece         |
|                       | Romania                      | Lithuania             |                            |                    | Ireland        |
|                       | Sweden                       | Norway                |                            |                    | Liechtenstein  |
|                       | United Kingdom               | Poland                |                            |                    | Luxembourg     |
|                       |                              | Portugal              |                            |                    | Malta          |
|                       |                              | Spain                 |                            |                    | Slovakia       |
|                       |                              |                       |                            |                    | Slovenia       |

In ten countries the data collection and validation is carried out at the national level only. In Liechtenstein and Slovenia one institution is responsible for the whole process of collecting and validating the data while in Cyprus, Estonia, Greece and Luxembourg different departments of the relevant ministries collaborate. In the Czech Republic, Ireland, Malta and Slovakia the competent ministries collaborate with other institutions such as environmental agencies.

In nine countries regional and national institutions are involved in the PRTR data flow. In Portugal and Norway, for example, there is a shared jurisdiction between the regional and the national level depending on the type of facility. In Belgium, a special case, the PRTR data is collected by the competent authorities of the three Regions (Flemish Region, Walloon Region and Brussels Capital Region) and delivered to the National Focal Point (interregional type of institution), which compiles the regional data to one national pollutant release and transfer register. In seven countries local, regional and national institutions are involved in data collection and validation whereas in only two countries the local and the national level are involved in the dataflow.

The institutions that are involved in the data flow also vary between countries. Whereas in some countries it is local and regional authorities and the respective ministries being involved, in other countries other institutions such as national or regional environment agencies play a role in the dataflow.

Table 11 provides a list of the competent authorities that are designated to collect PRTR data from facilities.

**Table 11: Competent authorities designated to collect information on releases/transfers from point sources**

| Country        | Competent authorities designated to collect information on releases of pollutant from point sources  |
|----------------|--|
| Austria        | <ul style="list-style-type: none"> <li>• Local district authority or the relevant Provincial Governor</li> <li>• In rare cases others are also responsible (Federal Minister for Agriculture, Forestry, the Environment and Water Management, Federal Minister for Economic Affairs, Family and Youth)</li> </ul>  |
| Belgium        | <ul style="list-style-type: none"> <li>• Flemish Region: The Environment, Nature and Energy Department, VMM – Flemish Environment Agency, OVAM – Flemish Public Waste Agency</li> <li>• Walloon Region: The Operational Directorate-General for Agriculture, Natural Resources and the Environment</li> <li>• Brussels Capital Region: The Brussels Institute for Management of the Environment</li> <li>• The National Focal Point (NFP)</li> </ul> |
| Bulgaria       | <ul style="list-style-type: none"> <li>• The Regional Inspectorates of Environment and Water</li> <li>• The Executive Environment Agency</li> </ul>  |
| Cyprus         | <ul style="list-style-type: none"> <li>• Department of Labour Inspection of the Ministry of Labour and Social Insurance</li> <li>• Department of Environment</li> </ul>  |
| Czech Republic | <ul style="list-style-type: none"> <li>• Ministry of the Environment</li> <li>• Czech Environmental Inspectorate (ČIŽP)</li> <li>• GENIA (Czech Environmental Information Agency)</li> </ul>   |
| Denmark        | <ul style="list-style-type: none"> <li>• The municipality or the decentralised units of the Environmental Protection Agency</li> </ul>   |
| Estonia        | <ul style="list-style-type: none"> <li>• The Environment Board</li> <li>• The Environment Information Centre</li> </ul>  |
| Finland        | <ul style="list-style-type: none"> <li>• Centre for Economic Development, Transport and the Environment</li> </ul>   |
| France         | <ul style="list-style-type: none"> <li>• Regional authorities: e.g. decentralised offices of the Ministry, the regional directorates for the environment, town planning and housing (DREAL)</li> </ul>   |
| Germany        | <ul style="list-style-type: none"> <li>• Local and regional authorities: depending on the administrative structure of the individual Federal State</li> </ul>  |
| Greece         | <ul style="list-style-type: none"> <li>• The Directorate of Air Pollution and Noise Control (EARTH) of the Ministry of the Environment Energy and Climate Change (YPEKA)</li> <li>• The Department of Waste</li> </ul>   |
| Hungary        | <ul style="list-style-type: none"> <li>• The regional Environmental, Conservation and Water Authorities</li> </ul>   |
| Iceland        | Questionnaire has not been submitted   |
| Ireland        | <ul style="list-style-type: none"> <li>• The Environmental Protection Agency (EPA) Ireland</li> </ul>  |
| Italy          | <ul style="list-style-type: none"> <li>• The Italian Ministry of Environment, Land and Sea (IMELS)</li> <li>• Regional/provincial authorities</li> </ul>   |
| Latvia         | <ul style="list-style-type: none"> <li>• Ministry of Environmental Protection and Regional Development (VARAM)</li> <li>• The State Environmental Service (VVD)</li> <li>• The State Environmental Service's Regional Environmental Offices (VVD RVP)</li> <li>• Latvian Environmental, Geological and Meteorological Centre' (LVĢMC)</li> </ul>   |
| Liechtenstein  | <ul style="list-style-type: none"> <li>• Office of environmental protection</li> </ul>   |
| Lithuania      | <ul style="list-style-type: none"> <li>• The regional environmental protection departments ("RAADs") of the Ministry of the Environment</li> </ul>   |
| Luxembourg     | <ul style="list-style-type: none"> <li>• The Administration of the Environment</li> <li>• The Administration of Water Management</li> </ul>  |



|                 |  |
|-----------------|--|
| Malta           | <ul style="list-style-type: none"> <li>• The Malta Environment and Planning Authority (MEPA)</li> </ul>  |
| The Netherlands | <ul style="list-style-type: none"> <li>• The municipality or the province</li> <li>• Water quality manager, i.e. the district water board or the Rijkswaterstaat</li> <li>• Ministry of Economic Affairs, Agriculture and Innovation: for institutions coming under activity 7a of Annex I</li> </ul>  |
| Norway          | <ul style="list-style-type: none"> <li>• The Climate and Pollution Agency</li> <li>• The County Governors</li> </ul>   |
| Poland          | <ul style="list-style-type: none"> <li>• Voivodship Inspectorates of Environmental Protection</li> </ul>   |
| Portugal        | <ul style="list-style-type: none"> <li>• Portuguese Environmental Agency</li> <li>• North Regional Coordination and Development Committee – CCDR Norte</li> <li>• River Basin District Administration for North Portugal</li> <li>• Central Regional Coordination and Development Committee – CCDR Centro</li> <li>• River Basin District Administration for Central Portugal</li> <li>• Lisbon and Tagus Valley Regional Coordination and Development Committee – CCDR LVT</li> <li>• River Basin District Administration for the Tagus Region</li> <li>• Alentejo Regional Coordination and Development Committee – CCDR Alentejo</li> <li>• River Basin District Administration for the Alentejo Region</li> <li>• Algarve Regional Coordination and Development Committee – CCDR Algarve</li> <li>• River Basin District Administration for the Algarve Region</li> <li>• Azores Regional Directorate for the Environment (RAA)</li> <li>• Madeira Regional Directorate for the Environment (RAM)</li> </ul> |
| Romania         | <ul style="list-style-type: none"> <li>• The environmental protection agency in each county</li> </ul>   |
| Slovakia        | <ul style="list-style-type: none"> <li>• The Slovak Hydrometeorological Institute</li> </ul>   |
| Slovenia        | <ul style="list-style-type: none"> <li>• The Slovenian Environment Agency</li> </ul>   |
| Spain           | <ul style="list-style-type: none"> <li>• The regional governments of the Autonomous Communities</li> </ul>   |
| Sweden          | <ul style="list-style-type: none"> <li>• The Swedish Environmental Protection Agency</li> </ul>  |
| United Kingdom  | <ul style="list-style-type: none"> <li>• The Environment Agency (for England and Wales)</li> <li>• Local authorities under Defra's and the Welsh Assembly's guidance</li> <li>• The Scottish Environment Protection Agency (SEPA)</li> <li>• The Department for Environment in Northern Ireland</li> <li>• The Department for Energy and Climate Change: for the off-shore sector</li> </ul>   |

## 5. Data quality assurance and assessment

The Czech Republic, Estonia, Greece, Hungary, Ireland, Malta and Portugal pointed out the fact that in line with Article 9(1) of the E-PRTR Regulation the operators are responsible for the quality of the PRTR data that they provide to the competent authorities. In addition, Article 9(2) of the E-PRTR Regulation requires the competent authorities to assess the quality of the data provided by the operators of PRTR facilities, in particular as to their completeness, consistency and credibility. All countries (29) reported that the data is checked in one way or the other. However, the thoroughness of the checks seems to vary significantly between countries. Most countries carry out checks on every single report whereas Greece reported that only a sample of reports is checked.

The types of checks also differ between countries. The most common checks are the comparison of PRTR reports with previous years' data and with data from other reporting obligations (such as from the EU Emissions Trading Scheme) and a detailed check of the operator's file including the environmental permit. Several countries (France, Belgium (Flemish region), Czech Republic, Germany, Ireland, Norway, Spain, Sweden, United Kingdom) have also implemented a series of automatic checks that are carried out when operators enter their PRTR data into the electronic reporting system. Such checks may, for example, include a completeness checks and a comparison with previous years' data. In the PRTR-España implausible values are automatically flagged for the competent authority. In the Swedish system, the user is made aware if a value has changed considerably since last year's report and it includes an automatic check of the combination of pollutants and the media which the pollutants

were released/transferred to. In Germany a separate audit report informs operators and competent authority about errors and warnings such as outliers or false coordinates. Finland plans to implement automated checks in 2011/2012.

Other quality checks include the comparison of PRTR data with data from other facilities with the same activity, the comparison with guidebooks and manuals and the comparison with an emissions factor or emissions reference value. Norway and the United Kingdom reported that public validation of data by early publishing of the data constitutes an additional step. Table 12 illustrates the main types of checks that countries have reported.

Countries have also undertaken efforts to improve the quality of E-PRTR data. Many countries reported the general quality checks (see Table 12) as a measure to improve data. 12 countries (Germany, Belgium, Denmark, Estonia, Greece, Hungary, Ireland, Luxembourg, Malta, Norway, Portugal, United Kingdom) reported that contacting the operators in case of data inconsistencies constitutes a main tool to improve the quality of E-PRTR data. Hungary also carries out workshops for operators to improve data quality. Other reported measures to improve data quality include the training of verifiers (Estonia), information sharing between competent authorities (Germany, Hungary, United Kingdom), a national PRTR helpdesk (The Netherlands, Ireland) and the development of a national PRTR guidance or methodological manual (The Netherlands, Norway, Poland). Finland reported that improvements to emissions monitoring and reporting systems are currently under discussion.

**Table 12: Overview on type of data quality checks**

| Automatic check upon entry into electronic system | Comparison with data submitted in previous years (time series) | Comparison with data from other reporting obligations | Detailed check of the operator's file including the environmental permit | Comparison with data from other facilities with same activity | Comparison with guidebooks and manuals (EU E-PRTR guidance, national guidance, etc.) | Comparison with an emissions reference value or emissions factor | Check general operator and facility data (name, activity, coordinate, etc.) | Site visits              | Public validation by early publishing |
|---|--|---|--|---|--|--|---|--------------------------|---------------------------------------|
| France  | Austria  | Bulgaria  | Austria  | Austria   | Austria  | Netherlands  | France  | Poland                   | Norway                                |
| Flemish region (Belgium)                          | Germany  | Germany   | Germany  | Flemish region (Belgium)                                      | Walloon region (Belgium)   | Walloon region (Belgium)   | Lithuania   | Walloon region (Belgium) | United Kingdom                        |
| Czech Republic                                    | Flemish region (Belgium)                                       | Belgium (all regions)                                 | Walloon region (Belgium)   | Malta   | Finland  | Brussels region (Belgium)  | Slovenia  |                          | Germany                               |
| Ireland   | Brussels region (Belgium)                                      | Liechtenstein   | Denmark  | Portugal  | Poland   |  | United Kingdom  |                          | Spain                                 |
| Norway  | Czech Republic   | Lithuania   | Estonia  | United Kingdom  |  |  | Germany   |                          |                                       |
| Spain   | France   | Portugal  | Italy  | Germany   |  |  | Spain   |                          |                                       |
| Sweden  | Lithuania  | Romania   | Latvia   | Spain   |  |  |   |                          |                                       |
| United Kingdom                                    | Malta  | Slovakia  | Lithuania  |   |  |  |   |                          |                                       |
| Germany   | Netherlands  | Slovenia  | Malta  |   |  |  |   |                          |                                       |
|   | Norway   | Spain   | Poland   |   |  |  |   |                          |                                       |
|   | Portugal   | United Kingdom  | Romania  |   |  |  |   |                          |                                       |
|   | Slovenia   |   | Slovakia   |   |  |  |   |                          |                                       |
|   | Spain  |   | Spain  |   |  |  |   |                          |                                       |
|   | Sweden   |   |  |   |  |  |   |                          |                                       |
|   | United Kingdom   |   |  |   |  |  |   |                          |                                       |

## 6. PRTR reporting practice

Countries provided information on reporting practice, deadlines and difficulties to reach the deadlines.

### Deadline for reporting

The deadlines for reporting to the competent authorities differed between the countries for the reporting years 2007-2009 (see Table 13). The majority of countries had one single reporting deadline for all three reporting years. This deadline is mostly 31 March of reporting year + 1, however, in some countries earlier or later deadlines such as 1 March or 30 April are in place. Some countries (Germany, Cyprus, Romania) had a later deadline in the first reporting year probably based on the fact that 2007 data had to be forwarded to the European Commission three months later than 2008 and 2009 data. Interestingly, Bulgaria and Luxembourg reported a later deadline for 2008 data than for 2007 data. Belgium and the United Kingdom have different deadlines depending on the region where the facility is located. In Estonia and Latvia there are different deadlines for the media air, water and waste.

**Table 13: Deadlines for reporting to the competent authorities**

| Country        | Deadlines                                      | Reference Year                       |      |
|----------------|--|--------------------------------------|------|
| Austria        | 31 <sup>st</sup> May of year + 1               | 2007 - 2009                          |      |
|                | Flemish Region                                 | 15 <sup>th</sup> March of year + 1   |      |
|                | Walloon Region                                 | 31 <sup>st</sup> March of year + 1   |      |
| Belgium        | Brussels Capital Region                        | 30 <sup>th</sup> June of year + 1    |      |
|                |  | 2007 - 2009                          |      |
|                |  | 31 <sup>st</sup> March 2009          | 2007 |
|                |  | 15 <sup>th</sup> December 2009       | 2008 |
| Bulgaria       | 31 <sup>st</sup> March 2010                    | 2009                                 |      |
| Cyprus         | Unclear answer <sup>29</sup>                   |                                      |      |
| Czech Republic | 31 <sup>st</sup> March of year + 1             | 2007-2009                            |      |
| Denmark        | 31 <sup>st</sup> May <sup>30</sup> of year + 1 | 2007-2009                            |      |
|                | waste  | 20 <sup>th</sup> January of year + 1 |      |
|                | air  | 31 <sup>st</sup> January of year + 1 |      |
|                | water  | 1 <sup>st</sup> February of year + 1 |      |
| Estonia        |  | 2008                                 |      |
| Finland        | 28 <sup>th</sup> February of year + 1          | 2007-2009                            |      |
| France         | 31 <sup>st</sup> March of year + 1             | 2007-2009                            |      |
|                |  | 15 <sup>th</sup> June 2008           | 2007 |
|                |  | 31 <sup>st</sup> May 2009            | 2008 |
|                |  | 31 <sup>st</sup> May 2010            | 2009 |
| Germany        |  |                                      |      |
| Greece         | Unclear answer <sup>31</sup>                   |                                      |      |
| Hungary        | 31 <sup>st</sup> March of year + 1             | 2007-2009                            |      |
| Iceland        | Questionnaire has not been submitted           |                                      |      |
| Ireland        | 31 <sup>st</sup> March of year + 1             | 2007-2009                            |      |
| Italy          | 30 <sup>th</sup> April of year + 1             | 2007-2009                            |      |

<sup>29</sup> Cyprus reported that the deadline for reporting for 2007 was 31 December 2008, 31 October 2009 and 31 October 2010.

<sup>30</sup> This is the deadline for facilities that do not have to submit green accounts. Facilities that have to send green accounts are obliged to do so by no later than 14 weeks after the close of the accounting period.

<sup>31</sup> Greece reported that the deadline for reporting 2007 and 2008 data to the national authority was 31 May 2009 and 31 December 2009, respectively. The deadline for reporting 2009 data to the Ministry of Environment was 31 March 2011.

| Country                     |  | Deadlines   | Reference Year |
|-----------------------------|--|---|----------------|
| Latvia                      | waste  | 15 <sup>th</sup> February of year + 1                   | 2007-2009      |
|                             | air  | 31 <sup>st</sup> January of year + 1                    |                |
|                             | water  | 31 <sup>st</sup> January of year + 1                    |                |
| Liechtenstein <sup>32</sup> |  | 30 <sup>th</sup> March 2011                             | 2009           |
| Lithuania                   |  | 1 <sup>st</sup> March of year + 1                       | 2007-2009      |
| Luxembourg                  |  | 1 <sup>st</sup> March 2009                              | 2007           |
|                             |  | 1 <sup>st</sup> July 2009                               | 2008           |
|                             |  | 1 <sup>st</sup> July 2010                               | 2009           |
| Malta                       |  | 30 <sup>th</sup> June 2008                              | 2007           |
|                             |  | 31 <sup>st</sup> March 2009                             | 2008           |
|                             |  | 31 <sup>st</sup> March 2010                             | 2009           |
| The Netherlands             |  | 31 <sup>st</sup> March of year + 1                      | 2007-2009      |
| Norway                      |  | 1 <sup>st</sup> March of year + 1                       | 2007-2009      |
| Poland                      |  | 31 <sup>st</sup> March of year + 1                      | 2007-2009      |
| Portugal <sup>33</sup>      |  | 21 <sup>st</sup> August/21 <sup>st</sup> September 2008 | 2007           |
|                             |  | 31 <sup>st</sup> March 2009                             | 2008           |
|                             |  | 31 <sup>st</sup> March 2010                             | 2009           |
| Romania                     |  | 30 <sup>th</sup> May 2008                               | 2007           |
|                             |  | 30 <sup>th</sup> April 2009                             | 2008           |
|                             |  | 30 <sup>th</sup> April 2010                             | 2009           |
| Slovakia                    |  | 31 <sup>st</sup> March of year + 1                      | 2007-2009      |
| Slovenia                    |  | 31 <sup>st</sup> March of year + 1                      | 2007-2009      |
| Spain                       |  | 31 <sup>st</sup> March of year + 1                      | 2007-2009      |
| Sweden                      |  | 31 <sup>st</sup> March of year + 1                      | 2007-2009      |
| The United Kingdom          | local authorities (England+Wales)                  | 28 <sup>th</sup> April 2011                             | 2010           |
|                             | The Environment Agency (England+Wales)             | 28 <sup>th</sup> February 2011                          |                |
|                             | Scottish Environment Protection Agency (SEPA)      | 28 <sup>th</sup> February 2011                          |                |
|                             | The Department for Environment in Northern Ireland | 31 <sup>st</sup> January 2011                           |                |

### Meeting the deadlines and reasons for delays

Seventeen countries (see Table 14) reported that the deadlines for reporting by facilities were generally met in practice whereas twelve countries reported that facilities did not always meet the deadlines for reporting.

<sup>32</sup> Deadlines for the reporting years 2007 and 2008 not available

<sup>33</sup> Portugal: PRTR 2007: 21 August 2008 deadline for operators of E-PRTR facilities which are also covered by the IPPC Directive; 21 September 2008 for operators of E-PRTR facilities which are not covered by the IPPC Directive.

**Table 14: Meeting the deadlines in practice**

| Countries in which facilities generally met the deadlines | Countries in which (at least some) facilities missed the deadlines |
|---|--|
| Cyprus  | Austria  |
| Czech Republic  | Belgium  |
| Estonia   | Bulgaria <sup>34</sup>   |
| Finland   | Denmark <sup>35</sup>  |
| Germany   | France   |
| Hungary   | Greece   |
| Ireland   | Latvia   |
| Italy   | Malta <sup>36</sup>  |
| Liechtenstein   | Norway <sup>37</sup>   |
| Lithuania   | Poland   |
| Luxembourg  | Portugal   |
| The Netherlands   | United Kingdom   |
| Romania   |  |
| Slovakia  |  |
| Slovenia  |  |
| Spain   |  |
| Sweden  |  |

The reported reasons for delays can be grouped into delays on the part of the operators, delays on the part of the competent authorities and other delays.

- Delays on the part of the operators

Six countries (Belgium, France, Hungary, Luxembourg, Norway, United Kingdom) reported that in some cases unwillingness and lack of discipline on part of the operators resulted in late reporting. Another reason for delays was that operators were unaware of the reporting obligation itself and had no experience with it (Austria, Belgium, Czech Republic, Malta, Poland). In Austria, Belgium, Bulgaria, Denmark, Latvia, Norway, Portugal and the United Kingdom some facilities missed the deadlines because of technical issues, especially problems with the electronic reporting systems. In Denmark delays (for the reporting year 2009) were also due to a new statutory order which came into force in March 2010 and a new responsible authority. Latvia also reported a lack of resource on the part of the operators to fill out the forms. Portugal and Latvia referred to difficulties in calculating releases/transfers to air and water and waste transfers.

The main problem on the part of the operator can thus be summarised as technical issues with the electronic tools, unwillingness of operators to report, lacking skills to correctly calculate releases and transfers and unawareness and lack of experience with the new reporting obligation in general.

- Delays on the part of the competent authority

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<sup>34</sup> In Bulgaria the operators missed the reporting deadline only for 2008 data.

<sup>35</sup> In Denmark the deadlines were missed only for the reporting year 2009.

<sup>36</sup> In Malta the reporting timeframes were largely respected by the operators in 2009, with only three reports being submitted more than one month after the allowed deadline.

<sup>37</sup> In Norway only a few facilities did not meet the deadlines.

One main difficulty for the competent authorities reported by Austria, Belgium and Greece was a lack of human resources in the competent authorities. Belgium reported problems with amending national law to be in accordance with PRTR (e.g. thresholds and nomenclature) and the adaptation of the reporting forms in accordance with national legislation.

- Other reasons for delays

For the first reporting year Bulgaria reported difficulties with the compatibility in building an integrated reporting information system. In addition, the short time span between the submission deadline for the 2007 and 2008 reports caused delays in Bulgaria. Denmark and Latvia reported problems when switching over to a new electronic reporting system such as operational problems with the new system or a decline in the quality of reports. Reasons for delays in Malta and Portugal were the PRTR reporting deadline coinciding with other reporting obligations. Another reason for delays in Malta was the time required for receipt of analysis results from external laboratories. Slovakia and Spain reported that difficulties occur in regard to the interaction with other legislative instruments and the reporting requirements deriving from those instruments.

### **Main difficulties regarding reporting of PRTR data**

The difficulties regarding the reporting of PRTR data partly overlap with the reasons for delays that are listed above. Liechtenstein is the only country that reported no difficulties for operators and for competent authorities regarding reporting of PRTR data. Nine countries (Bulgaria, Cyprus, Greece, Latvia, Lithuania, Luxembourg, Poland, Slovenia, Spain) reported difficulties with the methodologies for calculating releases and transfers. Bulgaria reported a lack of a methodology for calculating emission loads in water and from diffuse sources. Bulgaria pointed out that there were vast discrepancies in releases to air obtained by measurement and calculation methods. Cyprus and Greece identified weaknesses in some cases regarding the calculation of pollution releases and the determination of the methodology used. Five countries (Latvia, Lithuania, Luxembourg, Poland, Spain) stated that a uniform methodology for calculating emissions would make the compilation of reports easier. In addition, some countries noted that a standard methodology could facilitate the interpretation of the data.

Finland, Ireland, Latvia and Sweden reported that facilities had difficulties with the units of measurement (kg as reporting unit). Austria and Sweden indicated difficulties with defining the PRTR facility in case of complex installations. Sweden reported difficulties on the part of the operators with method type codes and method designation, information on addresses for facilities with off-site transfer of hazardous waste to other countries and pollutants reported both as single substances and as compounds. Some countries reported technical difficulties such as lacking IT skills and lack of experience with new reporting systems on the part of the operators.

Some countries indicated difficulties with time and resources. Austria, Malta and Portugal consider time-consuming plausibility checks to be a main difficulty. Finland, Norway, Sweden and the United Kingdom reported problems with the completeness of data. Two countries (Bulgaria, Germany) reported difficulties with assessing which data are subject to confidentiality.

Several countries also indicated difficulties in terms of interpreting and defining the scope of the E-PRTR Regulation, in particular regarding the new activities. Sweden had difficulties because of ambiguities in the guidelines "EUs Guidance Document for the implementation of the European PRTR" and "User manual for E-PRTR Validation" particularly concerning the method type codes and the method designations, which affected the electronic reporting tool and the generation of the xml file. The Netherlands indicated problems with the harmonization between other EU legislation (e.g. the IPPC Directive) and the E-PRTR Regulation.

The main difficulties can be summarised as follows:

- difficulties with the methodologies for calculation
- difficulties with the units of measurement

- technical difficulties (e.g. problems with reporting systems)
- E-PRTR classification of the facilities
- limited human resources
- interpretation of the scope of the E-PRTR Regulation
- completeness of data
- evaluation of confidentiality
- harmonization with other EU legislation

### Electronic versus paper-based reporting

Generally speaking, the way in which operators submit PRTR reports to the competent authorities is either on paper or electronically. Concerning electronic reporting a distinction has to be made between an online reporting tool and reports that are filled out in an Excel, Word or pdf file and are then sent by e-mail to the competent authorities. This is also considered to be electronic reporting.

Table 15 illustrates the percentage of electronic reporting compared to paper-based reporting for the reporting years 2007 to 2009.

The percentage of electronic reporting is relatively high with 14 countries reporting a percentage of 100% electronic reporting. In Poland facility operators are obliged to submit reports in both electronic and paper forms. In Malta reports are sent via e-mail, but filled out in a Word or pdf form. Some countries have exceptions from electronic reporting. In Spain, for example, farms for intensive rearing of poultry or pigs may submit their reports on paper because of lacking technology to submit an electronic report.

**Table 15: Proportion of electronic reporting compared to data delivered by operators on paper (2007-2009)**

| 100%   | above 90%  | 50% and more   | less than 50%                                      | 0% (100% paper)  |
|--|--|--|--|--|
| Austria, Bulgaria, Czech Republic, Finland, Germany, Ireland, Italy, Liechtenstein, Luxembourg, Malta, Netherlands, Norway, Poland, Sweden | Estonia, France, Portugal, Spain, United Kingdom | Belgium (Walloon Region), Greece <sup>38</sup> , Lithuania, Slovakia | Belgium (Flemish Region), Denmark, Hungary, Latvia | Belgium (Brussels Capital Region), Cyprus, Romania, Slovenia, Poland |

*Note: Iceland has not submitted the Article 16(1) questionnaire.*

Some countries reported that the percentage of electronic reporting increased in the course of the reporting cycle 2007 to 2009. In Denmark, for example, all PRTR data were submitted on paper until April 2010 when a new electronic reporting system was launched. In Latvia, the facilities reported 100% on paper for 2007 and already more than 60% electronically for 2008 and 2009.

### Description of the reporting tool

Twenty countries (Austria, Czech Republic, Cyprus, Denmark, Estonia, Finland, France, Germany, Ireland, Italy, Latvia, Liechtenstein, Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, United Kingdom) have electronic PRTR reporting tools/systems in place. Denmark launched its electronic reporting system in April 2010 and Cyprus and Romania in 2011. Greece also plans to implement an electronic reporting system. In general, the electronic reporting systems are web-based and are used by both the competent authorities and the operators. Operators enter the data into the system and are often supported by drop-down boxes, explanatory fields, etc. The system

<sup>38</sup> Greece reported that 40% - 60% of reports were submitted electronically (by e-mail).



may also carry out some automated checks. The competent authorities then review and approve the reports within the system.

In Bulgaria, Luxembourg and Malta 100% of reports are sent electronically via e-mail. In Bulgaria and Luxembourg Excel files are used whereas in Malta Word and pdf files are offered. Slovakia and Greece use a reporting system in which reports are partly sent via e-mail. In Slovakia most reports and in Greece 40-60% of reports are submitted via e-mail. The remaining reports are submitted on paper. In Lithuania data on transfers of waste are submitted via an electronic reporting tool whereas data on releases/transfers of pollutants into air and water are provided by operators in paper form.

In Hungary operators can download Word reporting files and submit data either on electronic media (e.g. CD, DVD) or on paper. The competent authority will then enter the data into the National Environmental Information Database System (OKIR) by using a special tool. In Belgium, the reporting tools differ between the regions. In the Flemish and Walloon region, the facilities have to submit the reporting form either in hard copy or electronically. In the Brussels region, reporting is paper-based.

## 7. Public access to PRTR data

All countries that submitted the Article 16(1) questionnaire except for Finland, Liechtenstein, Luxembourg, Portugal and Slovenia reported the link to their national PRTR website (see Table 16). Liechtenstein, Luxembourg, Portugal and Slovenia referred to the European PRTR website<sup>39</sup> instead, in order to gain access to their national PRTR data. However, it is unclear whether all of the national websites to which a link was provided actually allow for public access to national PRTR data or only inform about the PRTR reporting obligation<sup>40</sup>. A national PRTR website is a requirement for Parties of the UNECE PRTR Protocol, but not under the E-PRTR Regulation 116/2006/EC.

Portugal reported that the publication of PRTR data is planned in the National System for Environmental Information, a website run by the Portuguese Environment Agency. In Belgium, all three regions currently prepare to publish detailed PRTR data of 2010 from 2012 onwards. In the meantime, the data are published on other websites (see Table 16).

**Table 16: Links to national PRTR websites and PRTR related websites**

| Country        | National PRTR Websites and registers   |
|----------------|--|
| Austria        | <a href="http://www.prtr.at">http://www.prtr.at</a>  |
| Belgium        | <a href="http://environnement.wallonie.be/PRTR">http://environnement.wallonie.be/PRTR</a><br><a href="http://www.vmm.be/publicaties/2010/tabel-emissies-per-bedrijf/view">http://www.vmm.be/publicaties/2010/tabel-emissies-per-bedrijf/view</a> |
| Bulgaria       | <a href="http://eea.government.bg/forms/eprtr.jsp">http://eea.government.bg/forms/eprtr.jsp</a>  |
| Cyprus         | <a href="http://www.prtr.dli.mlsi.gov.cy/">http://www.prtr.dli.mlsi.gov.cy/</a>  |
| Czech Republic | <a href="http://www.irz.cz">http://www.irz.cz</a>  |
| Denmark        | <a href="http://www.DK-PRTR.dk">http://www.DK-PRTR.dk</a>  |
| Estonia        | <a href="http://register.keskkonnainfo.ee/">http://register.keskkonnainfo.ee/</a>  |
| Finland        | No links have been provided.   |
| France         | <a href="http://www.pollutionsindustrielles.ecologie.gouv.fr">http://www.pollutionsindustrielles.ecologie.gouv.fr</a>  |
| Germany        | <a href="http://www.prtr.bund.de">http://www.prtr.bund.de</a>  |
| Greece         | <a href="http://www.prtr.gr">http://www.prtr.gr</a>  |
| Hungary        | <a href="http://prtr.kvvm.hu">http://prtr.kvvm.hu</a>  |

<sup>39</sup> <http://prtr.ec.europa.eu/>

<sup>40</sup> On the national websites of Greece and Malta the authors of this report could not find any search function.

|                    |   |
|--------------------|---|
| Iceland            | Questionnaire has not been submitted  |
| Ireland            | <a href="http://www.prtr.ie">http://www.prtr.ie</a>   |
| Italy              | <a href="http://www.eper.sinanet.apat.it/site/it-IT;">http://www.eper.sinanet.apat.it/site/it-IT;</a>       |
| Latvia             | <a href="http://arcims.lvgma.gov.lv:8082/prtr/viz.jsp">http://arcims.lvgma.gov.lv:8082/prtr/viz.jsp</a>     |
| Liechtenstein      | Only link to EU E-PRTR website has been provided.   |
| Lithuania          | <a href="http://gamta.lt">http://gamta.lt</a> .   |
| Luxembourg         | Only link to EU E-PRTR website has been provided.   |
| Malta              | <a href="http://www.mepa.org.mt/eptr">http://www.mepa.org.mt/eptr</a>                                       |
| The Netherlands    | <a href="http://www.PRTR.nl">http://www.PRTR.nl</a>   |
| Norway             | <a href="http://www.norskeutslipp.no">http://www.norskeutslipp.no</a>                                       |
| Poland             | <a href="http://www.prtr-portal.gios.gov.pl">http://www.prtr-portal.gios.gov.pl</a>                         |
| Portugal           | Only link to EU E-PRTR website has been provided.   |
| Romania            | <a href="http://prtr.anpm.ro/">http://prtr.anpm.ro/</a>   |
| Slovakia           | <a href="http://ipkz.shmu.sk/index.php">http://ipkz.shmu.sk/index.php</a>                                   |
| Slovenia           | Only link to EU E-PRTR website has been provided.   |
| Spain              | <a href="http://www.prtr-es.es">http://www.prtr-es.es</a>   |
| Sweden             | <a href="http://utslappisiffror.naturvardsverket.se/en/">http://utslappisiffror.naturvardsverket.se/en/</a> |
| The United Kingdom | <a href="http://prtr.defra.gov.uk/">http://prtr.defra.gov.uk/</a>   |

### Publication of data

Eight countries reported the deadline by which PRTR data from 2009 shall be published (see Table 17). None of them indicated any plans to change this date. Spain makes the data publicly accessible on the national PRTR website four months before submitting them to the E-PRTR.

Eighteen countries (Austria, Belgium (Flemish Region), Bulgaria, Cyprus, Czech Republic, Estonia, Finland, France, Germany, Hungary, Ireland, Lithuania, Malta, Netherlands, Portugal, Romania, Slovakia, Slovenia) reported that the deadlines for having the information publicly accessible were met whereas six countries (Greece, Denmark, Italy, Liechtenstein, Norway, United Kingdom) reported that the deadlines were not met. Poland has no specific deadlines for making data accessible to the public. In Poland, the data are made accessible immediately after the report has been forwarded to the European Commission. Germany has as deadline one week after delivery of data to the EU to make the data publicly accessible. Luxembourg reported that the data are published on the EU E-PRTR website only and thus no date for publishing data applies.

**Table 17: Date for publishing PRTR data from 2009**

| Country        | Publication date of 2009 data |
|----------------|-------------------------------|
| Bulgaria       | 1 June 2011                   |
| Germany        | 18 April 2011                 |
| Ireland        | 30 April 2011                 |
| Netherlands    | 31 March 2011                 |
| Norway         | 1 June 2011                   |
| Romania        | 30 May 2011                   |
| Slovakia       | 31 March 2011                 |
| Spain          | 15 November 2010              |
| United Kingdom | 12 December 2011              |

The delays in publishing data in Greece were due to a lack of human resources. The Italian PRTR website was temporarily not directly available to the public due to the redesign of the national PRTR website to accommodate both Italian EPER data and PRTR data. Liechtenstein and Norway reported some delays with regard to the quality assessment of the incoming data and to incorrect data. In the United Kingdom and in Denmark there were some delays due to technical issues.

The Spanish system allows for public information to be corrected almost automatically. In Sweden, the national PRTR website is updated once a day with data from the Swedish Portal for Environmental Reporting (SMP).

### **Ensuring public access**

All of the 29 countries reported that the internet, especially their national websites, is the most important communication medium to inform the public. Nine countries (Austria, Belgium, Finland, Germany, Ireland, Malta, Romania, Slovenia, Sweden) noted that Internet-cafes, libraries with public computer access, etc. facilitate access to the registers. Bulgaria, the Netherlands, Norway, Poland, Slovakia and the United Kingdom reported that the PRTR data is displayed on their national PRTR websites free of charge.

Some countries reported measures other than their national PRTR website to ensure public access to their PRTRs. Two of the competent authorities in the United Kingdom – the Environment Agency and the Scottish Environment Protection Agency – have a pollution inventory which is publicly accessible on the internet. Bulgaria, Cyprus and Greece reported the introduction of their online reporting systems as means for introducing more extensive or more publicly accessible PRTR. Ireland makes all publications available to download on the website of the Environmental Protection Agency. Bulgaria plans to publish links on the websites of the Ministry of the Environment and Waters and the Regional Inspectorates to the E-PRTR National Reporting Information System and the Executive Environmental Agency.

In order to ensure that data are not only provided in electronic format, Belgium, Bulgaria, Portugal, Spain and the United Kingdom offer data on request in an alternative format (e.g. in hard copy) to the public. Information about the Latvian national register is provided to the public via the print media. An additional measure reported by Bulgaria relates to an information centre with a computer room where citizens can gain free internet access to the PRTR. In order to ensure public access to PRTR data in the Czech Republic, the Ministry of the Environment publishes annually, on paper and/or in electronic form, selected information from the integrated pollution register. Luxembourg publishes a summary of the information contained in the PRTR in the Ministry for Sustainable Development and Infrastructure's annual report. In accordance with the IPPC Directive, Cyprus publishes every three years a list of IPPC facilities with releases to air, water and land in the Government Gazette of the Republic. In Cyprus, the results of monitoring of discharges or releases by IPPC facilities are available to the public and may be examined during business days and hours of the competent authority.

PRTR helpdesks and hotlines were reported by Ireland and Spain as measures to better inform the public. In Luxemburg, the public can directly contact the Administration of the Environment for any questions concerning PRTR. In Finland the public can directly contact the inspectors per email or phone to get PRTR data. In Italy, two e-mail addresses are available for the public to ask for information and data. In Germany, stakeholders can contact the Federal Environment Agency with any questions via an OTRS-system (Open Ticket Request System – communication management system).

### **Description of national websites**

Most websites include search functions, e.g. name of facility, pollutant and activity. The Netherlands, for example, run the website via a GIS application which provides search options via postal code. Germany reported that the results of searches can be downloaded in various formats free of charge. Some websites provide information on the PRTR reporting obligation, for example infor-

mation on national and international laws and detailed information on the substances. In most cases a link to the European PRTR is provided and Spain reported that its website includes information on PRTRs in other countries and regions of the world. Some websites, e.g. the Romanian, offer a glossary of PRTR terms. Some websites also offer a contact form for requests by the public. In some cases, e.g. the Czech Republic, Germany and Romania, frequently asked questions (FAQs) concerning the national register are provided. The Dutch websites includes additional information on how to use the website.

Seven countries provided voluntary data on how releases and transfer can be searched and identified in the national PRTRs. On the Bulgarian, Dutch and Romanian PRTR website data can be searched and identified by the parameters set out in Article 4(1) of Regulation 166/2006/EC. The Norwegian system provides additional information on production volumes, energy use, carbon units, permits, audit and inspection reports. Searching data on the Slovakian website is possible according to the reporting year and the operator of a facility. Information on the facilities and releases/transfers is linked to each operator. The British and the Irish system allow various options for searches including by facility, pollutant, activity, and location (map). In terms of other functionalities, the Romanian and UK PRTR website supports viewing using Google maps.

### Links to other websites

Seven countries out of 29 reported available and activated links to relevant existing, publicly accessible database on subject matters related to environmental protection and to other PRTRs (see Table 18). In addition, Spain reported that the Spanish website includes a list of international, European and national links that are relevant to PRTR.

**Table 18: Links to other websites on environmental protection and other PRTRs**

| Country         | Links related to environmental protection and to other PRTRs  |
|-----------------|---|
| <b>Belgium</b>  | <a href="http://www.aarhus.be">http://www.aarhus.be</a>   |
| <b>Bulgaria</b> | <ul style="list-style-type: none"> <li>• The public register of the EPRTTR National Reporting Information System: <a href="http://eea.government.bg/forms/public.jsp">http://eea.government.bg/forms/public.jsp</a></li> </ul>  |
| <b>Ireland</b>  | <ul style="list-style-type: none"> <li>• Environmental Protection Agency Website Ireland: <a href="http://www.epa.ie">http://www.epa.ie</a></li> <li>• AER/PRTR reporting section of the website: <a href="http://www.epa.ie/whatwedo/enforce/lic/aerprtrreporting/#d.en.30275">http://www.epa.ie/whatwedo/enforce/lic/aerprtrreporting/#d.en.30275</a></li> <li>• Access to IPPC Licenses and AER: <a href="http://www.epa.ie/terminalfour/ippc/index.jsp">http://www.epa.ie/terminalfour/ippc/index.jsp</a></li> <li>• Access to Waste Licenses and AER: <a href="http://www.epa.ie/terminalfour/waste/index.jsp">http://www.epa.ie/terminalfour/waste/index.jsp</a></li> <li>• Access to Urban Waste Water Treatment Plant Licenses and AER: <a href="http://www.epa.ie/terminalfour/wwda/index.jsp">http://www.epa.ie/terminalfour/wwda/index.jsp</a></li> </ul>  |
| <b>Latvia</b>   | • Geological and Meteorological Centre website: <a href="http://arcims.lvgma.gov.lv:8082/prtr/">http://arcims.lvgma.gov.lv:8082/prtr/</a>   |
| <b>Romania</b>  | • The national PRTR website <a href="http://prtr.anpm.ro/">http://prtr.anpm.ro/</a>   |
| <b>Portugal</b> | <ul style="list-style-type: none"> <li>• Agência Portuguesa do Ambiente (Portuguese Environmental Agency): <a href="http://www.apambiente.pt/INSTRUMENTOS/REGISTOEMISSOESTRANSFERENCIASPOLUENTES/RESULTADOS_PRTR/Paginas/default.aspx">http://www.apambiente.pt/INSTRUMENTOS/REGISTOEMISSOESTRANSFERENCIASPOLUENTES/RESULTADOS_PRTR/Paginas/default.aspx</a></li> <li>• CCDR Alentejo: <a href="http://webb.ccdr-a.gov.pt/index.php?option=com_content&amp;view=article&amp;id=115&amp;Itemid=238">http://webb.ccdr-a.gov.pt/index.php?option=com_content&amp;view=article&amp;id=115&amp;Itemid=238</a></li> <li>• ARH Algarve: <a href="http://www.arhalgarve.pt/site/index.php?module=ContentExpress&amp;func=display&amp;ceid=64">http://www.arhalgarve.pt/site/index.php?module=ContentExpress&amp;func=display&amp;ceid=64</a></li> <li>• Archipelago of Azores: The notices on PRTR are disseminated by means of the following website: <a href="http://www.azores.gov.pt/GaCS/">http://www.azores.gov.pt/GaCS/</a></li> </ul> |
| <b>Slovakia</b> | <ul style="list-style-type: none"> <li>• <a href="http://www.enviroportal.sk">http://www.enviroportal.sk</a> (for instance: <a href="http://ipkz.enviroportal.sk/register-informacneho-systemu.php">ipkz.enviroportal.sk/register-informacneho-systemu.php</a>, <a href="http://ipkz.enviroportal.sk/informacny-system.php">ipkz.enviroportal.sk/informacny-system.php</a>, <a href="http://cms.enviroportal.sk/odpady/verejne-informacie.php">cms.enviroportal.sk/odpady/verejne-informacie.php</a>)</li> <li>• <a href="http://www.sazp.sk">http://www.sazp.sk</a></li> <li>• <a href="http://www.shmu.sk">http://www.shmu.sk</a> (<a href="http://ipkz.shmu.sk/index.php">ipkz.shmu.sk/index.php</a>)</li> </ul>   |

| Country               | Links related to environmental protection and to other PRTRs   |
|-----------------------|--|
|                       | <ul style="list-style-type: none"> <li>• <a href="http://www.sizp.sk">http://www.sizp.sk</a></li> <li>• <a href="http://www.minzp.sk">http://www.minzp.sk</a></li> </ul>   |
|                       | <ul style="list-style-type: none"> <li>• <a href="http://www.prtr-es.es/enlaces-de-interes/enlaces-de-interes,15464,00,00.html">http://www.prtr-es.es/enlaces-de-interes/enlaces-de-interes,15464,00,00.html</a></li> </ul> National websites: <ul style="list-style-type: none"> <li>• <a href="http://www.prtr-es.es/enlaces-de-interes/nacionales,15489,10,2007.html">http://www.prtr-es.es/enlaces-de-interes/nacionales,15489,10,2007.html</a></li> </ul> Regional PRTR systems: <ul style="list-style-type: none"> <li>• <a href="http://www.prtr-es.es/enlaces-de-interes/prtr-en-comunidades-autonomas,15487,10,2007.html">http://www.prtr-es.es/enlaces-de-interes/prtr-en-comunidades-autonomas,15487,10,2007.html</a></li> </ul> Regional governments: <ul style="list-style-type: none"> <li>• <a href="http://www.prtr-es.es/enlaces-de-interes/autonomicos,15488,10,2007.html">http://www.prtr-es.es/enlaces-de-interes/autonomicos,15488,10,2007.html</a></li> </ul> European websites: <ul style="list-style-type: none"> <li>• <a href="http://www.prtr-es.es/enlaces-de-interes/europeos,15931,01,2010.html">http://www.prtr-es.es/enlaces-de-interes/europeos,15931,01,2010.html</a></li> </ul> International websites: <ul style="list-style-type: none"> <li>• <a href="http://www.prtr-es.es/enlaces-de-interes/internacionales,15491,10,2007.html">http://www.prtr-es.es/enlaces-de-interes/internacionales,15491,10,2007.html</a></li> </ul> |
| <b>Spain</b>          | <ul style="list-style-type: none"> <li>• In England and Wales, the inventory is at: <a href="http://www.environment-agency.gov.uk/homeandleisure/37793.aspx">http://www.environment-agency.gov.uk/homeandleisure/37793.aspx</a></li> <li>• In Scotland the inventory is at: <a href="http://sepa.org.uk/air/process_industry_regulation/pollutant_release_inventory.aspx">http://sepa.org.uk/air/process_industry_regulation/pollutant_release_inventory.aspx</a></li> </ul>   |
| <b>United Kingdom</b> | <ul style="list-style-type: none"> <li>• In Northern Ireland: <a href="http://www.doeni.gov.uk/niea/general_public.htm">http://www.doeni.gov.uk/niea/general_public.htm</a></li> </ul>   |

## 8. Confidentiality

Nine countries (Belgium, Bulgaria, Denmark, Germany, Luxembourg, Netherlands, Romania, Sweden, United Kingdom) out of 29 reported on information that has been withheld because of confidentiality. Greece reported that there had been a request for confidentiality in previous years which does not exist anymore and thus did not provide details on the type of information that was held confidential in previous years although the answers to the Article 16(1) questionnaire should refer to the whole period 2007 – 2009.

Confidentiality was mostly claimed for information regarding the operator transfers of hazardous and non-hazardous waste. In Germany, confidentiality was also applied to the pollutant and to the activity. The most common reason for claiming confidentiality was Article 4 (2) (d) of Directive 2003/4/EC<sup>41</sup>. This Article refers to the confidentiality of commercial or industrial information where such confidentiality is provided for by national or community law to protect a legitimate economic interest, including the public interest in maintaining statistical confidentiality and tax secrecy. Other reasons for confidentiality were Articles 4 (2) (a), (b), (c) and (e) of Directive 2003/4/EC. Article (4) (2) (a) refers to the confidentiality of the proceedings of public authorities, where such confidentiality is provided for by law, Article (4) (2) (b) to confidentiality based on the prevention of adverse effects on international relations, public security or national defence, Article (4) (2) (c) to confidentiality based on the prevention of adverse effects on the course of justice, the ability of any person to receive a fair trial or the ability of a public authority to conduct an enquiry of a criminal or disciplinary nature and Article (4) (2) (e) to confidentiality based on intellectual property rights.

Table 19 provides an overview on the information that has been held confidential and the reasons for confidentiality:

<sup>41</sup> Directive 2003/4/EC of the European Parliament and of the Council of 28 January 2003 on public access to environmental information and repealing Council Directive 90/313(EEC)

**Table 19: Confidential data and reasons for confidentiality**

| Country                                | Confidential Data   | Main Reasons  |
|--|---|---|
| Belgium                                | Parent company name<br>Facility name  | The confidentiality of personal data  |
|  | Waste Handler table for facilities reporting hazardous waste outside country                                | Article 4(2)(d) of Directive 2003/4/EC – confidentiality of hazardous and non-hazardous waste   |
| Bulgaria                               | Quantities of pollutants and hazardous and/or non-hazardous waste released and transferred outside the site | Article 4(2)(b) of Directive 2003/4/EC – confidentiality of pollutants;<br>Article 4(2)(a) of Directive 2003/4/EC – confidentiality of hazardous and non-hazardous waste;<br>Article 4(2)(c) of Directive 2003/4/EC – confidentiality of hazardous and non-hazardous waste;<br>Article 4(2)(d) of Directive 2003/4/EC – confidentiality of hazardous and non-hazardous waste; |
| Denmark                                | Hazardous waste in the country: amount of waste   | Amount of hazardous waste via mass balance calculation will give too many information about efficiency and chosen technology compared to information in financial statement and thereby be a competitiveness parameter  |
| Germany                                | Confidentiality of industrial data  | Detrimental effects on international relations, defence or key public security assets   |
|  |   | Detrimental effects on the conduct of on-going court proceedings, an individual's entitlement to fair treatment or the conduct of criminal, administrative or disciplinary enquiries  |
|  |   | Disclosure of personal data<br>Industrial or commercial secret, tax or statistical secret   |
|  | More than one pollutant load of the same pollutant group labelled confidential (for release and transfer)   | Disclosure of personal data   |
|  |   | Infringement of intellectual property rights, in particular copyright<br>Industrial or commercial secret, tax or statistical secret   |
| Confidentiality of non-hazardous waste | Industrial or commercial secret, tax or statistical secret  |   |
| Confidentiality of hazardous waste     | Industrial or commercial secret, tax or statistical secret  |   |
| Luxembourg                             | Transfers of hazardous waste to other countries.  | Commercial or industrial confidentiality.   |
| The Netherlands                        | Ammonia emissions from a facility under activity 7a.  | On the basis of privacy   |
| Romania                                | Information regarding the operator (the name of the parent company, the name of the industrial facility)    | The policies of parent companies regarding the protection of legitimate economic interests (commercial or industrial) (Article 4(2d));  |
|  | Quantities of hazardous and non-hazardous waste transferred off-site within the country                     | Intellectual property rights (Article 4(2e)) regarding the quantity of non-hazardous waste transferred;<br>Personal data (Article 4(2f)) relating to a natural person.  |

| Country            | Confidential Data   | Main Reasons   |
|--------------------|---|--|
| Sweden             | Quantity data regarding off-site transfer of hazardous waste to other countries | Confidentiality claim is by virtue of Article 4(2)(d) of 2003/4/E: the confidentiality of commercial or industrial information where such confidentiality is provided for by national or Community law to protect a legitimate economic interest, including the public interest in maintaining statistical confidentiality and tax secrecy |
| The United Kingdom | Quantities of offsite waste transfer and (in some cases) the associated methods | Confidentiality claim is by virtue of Article 4(2)(d) of 2003/4/E - i.e. commercial confidentiality  |

*Note: Greece did not report any details on the information on which confidentiality was claimed in the reporting years 2007 and 2008.*

Countries also had to report the number of facilities per Annex I activity with confidential data and the corresponding total number of reporting facilities of the relevant Annex I activities (see Table 20). A comparison of these two numbers is interesting because it indicates the share of facilities with confidential data in the total number of facilities with a specific activity.

**Table 20: Number of facilities per Annex-I-Activity with confidential data**

| Reference year                  | Activity       | Number of facilities with confidential data | Total number of facilities under the relevant activity |
|---------------------------------|----------------|---|--|
| <b>Belgium (Flemish Region)</b> |                |   |  |
| 2009                            | Activity 1.(a) | 4   | 5  |
| 2009                            | Activity 2.(a) | 1   | 5  |
| 2009                            | Activity 2.(b) | 1   | 4  |
| 2009                            | Activity 2.(c) | 3   | 4  |
| 2009                            | Activity 2.(d) | 1   | 3  |
| 2009                            | Activity 2.(e) | 7   | 11   |
| 2009                            | Activity 2.(f) | 7   | 33   |
| 2009                            | Activity 3.(c) | 1   | 11   |
| 2009                            | Activity 3.(e) | 2   | 6  |
| 2009                            | Activity 3.(g) | 1   | 7  |
| 2009                            | Activity 4.(a) | 32  | 98   |
| 2009                            | Activity 4.(b) | 3   | 15   |
| 2009                            | Activity 4.(d) | 1   | 1  |
| 2009                            | Activity 4.(e) | 1   | 6  |
| 2009                            | Activity 5.(a) | 36  | 260  |
| 2009                            | Activity 5.(g) | 2   | 2  |
| 2009                            | Activity 7.(a) | 41  | 41   |
| 2009                            | Activity 8.(b) | 1   | 32   |
| 2009                            | Activity 8.(c) | 1   | 12   |
| 2009                            | Activity 9.(c) | 4   | 29   |
| <b>Belgium (Walloon Region)</b> |                |   |  |
| 2009                            | Activity 7.(a) | 32  | n.a.   |
| <b>Bulgaria</b>                 |                |   |  |
| 2008                            | Activity 1.(c) | 6   | 26   |

| Reference year | Activity              | Number of facilities with confidential data | Total number of facilities under the relevant activity |
|----------------|-----------------------|---|--|
| 2009           | Activity 1.(c)        | 6   | 26   |
|                | Activity 5.(f)        | 1   | 15   |
|                | Activity 3.(a)        | 2   | 6  |
|                | Activity 3.(c).(i)    | 1   | 5  |
|                | Activity 3.(e)        | 2   | 4  |
| <b>Denmark</b> |                       |   |  |
| 2009           | Activity 5.(a)        | 1   | n.a.   |
| <b>Germany</b> |                       |   |  |
| 2007           | Activity 2.(c).(i)    | 1   | 21   |
|                | Activity 2.(d)        | 1   | 145  |
|                | Activity 2.(e).(ii)   | 1   | 177  |
|                | Activity 2.(f)        | 1   | 444  |
|                | Activity 3.(e)        | 1   | 62   |
|                | Activity 3.(f)        | 1   | 6  |
|                | Activity 4.(a)        | 2   | 66   |
|                | Activity 4.(a).(ii)   | 3   | 88   |
|                | Activity 4.(a).(v)    | 1   | 3  |
|                | Activity 4.(a).(viii) | 2   | 128  |
|                | Activity 4.(b).(v)    | 2   | 35   |
|                | Activity 5.(a)        | 43  | 649  |
|                | Activity 5.(b)        | 1   | 79   |
|                | Activity 5.(c)        | 3   | 155  |
|                | Activity 5.(d)        | 1   | 231  |
|                | Activity 5.(e)        | 1   | 19   |
|                | Activity 6.(b)        | 4   | 152  |
|                | Activity 7.(a).(ii)   | 1   | 158  |
|                | Activity 7.(a).(iii)  | 2   | 70   |
|                | Activity 8.(b)        | 1   | 4  |
| Activity 9.(c) | 3                     | 224   |  |
| 2008           | Activity 2.(e).(ii)   | 1   | 178  |
|                | Activity 2.(f)        | 4   | 457  |
|                | Activity 3.(e)        | 2   | 72   |
|                | Activity 3.(f)        | 1   | 7  |
|                | Activity 4.(a)        | 2   | 156  |
|                | Activity 4.(a).(vii)  | 1   | 10   |
|                | Activity 4.(a).(viii) | 1   | 83   |
|                | Activity 4.(a).(x)    | 1   | 10   |
|                | Activity 4.(b).(v)    | 1   | 30   |
|                | Activity 5.(a)        | 44  | 734  |
|                | Activity 5.(c)        | 3   | 158  |
|                | Activity 6.(b)        | 1   | 153  |
|                | Activity 8.(a)        | 1   | 71   |
|                | Activity 9.(c)        | 1   | 71   |
| Activity 9.(d) | 1                     | 11  |  |



| Reference year            | Activity              | Number of facilities with confidential data | Total number of facilities under the relevant activity |
|---------------------------|-----------------------|---|--|
| 2009                      | Activity 2.(e).(ii)   | 1   | 172  |
|                           | Activity 2.(f)        | 4   | 475  |
|                           | Activity 3.(f)        | 1   | 7  |
|                           | Activity 4.(a)        | 2   | 145  |
|                           | Activity 4.(a).(ii)   | 1   | 4  |
|                           | Activity 4.(a).(viii) | 2   | 85   |
|                           | Activity 4.(a).(x)    | 1   | 12   |
|                           | Activity 4.(b).       | 1   | 40   |
|                           | Activity 4.(b).(v)    | 3   | 28   |
|                           | Activity 5.(a)        | 36  | 790  |
|                           | Activity 5.(c)        | 2   | 154  |
|                           | Activity 6.(b)        | 1   | 147  |
|                           | Activity 9.(c)        | 1   | 237  |
|                           | Activity 9.(d)        | 1   | 10   |
| <b>Luxembourg</b>         |                       |   |  |
| 2009                      | Activity 4.(a).(viii) | 1   | 1  |
|                           | Activity 5.(a)        | 1   | 1  |
|                           | Activity 6.(b)        | 1   | 1  |
| <b>The Netherlands</b>    |                       |   |  |
| 2007                      | Activity 7.(a)        | 1   | 43   |
| 2008                      | Activity 7.(a)        | 1   | 43   |
| 2009                      | Activity 7.(a)        | 1   | 43   |
| <b>Romania</b>            |                       |   |  |
| 2008                      | Activity 1.(c)        | 1   | 37   |
|                           | Activity 2.(f)        | 1   | 12   |
|                           | Activity 4.(a).(i)    | 1   | 5  |
|                           | Activity 5.(a)        | 1   | 3  |
|                           | Activity 8.(b).(ii)   | 1   | 8  |
| 2009                      | Activity 2.(f)        | 1   | 10   |
|                           | Activity 8.(b).(ii)   | 1   | 8  |
| <b>Sweden</b>             |                       |   |  |
| 2007                      | Activity 5.(a)        | 1   | 11   |
| 2008                      | Activity 5.(a)        | 1   | 19   |
| 2009                      | Activity 5.(a)        | 1   | 22   |
| <b>The United Kingdom</b> |                       |   |  |
| 2007                      | Activity 5.(a,b,c)    | 9   | n.a.   |
| 2008                      | Activity 5.(a,b,c)    | 20  | 2.178  |
| 2009                      | Activity 5.(a,b,c)    | 19  | 2.191  |

Note: n.a. means non available because not all countries have reported the corresponding total number of facilities for the respective activity.

## **Practical experience with confidentiality**

The United Kingdom, Sweden and Romania reported no problems in dealing with confidentiality claims. The United Kingdom reported that the provisions of Directive 2003/4/EC are clear and are implemented in England and Wales through the Environment Information Regulations (EIR) and similar legislation in Scotland and Northern Ireland. In Sweden, usually all types of information and documents submitted to an authority are available to the public pursuant to the Swedish Constitution. However, if the information concerns business interests it may be confidential. The authority decides whether the information is confidential or not pursuant to the Swedish Secrecy Act. It is possible to appeal against authority decisions. In Romania, many industrial facilities have requested confidentiality only for information which is reported voluntarily (production, number of operating hours and number of employees).

Luxembourg pointed out the problem that two of the facilities in its territory do not know the final destination of their waste because it is collected by third parties who may carry out some processing procedures before recycling or disposal takes place abroad. Therefore, this information was declared to be confidential. Bulgaria reported difficulties in assessing whether to approve or reject requests for confidentiality by operators.

Germany reported on major problems in submitting PRTR reports including confidential data to the European Commission or the European Environment Agency. Due to existing restrictions in the EU PRTR database, reports from facilities claiming confidentiality for their activities (in 2007: 7 facilities, in 2008: 1 facility and in 2009: 4 facilities) or from facilities not wishing to disclose information on domestic or transboundary transfer of hazardous waste (in 2007: 47 facilities, in 2008: 54 facilities and in 2009: 52 facilities) cannot be forwarded to the European Commission, but are included in Germany's national PRTR. Germany also encountered problems where releases and transfers were kept confidential because the European Commission required the pollutant group to be reported. Adapting the xml format for reporting the German data to the European Commission was also complicated. In some cases facility reports containing confidential information were not forwarded to the national competent authority on time because of administrative procedures in relation to the confidentiality claim.

Spain reported that in Spain no confidentiality is claimed because all the information in the Spanish PRTR is considered to be environmental information..

## **9. Public participation, public awareness and capacity building**

### **Public participation**

Seven countries out of 29 reported information on the opportunities for public participation in the development of the European PRTR system and any relevant experience with public participation in the development of the system. The main tool to foster public participation that countries reported were the national PRTR websites, most of which allow the public to submit feedback, and the organization of PRTR meetings or workshop. In addition, the Netherlands and the United Kingdom carried out a stakeholder consultation when setting up their national PRTRs.

In Bulgaria, the competent authority organizes annual working meetings with regard to E-PRTR reporting. The main target groups are operators, industry organizations and the Regional Inspectorates of Environment and Water. In Ireland, the competent authorities also organised various workshops and gave PRTR presentations at conferences for consultants and for industry sectors. Other opportunities for public participation in the development of the Bulgarian national reporting system is the 'Questions and Answers' menu in the system where any external user can ask questions or make comments to help improving the E-PRTR National Reporting Information System. Ireland also published information related to PRTR on its website and asks for feedback. The UK and Spanish PRTR websites have an email link through which any member of the public can get in touch and ask questions. In Slovakia, the public can participate in the development of the E-PRTR

by means of comments, proposals and questions through the national PRTR website. On the Internet portal [www.enviroportal.sk](http://www.enviroportal.sk) Slovakia operates a discussion forum for the public. In Germany and Spain, the national authority organized several workshops on the implementation of PRTR and invited stakeholders including operators, authorities, industrial associations, NGOs and the press.

### **Public awareness**

Out of 29 countries seven (Bulgaria, Cyprus, Greece, Ireland, Netherlands, Slovakia, United Kingdom) described how public awareness of the European PRTR has been promoted. Most of the measures to raise public awareness are the same that ensure public participation, such as a national PRTR website and contact possibilities for the public. Another media to raise public awareness is the press. When the Irish national PRTR website will be launched, there will be a press release to inform the public that the system is available online and what information it contains.

### **Capacity building and assistance and guidance to the public**

The reported measures on capacity buildings and assistance and guidance to the public overlap with the measures on public participation and public awareness and include PRTR presentations at conferences, workshops and seminars, information offered on the national websites and contact possibilities such as helpdesks for the public. Slovakia, for example, runs a National Training Centre on IPPC providing consultant activities to state authorities, operators and public on IPPC and relating issues i.e. on PRTR. This Centre offers consultations (personal, by e-mail, by phone). All consultations are free of charge. Ireland offers computer access at all regional offices and the headquarters of the competent authority.

## **10. Cooperation and assistance**

Five countries (Finland, Germany, Ireland, Netherlands, United Kingdom) out of 29 described how they cooperated and assisted other PRTRs and encouraged cooperation among relevant international organizations:

- In international actions

The United Kingdom and Ireland noted that they are members of the European Commission's Article 19 Committee which discusses PRTR implementation within the EU. In addition, the United Kingdom is a member of the International PRTR Coordinating Group which meets in conjunction with the OECD's task force on PRTR. In this group, the United Kingdom contributes to discussions designed to aid PRTR development globally.

- On the basis of mutual agreements

No country reported on cooperation and assistance on the basis of mutual agreements.

- In sharing information on releases and transfers within border areas

Data on the UK PRTR website is accessible globally and therefore can be used by everyone. Finland reported that the collection of emission data in cooperation with the city of St. Petersburg (Russia) has been discussed.

- In sharing information among other PRTR systems

As part of the OECD's PRTR task force for [prtr.net](http://prtr.net), the United Kingdom has shared data.

- In technical assistance

The Netherlands provided technical assistance to Armenia through a four-day study trip for the Netherlands. The Netherlands also provided technical assistance to Croatia and Bulgaria through intensive training on the validation of PRTR reports by competent authorities. The Netherlands played a leading role in setting up the Croatian PRTR Guideline.

Germany provided technical assistance to Romania in several workshops on implementation of PRTR.

#### **11. Access to justice in matters relating to public access to environmental information**

Only three countries (Bulgaria, Netherlands and Slovakia) out of 29 provided voluntary information on the procedure to ensure access to justice in matters relating to public access to environmental information in accordance with the provisions of Article 13 of the E-PRTR Regulation 166/2006/EC. The Netherlands and Slovakia noted that their PRTR data is publicly available through their national websites. Bulgaria reported that under Article 4(1) of the Access to Public Information Act (ZDOI) all citizens of Bulgaria have the right to access public information under the conditions and the procedures provided by the law. Citizens may appeal against decisions through the courts in case public access to information is not approved.

#### **12. Measures taken to ensure that employees of a facility and members of the public who report violations to public authorities are not penalized, persecuted or harassed for reporting the violation**

Only four countries (Ireland, the Netherlands, Norway and Slovakia) out of 29 reported on measures taken to ensure that employees of a facility and members of the public who report violations to public authorities are not penalized, persecuted or harassed for reporting the violation. In Ireland this has not been an issue for the PRTR team and the EPA (Environmental Protection Agency) has a separate department (Queries Unit) that deals with complaints. The Netherlands and Norway did not take specific measures taken in relation to E PRTR but consider that this is ensured by the general legislation. In Slovakia, everybody has the possibility to report violation anonymously. The control body is the Slovak Environmental Inspectorate which investigates anonymous reports. In addition, Slovakia reported that they adopted the anti-discriminatory law to protect every citizen from persecution and harassment.

## **APPENDIX 2 - PRTR DATAFLOW TO THE EU LEVEL**

### **1) Opportunity to correct data**

Based on the table of the submissions that was provided by the EEA the contractor assessed whether countries have used the opportunity to resubmit data. It was agreed that what is relevant is not the exact number of resubmissions but the fact whether the opportunity to resubmit has been used by countries per correction round.

**Table 21: Opportunities to correct data**

|                 | 2007 data                   |                             |                             |                             | 2008 data                   |                             |                             | 2009 data                   |
|-----------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
|                 | Resubmission<br>autumn 2009 | Resubmission<br>spring 2010 | Resubmission<br>spring 2011 | Resubmission<br>autumn 2011 | Resubmission<br>autumn 2010 | Resubmission<br>spring 2011 | Resubmission<br>autumn 2011 | Resubmission<br>autumn 2011 |
| Austria         | yes                         | yes                         | yes                         | yes                         | yes                         | yes                         | yes                         | yes                         |
| Belgium         | yes                         | yes                         | yes                         | yes                         | yes                         | yes                         | yes                         | yes                         |
| Bulgaria        | yes                         | yes                         | yes                         | no                          | yes                         | yes                         | no                          | yes                         |
| Cyprus          | yes                         | yes                         | yes                         | no                          | no                          | yes                         | no                          | no                          |
| Czech Republic  | yes                         | yes                         | yes                         | no                          | yes                         | yes                         | no                          | yes                         |
| Denmark         | yes                         | yes                         | no                          | no                          | no                          | yes                         | no                          | yes                         |
| Estonia         | yes                         | yes                         | yes                         | no                          | yes                         | yes                         | no                          | yes                         |
| Finland         | yes                         | yes                         | yes                         | no                          | no                          | no                          | no                          | yes                         |
| France          | yes                         | yes                         | yes                         | no                          | yes                         | yes                         | yes                         | yes                         |
| Germany         | yes                         | yes                         | yes                         | yes                         | yes                         | yes                         | yes                         | yes                         |
| Greece          | yes                         | yes                         | no                          | no                          | no                          | no                          | no                          | no                          |
| Hungary         | yes                         | yes                         | yes                         | yes                         | yes                         | yes                         | yes                         | yes                         |
| Iceland         | yes                         | no                          | no                          | no                          | no                          | no                          | no                          | no                          |
| Ireland         | yes                         | yes                         | yes                         | yes                         | yes                         | yes                         | yes                         | yes                         |
| Italy           | yes                         | yes                         | yes                         | no                          | no                          | yes                         | no                          | no                          |
| Latvia          | yes                         | no                          | no                          | no                          | no                          | no                          | no                          | no                          |
| Liechtenstein   | yes                         | yes                         | no                          | no                          | no                          | no                          | no                          | no                          |
| Lithuania       | yes                         | no                          | no                          | no                          | no                          | no                          | yes                         | yes                         |
| Luxembourg      | yes                         | yes                         | yes                         | no                          | no                          | yes                         | no                          | no                          |
| Malta           | yes                         | yes                         | no                          | no                          | yes                         | no                          | no                          | no                          |
| The Netherlands | yes                         | yes                         | yes                         | no                          | no                          | yes                         | no                          | yes                         |

|                                 |           |           |           |           |           |           |           |           |
|---------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Norway                          | yes       | yes       | yes       | yes       | no        | yes       | yes       | yes       |
| Poland                          | yes       | yes       | yes       | yes       | yes       | yes       | yes       | yes       |
| Portugal                        | yes       | yes       | yes       | no        | yes       | yes       | yes       | yes       |
| Romania                         | yes       | yes       | yes       | yes       | no        | yes       | yes       | yes       |
| Slovakia                        | yes       | yes       | yes       | no        | yes       | yes       | no        | no        |
| Slovenia                        | yes       | yes       | no        | no        | no        | no        | no        | yes       |
| Spain                           | yes       | yes       | yes       | no        | yes       | yes       | no        | no        |
| Sweden                          | yes       | yes       | yes       | yes       | yes       | yes       | yes       | yes       |
| United Kingdom                  | yes       | yes       | yes       | yes       | yes       | yes       | yes       | yes       |
| <b>Total opportunities used</b> | <b>30</b> | <b>27</b> | <b>22</b> | <b>10</b> | <b>16</b> | <b>22</b> | <b>13</b> | <b>20</b> |

## 2) Reasons for resubmissions

*Table 22: Overview on reasons for resubmissions*

| New methodology for calculating/estimating releases/transfers | Correction of errors in release/transfer reports | Correction of facility details, e.g. coordinates, name | Addition/Remove of facilities | Change of facility IDs | New data is available (e.g. CO <sub>2</sub> including biomass) | Change/correction of activity |
|---|--|--|-------------------------------|------------------------|--|-------------------------------|
| Cyprus  | Austria  | Austria  | Austria                       | Greece                 | Bulgaria   | Czech Republic                |
| Czech Republic  | Belgium  | Bulgaria   | Czech Republic                | Hungary                | Estonia  | Estonia                       |
| Estonia   | Bulgaria   | Czech Republic   | Denmark                       | Netherlands            | Greece   | Portugal                      |
| Greece  | Cyprus   | Denmark  | Greece                        | Romania                | Netherlands  | Romania                       |
| Hungary   | Czech Republic                                   | Estonia  | Ireland                       | Slovakia               | Romania  | Slovenia                      |
| Malta   | Denmark  | Finland  | Netherlands                   |                        | Slovenia   |                               |
| Portugal  | Estonia  | Hungary  | Poland                        |                        | Sweden   |                               |
| Sweden  | Finland  | Ireland  | Portugal                      |                        |  |                               |

| New methodology for calculating/estimating releases/transfers | Correction of errors in release/transfer reports | Correction of facility details, e.g. coordinates, name | Addition/Remove of facilities | Change of facility IDs | New data is available (e.g. CO <sub>2</sub> including biomass) | Change/correction of activity |
|---|--|--|-------------------------------|------------------------|--|-------------------------------|
| Slovakia  | Greece   | Malta  | Romania                       |                        |  |                               |
| Spain   | Hungary  | Portugal   | Slovakia                      |                        |  |                               |
|   | Luxembourg                                       | Romania  | Slovenia                      |                        |  |                               |
|   | Malta  | Spain  | Spain                         |                        |  |                               |
|   | Netherlands                                      |  | Sweden                        |                        |  |                               |
|   | Poland   |  |                               |                        |  |                               |
|   | Portugal   |  |                               |                        |  |                               |
|   | Romania  |  |                               |                        |  |                               |
|   | Slovakia   |  |                               |                        |  |                               |
|   | Slovenia   |  |                               |                        |  |                               |
|   | Spain  |  |                               |                        |  |                               |
|   | Sweden   |  |                               |                        |  |                               |
|   | United Kingdom                                   |  |                               |                        |  |                               |

*Note: France, Germany, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania and, Norway have not provided any explanatory files on resubmissions. Any entries for these countries are based on the "resubmit reason" field in the EEA table on resubmissions.*

*Sources: Explanatory files on resubmissions, "resubmit field" in table on resubmissions from CDR*



# APPENDIX 3 - ASSESSMENT OF THE E-PRTR WEBSITE

## 1. Does the register include information on accidental release?

Legal requirements:

Article 5(1) of the E-PRTR Regulation states that

“the operator of each facility that undertakes one or more of the activities specified in Annex I above the applicable capacity thresholds specified therein shall communicate to its competent authority the information identifying the facility in accordance with Annex III unless that information is already available to the competent Authority”.

Article 5(2) further stipulates that

“in providing this information operators shall specify, where available, any data that relate to accidental releases”.

Assessment:

Table 23 summarises the available information regarding accidental releases (within the search menu “search E-PRTR data”).

**Table 23: Overview of availability of information regarding accidental releases**

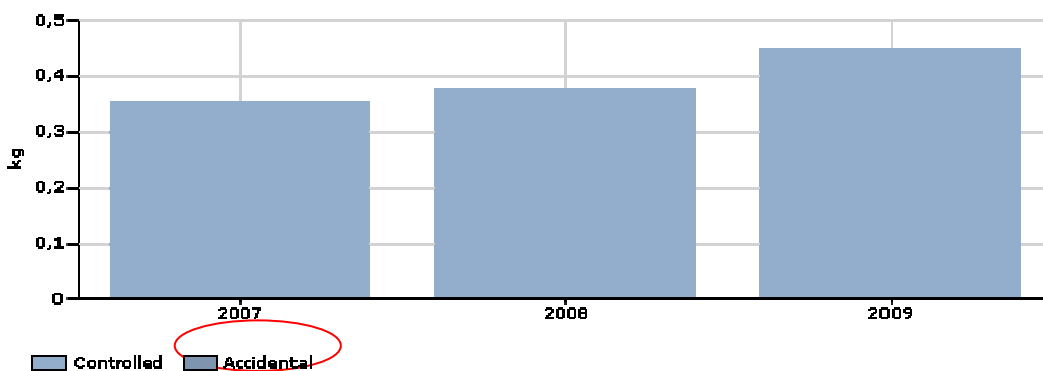
| Section                    | Information on accidental releases available | Description / Notes  |                |          |            |              |        |             |  |                 |  |  |                            |        |        |         |          |     |  |  |  |  |
|----------------------------|--|--|----------------|----------|------------|--------------|--------|-------------|--|-----------------|--|--|----------------------------|--------|--------|---------|----------|-----|--|--|--|--|
| Facility level             | ☑  | <p>In case certain facility is selected a ‘Contents box’ appears including hyperlinks to:</p> <ul style="list-style-type: none"> <li>• Details</li> <li>• <b>Pollutant releases</b></li> <li>• <u>Pollutant transfers</u></li> <li>• Waste transfers</li> <li>• <u>Confidentiality</u></li> </ul> <p>By following the ‘Pollutant releases’ hyperlink, users can access additional information, also including information on accidental releases (where available). The ‘Facility level/Pollutant release’ information will be presented in the following way:</p> <p><b>Example ‘Facility level/pollutant releases’</b> (For specific facility within EU 15; Year 2009; Pollutant group - Heavy metals)</p> <p><b>Releases to air</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Pollutant name</th> <th style="text-align: right;">Total</th> <th style="text-align: right;">Accidental</th> <th style="text-align: right;">Accidental %</th> <th style="text-align: left;">Method</th> </tr> </thead> <tbody> <tr> <td>Method used</td> <td></td> <td style="text-align: right;">Confidentiality</td> <td></td> <td></td> </tr> <tr> <td>Lead and compounds (as Pb)</td> <td style="text-align: right;">201 kg</td> <td style="text-align: right;">124 kg</td> <td style="text-align: right;">61.69 %</td> <td>Measured</td> </tr> <tr> <td>OTH</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> | Pollutant name | Total    | Accidental | Accidental % | Method | Method used |  | Confidentiality |  |  | Lead and compounds (as Pb) | 201 kg | 124 kg | 61.69 % | Measured | OTH |  |  |  |  |
| Pollutant name             | Total  | Accidental   | Accidental %   | Method   |            |              |        |             |  |                 |  |  |                            |        |        |         |          |     |  |  |  |  |
| Method used                |  | Confidentiality  |                |          |            |              |        |             |  |                 |  |  |                            |        |        |         |          |     |  |  |  |  |
| Lead and compounds (as Pb) | 201 kg                                       | 124 kg   | 61.69 %        | Measured |            |              |        |             |  |                 |  |  |                            |        |        |         |          |     |  |  |  |  |
| OTH                        |  |  |                |          |            |              |        |             |  |                 |  |  |                            |        |        |         |          |     |  |  |  |  |

| Industrial activity       | <input checked="" type="checkbox"/> | <p>Information regarding accidental releases is available. The information is presented in the following way:</p> <p><b>Example 'Industrial activity/Pollutant release'</b> (EU 15; Year 2009; All sectors and all activities/sub-activities)</p> <table border="0" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Releases per country</th> <th style="text-align: left;">Facilities</th> <th style="text-align: left;">Air</th> <th style="text-align: left;">Water</th> <th style="text-align: left;">Soil</th> </tr> </thead> <tbody> <tr> <td colspan="5"><b>Heavy metals (8/8)</b></td> </tr> <tr> <td></td> <td></td> <td colspan="2">Arsenic and compounds (as As)</td> <td style="text-align: right;">Total <a href="#">↗</a></td> </tr> <tr> <td></td> <td></td> <td colspan="2" style="text-align: center;"><b>Accidental</b></td> <td style="text-align: right;">733 <a href="#">↗</a></td> </tr> <tr> <td>10</td> <td>15.9 t</td> <td></td> <td></td> <td></td> </tr> <tr> <td colspan="5"><b>7.30 kg</b></td> </tr> <tr> <td></td> <td></td> <td>38.6 t</td> <td></td> <td></td> </tr> <tr> <td><b>8.95 kg</b></td> <td></td> <td>871 kg</td> <td></td> <td></td> </tr> <tr> <td><b>0</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td colspan="2">Cadmium and compounds (as Cd)</td> <td style="text-align: right;">Total <a href="#">↗</a></td> </tr> <tr> <td></td> <td></td> <td colspan="2" style="text-align: center;"><b>Accidental</b></td> <td style="text-align: right;">424 <a href="#">↗</a></td> </tr> <tr> <td>7</td> <td></td> <td>25.3 t</td> <td></td> <td></td> </tr> <tr> <td><b>90.0 kg</b></td> <td></td> <td>21,3 t</td> <td></td> <td></td> </tr> <tr> <td><b>72.1 kg</b></td> <td></td> <td>575 kg</td> <td></td> <td></td> </tr> <tr> <td><b>0</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td colspan="2">Chromium and compounds (as Cr)</td> <td style="text-align: right;">Total <a href="#">↗</a></td> </tr> <tr> <td></td> <td></td> <td colspan="2" style="text-align: center;"><b>Accidental</b></td> <td style="text-align: right;">470 <a href="#">↗</a></td> </tr> <tr> <td>8</td> <td></td> <td>62.9 t</td> <td></td> <td></td> </tr> <tr> <td>142 kg</td> <td></td> <td>464 t</td> <td></td> <td></td> </tr> <tr> <td>26.7 kg</td> <td></td> <td>13,5 t</td> <td></td> <td></td> </tr> <tr> <td><b>0</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td colspan="2">Copper and compounds (as Cu)</td> <td style="text-align: right;">Total <a href="#">↗</a></td> </tr> <tr> <td></td> <td></td> <td colspan="2" style="text-align: center;"><b>Accidental</b></td> <td style="text-align: right;">916 <a href="#">↗</a></td> </tr> <tr> <td>17</td> <td></td> <td>77.8 t</td> <td></td> <td></td> </tr> <tr> <td><b>182 kg</b></td> <td></td> <td>316 t</td> <td></td> <td></td> </tr> <tr> <td><b>195 kg</b></td> <td></td> <td>91.1 t</td> <td></td> <td></td> </tr> <tr> <td><b>0</b></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>...</td> <td></td> <td>...</td> <td>...</td> <td>...</td> </tr> </tbody> </table> <p>As can be seen, accidental releases to air, water and land are summarised. In order to obtain further information, also in relation to accidental releases, the user can follow the provided hyperlinks '<a href="#">↗</a>'.</p> <p>Related to this, see also the example 'Pollutant releases/Activities' below (Pollutant release search section)</p> | Releases per country | Facilities              | Air | Water | Soil | <b>Heavy metals (8/8)</b> |  |  |  |  |  |  | Arsenic and compounds (as As) |  | Total <a href="#">↗</a> |  |  | <b>Accidental</b> |  | 733 <a href="#">↗</a> | 10 | 15.9 t |  |  |  | <b>7.30 kg</b> |  |  |  |  |  |  | 38.6 t |  |  | <b>8.95 kg</b> |  | 871 kg |  |  | <b>0</b> |  |  |  |  |  |  | Cadmium and compounds (as Cd) |  | Total <a href="#">↗</a> |  |  | <b>Accidental</b> |  | 424 <a href="#">↗</a> | 7 |  | 25.3 t |  |  | <b>90.0 kg</b> |  | 21,3 t |  |  | <b>72.1 kg</b> |  | 575 kg |  |  | <b>0</b> |  |  |  |  |  |  | Chromium and compounds (as Cr) |  | Total <a href="#">↗</a> |  |  | <b>Accidental</b> |  | 470 <a href="#">↗</a> | 8 |  | 62.9 t |  |  | 142 kg |  | 464 t |  |  | 26.7 kg |  | 13,5 t |  |  | <b>0</b> |  |  |  |  |  |  | Copper and compounds (as Cu) |  | Total <a href="#">↗</a> |  |  | <b>Accidental</b> |  | 916 <a href="#">↗</a> | 17 |  | 77.8 t |  |  | <b>182 kg</b> |  | 316 t |  |  | <b>195 kg</b> |  | 91.1 t |  |  | <b>0</b> |  |  |  |  | ... |  | ... | ... | ... |
|---------------------------|-------------------------------------|---|----------------------|-------------------------|-----|-------|------|---------------------------|--|--|--|--|--|--|-------------------------------|--|-------------------------|--|--|-------------------|--|-----------------------|----|--------|--|--|--|----------------|--|--|--|--|--|--|--------|--|--|----------------|--|--------|--|--|----------|--|--|--|--|--|--|-------------------------------|--|-------------------------|--|--|-------------------|--|-----------------------|---|--|--------|--|--|----------------|--|--------|--|--|----------------|--|--------|--|--|----------|--|--|--|--|--|--|--------------------------------|--|-------------------------|--|--|-------------------|--|-----------------------|---|--|--------|--|--|--------|--|-------|--|--|---------|--|--------|--|--|----------|--|--|--|--|--|--|------------------------------|--|-------------------------|--|--|-------------------|--|-----------------------|----|--|--------|--|--|---------------|--|-------|--|--|---------------|--|--------|--|--|----------|--|--|--|--|-----|--|-----|-----|-----|
| Releases per country      | Facilities                          | Air   | Water                | Soil                    |     |       |      |                           |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |    |        |  |  |  |                |  |  |  |  |  |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |   |  |        |  |  |                |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                                |  |                         |  |  |                   |  |                       |   |  |        |  |  |        |  |       |  |  |         |  |        |  |  |          |  |  |  |  |  |  |                              |  |                         |  |  |                   |  |                       |    |  |        |  |  |               |  |       |  |  |               |  |        |  |  |          |  |  |  |  |     |  |     |     |     |
| <b>Heavy metals (8/8)</b> |                                     |   |                      |                         |     |       |      |                           |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |    |        |  |  |  |                |  |  |  |  |  |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |   |  |        |  |  |                |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                                |  |                         |  |  |                   |  |                       |   |  |        |  |  |        |  |       |  |  |         |  |        |  |  |          |  |  |  |  |  |  |                              |  |                         |  |  |                   |  |                       |    |  |        |  |  |               |  |       |  |  |               |  |        |  |  |          |  |  |  |  |     |  |     |     |     |
|                           |                                     | Arsenic and compounds (as As)   |                      | Total <a href="#">↗</a> |     |       |      |                           |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |    |        |  |  |  |                |  |  |  |  |  |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |   |  |        |  |  |                |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                                |  |                         |  |  |                   |  |                       |   |  |        |  |  |        |  |       |  |  |         |  |        |  |  |          |  |  |  |  |  |  |                              |  |                         |  |  |                   |  |                       |    |  |        |  |  |               |  |       |  |  |               |  |        |  |  |          |  |  |  |  |     |  |     |     |     |
|                           |                                     | <b>Accidental</b>   |                      | 733 <a href="#">↗</a>   |     |       |      |                           |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |    |        |  |  |  |                |  |  |  |  |  |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |   |  |        |  |  |                |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                                |  |                         |  |  |                   |  |                       |   |  |        |  |  |        |  |       |  |  |         |  |        |  |  |          |  |  |  |  |  |  |                              |  |                         |  |  |                   |  |                       |    |  |        |  |  |               |  |       |  |  |               |  |        |  |  |          |  |  |  |  |     |  |     |     |     |
| 10                        | 15.9 t                              |   |                      |                         |     |       |      |                           |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |    |        |  |  |  |                |  |  |  |  |  |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |   |  |        |  |  |                |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                                |  |                         |  |  |                   |  |                       |   |  |        |  |  |        |  |       |  |  |         |  |        |  |  |          |  |  |  |  |  |  |                              |  |                         |  |  |                   |  |                       |    |  |        |  |  |               |  |       |  |  |               |  |        |  |  |          |  |  |  |  |     |  |     |     |     |
| <b>7.30 kg</b>            |                                     |   |                      |                         |     |       |      |                           |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |    |        |  |  |  |                |  |  |  |  |  |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |   |  |        |  |  |                |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                                |  |                         |  |  |                   |  |                       |   |  |        |  |  |        |  |       |  |  |         |  |        |  |  |          |  |  |  |  |  |  |                              |  |                         |  |  |                   |  |                       |    |  |        |  |  |               |  |       |  |  |               |  |        |  |  |          |  |  |  |  |     |  |     |     |     |
|                           |                                     | 38.6 t  |                      |                         |     |       |      |                           |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |    |        |  |  |  |                |  |  |  |  |  |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |   |  |        |  |  |                |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                                |  |                         |  |  |                   |  |                       |   |  |        |  |  |        |  |       |  |  |         |  |        |  |  |          |  |  |  |  |  |  |                              |  |                         |  |  |                   |  |                       |    |  |        |  |  |               |  |       |  |  |               |  |        |  |  |          |  |  |  |  |     |  |     |     |     |
| <b>8.95 kg</b>            |                                     | 871 kg  |                      |                         |     |       |      |                           |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |    |        |  |  |  |                |  |  |  |  |  |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |   |  |        |  |  |                |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                                |  |                         |  |  |                   |  |                       |   |  |        |  |  |        |  |       |  |  |         |  |        |  |  |          |  |  |  |  |  |  |                              |  |                         |  |  |                   |  |                       |    |  |        |  |  |               |  |       |  |  |               |  |        |  |  |          |  |  |  |  |     |  |     |     |     |
| <b>0</b>                  |                                     |   |                      |                         |     |       |      |                           |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |    |        |  |  |  |                |  |  |  |  |  |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |   |  |        |  |  |                |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                                |  |                         |  |  |                   |  |                       |   |  |        |  |  |        |  |       |  |  |         |  |        |  |  |          |  |  |  |  |  |  |                              |  |                         |  |  |                   |  |                       |    |  |        |  |  |               |  |       |  |  |               |  |        |  |  |          |  |  |  |  |     |  |     |     |     |
|                           |                                     | Cadmium and compounds (as Cd)   |                      | Total <a href="#">↗</a> |     |       |      |                           |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |    |        |  |  |  |                |  |  |  |  |  |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |   |  |        |  |  |                |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                                |  |                         |  |  |                   |  |                       |   |  |        |  |  |        |  |       |  |  |         |  |        |  |  |          |  |  |  |  |  |  |                              |  |                         |  |  |                   |  |                       |    |  |        |  |  |               |  |       |  |  |               |  |        |  |  |          |  |  |  |  |     |  |     |     |     |
|                           |                                     | <b>Accidental</b>   |                      | 424 <a href="#">↗</a>   |     |       |      |                           |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |    |        |  |  |  |                |  |  |  |  |  |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |   |  |        |  |  |                |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                                |  |                         |  |  |                   |  |                       |   |  |        |  |  |        |  |       |  |  |         |  |        |  |  |          |  |  |  |  |  |  |                              |  |                         |  |  |                   |  |                       |    |  |        |  |  |               |  |       |  |  |               |  |        |  |  |          |  |  |  |  |     |  |     |     |     |
| 7                         |                                     | 25.3 t  |                      |                         |     |       |      |                           |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |    |        |  |  |  |                |  |  |  |  |  |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |   |  |        |  |  |                |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                                |  |                         |  |  |                   |  |                       |   |  |        |  |  |        |  |       |  |  |         |  |        |  |  |          |  |  |  |  |  |  |                              |  |                         |  |  |                   |  |                       |    |  |        |  |  |               |  |       |  |  |               |  |        |  |  |          |  |  |  |  |     |  |     |     |     |
| <b>90.0 kg</b>            |                                     | 21,3 t  |                      |                         |     |       |      |                           |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |    |        |  |  |  |                |  |  |  |  |  |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |   |  |        |  |  |                |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                                |  |                         |  |  |                   |  |                       |   |  |        |  |  |        |  |       |  |  |         |  |        |  |  |          |  |  |  |  |  |  |                              |  |                         |  |  |                   |  |                       |    |  |        |  |  |               |  |       |  |  |               |  |        |  |  |          |  |  |  |  |     |  |     |     |     |
| <b>72.1 kg</b>            |                                     | 575 kg  |                      |                         |     |       |      |                           |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |    |        |  |  |  |                |  |  |  |  |  |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |   |  |        |  |  |                |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                                |  |                         |  |  |                   |  |                       |   |  |        |  |  |        |  |       |  |  |         |  |        |  |  |          |  |  |  |  |  |  |                              |  |                         |  |  |                   |  |                       |    |  |        |  |  |               |  |       |  |  |               |  |        |  |  |          |  |  |  |  |     |  |     |     |     |
| <b>0</b>                  |                                     |   |                      |                         |     |       |      |                           |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |    |        |  |  |  |                |  |  |  |  |  |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |   |  |        |  |  |                |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                                |  |                         |  |  |                   |  |                       |   |  |        |  |  |        |  |       |  |  |         |  |        |  |  |          |  |  |  |  |  |  |                              |  |                         |  |  |                   |  |                       |    |  |        |  |  |               |  |       |  |  |               |  |        |  |  |          |  |  |  |  |     |  |     |     |     |
|                           |                                     | Chromium and compounds (as Cr)  |                      | Total <a href="#">↗</a> |     |       |      |                           |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |    |        |  |  |  |                |  |  |  |  |  |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |   |  |        |  |  |                |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                                |  |                         |  |  |                   |  |                       |   |  |        |  |  |        |  |       |  |  |         |  |        |  |  |          |  |  |  |  |  |  |                              |  |                         |  |  |                   |  |                       |    |  |        |  |  |               |  |       |  |  |               |  |        |  |  |          |  |  |  |  |     |  |     |     |     |
|                           |                                     | <b>Accidental</b>   |                      | 470 <a href="#">↗</a>   |     |       |      |                           |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |    |        |  |  |  |                |  |  |  |  |  |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |   |  |        |  |  |                |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                                |  |                         |  |  |                   |  |                       |   |  |        |  |  |        |  |       |  |  |         |  |        |  |  |          |  |  |  |  |  |  |                              |  |                         |  |  |                   |  |                       |    |  |        |  |  |               |  |       |  |  |               |  |        |  |  |          |  |  |  |  |     |  |     |     |     |
| 8                         |                                     | 62.9 t  |                      |                         |     |       |      |                           |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |    |        |  |  |  |                |  |  |  |  |  |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |   |  |        |  |  |                |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                                |  |                         |  |  |                   |  |                       |   |  |        |  |  |        |  |       |  |  |         |  |        |  |  |          |  |  |  |  |  |  |                              |  |                         |  |  |                   |  |                       |    |  |        |  |  |               |  |       |  |  |               |  |        |  |  |          |  |  |  |  |     |  |     |     |     |
| 142 kg                    |                                     | 464 t   |                      |                         |     |       |      |                           |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |    |        |  |  |  |                |  |  |  |  |  |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |   |  |        |  |  |                |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                                |  |                         |  |  |                   |  |                       |   |  |        |  |  |        |  |       |  |  |         |  |        |  |  |          |  |  |  |  |  |  |                              |  |                         |  |  |                   |  |                       |    |  |        |  |  |               |  |       |  |  |               |  |        |  |  |          |  |  |  |  |     |  |     |     |     |
| 26.7 kg                   |                                     | 13,5 t  |                      |                         |     |       |      |                           |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |    |        |  |  |  |                |  |  |  |  |  |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |   |  |        |  |  |                |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                                |  |                         |  |  |                   |  |                       |   |  |        |  |  |        |  |       |  |  |         |  |        |  |  |          |  |  |  |  |  |  |                              |  |                         |  |  |                   |  |                       |    |  |        |  |  |               |  |       |  |  |               |  |        |  |  |          |  |  |  |  |     |  |     |     |     |
| <b>0</b>                  |                                     |   |                      |                         |     |       |      |                           |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |    |        |  |  |  |                |  |  |  |  |  |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |   |  |        |  |  |                |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                                |  |                         |  |  |                   |  |                       |   |  |        |  |  |        |  |       |  |  |         |  |        |  |  |          |  |  |  |  |  |  |                              |  |                         |  |  |                   |  |                       |    |  |        |  |  |               |  |       |  |  |               |  |        |  |  |          |  |  |  |  |     |  |     |     |     |
|                           |                                     | Copper and compounds (as Cu)  |                      | Total <a href="#">↗</a> |     |       |      |                           |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |    |        |  |  |  |                |  |  |  |  |  |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |   |  |        |  |  |                |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                                |  |                         |  |  |                   |  |                       |   |  |        |  |  |        |  |       |  |  |         |  |        |  |  |          |  |  |  |  |  |  |                              |  |                         |  |  |                   |  |                       |    |  |        |  |  |               |  |       |  |  |               |  |        |  |  |          |  |  |  |  |     |  |     |     |     |
|                           |                                     | <b>Accidental</b>   |                      | 916 <a href="#">↗</a>   |     |       |      |                           |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |    |        |  |  |  |                |  |  |  |  |  |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |   |  |        |  |  |                |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                                |  |                         |  |  |                   |  |                       |   |  |        |  |  |        |  |       |  |  |         |  |        |  |  |          |  |  |  |  |  |  |                              |  |                         |  |  |                   |  |                       |    |  |        |  |  |               |  |       |  |  |               |  |        |  |  |          |  |  |  |  |     |  |     |     |     |
| 17                        |                                     | 77.8 t  |                      |                         |     |       |      |                           |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |    |        |  |  |  |                |  |  |  |  |  |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |   |  |        |  |  |                |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                                |  |                         |  |  |                   |  |                       |   |  |        |  |  |        |  |       |  |  |         |  |        |  |  |          |  |  |  |  |  |  |                              |  |                         |  |  |                   |  |                       |    |  |        |  |  |               |  |       |  |  |               |  |        |  |  |          |  |  |  |  |     |  |     |     |     |
| <b>182 kg</b>             |                                     | 316 t   |                      |                         |     |       |      |                           |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |    |        |  |  |  |                |  |  |  |  |  |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |   |  |        |  |  |                |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                                |  |                         |  |  |                   |  |                       |   |  |        |  |  |        |  |       |  |  |         |  |        |  |  |          |  |  |  |  |  |  |                              |  |                         |  |  |                   |  |                       |    |  |        |  |  |               |  |       |  |  |               |  |        |  |  |          |  |  |  |  |     |  |     |     |     |
| <b>195 kg</b>             |                                     | 91.1 t  |                      |                         |     |       |      |                           |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |    |        |  |  |  |                |  |  |  |  |  |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |   |  |        |  |  |                |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                                |  |                         |  |  |                   |  |                       |   |  |        |  |  |        |  |       |  |  |         |  |        |  |  |          |  |  |  |  |  |  |                              |  |                         |  |  |                   |  |                       |    |  |        |  |  |               |  |       |  |  |               |  |        |  |  |          |  |  |  |  |     |  |     |     |     |
| <b>0</b>                  |                                     |   |                      |                         |     |       |      |                           |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |    |        |  |  |  |                |  |  |  |  |  |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |   |  |        |  |  |                |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                                |  |                         |  |  |                   |  |                       |   |  |        |  |  |        |  |       |  |  |         |  |        |  |  |          |  |  |  |  |  |  |                              |  |                         |  |  |                   |  |                       |    |  |        |  |  |               |  |       |  |  |               |  |        |  |  |          |  |  |  |  |     |  |     |     |     |
| ...                       |                                     | ...   | ...                  | ...                     |     |       |      |                           |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |    |        |  |  |  |                |  |  |  |  |  |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |   |  |        |  |  |                |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                                |  |                         |  |  |                   |  |                       |   |  |        |  |  |        |  |       |  |  |         |  |        |  |  |          |  |  |  |  |  |  |                              |  |                         |  |  |                   |  |                       |    |  |        |  |  |               |  |       |  |  |               |  |        |  |  |          |  |  |  |  |     |  |     |     |     |
| Area overview             | Not included                        | Information on accidental releases is not available within the 'Area overview' section. Only the quantities of selected pollutants released and the total number of facilities is indicated.  |                      |                         |     |       |      |                           |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |    |        |  |  |  |                |  |  |  |  |  |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |   |  |        |  |  |                |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                                |  |                         |  |  |                   |  |                       |   |  |        |  |  |        |  |       |  |  |         |  |        |  |  |          |  |  |  |  |  |  |                              |  |                         |  |  |                   |  |                       |    |  |        |  |  |               |  |       |  |  |               |  |        |  |  |          |  |  |  |  |     |  |     |     |     |
| Pollutant release         | <input checked="" type="checkbox"/> | <p>In case certain pollutant group/pollutant is selected a 'Contents box' appears including hyperlinks to:</p> <ul style="list-style-type: none"> <li>• Summary</li> <li>• <b>Activities</b></li> <li>• <b>Areas</b></li> <li>• Area Comparison</li> <li>• <b>Facilities</b></li> <li>• <u>Confidentiality</u></li> </ul>   |                      |                         |     |       |      |                           |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |    |        |  |  |  |                |  |  |  |  |  |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                               |  |                         |  |  |                   |  |                       |   |  |        |  |  |                |  |        |  |  |                |  |        |  |  |          |  |  |  |  |  |  |                                |  |                         |  |  |                   |  |                       |   |  |        |  |  |        |  |       |  |  |         |  |        |  |  |          |  |  |  |  |  |  |                              |  |                         |  |  |                   |  |                       |    |  |        |  |  |               |  |       |  |  |               |  |        |  |  |          |  |  |  |  |     |  |     |     |     |

|                                     |                                | <p>By following the hyperlinks 'Activities', 'Areas' and 'Facilities' users can access additional information, also including information on accidental releases (where available). The information is presented in the following way:</p> <p><b>Example 'Pollutant releases/Activities'</b> (EU 15; Year 2009; Pollutant - Arsenic and compounds)</p> <table border="1"> <thead> <tr> <th>Releases per industrial activity</th> <th>Facilities</th> <th>Air</th> <th>Water</th> </tr> </thead> <tbody> <tr> <td>Soil</td> <td></td> <td></td> <td></td> </tr> <tr> <td>5. Waste and waste water management</td> <td>Total</td> <td></td> <td></td> </tr> <tr> <td></td> <td><b>Accidental</b></td> <td>341</td> <td></td> </tr> <tr> <td><b>8</b></td> <td>171 kg</td> <td></td> <td></td> </tr> <tr> <td><b>0</b></td> <td>19.5 t</td> <td></td> <td></td> </tr> <tr> <td><b>5.80 kg</b></td> <td>240 kg</td> <td></td> <td></td> </tr> <tr> <td><b>0</b></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p><b>Example 'Pollutant releases/Areas'</b> (EU 15; Year 2009; Pollutant - Arsenic and compounds)</p> <table border="1"> <thead> <tr> <th>Releases per country</th> <th>Facilities</th> <th>Air</th> <th>Water</th> <th>Soil</th> </tr> </thead> <tbody> <tr> <td>Netherlands</td> <td>Total</td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td><b>Accidental</b></td> <td>56</td> <td></td> <td></td> </tr> <tr> <td><b>1</b></td> <td>418 kg</td> <td></td> <td></td> <td></td> </tr> <tr> <td><b>7.3 kg</b></td> <td>1.54 t</td> <td></td> <td></td> <td></td> </tr> <tr> <td>3.05 kg</td> <td>-</td> <td></td> <td></td> <td></td> </tr> <tr> <td>-</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p><b>Example 'Pollutant releases/Facilities'</b> (EU 15; Year 2009; Pollutant - Arsenic and compounds releases to Air)</p> <table border="1"> <thead> <tr> <th>Facility</th> <th>Quantity</th> <th>Accidental</th> <th>Accidental.% ↓</th> <th>Activity</th> </tr> <tr> <th></th> <th>Country</th> <th></th> <th></th> <th></th> </tr> </thead> <tbody> <tr> <td><u>Corus Staal B.V.</u></td> <td></td> <td>302 kg</td> <td><b>7.30 kg</b></td> <td><b>2.42 %</b></td> <td>2.(b) NL</td> </tr> </tbody> </table> | Releases per industrial activity | Facilities    | Air      | Water | Soil |  |  |  | 5. Waste and waste water management | Total |  |  |  | <b>Accidental</b> | 341 |  | <b>8</b> | 171 kg |  |  | <b>0</b> | 19.5 t |  |  | <b>5.80 kg</b> | 240 kg |  |  | <b>0</b> |  |  |  | Releases per country | Facilities | Air | Water | Soil | Netherlands | Total |  |  |  |  | <b>Accidental</b> | 56 |  |  | <b>1</b> | 418 kg |  |  |  | <b>7.3 kg</b> | 1.54 t |  |  |  | 3.05 kg | - |  |  |  | - |  |  |  |  | Facility | Quantity | Accidental | Accidental.% ↓ | Activity |  | Country |  |  |  | <u>Corus Staal B.V.</u> |  | 302 kg | <b>7.30 kg</b> | <b>2.42 %</b> | 2.(b) NL |
|-------------------------------------|--------------------------------|---|----------------------------------|---------------|----------|-------|------|--|--|--|-------------------------------------|-------|--|--|--|-------------------|-----|--|----------|--------|--|--|----------|--------|--|--|----------------|--------|--|--|----------|--|--|--|----------------------|------------|-----|-------|------|-------------|-------|--|--|--|--|-------------------|----|--|--|----------|--------|--|--|--|---------------|--------|--|--|--|---------|---|--|--|--|---|--|--|--|--|----------|----------|------------|----------------|----------|--|---------|--|--|--|-------------------------|--|--------|----------------|---------------|----------|
| Releases per industrial activity    | Facilities                     | Air   | Water                            |               |          |       |      |  |  |  |                                     |       |  |  |  |                   |     |  |          |        |  |  |          |        |  |  |                |        |  |  |          |  |  |  |                      |            |     |       |      |             |       |  |  |  |  |                   |    |  |  |          |        |  |  |  |               |        |  |  |  |         |   |  |  |  |   |  |  |  |  |          |          |            |                |          |  |         |  |  |  |                         |  |        |                |               |          |
| Soil                                |                                |   |                                  |               |          |       |      |  |  |  |                                     |       |  |  |  |                   |     |  |          |        |  |  |          |        |  |  |                |        |  |  |          |  |  |  |                      |            |     |       |      |             |       |  |  |  |  |                   |    |  |  |          |        |  |  |  |               |        |  |  |  |         |   |  |  |  |   |  |  |  |  |          |          |            |                |          |  |         |  |  |  |                         |  |        |                |               |          |
| 5. Waste and waste water management | Total                          |   |                                  |               |          |       |      |  |  |  |                                     |       |  |  |  |                   |     |  |          |        |  |  |          |        |  |  |                |        |  |  |          |  |  |  |                      |            |     |       |      |             |       |  |  |  |  |                   |    |  |  |          |        |  |  |  |               |        |  |  |  |         |   |  |  |  |   |  |  |  |  |          |          |            |                |          |  |         |  |  |  |                         |  |        |                |               |          |
|                                     | <b>Accidental</b>              | 341   |                                  |               |          |       |      |  |  |  |                                     |       |  |  |  |                   |     |  |          |        |  |  |          |        |  |  |                |        |  |  |          |  |  |  |                      |            |     |       |      |             |       |  |  |  |  |                   |    |  |  |          |        |  |  |  |               |        |  |  |  |         |   |  |  |  |   |  |  |  |  |          |          |            |                |          |  |         |  |  |  |                         |  |        |                |               |          |
| <b>8</b>                            | 171 kg                         |   |                                  |               |          |       |      |  |  |  |                                     |       |  |  |  |                   |     |  |          |        |  |  |          |        |  |  |                |        |  |  |          |  |  |  |                      |            |     |       |      |             |       |  |  |  |  |                   |    |  |  |          |        |  |  |  |               |        |  |  |  |         |   |  |  |  |   |  |  |  |  |          |          |            |                |          |  |         |  |  |  |                         |  |        |                |               |          |
| <b>0</b>                            | 19.5 t                         |   |                                  |               |          |       |      |  |  |  |                                     |       |  |  |  |                   |     |  |          |        |  |  |          |        |  |  |                |        |  |  |          |  |  |  |                      |            |     |       |      |             |       |  |  |  |  |                   |    |  |  |          |        |  |  |  |               |        |  |  |  |         |   |  |  |  |   |  |  |  |  |          |          |            |                |          |  |         |  |  |  |                         |  |        |                |               |          |
| <b>5.80 kg</b>                      | 240 kg                         |   |                                  |               |          |       |      |  |  |  |                                     |       |  |  |  |                   |     |  |          |        |  |  |          |        |  |  |                |        |  |  |          |  |  |  |                      |            |     |       |      |             |       |  |  |  |  |                   |    |  |  |          |        |  |  |  |               |        |  |  |  |         |   |  |  |  |   |  |  |  |  |          |          |            |                |          |  |         |  |  |  |                         |  |        |                |               |          |
| <b>0</b>                            |                                |   |                                  |               |          |       |      |  |  |  |                                     |       |  |  |  |                   |     |  |          |        |  |  |          |        |  |  |                |        |  |  |          |  |  |  |                      |            |     |       |      |             |       |  |  |  |  |                   |    |  |  |          |        |  |  |  |               |        |  |  |  |         |   |  |  |  |   |  |  |  |  |          |          |            |                |          |  |         |  |  |  |                         |  |        |                |               |          |
| Releases per country                | Facilities                     | Air   | Water                            | Soil          |          |       |      |  |  |  |                                     |       |  |  |  |                   |     |  |          |        |  |  |          |        |  |  |                |        |  |  |          |  |  |  |                      |            |     |       |      |             |       |  |  |  |  |                   |    |  |  |          |        |  |  |  |               |        |  |  |  |         |   |  |  |  |   |  |  |  |  |          |          |            |                |          |  |         |  |  |  |                         |  |        |                |               |          |
| Netherlands                         | Total                          |   |                                  |               |          |       |      |  |  |  |                                     |       |  |  |  |                   |     |  |          |        |  |  |          |        |  |  |                |        |  |  |          |  |  |  |                      |            |     |       |      |             |       |  |  |  |  |                   |    |  |  |          |        |  |  |  |               |        |  |  |  |         |   |  |  |  |   |  |  |  |  |          |          |            |                |          |  |         |  |  |  |                         |  |        |                |               |          |
|                                     | <b>Accidental</b>              | 56  |                                  |               |          |       |      |  |  |  |                                     |       |  |  |  |                   |     |  |          |        |  |  |          |        |  |  |                |        |  |  |          |  |  |  |                      |            |     |       |      |             |       |  |  |  |  |                   |    |  |  |          |        |  |  |  |               |        |  |  |  |         |   |  |  |  |   |  |  |  |  |          |          |            |                |          |  |         |  |  |  |                         |  |        |                |               |          |
| <b>1</b>                            | 418 kg                         |   |                                  |               |          |       |      |  |  |  |                                     |       |  |  |  |                   |     |  |          |        |  |  |          |        |  |  |                |        |  |  |          |  |  |  |                      |            |     |       |      |             |       |  |  |  |  |                   |    |  |  |          |        |  |  |  |               |        |  |  |  |         |   |  |  |  |   |  |  |  |  |          |          |            |                |          |  |         |  |  |  |                         |  |        |                |               |          |
| <b>7.3 kg</b>                       | 1.54 t                         |   |                                  |               |          |       |      |  |  |  |                                     |       |  |  |  |                   |     |  |          |        |  |  |          |        |  |  |                |        |  |  |          |  |  |  |                      |            |     |       |      |             |       |  |  |  |  |                   |    |  |  |          |        |  |  |  |               |        |  |  |  |         |   |  |  |  |   |  |  |  |  |          |          |            |                |          |  |         |  |  |  |                         |  |        |                |               |          |
| 3.05 kg                             | -                              |   |                                  |               |          |       |      |  |  |  |                                     |       |  |  |  |                   |     |  |          |        |  |  |          |        |  |  |                |        |  |  |          |  |  |  |                      |            |     |       |      |             |       |  |  |  |  |                   |    |  |  |          |        |  |  |  |               |        |  |  |  |         |   |  |  |  |   |  |  |  |  |          |          |            |                |          |  |         |  |  |  |                         |  |        |                |               |          |
| -                                   |                                |   |                                  |               |          |       |      |  |  |  |                                     |       |  |  |  |                   |     |  |          |        |  |  |          |        |  |  |                |        |  |  |          |  |  |  |                      |            |     |       |      |             |       |  |  |  |  |                   |    |  |  |          |        |  |  |  |               |        |  |  |  |         |   |  |  |  |   |  |  |  |  |          |          |            |                |          |  |         |  |  |  |                         |  |        |                |               |          |
| Facility                            | Quantity                       | Accidental  | Accidental.% ↓                   | Activity      |          |       |      |  |  |  |                                     |       |  |  |  |                   |     |  |          |        |  |  |          |        |  |  |                |        |  |  |          |  |  |  |                      |            |     |       |      |             |       |  |  |  |  |                   |    |  |  |          |        |  |  |  |               |        |  |  |  |         |   |  |  |  |   |  |  |  |  |          |          |            |                |          |  |         |  |  |  |                         |  |        |                |               |          |
|                                     | Country                        |   |                                  |               |          |       |      |  |  |  |                                     |       |  |  |  |                   |     |  |          |        |  |  |          |        |  |  |                |        |  |  |          |  |  |  |                      |            |     |       |      |             |       |  |  |  |  |                   |    |  |  |          |        |  |  |  |               |        |  |  |  |         |   |  |  |  |   |  |  |  |  |          |          |            |                |          |  |         |  |  |  |                         |  |        |                |               |          |
| <u>Corus Staal B.V.</u>             |                                | 302 kg  | <b>7.30 kg</b>                   | <b>2.42 %</b> | 2.(b) NL |       |      |  |  |  |                                     |       |  |  |  |                   |     |  |          |        |  |  |          |        |  |  |                |        |  |  |          |  |  |  |                      |            |     |       |      |             |       |  |  |  |  |                   |    |  |  |          |        |  |  |  |               |        |  |  |  |         |   |  |  |  |   |  |  |  |  |          |          |            |                |          |  |         |  |  |  |                         |  |        |                |               |          |
| Pollutant transfer                  | Not available                  | Information on accidental releases is not available, however, links to 'Industrial activity' and 'Facility level' search is provided where information on accidental releases can be accessed (see description/notes given for 'Facility level' and 'Industrial activity' section).   |                                  |               |          |       |      |  |  |  |                                     |       |  |  |  |                   |     |  |          |        |  |  |          |        |  |  |                |        |  |  |          |  |  |  |                      |            |     |       |      |             |       |  |  |  |  |                   |    |  |  |          |        |  |  |  |               |        |  |  |  |         |   |  |  |  |   |  |  |  |  |          |          |            |                |          |  |         |  |  |  |                         |  |        |                |               |          |
| Waste transfer                      | Not relevant                   | Not relevant  |                                  |               |          |       |      |  |  |  |                                     |       |  |  |  |                   |     |  |          |        |  |  |          |        |  |  |                |        |  |  |          |  |  |  |                      |            |     |       |      |             |       |  |  |  |  |                   |    |  |  |          |        |  |  |  |               |        |  |  |  |         |   |  |  |  |   |  |  |  |  |          |          |            |                |          |  |         |  |  |  |                         |  |        |                |               |          |
| Map search                          | Information cannot be accessed | Even though the section 'Map search' directly connects to available information on 'Facility level', additional information on pollutant releases cannot be accessed. The hyperlink (i.e. pollutant release) is invalid.  |                                  |               |          |       |      |  |  |  |                                     |       |  |  |  |                   |     |  |          |        |  |  |          |        |  |  |                |        |  |  |          |  |  |  |                      |            |     |       |      |             |       |  |  |  |  |                   |    |  |  |          |        |  |  |  |               |        |  |  |  |         |   |  |  |  |   |  |  |  |  |          |          |            |                |          |  |         |  |  |  |                         |  |        |                |               |          |

Besides, under the search menu 'Time Series/Pollutant Release' additional information regarding accidental releases can be accessed. The available information will be displayed as a bar chart in the following way (Example: Pollutant Release/Time Series; EU15; Chlorinated organic substances PCDD/PCDF; releases to Air).

**Figure 3: Example - Pollutant Release/Time Series; EU15; Chlorinated organic substances PCDD/PCDF; releases to Air**



As shown in the bar chart accidental releases should appear in a darker blue colour compared to the controlled releases. However, the bar chart merely shows the total releases without graphically distinguishing between controlled and accidental releases. The user can only access the exact figures on total and accidental releases by moving the mouse cursor over the bar chart. The relevant data will then appear for a certain period of time. For instance, by moving the cursor to the peak in year 2008, the information will appear on the screen that from the total release of 378 g in 2008, 0.309 g was released accidentally, which represents about 0.082 % of the total release in this year. Even though data on accidental releases is provided, a clear graphical differentiation (i.e. different colours for controlled and accidental releases) would avoid confusion at this point.

Problems/deficits and proposal for improvement:

The deficits and proposals for improvement regarding information on accidental releases are summarised in Table 24.

**Table 24: Deficits/problems on E-PRTR website regarding information on accidental releases**

| Deficit/Problem   | Description  | Proposal for improvement  |
|---|--|---|
| Information on accidental releases not included in 'Area overview'                    | Information on accidental releases is not available within the 'Area overview' section. Only the quantities of selected pollutants released and the total number of facilities is indicated.   | Include information on accidental releases, or at least provide links to the 'Facility level' search or 'Pollutant release' search where these data can be obtained                       |
| Information cannot be accessed in 'Map search'  | Even though the section 'Map search' directly connects to available information on 'Facility level', additional information on pollutant releases cannot be accessed. The hyperlink (i.e. pollutant release) is invalid.   | The hyperlinks should be checked and fixed, or alternatively be removed from the homepage.  |
| Information on accidental releases difficult to find 'Time series/ Pollutant release' | The available bar charts merely display the total releases without graphically distinguishing between controlled and accidental releases. The user can only access the exact figures on total and accidental releases by moving the mouse cursor over the bar chart. | Even though data on accidental releases are provided, a clear graphical differentiation (i.e. different colours for controlled and accidental releases in the bar charts) should be made. |

Assessment note:

In most search sections, sufficient information on accidental releases is provided (i.e. Facility level, Industrial activity, Pollutant release). In other search sections minor amendments would be required. In the search section 'Area overview', links to the 'Facility level' search of 'Pollutant release' search would be helpful. Besides, the available hyperlinks within the 'Map search' should be checked and fixed, or at least removed from the homepage. The last proposal is related to the search section 'Time series/Pollutant release' where easier access to information should be facilitated. A clear graphical differentiation (i.e. different colours for controlled and accidental releases in the provided bar charts) would be of great help.

## 2. Does the register include information on measurement methods?

Legal requirements:

Article 5(1) of the E-PRTR Regulation states that

“the operator of each facility that undertakes one or more of the activities specified in Annex I above the applicable capacity thresholds specified therein shall communicate to its competent authority the information identifying the facility in accordance with Annex III unless that information is already available to the competent Authority”.

Article 5(1) further stipulates that

“in the case of data indicated as being based on measurement or calculation the analytical method and/or the method of calculation shall be reported”.

Assessment:

Table 25 summarises the available information regarding measurement methods (within search menu “search E-PRTR data”).

**Table 25: Overview of availability of information regarding measurement methods**

| Section        | Information on measurement methods available          | Description / Notes  |
|----------------|---|--|
| Facility level | ☑ (but abbreviations used could be briefly explained) | <p>In case certain facility is selected a 'Contents box' appears including hyperlinks to:</p> <ul style="list-style-type: none"> <li>• Details</li> <li>• Pollutant releases</li> <li>• <u>Pollutant transfers</u></li> <li>• Waste transfers</li> <li>• <u>Confidentiality</u></li> </ul> <p>By following the 'Pollutant releases', 'Pollutant transfers' and 'Waste transfers' hyperlinks, users can access additional information (in case reported), also including information on the applied analytical methods and/or methods of calculation.</p> <p>The reported methods are indicated as abbreviations (e.g. NRB, OTH, etc.). In addition to the three letter abbreviation (e.g. NRB) the short designation (e.g. VDI 3873) or a short description of the</p> |

| Section                              | Information on measurement methods available | Description / Notes  |                |            |            |              |        |                    |                 |  |  |  |                                   |           |   |     |            |            |  |  |  |  |                                      |          |   |     |            |            |  |  |  |  |
|--------------------------------------|--|--|----------------|------------|------------|--------------|--------|--------------------|-----------------|--|--|--|-----------------------------------|-----------|---|-----|------------|------------|--|--|--|--|--------------------------------------|----------|---|-----|------------|------------|--|--|--|--|
|                                      |  | <p>methodology could be given.</p> <p><b>Pollutant Releases - Releases to air</b></p> <table border="1"> <thead> <tr> <th>Pollutant name</th> <th>Total</th> <th>Accidental</th> <th>Accidental %</th> <th>Method</th> </tr> </thead> <tbody> <tr> <td><b>Method used</b></td> <td colspan="4">Confidentiality</td> </tr> <tr> <td>Carbon dioxide (CO<sub>2</sub>)</td> <td>192,000 t</td> <td>0</td> <td>0 %</td> <td>Calculated</td> </tr> <tr> <td><b>PER</b></td> <td colspan="4"></td> </tr> <tr> <td>(CO<sub>2</sub>) excluding biomass</td> <td>76,900 t</td> <td>0</td> <td>0 %</td> <td>Calculated</td> </tr> <tr> <td><b>PER</b></td> <td colspan="4"></td> </tr> </tbody> </table> <p>The abbreviations are explained within the FAQs (see list of abbreviations in <b>FAQ 17</b> below). For instance, the three letter abbreviation 'PER' stands for 'Measurement methodology already prescribed by the competent authority in a licence or an operating permit for that facility'.</p> | Pollutant name | Total      | Accidental | Accidental % | Method | <b>Method used</b> | Confidentiality |  |  |  | Carbon dioxide (CO <sub>2</sub> ) | 192,000 t | 0 | 0 % | Calculated | <b>PER</b> |  |  |  |  | (CO <sub>2</sub> ) excluding biomass | 76,900 t | 0 | 0 % | Calculated | <b>PER</b> |  |  |  |  |
| Pollutant name                       | Total  | Accidental   | Accidental %   | Method     |            |              |        |                    |                 |  |  |  |                                   |           |   |     |            |            |  |  |  |  |                                      |          |   |     |            |            |  |  |  |  |
| <b>Method used</b>                   | Confidentiality                              |  |                |            |            |              |        |                    |                 |  |  |  |                                   |           |   |     |            |            |  |  |  |  |                                      |          |   |     |            |            |  |  |  |  |
| Carbon dioxide (CO <sub>2</sub> )    | 192,000 t                                    | 0  | 0 %            | Calculated |            |              |        |                    |                 |  |  |  |                                   |           |   |     |            |            |  |  |  |  |                                      |          |   |     |            |            |  |  |  |  |
| <b>PER</b>                           |  |  |                |            |            |              |        |                    |                 |  |  |  |                                   |           |   |     |            |            |  |  |  |  |                                      |          |   |     |            |            |  |  |  |  |
| (CO <sub>2</sub> ) excluding biomass | 76,900 t                                     | 0  | 0 %            | Calculated |            |              |        |                    |                 |  |  |  |                                   |           |   |     |            |            |  |  |  |  |                                      |          |   |     |            |            |  |  |  |  |
| <b>PER</b>                           |  |  |                |            |            |              |        |                    |                 |  |  |  |                                   |           |   |     |            |            |  |  |  |  |                                      |          |   |     |            |            |  |  |  |  |
| Industrial activity                  | <input checked="" type="checkbox"/> LINK     | The same description/notes apply as for the 'Facility level' section above as the information regarding measurement methods is only accessible via 'Facility Level/Details'. A link to the 'Facility Level/Details' is provided.   |                |            |            |              |        |                    |                 |  |  |  |                                   |           |   |     |            |            |  |  |  |  |                                      |          |   |     |            |            |  |  |  |  |
| Area overview                        | Not included                                 | For instance in the case of releases of certain pollutant groups (e.g. chlorinated organic substances) only the total quantities released (i.e. to air, water and land) are summarised for a particular area chosen (e.g. EU 15, Belgium, etc.).   |                |            |            |              |        |                    |                 |  |  |  |                                   |           |   |     |            |            |  |  |  |  |                                      |          |   |     |            |            |  |  |  |  |
| Pollutant release                    | <input checked="" type="checkbox"/> LINK     | The same description/notes apply as for the 'Facility level' as the information regarding measurement methods is only accessible via 'Facility Level/Details'. A link to the 'Facility Level/Details' is provided.   |                |            |            |              |        |                    |                 |  |  |  |                                   |           |   |     |            |            |  |  |  |  |                                      |          |   |     |            |            |  |  |  |  |
| Pollutant transfer                   | <input checked="" type="checkbox"/> LINK     | The same description/notes apply as for the 'Facility level' as the information regarding measurement methods is only accessible via 'Facility Level/Details'. A link to the 'Facility Level/Details' is provided for each industrial activity.  |                |            |            |              |        |                    |                 |  |  |  |                                   |           |   |     |            |            |  |  |  |  |                                      |          |   |     |            |            |  |  |  |  |
| Waste transfer                       | <input checked="" type="checkbox"/> LINK     | The same description/notes apply as for the 'Facility level' as the information regarding measurement methods is only accessible via 'Facility Level/Details'. A link to the 'Facility Level/Details' is provided.   |                |            |            |              |        |                    |                 |  |  |  |                                   |           |   |     |            |            |  |  |  |  |                                      |          |   |     |            |            |  |  |  |  |
| Map search                           | Information cannot be accessed               | Even though the section 'Map search' directly connects to available information on 'Facility level', additional information on pollutant releases, pollutant transfer and waste transfers and consequently also the corresponding measurement methods cannot be accessed. The hyperlinks (i.e. details, pollutant release, pollutant transfer, waste transfers and confidentiality) which should lead to further information are invalid.  |                |            |            |              |        |                    |                 |  |  |  |                                   |           |   |     |            |            |  |  |  |  |                                      |          |   |     |            |            |  |  |  |  |

#### FAQ 17: Which methodologies are used for reporting data under E-PRTR?

Reporting to E-PRTR is carried out based on measurement, calculation or estimation of releases and off-site transfers. Where reported data is based on measurements or calculation, the method is indicated in the E-PRTR register using the following designations:

**Table 26: Methodologies used for reporting E-PRTR data**

| <b>Measurement methodologies</b>                                   |  |
|--|--|
| <b>Designation</b>   | <b>Method used for determination of releases/off-site transfers</b>  |
| <b>Relevant standard (e.g. EN 14385:2004)</b>                      | Internationally approved measurement standard  |
| <b>PER*</b>  | Measurement methodology already prescribed by the competent authority in a licence or an operating permit for that facility                            |
| <b>NRB*</b>  | National or regional binding measurement methodology prescribed by legal act for the pollutant and facility concerned                                  |
| <b>ALT</b>   | Alternative Measurement Method in accordance with existing CEN/ISO measurement standards   |
| <b>CRM</b>   | Measurement methodology the performance of which is demonstrated by means of certified reference materials and accepted by competent authority         |
| <b>OTH*</b>  | Other measurement methodology  |
| <b>*</b>   | In addition to the three letter abbreviation (e.g. NRB) the short designation (e.g. VDI 3873) or a short description of the methodology could be given |
| <b>Calculation methodologies</b>                                   |  |
| <b>Designation</b>   | <b>Method used for determination of releases/off-site transfers</b>  |
| <b>Short designation of the method used: ETS, IPCC, UNECE/EMEP</b> | Internationally approved calculation method  |
| <b>PER*</b>  | Calculation methodology already prescribed by the competent authority in a licence or an operating permit for that facility                            |
| <b>NRB*</b>  | National or regional binding calculation methodology prescribed by legal act for the pollutant and facility concerned                                  |
| <b>MAB*</b>  | Mass balance method which is accepted by the competent authority   |
| <b>SSC</b>   | European-wide sector specific calculation method   |
| <b>OTH*</b>  | Other calculation methodology  |
| <b>*</b>   | In addition to the three letter abbreviation (e.g. NRB) the short designation (e.g. VDI 3873) or a short description of the methodology could be given |

Problems/deficits and proposal for improvement:

The main deficits identified and proposals for improvement are summarised in Table 27.

**Table 27: Deficits/problems on E-PRTR website regarding measurement methods**

| <b>Deficit/Problem</b>    | <b>Description</b>  | <b>Proposal for improvement</b>   |
|---------------------------|---|---|
| <b>Abbreviations used</b> | The three letter abbreviations are explained within the FAQs only (i.e. Question 17). | It would be helpful to provide brief explanations for abbreviations when used, for instance 'PER' (Measurement methodology already prescribed by the competent authority in a licence or an operating permit for that facility), or at least clearly indicate where a complete list of abbreviations can be found (e.g. hyperlink to FAQ 17). |

|   |  |   |
|---|--|---|
| <p><b>Measurement methods not included in the 'Area overview' section</b></p>                   | <p>For instance in the case of releases of certain pollutant groups (e.g. chlorinated organic substances) only the total quantities released (i.e. to air, water and land) are summarised for a particular area decided to focus on (e.g. EU 15, Belgium, etc.).</p>             | <p>Indicating measurement methods in the 'Area overview' section might be confusing, as several methods will be applied to measure for instance the total releases of a substance. Nevertheless, similar to the 'Facility level' and 'Industrial level' section links could be provided to the 'Facility level' where such information can be obtained.</p> |
| <p><b>Information related to measurement methods cannot be accessed in the 'Map search'</b></p> | <p>Even though the section 'Map search' directly connects to available information on 'Facility level', additional information on pollutant releases, pollutant transfer and waste transfers and consequently also the corresponding measurement methods cannot be accessed.</p> | <p>The provided hyperlinks (i.e. details, pollutant release, pollutant transfer, waste transfers and confidentiality) which should lead to further information are in place, but invalid. These should be checked and fixed, or alternatively be removed from the homepage, in order to avoid confusion.</p>  |

Assessment note:

Information regarding measurement methods is exclusively available in the search section 'facility level'. Other relevant sections provide links to this section. However, the three letter abbreviations used are only explained within the FAQs (see Question 17). Therefore, it has been proposed to include brief descriptions of abbreviations applied or at least clearly indicate where explanations can be found (e.g. hyperlink to FAQ 17).

With regard to the 'Area overview', it is understandable that indicating measurement methods is not easy to summarise as several methods will be used to measure for instance the total release of a substance. Nevertheless, it has been proposed to provide links to the 'Facility level' where such information could be accessed.

The last minor deficit/problem identified during the review is connected to the 'Map search' section. Even though this section is directly connected to the available information on 'Facility level', the provided hyperlinks (i.e. details, pollutant release, pollutant transfer, waste transfer and confidentiality) which could lead to information regarding measurement methods are invalid. Consequently, it has been proposed to either fix the hyperlinks or alternatively remove them from the homepage in order to avoid confusion.

### 3. How does the register handle confidential data?

Legal requirements:

Article 11 of the E-PRTR Regulation states that

“whenever information is kept confidential by a Member State in accordance with Article 4 of Directive 2003/4/EC of the European Parliament and of the Council of 28 January 2003 on public access to environmental information, the Member State shall, in its report under Article 7(2) of this Regulation for the reporting year concerned, indicate separately for each facility claiming confidentiality the type of



information that has been withheld and the reason for which it has been withheld”.

Assessment:

Table 28 summarises the available information on confidentiality issues (within the search menu “search E-PRTR data”).

**Table 28: Overview of availability of information regarding confidentiality**

| Section        | Information on confidentiality included   | Description / Notes  |                            |             |              |              |          |         |              |      |  |                     |  |         |       |    |  |  |  |  |              |      |  |                            |  |  |        |       |  |    |  |  |              |      |  |             |  |            |       |    |  |  |  |  |              |      |  |               |  |            |             |       |  |    |  |  |              |  |              |              |  |              |       |  |    |  |  |  |              |  |              |              |  |              |       |  |    |  |  |  |
|----------------|---|--|----------------------------|-------------|--------------|--------------|----------|---------|--------------|------|--|---------------------|--|---------|-------|----|--|--|--|--|--------------|------|--|----------------------------|--|--|--------|-------|--|----|--|--|--------------|------|--|-------------|--|------------|-------|----|--|--|--|--|--------------|------|--|---------------|--|------------|-------------|-------|--|----|--|--|--------------|--|--------------|--------------|--|--------------|-------|--|----|--|--|--|--------------|--|--------------|--------------|--|--------------|-------|--|----|--|--|--|
| Facility level | <input checked="" type="checkbox"/> (included, but further explanations required) | <p>In case confidentiality claims affect the search result this will be indicated by the hyperlink ‘<a href="#">🚩 Confidentiality claims may affect the result</a>’, which leads to further information. Besides it is stated that the total releases and off site transfers in waste water of single pollutants as well as aggregated amount of waste transferred off-site may be affected by confidentiality claims.</p> <p>By specifying for instance the ‘Activity’, a list of facilities will appear, including facilities claiming confidentiality at the top of the list. The information that has been withheld is highlighted with ‘CONFIDENTIAL’ within the list (see example below). By ticking the ‘CONFIDENTIAL’ fields within the list further details will appear (i.e. Facility level/Details). In some cases only the name of the facility will be confidential, in other cases however, additional information is withheld, such as the postal code, address, etc. The reason for which certain information has been withheld is specified by referring to Directive 2003/4/EC. However, the content/brief explanation of individual Articles of the Directive to which the reference is made is not included (e.g. Article 4(2)(d)).</p> <p><b>Example ‘facility level confidentiality’</b> (EU 15; Year 2009; Waste Transfer; Activity, all sectors and all activities/sub-activities)</p> <table border="1"> <thead> <tr> <th>Facility </th> <th>Postal Code</th> <th>Address</th> <th>Town/Village</th> <th>Activity</th> <th>Country</th> </tr> </thead> <tbody> <tr> <td>CONFIDENTIAL</td> <td>8850</td> <td></td> <td>KNIJFFELINGSTRAAT 6</td> <td></td> <td>ARDOOIE</td> </tr> <tr> <td>7.(a)</td> <td>BE</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>CONFIDENTIAL</td> <td>8380</td> <td></td> <td>BLANKENBERGSE STEENWEG 456</td> <td></td> <td></td> </tr> <tr> <td>BRUGGE</td> <td>7.(a)</td> <td></td> <td>BE</td> <td></td> <td></td> </tr> <tr> <td>CONFIDENTIAL</td> <td>8647</td> <td></td> <td>ZAVELHOEK 5</td> <td></td> <td>LO-RENINGE</td> </tr> <tr> <td>7.(a)</td> <td>BE</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>CONFIDENTIAL</td> <td>8920</td> <td></td> <td>WATERSTRAAT 4</td> <td></td> <td>LANGEMARK-</td> </tr> <tr> <td>POELKAPELLE</td> <td>7.(a)</td> <td></td> <td>BE</td> <td></td> <td></td> </tr> <tr> <td>CONFIDENTIAL</td> <td></td> <td>CONFIDENTIAL</td> <td>CONFIDENTIAL</td> <td></td> <td>CONFIDENTIAL</td> </tr> <tr> <td>8.(a)</td> <td></td> <td>DE</td> <td></td> <td></td> <td></td> </tr> <tr> <td>CONFIDENTIAL</td> <td></td> <td>CONFIDENTIAL</td> <td>CONFIDENTIAL</td> <td></td> <td>CONFIDENTIAL</td> </tr> <tr> <td>4.(a)</td> <td></td> <td>DE</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> | Facility                   | Postal Code | Address      | Town/Village | Activity | Country | CONFIDENTIAL | 8850 |  | KNIJFFELINGSTRAAT 6 |  | ARDOOIE | 7.(a) | BE |  |  |  |  | CONFIDENTIAL | 8380 |  | BLANKENBERGSE STEENWEG 456 |  |  | BRUGGE | 7.(a) |  | BE |  |  | CONFIDENTIAL | 8647 |  | ZAVELHOEK 5 |  | LO-RENINGE | 7.(a) | BE |  |  |  |  | CONFIDENTIAL | 8920 |  | WATERSTRAAT 4 |  | LANGEMARK- | POELKAPELLE | 7.(a) |  | BE |  |  | CONFIDENTIAL |  | CONFIDENTIAL | CONFIDENTIAL |  | CONFIDENTIAL | 8.(a) |  | DE |  |  |  | CONFIDENTIAL |  | CONFIDENTIAL | CONFIDENTIAL |  | CONFIDENTIAL | 4.(a) |  | DE |  |  |  |
| Facility       | Postal Code   | Address  | Town/Village               | Activity    | Country      |              |          |         |              |      |  |                     |  |         |       |    |  |  |  |  |              |      |  |                            |  |  |        |       |  |    |  |  |              |      |  |             |  |            |       |    |  |  |  |  |              |      |  |               |  |            |             |       |  |    |  |  |              |  |              |              |  |              |       |  |    |  |  |  |              |  |              |              |  |              |       |  |    |  |  |  |
| CONFIDENTIAL   | 8850  |  | KNIJFFELINGSTRAAT 6        |             | ARDOOIE      |              |          |         |              |      |  |                     |  |         |       |    |  |  |  |  |              |      |  |                            |  |  |        |       |  |    |  |  |              |      |  |             |  |            |       |    |  |  |  |  |              |      |  |               |  |            |             |       |  |    |  |  |              |  |              |              |  |              |       |  |    |  |  |  |              |  |              |              |  |              |       |  |    |  |  |  |
| 7.(a)          | BE  |  |                            |             |              |              |          |         |              |      |  |                     |  |         |       |    |  |  |  |  |              |      |  |                            |  |  |        |       |  |    |  |  |              |      |  |             |  |            |       |    |  |  |  |  |              |      |  |               |  |            |             |       |  |    |  |  |              |  |              |              |  |              |       |  |    |  |  |  |              |  |              |              |  |              |       |  |    |  |  |  |
| CONFIDENTIAL   | 8380  |  | BLANKENBERGSE STEENWEG 456 |             |              |              |          |         |              |      |  |                     |  |         |       |    |  |  |  |  |              |      |  |                            |  |  |        |       |  |    |  |  |              |      |  |             |  |            |       |    |  |  |  |  |              |      |  |               |  |            |             |       |  |    |  |  |              |  |              |              |  |              |       |  |    |  |  |  |              |  |              |              |  |              |       |  |    |  |  |  |
| BRUGGE         | 7.(a)   |  | BE                         |             |              |              |          |         |              |      |  |                     |  |         |       |    |  |  |  |  |              |      |  |                            |  |  |        |       |  |    |  |  |              |      |  |             |  |            |       |    |  |  |  |  |              |      |  |               |  |            |             |       |  |    |  |  |              |  |              |              |  |              |       |  |    |  |  |  |              |  |              |              |  |              |       |  |    |  |  |  |
| CONFIDENTIAL   | 8647  |  | ZAVELHOEK 5                |             | LO-RENINGE   |              |          |         |              |      |  |                     |  |         |       |    |  |  |  |  |              |      |  |                            |  |  |        |       |  |    |  |  |              |      |  |             |  |            |       |    |  |  |  |  |              |      |  |               |  |            |             |       |  |    |  |  |              |  |              |              |  |              |       |  |    |  |  |  |              |  |              |              |  |              |       |  |    |  |  |  |
| 7.(a)          | BE  |  |                            |             |              |              |          |         |              |      |  |                     |  |         |       |    |  |  |  |  |              |      |  |                            |  |  |        |       |  |    |  |  |              |      |  |             |  |            |       |    |  |  |  |  |              |      |  |               |  |            |             |       |  |    |  |  |              |  |              |              |  |              |       |  |    |  |  |  |              |  |              |              |  |              |       |  |    |  |  |  |
| CONFIDENTIAL   | 8920  |  | WATERSTRAAT 4              |             | LANGEMARK-   |              |          |         |              |      |  |                     |  |         |       |    |  |  |  |  |              |      |  |                            |  |  |        |       |  |    |  |  |              |      |  |             |  |            |       |    |  |  |  |  |              |      |  |               |  |            |             |       |  |    |  |  |              |  |              |              |  |              |       |  |    |  |  |  |              |  |              |              |  |              |       |  |    |  |  |  |
| POELKAPELLE    | 7.(a)   |  | BE                         |             |              |              |          |         |              |      |  |                     |  |         |       |    |  |  |  |  |              |      |  |                            |  |  |        |       |  |    |  |  |              |      |  |             |  |            |       |    |  |  |  |  |              |      |  |               |  |            |             |       |  |    |  |  |              |  |              |              |  |              |       |  |    |  |  |  |              |  |              |              |  |              |       |  |    |  |  |  |
| CONFIDENTIAL   |   | CONFIDENTIAL   | CONFIDENTIAL               |             | CONFIDENTIAL |              |          |         |              |      |  |                     |  |         |       |    |  |  |  |  |              |      |  |                            |  |  |        |       |  |    |  |  |              |      |  |             |  |            |       |    |  |  |  |  |              |      |  |               |  |            |             |       |  |    |  |  |              |  |              |              |  |              |       |  |    |  |  |  |              |  |              |              |  |              |       |  |    |  |  |  |
| 8.(a)          |   | DE   |                            |             |              |              |          |         |              |      |  |                     |  |         |       |    |  |  |  |  |              |      |  |                            |  |  |        |       |  |    |  |  |              |      |  |             |  |            |       |    |  |  |  |  |              |      |  |               |  |            |             |       |  |    |  |  |              |  |              |              |  |              |       |  |    |  |  |  |              |  |              |              |  |              |       |  |    |  |  |  |
| CONFIDENTIAL   |   | CONFIDENTIAL   | CONFIDENTIAL               |             | CONFIDENTIAL |              |          |         |              |      |  |                     |  |         |       |    |  |  |  |  |              |      |  |                            |  |  |        |       |  |    |  |  |              |      |  |             |  |            |       |    |  |  |  |  |              |      |  |               |  |            |             |       |  |    |  |  |              |  |              |              |  |              |       |  |    |  |  |  |              |  |              |              |  |              |       |  |    |  |  |  |
| 4.(a)          |   | DE   |                            |             |              |              |          |         |              |      |  |                     |  |         |       |    |  |  |  |  |              |      |  |                            |  |  |        |       |  |    |  |  |              |      |  |             |  |            |       |    |  |  |  |  |              |      |  |               |  |            |             |       |  |    |  |  |              |  |              |              |  |              |       |  |    |  |  |  |              |  |              |              |  |              |       |  |    |  |  |  |

| Section                             | Information on confidentiality included | Description / Notes  |                        |                  |                    |                   |                   |  |  |  |             |                    |  |  |                                     |        |  |  |   |   |  |  |   |   |  |  |   |  |  |  |                 |        |                  |                    |  |                   |  |  |             |  |   |   |  |  |   |   |
|-------------------------------------|---|--|------------------------|------------------|--------------------|-------------------|-------------------|--|--|--|-------------|--------------------|--|--|-------------------------------------|--------|--|--|---|---|--|--|---|---|--|--|---|--|--|--|-----------------|--------|------------------|--------------------|--|-------------------|--|--|-------------|--|---|---|--|--|---|---|
| Industrial activity                 | ☑                                       | <p>In case confidentiality claims affect the search result this will be indicated by the hyperlink '<a href="#">🚫 Confidentiality claims may affect the result</a>', which leads to further information.</p> <p>By following the provided hyperlink, three 'tick boxes' appear which allow a distinction between pollutant release, pollutant transfer and waste transfer related confidentiality information.</p> <p>The total number of facilities claiming confidentiality is indicated and the reason for which information has been withheld is further specified (e.g. Article 4(2)(d) of Directive 2003/4/EC). If for instance, 'pollutant releases' is ticked, the following table and explanation appears:</p> <p><b>Example 'Industrial activity confidentiality'</b> (EU 15; Year 2009; Activity, Industrial activity, all sectors and all activities/sub-activities)</p> <p>In general the grounds for confidentiality claims are listed in <b>Article 4(2) of Directive 2003/4/EC</b> on public access to environmental information. An exception applies to emissions/releases and off-site transfers of pollutants in waste water.</p> <p>In case of confidentiality, the name of the pollutant is replaced by the name of a pollutant group while the method of measurement/calculation is not reported. The total emissions of single pollutants released in the environment by PRTR activities might be effected by confidentiality claims.</p> <p>Member States may refuse disclosure of environmental information on emissions/releases and off-site transfers in waste water if they would adversely affect:</p> <ul style="list-style-type: none"> <li>• International relations, public security or national defence - Article 4(2)(b)</li> <li>• The course of Justice- Article 4(2)(c)</li> <li>• Intellectual property rights- Article 4(2)(e)</li> </ul> <table border="0"> <tr> <td><b>Pollutant Group</b></td> <td>Facilities - Air</td> <td>Facilities - Water</td> <td>Facilities - Soil</td> </tr> <tr> <td>Facilities - Soil</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Other gases</td> <td>Facilities - total</td> <td></td> <td></td> </tr> <tr> <td>Facilities claiming confidentiality</td> <td>10,275</td> <td></td> <td></td> </tr> <tr> <td>1</td> <td>0</td> <td></td> <td></td> </tr> <tr> <td>0</td> <td>0</td> <td></td> <td></td> </tr> <tr> <td>0</td> <td></td> <td></td> <td></td> </tr> </table> <p><b>Confidentiality has been claimed for the following reasons</b></p> <table border="0"> <tr> <td>Pollutant Group</td> <td>Reason</td> <td>Facilities - Air</td> <td>Facilities - Water</td> </tr> <tr> <td></td> <td>Facilities - Soil</td> <td></td> <td></td> </tr> <tr> <td>Other gases</td> <td>Article 4(2)(e) of Directive 2003/4/EC</td> <td>1</td> <td>0</td> </tr> <tr> <td></td> <td></td> <td>0</td> <td>0</td> </tr> </table> <p>As can be seen, in contrast to the 'Facility level' section the content/brief explanation of individual Articles of the Directive 2003/4/EC to which the reference is made is included (e.g. Intellectual property rights – Article 4(2)(e)).</p> | <b>Pollutant Group</b> | Facilities - Air | Facilities - Water | Facilities - Soil | Facilities - Soil |  |  |  | Other gases | Facilities - total |  |  | Facilities claiming confidentiality | 10,275 |  |  | 1 | 0 |  |  | 0 | 0 |  |  | 0 |  |  |  | Pollutant Group | Reason | Facilities - Air | Facilities - Water |  | Facilities - Soil |  |  | Other gases | Article 4(2)(e) of Directive 2003/4/EC | 1 | 0 |  |  | 0 | 0 |
| <b>Pollutant Group</b>              | Facilities - Air                        | Facilities - Water   | Facilities - Soil      |                  |                    |                   |                   |  |  |  |             |                    |  |  |                                     |        |  |  |   |   |  |  |   |   |  |  |   |  |  |  |                 |        |                  |                    |  |                   |  |  |             |  |   |   |  |  |   |   |
| Facilities - Soil                   |   |  |                        |                  |                    |                   |                   |  |  |  |             |                    |  |  |                                     |        |  |  |   |   |  |  |   |   |  |  |   |  |  |  |                 |        |                  |                    |  |                   |  |  |             |  |   |   |  |  |   |   |
| Other gases                         | Facilities - total                      |  |                        |                  |                    |                   |                   |  |  |  |             |                    |  |  |                                     |        |  |  |   |   |  |  |   |   |  |  |   |  |  |  |                 |        |                  |                    |  |                   |  |  |             |  |   |   |  |  |   |   |
| Facilities claiming confidentiality | 10,275                                  |  |                        |                  |                    |                   |                   |  |  |  |             |                    |  |  |                                     |        |  |  |   |   |  |  |   |   |  |  |   |  |  |  |                 |        |                  |                    |  |                   |  |  |             |  |   |   |  |  |   |   |
| 1                                   | 0                                       |  |                        |                  |                    |                   |                   |  |  |  |             |                    |  |  |                                     |        |  |  |   |   |  |  |   |   |  |  |   |  |  |  |                 |        |                  |                    |  |                   |  |  |             |  |   |   |  |  |   |   |
| 0                                   | 0                                       |  |                        |                  |                    |                   |                   |  |  |  |             |                    |  |  |                                     |        |  |  |   |   |  |  |   |   |  |  |   |  |  |  |                 |        |                  |                    |  |                   |  |  |             |  |   |   |  |  |   |   |
| 0                                   |   |  |                        |                  |                    |                   |                   |  |  |  |             |                    |  |  |                                     |        |  |  |   |   |  |  |   |   |  |  |   |  |  |  |                 |        |                  |                    |  |                   |  |  |             |  |   |   |  |  |   |   |
| Pollutant Group                     | Reason                                  | Facilities - Air   | Facilities - Water     |                  |                    |                   |                   |  |  |  |             |                    |  |  |                                     |        |  |  |   |   |  |  |   |   |  |  |   |  |  |  |                 |        |                  |                    |  |                   |  |  |             |  |   |   |  |  |   |   |
|                                     | Facilities - Soil                       |  |                        |                  |                    |                   |                   |  |  |  |             |                    |  |  |                                     |        |  |  |   |   |  |  |   |   |  |  |   |  |  |  |                 |        |                  |                    |  |                   |  |  |             |  |   |   |  |  |   |   |
| Other gases                         | Article 4(2)(e) of Directive 2003/4/EC  | 1  | 0                      |                  |                    |                   |                   |  |  |  |             |                    |  |  |                                     |        |  |  |   |   |  |  |   |   |  |  |   |  |  |  |                 |        |                  |                    |  |                   |  |  |             |  |   |   |  |  |   |   |
|                                     |   | 0  | 0                      |                  |                    |                   |                   |  |  |  |             |                    |  |  |                                     |        |  |  |   |   |  |  |   |   |  |  |   |  |  |  |                 |        |                  |                    |  |                   |  |  |             |  |   |   |  |  |   |   |

| Section           | Information on confidentiality included | Description / Notes  |
|-------------------|---|--|
| Area overview     | Partly included                         | <p>In case confidentiality claims affect the search result this will be indicated by the hyperlink ‘<a href="#">🚩 Confidentiality claims may affect the result</a>’, which leads to further information. It is further stated that the total releases and off site transfers in waste water of single pollutants as well as aggregated amount of waste transferred off-site might be affected by confidentiality claims.</p>   |
| Pollutant release | ☑                                       | <p>In the ‘Pollutant release’ search section it is possible to search for confidential information in particular by choosing ‘Confidential in group’ instead of a specific pollutant within the provided dropdown box ‘Pollutant’.</p> <p>In case confidentiality claims affect the search result this will be indicated by the hyperlink ‘<a href="#">🚩 Confidentiality claims may affect the result</a>’, which leads to further information.</p> <p>The total number of facilities claiming confidentiality is indicated and the reason for which information has been withheld is further specified (e.g. Article 4(2)(b) of Directive 2003/4/EC).</p> <p><b>Example ‘Pollutant release’</b> (EU 27; Year 2009; Pollutant Group – Heavy metals, Pollutant – Confidential in group)</p> <p>Whenever information is kept confidential by a Member State in accordance with Article 4 of Directive <del>2003/4/EC</del> on public access to environmental information, the Member State has to indicate, separately for each type of data, the reason for which it has been withheld.</p> <p>According to Directive 2003/4/EC, Member States may refuse disclosure of environmental information if it would adversely affect:</p> <ul style="list-style-type: none"> <li>• confidentiality of proceeding of public authorities – Article 4(2)(a)</li> <li>• international relations, public security or national defence - Article 4(2)(b)</li> <li>• the course of Justice- Article 4(2)(c)</li> <li>• confidentiality of commercial or industrial information – Article 4(2)(d)</li> <li>• intellectual property rights- Article 4(2)(e)</li> <li>• confidentiality of personal data related to a natural person– Article 4(2)(f)</li> <li>• the interest or protection of any person providing data on a voluntary basis – Article 4(2)(g)</li> <li>• the protection of the environment to which such information relates – Article 4(2)(h)</li> </ul> <p>With regard to the identification of a facility, its name and address can only be kept confidential if the name of the facility refers to natural person.</p> <p>With regard to information on pollutant releases and off-site transfers in waste water, confidentiality can only be claimed under the following grounds:</p> <ul style="list-style-type: none"> <li>• international relations, public security or national defence - Article 4(2)(b)</li> <li>• the course of Justice- Article 4(2)(c)</li> <li>• intellectual property rights- Article 4(2)(e)</li> </ul> <p>Furthermore, in the case of data regarding releases and off-site transfers of pollutants in waste</p> |

| Section                                  | Information on confidentiality included | Description / Notes   |                   |                      |                    |                   |                           |                            |   |   |                   |                                 |                    |                   |  |   |   |   |                 |       |        |       |  |  |    |       |                   |               |               |  |                     |  |                          |  |                          |  |
|--|---|---|-------------------|----------------------|--------------------|-------------------|---------------------------|----------------------------|---|---|-------------------|---------------------------------|--------------------|-------------------|--|---|---|---|-----------------|-------|--------|-------|--|--|----|-------|-------------------|---------------|---------------|--|---------------------|--|--------------------------|--|--------------------------|--|
|  |   | <p>water, only the name of the pollutant can be kept confidential. In this case, the name must be replaced by the name of a pollutant group to which it belongs and the total releases and transfers have to be reported at the level of the pollutant group. The method of measurement/calculation does not have to be reported.</p> <table border="0"> <tr> <td><b>Pollutant</b></td> <td>Facilities - Air</td> <td>Facilities - Water</td> <td>Facilities - Soil</td> </tr> <tr> <td>Confidential heavy metals</td> <td>0</td> <td>1</td> <td>0</td> </tr> </table> <p><b>Confidentiality Reason:</b></p> <table border="0"> <tr> <td></td> <td>Facilities - Air</td> <td>Facilities – Water</td> <td>Facilities - Soil</td> </tr> <tr> <td>Article 4(2)(b) of Directive 2003/4/EC</td> <td>0</td> <td>0</td> <td>1</td> </tr> </table> <p>0</p> <p>The total releases and off site transfers in waste water of single pollutants as well as aggregated amount of waste transferred off-site might be effected by confidentiality claims.</p> <p>As can be seen, the content/brief explanation of individual Articles of the Directive 2003/4/EC to which the reference is made is included (e.g. International relations, public security or national defence – Article 4(2)(b)).</p>                             | <b>Pollutant</b>  | Facilities - Air     | Facilities - Water | Facilities - Soil | Confidential heavy metals | 0                          | 1 | 0 |                   | Facilities - Air                | Facilities – Water | Facilities - Soil | Article 4(2)(b) of Directive 2003/4/EC | 0 | 0 | 1 |                 |       |        |       |  |  |    |       |                   |               |               |  |                     |  |                          |  |                          |  |
| <b>Pollutant</b>                         | Facilities - Air                        | Facilities - Water  | Facilities - Soil |                      |                    |                   |                           |                            |   |   |                   |                                 |                    |                   |  |   |   |   |                 |       |        |       |  |  |    |       |                   |               |               |  |                     |  |                          |  |                          |  |
| Confidential heavy metals                | 0                                       | 1   | 0                 |                      |                    |                   |                           |                            |   |   |                   |                                 |                    |                   |  |   |   |   |                 |       |        |       |  |  |    |       |                   |               |               |  |                     |  |                          |  |                          |  |
|  | Facilities - Air                        | Facilities – Water  | Facilities - Soil |                      |                    |                   |                           |                            |   |   |                   |                                 |                    |                   |  |   |   |   |                 |       |        |       |  |  |    |       |                   |               |               |  |                     |  |                          |  |                          |  |
| Article 4(2)(b) of Directive 2003/4/EC   | 0                                       | 0   | 1                 |                      |                    |                   |                           |                            |   |   |                   |                                 |                    |                   |  |   |   |   |                 |       |        |       |  |  |    |       |                   |               |               |  |                     |  |                          |  |                          |  |
| <b>Pollutant transfer</b>                | <input checked="" type="checkbox"/>     | The same description/notes apply as for the 'pollutant release' section.  |                   |                      |                    |                   |                           |                            |   |   |                   |                                 |                    |                   |  |   |   |   |                 |       |        |       |  |  |    |       |                   |               |               |  |                     |  |                          |  |                          |  |
| <b>Waste transfer</b>                    | <input checked="" type="checkbox"/>     | <p>The same description/notes apply as for the 'pollutant release' and 'pollutant transfer' section.</p> <p><b>Example 'Waste transfer'</b> (EU 15; Year 2009; Waste Transfer; Activity, all sectors and all activities/sub-activities)</p> <table border="0"> <tr> <td></td> <td colspan="3"><b>Non hazardous</b></td> </tr> <tr> <td><b>Facilities</b></td> <td colspan="3"><b>Hazardous, domestic</b></td> </tr> <tr> <td><b>Facilities</b></td> <td colspan="3"><b>Hazardous, transboundary</b></td> </tr> <tr> <td><b>Facilities</b></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Waste transfers</td> <td>7,990</td> <td>14,033</td> <td>1,096</td> </tr> <tr> <td>Waste transfers claiming confidentiality</td> <td></td> <td>14</td> <td>8 110</td> </tr> </table> <p><b>Confidentiality has been claimed for the following reasons</b></p> <table border="0"> <tr> <td><b>Waste type</b></td> <td><b>Reason</b></td> </tr> <tr> <td>Non hazardous</td> <td>Article 4(2)(d) of Directive 2003/4/EC</td> </tr> <tr> <td>Hazardous, domestic</td> <td>Article 4(2)(d) of Directive 2003/4/EC</td> </tr> <tr> <td>Hazardous, transboundary</td> <td>Article 4(2)(b) of Directive 2003/4/EC</td> </tr> <tr> <td>Hazardous, transboundary</td> <td>Article 4(2)(d) of Directive 2003/4/EC</td> </tr> </table> |                   | <b>Non hazardous</b> |                    |                   | <b>Facilities</b>         | <b>Hazardous, domestic</b> |   |   | <b>Facilities</b> | <b>Hazardous, transboundary</b> |                    |                   | <b>Facilities</b>                      |   |   |   | Waste transfers | 7,990 | 14,033 | 1,096 | Waste transfers claiming confidentiality |  | 14 | 8 110 | <b>Waste type</b> | <b>Reason</b> | Non hazardous | Article 4(2)(d) of Directive 2003/4/EC | Hazardous, domestic | Article 4(2)(d) of Directive 2003/4/EC | Hazardous, transboundary | Article 4(2)(b) of Directive 2003/4/EC | Hazardous, transboundary | Article 4(2)(d) of Directive 2003/4/EC |
|  | <b>Non hazardous</b>                    |   |                   |                      |                    |                   |                           |                            |   |   |                   |                                 |                    |                   |  |   |   |   |                 |       |        |       |  |  |    |       |                   |               |               |  |                     |  |                          |  |                          |  |
| <b>Facilities</b>                        | <b>Hazardous, domestic</b>              |   |                   |                      |                    |                   |                           |                            |   |   |                   |                                 |                    |                   |  |   |   |   |                 |       |        |       |  |  |    |       |                   |               |               |  |                     |  |                          |  |                          |  |
| <b>Facilities</b>                        | <b>Hazardous, transboundary</b>         |   |                   |                      |                    |                   |                           |                            |   |   |                   |                                 |                    |                   |  |   |   |   |                 |       |        |       |  |  |    |       |                   |               |               |  |                     |  |                          |  |                          |  |
| <b>Facilities</b>                        |   |   |                   |                      |                    |                   |                           |                            |   |   |                   |                                 |                    |                   |  |   |   |   |                 |       |        |       |  |  |    |       |                   |               |               |  |                     |  |                          |  |                          |  |
| Waste transfers                          | 7,990                                   | 14,033  | 1,096             |                      |                    |                   |                           |                            |   |   |                   |                                 |                    |                   |  |   |   |   |                 |       |        |       |  |  |    |       |                   |               |               |  |                     |  |                          |  |                          |  |
| Waste transfers claiming confidentiality |   | 14  | 8 110             |                      |                    |                   |                           |                            |   |   |                   |                                 |                    |                   |  |   |   |   |                 |       |        |       |  |  |    |       |                   |               |               |  |                     |  |                          |  |                          |  |
| <b>Waste type</b>                        | <b>Reason</b>                           |   |                   |                      |                    |                   |                           |                            |   |   |                   |                                 |                    |                   |  |   |   |   |                 |       |        |       |  |  |    |       |                   |               |               |  |                     |  |                          |  |                          |  |
| Non hazardous                            | Article 4(2)(d) of Directive 2003/4/EC  |   |                   |                      |                    |                   |                           |                            |   |   |                   |                                 |                    |                   |  |   |   |   |                 |       |        |       |  |  |    |       |                   |               |               |  |                     |  |                          |  |                          |  |
| Hazardous, domestic                      | Article 4(2)(d) of Directive 2003/4/EC  |   |                   |                      |                    |                   |                           |                            |   |   |                   |                                 |                    |                   |  |   |   |   |                 |       |        |       |  |  |    |       |                   |               |               |  |                     |  |                          |  |                          |  |
| Hazardous, transboundary                 | Article 4(2)(b) of Directive 2003/4/EC  |   |                   |                      |                    |                   |                           |                            |   |   |                   |                                 |                    |                   |  |   |   |   |                 |       |        |       |  |  |    |       |                   |               |               |  |                     |  |                          |  |                          |  |
| Hazardous, transboundary                 | Article 4(2)(d) of Directive 2003/4/EC  |   |                   |                      |                    |                   |                           |                            |   |   |                   |                                 |                    |                   |  |   |   |   |                 |       |        |       |  |  |    |       |                   |               |               |  |                     |  |                          |  |                          |  |
| <b>Map search</b>                        | Not included                            | The section 'map search' is connected to available information on facility level. As the location of some facilities (postal code, address, etc.) is confidential, these facilities will not be displayed on the map.   |                   |                      |                    |                   |                           |                            |   |   |                   |                                 |                    |                   |  |   |   |   |                 |       |        |       |  |  |    |       |                   |               |               |  |                     |  |                          |  |                          |  |

Besides, under the search menu 'Time Series' additional information regarding confidentiality for 'pollutant releases', 'pollutant transfer' and 'waste transfer' sections can be accessed for the reporting years 2007-2009. For instance in case of 'Pollutant release' the following information can be obtained:

**Table 29: Example 'Pollutant Release/Confidentiality' (Germany; Nitrous oxide N<sub>2</sub>O; Releases to Air, Water, Land)**

| Year | Nitrous oxide (N <sub>2</sub> O) | Confidential greenhouse gases |
|------|----------------------------------|-------------------------------|
| 2007 | 24,362 t                         | 868,000 t                     |
| 2008 | 36,610 t                         | 2.09 t                        |
| 2009 | 38,841 t                         | -                             |


Problems/deficits and proposal for improvement:

Table 30 summarises the main deficits/problems identified and proposals for improvement regarding the reporting on confidentiality issues.

**Table 30: Deficit/ problems on the E-PRTR website regarding the reporting on confidentiality issues**

| Deficit/Problem  | Description   | Proposal for improvement  |
|--|---|---|
| <b>Confidentiality related information included, but further explanations required (i.e. 'Facility level')</b> | The reason for which certain information has been withheld is specified by referring to certain articles of Directive 2003/4/EC. However, the content/brief explanation of the Articles to which the reference is made is not included. | The Articles to which the reference is made could be briefly introduced, as it is for instance extensively done within the 'Industrial activity' search section.  |
| <b>Confidentiality information partly included (i.e. 'Area overview')</b>                                      | It is only stated that data might be affected by confidentiality claims. However, further clarifications are not provided.  | At this point it could be relevant to provide further information related to the affected data.   |
| <b>Confidentiality information not included (i.e. 'Map search')</b>  | As the location of some facilities (postal code, address, etc.) is confidential, these facilities will not be displayed on the map.   | If possible, include a search option for facilities claiming confidentiality or apply different colours to indicate facilities which withhold particular information (of course only in case that the facility location is not confidential). |

Assessment note:

The E-PRTR website includes information on confidentiality issues. It is positive that a hyperlink ' Confidentiality claims may affect the result' appears and alerts the users in case confidentiality claims affect any search results. It was also positive to recognise that in most of the search sections the total number of facilities claiming confidentiality is indicated and that the reason for which information has been withheld is specified. The possibility to search confidential information by choosing 'Confidential in group' within the provided dropdown box (e.g. within the 'Pollutant release' section) has been identified as very helpful. However, minor deficits/problems have been identified during the review. The main problems identified and possible solutions are summarised in Table 30.

#### 4. How are the data aggregated?

Legal requirements:

Article 4(1) of the E-PRTR Regulation stipulates that

“The Commission shall publish the European PRTR, presenting the data in both aggregated and non-aggregated forms, so that releases and transfers can be searched for and identified by:

- (a) facility, including the facilities parent company where applicable, and its geographical location, including the river basin;
- (b) activity;
- (c) occurrence at Member State or Community level;
- (d) pollutant or waste, as appropriate;
- (e) each environmental medium (air, water, land) into which the pollutant is released;
- (f) off-site transfers of waste and their destination, as appropriate;
- (g) off-site transfers of pollutants in waste water;
- (h) diffuse sources;
- (i) facility owner or operator.”

Article 4(2) of the E-PRTR Regulation further stipulates that

“The European PRTR shall be designed for maximum ease of public access to allow the information, under normal operating conditions, to be continuously and readily accessible on the Internet and by other electronic means. Its design shall take into account the possibility of its future expansion and shall include all data reported for previous reporting years...”

Assessment:

Table 31 summarises information related to the different levels of data aggregation available on the European PRTR homepage.

**Table 31: Overview on aggregation of data**

| Level of data aggregation   | Aggregation level and addition information included | Description / Notes  |
|---|---|--|
| <b>Facility, including the facilities parent company where applicable, and its geographical location, including the river basin</b> | <input checked="" type="checkbox"/>                 | <p>Under the search section 'Facility level' users can access information on facility level (no aggregation), also including facilities parent companies (where applicable) and its geographical location (in case not confidential).</p> <p>Besides, the user can choose between Regions and River basin districts by selecting the corresponding tick boxes.</p> <p>Furthermore, hyperlinks to the 'Facility level' section are provided in other search sections.</p> |
| <b>Activity</b>   | <input checked="" type="checkbox"/>                 | <p>Data are aggregated for different industrial activities. The users can choose between 8 main sectors (e.g. Energy sector, production and processing of metals, Mineral industry) various activities (e.g. mineral oil and gas refineries, processing of ferrous metals) as well as a number of sub-activities (e.g. hot-rolling mills, cement clinker in rotary kilns).</p>   |
| <b>Occurrence on Member State or Community level</b>  | <input checked="" type="checkbox"/>                 | <p>Data are aggregated on Community level (i.e. EU 15, EU 25 and EU 27) and on Member State level. Besides, aggregated data for certain non-EU countries can be accessed (i.e. Island, Lichtenstein, Norway, Serbia and Switzerland).</p>  |
| <b>Pollutant or Waste, as appropriate</b>   | <input checked="" type="checkbox"/>                 | <p>Data are aggregated for different pollutant groups (e.g. heavy metals, greenhouse gases, chlorinated organic substances) and specific pollutants within a particular group (e.g. methane, carbon dioxide, brominated diphenylethers).</p>   |
| <b>Each environmental medium (air, water, land) into which the pollutant is released</b>  | <input checked="" type="checkbox"/>                 | <p>Data are aggregated for each environmental medium (i.e. air, water and land). The user can choose which data should be displayed (e.g. only releases to air).</p> <p>Please note that within the Register the term 'soil' is applied instead of 'land' (used in the E-PRTR Regulation)</p>  |
| <b>Off-site transfer of waste and their destination, as appropriate</b>   | <input checked="" type="checkbox"/>                 | <p>Data are aggregated for Non Hazardous waste, Hazardous waste (domestic) and Hazardous waste (transboundary). Besides, it can be distinguished between treatment options 'Recovery', 'Disposal' and 'Unspecified'. Furthermore, information on waste destination (receiving Country and facilities) is given.</p>  |

| Level of data aggregation                             | Aggregation level and addition information included | Description / Notes  |
|---|---|--|
|   |   | Please note that within the Register the term 'Waste transfer' is used instead of 'Off-site transfer of waste' as applied in the E-PRTR Regulation.  |
| <b>Off-site transfer of pollutants in waste water</b> | <input checked="" type="checkbox"/>                 | Data are aggregated for different pollutant groups (e.g. heavy metals, greenhouse gases, chlorinated organic substances) and specific pollutants within a particular group (e.g. methane, carbon dioxide, brominated diphenylethers).<br><br>Please note that within the Register the terms 'Pollutant transfer' and more specific 'Transfers to waste-water' is used instead of 'Off-site transfer of pollutants in waste water' as applied in the E-PRTR Regulation. |
| <b>Diffuse sources</b>                                | <input checked="" type="checkbox"/>                 | Data are aggregated for diffuse sources (i.e. releases to water and releases to air). For instance in the case of releases to air the user can chose between industrial releases, non-industrial combustion, road transport, agriculture, etc. For each sector a number of layers will be available (e.g. NO <sub>x</sub> emissions from diffuse industrial releases, PM <sub>10</sub> emissions from agricultural sources).   |
| <b>Facility owner or operator</b>                     | <input checked="" type="checkbox"/>                 | The name of the operator (e.g. BASF AG, Werk (plant) Ludwigshafen, Progressive Waste Disposal Ltd, GfA, landfill Koethen) is included, if not confidential.  |

Problems/deficits and proposal for improvement:

The only minor problem/deficit identified during the assessment is related to the terminology used. In few cases, different terms are used in the E-PRTR Register and Regulation.

Assessment note:

As it can be seen in Table 31, data are presented in both aggregated and non-aggregated forms, as stipulated by the E-PRTR Regulation.

The only proposal for improvements is to apply exactly the same terms as applied within the E-PRTR Regulation in order to enable consistency. A definition of all technical terms applied would be of great help for users of the homepage.



## **5. Are data, presented in aggregated forms, comprehensive and easy to access and download?**

As mentioned previously, data are presented in various aggregated forms, as stipulated within the E-PRTR Regulation (e.g. activity, country/groups of countries, medium, etc.). It is for instance possible to choose between eight main sectors (e.g. Energy sector, Production and processing of metals, Mineral industry) various activities (e.g. mineral oil and gas refineries, processing of ferrous metals) as well as a number of sub-activities (e.g. hot-rolling mills, cement clinker in rotary kilns). The user can also decide whether data should be presented at Community level (i.e. EU 15, EU 25 or EU 27) or at the country level/regional level. It is also possible to obtain aggregated data for different pollutant groups (e.g. heavy metals, greenhouse gases, chlorinated organic substances) and specific pollutants within a particular group (e.g. methane, carbon dioxide, brominated diphenylethers). Further information regarding the different levels of data aggregation is summarised in Table 31.

Furthermore, the available data in aggregated forms can be easily accessed by users when following the corresponding search sections (e.g. industrial activity, area overview, pollutant release, etc.) within the well-structured search menu. Therefore, it can be concluded that the data presented in aggregated forms are comprehensive and easy to access by users of the website. The only minor proposal for improvements in this regard is to apply exactly the same terminology used in the E-PRTR Regulation.

Currently, it is possible to print but not to download aggregated data, even though in several cases download buttons (i.e. '↓') are in place. The buttons provided do not activate downloads of the selected datasets. Therefore, the option to download data is a point which should be improved in the future. Possibly also the opportunity to export data in an Excel spread sheet could be considered.

## **6. Are data, presented in non-aggregated forms, comprehensive and easy to access and download?**

Similar to the data presented in aggregated forms, the available non-aggregated data (i.e. Facility level) is comprehensive as well as easy to access. By using the search section 'Facility level' users can access information on facility level (no aggregation), also including further information such as facilities parent companies and its geographical location. Besides, the user can choose between Regions and River basin districts by selecting the corresponding tick boxes. Furthermore, hyperlinks to the 'Facility level' section are provided in other search sections (e.g. Industrial activity).

However, the same problem was identified when trying to download particular datasets. Even though download buttons (i.e. '↓') are provided at several locations of the website, they do not allow a download of data. Also in this case, it would be a good idea to provide the option to download/export data in an easy and practical way.

## **7. Can the Register be searched for off-site transfers of waste and off-site transfers of pollutants in waste water, also considering the destination of transferred wastes?**

As already mentioned, aggregated data can be obtained for non-hazardous waste, hazardous waste (domestic) and hazardous waste (transboundary). Besides, they can be distinguished between treatment options 'recovery', 'disposal' and 'unspecified'. The information can be displayed in various ways, for instance as 'transfers per industrial activity', 'transfers per country', 'transfer for the selected area' and 'facilities with transfer'. In addition, for hazardous waste, transboundary transfers can be accessed indicating exactly the country of destination, total transfer of waste with

indication whether this waste was finally recovered or disposed as well as the number of facilities within the country of destination. The hazardous waste receivers will be listed in the following way:

**Table 32: Example: Germany; waste transfer/hazardous waste receivers**

| Country     | Facilities           | Total    | Recovery | Disposal | Unspecified |
|-------------|----------------------|----------|----------|----------|-------------|
| Austria     | 5 <a href="#">↗</a>  | 2,834 t  | 2,834 t  | -        | -           |
| Belgium     | 40 <a href="#">↗</a> | 40,841 t | 40,841 t | -        | -           |
| Switzerland | 5 <a href="#">↗</a>  | 10,733 t | 10,345 t | 388 t    | -           |

By following the provided hyperlinks ‘[↗](#)’, users can access further facility related information within the particular country of destination. For instance, in the case of Switzerland, the German facility transferring the waste will be indicated and the name of the waste receiver in Switzerland also including the exact address of the receiving facility. Besides, the yearly quantity of waste transferred will be indicated accompanied by the information whether this waste was recovered or disposed.

With regard to ‘off-site transfer of pollutants to waste waters’ data is available for various pollutant groups (e.g. heavy metals, greenhouse gases, chlorinated organic substances) and specific pollutants within a particular group (e.g. methane, carbon dioxide, brominated diphenylethers). The user can also decide to focus on a particular activity (e.g. energy sector, Production and processing of metals).

Within the search section ‘time series’ additional information regarding off-site transfers of waste and pollutants in waste water can be obtained. For instance, under the search menu ‘time Series for pollutant transfers’ the development of the transfers to waste water of a specific pollutant can be displayed.

## 8. Can the register be searched for releases of pollutants from diffuse sources?


The E-PRTR Regulation (Article 8) requires the Commission, assisted by the European Environment Agency, to include releases from diffuse sources, where such information exists and has been reported.

‘Diffuse sources’ refers to the many smaller or scattered sources from which pollutants may be released to land, air or water, whose combined impact on those media may be significant and for which it is impractical to collect reports from each individual source.

Data on diffuse sources (i.e. releases to water and releases to air) can be accessed by using the provided search section ‘Releases diffuse sources’, within the main menu. For instance in the case of releases to air the user can chose between industrial releases, non-industrial combustion, road transport, domestic shipping/aviation, international shipping and agriculture. For each sector a number of ‘map layers’ are available (e.g. NO<sub>x</sub> emissions from diffuse industrial releases, PM<sub>10</sub> emissions from agricultural sources, SO<sub>2</sub> emissions from domestic shipping).

The layers provide a close-up picture of air pollution from various sources such as road transport, shipping, aviation, domestic heating, agriculture and small business (diffuse emissions). Pollution from diffuse sources occurs over large areas from often indistinct elements. Although the large numbers of houses and vehicles in cities represent many point sources, they collectively represent a large, diffuse source of pollution.

The maps enable users to locate releases of air pollutants. This includes emissions of nitrogen oxides (NO<sub>x</sub>), sulphur dioxide (SO<sub>2</sub>), carbon dioxide (CO<sub>2</sub>), ammonia (NH<sub>3</sub>) and particulate matter (PM<sub>10</sub>). The maps complement existing data on emissions from individual industrial plants from the European Pollutant Release and Transfer Register (E-PRTR).

In order to see all the functionalities of the map and its content the user can enlarge the maps by using the button on the top right of the map . Legends in different colours are applied for different amounts of releases to air (in t/grid).


The data presented are derived from a range of different sources and data collection processes. The emission data are based on datasets officially reported by countries to the United Nations Economic Commission for Europe (UNECE) Convention on Long-range Transboundary Air Pollution (CLRTAP) and United Nations Framework Convention on Climate Change (UNFCCC).

With respect to releases to water, the search section presently covers only a limited set of nutrient loss maps from agriculture to water bodies.

The data reported by countries reflect the use of a number of different calculation methodologies and are, typically, not directly comparable. Some approaches calculate or measure releases at the outlet of a catchment area (mouth) whilst others do so at the edge of the stream (edge). Large differences can arise between these two approaches due to in-stream nutrient transformation. Best available and most recent data have been selected for preparing Europe wide maps but the data vary as to the reporting year. This is important since inter-annual variability in diffuse releases can be considerable, reflecting the variability in rainfall.

The data on releases of agricultural nutrient stem from a range of different sources and data collection processes. This includes in particular data collected for the EEA's State of the Environment report, reports from Member States in the context of the implementation of the Water Framework Directive, International River Basin Commission reports, National Environment Agency websites and research papers.


The user can choose between the following layers, nitrogen loss from agriculture (kg per total river basin district (RBD) area), nitrogen loss from agriculture (kg per agricultural area), phosphorus loss from agriculture (kg per total RBD area) and phosphorus loss from agriculture (kg per agricultural area).

Similar to the releases to air, the user can enlarge the maps by using the button on the top right of the map  in order to see all the functionalities of the map (e.g. bookmarks, find location, street map, satellite, etc.) and its content. Legends in different colours are dedicated to different amounts of releases to water (in kg nitrogen or phosphorus /hectare of the river basin district (RBD) / year). Besides, the option to print and download maps (export in pdf or png format) is convenient.

## **9. Does the design of the E-PRTR allow for easy public access to the data?**

The first impression when accessing the E-PRTR webpage is that the webpage looks clear, professional and attractive. The main navigation menu is well structured and allows intuitive navigation throughout the entire homepage. It is also positive to see that for each menu point brief explanations are given, indicating what will be displayed as well as which further options can be chosen by users (e.g. 'This report will display the reported releases and transfers of a specific facility. You can also search for a facility by using the map search in the navigation menu').

The individual pages are well organised, providing in most cases dropdown boxes so that users can easily browse for particular information of their interest. Besides, the 'Search help' and 'Info' buttons, where users can obtain further information/explanations, are quite helpful (e.g. Information about pollutants). Consistency among individual pages on the website also stands out. In order to enhance readability, the developers used consistent and pleasant colours and ensured a strong contrast between the text and the background colour. The interactive maps can be enlarged to see additional functionalities and content.

However, the first impression might be different when trying to access the homepage via an internet browser which is not supported by the application, as the website has not been developed for multiple browsers. It is stated that the E-PRTR website is optimized for Internet Explorer 7.0 and that it fully supports Internet Explorer 8.0 and Mozilla Firefox 3.5. The behaviour of the website might therefore change or be inefficient when using other web browsers. In this regard it should also be mentioned that even though most of the internet browsers allow switching between different languages, an option to at least display the complete content of the E-PRTR homepage in English, without spending time for changing browser settings, should be provided (e.g.  at the top right corner of the webpage).

Besides, it happens quite often that pages freeze during loading of certain content, requiring the user to restart the browser. Users may also experience problems with invalid/broken links which do not lead to the desired page/data (e.g. a number of 'Download' links).

Another point which could be improved in the future is to provide print friendly summaries of data and allow the users to download/export data for further processing, in an easy and efficient way (e.g. in xls format).

To summarise, even though a number of problems/deficits have been identified during the review, the design of the E-PRTR allows for easy public access to the data. Nevertheless, the above mentioned problems should be taken seriously and would need to be tackled in the future. This will require some effort, but would significantly improve public access to data (e.g. to fix broken links, provide print friendly summaries, allow export of data for further processing).

**Table 33: General overview of availability of information**

| Issue  | Summary  |
|--|--|
| <p><b>Accidental releases</b></p>  | <ul style="list-style-type: none"> <li>• <b>Information sufficiently provided in most search section</b></li> <li>• Information not available in sections 'Area overview', and 'Pollutant transfer'</li> <li>• Links from 'map search' are invalid</li> <li>• Within section 'Time series', information available, but difficult to access by moving mouse cursor over bar chart</li> <li>• <b>Minor amendments required</b></li> </ul>  |
| <p><b>Measurement methods</b></p>  | <ul style="list-style-type: none"> <li>• <b>Information available in the search section 'facility level' only</b></li> <li>• Other relevant sections provide links to this section</li> <li>• No information or link from 'area overview'</li> <li>• Links from 'map search' are invalid</li> <li>• Three letter abbreviations are used; are only explained within the FAQs (i.e. Question 17). No link/hint to the FAQs provided</li> <li>• <b>Minor amendments required</b></li> </ul>   |
| <p><b>Confidentiality</b></p>  | <ul style="list-style-type: none"> <li>• <b>Information available in most search sections</b></li> <li>• Information that <a href="#">confidentiality claims may affect search result</a></li> <li>• Information not included in 'map search' / partly included in 'area overview'</li> <li>• Most search sections include information on total number of facilities claiming confidentiality / reason for confidentiality</li> <li>• Possibility to search confidential information by choosing 'Confidential in group'.</li> <li>• <b>Minor amendments required</b></li> </ul>   |
| <p><b>Data aggregation</b></p>   | <ul style="list-style-type: none"> <li>• <b>High level of data aggregation is performed</b></li> <li>• Aggregated data available for region and river basin, sector, activity, MS and Community level including non-EU countries, pollutants and pollutant group, air/water/land, waste properties and treatment options of waste,</li> <li>• <b>Minor deficits regarding the usage of terms</b></li> </ul>  |
| <p><b>Data comprehensiveness / access / download</b></p>                           | <ul style="list-style-type: none"> <li>• <b>Aggregated and non-aggregated data are in general comprehensive and easy to access</b></li> <li>• Data can be printed using print button</li> <li>• <b>Deficits regarding the possibility to download data</b></li> </ul>  |
| <p><b>Off-site transfers of waste and to waste water of specific pollutant</b></p> | <ul style="list-style-type: none"> <li>• <b>Information available in aggregated and non-aggregated form</b></li> <li>• Data can be obtained for waste properties (Non Hazardous, Hazardous (domestic) and Hazardous waste (transboundary))</li> <li>• Distinguished between treatment options ('Recovery', 'Disposal' and 'Unspecified').</li> <li>• Information as 'transfers per industrial activity', 'transfers per country', 'transfer for the selected area' and 'facilities with transfer'.</li> <li>• Transboundary transfers for hazardous waste indicating country of destination and facility, amount and information on treatment option</li> <li>• Off-site transfers to waste-water of a specific pollutant available</li> <li>• <b>No deficits</b></li> </ul>   |
| <p><b>Diffuse sources</b></p>  | <ul style="list-style-type: none"> <li>• <b>Information available in separate search section</b></li> <li>• Data available for different sectors (industrial releases, non-industrial combustion, road transport, domestic shipping/aviation, international shipping and agriculture, small business)</li> <li>• For each sector number of 'map layers' are readily available</li> <li>• Maps enable to locate releases of air pollutants (NO<sub>x</sub>, SO<sub>2</sub>, CO<sub>2</sub>, NH<sub>3</sub>, PM<sub>10</sub>)</li> <li>• To see functionalities and content the user can enlarge maps</li> <li>• Only a limited set of nutrient loss maps from agriculture to water bodies</li> <li>• Different calculation methodologies not directly comparable</li> <li>• Option to print and download data (export in pdf or png format) is quite convenient.</li> </ul> |

|               |   |
|---------------|---|
|               | <ul style="list-style-type: none"> <li>• <b>Information on currently available data sufficient, section could be extended to e.g. different sectors, pollutants, etc.</b></li> </ul>  |
| <b>Design</b> | <ul style="list-style-type: none"> <li>• <b>Webpage clear, professional and attractive</b></li> <li>• Navigation menu well structure including brief explanations</li> <li>• Individual pages well organized, dropdown boxes, 'Search help' and 'Info' buttons,</li> <li>• Great consistency among individual pages, pleasant, strong contrast between the text and the background colour</li> <li>• Interactive maps; can be enlarged for additional functionalities and content</li> <li>• <b>Problems occur regarding browser, language setting, loading, invalid links</b></li> </ul> |

## APPENDIX 4 - ANALYSIS OF USER PROTOCOLS

### 1. Availability of data

The following data were assessed with Weblog Expert for the ~1.5 year (1/3/2010 - 30/6/2011) and four month period (1/3/2011 - 30/6/2011):

- **Overall site usage numbers**
  - total visitors/daily visitors and average page views per visitor
  - total page views
  - number of visitors
  - total unique IPs
- **Time information** as view time
- **Traffic data**
  - pages, referring sites and path
  - entry and exiting pages
  - total hits
- **Additional data**
  - countries entering the page
  - errors type and information of certain error types
  - failed requests

Data is explained and interpreted in the following sections.

### 2. Overall site usage numbers

The following table serves as an overview of data regarding the total number of visitors of the map-search page.

**Table 34: Overview of data regarding overall site usage numbers**

| Time period                    | ~1.5 years period    | four month period    |
|--------------------------------|----------------------|----------------------|
| Parameter                      | 1/3/2010 - 30/6/2011 | 1/3/2011 - 30/6/2011 |
| total visitors                 | 288,375              | 102,627              |
| total page views               | 2,246,937            | 846,662              |
| average page views per visitor | 7.79                 | 8.25                 |
| number of visitors per day     | 589                  | 827                  |
| total unique IPs               | 106,285              | 68,769               |

#### Total visitors

The 'total visitors' is one of the key parameters for the assessment. It counts the total number of visitors at the E-PRTR site in a specific time period. The following data has been assessed:

- in the period from March 2010 to end of June 2011 a total of 288,375 site visits were detected
- 36 % of the visitors within the 1.5 years period took place in the last four months of the investigated time period

Figure 4 provides an overview of the ~1.5 year time period clearly showing the peak of website visits in May/June 2011 and a smaller peak in June 2011 and October 2010. The second plotting from March 2011 to the end of June 2011 (see

Figure 5) confirms the findings. A peak week can be detected from 25 May until 2 June 2011 after publishing the new E-PRTR dataset.



**Figure 4: Website visits for ~1.5 years period (1 March 2010 – 30 June 2011)**

**Figure 5: Website visits for four month period (1 March 2011- 30 June 2011)**



Total page views

The number of pages views represents the total number of views for one page within a specific time period.

Within the 1.5 year time period a total of 2,246,937 pages were viewed. Within the investigated time period of four month about 846,662 pages were viewed.

During the four month period more than 1/3, compared to the 1.5 years period, visited the website, which is a similar share as for the total visitors.



### Average page views per visitor

The average number of pages viewed during each visit represents the number of visited pages divided by the number of visitors.

The average number of page views per visitor is with 8.25 page views per visitor a bit higher within the four month period compared to the 7.79 page views per visitor for the 1.5 year time range. This divergence occurs from the peak period in May/June 2011.

### Number of visitors per day

In the period from March 2011 to the end of June 2011, the average number of visitors per day (827) was higher than in the 1.5 years period (589). The peak period in May/June 2011 with a very high number of visitors per day (maximum at 15,497 visitors per day on Friday 27 May 2011) strongly influences the average value..

### Total unique IPs

Total unique IPs represents the number of unduplicated (counted only once) IP addresses or domain names accessing the website. The following data have been assessed:

- in the period from March 2010 to end of June 2011 the site was accessed from 106,285 unique IP addresses
- about 65 % of the unique visitors visited the E-PRTR site during the four month time period

## **3. Time information**

### View time

'View time' is a list of viewed pages sorted by view time.

In average the visitor views the website **4:21 minutes** in the ~1.5 years and 3:59 minutes during the four month period. Visitors enter the pages more often during the peak period (see overall site usage numbers), visited more pages per visit, but they viewed them longer in the off-peak-period. The persons who visited the E-PRTR pages in the peak period therefore investigated more pages more quickly.

## **4. Traffic data**

Table 35 gives an overview of the access statistics.

**Table 35: Overview of data regarding access statistics**

| Time period | ~1.5 years period | four month period |
|-------------|-------------------|-------------------|
|-------------|-------------------|-------------------|

| Parameter     | 1/3/2010 - 30/6/2011 | 1/3/2011 - 30/6/2011 |
|---------------|----------------------|----------------------|
| pages         | see below            |                      |
| paths         | see below            |                      |
| entry pages   | see below            |                      |
| exiting pages | see below            |                      |
| total hits    | 23,654,306           | 8,805,473            |

### Pages

Pages are the web pages which are accessed by visitors.

The top five visited E-PRTR pages are the following:

**Table 36: Top five E-PRTR pages**

| ~1.5 years period   |         |          | four month period   |         |          |
|---|---------|----------|---|---------|----------|
| 1 March 2010 – 30 June 2011   |         |          | 1 March 2011 - 30 June 2011   |         |          |
| Page  | Hits    | Visitors | Pages   | Hits    | Visitors |
| <a href="http://www.e-prtr.com/DiffuseSourcesAir.aspx">http://www.e-prtr.com/DiffuseSourcesAir.aspx</a> | 921,960 | 104,117  | <a href="http://www.e-prtr.com/DiffuseSourcesAir.aspx">http://www.e-prtr.com/DiffuseSourcesAir.aspx</a> | 459,477 | 51,514   |
| <a href="http://www.e-prtr.com/home.aspx">http://www.e-prtr.com/home.aspx</a>                           | 123,732 | 70,635   | <a href="http://www.e-prtr.com/MapExpanded.aspx">http://www.e-prtr.com/MapExpanded.aspx</a>             | 40,831  | 25,490   |
| <a href="http://www.e-prtr.com/MapExpanded.aspx">http://www.e-prtr.com/MapExpanded.aspx</a>             | 84,115  | 52,447   | <a href="http://www.e-prtr.com/home.aspx">http://www.e-prtr.com/home.aspx</a>                           | 28,639  | 16,424   |
| <a href="http://www.e-prtr.com/MapSearch.aspx">http://www.e-prtr.com/MapSearch.aspx</a>                 | 55,047  | 42,077   | <a href="http://www.e-prtr.com/MapSearch.aspx">http://www.e-prtr.com/MapSearch.aspx</a>                 | 14,029  | 10,545   |
| <a href="http://www.e-prtr.com/FacilityLevels.aspx">http://www.e-prtr.com/FacilityLevels.aspx</a>       | 239,608 | 22,373   | <a href="http://www.e-prtr.com/FacilityLevels.aspx">http://www.e-prtr.com/FacilityLevels.aspx</a>       | 54,141  | 5,789    |

For both time periods the same pages are under the top five, but they differ in their order. This is the case for <http://www.e-prtr.com/home.aspx> and <http://www.e-prtr.com/MapExpanded.aspx>.

From position 30 on in the 1.5 years period and from position 42 in the four month period fewer than 100 visitors have been observed.

Accesses from referring sites are such visits which were linked to the web page. No referring site information is provided by the WebLog Expert analysing software.

### Paths

A path is the way of the visitor through the website.

The top five E-PRTR paths are the following:

**Table 37: Top five paths through the E-PRTR page**

| ~1.5 years period   |          |                     | four month period   |          |                     |
|---|----------|---------------------|---|----------|---------------------|
| 1 March 2010 – 30 June 2011                                     |          |                     | 1 March 2011- 30 June 2011                                      |          |                     |
| Paths   | Visitors | % of total visitors | Paths   | Visitors | % of total visitors |
| <a href="#">/DiffuseSourcesAir.aspx</a>                         | 64,017   | 25.48%              | <a href="#">/DiffuseSourcesAir.aspx</a>                         | 31,997   | 34.87%              |
| <a href="#">/home.aspx</a>                                      | 31,546   | 12.55%              | <a href="#">/MapExpanded.aspx</a>                               | 11,166   | 12.17%              |
| <a href="#">/MapSearch.aspx</a>                                 | 28,978   | 11.53%              | <a href="#">/home.aspx</a>                                      | 7,036    | 7.67%               |
| <a href="#">/MapExpanded.aspx</a>                               | 22,415   | 8.92%               | <a href="#">/MapSearch.aspx</a>                                 | 6,342    | 6.91%               |
| <a href="#">/DiffuseSourcesAir.aspx -&gt; /MapExpanded.aspx</a> | 7,130    | 2.84%               | <a href="#">/DiffuseSourcesAir.aspx -&gt; /MapExpanded.aspx</a> | 3,565    | 3.88%               |

The same pattern which was observed at the parameter pages can be found at paths. Among the top five the same paths occur, but they differ in their order. This is the case for /home.aspx, /MapSearch.aspx and /MapExpanded.aspx.

The majority of total visitors access DiffuseSourcesAir.aspx, from the second position on the percentage declines dramatically. According to this the “% of total visitors” declines under 1 % from position 9 on in the 1.5 years time period and from position 7 on in the four month time period.

### Entering pages

The entering page is the visitor’s first page on the E-PRTR website.

The top five E-PRTR entering pages are the following:

**Table 38: Top five entering pages of E-PRTR**

| ~1.5 years period  |          | four month period  |          |
|--|----------|--|----------|
| 1 March 2010 – 30 June 2011  |          | 1 March 2011- 30 June 2011   |          |
| Page   | Visitors | Page   | Visitors |
| <a href="http://www.e-prtr.com/DiffuseSourcesAir.aspx">http://www.e-prtr.com/ DiffuseSourcesAir.aspx</a> | 99,559   | <a href="http://www.e-prtr.com/DiffuseSourcesAir.aspx">http://www.e-prtr.com/ DiffuseSourcesAir.aspx</a> | 49,758   |
| <a href="http://www.e-prtr.com/home.aspx">http://www.e-prtr.com/ home.aspx</a>                           | 66,423   | <a href="http://www.e-prtr.com/home.aspx">http://www.e-prtr.com/ home.aspx</a>                           | 15,039   |
| <a href="http://www.e-prtr.com/MapSearch.aspx">http://www.e-prtr.com/ MapSearch.aspx</a>                 | 33,413   | <a href="http://www.e-prtr.com/MapExpanded.aspx">http://www.e-prtr.com/ MapExpanded.aspx</a>             | 11,642   |
| <a href="http://www.e-prtr.com/MapExpanded.aspx">http://www.e-prtr.com/ MapExpanded.aspx</a>             | 23,398   | <a href="http://www.e-prtr.com/MapSearch.aspx">http://www.e-prtr.com/ MapSearch.aspx</a>                 | 7,875    |
| <a href="http://www.e-prtr.com/Home.aspx">http://www.e-prtr.com/ Home.aspx</a>                           | 7,164    | <a href="http://www.e-prtr.com/Home.aspx">http://www.e-prtr.com/ Home.aspx</a>                           | 1,797    |

In contrast to the parameters path and pages, the entering pages are the same in both periods. The page <http://www.e-prtr.com/DiffuseSourcesAir.aspx>, which is ranked first for both page and path in both intervals, is also on position one in terms of entering pages.

Exiting pages

The exiting page is the visitors' last page before leaving the E-PRTR website.

The top five E-PRTR exiting pages are the following:

**Table 39: Top five exiting pages of E-PRTR**

| ~1.5 years period  |          | four month period  |          |
|--|----------|--|----------|
| 1 March 2010 – 30 June 2011  |          | 1 March 2011- 30 June 2011   |          |
| Page   | Visitors | Page   | Visitors |
| <a href="http://www.e-prtr.com/DiffuseSourcesAir.aspx">http://www.e-prtr.com/ DiffuseSourcesAir.aspx</a> | 79,108   | <a href="http://www.e-prtr.com/DiffuseSourcesAir.aspx">http://www.e-prtr.com/ DiffuseSourcesAir.aspx</a> | 39,451   |
| <a href="http://www.e-prtr.com/MapExpanded.aspx">http://www.e-prtr.com/ MapExpanded.aspx</a>             | 35,622   | <a href="http://www.e-prtr.com/MapExpanded.aspx">http://www.e-prtr.com/ MapExpanded.aspx</a>             | 17,551   |
| <a href="http://www.e-prtr.com/home.aspx">http://www.e-prtr.com/ home.aspx</a>                           | 35,534   | <a href="http://www.e-prtr.com/home.aspx">http://www.e-prtr.com/ home.aspx</a>                           | 8,141    |
| <a href="http://www.e-prtr.com/MapSearch.aspx">http://www.e-prtr.com/ MapSearch.aspx</a>                 | 32,205   | <a href="http://www.e-prtr.com/MapSearch.aspx">http://www.e-prtr.com/ MapSearch.aspx</a>                 | 7,426    |
| <a href="http://www.e-prtr.com/FacilityLevels.aspx">http://www.e-prtr.com/ FacilityLevels.aspx</a>       | 12,230   | <a href="http://www.e-prtr.com/FacilityLevels.aspx">http://www.e-prtr.com/ FacilityLevels.aspx</a>       | 3,050    |

In contrast to the parameters path and pages, the exiting pages are the same in both periods. The page <http://www.e-prtr.com/DiffuseSourcesAir.aspx>, which is ranked first for both page and path in both intervals, is also on position one in terms of exiting pages.

Total hits

'Total hits' is the total number of accesses to the webpages. It includes both hits from visitors and spiders. Spider is a program which automatically gets information from sites. Spiders gather information for search engines, extract emails, check links, etc.

37 % of the total hits in the 1.5 year period (23,654,306) were observed in the 4-month period (8,805,473).

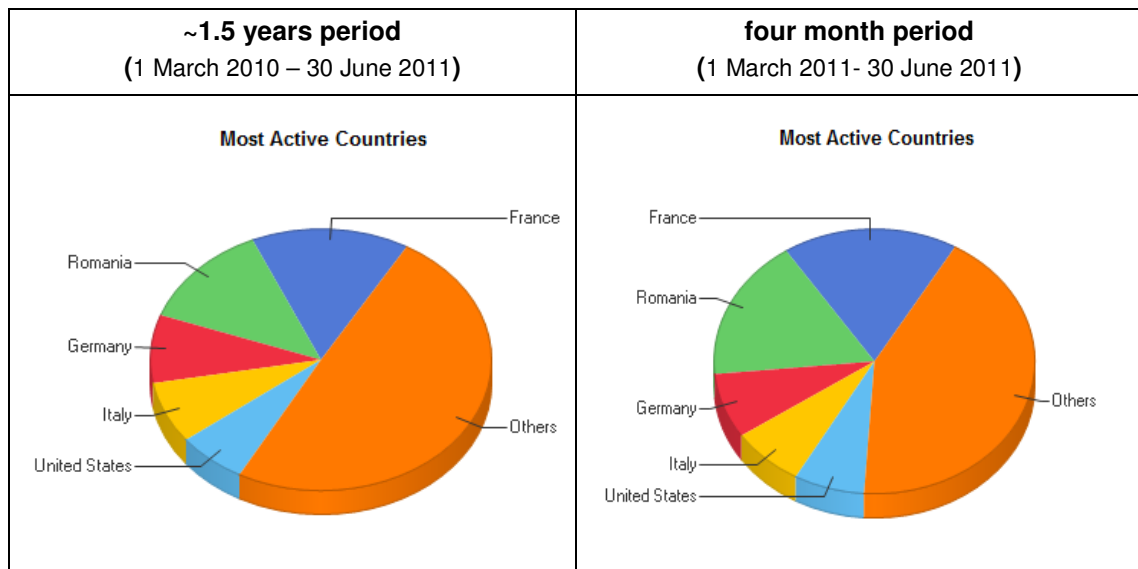
**5. Additional information**

Countries

The program uses an IP country geolocation database to determine countries by IP addresses.

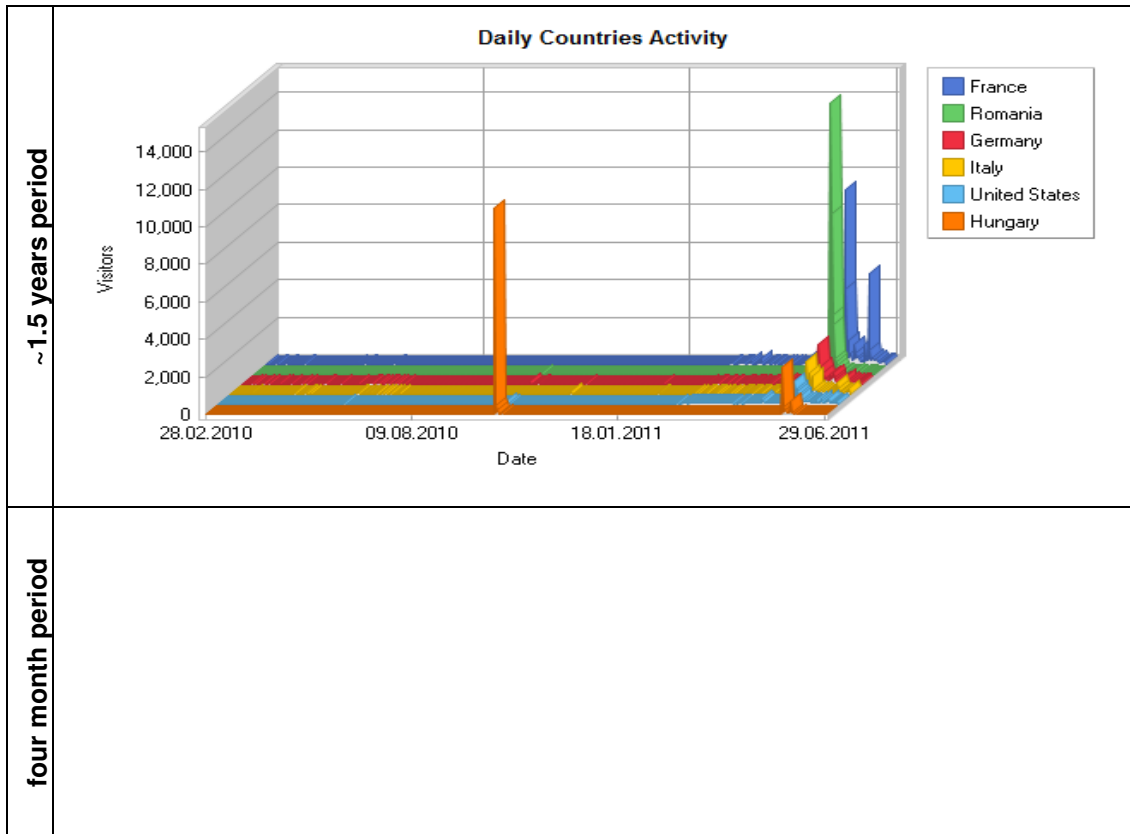
The country specific visitors are illustrated in Figure 6.

**Figure 6: Country specific visitors for the different time periods**



The differences between the two time periods of 1.5 years and four months, regarding the country specific visitors, are not significant.

Figure 7: Country specific visitors illustrated related to a time line



From the above graph it can be seen that the main visitors, which lead to the peak in October 2010, were from Hungary, whereas the main visitors during the peak period in May/June 2011 were mainly from Romania and France.

## 6. Error type

### Types of errors

The major error types are listed in Table 40.

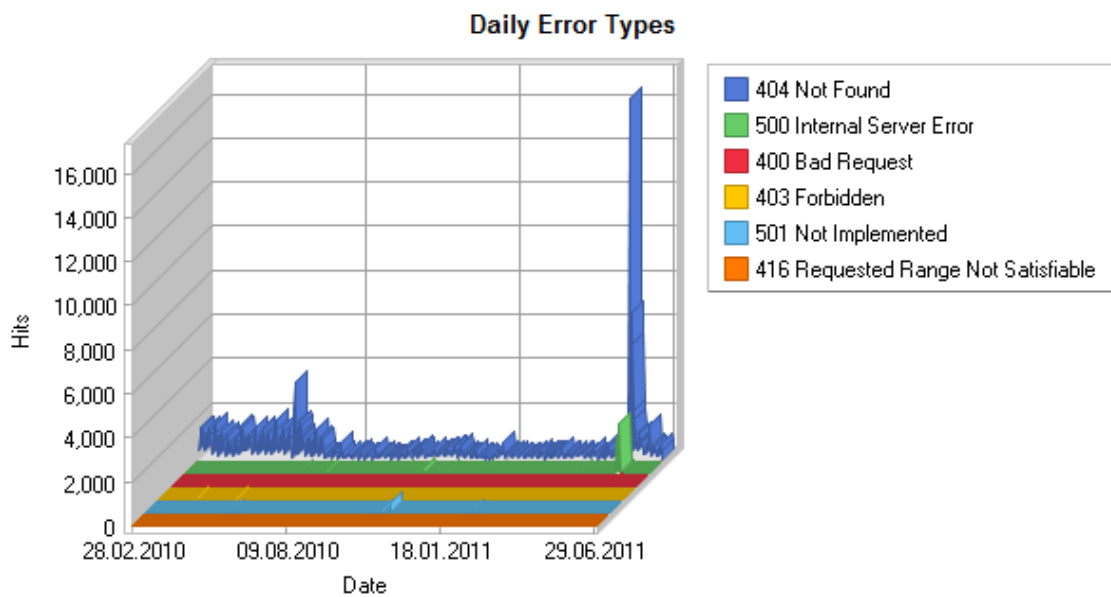
Table 40: Error types

| ~1.5 years period                   |         | four month period                   |        |
|-------------------------------------|---------|-------------------------------------|--------|
| 1 March 2010 – 30 June 2011         |         | 1 March 2011- 30 June 2011          |        |
| Error                               | Hits    | Error                               | Hits   |
| 404 Not Found                       | 254,222 | 404 Not Found                       | 80,416 |
| 500 Internal Server Error           | 5,408   | 500 Internal Server Error           | 4,316  |
| 400 Bad Request                     | 1,566   | 400 Bad Request                     | 434    |
| 403 Forbidden                       | 1,058   | 403 Forbidden                       | 388    |
| 501 Not Implemented                 | 840     | 501 Not Implemented                 | 110    |
| 416 Requested Range Not Satisfiable | 36      | 416 Requested Range Not Satisfiable | 21     |
| 406 Not Acceptable                  | 9       | 405 Method Not Allowed              | 5      |

|                        |                |                    |               |
|------------------------|----------------|--------------------|---------------|
| 405 Method Not Allowed | 5              | 406 Not Acceptable | 2             |
| <b>Total</b>           | <b>263,144</b> | <b>Total</b>       | <b>85,692</b> |

For both investigated time periods, Error 404 (page not found) was the most occurring error. Out of a total of 348,836 Errors, about 32 % occurred in the four month period.

**Figure 8: Daily error types**



The diagram above shows that many of the 404 Errors occurred at the beginning of the 1.5 year period and has reduced later, except during the peak period, when also the 404 Error increased dramatically.

Detailed information on 404 errors

A 404 error appears if a user requested a file, which doesn't exist in the site (file not found error).

Table 41 provides a list of the top 10 pages which are a reason for an error 404

**Table 41: Top ten list of pages/files which could not be found**

| ~1.5 years period            |        | four month period          |       |
|------------------------------|--------|----------------------------|-------|
| 1 March 2010 – 30 June 2011  |        | 1 March 2011- 30 June 2011 |       |
| Request                      | Hits   | Request                    | Hits  |
| /favicon.ico                 | 68,951 | /favicon.ico               | 51,69 |
| /css/subSheetStylesPrint.css | 63,415 | /robots.txt                | 4,743 |

|                                   |         |  |        |
|-----------------------------------|---------|--|--------|
| /css/nonIEsubSheetStylesPrint.css | 20,460  | /Charts/framework_3.2.0.3958.swz   | 3,243  |
| /robots.txt                       | 15,179  | /playerProductInstall.swf  | 495    |
| /Charts/framework_3.2.0.3958.swz  | 13,457  | /images/timeseries.jpg   | 302    |
| /cssPrint/subSheetStyles.css      | 2,247   | /Map/com/esri/solutions/flexviewer/assets/images/legends/en_US/EPTR_AREAS_legend.png | 97     |
| /playerProductInstall.swf         | 1,584   | /DiffuseSourcesAir.aspxen  | 79     |
| /images/timeseries.jpg            | 1,534   | /docs/EN_E-PRTR_fin.pdf  | 72     |
| /favicon.gif                      | 927     | /&/  | 70     |
| /en/                              | 209     | /scripts/iframe.js   | 65     |
| Total                             | 187,963 | Total  | 60,335 |

From Table 41 it can be seen that the top 10 pages for errors cover about 75% of all errors.

#### Other errors

Detailed information on other errors

Table 42 provides a list of the top other errors and the corresponding internet address.

**Table 42: Top five pages which caused an error**

| ~1.5 years period           |                           |       | four month period          |                           |       |
|-----------------------------|---------------------------|-------|----------------------------|---------------------------|-------|
| 1 March 2010 – 30 June 2011 |                           |       | 1 March 2011- 30 June 2011 |                           |       |
| Request                     | Error                     | Hits  | Request                    | Error                     | Hits  |
| /ErrorPage.aspx             | 500 Internal Server Error | 3,443 | /ErrorPage.aspx            | 500 Internal Server Error | 2,373 |
| /home.aspx                  | 500 Internal Server Error | 870   | /home.aspx                 | 500 Internal Server Error | 864   |
| /DiffuseSourcesAir.aspx     | 500 Internal Server Error | 655   | /DiffuseSourcesAir.aspx    | 500 Internal Server Error | 651   |
| /FacilityLevels.aspx        | 400 Bad Request           | 413   | /Home.aspx                 | 500 Internal Server Error | 226   |
| /IndustrialActivity.aspx    | 400 Bad Request           | 395   | /DiffuseSourcesAir.aspx    | 400 Bad Request           | 103   |

#### Failed request

- A failed request is a request which causes an error. In the time period of ~1.5 years 348,836 failed requests occurred.
- In the time period of four months 85,692 failed requests occurred, which is about 25 % of the failed requests in the 1.5 year time period.

Particular investigations for peak period (25 May 2011 – 2 June 2011)

As the peak period in May/June 2011 significantly influenced the whole dataset, a specific investigation has been performed to analyse user behaviour and some important parameters (i.e. geo-



graphical information and traffic sources) of this particular period. Within this period a peak week can be observed lasting from 25 May until 2 June 2011.

Table 43 includes the main parameters for the peak period compared to the four month period during publication of the new datasets in 2011. The data shows that by far the most visits originated from Romania (about 18,800 visits in the peak period). The majority of users entered the page as first time users and stayed about 3 minutes on the page.

The last column of the table includes the influence of the peak period data on the whole period during publication, expressed as ratio in percentage.

**Table 43: Main parameters for the peak week**

| Peak period (including peak week 25 May 2011 – 2 June 2011) |        |              |            | Period after publication |        |
|---|--------|--------------|------------|--------------------------|--------|
| 17/5/2011 - 8/6/2011  |        |              |            | 1/5/2011 -31/6/2011      |        |
| All traffic sources   | Visits | Average time | New visits | visits                   | ratio  |
| Romania   | 18,800 | 00:02:59     | 77.3 %     | 19,866                   | 94.6 % |
| France  | 11,757 | 00:01:39     | 58.9 %     | 18,396                   | 63.9 % |
| Germany   | 4,485  | 00:01:52     | 55.9 %     | 7,817                    | 57.4 % |
| Portugal  | 4,049  | 00:01:48     | 76.5 %     | 5,310                    | 76.2 % |
| Italy   | 3,573  | 00:02:03     | 63.9 %     | 6,745                    | 52.9 % |
| Austria   | 3,305  | 00:01:44     | 68.6 %     | 4,480                    | 73.7 % |
| Spain   | 2,959  | 00:02:27     | 66.9 %     | 5,390                    | 54.9 % |
| Belgium   | 2,129  | 00:01:45     | 53.2 %     | 3,303                    | 64.5 % |
| Hungary   | 1,844  | 00:01:42     | 76.4 %     | 2,461                    | 74.9 % |
| Serbia  | 1,256  | 00:03:05     | 2.5 %      | 2,068                    | 60.7 % |

For many countries, the vast majority of the visits in the timeframe of May to June 2011 took place in the peak week (25 May 2011 – 2 June 2011). Especially, Romania, Portugal, Hungary and Austria had a very high share of visits within the peak week.

The traffic sources have also been identified and are provided in

Table 44. For Romania, the sources stirileprotv, euractiv and evz are ranked within the top 10, for Portugal tek sapo, for Austria derstandard and for Hungary hvg.

**Table 44: Traffic sources of the peak week**

| Peak period 17 May 2011 - 8 June 2011 (including peak week 25 May 2011 – 2 June 2011) |        |              |            |
|---|--------|--------------|------------|
| All traffic sources   | Visits | Average time | New visits |
| (direct) / (none)   | 21,210 | 00:02:04     | 55.3 %     |
| stirileprotv.ro / referral  | 10,095 | 00:03:51     | 83.8 %     |
| lesnumeriques.com / referral  | 5,424  | 00:01:13     | 62.9 %     |
| gandul.info / referral  | 3,404  | 00:03:02     | 73.8 %     |
| eea.europa.eu / referral  | 3,172  | 00:01:56     | 48.6 %     |
| derstandard.at / referral   | 1,995  | 00:01:26     | 77.3 %     |
| tek.sapo.pt / referral  | 1,521  | 00:01:10     | 84.2 %     |
| euractiv.ro / referral  | 876    | 00:01:57     | 76.9 %     |
| evz.ro / referral   | 791    | 00:01:58     | 72.6 %     |
| Google / organic  | 743    | 00:02:27     | 26.5 %     |
| hvg.hu / referral   | 606    | 00:01:34     | 81.9 %     |

\* Lines marked in blue represent referring sites

All of these web-pages from where visitors entered the E-PRTR site in the peak week are online news or TV sites.

It can be presumed that after the publication of the new E-PRTR data in 2011 a direct link to the E-PRTR web-search site has been widely published. This also explains the high percentage of new visits which is normally well below 50 % and the drop of visitors after this one week as the direct link was not published anymore. Therefore, the typical visitor in this week can be considered to be an interested private person. In Romania, about 20,000 such visits were counted from May to June 2011. 75 % of these visits were new visits, representing about 15,000 visitors.

## APPENDIX 5 - AD-HOC USER SURVEY

In order to obtain project specific information, a compact and clearly structured questionnaire was developed in close coordination with the Commission Services. The questionnaire was realised as a web-based survey, using the survey platform 'Survey Monkey'. The platform enables easy access and filling-in of the questionnaire which was announced in advance via e-mail, also including a personalised link to the survey. The questions were presented one after another and discontinuous filling-in by stakeholders was possible.

The questionnaire was divided into the following main sections:

Section 1: Explaining the purpose of the questionnaire

Section 2: Including explanations on how to fill in the questionnaire

Section 3: Information on institution/company

Section 4: Information about access to E-PRTR website

Section 5: Information related to data use

Section 6: Information about data organisation and website design

The survey includes the structure and traceable sampling and evaluation of data (e.g. via Excel files) and the post-processing of the information including the elaboration of a summary of the information, the lessons learnt and the proposals made by the users.

The questionnaire was adapted according to comments by the Commission Services.

### Implementation of the survey

The platform also allows monitoring of already filled in questionnaires and assessing of responses by using the inquiry tools provided.

The questionnaires were distributed after the Member States had completed their reporting and the following schedule was followed:

1. Set-up and upload of the agreed questionnaire to the platform (**until 1 May 2011**)
2. E-mails sent to announce the survey to the agreed list of contacts, also including accompanying documents (recommendation letter) and personalised links to the questionnaire (**around 1 May 2011**)
3. Duration of the survey (**1 May – 31 May 2011**), reminder sent on **24 May 2011**
4. Compilation and assessment of information (until **15 July 2011**)
5. Evaluation report (until **30 July 2011**)

### List of stakeholders

Main users from industry and competent authorities are the addressees for the survey. The survey was, in particular, disseminated to the following stakeholder groups:

1. Country authorities for national E-PRTR Registers
2. Authorities on other levels (e.g. regional level)
3. Industry associations

4. Industry and companies
5. NGOs and other stakeholders

Regarding the regional authorities and the level of individual companies, the country authorities and the industry associations were asked for forwarding the survey to the relevant regional authorities/companies.

The web-survey was elaborated using a very short questionnaire containing clear questions. As a result the replies received were very clear. Also the proposals and comments made by the participating experts were very well understandable and clear, thus follow-up phone calls in order to clarify the information were not necessary.

#### **Overview of information retrieved from the survey**

The questionnaire was sent to the listed stakeholder groups (ca. 180 addressees) by 1 May 2011. More than 200 stakeholders were contacted by indirectly asking the European Environmental Bureau to distribute information addressing several working groups.

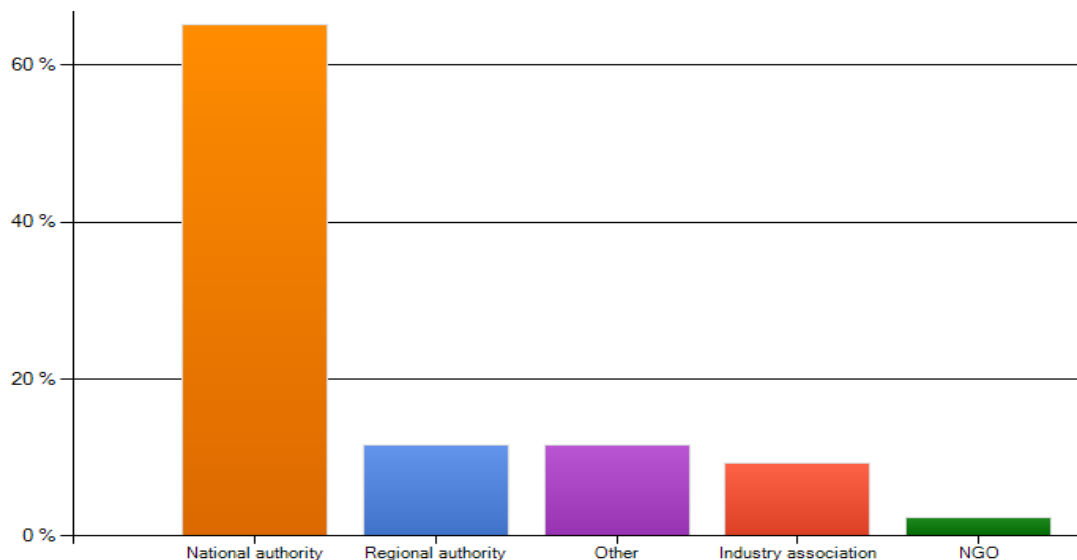
The recipients were invited to provide their feedback by 31 May. A reminder to complete the questionnaire was sent to all stakeholders on 24 May.

Out of a total number of 184 intended recipients, 49 stakeholders accessed the survey via the personalised link. 10 recipients indicated that they do not use the E-PRTR website on a regular basis. Consequently, due to the lack of experience as end-users of the E-PRTR website, they were not able to complete the provided questionnaire.

#### **Question 1: Type of Institution/Company**

As listed in Figure 9, 17 EU Member States (i.e. AT, BE, CY, DE, DK, EE, IT, LT, LV, MT, NL, PL, PT, SE, SI, SK and UK) provided answers to the questionnaire. In addition, a number of EU Industry Associations and the European Environmental Bureau responded. Furthermore, stakeholders from non-EU countries (i.e. CH, IS, NO and US) participated in the survey and provided valuable information.

**Figure 9: Type of Institution/Company**

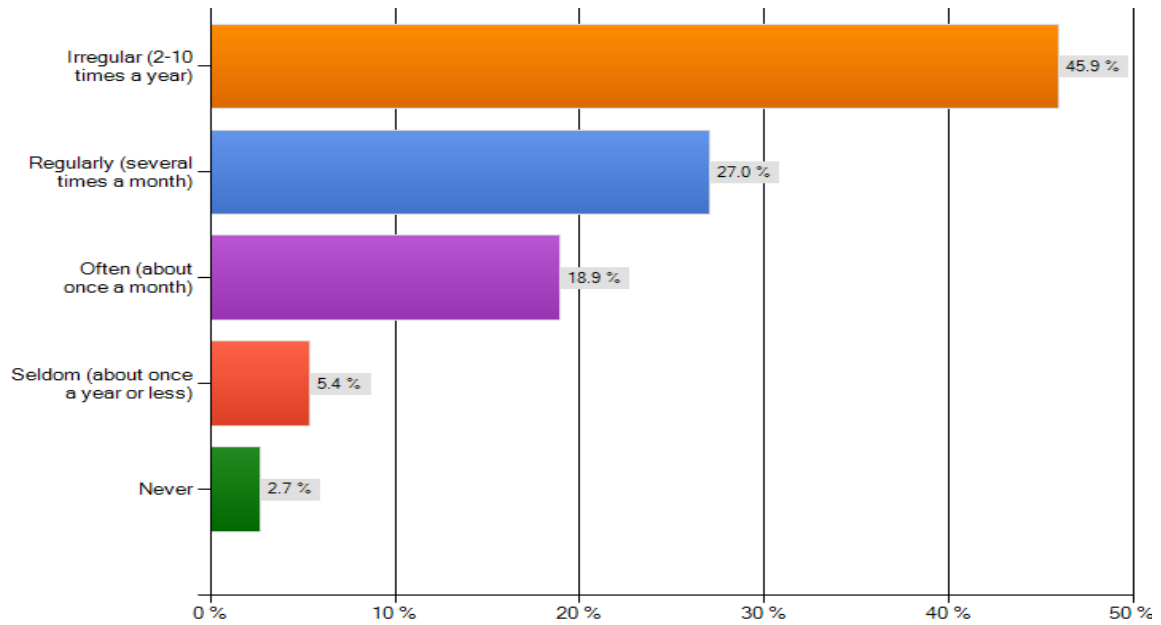


As can be seen in Figure 9, more than 60 % of the respondents were national authorities from EU and non-EU countries. Regional authorities (e.g. Vlaamse Milieumaatschappij, Bruxelles Environment, etc.) and stakeholders which fall under the category 'others' (e.g. Ecologic Institute, EFTA Surveillance Authority, waste management companies etc.) accounted for around 10 % each. The remaining answers were provided by a number of Industry Associations (e.g. European Association of Mining Industries, European Association of Metals, Glass for Europe, etc.) and the European Environmental Bureau (i.e. NGO).

**Question 2: How often do you access the E-PRTR website?**

Question 2 was answered by most of the stakeholders listed (i.e. 37). Figure 10 indicates that most users (~46 %) who replied to this question access the website irregularly, which means 2-10 times a year. Around 27 % of the respondents indicated that they visit the site several times a month and approximately 19 % replied that they use the E-PRTR site often (i.e. about once a month). The remaining respondents stated that they access the website about once a year or less (~5 %). One waste management company from the Netherlands replied that the E-PRTR website has not been used at all. However, the same respondent provided answers to other questions of the survey, particularly indicating for which purposes the website could be used by the company in the future.

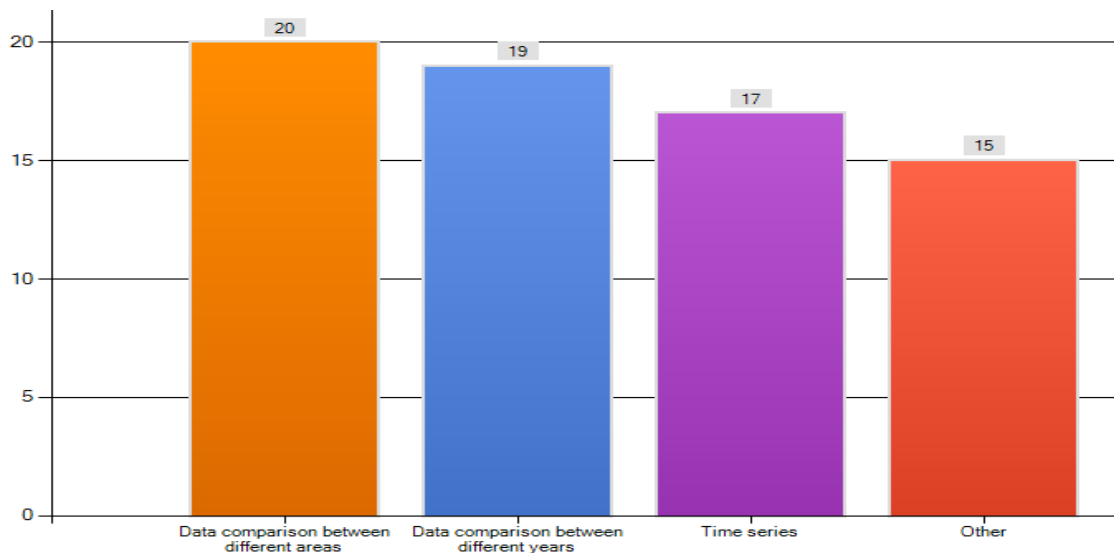
**Figure 10: Access to the E-PRTR website**



**Question 3: Which type of data do you access using the E-PRTR website?**

All 39 stakeholders replied to question 3. Please note that multiple answers to this question were possible. Therefore, the indicated numbers in Figure 11 indicate the number of respondents who ticked the particular answer.

**Figure 11: Type of data accessed**



As can be observed in Figure 11, data comparison between different areas and data comparison between different years were the answer choices indicated by most users, followed by the use of time series. A number of stakeholders indicated that the data are used for other purposes, such as:

- location of certain facilities on the map,
- data comparison between different facilities,
- data comparison between different areas in different regions,

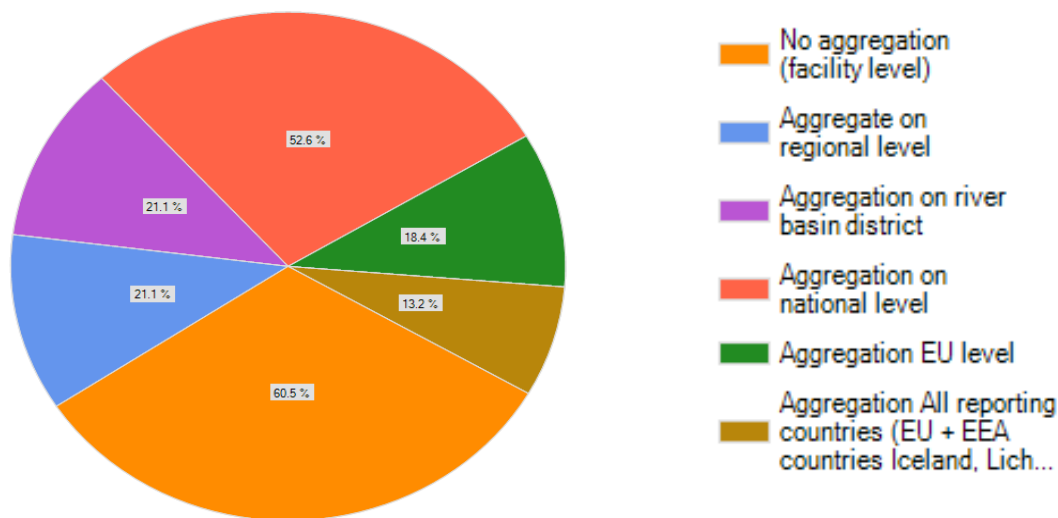
- data verification and comparison between different countries,
- comparison of National PRTR website with the European one,
- comparison between industrial sectors,
- ranking of top polluters in order to assess national data,
- access of chemical specific release data (e.g. benzene releases to air)
- etc.

**Question 4: On which level will you aggregate the data?**

38 stakeholders provided answers to this question, which is related to the level of data aggregation. Similar to question 3, multiple answers were allowed also in this case.

As displayed in Figure 12, the respondents indicated various levels on which they aggregate data. However, the answer choices ‘facility level (no aggregation)’ and ‘aggregation on national level’ were stated by most of the respondents.

**Figure 12: Level of data aggregation**



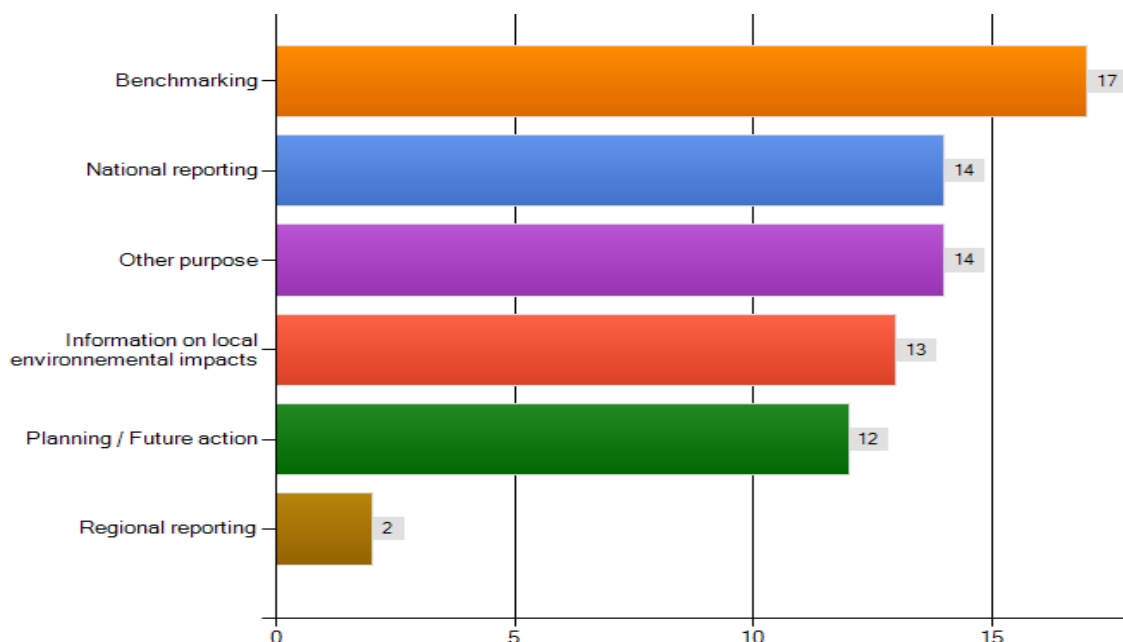
Furthermore, stakeholders indicated that they aggregate the data on regional and on river basin district level (i.e. 8 respondents for each level of aggregation). Around 18 % of the respondents pointed out that the data are aggregated on EU level and approximately 13 % of the respondents apply data aggregation on EU and EEA country level.

**Question 5: For which purpose do you use the E-PRTR data?**

Stakeholders were asked to specify for which purpose they use the E-PRTR data. All 39 institutions/companies responded to this question. As mentioned, the greyed out numbers in the bar chart indicate the number of respondents who ticked the particular check boxes within the matrix of choices. Similar to question 3, it was possible to provide multiple answers to this question.



**Figure 13: Use of E-PRTR data**



As shown in Figure 13, the E-PRTR data are used for various purposes. However, the data is mostly used for benchmarking (i.e. 17), national reporting (i.e. 14), information on local environmental impacts (i.e. 13), planning/future action (i.e. 12) and for several other purposes (i.e. 14). A comparable low number of stakeholders (i.e. 2) use the data, amongst other purposes for regional reporting.

Other purposes for the use of the E-PRTR data and additional clarifications given by stakeholders are summarised in Table 45.

**Table 45: Summary of further purposes and additional clarifications**

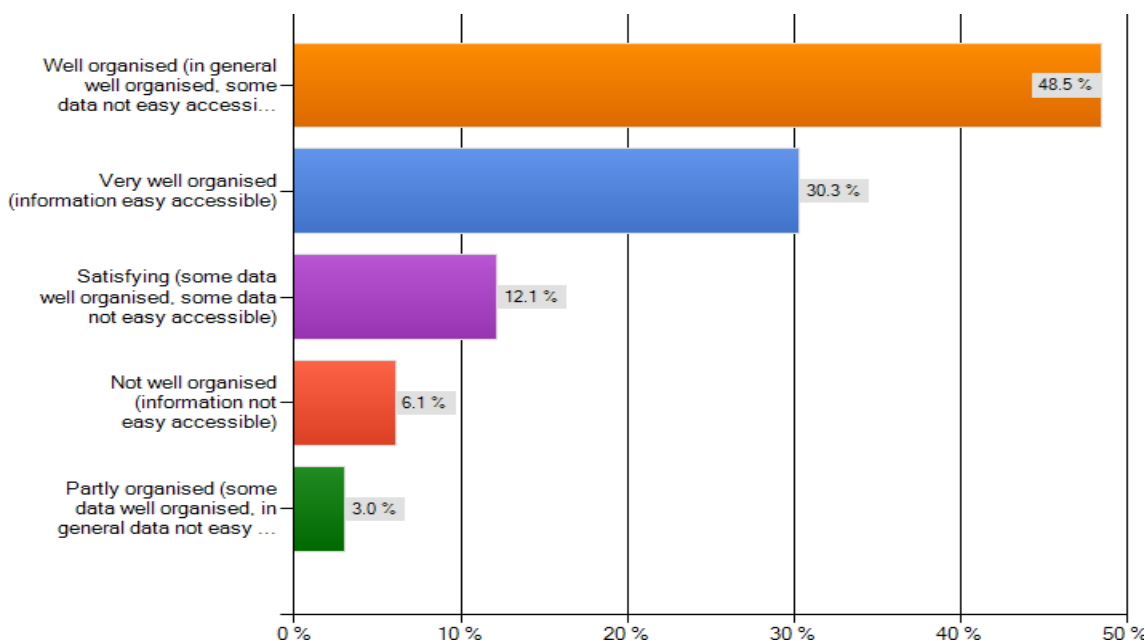
| Country | Summary of further purposes and additional clarifications:   |
|---------|--|
| BE      | ▪ benchmarking waste generation (transfer off site)  |
| BE      | ▪ inspiration for the Regional website   |
| BE      | ▪ control of reported data   |
| CH      | ▪ use for demonstration of possible use of PRTR data since there is more data than on National level   |
| EU      | ▪ spot need of information on emissions  |
| EU      | ▪ check emission load by facility level or MS for specific pollutants  |
| EU      | ▪ ideally it should be used for the assessment of environmental performance of an installation (i.e. against Best Available Techniques / requirements under the IPPC Directive) but this is not possible because crucial parameters are missing (i.e. raw material input/output, reference conditions, no link to BAT) |
| EU      | ▪ verification of E-PRTR content with company reports for alerting Members on error made by their Competent Authorities (the data transfer chain appears not free of errors specifically on unit transformations)  |
| IT      | ▪ additional checks for completeness of the National dataset concerning specific activities/pollutants   |
| NL      | ▪ comparison with the National system  |
| NL      | ▪ possibly checking if our reports end up unchanged on the publicly accessible site  |

| Country | Summary of further purposes and additional clarifications:   |
|---------|--|
| NO      | <ul style="list-style-type: none"> <li>▪ improvement of the Norwegian dataset</li> </ul>   |
| PT      | <ul style="list-style-type: none"> <li>▪ IPPC benchmarking</li> <li>▪ identification of local environmental impacts mainly regarding river basin pollution</li> </ul>  |
| SE      | <ul style="list-style-type: none"> <li>▪ comparison of data on facility level between E-PRTR and the Swedish PRTR website</li> <li>▪ demonstration of E-PRTR to colleagues, developers and other stakeholders</li> </ul> |
| SK      | <ul style="list-style-type: none"> <li>▪ preparing the national summaries on pollutants emitted to be reported</li> <li>▪ using data to inform public, state and public authorities at seminars and workshops</li> </ul> |
| UK      | <ul style="list-style-type: none"> <li>▪ formation of policy</li> </ul>  |
| US      | <ul style="list-style-type: none"> <li>▪ see whether there are trends from year to year</li> <li>▪ compare E-PRTR data to North American PRTR data</li> </ul>  |

### Question 6: Is the information on the E-PRTR website well organised and easily accessible?

Stakeholders were asked to indicate whether the information provided on the E-PRTR website is well organised and easily accessible. In total 33 stakeholders provided an answer to this question.

**Figure 14: Organisation and accessibility of information**



As shown in Figure 14, almost half the respondents replied that the provided data is in general well organised, including some data which is not easily accessible. Around 30 % of the stakeholders replied that the available data is very well organised and information easily accessible. 12 % share the opinion that some data is well organised and some data is not easily accessible (i.e. satisfying). Less than 10 % of the stakeholders who replied to this question think that the provided data is not well organised (information not easy accessible) and/or partly organised (i.e. some data well organised but in general data not easily accessible).

A number of stakeholders provided additional comments/critique and proposals for improving the organisation and accessibility of information provided on the E-PRTR website. These are summarised in Table 46.

**Table 46: Summary of additional comments/critique and proposals for improvements**

| Country | Summary of additional comments and proposals:  |
|---------|--|
| AT      | <ul style="list-style-type: none"> <li>▪ well organised, however if you want to search for a pollutant release you have to know the pollutant group in order to select the pollutant; this can be a hurdle for people who do not know the pollutant group</li> </ul>   |
| BE      | <ul style="list-style-type: none"> <li>▪ well organised, however NMVOC stands under 'Other gases'; it is an organic component and it is therefore better to put it under 'Other organic substances'</li> </ul>   |
| CH      | <ul style="list-style-type: none"> <li>▪ not well organised</li> <li>▪ the time series are a bit too clumsy since you have to start the query separately</li> </ul>  |
| DE      | <ul style="list-style-type: none"> <li>▪ partly organised</li> <li>▪ tool slow navigation; partly not intuitive</li> </ul>   |
| EU      | <ul style="list-style-type: none"> <li>▪ not well organised</li> <li>▪ additional searching options/queries should be developed</li> <li>▪ the possibility to generate/export data (range of several years, group of facilities, etc.) in an easy and practical way, in an Excel spread sheet would be very useful</li> <li>▪ the current system allows already for some advance search, however some knowledge of Access databases is required</li> </ul>                                       |
| EU      | <ul style="list-style-type: none"> <li>▪ satisfying</li> <li>▪ a facility that allows the generation of on-line reports that is now done by downloading the Access-database and writing own queries could become beneficial</li> </ul>   |
| NL      | <ul style="list-style-type: none"> <li>▪ well organised</li> <li>▪ problem remains that you have to know what you look for</li> <li>▪ for the general public interpretation may remain too difficult as you need a certain degree of expertise</li> </ul>  |
| NL      | <ul style="list-style-type: none"> <li>▪ satisfying</li> <li>▪ it is a complex user interface</li> </ul>   |
| SE      | <ul style="list-style-type: none"> <li>▪ well organised</li> <li>▪ slow map; the legends of the map are too large and not accessible</li> </ul>  |
| UK      | <ul style="list-style-type: none"> <li>▪ very well organised</li> <li>▪ NUTS region/polygon for the off shore sector needs to be clarified (presently the site assumes the off shore NUTS are wrong as they are not land based)</li> </ul>   |
| US      | <ul style="list-style-type: none"> <li>▪ very well organised</li> <li>▪ it is not clear as to what constitutes the '27 European Union Member States' (the counties are only listed under the 'Area Overview'; it takes a while to find this list; stating or identifying specifically the 27 counties or states that comprise the E-PRTR dataset would be a big enhancement; perhaps the names of the countries could be listed under the 'Welcome to E-PRTR' heading of the website)</li> </ul> |

As shown in Table 46, a number of proposals for improvements regarding organisation and accessibility of data were indicated by stakeholders, for instance:

- the Industry Association Glass for Europe proposed to create additional searching options and queries as well as to allow the generation/ export of data in an Excel spread sheet for further processing;
- the Flemish Environment Agency advises to place NMVOC under the category 'Other organic substances' rather than under the category 'Other gases';
- the Department for Environment, Food and Rural Affairs recommends to clarify the NUTS region/polygon for the off shore sector and the US Environmental Protection Agency proposes to list the names of all 27 EU MS under the 'Welcome to E-PRTR' heading of the website.

In the following, some of the problems/deficits identified by users will be further elaborated.

It was for instance expressed that in order to search for a pollutant release users need to know the pollutant group which might be a barrier (comment from Environment Agency Austria). This is fact, however, by ticking the corresponding 'Info button' in the right corner, an additional window will appear leading to a pollutant description. Within the pollutant description window users can choose the pollutant on which they want to focus and the corresponding pollutant group will automatically appear. For instance by choosing 'Benzo(g,h,i)perylene' the following table will emerge:

| Pollutant            | Pollutant Group          |
|----------------------|--------------------------|
| Benzo(g,h,i)perylene | Other Organic substances |

This function is quite helpful for users who are not familiar with pollutant groups/pollutants and do not have a certain degree of expertise. In addition, it is possible to obtain data related to pollutant thresholds, measurement and calculation methods, synonyms or other commercial names, other relevant reporting requirements and hazards and other technical characteristics.

The statement by the German Environment Agency that navigation is too slow can be reconfirmed. Besides, it happens quite often that pages freeze during loading of certain content, requiring the user to restart the browser. Also problems to export data (as expressed by the Industry Association, Glass for Europe) were identified. Currently, it is possible to print but not to download data, even though in several cases download buttons (i.e. '↓') are in place. The buttons provided do not activate downloads of the selected datasets. Therefore, the option to download data is a point which should be improved in the future. Possibly also the opportunity to export data in an Excel spread sheet could be offered (also indicated by 'Glass for Europe').

### **Question 7: Is the level of data aggregation provided sufficiently?**

In question 7, stakeholders were asked to indicate whether the provided level of data aggregation is sufficient. Only two out of 32 stakeholders decided that the level of data aggregation is not provided sufficiently; 30 answered that aggregation is provided in sufficient form.

In addition to their responses four stakeholders provided further information/explanations to this question. It was for instance stated that in addition to the already available options, open and advanced search possibilities that would allow a "case-by-case" aggregation, would be useful. Besides, one respondent proposed to develop time series on facility level. Two stakeholders expressed their uncertainty to answer question 7, as they are irregular users of the E-PRTR website.

### **Question 8: Are the data complete?**

73 % of the respondents who provided an answer to this question share the opinion that the data are complete while 27 % answered that there is incompleteness.

Even though the majority of the respondents indicated that the available data is complete a number of additional comments/explanations and proposals for improvements were given, in particular:

- It was for instance stated that diffuse sources are not compared with the emissions from facilities (point sources). As the threshold values for reporting under E-PRTR are relative-

ly high, the values for diffuse sources can also be quite high. A comparison would help to understand the dimensions of diffuse emissions compared to point sources.

- Besides, different types of problems have been identified in the published data: Some facilities are missing in the reporting. Some data reported to national authorities are missing in the reporting. Some figures reported by operators have been published differently.
- In addition, stakeholders highlighted that it is not possible (no query) to search for confidential data (i.e. numbers, names of facilities or information on the data that are kept confidential).
- Respondent also pointed out that the application only displays the largest industries and that several sites are missing or geographically misplaced or in the wrong industrial category, etc. Restrictions in the design of the data model were also identified which prevent the upload of all available information.

**Question 9: Do you have any further proposals for better access/design and organisation of PRTR data?**

In comparison to the previous questions, this and the following question were answered by a quite low number of stakeholders (i.e. 7). Nevertheless, when asked to provide further proposals for better access/design and organisation of PRTR data respondents highlighted the following issues (see Table 47).

**Table 47: Summary of main proposals for better access/design/ organisation of PRTR data**

| Country | Summary of main proposals for better access/design and organisation:  |
|---------|---|
| BE      | <ul style="list-style-type: none"> <li>▪ improve the Dutch translation</li> </ul>   |
| BE      | <ul style="list-style-type: none"> <li>▪ include off site waste transfer from diffuse sources (scattered point sources for which it is in practice almost impossible to gather data for each individual point source, but for which the sum is very relevant)</li> </ul>  |
| EE      | <ul style="list-style-type: none"> <li>▪ modify the site, so that it would be easily accessible with all main internet browsers (the E-PRTR webpage is correctly displayed only with the Internet Explorer, other web browsers (e.g. Chrome, Firefox) cannot display the site correctly)</li> </ul>   |
| EU      | <ul style="list-style-type: none"> <li>▪ assess and verify data reported by operators (ensure credibility and confidence in the system through clear, transparent and well controlled assessment and verification procedures)</li> <li>▪ National Authorities should report back to operators (when data reported by operators is not published, this should be identified and reported back to operators, in which stage of the process data has not been validated)</li> </ul>  |
| NL      | <ul style="list-style-type: none"> <li>▪ allow comparison with other sources of data on facility level, like LCP, ETS and WWTP</li> </ul>   |
| SK      | <ul style="list-style-type: none"> <li>▪ enable print friendly summaries or sets of data by using filters</li> <li>▪ prepare the possibility to export such data sets into xls format</li> </ul>  |
| US      | <ul style="list-style-type: none"> <li>▪ develop an iPhone App for the E-PRTR website; the US EPA recently developed an App for accessing the US PRTR dataset (i.e. the toxics release inventory TRI dataset); it has become very popular (the App is known as 'MyRTK'); the EPA has received a lot of praise for developing this App</li> <li>▪ add a hazard ranking indicator or function which helps to provide some context to the information (the North American CEC PRTR Taking Stock online tool has this function, as does the US EPA's TRI.net tool)</li> </ul> |

In the following, some of the main proposals for better access/design and organisation of the website expressed by users will be further elaborated.

It is true that at the moment only releases from diffuse sources are available (i.e. to water and air). The proposal to also include off site waste transfer from diffuse sources as proposed by the Flemish Public Waste Agency should be taken into consideration.

The proposal received from the Ministry of Environment of Estonia to modify the site so it would be easily accessible via all main internet browsers should be considered. As identified, the website has not been developed for multiple browsers. It is optimized for Internet Explorer 7.0 and that it fully supports Internet Explorer 8.0 and Mozilla Firefox 3.5. The behaviour of the website might therefore change or be inefficient when using other web browsers.

Another deficit which was identified during the assessment and expressed by the Slovak Environment Agency is related to the possibility to print and download data (i.e. provide print friendly summaries and allow easy and efficient export of data, for instance in xls format).

Other proposals for better access/design and organisation, listed in Table 47, could of course also be considered.

**Question 10: Do you have any further comments?**

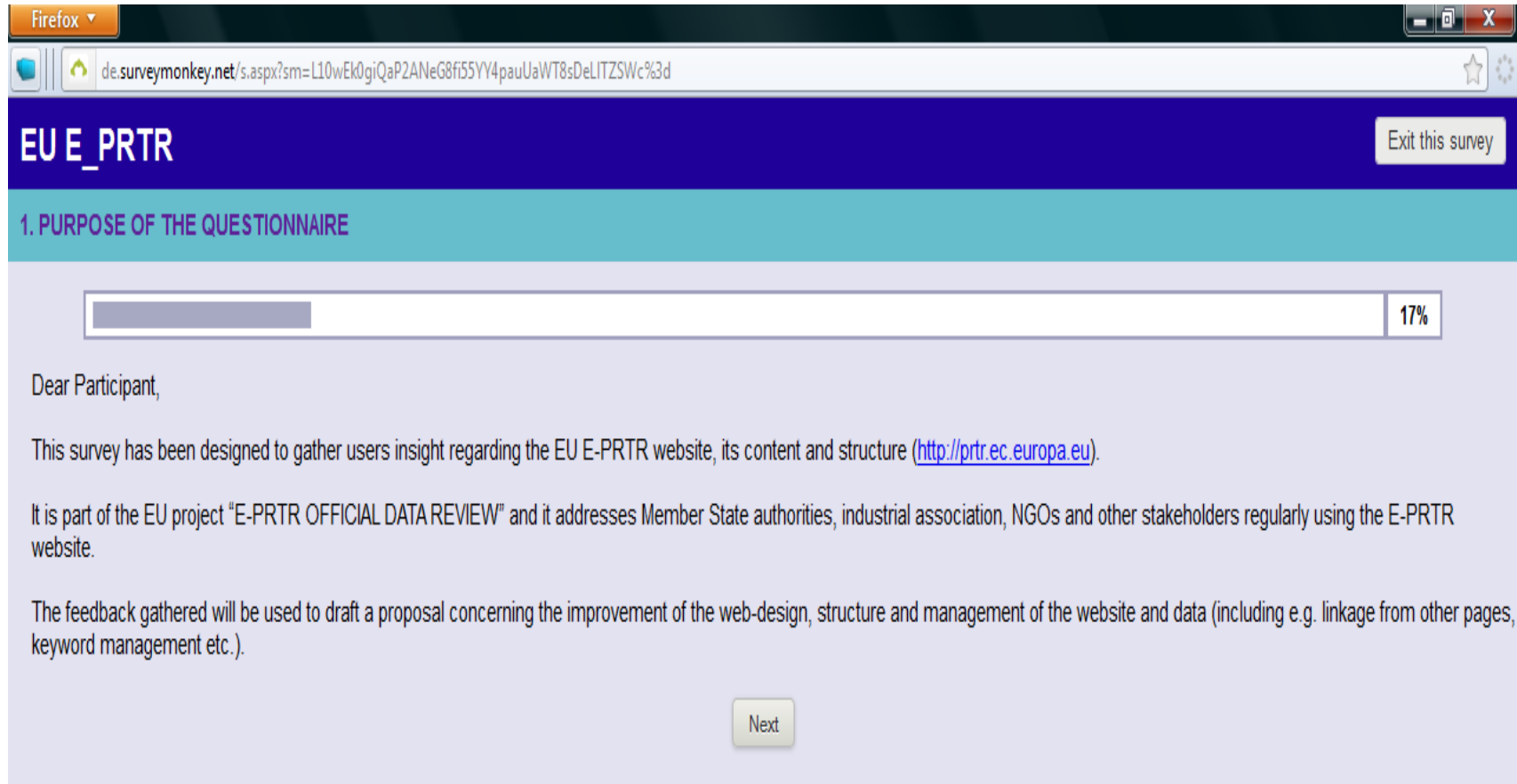
Additional comments received from 6 respondents are summarised in Table 48 below.

**Table 48: Further comments**

| Country          | Summary of further comments:   |
|------------------|--|
| <b>BE</b>        | <ul style="list-style-type: none"> <li>▪ the differences between quantities reported under the waste statistics regulation and under PRTR should be elaborated</li> </ul>                                |
| <b>BE and US</b> | <ul style="list-style-type: none"> <li>▪ good work by the Commission and EEA</li> <li>▪ the site looks good, compliment to the developers</li> </ul>   |
| <b>DE</b>        | <ul style="list-style-type: none"> <li>▪ the load balance of the website is not good, it is slowly and there is often a drop</li> </ul>  |
| <b>EU</b>        | <ul style="list-style-type: none"> <li>▪ the consistency of data reported across the EU is not great (e.g. for the same economic sector, the number of pollutants reported varies amongst MS)</li> </ul> |
| <b>NO and CH</b> | <ul style="list-style-type: none"> <li>▪ compliments to the interactive map</li> </ul>   |

# APPENDIX 6 - QUESTIONNAIRE ON THE USE OF E-PRTR DATA

Screenshot of Questionnaire (first page when entering the survey)



# Full questionnaire

## 1. PURPOSE OF THE QUESTIONNAIRE

Dear Participant,

This survey has been designed to gather users insight regarding the EU E-PRTR website, its content and structure (<http://prtr.ec.europa.eu>).

It is part of the EU project “E-PRTR OFFICIAL DATA REVIEW” and it addresses Member State authorities, industrial association, NGOs and other stakeholders regularly using the E-PRTR website.

The feedback gathered will be used to draft some proposal concerning the improvement of web-design, structure and management of the website and data (including e.g. linkage from other pages, keyword management etc.). We thank you in advance for your time!

## 2. HOW TO FILL IN THE QUESTIONNAIRE

The questionnaire consists of 8 questions and answering the questions will need less than 10 minutes.

Each page is saved automatically when moving to the next one (by clicking 'next') or when you exit the questionnaire.

The next time you access the URL of the questionnaire you will be automatically re-directed to the last question you have filled.

You can invite other person to answer certain areas of the questionnaire

We thank you for your time!

The project team

## 3. INFORMATION ON INSTITUTION / COMPANY

**Name of institution / company**

**Type of institution / company**

(A drop list have been installed)

- National authority
- Regional authority
- Industry association
- NGO

## 4. ACCESS TO E-PRTR WEBSITE

### 1. How often do you access the E-PRTR website?

(A drop list will be installed) Regularly (several times a month) (1)

- Often (about once a month) (2)
- Irregular (2-11 times a year) (3)
- Seldom (about once a year or less) (4)
- Never (5)



## 5. DATA USE

### 1. Which type of data do you access using the E-PRTR website?

Please specify:

#### Do you use the following type of data

- Time series
- Data comparison between different years
- Data comparison between different areas

### 2. On which level will you aggregate the data?

- No aggregation ( facility level)
- Aggregate on regional level
- Aggregation on river basin district
- Aggregation on national level
- Aggregation EU level
- Aggregation All reporting countries ( EU + EEA countries Iceland, Lichtenstein, Switzerland, Norway)
- Other (please specify):.....

### 3. For what purpose do you use the E-PRTR data?

- National reporting
- Regional reporting
- Benchmarking
- Planning / Future action
- Information on local environmental impacts
- Other (please specify):.....

Please shortly describe information and the purpose used

## 6. DATA ORGANISATION AND WEBSITE DESIGN

### 1. Is information on the E-PRTR website well organised and is information easy accessible?

(A drop list will be installed)

- Very well organised (information easy accessible) (1)
- Well organised (in general well organised, some data not easy accessible) (2)
- Satisfying (some data well organised, some data not easy accessible) (3)
- Partly organised (some data well organised, in general data not easy accessible) (4)
- Not well organised (information not easy accessible) (5)

Please note any improvements regarding organisation and accessibility of the E-PRTR website

.....  
.....

### 2. Is the level of data aggregation provided sufficient?

Yes       No

If no, please specify, what aggregation level is missing

.....  
.....

### 3. Is data complete?

Yes       No

If no, please specify, which data is missing

.....  
.....

### 4. Do you have any further proposals for better access/design and organisation of PRTR data?

**Do you have any further comments?**

.....  
.....

## APPENDIX 7 - EVALUATION OF COMPLETENESS, EMISSION LEVELS AND REPRESENTATIVENESS OF E-PRTR DATA – METHODOLOGY

The main objective of this subtask is to select those pollutants and activities for which a more detailed threshold analysis is possible. The major task is to assess whether reporting is complete/correct for E-PRTR Annex II pollutants. The methodology has been applied for releases to air, water, land and transfers of pollutants in water. Waste transfers have not been analysed under this subtask because no preselecting is necessary for waste.

Several tasks were performed in order to address the mentioned objectives:

- Selection of the reference year, elimination of outliers and identification of major activities
- Elimination of outliers to prepare data for further analysis
- Identification of key activities and of pollutants of minor relevance
- Analysis of completeness and representativeness

### Reference year

Although the formal review covers E-PRTR data reported for the period 2007 to 2009, one specific 'reference' year has been selected for more a detailed analysis. It is not assumed that data analysis would show significant differences in results for different reporting years provided that the data is complete but the outcomes/conclusions of such evaluations will be checked for consistency with the data available for the other years.

The reporting year 2009 has been selected as the reference year because the 2009 dataset seems to be the most solid dataset – countries reported the highest number of facilities under E-PRTR 2009. Taking into account the experience that countries gathered when submitting 2007 and 2008 data it is assumed that the 2009 dataset should be of the highest quality.

**Table 49: Number of facilities reported under E-PRTR**

|  | E-PRTR 2007 | E-PRTR 2008 | E-PRTR 2009 | difference<br>2009-2007 | difference<br>2009-2008 |
|--|-------------|-------------|-------------|-------------------------|-------------------------|
| Total number of facilities –<br>March 2011 dataset     | 26,059      | 28,170      | 28,471      | 9%                      | 1%                      |
| Total number of facilities –<br>September 2011 dataset | 26,395      | 28,358      | 29,157      | 10%                     | 3%                      |
| difference<br>(March-September)                        | 1.3%        | 0.7%        | 2.4%        | -                       | -                       |

*Note: This table is based on the dataset submitted by countries by 31 March 2011 compared to the dataset that was resubmitted by countries by 30 September 2011.*

However, in some cases 2009 data are not available, especially for comparison of water releases. The various datasets used and the respective reference years are summarised in Table 50.

**Table 50: Datasets used for data comparison**

| Medium | Dataset  | Reference year  |
|--------|--|---|
| Water  | Urban wastewater treatment directive (UWWTD) dataset <sup>42</sup> | 2007: Cyprus, Denmark, Estonia, Finland, Greece, Hungary, Ireland, Italy, Lithuania, Latvia, Netherlands, Portugal, Romania, Slovenia<br>2008: Austria, Belgium, Bulgaria, Czech Republic, Germany, Spain, France, Luxembourg, Malta, Poland, Sweden, Slovakia, United Kingdom                        |
| Water  | State of the Environment (SoE) Reporting <sup>43</sup>             | 2007: Austria, Belgium, Bulgaria, France, Finland, Latvia, Slovenia, Switzerland<br>2008: Belgium, Bulgaria, Czech Republic, Estonia, Finland, France, Island, Latvia, Lithuania, Sweden, Slovenia, Slovakia<br>2009: Bulgaria, Czech Republic, Estonia, Latvia, Lithuania, Romania, Sweden, Slovenia |

### Identification of outliers

Potential outliers are not considered in the analysis of Annex I and Annex II of the E-PRTR Regulation. The following approach has been used for the detection of outliers:

- **Step 1: Identification of potential outliers by applying defined criteria**

A release/transfer report is considered to be an outlier if the release/transfer amounts to more than 10% of total E-PRTR releases/transfers of this pollutant AND is higher than 10,000 times the E-PRTR Annex II threshold

- **Step 2: Identification of potential outliers by application of the cumulative Weibull function**

The cumulative Weibull function is used for the extrapolation of the maximum total emission. In this step of identification of potential outliers the cumulative Weibull distribution is applied to all pollutants for which at least 10 release/transfer reports were available for all 3 reporting years including all E-PRTR release and transfer data (including also potential outliers identified in step 1)

The three parameters of the cumulative Weibull distribution were determined by non-linear regression. Parameter (b) is the estimate of the highest release/transfer report in relation to the maximum expected release/transfer quantity. For a description of the application of the cumulative Weibull distribution refer to Appendix 6. Release/transfer reports producing estimates for parameter b amounting to 75% of the expected maximum release are highlighted as potential outliers. The results of the assessment are compared to the results from step 1. These outliers typically meet the criterion of > 10% of total E-PRTR releases/transfers of this pollutant, but do not exceed the E-PRTR Annex II threshold by more than 10,000 times.

- **Step 3: Confirmation of detected outliers using expert judgment**

In a third step, the detected outliers are assessed by expert judgment. Some of the potential outliers that had been detected in step 1 were excluded again from the list of outliers because some very high releases/transfers are typical for specific activities.

<sup>42</sup> <http://www.eea.europa.eu/data-and-maps/data/waterbase-uwtd-urban-waste-water-treatment-directive>

<sup>43</sup> <http://dd.eionet.europa.eu/>

## Identification of key activities<sup>44</sup>

This step involves identifying the major sources (Annex I activities) of releases for each Annex II pollutant based on the E-PRTR data for 2007, 2008 and 2009 by evaluating the relative contributions of various Annex I activities to the total release. As major sources, those E-PRTR Annex I activities are defined whose cumulative contribution amounts to more than 80% of the total reported releases/transfers in one year.

## Limited reporting

In a second assessment pollutants from E-PRTR Annex II are identified, for which only a small number of release/transfer reports are available. All Annex II pollutants, for which 10 or fewer release/transfer reports are available for the reporting years 2007, 2008 and 2009, are flagged. The result of the assessment is checked against the indicative list for pollutants per sector according to Annex 5 of the E-PRTR Guidance Document. No or a low number of available release/transfer reports although the pollutant/sector combination would be expected according to the indicative list (Annex 5 of the E-PRTR guidance) could be attributed to various reasons:

- Due to the banning of a pollutant no or only few release/transfers are expected, but the reporting is assumed to be complete
- The low number of release/transfer reports is attributed to incomplete reporting.

## Analysis of completeness and representativeness

The purpose of this step is to check completeness and to evaluate the representativeness of data. For analysis only the regular quantity of releases/transfers will be considered because accidental releases are not useful for the check.

To assess the completeness and representativeness of E-PRTR data the following analyses have been performed:

- 1) Comparison with E-PRTR Guidance
- 2) Comparison with IPPC permits
- 3) Analysis of voluntary reporting below pollutant threshold
- 4) Cross pollutant analyses
- 5) Comparison of E-PRTR air releases with CLRTAP/ NECD and UNFCCC emissions
- 6) Correlation of air emissions with other statistical data
- 7) Correlation of 1.(c) combustion installations with LCP
- 8) Comparison of water emissions with UWWTD reporting data
- 9) Comparison of water emissions with SoE reporting data

### *Description of the specific tool used for completeness assessment*

For this task a specific tool (Excel pivot tables) has been created based on the E-PRTR full database. The tool enables searching and filtering across different criteria. The output of the tool is a set of three pivot tables (A,B,C) providing the following data:

- A) country, region, RBD activity (three digits), [facility information], medium, pollutant group, pollutant, year, regular quantity, outlier corrected quantity, method basis, below threshold

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<sup>44</sup> Key activity is the one which has significant influence on the E-PRTR total emissions in terms of absolute level of emissions. The activities in descending order of a size that cumulatively total 80% of the total E-PRTR emissions are identified as being key activities.

- B) country, region, RBD activity, medium, pollutant group, pollutant year, number of reported values
- C) country, region, RBD activity, year, number of facilities

Regular Quantity = Total Quantity – Accidental Quantity

Below threshold = yes or no. Indicates whether a value is below the threshold (voluntary).

Medium is one of the following values:

- air
- water
- land
- transfer into water

The outlier corrected quantity is either the reported quantity or may be (manually) set to zero if a reported quantity has been identified as high outlier.

Pivot tables are provided in MS-Excel 2007 format because earlier versions are limited to 65,000 records.

Pivot table data was used for comparison of E-PRTR with national air emission inventory data reported under CLRTAP or the UNFCCC.

### **1) Comparison with E-PRTR Guidance**

At activity level, reported emission releases are compared with appendixes 4 and 5 of the E-PRTR Guidance Document which provides a list of pollutants for which a release to air and water might be expected. The comparison is made for each activity that is reported by a facility; e.g. chemical plants mostly report several activities (in one case 24).

### **2) Comparison with IPPC permits**

The number of IPPC permits was compared to the number of E-PRTR facilities on the basis of the main activity. A linkage from IPPC to Annex I activities is provided in the Guidance Document for the implementation of the European PRTR<sup>45</sup> Appendix 2.

The result is used as an additional check to estimate the completeness of reporting at country and sectoral level. If the number of E-PRTR facilities is much lower than the number of IPPC permits this might indicate incomplete reporting by the respective countries. However, this comparison is limited by the fact that one E-PRTR facility may correspond to more than one IPPC installation.

It has to be noted that for Spain the number of IPPC permits is not available and for Denmark the permits are only available at aggregated level. Germany, in general, reports a significantly higher number of IPPC permits than all other countries, which might be due to inclusion of facilities with lower capacity thresholds than E-PRTR.

### **3) Analysis of voluntary reporting below pollutant threshold**

The purpose of this step is to decide whether voluntary reporting below the pollutant threshold is appropriate for assessing the completeness of reporting. First, the number of reported values which are below threshold have been evaluated for each country and pollutant. In a second step, a selection of countries and pollutants to be analysed in more detail has to be made. A criterion for this selection is the number of voluntarily reported values which should be at least five releases or represent at least 5% of the number of mandatorily reported values. If voluntary reporting refers only to a specific activity especially major sources have been analysed in more detail. For each of the selected countries and pollutants it has been analysed whether only single activities are affected and whether these activities are major sources.

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<sup>45</sup> [http://prtr.ec.europa.eu/docs/EN\\_E-PRTR\\_fin.pdf](http://prtr.ec.europa.eu/docs/EN_E-PRTR_fin.pdf)

#### 4) **Comparison of air releases with UNFCCC and CLRTAP data**<sup>46</sup>

Correlation of E-PRTR air releases with CLRTAP/NECD and UNFCCC data is carried out using absolute values or trends. The releases under E-PRTR should never exceed national totals reported under CLRTAP/UNFCCC which include all anthropogenic emissions.

The categories for reporting of emissions under UNFCCC and CLRTAP/NECD are harmonized but differ significantly from E-PRTR Annex I activities. The comparison of sectoral data has limitations because of the differences between the definition of E-PRTR activities and UNFCCC/CLRTAP categories. A mapping of Annex I activities with the CLRTAP/NECD and UNFCCC reporting categories is provided in the E-PRTR Methodology report, Stage 1 and stage 2 checks for E-PRTR (2011).

Accuracy of mapping is technically limited by the different system boundaries defined by E-PRTR and national emissions inventories. For CLRTAP/NECD and UNFCCC emission data is reported at technical process level while E-PRTR includes single releases for multiple technologies like fuel combustion, process specific emissions, fugitive emissions, solvent use and waste treatment.

The degree of correlation has to be judged carefully because reporting under UNFCCC and CLRTAP is not always consistent across categories, depending on the country and the pollutant. Of course, it has to be considered that the methodology of emission calculation is not fully harmonized between countries. Furthermore, accidental emissions are in general not included in UNFCCC and CLRTAP data.

It has to be noted that the definitions of air pollutants are harmonized between E-PRTR, UNFCCC and CLRTAP by means of CAS numbers.

The following substances are compared with UNFCCC data:

- Carbon dioxide (CO<sub>2</sub>)
- Methane (CH<sub>4</sub>)
- Nitrous oxide (N<sub>2</sub>O)
- Hydro-fluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulphur hexafluoride (SF<sub>6</sub>)

The following substances are compared with CLRTAP data:

- Nitrogen oxides (NO<sub>x</sub>/NO<sub>2</sub>)
- Sulphur oxides (SO<sub>x</sub>/SO<sub>2</sub>)
- Ammonia (NH<sub>3</sub>)
- Non-methane volatile organic compounds (NMVOC)
- Particulate matter (PM<sub>10</sub>)
- Carbon monoxide (CO)
- Cadmium and compounds (as Cd)
- Mercury and compounds (as Hg)
- Lead and compounds (as Pb)
- Hexachlorobenzene (HCB)
- PCDD + PCDF (dioxins + furans) (as Teq)
- Polycyclic aromatic hydrocarbons (PAHs)
- Arsenic and compounds (as As)
- Chromium and compounds (as Cr)
- Copper and compounds (as Cu)
- Nickel and compounds (as Ni)
- Zinc and compounds (as Zn)
- 1,2,3,4,5,6-hexachlorocyclohexane(HCH)
- Polychlorinated biphenyls (PCBs)

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<sup>46</sup> The results in this section have been produced during the ETC ACM informal E-PRTR review 2011.

## 5) **Correlation of 1.(c) combustion installations with LCP**

Most 'LCP Directive plants' are significant producers of NO<sub>x</sub> and SO<sub>x</sub> emissions and therefore most of these plants should appear also among E-PRTR facilities. On the other hand, the E-PRTR database also contains activities other than fuel combustion. Therefore, countries report significantly more E-PRTR facilities than LCPs.

The comparison of these two datasets is limited to combustion installations and by the fact that LCP data includes only boilers with a thermal capacity >= 50 MW. Furthermore, data reported under the LCP Directive do not always include emissions and have not been reviewed so far.

## 6) **Correlation of air emissions with statistical data**

In general, it is almost impossible to find statistical data available at country and activity level other than for fuel combustion which would correlate with air emissions. For example lower CO<sub>2</sub> or SO<sub>2</sub> emissions do not correlate with lower GDP because e.g. the structure of energy generation (hydro, nuclear, gas, coal) is very different from country to country. The same is valid for correlation of country population or area. Even e.g. for pig farms the farming structure (small scale vs. industrial scale) is rather different in e.g. western and eastern countries so that high correlation with ammonia emissions will in general not occur.

At country level, the completeness analysis based on an activity-, medium- and pollutant-specific comparison across countries is limited to activities for which other statistical data are available. This approach needs reliable and complete statistical data which correspond to an activity and is limited to those cases where a single activity is reported by facilities. For e.g. chemical plants, which produce several bulk products, or integrated iron and steel plants it is not possible to link facility emissions to products. For example, activity 1.(c) coke ovens is reported 82 times as main activity and 183 times as a secondary activity (for all three reporting years). When comparing releases from 1.(d) coke ovens with national coke production it does not consider coke ovens reported in other activities like 2.(b).

Table 51 illustrates selected sources of statistical data for key categories that are relevant for air.

**Table 51: Sources of statistical data to be used for completeness analysis**

| <b>E-PRTR Activity /NACE code</b>  | <b>Statistical data</b>   | <b>Data source</b>              |
|--|---------------------------|---------------------------------|
| NACE 6.10 and 6.20<br>Extraction of crude petroleum and natural gas                            | Natural gas production    | Eurostat energy statistics      |
| 6.(a)<br>Industrial plants for the production of pulp from timber or similar fibrous materials | Paper and pulp production | Eurostat industry statistics    |
| 7.(a).(ii)<br>Installations with 2 000 places for production pigs (over 30kg)                  | Number of pigs            | Eurostat agriculture statistics |

It is expected that the correlation of air emissions with production data will not be very high except for CO<sub>2</sub> even for products like cement or lime because the threshold is too high for most kilns which have a typical range in capacity due to logistics issues.

Due to such weak correlations statistical functions will probably not provide significant output which could be used to estimate the completeness of reporting and therefore comparison of E-PRTR releases/transfers with statistical data might not produce useful results.

## 7) **Cross pollutant checks**

### *Releases to air*

Some selected cross pollutant checks are performed at activity and country level to assess completeness. CO<sub>2</sub> emissions are used as a reference substance and other pollutants are used to cal-



culate a ratio. The method is very limited because it does not take into consideration plant specific abatement technologies.

If a correlation seems to fit well for most countries it may be concluded that it should fit also for other countries and outliers could indicate errors in reporting or incomplete reporting.

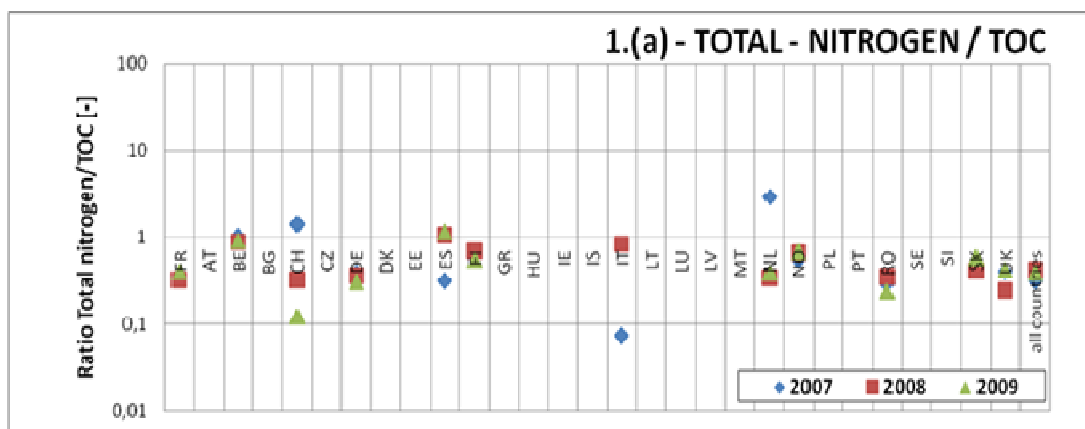
A limitation of the cross pollutant check is that plant specific abatement technologies are not taken into consideration.

*Releases/Transfers to water*

The cross pollutant analysis is performed by using data of all reporting years. This is done for increasing the data basis for the development of typical pollutant to pollutant ratios.

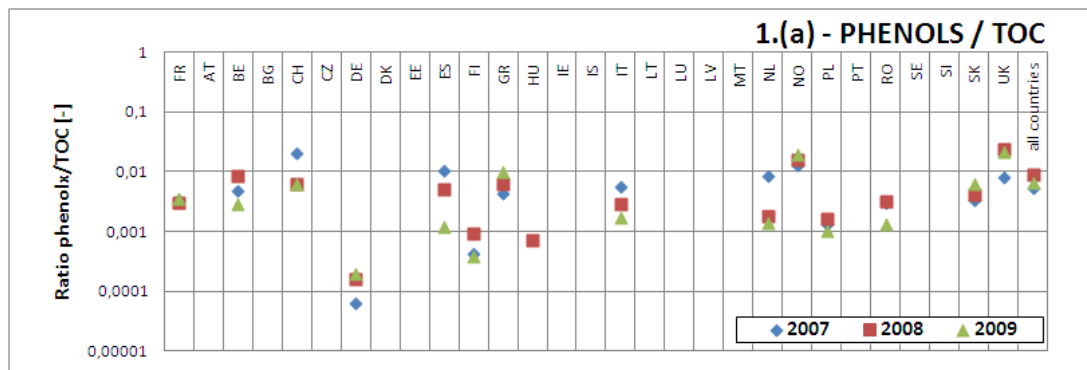
For releases to water the sum parameters (e.g. TOC, total nitrogen, total phosphorus, chlorides, cyanides, fluorides, halogenated organic compounds or phenols) are important parameters. These pollutants are frequently monitored and a suitable number of values for the assessment are available. For the cross pollutant assessment these sum parameters were related to the TOC on activity level for countries where data are available. The cross pollutant check for releases/transfers to water is performed for all three reporting years (2007, 2008 and 2009). If the ratios are about the same order of magnitude the result can be assumed to be comparable and there is no indication of incomplete reporting for these substances. An example is shown in Figure 15. The ratios for total nitrogen to TOC are varying between 0.5 and 1 for all countries. For Switzerland in 2009 and for Italy in 2007 lower ratios are observed, indicating high TOC releases or missing or low total nitrogen releases. For the Netherlands higher ratios are observed in 2007, indicating high total nitrogen releases or missing or low TOC releases.

**Figure 15: Example for the cross pollutant assessment of releases into water – 1.(a) total nitrogen / TOC**



The cross pollutant analysis furthermore provides information on potential data gaps. If several countries report the considered pollutants and the calculated ratios vary within a certain range, there could be potential data gaps if other countries only report one of the considered pollutants. An example is presented in Figure 16. Numerous countries report releases of phenols and TOC into water and the calculated ratios vary within 0.001 and 0.01. A few countries (Ireland, Portugal and Sweden) report releases of phenols, but did not report releases of TOC. Ireland reports phenol releases around 20 kg/y and back calculating the correlated TOC release by applying a phenols to TOC ratio of 0.001 the expected TOC releases result below the E-PRTR reporting threshold. For Sweden the phenol releases amount to 800-1700 kg/y. Also applying a phenols to TOC ratio of 0.01, the back calculated theoretical TOC releases would exceed the E-PRTR reporting threshold for TOC. Hence, a potential data gap exists.

**Figure 16: Example for the cross pollutant assessment of releases into water – 1.(a) phenols / TOC**



The observations are summarised in a result table, indicating the countries reporting the respective pollutants and summarising specific observations and conclusions on potential data gaps.

**8) Comparison of water emissions with UWWTD reporting data**

The analysis was done with the latest available UWWTD-data set (2007 or 2008). The UWWTD-data includes data on treatment capacity and generated load of UWWTPs and, on a voluntary basis, also discharge data for TOC, total phosphorus and total nitrogen. The UWWTD-data is used to assess completeness:

- By comparing the number of UWWTPs with a treatment capacity and/or a generated load of more than 100,000 pe to the number of facilities reporting under main E-PRTR activity 5.(f).
- By comparing the reported discharges for TOC, total phosphorus and total nitrogen in the UWWTD-data with the release reports in E-PRTR. A requirement for a comparison of the release data is consistency between the two data sets.

No information is available from the UWWTD database on UWWTPs for Switzerland, Norway and Iceland.

**9) Comparison of water emissions with SoE reporting data**

The assessment comparing the E-PRTR and the SoE datasets was done on country level with available SoE data for 2008 and/or 2009. The evaluation was focused on urban wastewater emissions, industrial discharges and total discharges. For the comparison the respective SoE data were available from 8 countries. A requirement for a comparison of the release data in order to assess completeness is consistency between the data sets.

## APPENDIX 8 - EVALUATION OF COMPLETENESS, EMISSION LEVELS AND REPRESENTATIVENESS OF E-PRTR DATA – RESULTS

### Releases to Air

#### 1) Comparison with the E-PRTR Guidance Document

The following table shows the completeness assessment of reporting for air releases for which at least one release has been reported. The completeness rating is based on expert judgement considering the suggested relevance of an activity, the share of how many of the expected pollutants are reported and the “importance” of the activity regarding air pollutants. The number of reported releases per activity has not been considered. The rating is from very good (close to 100% coverage) to good (70% coverage), partly (around 50%), poor (less than 30%) and very poor (no or almost no coverage).

**Table 52: Activities for which a release is expected but not reported to air**

| Air pollutant                                       | Activity not reported                             | Completeness Rating     |
|---|---|-------------------------|
| Methane (CH <sub>4</sub> )                          | 8.(a,c).  | Very good               |
| Carbon monoxide (CO)                                | 1.(f), 8.(c), 9.(a, d).                           | Very good               |
| Carbon dioxide (CO <sub>2</sub> )                   | 9.(e)   | Very good               |
| Hydro-fluorocarbons (HFCs)                          | 1.(e, f), 3.(f), 6.(b), 9.(e)                     | Good                    |
| Nitrous oxide (N <sub>2</sub> O)                    | 1.(f), 9.(e)                                      | Very good               |
| Ammonia (NH <sub>3</sub> )                          | 1.(b,f), 2.(d), 4.(f), 9.(a,b)                    | Very good               |
| Non-methane volatile organic compounds (NMVOC)      | 1.(f), 2.(e)                                      | Very good               |
| Nitrogen oxides (NO <sub>x</sub> /NO <sub>2</sub> ) | 9.(b)   | Very good               |
| Perfluorocarbons (PFCs)                             | 1.(e, f), 2.(f), 4.(c), 5.(g), 9.(e)              | Partly                  |
| Sulphur hexafluoride (SF <sub>6</sub> )             | 2.(c), 4.(d), 5.(a,c,g), 9.(e)                    | Poor                    |
| Sulphur oxides (SO <sub>x</sub> /SO <sub>2</sub> )  | 9.(a,e)   | Very good               |
| Hydrochlorofluorocarbons (HCFCs)                    | -   | Very good               |
| Chlorofluorocarbons (CFCs)                          | 2.(c,d,e)   | Partly                  |
| Halons  | 2.(c,e), 4(b)                                     | Poor                    |
| Arsenic and compounds (as As)                       | 1.(f), 3.(f), 4.(d,e,f), 6.(c), 8.(a,b,c), 9.(e)  | Good                    |
| Cadmium and compounds (as Cd)                       | 1.(f), 3(a,f), 4.(d,e,f), 8.(a,b,c), 9.(e)        | Good                    |
| Chromium and compounds (as Cr)                      | 1.(f), 3(a,f), 4.(d,e,f), 8.(a,b,c), 6.(c), 9.(e) | Good                    |
| Copper and compounds (as Cu)                        | 1.(f), 4.(c,e,f), 6.(c)                           | Good                    |
| Mercury and compounds (as Hg)                       | 1.(b), 3.(f), 4.(e,f), 8.(a,b,c), 9.(d,e)         | Good                    |
| Nickel and compounds (as Ni)                        | 1.(f), 3.(a,f), 4.(e,f), 8.(a), 9.(e)             | Good                    |
| Lead and compounds (as Pb)                          | 1.(f), 4.(c,d,f), 9.(e)                           | Good                    |
| Zinc and compounds (as Zn)                          | 1.(f), 4.(d,f), 9.(e)                             | Good                    |
| 1,2-dichloroethane (EDC)                            | 4.(f), 5.(f), 9.(c,e)                             | Partly                  |
| Dichloromethane (DCM)                               | 2.(c), 4.(c,f), 8.(a,b,c), 9.(b,e)                | Partly                  |
| Hexachlorobenzene (HCB)                             | 2.(c,e,f), 4.(a,c), 5.(a,c,d,f), 9.(c)            | Very poor               |
| 1,2,3,4,5,6- hexachlorocyclohexane(HCH)             | 4.(a,b,c), 5.(a), 9.(c)                           | Very poor (all missing) |

| Air pollutant                             | Activity not reported   | Completeness Rating |
|---|---|---------------------|
| PCDD + PCDF (dioxins + furans) (as Teq)   | 3.(e,f), 5.(e), 8.(a), 9.(e)                                    | Very good           |
| Pentachlorobenzene                        | 2.(a,c,e,f), 4.(a,b,c,d,e,f), 5.(a,b,c,e,f,g), 8.(a,b,c), 9.(e) | Very poor           |
| Pentachlorophenol (PCP)                   | 2.(c,e,f), 4.(a,b,c), 9.(c)                                     | Very poor           |
| Polychlorinated biphenyls (PCBs)          | 2.(e), 3(c,e,f), 4.(a), 9.(e)                                   | Partly              |
| Tetrachloroethylene (PER)                 | 2.(c), 4.(c), 5.(b,f,g), 6.(a), 9.(b)                           | Partly              |
| Tetrachloromethane (TCM)                  | 4.(c,e), 5.(c,f,g), 9.(c)                                       | Poor                |
| Trichlorobenzenes (TCBs) (all isomers)    | 4.(c), 5.(g), 9.(c)   | Poor                |
| 1,1,1-trichloroethane                     | 4.(c), 5.(f,g), 9.(e)   | Poor                |
| 1,1,2,2-tetrachloroethane                 | 2.(a), 4.(c,d,e), 5.(a)   | Poor                |
| Trichloroethylene                         | 2.(c,e), 3.(d), 4.(c,d,f), 5.(b,f), 6.(a,b), 9.(e)              | Partly              |
| Trichloromethane                          | 9.(c,e)   | Good                |
| Vinyl chloride                            | 4.(d,f)   | Partly              |
| Anthracene                                | 2.(d), 4.(a,c), 6.(c)   | Poor                |
| Benzene                                   | 1.(f), 2.(e), 5.(f), 6.(c), 9.(e)                               | Good                |
| Ethylene oxide                            | 4.(d)   | Partly              |
| Naphthalene                               | 2.(d)   | Good                |
| Di-(2-ethyl hexyl) phthalate (DEHP)       | 4.(d,e), 9.(e)  | Partly              |
| Polycyclic aromatic hydrocarbons (PAHs)   | 1.(b), 1.(f), 3.(e), 5.(e), 9.(e)                               | Good                |
| Chlorine and inorganic compounds (as HCl) | 3.(d), 8.(a), 8.(c), 9.(c)                                      | Good                |
| Asbestos                                  | 3.(d)   | Very poor           |
| Fluorine and inorganic compounds (as HF)  | 9.(e)   | Very good           |
| Hydrogen cyanide (HCN)                    | 2.(e), 4.(e)  | Good                |
| Particulate matter (PM <sub>10</sub> )    | 3.(d), 4.(f), 9.(a)   | Very good           |

The table shows that for pollutants which are reported only a few times the coverage of the expected activities is also poor. Reasons for this might be that the thresholds are too high for a 'typical' plant-size (capacity) of the respective activity or the absence of emission estimation guidance.

Furthermore, for some of the activities only a few pollutants are reported which indicates that the capacity threshold is too high or that the activity itself is not relevant for the expected air pollutants.

Some of the activities were not considered in the coverage rating in the table above considering that they are not relevant for air pollutants. This does not explicitly indicate that lowering the capacity threshold would contribute significantly to total air releases. For the following activities almost none of the intended air pollutants have been reported in 2009. The numbers in brackets show the number of facilities which report the activity. The following list shows activities which are not relevant for air releases:

- 1.(f) Installations for the manufacture of coal products and solid smokeless fuel (16 facilities)
- 3.(d) Installations for the production of asbestos and the manufacture of asbestos-based products (0 facilities)
- 9.(b) Plants for the tanning of hides and skins (19 facilities)

- 9.(e) Installations for the building of, and painting or removal of paint from ships (105 facilities)

Activity-specific findings have been found regarding reporting of pollutant groups as listed in Table 53.

**Table 53: Activity and pollutant group specific reporting gaps**

| <b>Annex I activity</b>   | <b>Reporting gap</b>  |
|---|---|
| 3.(f) Installations for melting mineral substances, including the production of mineral fibres  | Most heavy metals are not reported  |
| 4.(a) Chemical installations for the production on an industrial scale of basic organic chemicals, such as  | Pesticides are not reported   |
| 4.(c) Chemical installations for the production on an industrial scale of phosphorous-, nitrogen- or potassium-based fertilisers (simple or compound fertilisers) | Only one release of F-gases (PFCs, HFCs, SF <sub>6</sub> ) is reported. No chlorinated organic substances are reported. |
| 4.(d) Chemical installations for the production on an industrial scale of basic plant health products and of biocides   | Pesticides and chlorinated organic substances are not or just poorly reported.  |
| 4.(e) Installations using a chemical or biological process for the production on an industrial scale of basic pharmaceutical products                             | Most of the heavy metals are not or just poorly reported  |
| 4.(f) Installations for the production on an industrial scale of explosives and pyrotechnic products  | Heavy metals are not reported.  |
| 5.(f) Urban waste-water treatment plants  | Chlorinated organic substances are not or just poorly reported.   |
| 5.(g) Independently operated industrial waste-water treatment plants which serve one or more activities of this annex   | Chlorinated organic substances are not or just poorly reported.   |
| 6.(c) Industrial plants for the preservation of wood and wood products with chemicals   | Generally poor reporting regarding expected pollutants. No heavy metals are reported.                                   |
| 8.(a) Slaughterhouses   | Heavy metals are not reported.  |
| 8.(b) Treatment and processing intended for the production of food and beverage products from   | Heavy metals are not or poorly reported.  |
| 8.(c) Treatment and processing of milk  | Heavy metals are not or poorly reported.<br>No chlorinated substances are reported.                                     |

Table 53 shows that there are some pollutant groups which show a larger discrepancy to Annex 4 of the E-PRTR guidance:

- Heavy metals: Some activities are listed as a potential source of most heavy metals but not all of them are relevant.
- Chlorinated organic substances: mainly released by unintentional production. In general poor reporting (low number of reports) limited to chemical plants and particularly reporting from waste landfills/recycling.
- Pesticides: banned and therefore not reported
- Fluorinated GHGs (PFCs, HFCs, SF<sub>6</sub>): Threshold may be too high.

## 2) Comparison with IPPC permits

The comparison with the number of IPPC installations for EU-27 member states shows that for most countries the number of E-PRTR facilities which report releases into air is significantly lower than the number of IPPC permits. This comparison is limited by the fact that one E-PRTR facility may correspond to more than one IPPC installation. The following table compares the number of E-

PRTR facilities which are reporting releases into air for the year 2009 with the number of IPPC installations reported by Member States in April 2008.

Table 54 shows a comparison of the number of E-PRTR facilities with releases to air with the number of IPPC installations at sectoral level. For Spain, detailed IPPC data at sectoral level is not available.

**Table 54: Number of total E-PRTR facilities with releases to air for 2009 and number of IPPC installations**

| EU-27 member state | Number of E-PRTR facilities | Number of IPPC installations | Share of E-PRTR facilities on IPPC installations |
|--------------------|-----------------------------|------------------------------|--|
| Austria            | 74                          | 542                          | 14%  |
| Belgium            | 306                         | 1275                         | 24%  |
| Bulgaria           | 118                         | 327                          | 36%  |
| Cyprus             | 55                          | 80                           | 69%  |
| Czech Republic     | 326                         | 1597                         | 20%  |
| Denmark            | 193                         | 1057                         | 18%  |
| Estonia            | 31                          | 90                           | 34%  |
| Finland            | 240                         | 689                          | 35%  |
| France             | 1614                        | 6088                         | 27%  |
| Germany            | 1483                        | 7460                         | 20%  |
| Greece             | 68                          | 293                          | 23%  |
| Hungary            | 442                         | 979                          | 45%  |
| Ireland            | 141                         | 461                          | 31%  |
| Italy              | 1030                        | 5562                         | 19%  |
| Latvia             | 23                          | 76                           | 30%  |
| Lithuania          | 60                          | 151                          | 40%  |
| Luxembourg         | 14                          | 32                           | 44%  |
| Malta              | 5                           | 8                            | 63%  |
| Netherlands        | 321                         | 2565                         | 13%  |
| Poland             | 539                         | 2673                         | 20%  |
| Portugal           | 314                         | 632                          | 50%  |
| Romania            | 357                         | 463                          | 77%  |
| Slovakia           | 88                          | 452                          | 19%  |
| Slovenia           | 82                          | 167                          | 49%  |
| Spain              | 2297                        | 4499                         | 51%  |
| Sweden             | 215                         | 1066                         | 20%  |
| United Kingdom     | 1226                        | 3980                         | 31%  |

Table 55 compares the number of E-PRTR facilities which are reporting releases into air under the activities 1.(a,b,c,d) with the number of IPPC installations reported under “energy industries”.

**Table 55: Number of E-PRTR facilities reporting releases into air under activity 1.(a,b,c,d) for 2009 and number of IPPC installations of 1.Energy Industries.**

| EU-27 member state | Number of E-PRTR facilities | Number of IPPC installations | Share of E-PRTR fac. on IPPC inst. |
|--------------------|-----------------------------|------------------------------|------------------------------------|
| Austria            | 27                          | 48                           | 56%                                |
| Belgium            | 42                          | 71                           | 59%                                |
| Bulgaria           | 28                          | 40                           | 70%                                |
| Cyprus             | 3                           | 3                            | 100%                               |
| Czech Republic     | 72                          | 170                          | 42%                                |
| Denmark            | 32                          | 55                           | 58%                                |
| Estonia            | 12                          | 13                           | 92%                                |
| Finland            | 78                          | 117                          | 67%                                |
| France             | 158                         | 258                          | 61%                                |
| Germany            | 273                         | 591                          | 46%                                |
| Greece             | 30                          | 25                           | 120%                               |
| Hungary            | 37                          | 49                           | 76%                                |
| Ireland            | 22                          | 18                           | 122%                               |
| Italy              | 194                         | 255                          | 76%                                |
| Latvia             | 7                           | 22                           | 32%                                |
| Lithuania          | 12                          | 28                           | 43%                                |
| Luxembourg         | 1                           | 3                            | 33%                                |
| Malta              | 2                           | 2                            | 100%                               |
| Netherlands        | 68                          | 76                           | 89%                                |
| Poland             | 222                         | 305                          | 73%                                |
| Portugal           | 21                          | 14                           | 150%                               |
| Romania            | 38                          | 67                           | 57%                                |
| Slovakia           | 31                          | 55                           | 56%                                |
| Slovenia           | 7                           | 6                            | 117%                               |
| Sweden             | 69                          | 126                          | 55%                                |
| United Kingdom     | 293                         | 338                          | 87%                                |

**Table 56: Number of E-PRTR facilities reporting releases into air under sector 2 for 2009 and number of IPPC installations of 2. Ferrous metals**

| EU-27 member state | Number of E-PRTR facilities | Number of IPPC installations | Share of E-PRTR fac. on IPPC inst. |
|--------------------|-----------------------------|------------------------------|------------------------------------|
| Austria            | 4                           | 103                          | 4%                                 |
| Belgium            | 28                          | 158                          | 18%                                |
| Bulgaria           | 5                           | 43                           | 12%                                |
| Cyprus             |                             | 2                            | 0%                                 |
| Czech Republic     | 17                          | 204                          | 8%                                 |
| Denmark            | 5                           | 58                           | 9%                                 |
| Estonia            | 1                           | 5                            | 20%                                |

| EU-27 member state | Number of E-PRTR facilities | Number of IPPC installations | Share of E-PRTR fac. on IPPC inst. |
|--------------------|-----------------------------|------------------------------|------------------------------------|
| Finland            | 9                           | 75                           | 12%                                |
| France             | 116                         | 780                          | 15%                                |
| Germany            | 88                          | 1286                         | 7%                                 |
| Greece             | 5                           | 37                           | 14%                                |
| Hungary            | 6                           | 72                           | 8%                                 |
| Ireland            | 1                           | 26                           | 4%                                 |
| Italy              | 58                          | 939                          | 6%                                 |
| Latvia             | 1                           | 3                            | 33%                                |
| Lithuania          |                             | 2                            | 0%                                 |
| Luxembourg         | 5                           | 21                           | 24%                                |
| Netherlands        | 14                          | 129                          | 11%                                |
| Poland             | 41                          | 261                          | 16%                                |
| Portugal           | 11                          | 79                           | 14%                                |
| Romania            | 10                          | 68                           | 15%                                |
| Slovakia           | 4                           | 43                           | 9%                                 |
| Slovenia           | 6                           | 52                           | 12%                                |
| Sweden             | 25                          | 163                          | 15%                                |
| United Kingdom     | 62                          | 343                          | 18%                                |

**Table 57: Number of E-PRTR facilities reporting releases into air under activities 3(c,d,e,f,g) for 2009 and number of IPPC installations of 3.Minerals industry.**

| EU-27 member state | Number of E-PRTR facilities | Number of IPPC installations | Share of E-PRTR fac. on IPPC inst. |
|--------------------|-----------------------------|------------------------------|------------------------------------|
| Austria            | 7                           | 50                           | 14%                                |
| Belgium            | 31                          | 50                           | 62%                                |
| Bulgaria           | 11                          | 45                           | 24%                                |
| Cyprus             | 2                           | 11                           | 18%                                |
| Czech Republic     | 19                          | 96                           | 20%                                |
| Denmark            | 14                          | 28                           | 50%                                |
| Estonia            | 1                           | 6                            | 17%                                |
| Finland            | 12                          | 22                           | 55%                                |
| France             | 91                          | 177                          | 51%                                |
| Germany            | 111                         | 389                          | 29%                                |
| Greece             | 9                           | 54                           | 17%                                |
| Hungary            | 11                          | 61                           | 18%                                |
| Ireland            | 6                           | 9                            | 67%                                |
| Italy              | 97                          | 493                          | 20%                                |
| Latvia             | 2                           | 7                            | 29%                                |
| Lithuania          | 1                           | 9                            | 11%                                |
| Luxembourg         | 3                           | 3                            | 100%                               |



|                |    |     |     |
|----------------|----|-----|-----|
| Netherlands    | 17 | 57  | 30% |
| Poland         | 46 | 331 | 14% |
| Portugal       | 34 | 87  | 39% |
| Romania        | 9  | 43  | 21% |
| Slovakia       | 15 | 41  | 37% |
| Slovenia       | 6  | 21  | 29% |
| Sweden         | 11 | 21  | 52% |
| United Kingdom | 52 | 168 | 31% |

**Table 58: Number of E-PRTR facilities reporting releases into air under activity 4 for 2009 and number of IPPC installations of 4.Chemicals industry**

| EU-27 member state | Number of E-PRTR facilities | Number of IPPC installations | Share of E-PRTR fac. on IPPC inst. |
|--------------------|-----------------------------|------------------------------|------------------------------------|
| Austria            | 4                           | 84                           | 5%                                 |
| Belgium            | 77                          | 185                          | 42%                                |
| Bulgaria           | 3                           | 68                           | 4%                                 |
| Czech Republic     | 16                          | 263                          | 6%                                 |
| Denmark            | 9                           | 67                           | 13%                                |
| Estonia            | 0                           | 9                            | 0%                                 |
| Finland            | 14                          | 77                           | 18%                                |
| France             | 170                         | 503                          | 34%                                |
| Germany            | 108                         | 1499                         | 7%                                 |
| Greece             | 4                           | 23                           | 17%                                |
| Hungary            | 14                          | 65                           | 22%                                |
| Ireland            | 12                          | 57                           | 21%                                |
| Italy              | 64                          | 462                          | 14%                                |
| Latvia             | 2                           | 5                            | 40%                                |
| Lithuania          | 2                           | 4                            | 50%                                |
| Malta              | 1                           | 4                            | 25%                                |
| Netherlands        | 50                          | 152                          | 33%                                |
| Poland             | 29                          | 330                          | 9%                                 |
| Portugal           | 10                          | 39                           | 26%                                |
| Romania            | 12                          | 55                           | 22%                                |
| Slovakia           | 4                           | 60                           | 7%                                 |
| Slovenia           | 4                           | 21                           | 19%                                |
| Sweden             | 11                          | 77                           | 14%                                |
| United Kingdom     | 87                          | 467                          | 19%                                |

**Table 59: Number of E-PRTR facilities reporting releases into air under activity 7.(a) for 2009 and number of IPPC installations of 6.6. Intensive Rearing**

| EU-27 member state | Number of E-PRTR facilities | Number of IPPC installations | Share of E-PRTR fac. on IPPC inst. |
|--------------------|-----------------------------|------------------------------|------------------------------------|
| Austria            | 0                           | 1                            | 0%                                 |
| Belgium            | 73                          | 518                          | 14%                                |
| Bulgaria           | 48                          | 80                           | 60%                                |
| Cyprus             | 50                          | 61                           | 82%                                |
| Czech Republic     | 189                         | 418                          | 45%                                |
| Estonia            | 11                          | 40                           | 28%                                |
| Finland            | 63                          | 131                          | 48%                                |
| France             | 724                         | 2813                         | 26%                                |
| Germany            | 491                         | 1321                         | 37%                                |
| Greece             | 2                           | 42                           | 5%                                 |
| Hungary            | 382                         | 502                          | 76%                                |
| Ireland            | 60                          | 209                          | 29%                                |
| Italy              | 490                         | 1424                         | 34%                                |
| Latvia             | 11                          | 32                           | 34%                                |
| Lithuania          | 41                          | 45                           | 91%                                |
| Luxembourg         | 0                           | 1                            | 0%                                 |
| Malta              | 0                           | 2                            | 0%                                 |
| Netherlands        | 99                          | 1781                         | 6%                                 |
| Poland             | 80                          | 594                          | 13%                                |
| Portugal           | 159                         | 196                          | 81%                                |
| Romania            | 235                         | 169                          | 139%                               |
| Slovakia           | 34                          | 113                          | 30%                                |
| Slovenia           | 20                          | 25                           | 80%                                |
| Sweden             | 55                          | 274                          | 20%                                |
| United Kingdom     | 362                         | 1179                         | 31%                                |

### 3) Analysis of voluntary reporting below pollutant threshold

Table 60 shows the number of voluntarily reported releases which are releases below the pollutant thresholds. The table shows that more than 1,500 releases have been provided. Only a few countries have provided a significant number of voluntary data to the Commission which does not allow for a complete analysis for all countries and all pollutants. However, where voluntary data is available, conclusions on the adequacy of reporting thresholds are possible.

**Table 60: Number of voluntarily reported release reports into air for 2009**

| Pollutant                        | FR | CH | DE | FI | IS | NL | NO | RO | SE | UK | Total |
|----------------------------------|----|----|----|----|----|----|----|----|----|----|-------|
| DICHLOROMETHANE (DCM)            |    | 1  |    |    |    |    |    |    |    |    | 1     |
| HEXACHLOROBENZENE (HCB)          |    |    |    |    |    |    | 1  |    |    |    | 1     |
| PCDD+PCDF (DIOXINS+FURANS)       | 2  | 2  |    |    |    |    | 33 |    |    |    | 37    |
| POLYCHLORINATED BIPHENYLS (PCBS) |    |    |    |    |    |    | 2  |    |    |    | 2     |

| Pollutant                        | FR       | CH         | DE        | FI        | IS        | NL       | NO           | RO       | SE        | UK       | Total        |
|----------------------------------|----------|------------|-----------|-----------|-----------|----------|--------------|----------|-----------|----------|--------------|
| TETRACHLOROETHYLENE (PER)        |          | 1          |           |           |           |          |              |          |           |          | 1            |
| TRICHLOROETHANE-1,1,1 (TCE)      |          |            |           |           |           |          | 1            |          |           |          | 1            |
| TRICHLOROMETHANE                 |          | 1          |           |           |           |          |              |          |           |          | 1            |
| CH <sub>4</sub>                  |          | 7          |           |           | 2         |          | 61           |          |           |          | 70           |
| CO <sub>2</sub>                  | 1        | 29         |           |           | 1         |          | 119          |          |           |          | 150          |
| HFCS                             |          | 1          |           |           |           |          |              |          |           |          | 1            |
| N <sub>2</sub> O                 |          | 2          |           |           |           |          | 56           |          |           |          | 58           |
| SF <sub>6</sub>                  |          | 1          |           |           |           |          | 2            |          |           |          | 3            |
| AS AND COMPOUNDS                 |          | 1          |           |           |           |          | 36           |          |           |          | 37           |
| CD AND COMPOUNDS                 |          | 4          |           |           |           |          | 44           |          |           |          | 48           |
| CR AND COMPOUNDS                 |          | 1          |           |           |           |          | 42           |          |           |          | 43           |
| CU AND COMPOUNDS                 |          | 5          |           |           |           |          | 41           |          |           |          | 46           |
| HG AND COMPOUNDS                 |          | 3          |           |           |           | 1        | 50           |          |           |          | 54           |
| NI AND COMPOUNDS                 |          |            |           |           |           |          | 29           |          |           |          | 29           |
| PB AND COMPOUNDS                 |          | 5          |           |           |           |          | 48           |          |           |          | 53           |
| ZN AND COMPOUNDS                 | 1        | 3          |           |           |           |          | 23           |          |           |          | 27           |
| PM <sub>10</sub>                 |          | 9          |           |           | 7         |          | 77           |          |           |          | 93           |
| CHLORINE AND INORGANIC COMPOUNDS |          | 5          |           |           |           |          | 2            |          |           |          | 7            |
| CO                               |          | 16         |           |           |           |          | 45           |          |           |          | 61           |
| FLUORINE AND INORGANIC COMPOUNDS |          | 2          |           |           |           |          | 24           |          |           |          | 26           |
| NH <sub>3</sub>                  | 1        | 3          |           |           | 2         |          | 10           |          |           |          | 16           |
| NM VOC                           |          | 20         |           |           |           |          | 91           |          |           |          | 111          |
| NO <sub>x</sub>                  |          | 23         |           |           |           |          | 113          |          |           |          | 136          |
| SO <sub>x</sub>                  |          | 16         |           |           | 1         |          | 147          |          |           |          | 164          |
| POLYCYCLIC AROMATIC HYDROCARBONS |          | 1          |           |           |           |          | 13           |          |           |          | 14           |
| <b>Total</b>                     | <b>5</b> | <b>162</b> | <b>31</b> | <b>19</b> | <b>13</b> | <b>1</b> | <b>1.211</b> | <b>1</b> | <b>59</b> | <b>4</b> | <b>1,506</b> |

Table 61 shows the share of voluntarily reported quantities on total reported quantities by country and pollutant. For some pollutants, Switzerland (CH) and Norway (NO) are reporting only releases below the threshold (100%). The total voluntarily reported releases are at the maximum 2% for the pollutants Cd and Hg.

**Table 61: Share of voluntarily reported releases into air for 2009**

| Pollutant                        | FR | CH | DE | FI | IS | NL | NO   | RO | SE | UK | Total |
|----------------------------------|----|----|----|----|----|----|------|----|----|----|-------|
| DICHLOROMETHANE (DCM)            |    | 0% |    |    |    |    |      |    |    |    | 0%    |
| HEXACHLOROBENZENE (HCB)          |    |    |    |    |    |    | 100% |    |    |    | 0%    |
| PCDD+PCDF (DIOXINS+FURANS)       | 0% | 8% |    |    |    |    | 32%  |    |    |    | 1%    |
| POLYCHLORINATED BIPHENYLS (PCBS) |    |    |    |    |    |    | 3%   |    |    |    | 0%    |

| Pollutant                        | FR | CH   | DE | FI | IS | NL | NO   | RO | SE  | UK | Total |
|----------------------------------|----|------|----|----|----|----|------|----|-----|----|-------|
| TETRACHLOROETHYLENE (PER)        |    | 10%  |    |    |    |    |      |    |     |    | 1%    |
| TRICHLOROETHANE-1,1,1 (TCE)      |    |      |    |    |    |    | 100% |    |     |    | 0%    |
| TRICHLOROMETHANE                 |    | 14%  |    |    |    |    |      |    |     |    | 0%    |
| CH <sub>4</sub>                  |    | 33%  |    |    | 4% |    | 2%   |    |     |    | 0%    |
| CO <sub>2</sub>                  | 0% | 6%   |    |    | 0% |    | 8%   |    |     |    | 0%    |
| HFCS                             |    |      | 0% | 3% |    |    | 11%  | 1% | 13% | 0% | 1%    |
| N <sub>2</sub> O                 |    | 7%   |    |    |    |    |      |    |     |    | 0%    |
| SF <sub>6</sub>                  |    | 2%   |    |    |    |    | 3%   |    |     |    | 0%    |
| AS AND COMPOUNDS                 |    | 3%   |    |    |    |    | 100% |    |     |    | 0%    |
| CD AND COMPOUNDS                 |    | 2%   |    |    |    |    | 46%  |    |     |    | 2%    |
| CR AND COMPOUNDS                 |    | 60%  |    |    |    |    | 47%  |    |     |    | 1%    |
| CU AND COMPOUNDS                 |    | 7%   |    |    |    |    | 100% |    |     |    | 1%    |
| HG AND COMPOUNDS                 |    | 100% |    |    |    |    | 33%  |    |     |    | 2%    |
| NI AND COMPOUNDS                 |    | 4%   |    |    |    | 1% | 57%  |    |     |    | 0%    |
| PB AND COMPOUNDS                 |    | 0%   |    |    |    |    | 8%   |    |     |    | 0%    |
| ZN AND COMPOUNDS                 |    | 8%   |    |    |    |    | 62%  |    |     |    | 1%    |
| PM <sub>10</sub>                 | 0% | 1%   |    |    |    |    | 8%   |    |     |    | 0%    |
| CHLORINE AND INORGANIC COMPOUNDS |    | 100% |    |    | 3% |    | 12%  |    |     |    | 1%    |
| CO                               |    | 13%  |    |    |    |    | 100% |    |     |    | 0%    |
| FLUORINE AND INORGANIC COMPOUNDS |    | 9%   |    |    |    |    | 26%  |    |     |    | 0%    |
| NH <sub>3</sub>                  |    | 100% |    |    |    |    | 22%  |    |     |    | 0%    |
| NMVOC                            | 0% | 1%   |    |    | 8% |    | 2%   |    |     |    | 0%    |
| NO <sub>x</sub>                  |    | 10%  |    |    |    |    | 2%   |    |     |    | 0%    |
| SO <sub>x</sub>                  |    | 7%   |    |    |    |    | 3%   |    |     |    | 0%    |
| POLYCYCLIC AROMATIC HYDROCARBONS |    | 1%   |    |    | 1% |    | 22%  |    |     |    | 0%    |

#### 4) Comparison of air releases with UNFCCC and CLRTAP data<sup>47</sup>

The comparison was made by using a mapping from the E-PRTR activities to the IPCC Common Reporting Format (CRF) and the EMEP Nomenclature for Reporting (NFR). The CRF mapping is applied for GHGs and the NFR mapping is used for all pollutants reported under CLRTAP.

CLRTAP air emission data were downloaded from [www.ceip.at](http://www.ceip.at) and UNFCCC air emission data were provided by ETC/ACM.

The full comparison is provided as an Excel pivot table. The following table shows all cases where E-PRTR air releases are higher than the national totals for the year 2009. Please note that high outliers have been removed before this comparison (see Table 95).

<sup>47</sup> The results in this section were produced during the ETC ACM informal E-PRTR review 2011.

**Table 62: Countries with air emissions from E-PRTR higher than national totals reported under UNFCCC and CLRTAP**

| Country | Pollutant                               | Share of E-PRTR |
|---------|---|-----------------|
| Iceland | Carbon dioxide (CO <sub>2</sub> )       | 150%            |
| Germany | Mercury and compounds (as Hg)           | 126%            |
| France  | PCDD + PCDF (dioxins + furans) (as Teq) | 234%            |
| Poland  | PCDD + PCDF (dioxins + furans) (as Teq) | 211%            |
| Italy   | Perfluorocarbons (PFCs)                 | 100%            |
| Norway  | Polycyclic aromatic hydrocarbons (PAHs) | 276%            |
| France  | Zinc and compounds (as Zn)              | 101%            |

In case of Italy a single facility reports 62% of total PFCs releases under category 2.(e) from aluminium production. In case of France, a single facility reports 41% of total zinc releases under category 5.(c) which could indicate an outlier and another single facility reports 87% of total dioxins + furans, which also indicates an outlier.

Considering the pollutants it is interesting to see that dioxins + furans are higher for three (large) countries even if high outliers are removed. The reason for this might be that uncertainty and measurement costs are comparatively high for these substances.

A sectoral comparison for Energy and manufacturing industries has been performed to indicate whether E-PRTR reporting is complete. Finland, Iceland and Sweden reported significantly higher CO<sub>2</sub> emissions under E-PRTR, which indicates a high share of biomass used in manufacturing industries rather than misreporting. Latvia, Slovenia, Norway and Austria reported the lowest share of E-PRTR CO<sub>2</sub> emissions (16%, 28%, 54%, 55%). Only eight countries reported a share of more than 90%.

**Table 63: Share of E-PRTR CO<sub>2</sub> emissions on UNFCCC emissions for 'manufacturing industries'**

| Country     | Share of E-PRTR in national total | Country        | Share of E-PRTR in national total |
|-------------|-----------------------------------|----------------|-----------------------------------|
| Latvia      | 16%                               | United Kingdom | 85%                               |
| Slovenia    | 28%                               | Czech Republic | 86%                               |
| Norway      | 54%                               | Belgium        | 86%                               |
| Austria     | 55%                               | France         | 87%                               |
| Lithuania   | 64%                               | Germany        | 87%                               |
| Denmark     | 71%                               | Slovakia       | 87%                               |
| Spain       | 74%                               | Hungary        | 87%                               |
| Romania     | 75%                               | Greece         | 90%                               |
| Switzerland | 76%                               | Netherlands    | 94%                               |
| Luxembourg  | 77%                               | Cyprus         | 98%                               |
| Italy       | 77%                               | Malta          | 99%                               |
| Poland      | 79%                               | Portugal       | 99%                               |
| Ireland     | 80%                               | Finland        | 128%                              |
| Bulgaria    | 82%                               | Sweden         | 199%                              |
| Estonia     | 83%                               | Island         | 264%                              |

Industrial boilers, furnaces and kilns are E-PRTR key sources for most of all air pollutants and have a high fossil fuel consumption which correlates with CO<sub>2</sub> emissions. It is considered that the calculation of CO<sub>2</sub> has the lowest uncertainty and the highest priority of all air pollutants. Therefore, a lower coverage of E-PRTR CO<sub>2</sub> emissions compared with UNFCCC data indicates lower capacity coverage of power plants and manufacturing installations for a specific country. Coverage below 70% was only reported by five smaller countries (LV, SI, NO, AT, LT). Coverage higher than 100% is only reported by three smaller countries (FI, SE, IS), which is explained by the high biomass consumption for Finland and Sweden.

Table 64 shows a comparison of CO<sub>2</sub> emissions from CRF category 1.A.1.b Petroleum Refining with E-PRTR air releases from NACE 19.20 Manufacture of refined petroleum products for the year 2009.

**Table 64: Comparison of CO<sub>2</sub> air releases from refineries with UNFCCC data for the year 2009**

| Country        | E-PRTR CO <sub>2</sub> (kt) | UNFCCC CO <sub>2</sub> (kt) | Share of E-PRTR in UNFCCC |
|----------------|-----------------------------|-----------------------------|---------------------------|
| France         | 16,604                      | 12,982                      | 128%                      |
| Austria        | 2,810                       | 2,809                       | 100%                      |
| Belgium        | 6,151                       | 4,758                       | 129%                      |
| Bulgaria       | 1,110                       | 1,016                       | 109%                      |
| Switzerland    | 978                         | 945                         | 103%                      |
| Czech Republic | 952                         | 902                         | 106%                      |
| Germany        | 27,230                      | 20,270                      | 134%                      |
| Denmark        | 0                           | 933                         | 0%                        |
| Spain          | 12,577                      | 11,637                      | 108%                      |
| Finland        | 3,475                       | 2,833                       | 123%                      |
| Greece         | 3,981                       | 3,979                       | 100%                      |
| Hungary        | 1,340                       | 1,277                       | 105%                      |
| Ireland        | 315                         | 315                         | 100%                      |
| Italy          | 20,315                      | 25,251                      | 80%                       |
| Lithuania      | 2,100                       | 1,707                       | 123%                      |
| Netherlands    | 10,747                      | 9,741                       | 110%                      |
| Norway         | 1,899                       | 1,014                       | 187%                      |
| Poland         | 7,250                       | 5,616                       | 129%                      |
| Portugal       | 2,367                       | 2,239                       | 106%                      |
| Romania        | 3,282                       | 0                           | -                         |
| Sweden         | 2,770                       | 2,092                       | 132%                      |
| Slovakia       | 1,380                       | 1,831                       | 75%                       |
| United Kingdom | 18,189                      | 14,813                      | 123%                      |

The comparison shows for almost all countries that under E-PRTR in general (much) more CO<sub>2</sub> emissions from refineries are reported than under the UNFCCC, which is surprising but at least indicates a good coverage for refineries except for Denmark which did not report any CO<sub>2</sub> emissions from refineries in 2009. The higher CO<sub>2</sub> emissions from E-PRTR could result from including emissions from petrochemical plants. Under the UNFCCC some countries report a share of CO<sub>2</sub> emissions from e.g. refinery gas or process emissions under other categories.

The following table shows a comparison of SO<sub>x</sub> and NO<sub>x</sub> emissions from CLRTAP category 1.A.1.b Petroleum Refining with E-PRTR air releases from NACE 19.20 Manufacture of refined petroleum products for the year 2009.

**Table 65: Comparison of NO<sub>x</sub> and SO<sub>x</sub> air releases from refineries with CLRTAP data for the year 2009**

| Country        | E-PRTR             |                    | CLRTAP             |                    | Share of E-PRTR in UNFCCC |                 |
|----------------|--------------------|--------------------|--------------------|--------------------|---------------------------|-----------------|
|                | kt NO <sub>x</sub> | kt SO <sub>x</sub> | kt NO <sub>x</sub> | kt SO <sub>x</sub> | NO <sub>x</sub>           | SO <sub>x</sub> |
| France         | 22.94              | 73.28              | 17.11              | 37.72              | 134%                      | 194%            |
| Austria        | 1.05               | 0.58               | 1.05               | 0.58               | 100%                      | 100%            |
| Belgium        | 5.3                | 22.29              | 4.05               | 22.35              | 131%                      | 100%            |
| Bulgaria       | 3.63               | 6.36               | 0.01               | 0.04               | -                         | -               |
| Switzerland    | 0.72               | 0.55               | 1.16               | 1.77               | 62%                       | 31%             |
| Czech Republic | 1.45               | 7.76               | 0.66               | 2.31               | 222%                      | 335%            |
| Germany        | 19.55              | 41.22              | 18.93              | 42.93              | 103%                      | 96%             |
| Denmark        | 0                  | 0                  | 1.61               | 0.34               | 0%                        | 0%              |
| Estonia        | 0.22               | 0.4                | 0                  | 0                  | 6130%                     | -               |
| Spain          | 23.95              | 62.25              | 21.33              | 42.26              | 112%                      | 147%            |
| Finland        | 3.89               | 6.83               | 3.56               | 2.04               | 109%                      | 335%            |
| Greece         | 5.96               | 11.62              | 5.87               | 37.5               | 102%                      | 31%             |
| Hungary        | 0.84               | 0.54               | 0                  | 0                  | -                         | -               |
| Ireland        | 0.75               | 0.88               | 0.75               | 0.88               | 100%                      | 100%            |
| Italy          | 19.22              | 45.23              | 17.73              | 37.96              | 108%                      | 119%            |
| Lithuania      | 2.44               | 10.9               | 1.42               | 3.01               | 171%                      | 363%            |
| Netherlands    | 6.15               | 17.92              | 6.15               | 17.92              | 100%                      | 100%            |
| Norway         | 2.05               | 1.2                | 0.98               | 0.29               | 210%                      | 410%            |
| Poland         | 8.25               | 25.42              | 7.76               | 25.54              | 106%                      | 100%            |
| Portugal       | 4.19               | 17.45              | 5.27               | 11.61              | 79%                       | 150%            |
| Romania        | 4.33               | 11.99              | 0.62               | 1.43               | 696%                      | 838%            |
| Sweden         | 1.25               | 0.49               | 1.19               | 0.29               | 105%                      | 170%            |
| Slovakia       | 1.43               | 3.63               | 1.08               | 1.54               | 132%                      | 235%            |
| United Kingdom | 24.25              | 60.02              | 23.83              | 58.99              | 102%                      | 102%            |

The comparison indicates a good coverage of NO<sub>x</sub> and SO<sub>x</sub> emissions from refineries reported under E-PRTR.

##### **5) Correlation of 1.(c) combustion installations with LCP**

A comparison of LCP 2008 data with E-PRTR 2008 data was conducted by the ETC ACM<sup>48</sup> in 2010/11. The main burden observed was inconsistent and incomplete information (address, name of plant) reported under the LCP Directive.

The LCP emission inventory 2008 contains information on 3,232 boilers with a thermal capacity of 50 MW and more. 2,098 (65 %) of these plants could be linked with an E-PRTR facility.

<sup>48</sup> Comparison of LCP and E-PRTR facilities covering 2008 datasets; ETC ACM working paper 2010

807 (5 %) of E-PRTR 2008 facilities that reported under activity 1.(c) could be not linked with any of the reported LCPs. This indicates a significant gap (up to 25%) in reporting under the LCP Directive.

On the other hand, 276 LCPs (from 1,134 LCPs not linked to E-PRTR facilities) reported NO<sub>x</sub> emissions<sup>49</sup> above the E-PRTR Annex II threshold of 100,000 kg. For 14 countries (Austria, Belgium, Estonia, Germany, Greece, France, Italy, Hungary, Latvia, Portugal, Slovakia, Spain, Sweden, United Kingdom) it was not possible to link all LCPs which reported NO<sub>x</sub> emissions equal or higher than 100,000 kg (E-PRTR threshold) and SO<sub>x</sub> emissions higher than 150,000 kg with the corresponding E-PRTR facilities. These findings might indicate potential gaps in the E-PRTR 2008 dataset. However, because of missing/incomplete information on LCPs (address, name of plant) the number of not reported E-PRTR facilities will probably be less than 276.

Conclusion: The LCP data set is not ideal for the completeness assessment of E-PRTR because the plants cannot be easily linked.

Recommendation: LCP reporting format needs standardisation and should include the E-PRTR facility ID to be used in the future E-PRTR reviews.

## 6) Correlation of air emissions with statistical data

In the following the results from a comparison of air releases with Eurostat statistics are presented.

### 7.(a) Pig farms

Under E-PRTR pig farms are the most important key source for ammonia emissions. A comparison of the number of facilities with NACE 01.46 Raising of swine/pigs and the number of pigs<sup>50</sup> has been made for the years 2008 and 2009. The number of pigs per facility was calculated in the last two columns of Table 66

**Table 66: Number of pig farms, number of pigs and number of pigs per facility for the years 2008 and 2009**

|                | Number of E-PRTR facilities (pig farms) |       | Number of pigs (1000) |        | 1000 pigs/farm |      |
|----------------|---|-------|-----------------------|--------|----------------|------|
|                | 2008                                    | 2009  | 2008                  | 2009   | 2008           | 2009 |
| France         | 279                                     | 296   | 14,915                | 14 552 | 53             | 49   |
| Belgium        | 69                                      | 58    | 6,263                 | 6 321  | 91             | 109  |
| Bulgaria       | 19                                      | 20    |                       | 664    |                | 33   |
| Cyprus         | 36                                      | 35    |                       |        |                |      |
| Czech Republic | 143                                     | 113   | 2,135                 | 3 827  | 15             | 34   |
| Germany        | 289                                     | 247   | 26,687                |        | 92             |      |
| Denmark        | 39                                      | 46    | 12,195                | 12 873 | 313            | 280  |
| Estonia        | 11                                      | 12    |                       | 364    |                | 30   |
| Spain          | 1,122                                   | 1,303 | 26,026                |        | 23             |      |
| Finland        | 36                                      | 19    | 1,400                 | 1 353  | 39             | 71   |
| Greece         | 2                                       | 2     | 1,087                 |        | 543            |      |
| Hungary        | 187                                     | 183   | 3,383                 | 3 247  | 18             | 18   |
| Ireland        | 54                                      | 53    | 1,605                 |        | 30             |      |

<sup>49</sup> A few facilities having SO<sub>x</sub> emissions above E-PRTR Annex II threshold (150,000kg) had also NO<sub>x</sub> emissions above E-PRTR threshold, therefore NO<sub>x</sub> emissions have been selected as criterion.

<sup>50</sup> Source: EUROSTAT agriculture animals statistics.



|                |     |     |        |        |     |     |
|----------------|-----|-----|--------|--------|-----|-----|
| Iceland        | 2   | 2   |        |        |     |     |
| Italy          | 315 | 330 |        | 18 314 |     | 55  |
| Lithuania      | 34  | 29  | 897    | 928    | 26  | 32  |
| Latvia         | 7   | 7   | 384    | 377    | 55  | 54  |
| Netherlands    | 22  | 31  | 11,735 | 12 108 | 533 | 391 |
| Poland         | 32  | 28  | 14,242 |        | 445 |     |
| Portugal       | 79  | 73  | 2,340  | 2 325  | 30  | 32  |
| Romania        | 85  | 100 | 6,174  | 5 793  | 73  | 58  |
| Sweden         | 13  | 18  | 1,703  | 1 529  | 131 | 85  |
| Slovenia       | 7   | 5   | 432    | 415    | 62  | 83  |
| Slovakia       | 27  | 27  | 749    | 741    | 28  | 27  |
| United Kingdom | 130 | 139 | 4,550  | 4 601  | 35  | 33  |

The calculated number of pigs per pig farm shows a very different picture. For countries with large pig production (France, Germany, Denmark, Spain, Netherlands, Poland) the ratio is between 23,000 pigs and 533,000 pigs per reported facility. In case of the Netherlands and Poland all facilities reported ammonia releases that are very close to the threshold with a maximum of four times the threshold (10,000 kg) while facilities from other countries report up to 983,000 kg of Ammonia. This indicates that not only the farm size but also the emissions estimation methods differ significantly between countries. In case of the Netherlands and Poland the threshold for Ammonia should be much lower to cover 90% of releases from pig farms.

#### ***Paper and wood production and processing***

A comparison of CO<sub>2</sub> emissions from the pulp and paper industries with production data has been performed. The comparison is limited because wood pulp production<sup>51</sup> is only available for the year 2006. Table 67 shows the results of the comparison of CO<sub>2</sub> emissions from NACE 17.11 Manufacture of pulp and NACE 17.12 Manufacture of paper and paperboard with wood pulp production.

**Table 67: Wood pulp production, CO<sub>2</sub> emissions from pulp and paper industry and CO<sub>2</sub> emissions per tonne of wood pulp for the year 2007**

| <b>Country</b> | <b>Wood pulp 2006<br/>(kt)</b> | <b>CO<sub>2</sub> 2007</b> | <b>t CO<sub>2</sub>/t pulp</b> |
|----------------|--------------------------------|----------------------------|--------------------------------|
| Finland        | 13,067                         | 23,561                     | 1.8                            |
| Sweden         | 12,240                         | 22,679                     | 1.9                            |
| Germany        | 2,938                          | 6,895                      | 2.3                            |
| France         | 2,408                          | 6,107                      | 2.5                            |
| Norway         | 2,303                          | 1,127                      | 0.5                            |
| Spain          | 2,104                          | 2,078                      | 1                              |
| Portugal       | 2,065                          | 0                          | -                              |
| Austria        | 1,928                          | 2,514                      | 1.3                            |
| Poland         | 1,061                          | 964                        | 0.9                            |
| Czech republic | 762                            | 1,512                      | 2                              |
| Slovakia       | 626                            | 605                        | 1                              |
| Belgium        | 509                            | 1,248                      | 2.5                            |
| Italy          | 502                            | 1,329                      | 2.6                            |

<sup>51</sup> Source: EUROSTAT Statistics in focus 48/2008. Production and trade of wood products in 2006.

|                |     |     |     |
|----------------|-----|-----|-----|
| United Kingdom | 287 | 494 | 1.7 |
| Switzerland    | 239 | 61  | 0.3 |
| Romania        | 148 | 0   | 0   |
| Estonia        | 136 | -   | -   |
| Bulgaria       | 135 | 503 | 3.7 |
| Slovenia       | 112 | 197 | 1.8 |
| Netherland     | 109 | 879 | 8.1 |
| Croatia        | 107 | -   | -   |

The calculated ratios show that for the large producers Finland and Sweden the ratio is between 1.8 – 1.9 t CO<sub>2</sub>/t wood pulp which looks quite consistent. In case of countries with lower production the ratios have a wider range. It has to be considered that CO<sub>2</sub> emissions also include emissions from paper and paper board production.

### **NACE 6.10 and 6.20 Extraction of crude petroleum and natural gas**

At the following the completeness of facilities reported under NACE 6.10 Extraction of crude petroleum and NACE 6.20 Extraction of natural gas has been assessed.

The following table shows the number of facilities reporting under NACE 6.10 Extraction of crude petroleum.

**Table 68: Number of facilities reporting under “NACE 6.10 Extraction of crude petroleum” for the year 2009.**

| Country        | Number of facilities | Number of re-releases into air |
|----------------|----------------------|--------------------------------|
| Czech Republic | 2                    |                                |
| Estonia        | 4                    | 2                              |
| Hungary        | 22                   |                                |
| Italy          | 9                    | 6                              |
| Poland         | 4                    |                                |
| United Kingdom | 94                   | 356                            |

The United Kingdom reports a high number of releases into air, most of them are main pollutants (CH<sub>4</sub>, CO<sub>2</sub>, N<sub>2</sub>O, NO<sub>x</sub>, NMVOC). A comparison with “primary production of crude oil”<sup>52</sup> shows that e.g. the United Kingdom has a crude oil production of 69.1 million t in 2009. Norway has the highest crude oil production (111.2 million t) but does not report any facilities under this NACE code. Also Denmark has a notable crude oil production of 13.2 million t but no reporting under the corresponding NACE.

The following table shows the number of facilities reporting under NACE 6.20 Extraction of natural gas.

**Table 69: Number of facilities reporting under “NACE 6.20 Extraction of natural gas” for the year 2009.**

| Country | Number of facilities | Number of re-releases into air | Natural gas production (mio t) |
|---------|----------------------|--------------------------------|--------------------------------|
| Hungary | 31                   | 2                              | 2.3                            |

<sup>52</sup> Source: Eurostat online database

|                |    |    |      |
|----------------|----|----|------|
| Italy          | 38 | 5  | 6.6  |
| Netherlands    | 9  | 10 | 56.4 |
| Norway         | 4  | 27 | 90.7 |
| Poland         | 37 | 14 | 3.7  |
| United Kingdom | 3  | 15 | 53.7 |

A comparison with “primary production of natural gas”<sup>53</sup> shows that reporting is not homogenous between countries. Some countries with notable natural gas production like Denmark (7.5 mio t) and Germany (11.1 mio t) again do not report under the corresponding NACE.

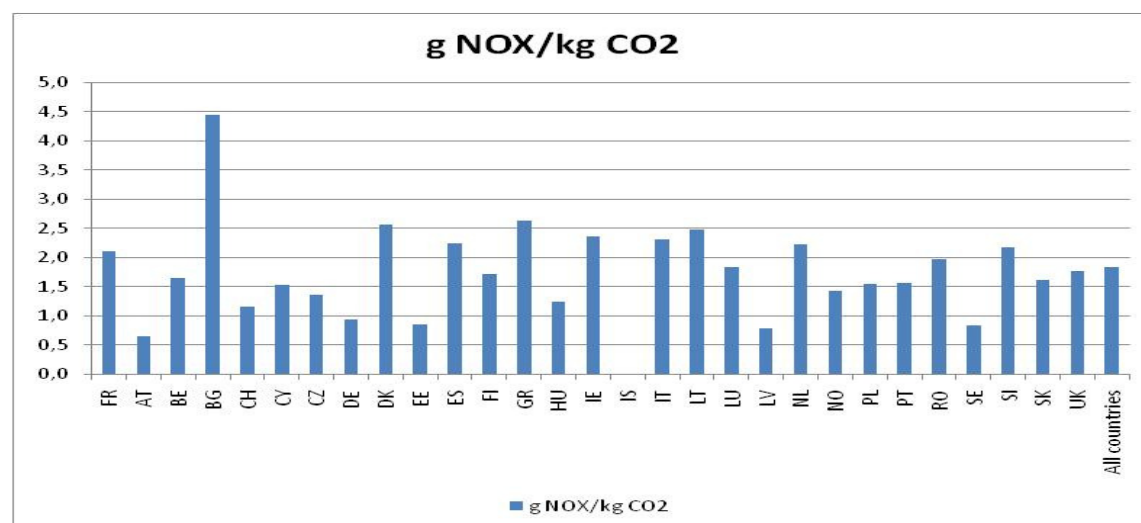
It seems that only a few countries consider crude oil and natural gas extraction as an activity included under the E-PRTR regulation. Reporting of countries with comparable production is very inhomogeneous.

## 7) Cross pollutant analysis of air releases by NACE codes

### 3.(c) Cement and lime production

The ratio of g NO<sub>x</sub> per kg CO<sub>2</sub> for activity 3.(c) has been calculated. The figure below shows the result.

Figure 17: 3.(c) Cement and lime production - NO<sub>x</sub> to CO<sub>2</sub> ratio



The NO<sub>x</sub>/CO<sub>2</sub> ratio for Austria is quite low and the ratio of Bulgaria is quite high which is possibly due to misreporting of a single facility. For most large producers (France, Belgium, Spain, Italy, Poland, Portugal, United Kingdom) the ratio is between 1.6 – 2.2 g NO<sub>x</sub>/kg CO<sub>2</sub> except for Germany, which has a ratio of 0.7 g NO<sub>x</sub>/kg CO<sub>2</sub>.

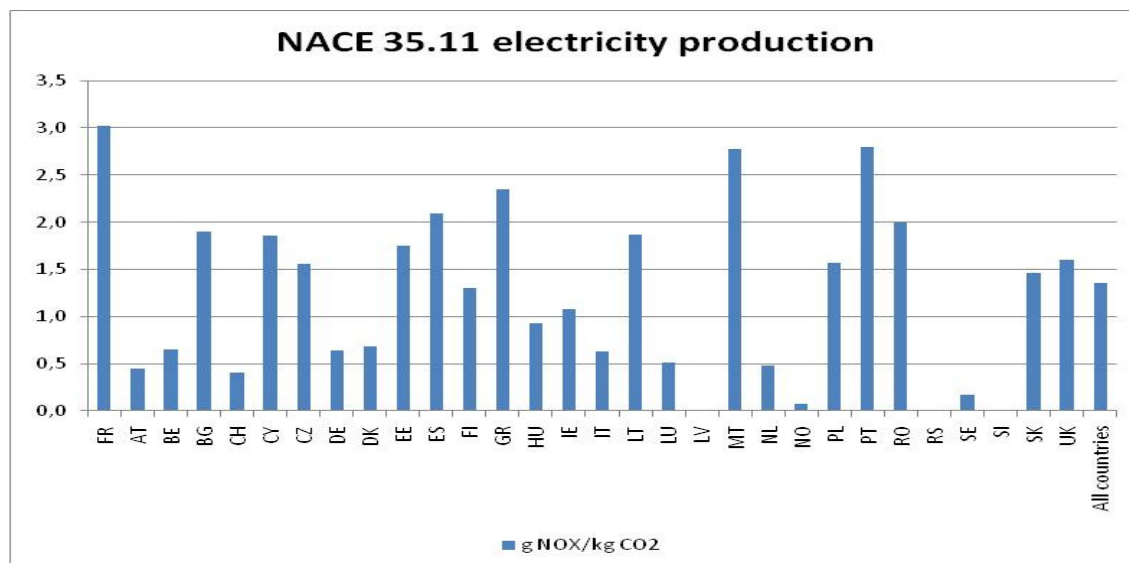
Conclusion: Considering that different abatement NO<sub>x</sub> technologies are applied the reporting looks consistent.

### Electricity production

The ratio for NO<sub>x</sub>/CO<sub>2</sub> has been calculated for NACE 35.11 Production of electricity.

<sup>53</sup> Source: Eurostat online database

**Figure 18: Electricity production - NO<sub>x</sub> to CO<sub>2</sub> ratio**



The NO<sub>x</sub>/CO<sub>2</sub> ratios from electricity production show a high variation from 0.1 – 3.0 g NO<sub>x</sub>/kg CO<sub>2</sub>. However, for countries (BG, CZ, DE, EE, GR, PL, RO, SI) which mainly (more than 60%) use coal for electricity production<sup>54</sup>, the ratio is between 1.6 and 2.4 g NO<sub>x</sub>/kg CO<sub>2</sub> except for Germany, which only reports 0.6 g NO<sub>x</sub>/kg CO<sub>2</sub>. The ratio for the United Kingdom and Spain, which reported the highest NO<sub>x</sub> emissions in 2009 and which also have high coal consumption, lies also within this range.

Conclusion: Considering that different NO<sub>x</sub> abatement technologies are applied the reporting looks consistent.

## Releases and Transfers to Water

### 1. Identification of potential outliers

The release and transfer reports identified as high outliers and have been excluded from the various steps of the assessment are summarised in Table 72.

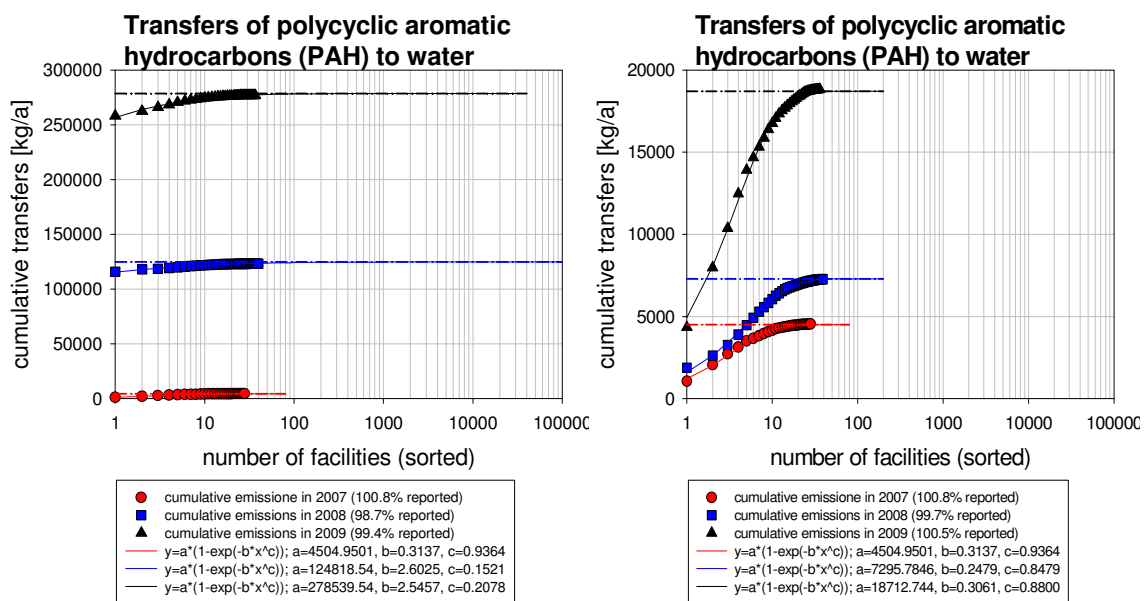
### 2. Identification of potential outliers by application of the cumulative Weibull function to releases and transfers into water

All pollutants, for which ten or more release/transfer reports were available, were assessed by application of the cumulative Weibull distribution in order to identify potential outliers. All release and transfer reports are used in this assessment. Parameter b of the cumulative Weibull distribution is an indicator of the highest release/transfer report in relation to the extrapolated maximum. Release/transfer reports are defined as potential outliers if the highest calculated release/transfer report (x=1) amounts to 75% or more of the total extrapolated release/transfer amount. This total extrapolated maximum emission is expressed by parameter a. The criterion is met, if the b-value obtained by the regression is higher than 1.4 (for details on the cumulative Weibull function refer to Appendix 6).

The following example shows that possible outliers may have a significant influence on the result. With the cumulative Weibull function some outliers have been identified. The potential outliers lead to a falsification of the curve fitting and thus to a wrong conclusion on the coverage. An example for the releases of chromium and its compounds into water is shown in Figure 24 and another example for transfers of polycyclic aromatic hydrocarbons into water is shown in Figure 19.

<sup>54</sup> Eurostat energy statistics 2012

**Figure 19: Results of the curve fitting including all transfer reports (left figure) and without the potential outliers (right figure)**



The table (Table 70) summarises pollutants for which potential outliers were identified during the threshold analysis and excluded for further analysis. The threshold analysis only considers those pollutants, for which at least ten release/transfer reports are available.

**Table 70: List of pollutants, potentially influenced by outliers**

| Pollutants potentially influenced by outliers | Releases to water |      |      | Transfers to water |      |      |
|---|-------------------|------|------|--------------------|------|------|
|   | 2007              | 2008 | 2009 | 2007               | 2008 | 2009 |
| BENZO(G,H,I)PERYLENE                          | 1                 |      |      |                    |      |      |
| CR AND COMPOUNDS                              |                   | 1    |      |                    |      |      |
| FLUORANTHENE                                  | 1                 | 1    |      |                    |      |      |
| CHLORO-ALKANES (C10-13)                       |                   |      | 1    |                    |      |      |
| ORGANOTIN - COMPOUNDS                         |                   |      | 1    |                    |      |      |
| PCDD+PCDF (DIOXINS+FURANS)                    |                   |      | 2    |                    | 2    | 1    |
| AS AND COMPOUNDS                              |                   |      |      | 1                  | 1    | 2    |
| PB AND COMPOUNDS                              |                   |      |      | 1                  | 1    | 1    |
| NI AND COMPOUNDS                              |                   |      |      |                    |      | 1    |
| ZN AND COMPOUNDS                              |                   |      |      |                    |      | 1    |
| POLYCYCLIC AROMATIC HYDROCARBONS              |                   |      |      |                    | 1    | 1    |
| DICHLOROETHANE-1,2 (DCE)                      |                   |      |      |                    |      | 1    |
| TETRACHLOROETHYLENE (PER)                     |                   |      |      |                    |      | 1    |
| TRICHLOROETHYLENE (TRI)                       |                   |      |      |                    | 1    |      |

As indicated above for trichloroethylene (TRI), also the uncertainty linked to the estimation of the total release amount (parameter a of the cumulative Weibull function) indicates the presence of potential outliers. Besides for TRI also for anthracen, trichlorobenzenes (TCB) and benzo-g,h,i-perylen releases to water, very high standard errors for the parameter a estimate were obtained

during the regression. The estimated total released quantities and the associated uncertainties are summarised in Table 71.

**Table 71: Results of the regression for releases of anthracen, trichlorobenzenes (TCB) and benzo-g,h,i-perylen into water: standard error of the extrapolated total released amount**

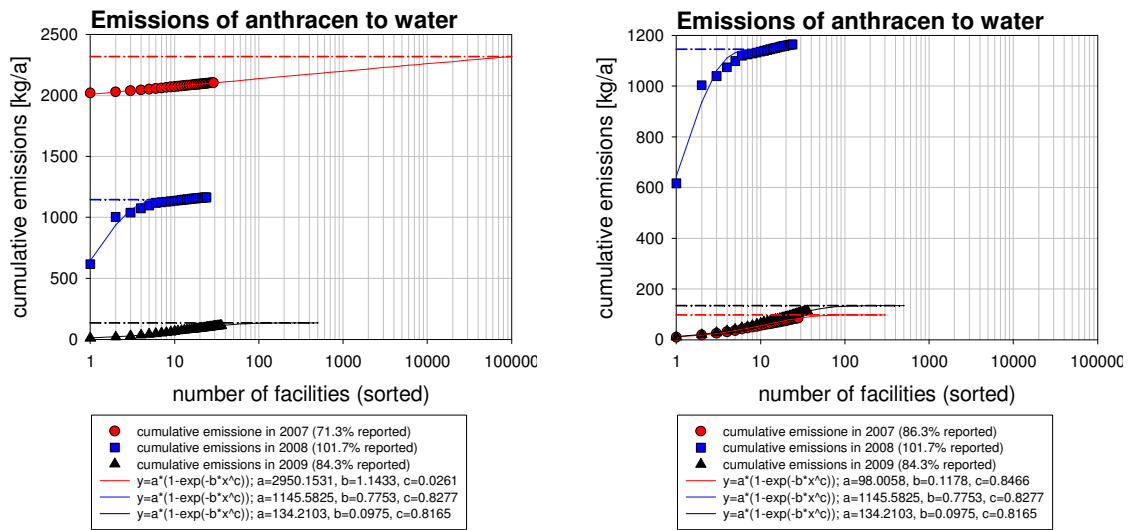
| Pollutant           | Extrapolated totals [kg/y] |          |        | Standard error SE [kg/y] |                |                |
|---------------------|----------------------------|----------|--------|--------------------------|----------------|----------------|
|                     | 2007                       | 2008     | 2009   | 2007                     | 2008           | 2009           |
| ANTHRACEN           | 2,950.15                   | 1,145.58 | 134.21 | 1,828.00<br>(62%)        | 5.36 (0.47%)   | 2.90<br>(2.2%) |
| TRICHLOROBENEZENS   | 2,206.15                   | 1,038.84 | 783.99 | 7.06<br>(0.3%)           | 351.83 (34%)   | 6.78<br>(0.9%) |
| BENZO(G,H,I)PERYLEN | 293.22                     | 1,339.01 | 164.62 | 4.63<br>(1.6%)           | 2215.03 (165%) | 3.17<br>(2.0%) |

For anthracen the reporting year 2007 seems to be influenced by a potential outlier, which contributes to 96% of the overall releases from all countries. Removing the potential outlier the curves for the reporting years 2007 and 2009 are comparable from their shape as well as referring to the extrapolated maximum but there is a notable difference compared to the reporting year 2008 (see Figure 20).

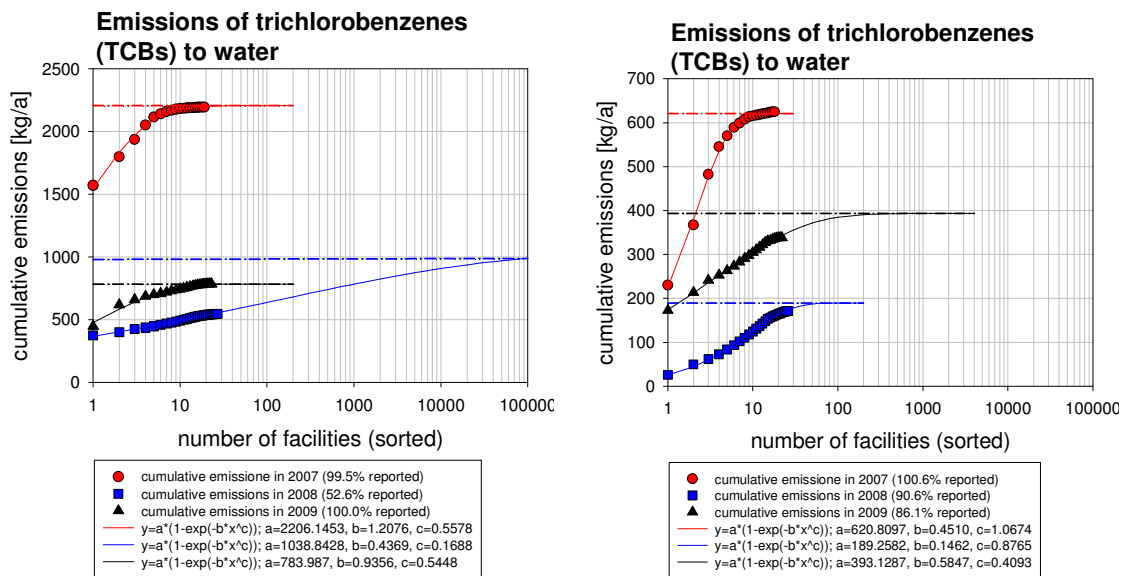
A similar distribution as for anthracen is also observed for benzo-g,h,i-perylen. One facility reports this pollutant for all three reporting years, contribution to 80% (230 kg/y in 2007), 88% (539 kg/y in 2008) and 1.2% (2 kg/y in 2009) to the total releases.

For trichlorobenzenes (TCB) an assessment is more difficult. From the statistical evaluation the standard error determined for the reporting year 2008 for the total released quantity would hint to a potential outlier, but not for the other two reporting years. The highest reported releases derive from one facility, which contributes with 72% (2007), 69% (2008) and 57% (2009) to the total releases. Trichlorobenzenes are subjected to restrictions on marketing and use and according to directive 2005/59/EC they are not to be placed on the market or used as a substance or constituent of preparations in a concentration equal to or higher than 0,1 % by mass for all uses except as an intermediate of synthesis, or as a process solvent in closed chemical applications for chlorination reactions or in the manufacture of 1,3,5-trinitro-2,4,6-triaminobenzene (TATB). The facility reporting the highest emissions reports under subsector 4.(a) industrial scale production of base organic chemicals and it is not possible to assess whether these emissions could be potential outliers or not. The results for the curve fitting for both cases (with consideration of the emissions from the one facility and without consideration of those emissions) are shown in Figure 21.

**Figure 20:** Curve fitting for anthracen releases to water: including all release reports (left figures), without potential outliers (right figures)



**Figure 21:** Curve fitting for trichlorobenzene releases to water: including all release reports (left figures), without the reported emissions from one facility contribution to large extents to the total release amounts (right figures)



**Table 72: List of potential outliers for releases/transfers into water identified by applying the cumulative Weibull function**

| Country | Year | FacilityID | Medium            | FacilityName   | MainActivity | Pollutant                              | Remark                         | Rationale                                 |
|---------|------|------------|-------------------|--|--------------|--|--------------------------------|---|
| PL      | 2007 | 214        | Transfer in water | KGHM POLSKA MIEDŹ S.A.,<br>Huta Miedzi GŁOGÓW                              | 2.(e)        | AS AND COMPOUNDS                       | 81.80% all countries share     | Identified in step 1, confirmed by step 2 |
| NL      | 2007 | 5934       | Transfer in water | Akzo Nobel Chemicals BV<br>(Chemie Park Delfzijl)                          | 4.(b)        | HEXACHLOROCYCLOH<br>EXANE(HCH)         | 99.9% all country share        | Identified in step 1, confirmed by step 2 |
| AT      | 2007 | 110571     | Transfer in water | Chemson Polymer Additive AG  | 4.(b)        | PB AND COMPOUNDS                       | 76% all country share          | Identified in step 1, confirmed by step 2 |
| IT      | 2007 | 114853     | Transfer in water | STABILIMENTO DI CASELLE<br>NORD  | 2.(f)        | TETRACHLOROETHYL<br>ENE (PER)          | 99% all country share          | Expert judgement                          |
| PL      | 2008 | 214        | Transfer in water | KGHM POLSKA MIEDŹ S.A.,<br>Huta Miedzi GŁOGÓW                              | 2.(e)        | AS AND COMPOUNDS                       | 92.78% all countries share.    | Identified in step 1, confirmed by step 2 |
| AT      | 2008 | 110571     | Transfer in water | Chemson Polymer Additive AG  | 4.(b)        | PB AND COMPOUNDS                       | 76% all country share          | Identified in step 1, confirmed by step 2 |
| ES      | 2008 | 9059       | Transfer in water | MANCOMUNIDAD MUNICIPAL<br>DE SAN MARCOS, C.L.<br>(VERTEDERO DE AIZMENDI)   | 5.(d)        | PCDD+PCDF<br>(DIOXINS+FURANS)          | 93% all country share          | Identified in step 1, confirmed by step 2 |
| IT      | 2008 | 117581     | Transfer in water | Priolo Servizi S.C.p.A.  | 5.(a)        | POLYCYCLIC<br>AROMATIC<br>HYDROCARBONS | 94% all country share          | Identified in step 1, confirmed by step 2 |
| ES      | 2008 | 132129     | Transfer in water | UNION EXPLOSIVOS-ENSIGN<br>BICKFORD SISTEMAS DE<br>INICIACION , S.L. (UEB) | 4.(f)        | TRICHLOROETHYLENE<br>(TRI)             | 99.7% all country share        | Identified in step 1, confirmed by step 2 |
| AT      | 2008 | 5763       | Transfer in water | Lenzing AG   | 4.(a)        | ZN AND COMPOUNDS                       | 69.20% share.                  | Identified in step 1                      |
| PL      | 2009 | 214        | Transfer in water | KGHM POLSKA MIEDŹ S.A.,<br>Huta Miedzi GŁOGÓW                              | 2.(e)        | AS AND COMPOUNDS                       | 82.71% all countries share.    | Identified in step 1, confirmed by step 2 |
| RO      | 2009 | 99285      | Transfer in water | SC PUROLITE SRL  | 4.(a)        | DICHLOROETHANE-1,2<br>(DCE)            | 88% all country share          | Identified in step 2                      |
| UK      | 2009 | 128797     | Transfer in water | Precision Disc Castings Ltd  | 2.(b)        | NI AND COMPOUNDS                       | All country share 2009 is 99%. | Identified in step 1, confirmed by step 2 |



| Country | Year | FacilityID | Medium            | FacilityName                               | MainActivity | Pollutant                        | Remark   | Rationale                                 |
|---------|------|------------|-------------------|--|--------------|----------------------------------|--|---|
| UK      | 2009 | 128797     | Transfer in water | Precision Disc Castings Ltd                | 2.(b)        | PB AND COMPOUNDS                 | All country share 2009 is 99.7%.                               | Identified in step 1, confirmed by step 2 |
| FR      | 2009 | 1217       | Transfer in water | Usine d'incinération des ordures ménagères | 5.(b)        | PCDD+PCDF (DIOXINS+FURANS)       | All country share is 99.5%                                     | Identified in step 1                      |
| IT      | 2009 | 119977     | Transfer in water | Priolo Servizi S.C.p.A.                    | 5.(a)        | POLYCYCLIC AROMATIC HYDROCARBONS | 93% all country share.   | Identified in step 1, confirmed by step 2 |
| IT      | 2009 | 119312     | Transfer in water | STABILIMENTO DI CASELLE NORD               | 2.(f)        | TETRACHLOROETHYLENE (PER)        | 92% all country share.   | Identified in step 2                      |
| IT      | 2009 | 119977     | Transfer in water | Priolo Servizi S.C.p.A.                    | 5.(a)        | TOTAL ORGANIC CARBON (TOC)       | 50% all country share.   | Identified in step 1, confirmed by step 2 |
| UK      | 2009 | 128797     | Transfer in water | Precision Disc Castings Ltd                | 2.(b)        | ZN AND COMPOUNDS                 | All country share 2009 is 95%.                                 | Identified in step 1, confirmed by step 2 |
| SE      | 2007 | 7917       | Water             | Kubikenborg Aluminium AB                   | 2.(e)        | BENZO(G,H,I)PERYLENE             | 80% all country share.   | Identified in step 2                      |
| SE      | 2007 | 7917       | Water             | Kubikenborg Aluminium AB                   | 2.(e)        | FLUORANTHENE                     | 98% all country share.   | Identified in step 1, confirmed by step 2 |
| BE      | 2008 | 130760     | Water             | Station d'épuration De Bruxelles Nord      | 5.(f)        | CR AND COMPOUNDS                 | All country share 2008 is 93%. Reported 2008 only.             | Identified in step 1, confirmed by step 2 |
| SE      | 2008 | 7917       | Water             | Kubikenborg Aluminium AB                   | 2.(e)        | FLUORANTHENE                     | 97% all country share.   | Identified in step 2                      |
| BE      | 2009 | 98662      | Water             | ARCELORMITTAL RINGMILL                     | 2.(c)        | CHLORO-ALKANES (C10-13)          | 79% all country share.   | Identified in step 2                      |
| FR      | 2009 | 103820     | Water             | STEP - Seine-centre                        | 5.(f)        | ORGANOTIN - COMPOUNDS            | 85% all country share.   | Identified in step 2                      |
| SK      | 2009 | 10251      | Water             | U.S.Steel s.r.o.                           | 2.(b)        | PCDD+PCDF (DIOXINS+FURANS)       | All country share 2009 is 85%. Not reported in previous years. | Identified in step 1, confirmed by step 2 |
| UK      | 2009 | 130107     | Water             | Plastic Omnium Automotive Ltd.             | 2.(f)        | TRIBUTYLTIN AND COMPOUNDS        | 99.8% all country share.                                       | Identified in step 1                      |

### 3. Identification of major source activities and of very minor sources

#### Releases to water

Some pollutants listed in Annex II of the E-PRTR Regulation are reported predominantly by facilities from specific E-PRTR Annex I activities. Those pollutants for which one activity contributes to more than 80% to the total reported releases are summarised in Table 73. Only those pollutants are considered for which more than 10 release reports are available.

**Table 73: Identification of major sources for pollutant releases to water (2007-2009)**

| Pollutant                                     | Main activity | Remarks  |
|---|---------------|--|
| BENZENE<br>ETHYLBENZENE<br>TOLUENE<br>XYLENES | 1.(c)         | Not reported by activities 1.(d), 3.(e), 3.(f), 4.(c), 5.(b), 9.(a), 9.(e) although listed in the indicative list in Annex 5 of the E-PRTR guidance<br>Activity 1.(c) not indicated in the list in Annex 5 of the E-PRTR guidance<br>Only reported by facilities from the United Kingdom<br>Incomplete reporting as only reported by facilities from the United Kingdom  |
| NAPHTHALIN                                    | 1.(c)         | Not reported by activities 5.(a), 6.(c) although listed in the indicative list in Annex 5 of the E-PRTR guidance<br>Activity 1.(c) not indicated in the list in Annex 5 of the E-PRTR guidance<br>Only reported by facilities from the United Kingdom<br>Incomplete reporting as only reported by facilities from the United Kingdom   |
| VINYL CHLORIDE                                | 4.(a)         | Not reported by activities 4.(d), 4.(f) although listed in the indicative list in Annex 5 of the E-PRTR guidance   |
| ASBESTOS                                      | 5.(f)         | Not reported by facilities from activities listed in the indicative list in Annex 5 of the E-PRTR guidance<br>Activity 5.(f) not indicated in the list in Annex 5 of the E-PRTR guidance<br>Only reported by facilities from the United Kingdom<br>Incomplete reporting as only reported by facilities from the United Kingdom   |
| DEHP  | 5.(f)         | Not reported by activities 1.(d), 4.(d), 4.(e), 6.(c), 9.(c), 9.(e) although listed in the indicative list in Annex 5 of the E-PRTR guidance<br>Number of release reports from activity 5.(f) facilities increasing (67 in 2007, 159 in 2008 and 213 in 2009)<br>Incomplete reporting as assumed as approx. 1,400 UWWTPs with a treatment capacity or an incoming load of more than 100,000 pe are included in the UWWTD database, but only 213 of them report releases of DEHP to water |
| DIURON  | 5.(f)         | Not reported by activities 4.(a), 4.(d), 5.(a), 5.(d), 5.(g) although listed in the indicative list in Annex 5 of the E-PRTR guidance  |
| ISOPROTURON                                   | 5.(f)         | Not reported by activities 4.(a), 5.(a), 5.(d), 5.(g) although listed in the indicative list in Annex 5 of the E-PRTR guidance<br>Authorised as herbicide in 20 Member States<br>Only reported by a few facilities, incomplete reporting assumed   |
| NONYLPHENOLS                                  | 5.(f)         | Not reported by activities 9.(b), 9.(d), 9.(e) although listed in the indicative list in Annex 5 of the E-PRTR guidance<br>More than 60 % of reporting 5.(f) facilities originate from the Unit-   |

| Pollutant                 | Main activity | Remarks  |
|---------------------------|---------------|--|
|                           |               | ed Kingdom   |
| POLYCHLORINATED BIPHENYLS | 5.(f)         | Not reported by activities 5.(g), 9.(e) although listed in the indicative list in Annex 5 of the E-PRTR guidance<br>Only reported by a few facilities, incomplete reporting probable |

Benzene, ethylbenzene, toluene, xylenes and naphthalene are reported only from facilities reporting under main activity 1.(c) from the United Kingdom. The E-PRTR database includes 1696 E-PRTR facilities reporting under main activity 1.(c) in 2009 and about 2633 IPPC permits exist. The United Kingdom contributes to approximately 11% to the facilities reporting in E-PRTR under main activity 1.(c) and hold approx. 13% of the respective IPPC permits. These numbers confirm the conclusion that an incomplete reporting is assumed for these pollutants from activity 1.(c). As the activity is not listed in the indicative list in Annex 5 of the E-PRTR Guidance Document the list should be revised and the activity should be added.

Vinyl chloride is mainly reported from facilities with main activity 4.(a). As the indicative list in Annex 5 of the E-PRTR Guidance Document does not include this activity the list should be revised and the activity added to the list.

Asbestos releases are reported for urban wastewater treatment plants in the United Kingdom. According to the UWWTD database more than 1,300 urban wastewater treatment plants with an incoming load or a treatment capacity of more than 100,000 population equivalents are registered in the European Union. The United Kingdom contributes 157 urban wastewater treatment plants (approximately 12%). It is to be expected that also other wastewater treatment plants outside the United Kingdom will exceed the E-PRTR reporting thresholds and therefore the reporting is considered as not complete<sup>55</sup>. This is also the case for other pollutants mainly released by facilities with main activity 5.(f) as DEHP, polychlorinated byphenyls, isoproturon and others. There is a lack of information as these pollutants are not monitored regularly in the effluents of urban wastewater treatment plants.

For 17 E-PRTR Annex II pollutants less than ten release reports are available for all reporting years and most of them are either banned, not authorized in Europe or severely restricted concerning their use and placing on the market. For an additional ten pollutants less than ten release reports are available for one or two years. Theoretically for those years the statistical evaluation could be performed, but considering the fact that the number of available release reports only slightly exceeds ten and that the substances are strongly regulated, the statistical evaluation is not suitable. These 27 substances are listed in Table 74.

**Table 74: List of substances with fewer than ten release or transfer reports to water (x...less than ten reports available for 2007, 2008 and 2009, (x)...less than ten reports available for 2007, 2008 or 2009)**

| Pollutant | Releases to water |      |      | Remark |                                       |
|-----------|-------------------|------|------|--------|---------------------------------------|
|           | 2007              | 2008 | 2009 |        |                                       |
| ALACHLOR  | x                 | 3    | 3    | 4      | not authorised in Europe, 2006/966/EC |

<sup>55</sup> It can be assumed that municipal wastewater has a comparable composition across countries. This has already been proven by summary parameters such as COD, total nitrogen and/or total phosphorus. In addition, it can be assumed that releases from construction materials, consumer products and commercial/industrial facilities are comparable across different catchment areas. Nevertheless, differences may and will occur due to local influences. Specific industrial activities may contribute significantly to specific pollutant releases.

| Pollutant                   | Releases to water |      |      | Remark |   |
|-----------------------------|-------------------|------|------|--------|---|
|                             | 2007              | 2008 | 2009 |        |   |
| ALDRIN                      | x                 | 8    | 7    | 5      | Banned, Regulation (EC) No 850/2004 <sup>56</sup>                                       |
| ATRAZINE                    | (x)               | 16   | 9    | 11     | not authorised in Europe, 2004/248/EC   |
| BROMINATED DIPHENYLETHER    | (x)               | 10   | 7    | 15     | Banned, Regulation (EC) No 850/2004 (Tetra-, penta, hexa and heptabromodiphenyl ethers) |
| CHLORDECONE                 | x                 | -    | 1    | 1      | Banned, Regulation (EC) No 850/2004 <sup>1</sup>  |
| CHLORFENVINPHOS             | x                 | 2    | 2    | 1      | Banned, Regulation (EC) No 850/2004 <sup>1</sup>  |
| CHLORPYRIFOS                | x                 | 3    | 2    | 3      | Authorised in 21 EU Member States   |
| CLORDANE                    | x                 | -    | 1    | -      | Banned, Regulation (EC) No 850/2004 <sup>1</sup>  |
| DDT                         | x                 | 2    | 3    | 3      | Banned, Regulation (EC) No 850/2004 <sup>1</sup>  |
| DIELDRIN                    | (x)               | 11   | 11   | 9      | Banned, Regulation (EC) No 850/2004 <sup>1</sup>  |
| ENDOSULPHAN                 | x                 | 3    | 4    | 4      | not authorised in Europe, 2005/864/EC   |
| ENDRIN                      | x                 | 7    | 9    | 6      | Banned, Regulation (EC) No 850/2004 <sup>1</sup>  |
| ETHYLENE OXIDE              | x                 | -    | -    | 2      | -   |
| HEPTACHLOR                  | x                 | 1    | 1    | 1      | Banned, Regulation (EC) No 850/2004 <sup>1</sup>  |
| HEXABROMOBIPHENYL           | x                 | -    | 3    | 2      | Banned, Regulation (EC) No 850/2004 <sup>1</sup>  |
| HEXACHLORO BENZENE (HCB)    | (x)               | 13   | 6    | 6      | Banned, Regulation (EC) No 850/2004 <sup>1</sup>  |
| HEXACHLOROBUTADIENE (HCBd)  | (x)               | 8    | 11   | 16     | -   |
| HEXACHLOROCYCLOHEXANE (HCH) | (x)               | 10   | 9    | 7      | Banned, Regulation (EC) No 850/2004 <sup>57</sup>                                       |
| ISODRIN                     | (x)               | 11   | 9    | 8      | No information available  |
| LINDANE                     | (x)               | 7    | 12   | 5      | Banned, Regulation (EC) No 850/2004 <sup>1</sup>  |
| MIREX                       | x                 | -    | 1    | -      | Banned, Regulation (EC) No 850/2004 <sup>1</sup>  |
| PENTACHLORO BENZENE         | x                 | 5    | 6    | 5      | Banned, Regulation (EC) No 850/2004 <sup>1</sup>  |
| SIMAZINE                    | (x)               | 11   | 13   | 8      | not authorised in Europe, 2004/247/EC   |
| TOXAPHENE                   | x                 | -    | -    | 2      | Banned, Regulation (EC) No 850/2004 <sup>1</sup>  |
| TRIBUTYLTIN AND COMPOUNDS   | (x)               | 11   | 9    | 9      | Prohibited for use as plant protection product and biocide and strong-                  |

<sup>56</sup> <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:223:0029:0036:EN:PDF>

<sup>57</sup> <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:223:0029:0036:EN:PDF>

| Pollutant                  | Releases to water |      |      | Remark                            |  |
|----------------------------|-------------------|------|------|-----------------------------------|--|
|                            | 2007              | 2008 | 2009 |                                   |  |
|                            |                   |      |      | ly restricted for use in articles |  |
| TRIFLURALIN                | x                 | 2    | 3    | 2                                 | not authorised in Europe,<br>2010/355/EU   |
| TRIPHENYLTIN AND COMPOUNDS | x                 | 4    | 5    | 2                                 | Severely restricted for use as plant<br>protection product and biocide,<br>2009/425/EC |

However, although pollutants are strongly regulated there are still a few release reports, which mainly derive from sector 5 facilities (waste and wastewater management). A potential explanation for these releases is that waste and wastewater treatment facilities receive a mixture of releases from applications, products, industrial and commercial activities within their catchment area. Even if compounds are banned there are old products still in use which may release the pollutants or pollutants are contained in articles below the mass thresholds imposed by the chemicals regulations.

These pollutants will not be considered for the Weibull evaluation. Due to the limited number of release reports the approach is not applicable. As the releases predominantly occur from waste and wastewater facilities they have to be interpreted as “accidental” releases as they depend on the “deposit” within the catchment areas. These deposits are not comparable and no extrapolation to a maximum cumulative discharge (100%) is possible. None of these pollutants are monitored regularly in discharges from urban wastewater treatment plants, although they might be present. As no emission factors for these pollutants from wastewater treatment facilities are available either, no estimation is possible.

For 24 of the 27 pollutants listed in Table 74 the low number of release reports can be explained by the restrictions or bans on their use. Most of these pollutants (18) are not included in the indicative list in Annex 5 of the E-PRTR Regulation for E-PRTR activity 5.(f). Only six pollutants are included. These six pollutants are atrazine, hexachlorobenzene, lindane, simazine, tributyltin compounds and triphenyltin compounds. However, also considering the legal measures on these pollutants there is still a low number of release reports from E-PRTR activity 5.(f) facilities available and due to the limited number the reporting has to be assessed as incomplete. The incomplete reporting is attributed to missing information as the compounds are not regularly monitored in urban wastewater treatment plant effluents. The reporting can be improved by providing guidance on the assessment of the discharge, e.g. by providing emission factors in order to estimate the emissions at least for those compounds which are also included in the indicative list in Annex 5 of the E-PRTR guidance.

In this context the on-going work under the implementation of the Water Framework Directive (WFD, 2000/60/EC) has to be mentioned. According to Article 5 of the Directive 2008/105/EC on Environmental Quality Standards in the Field of Water Policy, Member States (MS) are obliged to establish an inventory of emissions, discharges and losses of all priority substances and pollutants listed in Part A of Annex I to this Directive. For the implementation of the inventory a guidance paper is being drafted by the European Commission in cooperation with MS, in which a tiered approach depending on the availability of data is described. There is a strong linkage between the water data under E-PRTR and this inventory of emissions, discharges and losses as E-PRTR data represents one major input data source to this inventory. In order to fill data gaps and also for quality assurance of the reported discharged loads from point sources (especially from urban wastewater treatment plants) to surface water bodies, the development and application of emission factors is strongly recommended in the draft guidance paper. For harmonisation and consistency of legislation it is recommended that the WFD expert group work with the E-PRTR Art(19) Committee to develop those emission factors. It is expected that the efforts undertaken for the implementation of the WFD will also improve reporting under E-PRTR.

Chlorpyrifos, isoproturon, hexachlorbutadiene and ethylene oxide are not subjected to severe restrictions. Chlorpyrifos is an insecticide authorized in twenty-one Member States in the European Union. Ethylene oxide is an industrial chemical and according to the European Substance Information System (ESIS)<sup>58</sup> it is a high production volume chemical and in ESIS twenty-three producers/importers are listed. Hexachlorbutadiene is an industrial chemical and according to the European Substance Information System (ESIS) it is a low production volume chemical and in ESIS four producers/importers are listed. Hence, for these three substances a higher number of release reports would be expected.

### Transfers to water

Some pollutants listed in Annex II of the E-PRTR regulation are reported predominantly by facilities from specific E-PRTR Annex I activities. Those pollutants for which one activity contributes to more than 80% to the total reported transfers into water are summarised in Table 75. Only those pollutants are considered, for which more than 10 release reports are available.

**Table 75: Identification of major sources for pollutant transfers to water**

| Pollutant        | Main activity | Remarks   |
|------------------|---------------|---|
| BENZENE          | 4.(a)         | Not reported by activities 1.(d), 3.(e), 3.(f), 4.(b), 4.(c), 4.(f), 5.(b), 5.(d), 5.(f), 9.(a), 9.(e) although listed in the indicative list in Annex 5 of the E-PRTR guidance |
| NAPHTHALENE      | 4.(a)         | Not reported by activities 4.(d), 5.(d), 5.(f), 5.(g), 6.(c) although listed in the indicative list in Annex 5 of the E-PRTR guidance   |
| VINYL CHLORIDE   | 4.(a)         | Not reported by activities 4.(d), 4.(f), 5.(a), 5.(g) although listed in the indicative list in Annex 5 of the E-PRTR guidance  |
| AS AND COMPOUNDS | 5.(d)         | Not reported by activities 1.(b), 1.(e), 1.(f), 2.(d), 3.(b), 3.(c), 3.(f), 6.(c), 8.(a), 9.(e) although listed in the indicative list in Annex 5 of the E-PRTR guidance        |

Fewer reports are available for transfers to water than for releases to water. Beside the 27 E-PRTR Annex II pollutants listed in Table 74 also for the pollutants summarised in Table 76 less than 10 transfer reports to water are available.

**Table 76: List of substances, for which less than ten transfer reports to water are available**

| Pollutant  |   | Releases to water |       |        | Remark  |
|------------|---|-------------------|-------|--------|---|
|            |   | 2007              | 2008  | 2009   |   |
| ANTHRACENE | x | 83.91             | 97.7  | 196.72 | PBT (persistent, bioaccumulative and toxic), candidate list for REACH Annex XIV (authorization) <sup>59</sup> |
| ASBESTOS   | x | -                 | 1,830 | 7.8    | Included in REACH Annex XVII (restrictions on marketing and   |

<sup>58</sup> <http://esis.jrc.ec.europa.eu/>

<sup>59</sup> [http://echa.europa.eu/chem\\_data/authorisation\\_process/candidate\\_list\\_table\\_en.asp](http://echa.europa.eu/chem_data/authorisation_process/candidate_list_table_en.asp)

| Pollutant                                | Releases to water |          |           | Remark   |  |
|--|-------------------|----------|-----------|--|--|
|  | 2007              | 2008     | 2009      |  |  |
|  |                   |          |           | use), use prohibited with a few exemptions <sup>60</sup> |  |
| BENZO(G,H,I)PERYLENE                     | x                 | 2.27     | 2.17      | 3.34   | Restrictions on marketing and use 2001/90/EC and 2005/69/EC  |
| CHLORO-ALKANES (C10-13)                  | x                 | 22.3     | 1,903.08  | 39.48  | Included in REACH Annex XVII (restrictions on marketing and use) <sup>61</sup>   |
| DEHP                                     | x                 | 118.73   | 50.16     | 379.38   | Included in REACH Annex XVII (restrictions on marketing and use) <sup>4</sup> and candidate list for REACH Annex XIV (authorisation) <sup>62</sup> |
| DIURON                                   | x                 | 12       | 1.9       | 39.7   | Authorised for use as herbicide in Bulgaria and Spain <sup>63</sup>  |
| ISOPROTURON                              | x                 | -        | -         | -  | Authorised for use as herbicide in most EU Member States <sup>8</sup>  |
| OCTYLPHENOLS AND OCTYLPHENOL ETHOXYLATES | x                 | 4,337.01 | 1,412.33  | 4,122.27   | -  |
| ORGANOTIN - COMPOUNDS                    | x                 | 1,279    | 2,040.2   | 1,868.3  | Ban on use of certain compounds in articles or mixtures where the concentration is greater than 0.1% by weight of tin, 2009/425/EC                 |
| PCDD+PCDF (DIOXINS+FURANS)               | (x)               | 0.0026   | 0.8035    | 76.9757  | -  |
| PENTACHLOROPHENOL (PCP)                  | x                 | 17.53    | 17.97     | 11.05  | Included in REACH Annex XVII (restrictions on marketing and use) <sup>4</sup>  |
| POLYCHLORINATED BIPHENYLS (PCBS)         | x                 | 9.23     | 39.126    | 119.38   | Banned, Regulation (EC) No 850/2004 <sup>64</sup>  |
| TETRACHLOROETHYLENE                      | (x)               | 20,716.4 | 397.1     | 10,675.4   | -  |
| TETRACHLOROMETHANE                       | (x)               | 627.33   | 3484.97   | 625.3  | -  |
| TRICHLOROBENZENES                        | x                 | 67.96    | 112.34    | 203.06   | Included in REACH Annex XVII (restrictions on marketing and use) <sup>4</sup>  |
| TRICHLOROETHYLENE                        | x                 | 97,575.8 | 107,350.4 | 477.8  | -  |

Note: (x)...less than ten reports available for 2007, 2008 and 2009, (x)...less than 10 reports available for 2007, 2008 or 2009)

<sup>60</sup> <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:164:0007:0031:EN:PDF>

<sup>61</sup> <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:164:0007:0031:EN:PDF>

<sup>62</sup> [http://echa.europa.eu/chem\\_data/authorisation\\_process/candidate\\_list\\_table\\_en.asp](http://echa.europa.eu/chem_data/authorisation_process/candidate_list_table_en.asp)

<sup>63</sup> [http://ec.europa.eu/sanco\\_pesticides/public/index.cfm?event=activesubstance\\_detail](http://ec.europa.eu/sanco_pesticides/public/index.cfm?event=activesubstance_detail)

<sup>64</sup> <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:223:0029:0036:EN:PDF>

Most of the substances listed in Table 76 and for which ten or fewer transfer reports are available are subjected to restrictions on marketing and use. Although these regulations provide an explanation for the low number of transfer reports, the list also includes high production volume chemicals (tetrachloroethylene, tetrachloromethane and trichloroethylene) as well as substances which are generated during certain processes (e.g. dioxins or polycyclic aromatic hydrocarbons as anthracene, benzo-g,h,i-perylene during combustion processes).

The European Chemical Substance Information System ESIS<sup>65</sup> lists tetrachloroethylene (PER), tetrachloromethane (TCM) and trichloroethylene (TRI) as high production volume chemicals and provides for each of these pollutants a list of producers/importers. For PER 17 producers/importers are listed, for TCM 15 and for TRI 18 producers/importers.

For these substances as well as for those pollutants, which are generated during production processes a higher number of transfer reports would be expected and the reporting is assessed as incomplete.

#### **4. Analysis of completeness and representativeness**

##### **Cross pollutant check**

##### ***Releases to water***

The results of the cross pollutant checks are reported in the following tables (Table 77-Table 83).

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<sup>65</sup> <http://esis.jrc.ec.europa.eu/>



**Table 77: Results of the cross pollutant check for releases into water – total nitrogen / TOC**

| Main activity | Countries  | ratio   | remark   |
|---------------|--|---------|--|
| 1.(a)         | FR, BE, CH, DE, ES, FI, IT, NL, NO, RO, SK, UK                 | 0.1-1   | 2007 Switzerland and The Netherland observed higher ratios, Italy lower ratios<br>2008 Switzerland observed lower ratios<br>Greece, Hungary and Poland report TOC, but did not report total nitrogen<br>Portugal reports total nitrogen but not TOC in 2008<br>Austria reports total nitrogen but no TOC in 2009 |
| 1.(c)         | FR, AT, BE, CZ, DE, ES, FI, IT, MT, NL, SK, UK                 | 0.1-1   | lower ratios for Finland all three years<br>Poland reports total nitrogen but not TOC<br>Czech Republic, Spain and Portugal report total nitrogen but not TOC in 2009<br>Sweden reports TOC, but did not report total nitrogen   |
| 2.(b)         | FR, BE, DE, ES, FI, IT, NL, SK                                 | 0.8-4   | Austria reports TOC, but did not report total nitrogen<br>Romania and Sweden report total nitrogen, but did not report TOC   |
| 2.(c)         | FR, UK   | 0.6-1.4 | Sweden reports total nitrogen, but did not report TOC  |
| 2.(f)         | DE, ES, IT   | 1-4     | France reports total nitrogen, but not TOC<br>Belgium and the United Kingdom report TOC, but did not report total nitrogen   |
| 3.(a)         | DE, PL   | 0.5-3   | Ireland, Norway and Sweden report total nitrogen, but did not report TOC   |
| 4.(a)         | FR, BE, CZ, DE, ES, FI, HU, IS, IT, NL, NO, PL, PT, SE, SK, UK | 0.1-1   | higher ratios observed for Czech Republic, Norway and Poland   |
| 4.(b)         | FR, BE, BG, DE, ES, IT, NL, NO, PT, SK, UK                     | 1-10    | lower values observed for Belgium and Norway<br>higher values observed for Bulgaria<br>Poland and Finland report total nitrogen, but did not report TOC<br>Romania reports TOC, but did not report total nitrogen  |
| 4.(c)         | BG, CZ, HU, ES, PL   | 1-10    | higher values observed for Poland in 2008 and 2009<br>Belgium, Finland, Greece, Lithuania, The Netherlands, Norway, Romania, Sweden and the United Kingdom report total nitrogen, but did not report TOC   |
| 4.(e)         | CH, ES, IT, SE, SK, UK   | 0.4-3.5 | Slightly lower ratios observed for France in 2008<br>Germany and Hungary report TOC, but did not report total nitrogen<br>Norway reports total nitrogen, but did not report TOC  |
| 5.(a)         | FR, CH, DE, IT, NO   | 0.1-1   | for Norway notably higher ratio in 2007 and notably lower ratio in 2009  |

| Main activity | Countries  | ratio     | remark  |
|---------------|--|-----------|---|
| 5.(b)         | FR, IT, UK   | 0.6-1.9   | -   |
| 5.(c)         | FR, AT, DK, ES, IT, NL, UK                         | 0.3-3     | higher values observed in Italy in 2007   |
| 5.(d)         | BG, DK, FI, IS, IT, NL, NO, PL                     | 0.5-5     | higher ratios in Bulgaria<br>lower ratios in Finland<br>Italy reports total nitrogen, but not TOC in 2009 and reports TOC but not total nitrogen in 2007 and 2008 |
| 5.(e)         | IT, UK   | 0.7-2.7   | -   |
| 5.(f)         | all countries besides IS and NO                    | 0.5-5     | higher ratios in Lithuania<br>lower ratio in Sweden in 2007<br>Norway reports total nitrogen, but not TOC   |
| 5.(g)         | FR, AT, CZ, DE, FI, PL UK                          | 0.1-1     | Lower ratios in Finland in 2009<br>Italy reports total nitrogen, but not TOC<br>Romania reports TOC, but not total nitrogen                                       |
| 6.(a)         | FR, BG, CH, CZ, DE, ES, FI, NO, PL, PT, SE         | 0.01-0.1  | Notably lower ratios for Bulgaria<br>higher ratios for Norway<br>Austria, Estonia, Slovakia and the United Kingdom report TOC, but did not report total nitrogen  |
| 6.(b)         | FR, BG, CH, CZ, DE, ES, FI, HU, IT, PL, PT, SE, SK | 0.02-0.2  | Notably higher values for Bulgaria<br>lower ratios for Switzerland  |
| 7.(b)         | MT, NO, UK   | 0.23-0.44 | Spain and Iceland report total nitrogen, but not TOC  |
| 8.(b)         | FR, AT, BE, DE, ES, GR, IT, NL, NO, SE, UK         | 0.1-1     | Lower values observed for France and Greece in 2008<br>higher values observed for Germany and Norway in 2008  |
| 8.(c)         | FR, DE, LU   | 0.08-0.8  | Italy reported total nitrogen, but no TOC in 2007   |

**Table 78: Results of the cross pollutant check for releases into water – total phosphorus / TOC**

| Main activity | Countries  | ratio      | remark   |
|---------------|--|------------|--|
| 1.(a)         | FR, CH, ES, GR, IT, NL, NO, SK, UK                 | 0.01-0.1   | Switzerland and the United Kingdom lower ratios in 2008 and 2009, The Netherlands higher ratios in 2007<br>Lithuania reports total phosphorus, but not TOC |
| 1.(c)         | FR, BE, CZ, DE, ES, FI, IT, NL, SK, UK             | 0.01-0.1   | Higher ratios observed for Belgium and the United Kingdom<br>lower ratios observed for Finland<br>Portugal reports total phosphorus, but not TOC in 2009   |
| 2.(b)         | DE, ES, IT, NL                                     | 0.01-0.1   | -  |
| 4.(a)         | FR, AT, BE, CZ, DE, ES, IS, IT, NL, NO, UK         | 0.01-0.1   | Higher ratios observed for Norway<br>Lower ratios observed for Iceland<br>Switzerland reports total phosphorus but not TOC                                 |
| 4.(b)         | FR, BE, BG, DE, ES, IT, NL, NO, RO, SK, UK         | 0.01-0.1   | Higher ratios observed for Belgium<br>Lower ratios observed for Norway<br>Austria and Poland report total phosphorus but not TOC                           |
| 4.(e)         | FR, CH, ES, IT, UK                                 | 0.01-0.1   | Lower ratios observed for Switzerland<br>Ireland reports total phosphorus but not TOC  |
| 5.(a)         | FR, CH, DE, IT, NO                                 | 0.01-0.1   | Norway reports lower ratios in 2007 and higher ratios in 2008  |
| 5.(b)         | FR, IT, UK   | 0.02-0.3   | Italy and The Netherlands report total phosphorus but not TOC in 2009  |
| 5.(c)         | AT, DK, ES, IT, NL, UK                             | 0.06-0.3   | Spain and Norway report total phosphorus but not TOC in 2007 and 2008  |
| 5.(d)         | DK, FI, NO, PL                                     | 0.01-0.1   | Lower ratios observed for Switzerland  |
| 5.(f)         | All countries besides NO, IS, MT                   | 0.05-0.5   | Lower ratios observed for Finland and Sweden<br>Higher ratios observed for Lithuania   |
| 5.(g)         | FR, AT, CZ, DE, FI, PL, RO, UK                     | 0.01-0.1   | Lower ratios observed for Austria and Finland<br>Italy reports total phosphorus but not TOC  |
| 6.(a)         | FR, BG, CH, CZ, DE, ES, FI, NO, PL, PT, SE         | 0.005-0.05 | Norway reports total phosphorus but not TOC  |
| 6.(b)         | FR, AT, BE, CH, CZ, DE, FI, HU, PL, PT, SE, SK, UK | 0.002-0.03 | Norway reports total phosphorus but not TOC  |
| 7.(a)         | BG, PT, RO   | 0.07-0.6   | Norway reports total phosphorus but not TOC and Spain reports total phosphorus but not TOC   |

| Main activity | Countries                              | ratio    | remark   |
|---------------|--|----------|--|
|               |  |          | in 2008  |
| 7.(b)         | MT, NO, UK                             | 0.01-0.1 | Spain and Iceland report total phosphorus but not TOC  |
| 8.(b)         | FR, BE, DE, ES, GR, IT, NL, NO, PT, UK | 0.05-0.5 | Lower ratios observed in Italy<br>Higher ratios observed in Germany<br>Hungary reports total phosphorus but not TOC<br>Spain reports total phosphorus but not TOC in 2009    |
| 8.(c)         | FR, DE, ES, IT, LU, NL, NO, PT, UK     | 0.01-0.1 | Higher ratios observed for Italy and Norway<br>Greece and Sweden report total phosphorus but not TOC<br>The Netherlands report total phosphorus but not TOC in 2007 and 2008 |

**Table 79: Results of the cross pollutant check for releases into water – chlorides / TOC**

| Main activity | Countries                                      | ratio      | remark  |
|---------------|--|------------|---|
| 1.(a)         | BE, CH, DE, ES, IT, NL, PL, RO, UK             | 1-10       | Lower ratios observed for Switzerland in 2008 and 2009 and Romania in 2009<br>France, Finland, Greece, Hungary, Norway, Slovakia did reported TOC but did not report chlorides<br>Romania and the United Kingdom did reported TOC but did not report chlorides in 2007 and 2008 |
| 1.(c)         | FR, BE, DE, ES, FI, IT, NL, SE, UK             | 20-150     | France observed lower ratios in 2007 and also Finland. Spain<br>Austria, Czech Republic, Malta, Sweden and Slovakia reported TOC but did not report chlorides in one of the three reporting years   |
| 2.(b)         | BE, DE, ES, IT, SK                             | 5-80       | France, Austria, Spain, Hungary and The Netherlands reported TOC but did not report chlorides in one of the three reporting years   |
| 3.(a)         | DE, PL   | 7500-26000 | Finland reported TOC in 2008, but did not report chlorides  |
| 4.(a)         | FR, BE, CZ, DE, ES, HU, IT, NL, PT, SE, SK, UK | 15-150     | Lower ratios observed for the United Kingdom and higher ratios observed in The Netherlands and in Germany in 2007 and 2008<br>Finland, Iceland, Romania and Norway report TOC, but did not report chlorides   |
| 4.(b)         | FR, BE, DE, ES, IT, NL, PT, RO, SK, UK         | 30-12000   | Very strong variation   |

| Main activity | Countries  | ratio  | remark  |
|---------------|--|--------|---|
| 4.(d)         | BE, IT   | 25-100 | Denmark reported TOC, but did not report chlorides  |
| 4.(e)         | FR, CH, DE, ES   | 10-100 | Hungary and Sweden report TOC, but did not report chlorides   |
| 5.(a)         | FR, BE, CH, DE, IT, NO, UK   | 30-300 | United Kingdom (2007) and Norway (2009) observed lower ratios   |
| 5.(c)         | ES, IT, NL, UK   | 4-30   | Austria, France and Denmark report TOC, but did not report chlorides  |
| 5.(f)         | FR, BE, CH, CZ, DE, ES, FI, IE, IT, LT, NL, PL, PT, RO, SE, SI, UK | 5-50   | Lower ratios observed for France, Czech Republic and Romania and higher ratios observed for Lithuania<br>Austria, Bulgaria, Denmark, Estonia, Greece, Hungary, Luxembourg, Latvia and Slovakia report TOC, but did not report chlorides |
| 5.(g)         | FR, DE, FI, PL, RO, UK   | 1-100  | Strongly varying, lowest ratios observed in the United Kingdom and highest ratios observed in Poland  |
| 6.(a)         | FI, PT, SE   | 0.2-2  | France, Bulgaria, Germany, Denmark, Spain, Poland, Slovakia and the United Kingdom report TOC, but did not report chlorides   |
| 6.(b)         | BE, CZ, FI, PL, PT, SE   | 0.5-5  | Austria, France, Bulgaria, Switzerland, Germany, Spain, Hungary, Italy, Slovenia, Slovakia and the United Kingdom report TOC, but did not report chlorides  |

**Table 80: Results of the cross pollutant check for releases into water – cyanides / TOC**

| Main activity | Countries                              | ratio        | remark   |
|---------------|--|--------------|--|
| 1.(a)         | FR, BE, CH, DE, ES, HU, IT, NL, RO, UK | 0.0001-0.001 | -  |
| 1.(c)         | FR, CZ, DE, IT, NL                     | 0.0001-0.001 | Czech Republic and Portugal report cyanides, but did not report TOC in 2009                                  |
| 2.(b)         | FR, AT, BE, DE, ES, FI, HU, IT, NL, SK | 0.0001-0.1   | Ratios varying in a wide range<br>Czech Republic, Romania and Sweden report cyanides, but did not report TOC |
| 2.(c)         | FR, UK                                 | 0.002-0.004  | -  |
| 4.(a)         | FR, BE, CZ, DE, ES, SE, UK             | 0.0001-0.001 |  |
| 4.(b)         | FR, ES, IT, NL, UK                     | 0.0002-0.002 | Higher ratios observed for the United Kingdom<br>Czech Republic reports cyanides, but did not report TOC     |
| 5.(a)         | FR, DE, IT, NO                         | 0.0003-0.005 | Lower ratios observed in Norway  |

| Main activity | Countries  | ratio        | remark   |
|---------------|--|--------------|--|
| 5.(c)         | IT, NL   | 0.0001       | -  |
| 5.(f)         | FR, AT, BE, BG, CZ, DE, ES, IE, IT, NL, PL, PT, RO, SE, UK | 0.0005-0.005 | Slightly higher ratios observed in Czech Republic and Sweden |

**Table 81: Results of the cross pollutant check for releases into water – fluorides / TOC**

| Main activity | Countries  | ratio      | remark  |
|---------------|--|------------|---|
| 1.(a)         | FR, BE, CH, DE, ES, HU, IT, NL, PL, UK                         | 0.01-0.1   | -   |
| 1.(c)         | FR, AT, CZ, DE, ES, IT, NL, SK, UK                             | 0.01-0.1   | Lower ratios observed for France in 2007 and higher ratios for Spain in 2007<br>Czech Republic and Spain report fluorides in 2009, but did not report TOC                                 |
| 2.(b)         | FR, AT, BE, DE, ES, FI, IT, NL, SK                             | 0.1-1      | Slightly lower ratios observed for Austria and France and for Germany in 2007<br>Czech Republic, Luxembourg, Sweden and Slovenia report fluorides but did not report TOC                  |
| 2.(e)         | FR, BE, DE, NO, SE   | 0.1-1      | Higher ratios observed in Norway<br>France, Hungary, Iceland, Italy, The Netherlands, Poland, Austria (2007), Slovenia (2007) and Estonia (2009) report fluorides, but did not report TOC |
| 2.(f)         | DE, IT   | 0.02-0.1   | Spain as well as France and Austria (2009) report cyanides but did not report TOC   |
| 4.(a)         | FR, BE, CZ, DE, FI, IT, NL, UK                                 | 0.01-0.1   | Higher ratios observed for The Netherlands in 2008  |
| 4.(b)         | FR, BE, DE, ES, IT, NL, NO, SK                                 | 0.1-1      | Higher ratios observed for Norway and lower ratios observed for Italy and The Netherlands<br>Hungary, Poland and Sweden report fluorides, but did not report TOC                          |
| 4.(c)         | BG, CZ, PL   | 0.02-0.5   | Belgium, Finland, Greece, Lithuania, The Netherlands and Romania report fluorides, but did not report TOC   |
| 4.(e)         | FR, CH, IT   | 0.01-0.1   | Ireland reports fluorides, but did not report TOC   |
| 5.(a)         | FR, BE, CH, DE, IT, NO, UK                                     | 0.01-0.1   | Spain and the United Kingdom report fluorides, but did not report TOC   |
| 5.(b)         | DE, IT, UK   | 0.01-0.1   | The Netherlands report fluorides, but did not report TOC  |
| 5.(c)         | FR, ES, IT, NL, UK   | 0.001-0.1  | -   |
| 5.(f)         | FR, AT, BE, CH, CZ, DE, ES, FI, IE, IT, LT, NL, PL, PT, SE, UK | 0.003-0.03 | Lower ratios observed for France and Sweden in 2007 and for Portugal in 2009  |
| 5.(g)         | FR, AT, CZ, DE, PL   | 0.006-0.04 | Lower ratios observed in Austria  |

| Main activity | Countries | ratio | remark  |
|---------------|-----------|-------|---|
|               |           |       | Italy reports fluorides, but did not report TOC |

**Table 82: Results of the cross pollutant check for releases into water – halogenated organic compounds / TOC**

| Main activity | Countries  | ratio        | remark  |
|---------------|--|--------------|---|
| 1.(a)         | FR, BE, CH, ES, SK                                     | 0.002-0.02   | Sweden reports AOX, but did not report TOC  |
| 1.(c)         | FR, CZ, DE, ES, FI, UK                                 | 0.005-0.05   | Lower ratio observed for France in 2007 and higher ratio observed for Spain in 2008   |
| 2.(b)         | BE, DE, ES, NL   | 0.002-0.02   |   |
| 2.(e)         | FR, BE, NO   | 0.007-0.05   |   |
| 4.(a)         | FR, BE, CZ, DE, ES, HU, SE, SK, UK                     | 0.003-0.03   | Lower ratios observed in the United Kingdom   |
| 4.(b)         | FR, BE, DE, ES, SK                                     | 0.007-0.04   | -   |
| 5.(a)         | FR, DE   | 0.02         | -   |
| 5.(b)         | FR, DE, UK   | 0.001-0.01   | -   |
| 5.(c)         | ES, NL, UK   | 0.002-0.03   | -   |
| 5.(f)         | FR, AT, BE, CH, CZ, DE, ES, FI, NL, PL, PT, SE, SI, UK | 0.0005-0.005 | France and Sweden show lower ratios in 2007<br>Bulgaria, Denmark, Estonia, Greece, Hungary, Ireland, Iceland, Italy, Lithuania, Luxembourg, Latvia, Malta, Norway, Romania, Slovakia report TOC, but did not report AOX |
| 5.(g)         | FR, AT, CZ, DE, FI, PL                                 | 0.004-0.04   | Higher ratios observed in Poland  |
| 6.(a)         | FR, CH, CZ, DE, ES, FI, PT, SE, SK                     | 0.004-0.04   | Higher ratios observed in Slovakia  |
| 6.(b)         | FR, BE, CZ, DE, ES, FI, HU, PL, PT, SE, SK, UK         | 0.001-0.01   | Lower ratios observed in Germany and higher ratios observed in Poland and Portugal  |

**Table 83: Results of the cross pollutant check for releases into water – phenols / TOC**

| Main activity | Countries  | ratio          | remark  |
|---------------|--|----------------|---|
| 1.(a)         | FR, BE, CH, DE, ES, FI, GR, HU, IT, NL, NO, PL, RO, SK, UK             | 0.001-0.01     | Lower ratios observed for Germany and Finland and higher ratios observed for Norway Ireland, Portugal and Sweden report phenols, but did not report TOC |
| 1.(c)         | FR, CZ, DE, ES, FI, IT, SE, UK   | 0.0004-0.004   | Higher ratios observed in the United Kingdom Poland and Romania report phenols, but did not report TOC  |
| 2.(b)         | FR, BE, DE, ES, HU, IT, SK   | 0.004-0.03     | Lower ratios observed for Hungary Czech Republic, Sweden and Romania report phenols, but did not report TOC   |
| 2.(c)         | FR, UK   | 0.004-0.04     | Italy and Portugal report phenols, but did not report TOC   |
| 4.(a)         | FR, BE, CZ, DE, ES, HU, IT, NL, NO, RO, SE, SK, UK                     | 0.0002-0.002   |   |
| 4.(b)         | FR, IT, RO, SK, UK   | 0.0001-0.03    | Ratios varying very strongly Poland reports phenols, but did not report TOC   |
| 4.(e)         | FR, BG, ES, HU, IT, UK   | 0.0001-0.001   | Lower ratios observed for Bulgaria in 2007  |
| 5.(a)         | FR, BE, DE, IT, NO, UK   | 0.0002-0.002   | Higher ratios observed for the United Kingdom Austria and Sweden report phenols, but did not report TOC   |
| 5.(d)         | IT, NO, PL, PT   | 0.0001-0.001   | Higher ratio observed for Norway in 2009 Spain and Portugal report phenols, but did not report TOC  |
| 5.(f)         | FR, BE, BG, CH, CZ, DE, DK, ES, FI, HU, IE, IT, LV, PL, PT, RO, SE, UK | 0.00004-0.0004 | Higher ratios observed for Bulgaria and Poland. Lower ratios observed for Germany and the United Kingdom  |
| 5.(g)         | FR, PL, RO, UK   | 0.0003-0.003   |   |
| 6.(b)         | FR, ES, FI, IT, PL, PT, RO   | 0.00004-0.0005 | Lower ratios observed for France and Spain in 2009 and higher ratio observed for Italy in 2009  |



## Comparison of water emissions with UWWTD reporting data

According to the UWWTD database 1,344 urban wastewater treatment plants with a capacity of more than 100,000 population equivalents (pe) exist in the European Union. According to the E-PRTR database, 1041 facilities report for main activity 5.(f). Table 84 compares the number of facilities reporting for main activity 5.(f) in the E-PRTR to the number of urban wastewater treatment plants with an incoming load or a treatment capacity of more than 100,000 pe according to the UWWTD database. Bulgaria, Sweden, Norway, Iceland and Switzerland are not considered as no information on treatment capacities or incoming loads is available for facilities from these countries in the UWWTD database. As indicated in section D.1.1.1 the data from the UWWTD database refers to the years 2007 or 2008, whereas the E-PRTR data refers to the year 2009, thus causing some uncertainties in the comparison. However, the changes in the number of UWWTPs due to closure, disconnection or new construction are considered to be marginal.

**Table 84: Comparing the number of urban wastewater treatment plants included in the UWWTD database in in E-PRTR**

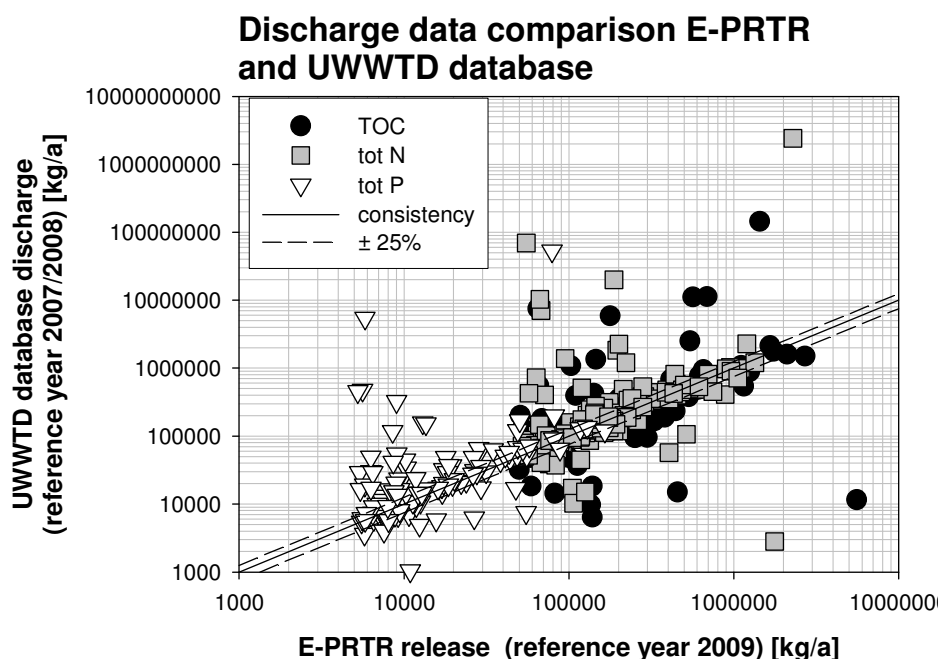
| Country              | Expected E-PRTR plants according UWWTD | Existing facilities in E-PRTR (2009) | % of existing facilities in E-PRTR |
|----------------------|--|--------------------------------------|------------------------------------|
| Austria              | 32                                     | 22                                   | 69                                 |
| Belgium              | 17                                     | 16                                   | 94                                 |
| Cyprus               | 3                                      | 1                                    | 33                                 |
| Czech Republic       | 25                                     | 21                                   | 84                                 |
| Denmark              | 27                                     | 21                                   | 78                                 |
| Estonia              | 7                                      | 6                                    | 86                                 |
| Finland              | 14                                     | 12                                   | 86                                 |
| France               | 141                                    | 112                                  | 79                                 |
| Germany              | 240                                    | 218                                  | 91                                 |
| Greece               | 12                                     | 3                                    | 25                                 |
| Hungary              | 27                                     | 19                                   | 70                                 |
| Ireland              | 7                                      | 5                                    | 71                                 |
| Italy                | 169                                    | 56                                   | 33                                 |
| Latvia               | 6                                      | 1                                    | 17                                 |
| Lithuania            | 9                                      | 7                                    | 78                                 |
| Luxembourg           | 1                                      | 1                                    | 100                                |
| Malta                | 1                                      | 0                                    | 0                                  |
| Netherlands          | 61                                     | 54                                   | 89                                 |
| Poland               | 109                                    | 73                                   | 67                                 |
| Portugal             | 35                                     | 24                                   | 69                                 |
| Romania              | 36                                     | 22                                   | 61                                 |
| Slovakia             | 16                                     | 5                                    | 31                                 |
| Slovenia             | 4                                      | 4                                    | 100                                |
| Spain                | 188                                    | 112                                  | 60                                 |
| United Kingdom       | 157                                    | 137                                  | 87                                 |
| <b>All countries</b> | <b>1,344</b>                           | <b>952</b>                           | <b>71</b>                          |

It is noted that more than 70% of the urban wastewater treatment plants with a treatment capacity or an incoming load of more than 100,000 pe (based on data from the UWWTD database) also report under E-PRTR.

Not all of the 1,344 urban wastewater treatment plants are supposed to report under E-PRTR as they do not necessarily exceed the E-PRTR reporting thresholds for Annex II pollutants. The UWWTD database could be used to assess whether the aim of covering 90% is reached for activity 5.f for TOC, total nitrogen and total phosphorus because this information is provided on a voluntary basis in the UWWTD database. Eleven Member States reported discharges of total nitrogen, total phosphorus and / or TOC for some of their UWWTPS. The reported data refer to the years 2007 or 2008.

A requirement for using the data from the UWWTD database for the assessment whether the 90% coverage is reached is that the data in the two databases are consistent. In order to compare the release reports for TOC, total nitrogen and total phosphorus the reported releases in E-PRTR and in the UWWTD database are compared for those facilities for which the data is available in both databases. The results of the comparison are shown in Figure 22.

**Figure 22: Comparison of releases for TOC, tot N and tot P as reported in E-PRTR (activity 5.f, reference year 2009) and discharges from the UWWTD database (reference year 2007/2008) at facility level**



The comparison highlights potential inconsistencies between E-PRTR reporting and the UWWTD reporting. Based on these inconsistencies the comparison of E-PRTR release data with the data from the UWWTD database is not suitable to assess whether the 90% value of emissions of total nitrogen, total phosphorus or TOC is reached.

The number of urban wastewater treatment plants with an incoming load or a treatment capacity of more than 100,000 pe derived from the UWWTD database can be used to assess completeness of reporting under E-PRTR for those pollutants which are predominantly released from facilities with main activity 5.(f). As described above some pollutants (e.g. asbestos, polychlorinated biphenyls) are reported only from facilities with main activity 5.(f) originating from the United Kingdom. It has to be assumed that also urban wastewater treatment plants from other countries are presumed to report discharges of these compounds as the United Kingdom only contributes to 12% of the overall number of plants.

## Comparison of water emissions with SoE reporting data

SoE data are aggregated in river basin districts at the national level. Parameters covered are COD, BOD, nutrients (like nitrogen and phosphorus) and metals.

The reported releases into water were assessed concerning the consistency between reported releases from the various Annex I activities concerning Annex II substances as comparable emissions are to be expected within a release category.

This assessment was worked out at the aggregated level for all Member States that reported under SoE hazardous substances compared with the aggregated loads of the E-PRTR reporting within the same Member States.

The following table shows the comparison of E-PRTR data with SoE data (hazardous substances). For the aggregation of SoE data available records were used if at least three countries reported the pollutant.

**Table 85: Comparison of reported emissions (cumulated) from E-PRTR reported emissions (cumulated) from the SoE-database for selected hazardous substances**

| Pollutant                     | PRTR    | SoE     | Ratio | PRTR    | SoE     | Ratio | PRTR    | SoE     | Ratio |
|-------------------------------|---------|---------|-------|---------|---------|-------|---------|---------|-------|
|                               | 2007    | 2007    |       | 2008    | 2008    |       | 2009    | 2009    |       |
| AS AND COMPOUNDS              |         |         |       |         |         |       | 1,918   | 1,415   | 74%   |
| BENZENE                       |         |         |       | 2,091   | 1,682   | 80%   |         |         |       |
| CD AND COMPOUNDS              | 2,375   | 2,051   | 86%   | 4,638   | 1,537   | 33%   | 4,223   | 1,372   | 32%   |
| CR AND COMPOUNDS              |         |         |       |         |         |       | 3,340   | 5,187   | 155%  |
| CU AND COMPOUNDS              | 88,961  | 53,240  | 60%   | 69,518  | 151,625 | 218%  | 69,113  | 182,348 | 264%  |
| CYANIDES                      | 9,359   | 8,588   | 92%   | 11,697  | 20,832  | 178%  | 12,497  | 16,192  | 130%  |
| DICHLOROETHANE-1,2            | 1,544   | 2,178   | 141%  | 3,397   | 5,186   | 153%  |         |         |       |
| DICHLORO-METHANE              | 32,966  | 41,043  | 125%  | 5,194   | 4,717   | 91%   |         |         |       |
| FLUORANTHENE                  |         |         |       | 29      | 47      | 161%  |         |         |       |
| HALOGENATED ORGANIC COMPOUNDS |         |         |       |         |         |       | 555,520 | 586,086 | 106%  |
| HG AND COMPOUNDS              | 659     | 717     | 109%  | 614     | 810     | 132%  | 595     | 200     | 34%   |
| NI AND COMPOUNDS              | 51,196  | 48,132  | 94%   | 49,091  | 37,484  | 76%   | 23,059  | 20,019  | 87%   |
| PB AND COMPOUNDS              | 60,506  | 17,015  | 28%   | 29,834  | 24,573  | 82%   | 21,161  | 15,297  | 72%   |
| TOLUENE                       | 3,537   | 4,974   | 141%  |         |         |       |         |         |       |
| TRICHLORO-METHANE             | 3,213   | 3,730   | 116%  | 1,137   | 1,592   | 140%  |         |         |       |
| ZN AND COMPOUNDS              | 485,445 | 371,180 | 76%   | 410,911 | 254,790 | 62%   | 210,714 | 338,481 | 161%  |

The results of this assessment show a heterogeneous picture of SoE / E-PRTR ratios between 28 % (lead in 2007) and 264 % (copper in 2009). The assumption that PRTR values should be slightly lower than the SoE data could be proven in some cases only (e.g. nickel). Higher values of PRTR discharges indicate possible incomplete reporting in SoE. The informative value of the comparison of E-PRTR data with SoE data is therefore very limited.

### **Activity 7(b) – intensive aquaculture**

Aquaculture in some countries is an important economic sector. The production figures show that in Norway in 2009 more than 960,000 tonnes of fish or shellfish were produced followed by Spain with almost 245,000 tonnes and France (190,000 tonnes) and the United Kingdom with almost 170,000 tonnes. The marine aquaculture production for Europe in 2007, 2008 and 2009 is summarised in Table 86.

**Table 86: Marine aquaculture production [tonnes] for Europe in 2007, 2008 and 2009 (sorted by 2009<sup>66</sup>)**

| Country                | 2007             | 2008             | 2009             |
|------------------------|------------------|------------------|------------------|
| France                 | 196,247          | 194,969          | 191,962          |
| Greece                 | 108,873          | 109,915          | 118,067          |
| Italy                  | 67,585           | 75,733           | 85,116           |
| Netherlands            | 47,121           | 38,151           | 47,629           |
| Ireland                | 56,296           | 44,030           | 46,253           |
| Denmark                | 8,594            | 12,329           | 12,680           |
| Sweden                 | 2,648            | 3,579            | 4,556            |
| Germany                | 10,686           | 6,982            | 3,686            |
| Portugal               | 5,924            | 6,149            | 3,478            |
| Bulgaria               | 288              | 595              | 807              |
| Slovenia               | 316              | 274              | 377              |
| Bosnia and Herzegovina | 260              | 260              | 260              |
| Montenegro             | 200              | 200              | 210              |
| <b>Total Europe</b>    | <b>1,762,507</b> | <b>1,736,044</b> | <b>1,893,842</b> |

In E-PRTR emission reports under the activity 7(b) – intensive aquaculture are available from Norway, Spain, United Kingdom, Cyprus, Malta and Iceland. Considering only the largest producers, release reports for activity 7(b) would also be expected from France and Greece.

The pollutants with reported releases to water within activity 7.(b) are TOC, total nitrogen, total phosphorus, copper and zinc. A cross pollutant assessment of released emissions related to TOC was carried out for the period 2007-2009 with all available pairs of values at facility level for the countries Malta, Norway and United Kingdom. For TOC/Total nitrogen and TOC/Total phosphorus the ratios are comparable for the three countries. The results for TOC/copper and TOC/zinc differ between countries.

<sup>66</sup> Source FAO:

[http://www.fao.org/figis/servlet/TabLAndArea?tb\\_ds=Aquaculture&tb\\_mode=TABLE&tb\\_act=SELECT&tb\\_grp=COUNTRY](http://www.fao.org/figis/servlet/TabLAndArea?tb_ds=Aquaculture&tb_mode=TABLE&tb_act=SELECT&tb_grp=COUNTRY)

With the available production data from FAO or EUROSTAT and E-PRTR discharges production specific emissions were calculated. The results for copper show big differences between Norway and the United Kingdom. The production specific emissions for Malta calculated with maximum four facilities show for the other considered substances much higher values compared to Norway and United Kingdom.

Further and more detailed information is provided in the E-PRTR Informal Review Report 2011 covering the 2009 E-PRTR dataset (see ETC ACM, 2011).

## APPENDIX 9 – SCOPE ANALYSIS – METHODOLOGY FOR WEIBULL ANALYSIS

Since no information on unreported emissions is available, the approach is to approximate the distribution function of emissions of a certain pollutant within all E-PRTR facilities or a subset thereof. If such a distribution function is known, the total emissions for the pollutant can be estimated by integrating this distribution function. If such a distribution function is established the total emission (100%) for a certain pollutant can be derived. This method is applicable for all media. In principle several distribution functions could be used.

The EPER review 2004 analysed several distribution functions regarding their suitability for this assessment and concluded that the Weibull function is the most adequate one.

The Weibull function is quite common and can be used with cumulated data sets, with data that would "increase monotonically" when x goes to infinity. For calculation purposes the facilities' emissions were sorted from the largest to the smallest emitters. In the next step, the sorted data were cumulated. The result is a cumulative frequency distribution for all reported E-PRTR data for a specific pollutant. Finally, the Weibull function (see formula 1) is fitted to the cumulative frequency distribution by application of a non-linear regression and using the methods of "least squares", meaning that the overall solution minimizes the sum of the squares of the errors/residuals made in solving the fitted equation to every single data point. For calculation the statistical software SigmaPlot is used for curve fitting. Applicability of the Weibull distribution to the background dataset is assessed by testing whether the data is distributed normally around the fitted regression line. This is done by testing whether the residuals are normally distributed and normality testing is done with the Kolmogorov-Smirnov test. The Weibull function was applied to all substances considered in the threshold analysis at least in one of the three investigated years. If the requirement of normal distribution of residuals is not met in a specific year for a specific substance, this is marked by not applicable (NA) in the result tables.

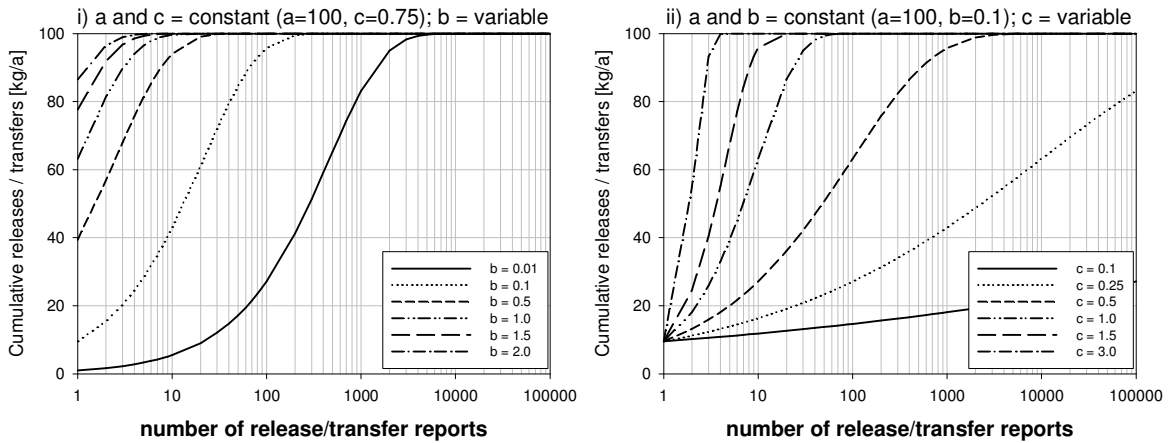
Formula 1: cumulative Weibull function

$$y = a \times (1 - e^{-b \times x^c})$$

- x... number of facilities
- y ... total emissions in the x largest facilities
- a ... total emission in all facilities
- b and c: shape parameters of the Weibull function ( $0 < b$  and  $c < 5$ )

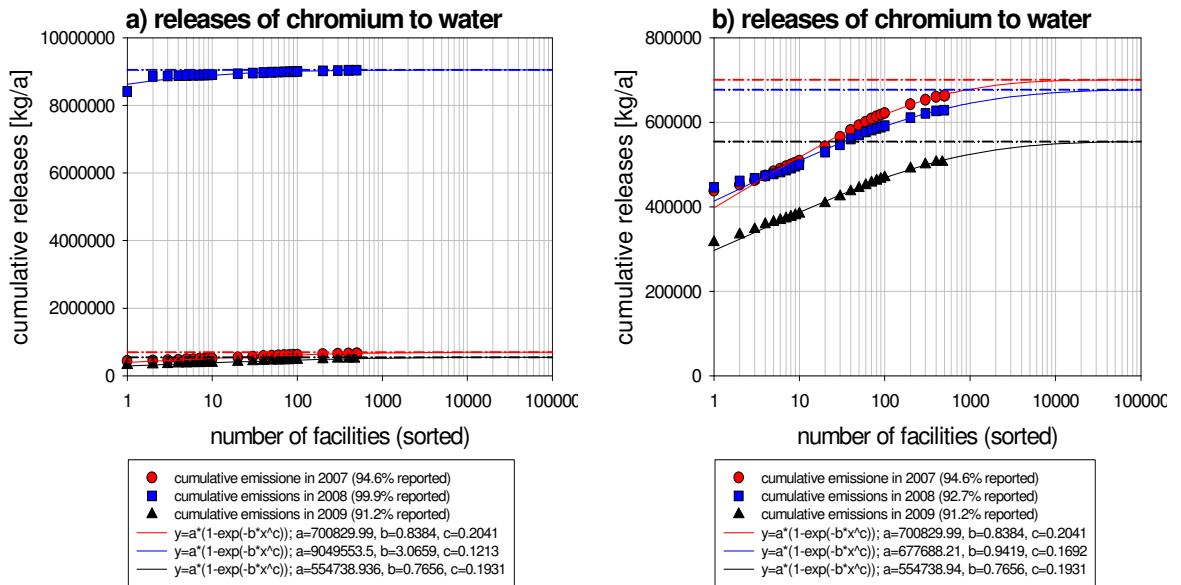
The curve fitting results in the derivation of values for the parameters a, b and c. The parameter a is the extrapolated total cumulative emission of a defined pollutant, which the fitted curve is approaching asymptotically. This maximum value is used for the assessment of the coverage of E-PRTR reporting. The parameter b describes the relation of the highest emission report to the maximum value and provides the starting point (y with x=1) of the fitted curve. Parameter c describes the slope and the bending of the fitted curve. The influence of parameters b and c on the cumulative Weibull function is exemplified in Figure 23.

**Figure 23:** The influence of the parameters *b* and *c* on the shape of the cumulative Weibull function: i) influence of parameter *b* with parameters *a* and *c* kept constant and ii) influence of parameter *c* with *a* and *b* constant



Parameter *b* provides an estimate on the contribution of the highest release/transfer report to the total cumulated amount. Values for parameter *b* higher than 1.5 indicate that the highest release/transfer report contributes to more than 75% of the total cumulated emission. Due to this characteristic of parameter *b* it has also been used for the identification of outliers. For releases and transfers to water, the highest release/transfer reports to water of those pollutants are flagged as potential outliers, for which the curve fitting resulted in *b* values higher than 1.5. For releases to air, the same approach was applied and the identified outliers were checked by using expert judgement in a second step. Those potential outliers are removed and the curve fitting is repeated without these data. An example is shown in Figure 24.

**Figure 24:** Curve fitting results for releases of chromium and its compounds to water; a) including all data and indicating the presence of potential outliers and b) without the potential outliers

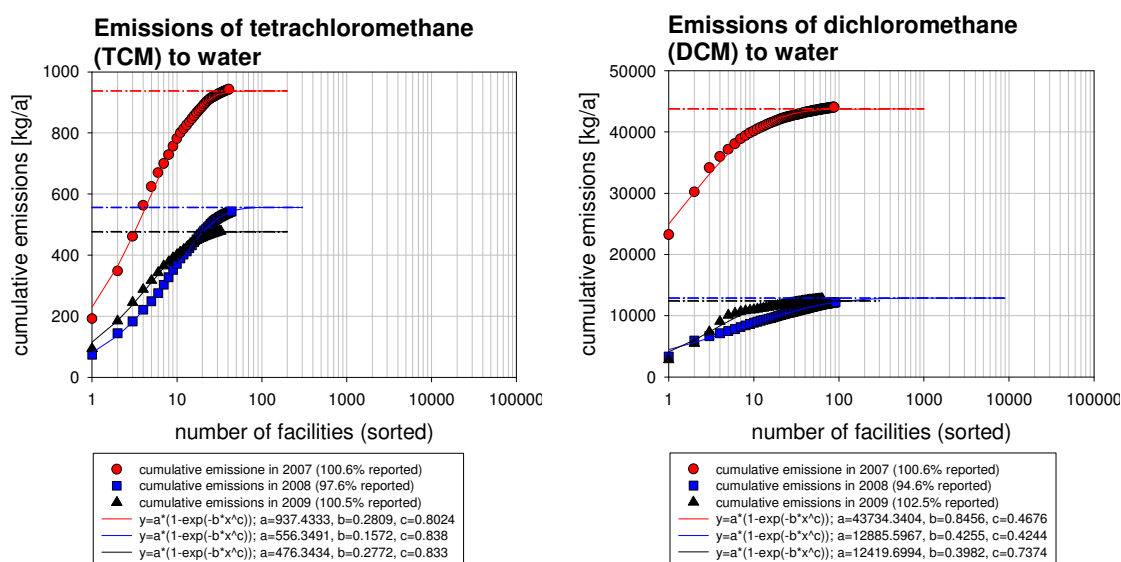


For the calculation of the coverage, parameter *a* from the curve fitting is used as an indicator of the maximum cumulated releases/transfers. The coverage corresponds to the ratio of the sum of the reported releases/transfers (or the highest number of the sorted cumulated releases/transfers) and parameter *a*.

The parameters a, b and c of the fitted curves are determined by non-linear regression by application of the least squares method and associated with statistical uncertainty. The standard errors are estimates of the uncertainties in the estimates of the regression coefficients (analogous to the standard error of the mean). The true regression coefficients of the underlying population generally fall within about two standard errors (variance) of the observed sample coefficients. For most pollutants this confidence interval of two standard errors is below or up to 1% of the estimate of parameter a used for the calculation of the coverage. Two examples for tetrachloromethane (TCM) and dichloromethane (DCM) releases to water are provided below.

The results of the curve fitting for tetrachloromethane (TCM) and dichloromethane (DCM) releases to water are presented in Figure 25. Based on the parameters (parameter a) determined by the curve fitting and the cumulated reported releases the coverage [%] for the reporting years 2007, 2008 and 2009 are calculated (see Table 87). The calculated coverage amounts to 95% for dichloromethane in 2008 up to 103% in 2009.

**Figure 25:** Curve fitting results for tetrachloromethane and dichloromethane releases to water



**Table 87:** Cumulated releases for dichloromethane and tetrachloromethane to water, extrapolated totals from the curve fitting (parameter a) and calculated coverage for the reporting years 2007, 2008 and 2009

|                                   | DICHLOROMETHANE | TETRACHLOROMETHANE |
|-----------------------------------|-----------------|--------------------|
| <b>Cumulated releases [kg/y]</b>  |                 |                    |
| 2007                              | 44,009.50       | 942.65             |
| 2008                              | 12,191.90       | 543.09             |
| 2009                              | 12,733.22       | 478.62             |
| <b>Extrapolated totals [kg/y]</b> |                 |                    |
| 2007                              | 43,734.34       | 937.43             |
| 2008                              | 12,885.60       | 556.35             |
| 2009                              | 12,419.70       | 476.34             |
| <b>Coverage [%]</b>               |                 |                    |
| 2007                              | 1.01            | 1.01               |
| 2008                              | 0.95            | 0.98               |



|      |      |      |
|------|------|------|
| 2009 | 1.03 | 1.01 |
|------|------|------|

## Uncertainty

As mentioned above the parameters determined by curve fitting are associated to statistical uncertainty and the true regression coefficients generally fall within about two standard errors. The parameters  $a$  and the respective standard errors obtained from the regression are summarized in Table 88. The coverage has been recalculated by applying the extrapolated totals  $\pm$  two standard errors to the cumulated releases resulting in a range the expected coverage falls into (see Table 89).

**Table 88: Parameter  $a$  from the regression and associated uncertainty (standard error)**

| Pollutant          | Extrapolated totals [kg/y] |           |          | Standard error SE [kg/y] |        |       |
|--------------------|----------------------------|-----------|----------|--------------------------|--------|-------|
|                    | 2007                       | 2007      | 2009     | 2007                     | 2008   | 2009  |
| DICHLOROMETHANE    | 43,734.34                  | 12,885.60 | 12,419.7 | 58.84                    | 111.59 | 62.50 |
| TETRACHLOROMETHANE | 937.43                     | 556.35    | 476.34   | 3.58                     | 1.42   | 2.22  |

**Table 89: Ratio (coverage) between the cumulated releases and the extrapolated totals  $\pm$  two standard errors**

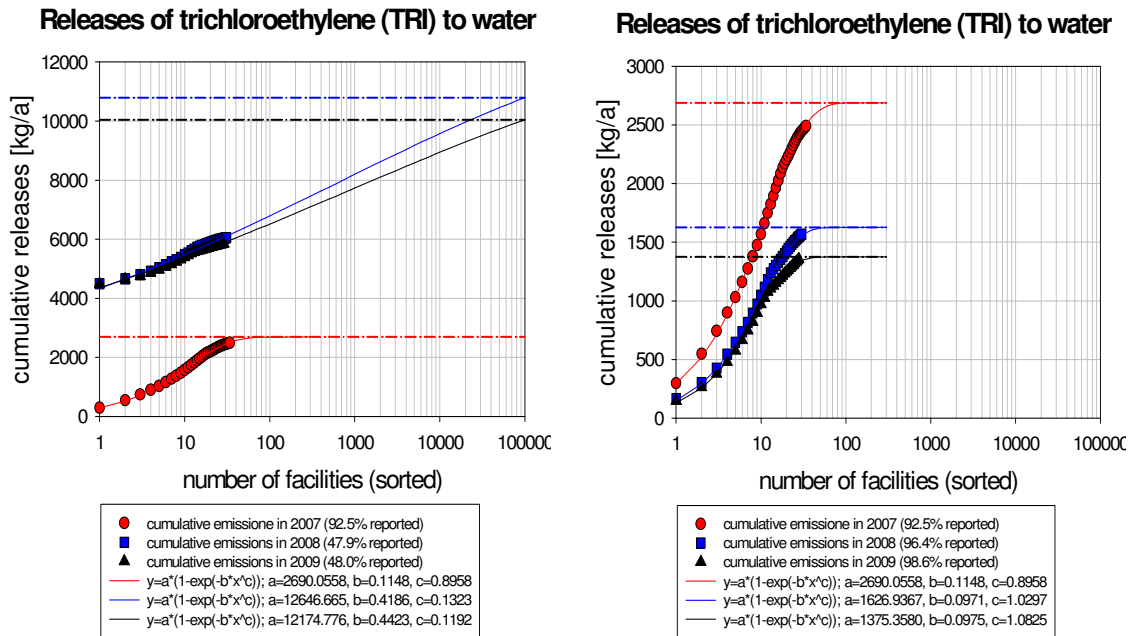
| Pollutant          | Coverage [%] |         |           |
|--------------------|--------------|---------|-----------|
|                    | 2007         | 2008    | 2009      |
| DICHLOROMETHANE    | 100%-101%    | 93%-96% | 102%-104% |
| TETRACHLOROMETHANE | 100%-101%    | 97%-98% | 100%-101% |

Usually the variance of the data results in uncertainties ranging up to 1% and only in specific cases higher uncertainties are observed. trichloroethylene (TRI) is an example for higher variances. The curve fitting for TRI is presented in Figure 26. The applicability of the Weibull distribution was tested by normality testing of the residuals and the Kolmogorov-Smirnov testing is positive at a significance level of 5% ( $\alpha=0.05$ ). The standard error (SE) of parameter  $a$  determined by the regression amounts to  $\pm 0.8\%$  in 2007,  $\pm 59\%$  in 2008 and  $\pm 74\%$  in 2009. The statistical extrapolation is not applicable to the data of 2008 and 2009. However, even if the statistical evaluation (parameter  $b$ ) does not fulfil the criteria for outlier definition, the presented data suggest, that the highest report could be a potential outlier as the highest release report amounts to 74% and 77% of the cumulated releases in the years 2008 and 2009 respectively. If these potential outliers are removed from the evaluation the shapes of the curves become comparable between the different years and also the associated uncertainty strongly decreases. Hence, the standard error of parameter  $a$  can be useful for the identification of outliers.

Based on the above considerations uncertainties associated to the regression parameters may influence the result of the calculation of the coverage up to 1% and therefore calculated coverage between 89% and 101% are considered as acceptable. Higher uncertainties of parameters may hint to potential outliers, but have to be evaluated individually.

However, if the calculated coverage is higher than 101% or below 89% a refinement of the evaluation becomes necessary. Higher coverage indicates that the cumulated releases/transfers are still increasing, suggesting that there are potentially missing release/transfer reports.

**Figure 26:** Curve fitting results for trichloroethylene releases to water with all data (left figure) and without potential outliers (right figure)



# APPENDIX 10 – SCOPE ANALYSIS OF E-PRTR REGULATION – METHODOLOGY FOR WASTE

## 1. Introduction

Waste transfers were included for the first time under the E-PRTR reporting for 2009 covering data for 2007. Waste was not included previously under EPER.

The reporting obligation for waste transfers is for some activities linked to the capacity of the facility. Waste transfer does not include waste handled on the facility itself. Only transfers larger than 2,000 tonnes of non-hazardous waste and 2 tonnes of hazardous waste must be reported. As a consequence, waste transfers from a facility rarely equal the generation of waste. However, the generation is the best approximation to use for comparisons.

Apart from the two threshold values, the E-PRTR reporting of waste transfers is related to three characteristics:

- The **transfer** of the waste: whether it is non-hazardous or hazardous waste. The waste transfers are assumed to reflect the facilities' total generation over time minus the amount that is recovered or disposed of on-site;
- The management of the waste: whether it is transferred for **recovery** or **disposal**;
- The geographic location of the management of the waste: whether it is **transferred inside** the country or it is a **transboundary shipment**.

For all three elements, limited possibilities exist for using other data sources for comparison with E-PRTR reporting. In order to identify the completeness and potential problems with E-PRTR reporting of waste data the following activities were undertaken.

## 2. Evaluation of waste transfers related to generation

The evaluation of the waste transfers (generation) is undertaken by using three different sources:

- 1) Comparison of the absolute amounts reported to the E-PRTR as transferred with the generated amounts reported according to the EU Waste Statistic Regulation;
- 2) Comparison of the reported waste intensity per sector defined as the amount per number of employees;
- 3) Comparison of the reported waste intensity per sector defined as the amount per gross value added.

These three separate methods were used for an individual assessment of the countries' reporting and were finally aggregated into one final assessment for each sector per country. The methodology is described in detail in the separate methodology report.

### Comparison with reporting according to the EU Waste Statistical Regulation

The waste transfer data were compared with the generated amounts reported to Eurostat for 2008 according to the EU Waste Statistic Regulation, which aims at covering 100% of waste generation. Reporting of waste to Eurostat only takes place for even years (year -2). Therefore 2008 data were used for the comparison because both E-PRTR and Eurostat data are available. The comparison between the E-PRTR data and Eurostat data were undertaken in relation to different economic activities (on NACE 2-digit level or aggregation of 2-digit levels) for hazardous waste, non-hazardous waste and total waste for each NACE code.

The 2-digit level was chosen because it is the most detailed level at which waste transfer data/generation data are available for both E-PRTR data and Eurostat data. It is also possible for

each facility reporting waste to E-PRTR to relate the facility's E-PRTR activity code to a NACE 2-digit code because in addition to stating the E-PRTR activity code facilities also state their NACE code on a 4-digit level.

The total numbers for each NACE 2-digit level are hereafter compared directly for each country. Values are highlighted in case the amount reported by the E-PRTR is higher than that reported by Eurostat (between 0-50% larger than the Eurostat amount, between 50-100% larger than the Eurostat amount or more than 100% larger than the Eurostat amount) and also in case the reporting by the E-PRTR is lower than 20% or 60 % than the Eurostat amount.

It is a general assumption that the E-PRTR values must not be higher than the Eurostat values because E-PRTR only includes waste transferred by facilities and not generated waste. Furthermore, it has to be underlined that E-PRTR does not include all the activities in each of the relevant NACE 2-digit codes covered by the Eurostat data. E-PRTR reporting also depends on a threshold of 2 tonnes of hazardous waste transferred or 2,000 tonnes of non-hazardous waste transferred. Therefore, the E-PRTR values have to be lower than the Eurostat values.

#### Comparison of intensities of waste transferred per economic activity and per employee

Another way to identify the completeness and potential problems with the E-PRTR reporting of waste data is to include the waste intensity related to the economic activity (gross value added) and the people employed. The intensity is defined as waste amount per number of employees and per gross value added. If large differences can be found among the countries, this may indicate a lack of completeness. The comparison has been undertaken by using 2008 data.

Ideally the countries should have very similar values based on the idea that the industries covered by the NACE codes produce the same product, therefore generating the same income and requiring the same number of employees. Although in reality this might differ from country to country based on technology used and production size, it could still be a good indicator for finding values which seem to deviate too much from the overall trend.

#### Comparison of waste intensity per economic activity

Eurostat publishes National Accounts in 60 branches which can be used to evaluate whether a country's low or no reporting of waste from an economic activity is due to no or limited economic activity as such. The economic activity is measured as gross value added (GVA).

This information can also be used to calculate the 2008 waste transfer intensity of the different E-PRTR activities or aggregates of E-PRTR activities at EU-level and national level.

For waste per GVA, the data from Eurostat on Gross Value Added is presented on an aggregated NACE level and on a country level. Therefore, the data on waste transferred by the E-PRTR has to be aggregated. The intensity is calculated by dividing the amount of waste by the GVA.

The intensity is then presented for the different NACE codes on an aggregated level and for each country. The intensity is presented both for hazardous waste and for non-hazardous waste. To analyse the data, a special average is calculated for each NACE code, where the highest and the lowest value is excluded from the average, thereby removing possible outliers.

Sum of intensities – Maximum value - Minimum value

Number of values – 2

The average is then related to the countries reporting and in cases where the reporting deviates by a factor of +/-5 or more the value is highlighted. In particular, values which are very low could

indicate that the thresholds on respectively 2 tonnes hazardous waste or 2,000 tonnes non-hazardous waste are too high.

#### Comparison of waste intensity per employee

Each year Member States report to Eurostat on a 3-digit NACE code level the number of people employed in each economic activity and the number of enterprises related to different intervals of employed people. By relating this information to the E-PRTR reporting it might be possible to find differences between the Member States' completeness of reporting, e.g. by comparing the reported waste generation per person employed.

For waste per employed persons, the E-PRTR data on waste transferred was divided by the number of employees in the corresponding sectors according to the NACE codes. The data on industries from Eurostat is available on a 3-digit NACE rev. 2 codes but the data was aggregated to 2-digit level and expressed on a country level.

The employee data from Eurostat was then used to derive the intensity by dividing the waste transferred in tonne by the number of employed persons.

The intensity is presented both for hazardous waste and for non-hazardous waste. Afterwards, the data is analysed by calculating the average, using the same method as for waste per economic intensity. Intensities with a deviation of five or more are highlighted.

### **3. The linkage between E-PRTR activities and NACE codes**

E-PRTR covers only part of the activities belonging to a NACE code on the 2-digit level. Results from the EEA's work undertaken as part of the informal E-PRTR 2011 review can be used to qualify this linkage between the E-PRTR activities and NACE codes (Rev 2.0). This linkage can be undertaken on a very detailed level (3-digit and 4-digit NACE code level) and in that way provide information on whether particular countries do not report at all on certain activities, which might explain why possible differences between the countries on the more aggregated 2-digit level may be found.

### **4. Evaluation of waste transfers by using the Weibull function**

Another way of evaluating the quality of the E-PRTR reporting including the chosen threshold values of 2,000 tonnes non-hazardous waste and 2 tonnes hazardous waste is to make an assessment by using the Weibull function. Many facilities have reported waste within each E-PRTR activity. Therefore, the statistical Weibull function can be used as an indicator whether the completeness of the waste reporting is good. The assessment is related to each E-PRTR activity, non-hazardous and hazardous waste for 2008 and 2009.

The method is used for each activity code, for both hazardous (hazardous waste inside country and hazardous waste outside country) and non-hazardous waste. The data is arranged and sorted in descending order. A plot of the data is then made where the plot shows the accumulated values. In order to determine the total number of facilities the statistical program Curveexpert is used to fit the Weibull function to the corresponding plot. Outliers are excluded from the data used when fitting the Weibull function. Outliers are defined as facilities reporting more than 25 % of the total amount in the EPRTR activity. Furthermore, the reliability of this method decreases when the number of facilities reporting is too low. More details on the Weibull function can be found in [Appendix 9](#).

### **Assessment of landfills and incineration plants**

In order to focus more on activity 5 in the E-PRTR reporting (Waste and waste water management) it is relevant to make comparisons with information which can be obtained from reporting according to other EU waste directives or from other sources.

Information about the number of waste management plants reported to Eurostat according to the Waste Statistic Regulation is on a more aggregated level and provides information only about the total number of facilities per country related to waste incineration without energy recovery, waste incineration with energy recovery, the total number of other recovery plants and the total number of landfills. The project team received the number of plants covering 2004, 2006 and 2008 from Eurostat, although it seems difficult to use this information for a comparison with E-PRTR.

It has therefore been decided to focus on incineration plants (E-PRTR activity 5b) and landfills (E-PRTR activity 5d) by using other sources.

Other relevant information reported according to the EU waste directives is firstly the Landfill Directive (Questionnaire according to Commission Decision of 17 November 2000 (2000/738/EC)) and the reporting according to the Incineration Directive (Questionnaire according to Commission Decision on 20 February 2006 (2006/329/EC)). The Landfill Questionnaire was reported in 2010 covering the years from 2007 to 2009. The Incineration Questionnaire was reported by September 2009 at the latest and it covers 2006 to 2008. These questionnaires can provide relevant information especially regarding E-PRTR activity 5(b) and 5(d).

The landfill questionnaire includes the number of landfills for hazardous waste, landfills for non-hazardous waste and landfills for inert waste. The numbers cover the year 2009.

Landfills for inert waste are not obliged to report to E-PRTR. However, the number of landfills for hazardous waste and for non-hazardous waste according to the information in the questionnaire can be added and compared with the number of landfills reporting according to E-PRTR activity 5d, which covers landfills for hazardous waste and for non-hazardous waste (excluding landfills of inert waste and landfills, which were definitely closed before 16 June 2001 or for which the after-care phase required by the competent authorities according to Article 13 of Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste (3) has expired).

Regarding the incineration questionnaire it seems that the information includes a large number of smaller incineration plants or smaller technical installations incinerating waste, which are not dedicated incineration plants for non-hazardous waste. It therefore cannot be used for comparison with E-PRTR activity 5b.

Another source for the number of incineration plants is the information provided by CEWEP (Confederation of European Waste-to-Energy Plants). CEWEP has country information on incineration plants for 16 European countries including the incinerated amounts of MSW, the total number of incinerators in the country and the number represented by the organization member of the CEWEP, the generated amount of slag/bottom ash and flue gas cleaning products etc. This information can be used for the assessment of whether sufficient incineration plants covering the 17 countries are reporting to E-PRTR.

### **Assessment of power stations with a special focus on coal-fired power plants**

One sector with large differences between the amounts reported to E-PRTR and to Eurostat is the electricity, gas and water supply sector (NACE code 35). For hazardous waste, the 2008 generation in the EU was 6.7 million tonnes according to Eurostat and 1.4 million according to E-PRTR; equivalent to an E-PRTR coverage of 21%. For non-hazardous waste the amounts were 84 and 54 million tonnes, respectively, indicating an E-PRTR coverage of 64%. It is therefore relevant to see whether it is possible to verify and explain why these large differences occur.

It is assumed that from NACE code 35 the coal- and brown coal (lignite) fired power stations generate the largest amounts of waste residues including flue gas cleaning products. It was the original intention to use the distribution of fuels for each country to calculate the amounts of used coal and the generated waste amounts. However, it seems that this calculation has too much uncertainty due to missing information about the type of coal used.

Instead a request was sent to ECOBA (European Coal Combustion Products Association) to provide access to ECOBA's country data regarding ashes and slag from coal fired power plants. However, due to confidentiality it was only possible to get information at an aggregated level.

### **Evaluation of recovery and disposal**

Many facilities had large differences in their reporting of recovery rates and disposal rates between 2007 and 2008 and between 2008 and 2009. In its informal E-PRTR review, the EEA defined a significant difference as changes of at least 50 percentage points and total quantity changes of at least 1,000 or 5,000 tonnes, for hazardous and non-hazardous waste, respectively. The EEA informal review 2011 showed that for hazardous waste 121 facilities had a significant difference between 2008 and 2009 and 184 facilities for non-hazardous waste. However, this should be seen in the context of 17,000 facilities reporting hazardous waste and around 10,000 facilities reporting non-hazardous waste.

There are no other official statistics available for analysing how different economic industrial activities handle their waste. The Eurostat data does not include information on the treatment of waste related to economic activity and its data on recovery and disposal are only related to waste types.

One possibility for assessing the quality of the reported E-PRTR recovery and disposal rates is to include the development for each country at either the aggregated NACE code level or on each E-PRTR code level and state the percentage development in waste recovered and disposed of from 2007 to 2008, from 2008 to 2009 and from 2007 to 2009. The direction was classified as an increase or decrease less than 10%, between 10% to 30% and larger than 30%. Such an overview will indicate whether the direction within each category is the same for the reporting countries. If the direction is very diverse between the countries it can either indicate poor quality of the reporting or that some countries are better than others in recovering their waste. The direction for all E-PRTR activities are related to hazardous waste and non-hazardous waste, to intervals and to the number of countries included. For hazardous waste the information includes both waste transferred inside the country and outside the country.

### **Evaluation of waste transfers related to transboundary shipments**

E-PRTR reporting can be compared with the transboundary shipments of waste reported to the EU Commission according to the EU Waste Shipment Regulation. The latter is not related to an economic activity (NACE code) or to an E-PRTR code. It means that it is only possible to relate a country's total amount of hazardous waste transboundary shipped according to the E-PRTR Regulation with the total hazardous part of the notified waste according to the Waste Shipment Regulation.

Results from the EEA's work undertaken as a part of the informal E-PRTR 2011 review are used for the assessment of transboundary shipments of waste. The checks include 2007, 2008 and 2009 data.

It has to be underlined that the reporting according to the EU Waste Shipment Regulation includes both hazardous waste and other wastes (non-hazardous) which have to be notified before shipment according to either the Basel Convention or additional requirements according to the EU Waste Shipment Regulation. The comparison only includes notified hazardous waste reported according to the EU Waste Shipment Regulation because only hazardous waste has to be reported according to E-PRTR. Furthermore, the comparison includes only EU Member States because these countries are the only ones which have to report to the European Commission.

## APPENDIX 11 – SCOPE ANALYSIS OF E-PRTR REGULATION – RESULTS FOR AIR

Table 90 presents an overview of the number of pollutant releases into air for the year 2007/2008/2009. The last column indicates whether the Weibull approach has been applied during the EPER review or whether the pollutant is new. For the analysis for air the last data set from October 2011 (submissions from countries by 30 September 2011) was used.

The tests on data for the years 2007/ 2008/ 2009 indicate that this type of analysis can provide good results already with ten release reports, which would mean that completeness of reporting can be assessed with this statistical method for a maximum of 42 pollutants to air (see next table) for which emissions to air have been reported in 2009.

**Table 90: Number of releases into air 2007/2008/2009 for pollutants with more than ten reported releases**

| No. | Pollutant   | Number PRTs Air |      |      | Weibull used in EPER review? |
|-----|---|-----------------|------|------|------------------------------|
|     |   | 2007            | 2008 | 2009 |                              |
| 1   | Methane (CH <sub>4</sub> )                          | 1684            | 1750 | 1706 | Yes                          |
| 2   | Carbon monoxide (CO)                                | 729             | 692  | 611  | Yes                          |
| 3   | Carbon dioxide (CO <sub>2</sub> )                   | 2384            | 2449 | 2358 | Yes                          |
| 4   | Hydro-fluorocarbons (HFCs)                          | 204             | 210  | 229  | No                           |
| 5   | Nitrous oxide (N <sub>2</sub> O)                    | 723             | 727  | 690  | Yes                          |
| 6   | Ammonia (NH <sub>3</sub> )                          | 5497            | 5525 | 5776 | Yes                          |
| 7   | Non-methane volatile organic compounds (NMVOC)      | 1139            | 1115 | 1017 | Yes                          |
| 8   | Nitrogen oxides (NO <sub>x</sub> /NO <sub>2</sub> ) | 2997            | 2964 | 2810 | Yes                          |
| 9   | Perfluorocarbons (PFCs)                             | 48              | 47   | 45   | Yes                          |
| 10  | Sulphur hexafluoride (SF <sub>6</sub> )             | 31              | 34   | 36   | Yes                          |
| 11  | Sulphur oxides (SO <sub>x</sub> /SO <sub>2</sub> )  | 1690            | 1599 | 1487 | Yes                          |
| 14  | Hydrochlorofluorocarbons (HCFCs)                    | 696             | 742  | 748  | Yes                          |
| 15  | Chlorofluorocarbons (CFCs)                          | 289             | 293  | 290  | New                          |
| 16  | Halons  | 10              | 8    | 14   | No                           |
| 17  | Arsenic and compounds (as As)                       | 332             | 320  | 286  | Yes                          |
| 18  | Cadmium and compounds (as Cd)                       | 377             | 345  | 292  | No                           |
| 19  | Chromium and compounds (as Cr)                      | 266             | 247  | 218  | Yes                          |
| 20  | Copper and compounds (as Cu)                        | 242             | 255  | 225  | Yes                          |
| 21  | Mercury and compounds (as Hg)                       | 558             | 579  | 538  | Yes                          |
| 22  | Nickel and compounds (as Ni)                        | 601             | 569  | 498  | Yes                          |
| 23  | Lead and compounds (as Pb)                          | 323             | 305  | 247  | Yes                          |
| 24  | Zinc and compounds (as Zn)                          | 529             | 525  | 473  | Yes                          |
| 34  | 1,2-dichloroethane (EDC)                            | 34              | 34   | 27   | Yes                          |
| 35  | Dichloromethane (DCM)                               | 160             | 148  | 142  | No                           |
| 47  | PCDD + PCDF (dioxins + furans) (as Teq)             | 243             | 272  | 243  | Yes                          |
| 50  | Polychlorinated biphenyls (PCBs)                    | 70              | 73   | 66   | New                          |
| 52  | Tetrachloroethylene (PER)                           | 38              | 36   | 29   | Yes                          |
| 53  | Tetrachloromethane (TCM)                            | 17              | 16   | 15   | Yes                          |
| 54  | Trichlorobenzenes (TCBs) (all isomers)              | 9               | 12   | 20   | No                           |
| 55  | 1,1,1-trichloroethane                               | 13              | 20   | 23   | No                           |



| No. | Pollutant  | Number PRTs Air |      |      | Weibull used in EPER review? |
|-----|--|-----------------|------|------|------------------------------|
|     |  | 2007            | 2008 | 2009 |                              |
| 57  | Trichloroethylene                                | 59              | 29   | 21   | Yes                          |
| 58  | Trichloromethane                                 | 42              | 36   | 33   | Yes                          |
| 60  | Vinyl chloride                                   | 46              | 40   | 43   | New                          |
| 62  | Benzene  | 319             | 319  | 280  | Yes                          |
| 66  | Ethylene oxide                                   | 12              | 10   | 12   | No                           |
| 68  | Naphthalene                                      | 83              | 83   | 80   | New                          |
| 70  | Di-(2-ethyl hexyl) phthalate (DEHP)              | 26              | 32   | 31   | New                          |
| 72  | Polycyclic aromatic hydrocarbons (PAHs)          | 143             | 151  | 141  | Yes                          |
| 76  | Total organic carbon (TOC) (as total C or COD/3) | 580             | 545  | 449  | No                           |
| 80  | Chlorine and inorganic compounds (as HCl)        | 441             | 416  | 317  | Yes                          |
| 83  | Fluorides (as total F)                           | 69              | 81   | 70   | No                           |
| 84  | Fluorine and inorganic compounds (as HF)         | 854             | 803  | 632  | Yes                          |
| 85  | Hydrogen cyanide (HCN)                           | 1684            | 1750 | 1706 | Yes                          |
| 86  | Particulate matter (PM <sub>10</sub> )           | 729             | 692  | 611  | Yes                          |

For some pollutants, releases were reported even if there is no obligation and no threshold for air (Table 91). These pollutants were excluded from further analysis.

**Table 91: Number of releases into air 2007/2008/2009 for pollutants with no threshold for releases to air**

| No. | Pollutant  | Number PRTs Air |      |      |
|-----|--|-----------------|------|------|
|     |  | 2007            | 2008 | 2009 |
| 12  | Total nitrogen                                   | 1               | 1    | 1    |
| 71  | Phenols (as total C)                             | 6               | 6    | 6    |
| 76  | Total organic carbon (TOC) (as total C or COD/3) | 16              | 19   | 22   |
| 83  | Fluorides (as total F)                           | 14              | 14   | 15   |

Table 92 lists seven pollutants to air, of which only few releases were reported. For these specific pollutants other methods than the Weibull curve fit must be developed.

**Table 92: Number of releases into air 2007/2008/2009 for pollutants with less than ten reported releases**

| No. | Pollutant                               | Number PRTs Air |      |      |
|-----|---|-----------------|------|------|
|     |   | 2007            | 2008 | 2009 |
| 42  | Hexachlorobenzene (HCB)                 | 5               | 5    | 3    |
| 44  | 1,2,3,4,5,6- hexachlorocyclohexane(HCH) | 0               | 0    | 1    |
| 48  | Pentachlorobenzene                      | 0               | 3    | 3    |
| 49  | Pentachlorophenol (PCP)                 | 0               | 5    | 4    |
| 56  | 1,1,2,2-tetrachloroethane               | 6               | 6    | 7    |
| 61  | Anthracene                              | 8               | 8    | 7    |
| 81  | Asbestos                                | 0               | 1    | 0    |

For completeness, Table 93 shows eleven pollutants for which thresholds for releases to air exist but no releases were reported. Furthermore,

Table 94 lists 27 pollutants for which neither thresholds for air exist nor releases were reported. Therefore, these pollutants are not included in the further analysis.

**Table 93: Pollutants with threshold for releases to air but without reported releases**

| No. | Pollutant <i>with</i> threshold to air but no reports |
|-----|---|
| 26  | Aldrin  |
| 28  | Chlordane   |
| 29  | Chlordecone   |
| 33  | DDT   |
| 36  | Dieldrin  |
| 39  | Endrin  |
| 41  | Heptachlor  |
| 45  | Lindane   |
| 46  | Mirex   |
| 59  | Toxaphene   |
| 90  | Hexabromobiphenyl                                     |

**Table 94: Pollutants without threshold for releases to Air and without reported releases**

| No. | Pollutant <i>without</i> threshold to air, no reports |
|-----|---|
| 13  | Total phosphorus                                      |
| 25  | Alachlor  |
| 27  | Atrazine  |
| 30  | Chlorfenvinphos                                       |
| 31  | Chloro-alkanes, C10-C13                               |
| 32  | Chlorpyrifos  |
| 37  | Diuron  |
| 38  | Endosulphan   |
| 40  | Halogenated organic compounds (as AOX)                |
| 43  | Hexachlorobutadiene (HCBd)                            |
| 51  | Simazine  |
| 63  | Brominated diphenylethers (PBDE)                      |
| 64  | Nonylphenol and Nonylphenol ethoxylates (NP/NPEs)     |
| 65  | Ethyl benzene   |
| 67  | Isoproturon   |
| 69  | Organotin compounds(as total Sn)                      |
| 73  | Toluene   |
| 74  | Tributyltin and compounds                             |
| 75  | Triphenyltin and compounds                            |
| 77  | Trifluralin   |
| 78  | Xylenes   |
| 79  | Chlorides (as total Cl)                               |
| 82  | Cyanides (as total CN)                                |

| No. | Pollutant <i>without threshold to air, no reports</i> |
|-----|---|
| 87  | Octylphenols and Octylphenol ethoxylates              |
| 88  | Fluoranthene  |
| 89  | Isodrin   |
| 91  | Benzo(g,h,i)perylene                                  |

### Outlier elimination

The following example shows that possible outliers may have a significant influence on the result. During the statistical analysis some outliers have been identified. For the pollutant Cd this potential outlier leads to a falsification of the curve fitting and thus to a wrong conclusion on the coverage.

Figure 27: Curve fitting – Cd emissions to air, without elimination of outlier

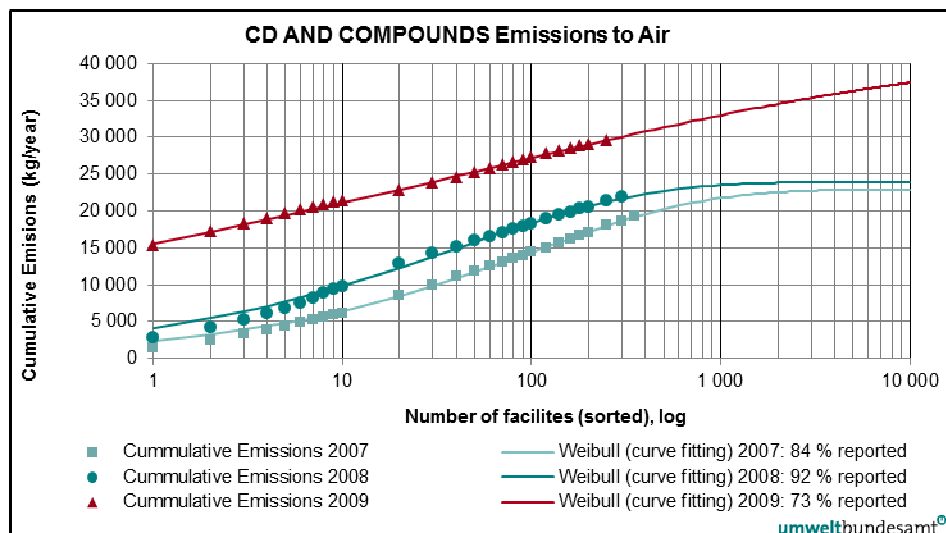


Figure 28: Curve fitting – Cd emissions to air, with elimination of outlier

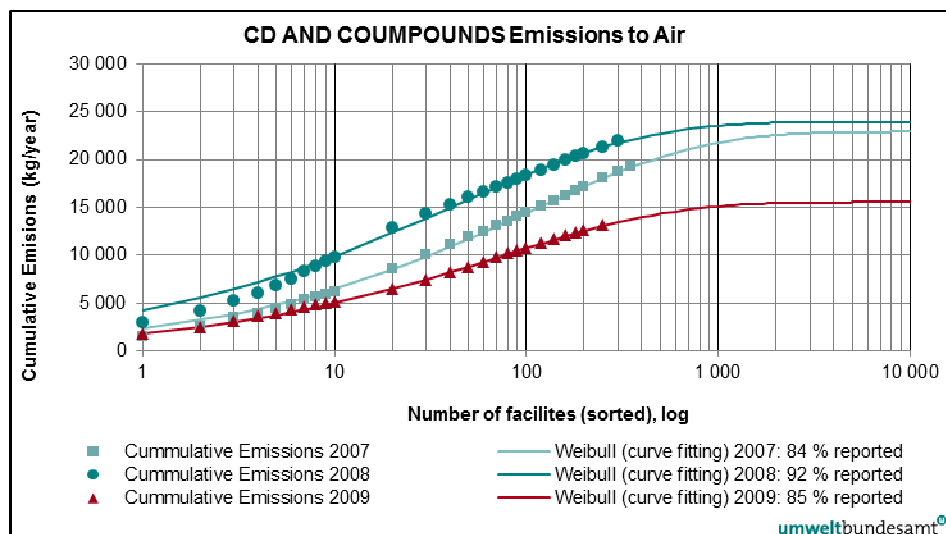


Table 95 lists five pollutants for which potential outliers have been eliminated. A detailed description (e.g. facility ID) and a rationale for excluding the reported releases in the further analyses can be found in Table 96 .

**Table 95: Pollutants (releases into air) 2007/2008/2009 with identified outliers**

| No. | Pollutant  | 2007 | 2008 | 2009 |
|-----|--|------|------|------|
| 5   | Nitrous oxide (N <sub>2</sub> O)                   |      |      | 1    |
| 11  | Sulphur oxides (SO <sub>x</sub> /SO <sub>2</sub> ) |      |      | 1    |
| 56  | 1,1,2,2-tetrachloroethane                          |      | 1    |      |
| 61  | Anthracene   |      |      | 1    |
| 68  | Naphthalene  |      |      | 1    |

Table 96 shows the outliers for air which were detected by applying the cumulative Weibull function and the filtered approach (step 1 and 2). All values have been checked at facility level by looking at the trend consistency and reporting of other pollutants. Furthermore a comparison with CLRTAP and UNFCCC data at sectoral level shows inconsistencies.

**Table 96: List of potential outliers for releases into air identified by applying the cumulative Weibull function and the filtered outlier check**

| Country | Year | Facility ID | FacilityName                              | Main activity | Pollutant         | Remark  | Rationale    |
|---------|------|-------------|---|---------------|-------------------|---|--------------|
| UK      | 2008 | 151143      | Total Uk Ltd, Lindsey Oil Refinery        | 1.(a)         | TETRACHLOROETHANE | 59% all country share. Found during statistical analysis. The value is about 150 times greater than for the other two years.                          | Expert guess |
| UK      | 2009 | 154030      | Burt Boulton & Haywood Ltd - Newport Site | 6.(b)         | ANTHRACENE        | 89% all country share. Found during statistical analysis.   | Expert guess |
| BE      | 2009 | 138990      | Station d'épuration de Bruxelles Nord     | 5.(f)         | N <sub>2</sub> O  | 26% all country share. Found during statistical analysis. Value is 25% higher than N <sub>2</sub> O from waste water treatment reported under CLRTAP. | Expert guess |
| UK      | 2009 | 154030      | Burt Boulton & Haywood Ltd - Newport Site | 6.(b)         | NAPHTHALENE       | 86% all country share. Found during statistical analysis.   | Expert guess |
| CZ      | 2009 | 14301       | Teplárna Strakonice, a.s.                 | 1.(c)         | SO <sub>x</sub>   | 25% all country share. Found during statistical approach and filtered approach. Value is 8 times higher than under CLRTAP.                            | Expert guess |

The following Table 97 shows the results of the curve fitting for all releases to air for the years 2007, 2008 and 2009. Data reported by Serbia are not included in the statistical analysis because only limited data have been reported. Furthermore, only pollutants with more than ten releases to air have been included in this assessment.

Reporting is considered complete (in line with E-PRTR Regulation requirements) if reported total emissions for a pollutant in comparison with the extrapolated total (from the Weibull curve fit) will reach at least 90% or more.

Based on the result concerning the E-PRTR coverage, recommendations towards amendments of Annex II of the E-PRTR Regulation are made. If the reported emissions are considerably below 90% further investigation towards lowering the emissions thresholds and/or including further activities are carried out.

**Table 97: Results of the Weibull curve fit for releases to Air (NA... Weibull function not applicable)**

| No. | Pollutant   | PRTR Coverage |      |      |
|-----|---|---------------|------|------|
|     |   | 2007          | 2008 | 2009 |
| 1   | Methane (CH <sub>4</sub> )                          | 95%           | 95%  | 94%  |
| 2   | Carbon monoxide (CO)                                | 98%           | 99%  | 98%  |
| 3   | Carbon dioxide (CO <sub>2</sub> )                   | 95%           | 95%  | 94%  |
| 4   | Hydro-fluorocarbons (HFCs)                          | 101%          | 101% | 101% |
| 5   | Nitrous oxide (N <sub>2</sub> O)                    | 102%          | 101% | 100% |
| 6   | Ammonia (NH <sub>3</sub> )                          | 36%           | 44%  | 41%  |
| 7   | Non-methane volatile organic compounds (NMVOC)      | 93%           | 92%  | 90%  |
| 8   | Nitrogen oxides (NO <sub>x</sub> /NO <sub>2</sub> ) | 95%           | 95%  | 93%  |
| 9   | Perfluorocarbons (PFCs)                             | 96%           | 97%  | 89%  |
| 10  | Sulphur hexafluoride (SF <sub>6</sub> )             | 99%           | 100% | 99%  |
| 11  | Sulphur oxides (SO <sub>x</sub> /SO <sub>2</sub> )  | 99%           | 97%  | 97%  |
| 14  | Hydrochlorofluorocarbons (HCFCs)                    | 100%          | 100% | 100% |
| 15  | Chlorofluorocarbons (CFCs)                          | 100%          | 99%  | 98%  |
| 16  | Halons  | 99%           | 100% | 100% |
| 17  | Arsenic and compounds (as As)                       | 86%           | 86%  | 84%  |
| 18  | Cadmium and compounds (as Cd)                       | 84%           | 92%  | 85%  |
| 19  | Chromium and compounds (as Cr)                      | 86%           | 90%  | 89%  |
| 20  | Copper and compounds (as Cu)                        | 97%           | 96%  | 97%  |
| 21  | Mercury and compounds (as Hg)                       | 94%           | 91%  | 89%  |
| 22  | Nickel and compounds (as Ni)                        | 98%           | 99%  | 98%  |
| 23  | Lead and compounds (as Pb)                          | 95%           | 97%  | 97%  |
| 24  | Zinc and compounds (as Zn)                          | 98%           | 99%  | 97%  |
| 34  | 1,2-dichloroethane (EDC)                            | 101%          | 101% | 98%  |
| 35  | Dichloromethane (DCM)                               | NA            | NA   | 100% |
| 47  | PCDD + PCDF (dioxins + furans) (as Teq)             | 100%          | 100% | 100% |
| 50  | Polychlorinated biphenyls (PCBs)                    | 101%          | 100% | 100% |
| 52  | Tetrachloroethylene (PER)                           | 94%           | NA   | 67%  |
| 53  | Tetrachloromethane (TCM)                            | 102%          | 101% | 101% |
| 54  | Trichlorobenzenes (TCBs) (all isomers)              | 92%           | 67%  | 60%  |
| 55  | 1,1,1-trichloroethane                               | 100%          | 64%  | 97%  |
| 57  | Trichloroethylene                                   | 83%           | 100% | 96%  |
| 58  | Trichloromethane                                    | 82%           | 58%  | 91%  |
| 60  | Vinyl chloride                                      | 94%           | 96%  | 94%  |

| No. | Pollutant                                 | PRTR Coverage |      |      |
|-----|---|---------------|------|------|
|     |   | 2007          | 2008 | 2009 |
| 62  | Benzene                                   | 98%           | 97%  | 97%  |
| 66  | Ethylene oxide                            | 96%           | 98%  | 99%  |
| 68  | Naphthalene                               | 102%          | 101% | NA   |
| 70  | Di-(2-ethyl hexyl) phthalate (DEHP)       | NA            | 101% | 102% |
| 72  | Polycyclic aromatic hydrocarbons (PAHs)   | 100%          | NA   | 101% |
| 80  | Chlorine and inorganic compounds (as HCl) | 97%           | 95%  | 93%  |
| 84  | Fluorine and inorganic compounds (as HF)  | 96%           | 95%  | 97%  |
| 85  | Hydrogen cyanide (HCN)                    | 99%           | NA   | 101% |
| 86  | Particulate matter (PM <sub>10</sub> )    | 93%           | 89%  | 88%  |

In some cases the statistically estimated completeness is higher than 100 % (see six pollutants in Table 97 red marking), which is possible because of the statistical uncertainty of the method. This minor difference (1 to 2 %) is considered to be acceptable and it is assumed that such results indicate that reporting is complete.

The following figures present the curve fit with the Weibull function for the main pollutants of the national air emission inventory (GHGs, NEC-Gases, Heavy Metals and POPs) for the years 2007, 2008 and 2009.

**Figure 29: Curve fitting – CO<sub>2</sub> emissions to air**

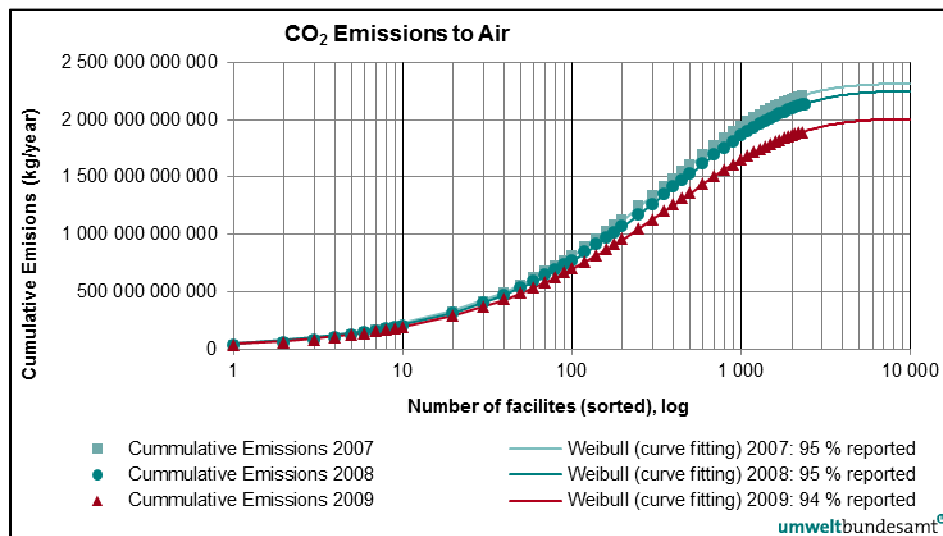


Figure 30: Curve fitting – CH<sub>4</sub> emissions to air

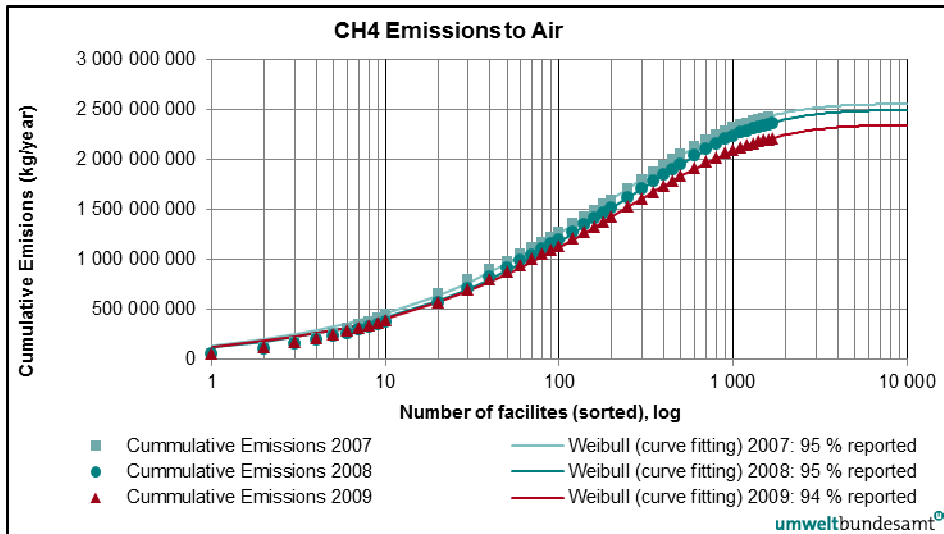


Figure 31: Curve fitting – NO<sub>x</sub> emissions to air

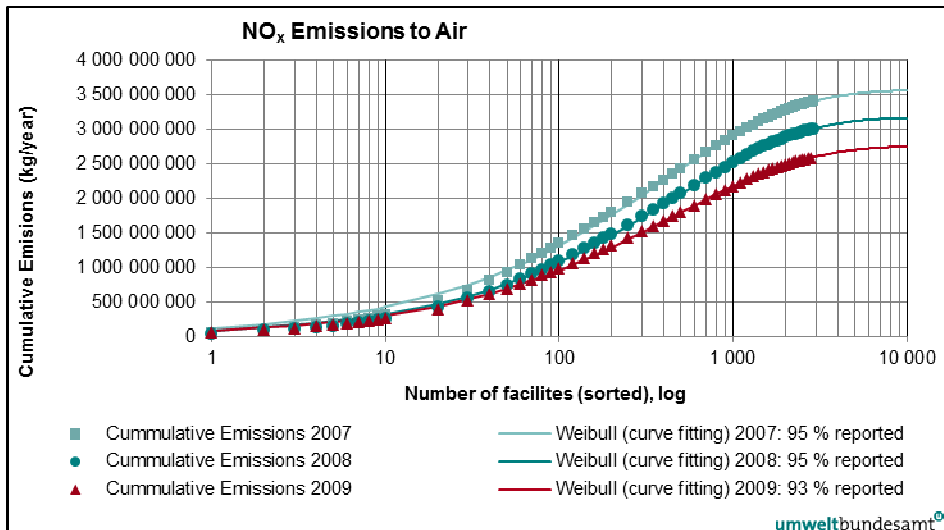


Figure 32: Curve fitting – NMVOC emissions to air

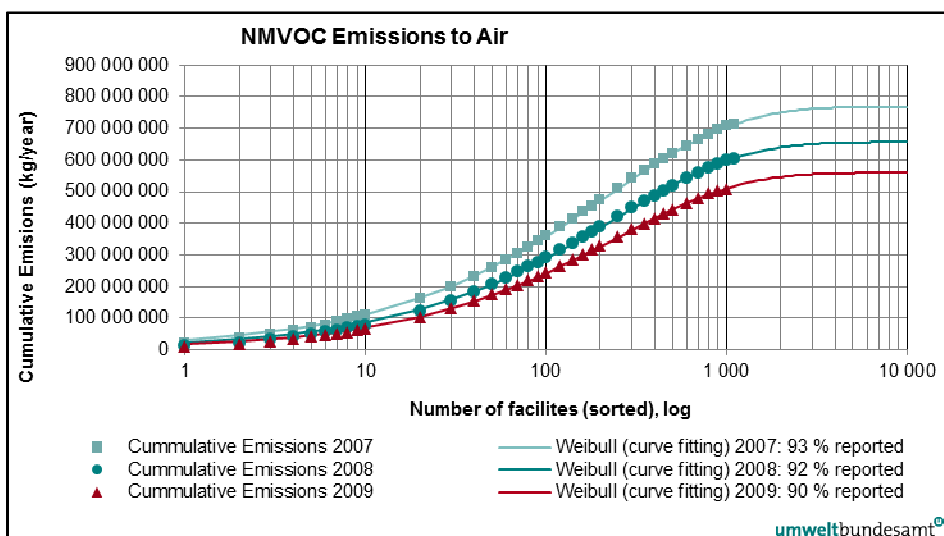


Figure 33: Curve fitting – SO<sub>x</sub> emissions to air

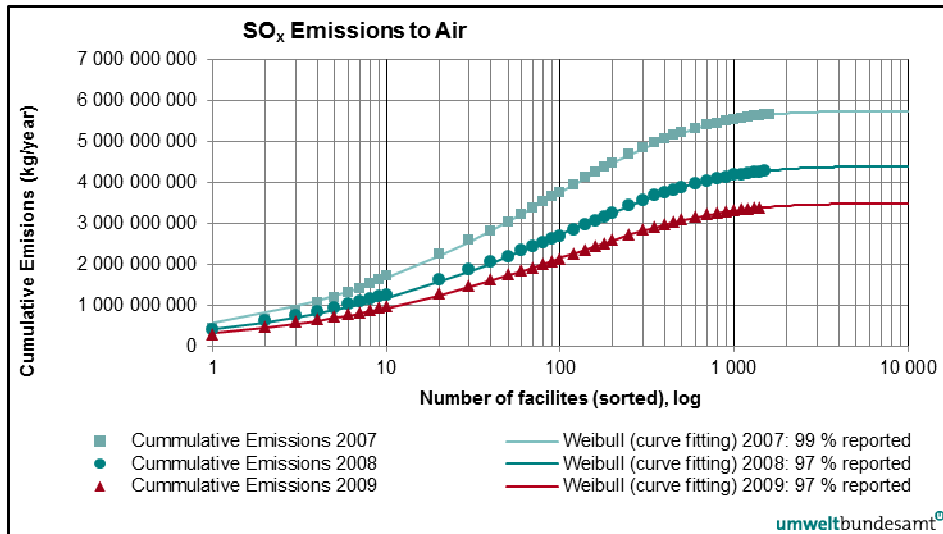


Figure 34: Curve fitting – Hg emissions to air

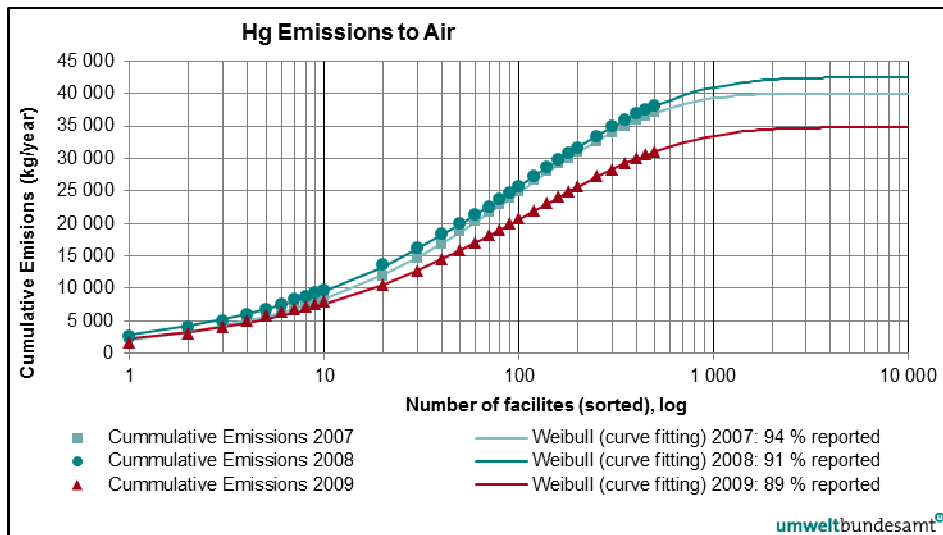


Figure 35: Curve fitting – Pb emissions to air

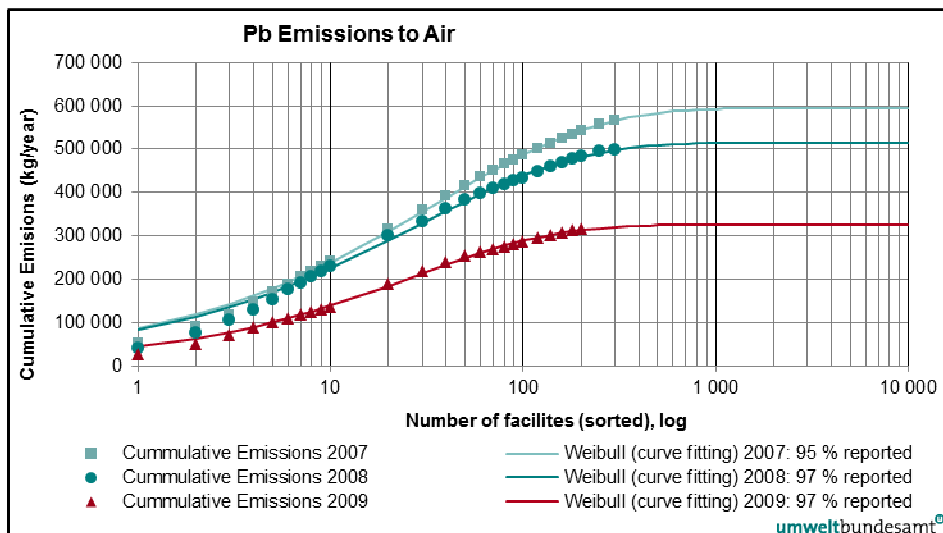




Figure 36: Curve fitting – PCDD/PCDF emissions to air

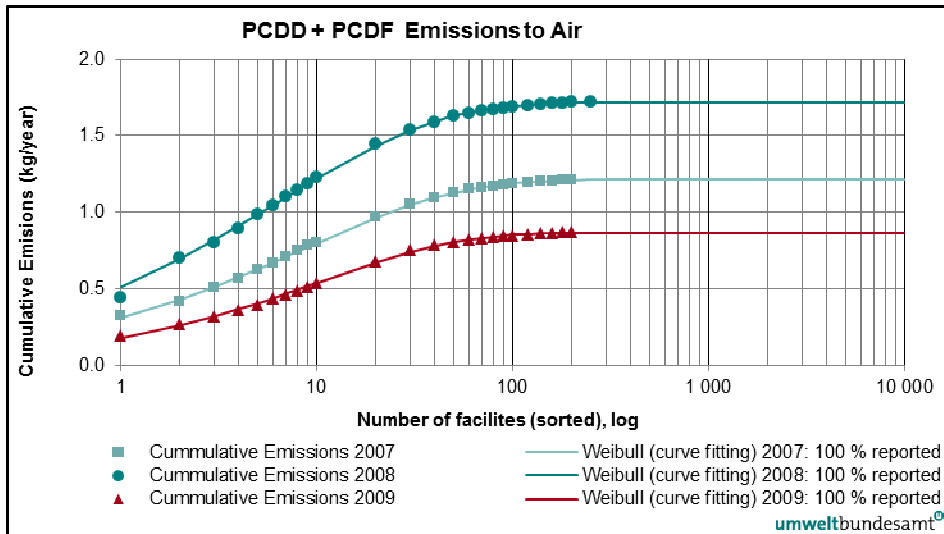
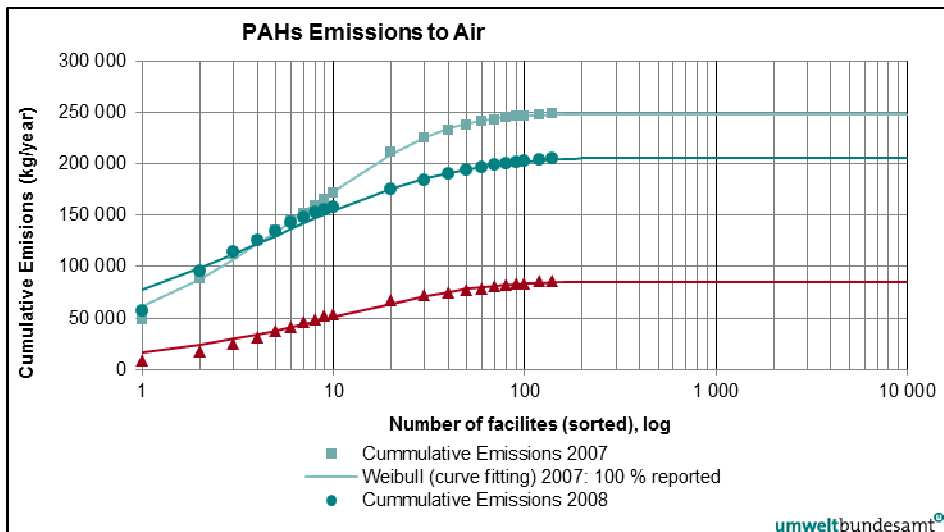


Figure 37: Curve fitting – PAH emissions to air



For some pollutants the results show 99% completeness, but the curve fit is not satisfactory for the total reported emissions. In such a case there are usually some subsectors which show a very different distribution than the majority of emissions. The Weibull results at total E-PRTR level were not good for the pollutants CO, N<sub>2</sub>O and NH<sub>3</sub> (see figures below). Therefore, a sectoral approach has been applied for these three pollutants.

Figure 38: Curve fitting – CO emissions to air

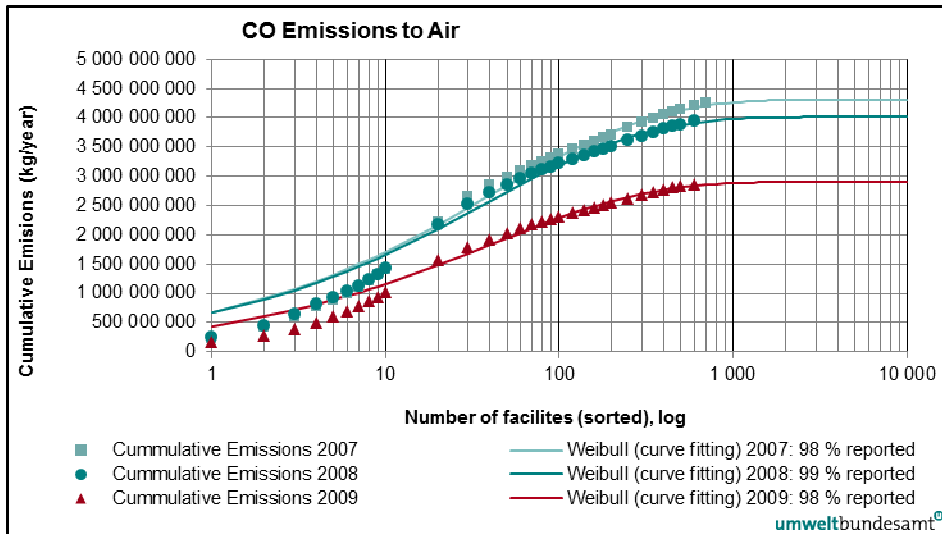


Figure 39: Curve fitting – N<sub>2</sub>O emissions to air

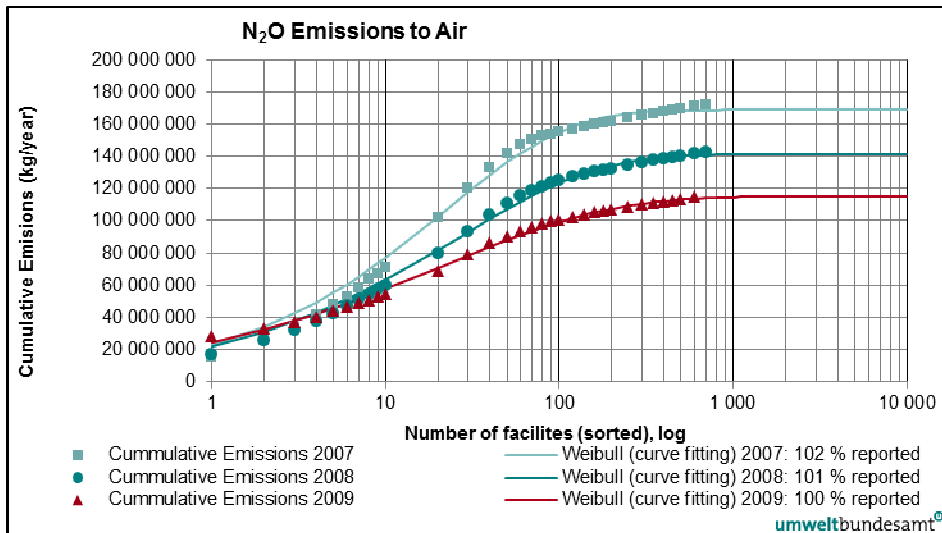
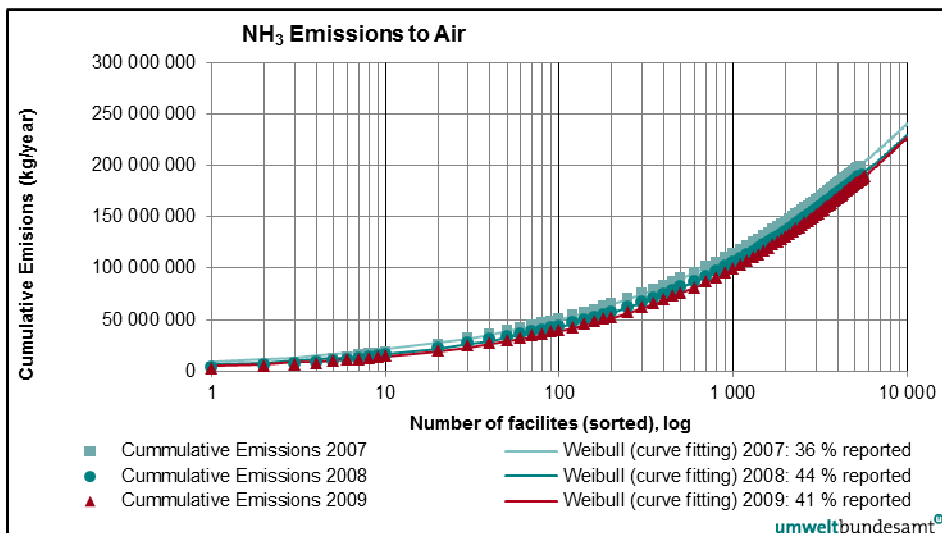


Figure 40: Curve fitting – NH<sub>3</sub> emissions to air



Other cases that have to be investigated further are if the extrapolated total is far over the 100% or far below 90 % of reported emissions. For releases to air the first situation was observed for N<sub>2</sub>O, for which the Weibull function has a relatively bad fit because of dominating subsectors (for results see sectoral approach below).

For ten pollutants the estimated coverage remains below the threshold of 90 % (see Table 98, yellow mark).

**Table 98: First results of the Weibull curve fit for releases to air, below threshold**

| No. | Pollutant                              | PRTR Coverage |      |      |
|-----|--|---------------|------|------|
|     |  | 2007          | 2008 | 2009 |
| 6   | Ammonia (NH <sub>3</sub> )             | 36%           | 44%  | 41%  |
| 17  | Arsenic and compounds (as As)          | 86%           | 86%  | 84%  |
| 18  | Cadmium and compounds (as Cd)          | 84%           | 92%  | 85%  |
| 19  | Chromium and compounds (as Cr)         | 86%           | 90%  | 89%  |
| 52  | Tetrachloroethylene (PER)              | 94%           | 91%  | 67%  |
| 54  | Trichlorobenzenes (TCBs) (all isomers) | 92%           | 67%  | 60%  |
| 55  | 1,1,1-trichloroethane                  | 100%          | 64%  | 97%  |
| 57  | Trichloroethylene                      | 83%           | 100% | 96%  |
| 58  | Trichloromethane                       | 82%           | 58%  | 91%  |
| 86  | Particulate matter (PM <sub>10</sub> ) | 93%           | 89%  | 89%  |

For the statistical approach the pollutant **6 and 17** show a coverage which is significantly below 90% and therefore the sectoral analysis has to be performed. The reported releases for **cadmium (no. 18)** lie below the threshold for 2007 und 2009. Since the threshold for this pollutant is the same as under EPER, a sufficient number of facilities have reported releases and there is a dominating subsector, this pollutant will be further investigated in the sectoral analysis. **Chromium (no. 19)** has better coverage than cadmium but will still be included in the sectoral analysis.

The pollutants with number **52, 55, 57 and 58** either have a relatively small number of reported releases or a homogenous sectoral distribution so that a sectoral approach would not lead to better result. Furthermore, the coverage for each pollutant lies at least in one year above the threshold of 90 %. If the 90% coverage can be reached in one year it is concluded that the threshold is set so that the 90% coverage can be reached. The pollutant **TCBs (no. 54)** shows a decreasing trend of coverage from 2007 to 2009 although the number of reporting facilities doubled. Furthermore, the number of reporting facilities was below ten for the year 2007. These are signs that the TCB threshold is set to high to cover 90% of all TCB releases to air.

For the pollutant **PM<sub>10</sub> (no. 86)** the statistical approach shows values for the years 2008 and 2009 which are slightly below the threshold with 89 %. Due to uncertainty of the statistical method and the fact that for the last two years not all releases have been reported so far it is concluded that no further investigations are necessary. The Weibull analysis provides sufficient results which indicate that completeness of PM<sub>10</sub> reporting is around the 90% target.

## Sectoral Approach

Prerequisite for the sectoral statistical approach are:

- Ordinary statistical approach delivers no proper results (e.g. below threshold, bad fit)
- A sufficient number of reported releases per subsector (at least ten)

- Heterogeneous sources (different sectors with releases)
- One or two dominating subsectors

Table 99 shows selected pollutants (see previous section) for which the sectoral approach was applied and the reason for applying the sectoral approach.

**Table 99: Pollutants for sectoral statistical approach for Air**

| No. | Pollutant                        | Why sectoral approach?                        |
|-----|----------------------------------|---|
| 2   | Carbon monoxide (CO)             | bad fit, dominating subsectors                |
| 5   | Nitrous oxide (N <sub>2</sub> O) | bad fit, dominating subsectors                |
| 6   | Ammonia (NH <sub>3</sub> )       | below threshold, dominating subsectors        |
| 17  | Arsenic and compounds (as As)    | below threshold, dominating subsectors        |
| 18  | Cadmium and compounds (as Cd)    | partly below threshold, dominating subsectors |
| 19  | Chromium and compounds (as Cr)   | partly below threshold, dominating subsectors |

Table 100 gives an overview of dominating activities (see E-PRTR Regulation Annex I) for the analysed pollutants. For detail view also see key source analysis for these pollutant in Annex I. On closer inspection it is visible that a relatively few facilities are frequently accountable for most of the total emissions.

**Table 100: Comparison of dominating sectors for selected pollutants for sectoral approach**

| Pollutant             | Activity level <sup>1)</sup> | Quantity of releases [kg] |                      |                      | Number of releases |              |              |
|-----------------------|------------------------------|---------------------------|----------------------|----------------------|--------------------|--------------|--------------|
|                       |                              | 2007                      | 2008                 | 2009                 | 2007               | 2008         | 2009         |
| <b>CO</b>             | <b>Total</b>                 | <b>4.248.331.293</b>      | <b>3.966.040.994</b> | <b>2.858.085.902</b> | <b>729</b>         | <b>692</b>   | <b>611</b>   |
| CO                    | 2.(b)                        | 1.936.293.002             | 1.651.223.002        | 1.234.720.002        | 80                 | 67           | 60           |
| CO                    | not 2.(b)                    | 2.312.038.291             | 2.314.817.991        | 1.623.365.900        | 649                | 625          | 550          |
| <b>N<sub>2</sub>O</b> | <b>Total</b>                 | <b>171.594.093</b>        | <b>142.630.509</b>   | <b>115.030.642</b>   | <b>723</b>         | <b>727</b>   | <b>690</b>   |
| N <sub>2</sub> O      | 4.(c)                        | 63.091.000                | 44.309.600           | 23.298.700           | 24                 | 27           | 27           |
| N <sub>2</sub> O      | not 4.(c)                    | 108.503.093               | 98.320.909           | 91.731.942           | 699                | 700          | 664          |
| <b>NH<sub>3</sub></b> | <b>Total</b>                 | <b>200.109.236</b>        | <b>190.565.501</b>   | <b>189.263.805</b>   | <b>5.497</b>       | <b>5.525</b> | <b>5.776</b> |
| NH <sub>3</sub>       | 7.(a)                        | 148.612.000               | 142.436.100          | 147.551.500          | 5.056              | 5.098        | 5.366        |
| NH <sub>3</sub>       | not 7.(a)                    | 50.830.936                | 47.108.851           | 37.808.996           | 442                | 429          | 415          |
| <b>As</b>             | <b>Total</b>                 | <b>49.336</b>             | <b>43.635</b>        | <b>30.808</b>        | <b>332</b>         | <b>320</b>   | <b>286</b>   |
| As                    | 2.(b)                        | 4.631                     | 4.008                | 2.369                | 36                 | 27           | 24           |
| As                    | not 2.(b)                    | 44.705                    | 39.628               | 28.438               | 296                | 293          | 262          |
| <b>Cd</b>             | <b>Total</b>                 | <b>19.254</b>             | <b>21.994</b>        | <b>13.127</b>        | <b>377</b>         | <b>345</b>   | <b>292</b>   |
| Cd                    | 2.(b)                        | 7.352                     | 6.280                | 3.098                | 65                 | 64           | 52           |
| Cd                    | not 2.(b)                    | 11.902                    | 15.714               | 10.029               | 312                | 281          | 240          |
| <b>Cr</b>             | <b>Total</b>                 | <b>136.949</b>            | <b>120.927</b>       | <b>80.367</b>        | <b>266</b>         | <b>247</b>   | <b>218</b>   |
| Cr                    | 2.(b)                        | 58.080                    | 48.966               | 31.589               | 62                 | 64           | 54           |
| Cr                    | not 2.(b)                    | 78.869                    | 71.961               | 48.778               | 204                | 183          | 164          |

Notes: 2.(b) Installations for the production of pig iron or steel (primary or secondary melting) including continuous casting

4.(c) Chemical installations for the production on an industrial scale of phosphorous-, nitrogen- or potassium-based fertilisers (simple or compound fertilisers)

7.(a) Installations for the intensive rearing of poultry or pigs

The results of the sectoral approach deliver valuable information for concluding whether to change the release thresholds or not. The pollutant CO has a relatively bad curve fitting in the statistical analysis, which is an indicator for dominating subsectors. Furthermore, CO is a good example for pollutants for which the Weibull approximation delivers good fitting for both the dominating sector (here “metal industry”) and other activities even if one subsector partly falls below the threshold. After adding up the results of both subsectors the target of reaching a 90% coverage is reached.

The pollutant N<sub>2</sub>O exceeds the 100% coverage in the analysis at the total E-PRTR level. The detailed analysis shows a proper fit for both subsectors.

For the pollutants NH<sub>3</sub>, As and Cd the subsectoral analysis shows that the 90% coverage is not reached in at least one subsector. The conclusions for these pollutants can be found below.

**Table 101: Results of the sectoral approach for selected pollutants**

| No. |                                  | PRTR Coverage |             |             |
|-----|----------------------------------|---------------|-------------|-------------|
|     |                                  | 2007          | 2008        | 2009        |
| 2   | Carbon monoxide (CO)             | <b>98%</b>    | <b>99%</b>  | <b>98%</b>  |
|     | 2.(b)                            | 101%          | 101%        | 101%        |
|     | and other activities             | 89%           | 91%         | 89%         |
|     | combined subsectors              | 94%           | 94%         | 93%         |
| 5   | Nitrous oxide (N <sub>2</sub> O) | <b>102%</b>   | <b>101%</b> | <b>100%</b> |
|     | 4.(c)                            | 95%           | 88%         | 87%         |
|     | and other activities             | 101%          | 99%         | 97%         |
|     | combined subsectors              | 98%           | 96%         | 95%         |
| 6   | Ammonia (NH <sub>3</sub> )       | <b>36%</b>    | <b>44%</b>  | <b>41%</b>  |
|     | 7.(a)                            | 45%           | 57%         | 47%         |
|     | and other activities             | 95%           | 95%         | 94%         |
|     | combined subsectors              | 52%           | 63%         | 54%         |
| 17  | Arsenic and compounds (as As)    | <b>86%</b>    | <b>86%</b>  | <b>84%</b>  |
|     | 2.(b)                            | 90%           | 97%         | 98%         |
|     | and other activities             | 85%           | 83%         | 83%         |
|     | combined subsectors              | 85%           | 84%         | 84%         |
| 18  | Cadmium and compounds (as Cd)    | <b>84%</b>    | <b>92%</b>  | <b>85%</b>  |
|     | 2.(b)                            | 99%           | 101%        | 93%         |
|     | and other activities             | 77%           | 83%         | 80%         |
|     | combined subsectors              | 84%           | 88%         | 83%         |
| 19  | Chromium and compounds (as Cr)   | <b>86%</b>    | <b>90%</b>  | <b>89%</b>  |
|     | 2.(b)                            | 92%           | 94%         | 93%         |
|     | and other activities             | 78%           | 88%         | 87%         |
|     | combined subsectors              | 83%           | 90%         | 89%         |

### Conclusions for air

- Overall, the Weibull approximation delivers good results for most pollutants. For the majority of the pollutants the 90% coverage is reached.
- For **CO** the analysis indicates that reporting of iron and steel facilities and all other activities is complete.
- For **N<sub>2</sub>O** the sectoral analysis shows a complete coverage for activity 4.(c) (production of fertilizers) and other activities.

- **NH<sub>3</sub>** emissions are only covered by about 40%. The sectoral approach shows that if activity 7.(a) (intensive rearing of poultry or pigs) is excluded a coverage of over 90% is reached. For the activity 7.(a) only a coverage of around 50% is achieved. According to the Weibull curve fit the threshold for releases to air should be reduced so that more than 20.000 additional facilities have to report NH<sub>3</sub> emissions, assuming that the current reporting is complete. There is some evidence for incompleteness because not all countries reported under activity 7.(a) and many countries reported just a few facilities.
- Lowering thresholds for **arsenic and cadmium (Cd)** can be considered. The sectoral estimation for the years 2007-2009 confirms that the threshold for releases (20 kg/year) is probably set too high. Even in the last review (EPER 2004) arsenic was partially below the coverage level of 90 %. Furthermore, the threshold for **Cd** for releases to air should be adapted to the threshold to water/land (that is from 10 kg/year to 5 kg/year).
- The coverage of **chromium** is considered to reach the 90% target. The subsectoral analysis confirms the result from the overall analysis.
- For the pollutant **TCB** the statistical analysis delivers a coverage significantly below 90% except for the year 2007 (in which only nine facilities reported). This indicates that either too few facilities reported TCB releases to air or the threshold (10 kg /year) is set too high. In addition, more than half of the reported releases (in kg and number of facilities) are situated in the United Kingdom (especially treatment of waste), which might indicate that releases in most other countries were not fully reported.

Pollutants for which further methods are needed:

- 42 Hexachlorobenzene (HCB)
- 44 1,2,3,4,5,6- hexachlorocyclohexane(HCH)
- 48 Pentachlorobenzene
- 49 Pentachlorophenol (PCP)
- 56 1,1,2,2-tetrachloroethane
- 61 Anthracene
- 81 Asbestos

Above listed pollutants mainly occur from specific processes in chemical industry rather than during product use. It is assumed that only a few chemical plants are potential emission sources. Therefore, any threshold will potentially limit the reporting to a large extent. However, because current reporting is very limited, lowering the current thresholds seems to be appropriate.

## APPENDIX 12 – SCOPE ANALYSIS OF E-PRTR REGULATION – RESULTS FOR WATER

### 1) Releases to water

The threshold analysis with the cumulative Weibull distribution is done for all pollutants and all three reporting years if at least ten release/transfer reports are available and the reporting has not been assessed incomplete in the completeness assessment.

Table 102 summarises the results of the extrapolation for the 44 pollutants for releases to water, for which more than ten release reports are available. Reporting is considered in line with the E-PRTR Regulation requirements if the reported total emissions for a pollutant reach at least 90% of the extrapolated total (parameter a from the Weibull distribution, obtained by non-linear regression). However, it has to be considered that the estimates for parameter a, which was used to calculate the coverage, is influenced by statistical uncertainty (as explained in [Appendix 9](#)). Therefore, a calculated coverage between 89% and 101% is accepted as fulfilling the reporting requirements. Coverage below 89% or above 101% indicates that the overall goal of achieving the 90% threshold is not achieved. A calculated coverage below 90% or above 100% is marked red in Table 102.

**Table 102: Calculated E-PRTR coverage [%] for releases into water based on the curve fitting results (NA...Weibull function not applicable)**

| Nr. | Pollutant                     | E-PRTR coverage [%] |      |      |
|-----|-------------------------------|---------------------|------|------|
|     |                               | 2007                | 2008 | 2009 |
| 12  | TOTAL - NITROGEN              | 88%                 | 90%  | 87%  |
| 13  | TOTAL - PHOSPHORUS            | 83%                 | 91%  | 85%  |
| 17  | AS AND COMPOUNDS              | 97%                 | 98%  | 95%  |
| 18  | CD AND COMPOUNDS              | 92%                 | 95%  | 93%  |
| 19  | CR AND COMPOUNDS              | 95%                 | 93%  | 91%  |
| 20  | CU AND COMPOUNDS              | 95%                 | 95%  | 96%  |
| 21  | HG AND COMPOUNDS              | 97%                 | 96%  | 96%  |
| 22  | NI AND COMPOUNDS              | 94%                 | 94%  | 94%  |
| 23  | PB AND COMPOUNDS              | 97%                 | 89%  | 94%  |
| 24  | ZN AND COMPOUNDS              | 89%                 | 92%  | 89%  |
| 31  | CHLORO-ALKANES (C10-13)       | 99%                 | 99%  | 102% |
| 34  | DICHLOROETHANE-1,2 (DCE)      | NA                  | 99%  | 97%  |
| 35  | DICHLOROMETHANE (DCM)         | 101%                | NA   | 103% |
| 37  | DIURON                        | 89%                 | NA   | 95%  |
| 40  | HALOGENATED ORGANIC COMPOUNDS | 101%                | NA   | NA   |
| 47  | PCDD+PCDF (DIOXINS+FURANS)    | 95%                 | 96%  | 96%  |
| 49  | PENTACHLOROPHENOL (PCP)       | 97%                 | 97%  | 85%  |
| 52  | TETRACHLOROETHYLENE (PER)     | 98%                 | 99%  | 65%  |
| 53  | TETRACHLOROMETHANE (TCM)      | 101%                | 98%  | 100% |
| 54  | TRICHLOROBENZENES (TCB)       | 99%                 | 53%  | 100% |
| 57  | TRICHLOROETHYLENE (TRI)       | 93%                 | 96%  | 99%  |
| 58  | TRICHLOROMETHANE              | NA                  | 97%  | NA   |
| 60  | VINYL CHLORIDE                | 99%                 | 96%  | 97%  |
| 61  | ANTHRACENE                    | 86%                 | 102% | 84%  |
| 64  | NP/NPES                       | 94%                 | 95%  | 88%  |

| Nr. | Pollutant                                | E-PRTR coverage [%] |      |      |
|-----|--|---------------------|------|------|
|     |  | 2007                | 2008 | 2009 |
| 69  | ORGANOTIN - COMPOUNDS                    | 96%                 | 94%  | 99%  |
| 71  | PHENOLS                                  | 100%                | 100% | 100% |
| 72  | POLYCYCLIC AROMATIC HYDROCARBONS         | 101%                | 101% | 100% |
| 76  | TOTAL ORGANIC CARBON (TOC)               | 73%                 | 90%  | 91%  |
| 79  | CHLORIDES                                | 102%                | 101% | 101% |
| 82  | CYANIDES                                 | NA                  | NA   | 100% |
| 83  | FLUORIDES                                | 96%                 | 96%  | 90%  |
| 87  | OCTYLPHENOLS AND OCTYLPHENOL ETHOXYLATES | NA                  | NA   | 100% |
| 88  | FLUORANTHENE                             | 83%                 | 94%  | 101% |
| 91  | BENZO(G,H,I)PERYLENE                     | 16%                 | 93%  | 99%  |

The curve fitting is very good for all parameters and also the shape parameters of the cumulative Weibull distribution are comparable. It can also be seen that for most pollutants the lowest cumulative emissions are calculated for the reporting year 2009, whereas the highest reported emissions are observed in the reporting year 2008.

If the 90% threshold is exceeded in one of the three reporting years and in the other two reporting years the coverage also reaches approx. 90% (e.g. total nitrogen, zinc and its compounds) the E-PRTR reporting threshold seems suitable and no change of the threshold seems necessary as the 90% threshold is achieved. A more detailed assessment is required for pollutants for which coverage below 90% or above 100% is determined for all three reporting years. Those compounds to be further analysed are listed in Table 103.

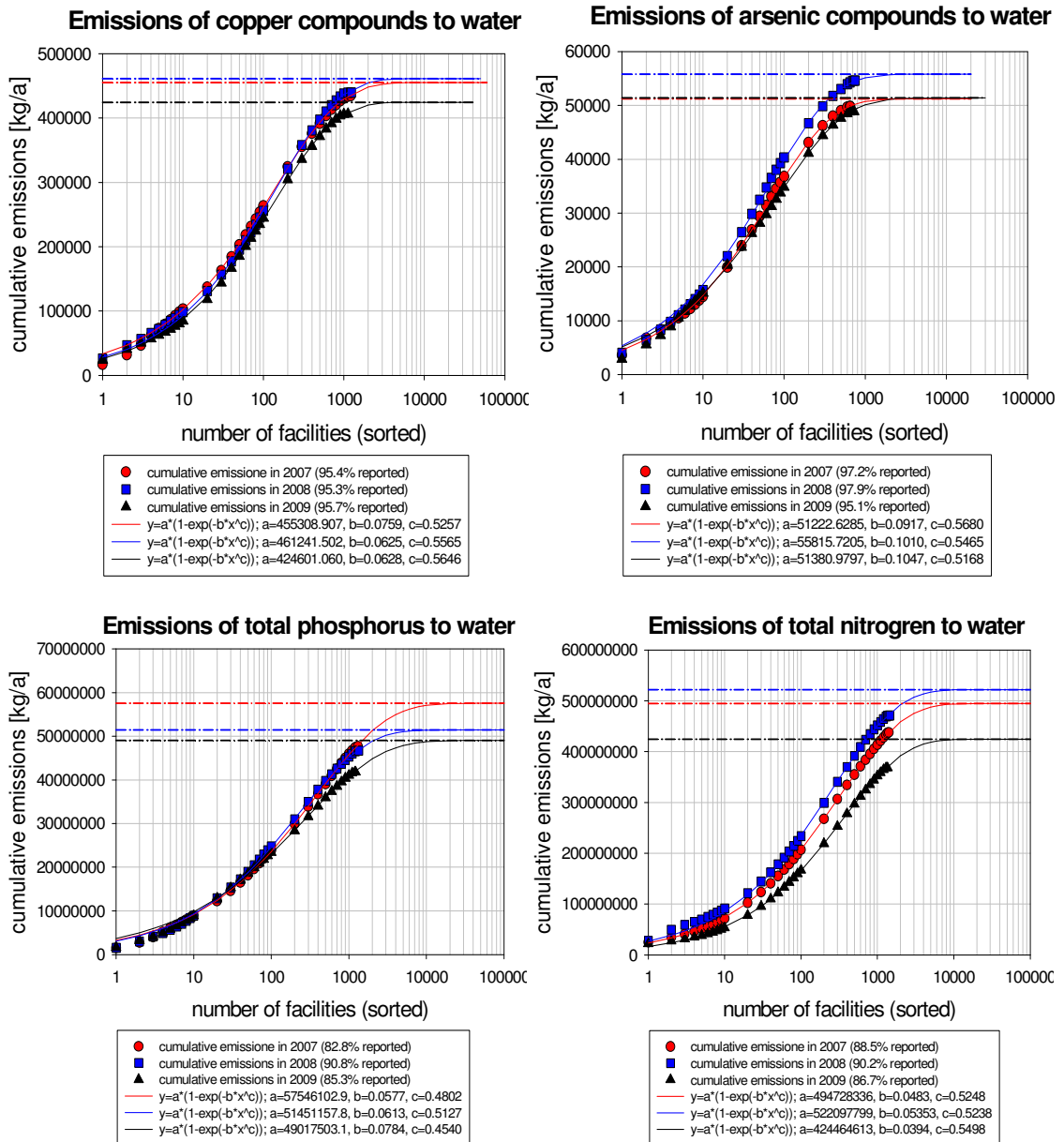
For Dichloromethane (DCM) it is observed that in two of three reporting years the coverage amounts to more than 100%. It is also observed that in 2007 one release report contributes approx. 53% of the total released quantity (23,200 kg/y). The facility (SIAAP Site Seine Aval) reports releases to air also for the years 2008 and 2009 but no longer releases to water. As the applied criteria for the detection of outliers did not reveal this release report as potential outlier it cannot be assessed whether this release report is a potential outlier or whether the facility should have reported the release also for the forthcoming years and the missing reports are due to wrong reporting. When removing the questionable report from the evaluation a coverage of 100% is calculated for the reporting year 2007. For 2008 a coverage of 95% is calculated, whereas for 2009 the calculated coverage amounts to 103%. For the reporting year 2009 the reporting of releases to water is presumably still not complete as the number of reporting facilities is notably lower than in the years before (approx. 25-30% lower). This is reflected also in the curves with the cumulative emissions still increasing indicating missing release reports.

**Table 103: Pollutants subjected to sectoral approach**

| Nr. | Pollutant                        | E-PRTR coverage [%] |      |      |
|-----|----------------------------------|---------------------|------|------|
|     |                                  | 2007                | 2008 | 2009 |
| 40  | HALOGENATED ORGANIC COMPOUNDS    | 101%                | NA   | NA   |
| 61  | ANTHRACENE                       | 86%                 | 102% | 84%  |
| 72  | POLYCYCLIC AROMATIC HYDROCARBONS | 101%                | 101% | 100% |
| 79  | CHLORIDES                        | 102%                | 101% | 101% |



**Figure 41: Curve fitting: cumulative Weibull function fitted to cumulative emissions (kg/year) of arsenic compounds, copper compounds, total nitrogen and total phosphorus to water**



### Sectoral approach

For the four pollutants listed in Table 103 the relative sectoral contribution to the total release amount for the three reporting years is summarised in Table 104.

**Table 104: Relative sectoral contribution to total releases to water for the selected pollutants**

| Pollutant                        | Year | Relative contribution from sector |             |      |             |             |             |   |     |     |
|----------------------------------|------|-----------------------------------|-------------|------|-------------|-------------|-------------|---|-----|-----|
|                                  |      | 1                                 | 2           | 3    | 4           | 5           | 6           | 7 | 8   | 9   |
| ANTHRACENE                       | 2007 | <b>90.3</b>                       | 0.0         |      | 1.9         | 7.9         |             |   |     |     |
|                                  | 2008 | 13.1                              | <b>53.0</b> |      | <b>33.6</b> | 0.4         |             |   |     |     |
|                                  | 2009 | <b>78.0</b>                       | 4.3         |      |             | 17.7        |             |   |     |     |
| CHLORIDES                        | 2007 | 3.4                               | 1.6         | 22.6 | <b>55.3</b> | 16.5        | 0.5         |   | 0.2 |     |
|                                  | 2008 | 18.8                              | 0.9         | 15.7 | <b>47.6</b> | 16.3        | 0.5         |   | 0.2 |     |
|                                  | 2009 | 4.4                               | 1.7         | 22.2 | <b>46.6</b> | 24.3        | 0.6         |   | 0.2 |     |
| HALOGENATED ORGANIC COMPOUNDS    | 2007 | 4.2                               | 0.3         |      | 5.3         | <b>35.0</b> | <b>55.2</b> |   |     |     |
|                                  | 2008 | 5.2                               | 0.2         | 0.2  | 4.6         | <b>34.4</b> | <b>55.4</b> |   |     |     |
|                                  | 2009 | 4.6                               | 0.3         |      | 4.1         | <b>37.6</b> | <b>53.5</b> |   |     |     |
| POLYCYCLIC AROMATIC HYDROCARBONS | 2007 | 11.8                              | <b>72.1</b> |      | 0.6         | 15.1        | 0.4         |   |     | 0.1 |
|                                  | 2008 | 10.4                              | <b>66.3</b> |      | 0.8         | 20.2        | 0.1         |   | 1.8 | 0.3 |
|                                  | 2009 | <b>36.9</b>                       | <b>40.7</b> |      | 2.8         | 15.3        | 4.1         |   |     | 0.2 |

Halogenated organic compounds

For the halogenated compounds the Weibull distribution was not applicable to the data. Releases of halogenated organic compounds are predominantly reported from facilities from sectors 5 and 6. The major contributing activity is 6.(a), contributing to approx. 45% of the total releases, followed by activities 5.(f) and 6.(b), contributing to approx. 20-27% and approx. 10% to the total releases, respectively. The data for the three reporting years is summarised in Table 105.

The curve fitting was performed for the main contributing activities and the remaining activities separately and the results are presented in Figure 42. The coverage presented in Table 105 and Figure 42 represent the ratio of the sum of the reported releases in the major contributing activities to the extrapolated totals for the respective activity.

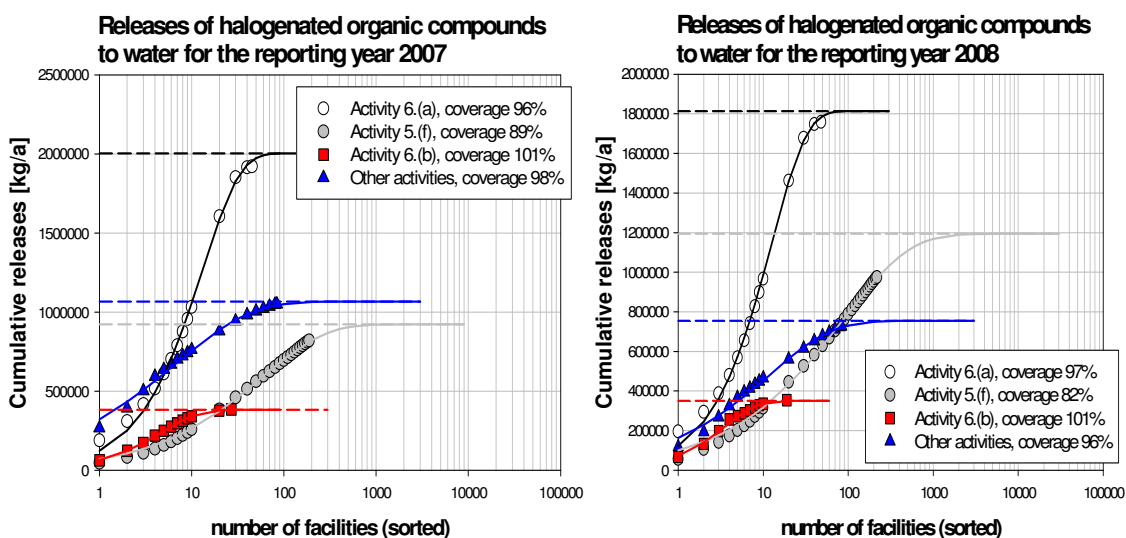
**Table 105: Identification of dominating activities for releases of halogenated organic compounds to water**

|                                   | Reporting year |           |           | Coverage [%] |      |      |
|-----------------------------------|----------------|-----------|-----------|--------------|------|------|
|                                   | 2007           | 2008      | 2009      | 2007         | 2008 | 2009 |
| Total released amount [kg/y]      | 4,178,537      | 3,814,683 | 3,403,924 | -            | -    | -    |
| Contribution activity 6.(a) [%]   | 46             | 46        | 45        | 96           | 97   | 95   |
| Contribution activity 5.(f) [%]   | 20             | 26        | 27        | 89           | 82   | 78   |
| Contribution activity 6.(b) [%]   | 9              | 9         | 8         | 101          | 101  | 102  |
| Contribution other activities [%] | 25             | 19        | 20        | 98           | 96   | 100  |

Considering the main sectors for the halogenated compound releases the Weibull function proves to be applicable except to activity 5.(f).

Only for activity 5.(f) the coverage does not reach the required threshold. Whereas in 2007 the 90% threshold would be achieved taking into account the statistical uncertainty, the calculated coverage is notably below 90% in 2008 and 2009. Also the number of release reports amounts to a few hundred, whereas more than 1,400 urban wastewater treatment plants with a capacity of more than 100,000 pe exist in Europe.

**Figure 42: Results of the curve fitting for releases of halogenated organic compounds to water for the main contributing activities for the reporting years 2007 and 2008**



Most urban wastewater treatment plants reporting releases of halogenated organic compounds to water are located in the United Kingdom. In the United Kingdom 157 wastewater treatment plants with an incoming load or a treatment capacity of more than 100,000 pe are registered in the UWWTD database. In 2008, 121 and in 2009, 92 facilities with main activity 5.(f) reported releases of AOX to water. Hence, more than 70% of the UWWTPs in the United Kingdom report releases of AOX to water, whereas only a limited number of facilities with main activity 5.(f) do so from other European countries.

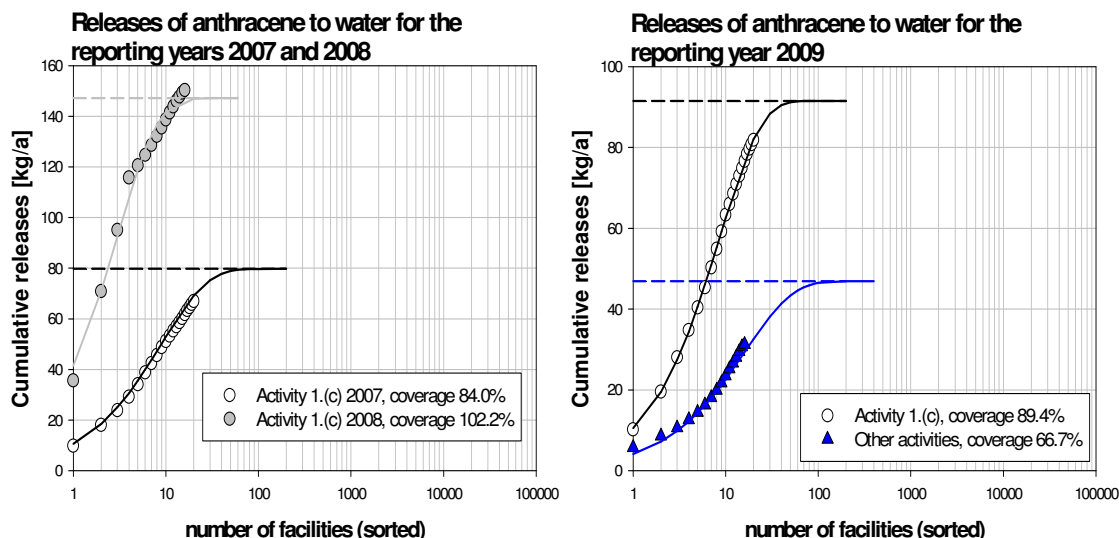
It is concluded that not all activity 5.(f) facilities which are supposed to report releases of halogenated organic compounds to water do report and missing the 90% target is attributed to incomplete reporting. The incomplete reporting is not linked to the E-PRTR Annex II threshold but to missing information on the occurrence of this pollutant in the effluents of urban wastewater treatment plants.

### Anthracene

For anthracene the assessment is difficult. In two reporting years (2007 and 2009) the major contributing activity to anthracene releases to water is activity 1.(c), contributing to 79% and 72% of the total released quantity, respectively. In 2008, high releases are reported by one facility from activity 2.(e) (i) and by one facility from activity 4.(c). These two facilities contribute to 86% of the total released quantity in 2008 but no release reports are available for these two facilities for anthracene for the reporting years 2007 and 2009. The two values were not identified as potential outliers and therefore no conclusion on these two release reports is possible. As these two release reports significantly influence the assessment, the two values are removed from the evaluation. Neglecting these two release reports results in comparable distribution of reported releases of anthracene into water with activity 1.(c) being the major contributor.

For the reporting years 2007 and 2008 fewer than ten release reports were available for other activities than activity 1.(c) and the curve fitting is not applicable. In all years it is observed that 90% threshold is not reached for activity 1.(c). Considering the fact that only facilities from the United Kingdom reported releases of anthracene into water it can be concluded that there might be potentially missing facilities because other activity 1.(c) facilities situated in other Member States than the United Kingdom are also expected to report discharges of anthracene into water

**Figure 43: Results of the curve fitting for releases of anthracene to water for the main contributing activity for the reporting years 2007 and 2008 (left figure) and curve fitting for the main contribution activity and the other activities for the reporting year 2009 (right figure)**



Polycyclic aromatic hydrocarbons (PAH)

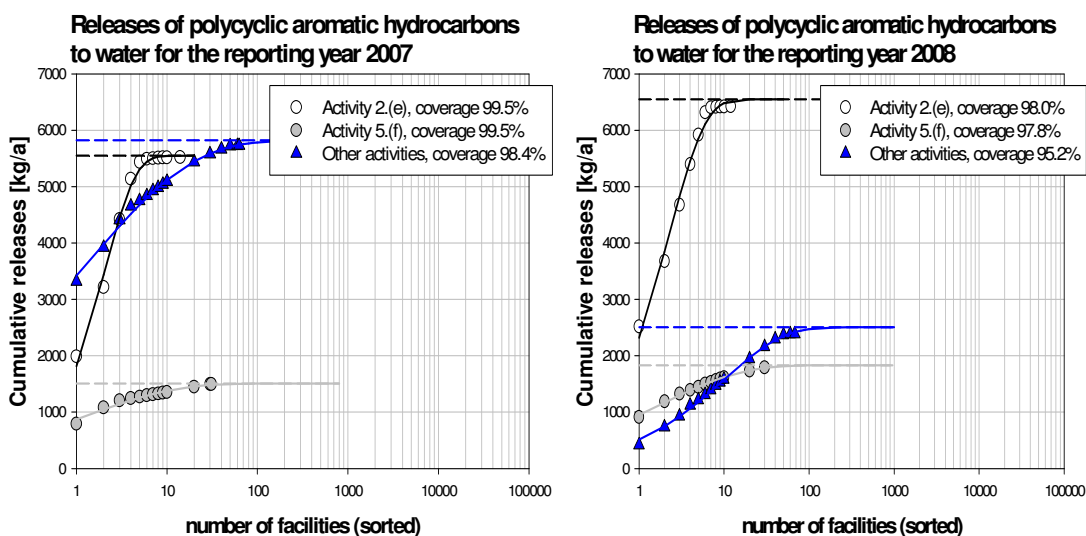
Releases of polycyclic aromatic hydrocarbons are predominantly reported from facilities from sectors 2 and 5. The major contributing activity is 2.(e) (i), contributing to approx. 43% (2007) and 61% (2008) of the total releases, followed by activity 5.(f) contributing to approx. 11 to 17% to the total releases. For 2007, there is also one release report available from an activity 2.(b) facility from Italy, which makes up for approx. 27% of the total PAH release but reported considerably lower emissions for 2008 and 2009. For 2009, it is not possible to identify one major contributing activity as activities 1.(d), 2.(b), 2.(e) (i) and 5.(f) are contributing to the total release in comparable amounts. Since for the reporting year 2009 there might still be a reasonable number of missing reports, 2009 is not considered further for PAH. The data for the three reporting years is summarised in Table 106.

The curve fitting was performed for the main contributing activities and the remaining activities separately and the results are presented in Figure 44. The coverage presented in Table 106 and Figure 44 represents the ratio of the sum of the reported releases in the major contributing activities to the extrapolated totals for the respective activity. The 90% target is achieved for the major activities and also the evaluation of the remaining activities shows a good result.

**Table 106: Identification of dominating activities for releases of PAHs to water**

|                                     | Reporting year |           |          | Coverage [%] |      |
|-------------------------------------|----------------|-----------|----------|--------------|------|
|                                     | 2007           | 2008      | 2009     | 2007         | 2008 |
| Total released amount [kg/y]        | 12,753.25      | 10,604.88 | 7,308.77 |              |      |
| Contribution activity 2.(e) (i) [%] | 43             | 61        | 19       | 100          | 98   |
| Contribution activity 5.(f) [%]     | 12             | 17        | 11       | 100          | 98   |
| Contribution other activities [%]   | 45             | 22        | 70       | 98           | 95   |

**Figure 44: Results of the curve fitting for releases of PAHs to water for the main contributing activities for the reporting years 2007 and 2008**



### Chlorides

Releases of chlorides are predominantly reported from facilities from sectors 3, 4 and 5. The major contributing activity is 4.(b), contributing to approx. 34-41% of the total releases, followed by activities 3.(a) and 5.(f), contributing to approx. 16-23% and approx. 11-17% to the total releases, respectively. The data for the three reporting years is summarised in Table 107.

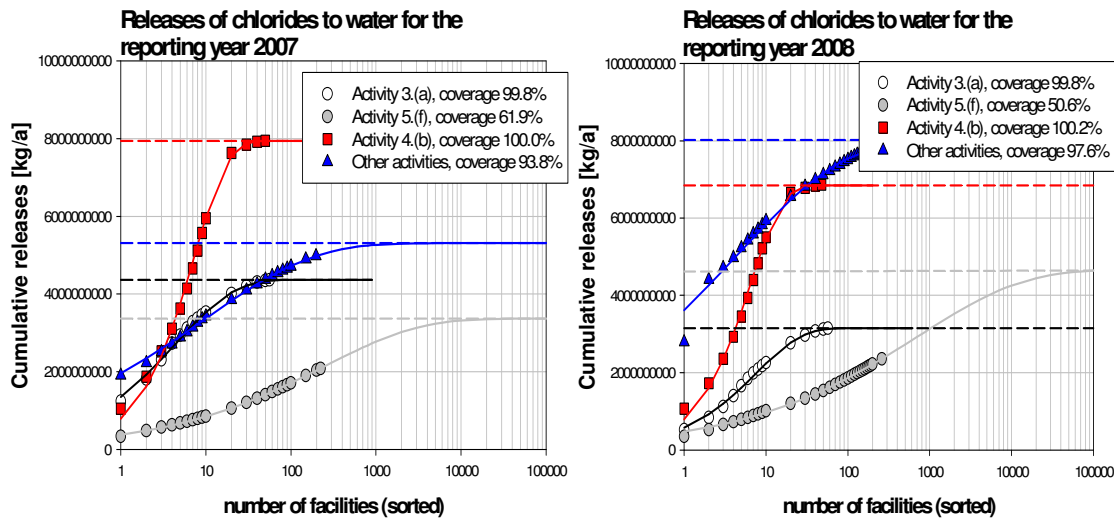
The curve fitting was performed for the main contributing activities and the remaining activities separately and the results are presented in Figure 45. The coverage presented in Table 107 and Figure 45 represents the ratio of the sum of the reported releases in the major contributing activities to the extrapolated totals for the respective activity.

**Table 107: Identification of dominating activities for releases of chlorides to water**

|                                   | Reporting year |            |            | Coverage [%] |      |      |
|-----------------------------------|----------------|------------|------------|--------------|------|------|
|                                   | 2007           | 2008       | 2009       | 2007         | 2008 | 2009 |
| Total released amount [t/a]       | 19,380,936     | 20,195,208 | 14,204,891 |              |      |      |
| Contribution activity 3.(a) [%]   | 23             | 16         | 22         | 100          | 100  | 100  |
| Contribution activity 4.(b) [%]   | 41             | 34         | 40         | 100          | 100  | 100  |
| Contribution activity 5.(f) [%]   | 11             | 12         | 17         | 62           | 51   | 54   |
| Contribution other activities [%] | 25             | 38         | 21         | 94           | 98   | 97   |

As already observed for halogenated organic compounds, the coverage does not reach the required target in any of the three reporting years for activity 5.(f) only. In addition, the number of release reports amounts to a few hundred, whereas more than 1,400 urban wastewater treatment plants with a capacity of more than 100,000 pe exist in Europe. It is concluded that not all activity 5.(f) facilities which are supposed to report releases of chlorides to water submit a release report.

**Figure 45: Results of the curve fitting for releases of chlorides to water for the main contributing activities for the reporting years 2007 and 2008**



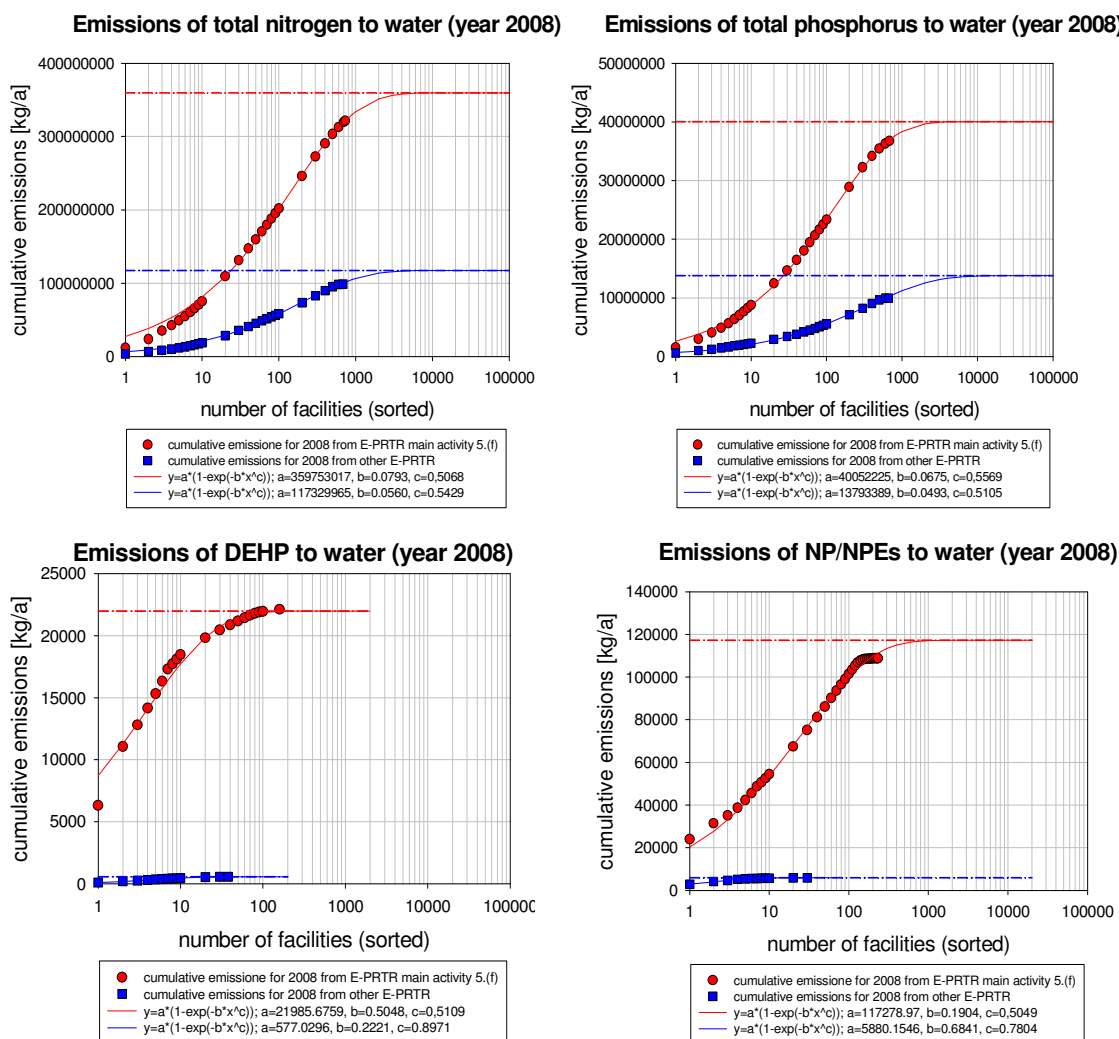
**Urban wastewater treatment plants (activity 5.(f)) - results Weibull distribution**

Figure 46 shows the result of the curve fitting for several of the listed compounds for the reporting year 2008. For total nitrogen and total phosphorus the 90% threshold is reached. The UWWTD database all includes approx. 26,700 UWWTPs overall with a treatment capacity of more than 2,000 pe. For most pollutants for which E-PRTR activity 5.(f) is the major source the extrapolation with the cumulative Weibull function results in a comparable number of facilities to reach the maximum release amount. As the 90% coverage is reached, the capacity threshold of 100,000 pe for the E-PRTR reporting seems suitable.

However, this is not the case for all pollutants. Figure 46 shows an example for DEHP. The Weibull distribution reaches its maximum with a few hundred facilities, whereas the reported data still continue to include emission amounts when more and more facilities are included. The extrapolated maximum is reached with approx. 2,000 UWWTPs, but as already mentioned the UWWTD database includes more than 20,000 UWWTPs. It is to be concluded that for DEHP there are presumably missing release reports in the E-PRTR dataset and more UWWTPs with a capacity or an incoming load of more than 100,000 pe would be expected to report releases of DEHP to water.

It was also noted for other pollutants (e.g. chlorides, halogenated organic compounds) which are released to a notable extent by activity 5.(f) facilities that the reporting seems to be incomplete. Besides total nitrogen, total phosphorus and TOC none or only a few pollutants are monitored regularly in discharges from wastewater treatment plants. Wastewater from municipalities is a mixture of all kind of pollutants, which are used within the catchment area, thus including intentional and unintentional releases and for most compounds effluent concentrations are not really known due to a lack of data. In order to improve the reporting the development of emission factors and the provision of guidance on the derivation and use of such emission factors is recommended. A further improvement would be the inclusion of discharged wastewater amounts as these could be used to back-calculate concentrations. Such back-calculated concentrations would be helpful for plausibility checks and for a comparison of facilities within the activity.

**Figure 46: Curve fitting: cumulative Weibull function fitted to cumulative emissions of total nitrogen, total phosphorus, DEHP and nonylphenoles/nonylphenol ethoxylates to releases to water for E-PRTR main activity 5.(f) only and for all other activities for the reporting year 2008**



### Independently operated wastewater treatment plants (IOWWTP)

Eleven countries reported E-PRTR facilities with main activity 5.(g) and 61 (2009) to 66 (2008) facilities are included in E-PRTR, half of them originating from France. Approximately two thirds of them also report releases above the E-PRTR thresholds. The information is summarised in Table 108.

Data from IOWWTPs directly discharging into waters with capacities below the threshold in Annex I of the E-PRTR Regulation were collected on a voluntary basis. Eight Member States provided data on IOWWTPs including release data. The data provided by the eight Member States is assessed individually on a country per country level.

**Table 108: Number of facilities reporting for main activity 5.(g) per country**

| Country        | Facilities in E-PRTR |           |           | Release reports in E-PRTR |           |           |
|----------------|----------------------|-----------|-----------|---------------------------|-----------|-----------|
|                | 2007                 | 2008      | 2009      | 2007                      | 2008      | 2009      |
| France         | 30                   | 30        | 28        | 17                        | 16        | 13        |
| Austria        | 6                    | 6         | 5         | 6                         | 6         | 5         |
| Belgium        | 2                    | 2         | 2         | 2                         | 2         | 1         |
| Czech Republic | 3                    | 3         | 2         | 3                         | 2         | -         |
| Germany        | 3                    | 4         | 4         | 2                         | 3         | 3         |
| Spain          | 1                    | 1         | 1         | -                         | -         | -         |
| Finland        | -                    | -         | 1         | -                         | -         | 1         |
| Italy          | 2                    | 3         | 2         | 1                         | 2         | 1         |
| Poland         | 9                    | 9         | 9         | 8                         | 8         | 8         |
| Romania        | 3                    | 3         | 2         | 3                         | 3         | 2         |
| United Kingdom | 4                    | 5         | 5         | 2                         | 2         | 2         |
| <b>Total</b>   | <b>63</b>            | <b>66</b> | <b>61</b> | <b>44</b>                 | <b>44</b> | <b>36</b> |

**Belgium:** Two facilities from Belgium reported releases to water under main activity 5.(g) in 2007. Both facilities reported releases of nickel. The voluntary reporting included three facilities and data on TOC and zinc releases are reported. The values are below the respective reporting threshold. No further conclusion can be drawn from these data.

**Germany:** Germany reported ten additional IOWWTPs with a capacity below the E-PRTR Annex I threshold. The E-PRTR database includes two facilities reporting TOC (total released quantity 411.900 kg/y) and copper (total released quantity 104 kg/y) for the reporting year 2007. The ten voluntarily reported facilities discharged 561,731 kg/y TOC, 696.3 kg/y of zinc and 9.9 kg/y of copper. Whereas for copper the 90% coverage is reached with the mandatory release reports, this is not the case for TOC and zinc. Three of the voluntarily reported IOWWTPs discharge total quantities of TOC above the E-PRTR threshold in Annex II. Considering also the emissions from these three facilities a theoretical coverage of 88% for TOC and of 89% for zinc is reached. These three facilities have a daily capacity of 8,000 m<sup>3</sup> or more.

**France:** France reported 66 additional IOWWTPs with a capacity below the E-PRTR Annex I threshold. The E-PRTR database includes nine facilities reporting TOC (total released quantity 579,800 kg/y), zinc (total released quantity 1,655 kg/y) and copper (total released quantity 346.6 kg/y) for the reporting year 2007. The 66 voluntarily reported facilities discharged 5,588,911 kg/y TOC, 23,835.4 kg/y of zinc and 3,039.4 kg/y of copper. Considering these releases the actual reporting under E-PRTR does not cover 90% of the total releases from this activity (E-PRTR main activity 5.(g)). The voluntary reporting also includes one facility with a treatment capacity of more than 10,000 m<sup>3</sup>/d, which is included also in E-PRTR. Furthermore, nine facilities with a treatment capacity of 10,000 m<sup>3</sup>/d are listed, most of them also exceeding the reporting thresholds according to Annex II of the E-PRTR Regulation. These facilities should also report under E-PRTR and a potential inconsistency is thus highlighted. In order to assess the Annex I threshold all facilities from the voluntary reporting and the reporting under E-PRTR were considered besides one facility with a very high TOC release but a treatment capacity of 620 m<sup>3</sup>/d. Considering all facilities with a treatment capacity of more than 8,000 m<sup>3</sup>/d the 90% coverage is reached for copper and zinc but not for TOC (coverage 70%).



**Lithuania:** Lithuania reported 14 additional IOWWTPs with a capacity below the E-PRTR Annex I threshold and provided release data for one additional IOWWTP with a treatment capacity of more than 10,000 m<sup>3</sup>/d (releases below E-PRTR Annex II threshold). The E-PRTR database does not include any facilities from Lithuania reporting for main activity 5.(g). Besides two release reports for zinc all releases reported in the voluntary reporting are below the respective E-PRTR thresholds. For the two release reports for zinc exceeding the reporting threshold the treatment capacity has been provided only for one IOWWTP. Excluding the second IOWWTP due to the missing information regarding the treatment capacity and considering the remaining facility exceeding the E-PRTR reporting threshold contributes to 92% of the total zinc release. This facility has a treatment capacity of more than 8,000 m<sup>3</sup>/d.

**Poland:** Poland reported nine IOWWTPs during the voluntary reporting. Besides three of these facilities all exceed the capacity threshold according to Annex I of the E-PRTR Regulation. Four of the six IOWWTPs exceeding the E-PRTR capacity threshold are also included in the E-PRTR database. One of these facilities does not report TOC although the E-PRTR Annex II threshold is exceeded, indicating a potential inconsistency in the reporting. Two facilities with a treatment capacity of more than 10,000 m<sup>3</sup>/d are not included in E-PRTR, although one of the missing facilities should report releases as the E-PRTR Annex II threshold for copper and zinc are exceeded, indicating a potential inconsistency. Considering all data from the voluntary reporting and the IOWWTPs reports included in the E-PRTR database the 90% coverage is achieved if all IOWWTPs which are supposed to report releases (because they exceed the capacity threshold according to Annex I and the reporting threshold according to Annex II of the E-PRTR Regulation).

**Romania:** Romania reported two additional IOWWTPs in the voluntary reporting. The E-PRTR database includes two facilities reporting TOC (total released quantity 1,018,000 kg/y) and one facility reporting copper (total released quantity 200 kg/y) for the reporting year 2007. The two voluntarily reported facilities discharged 30,320 kg/y TOC, 19 kg/y of zinc and 2 kg/y of copper. The 90% coverage is reached for both TOC and zinc by the IOWWTPs included in the E-PRTR database also considering the additionally provided release data.

**Slovakia:** Slovakia reported six additional facilities in the voluntary reporting, but beside one all facilities are marked as urban wastewater treatment plants (UWWTPs) and are also reported under the Urban Wastewater Treatment Directive. Only one of these additionally reported facilities is an industrial wastewater treatment plant. This IOWWTP has a treatment capacity of 8,500 m<sup>3</sup>/d and releases 91,085 kg TOC per year, thus exceeding the E-PRTR reporting threshold according to Annex II. The E-PRTR database does not contain IOWWTPs from Slovakia.

**United Kingdom:** The United Kingdom reported numerous (1,987) additional facilities in the voluntary reporting, including also urban wastewater treatment plants (UWWTPs) reported under the Urban Wastewater Treatment Directive. These facilities are not to be regarded as IOWWTPs. The UWWTD database includes 1,744 UWWTPs with a capacity between 2,000 and 100,000 population equivalents and most or even all of these facilities are included also in the voluntary reporting from the United Kingdom. A linking between the UWWTD database and the voluntary reporting has to be done manually in order to identify the IOWWTPs. Considering the high number of UWWTPs this linking is outside the scope of this project and the data is not further assessed.

In evaluating the data provided in the voluntary reporting for IOWWTPs some inconsistencies have been observed. However, it can be concluded that the actual capacity threshold of 10,000 m<sup>3</sup>/d does not allow reaching a coverage of 90%.

Besides the evaluation of the voluntarily provided data for IOWWTPs a further assessment based on the general methodology described in [Appendix 9](#) and the cumulative Weibull distribution is applied to release reports from E-PRTR facilities with main activity 5.(g) and for pollutants for which more than ten release reports are available. Besides nickel in 2007, the cumulative Weibull function was applicable to all of those pollutants and the results are presented in Table 109. The 90% coverage is achieved only for a few pollutants listed in Table 109 for most reporting years.

**Table 109: Results of the threshold analysis for IOWWTPs (NA...Weibull distribution not applicable, ...number of available release reports less than ten)**

| Pollutant                  | Reporting year |      |      |
|----------------------------|----------------|------|------|
|                            | 2007           | 2008 | 2009 |
| CHLORIDES                  | 97%            | 99%  | -    |
| CR AND COMPOUNDS           | 100%           | 9%   | -    |
| CU AND COMPOUNDS           | 90%            | -    | -    |
| NI AND COMPOUNDS           | NA             | 90%  | 92%  |
| PB AND COMPOUNDS           | 83%            | 100% | -    |
| PHENOLS                    | 99%            | 96%  | -    |
| TOTAL - NITROGEN           | 30%            | 4%   | 50%  |
| TOTAL - PHOSPHORUS         | 81%            | 84%  | 86%  |
| TOTAL ORGANIC CARBON (TOC) | 97%            | 99%  | 102% |
| ZN AND COMPOUNDS           | 100%           | 100% | 101% |

## 2) Transfers to water

Table 110 summarises the results of the extrapolation for the 28 pollutants for transfers to water, for which more than ten release reports are available. Reporting is considered in line with the E-PRTR Regulation requirements if the reported total emissions for a pollutant reach at least 90% of the extrapolated total (parameter a from the Weibull distribution, obtained by non-linear regression). However, it has to be considered that the estimates for parameter a, which was used to calculate the coverage, is influenced by statistical uncertainty (as explained in [Appendix 9](#)). Therefore, a calculated coverage between 89% and 101% is accepted as fulfilling the reporting requirements. Coverage below 89% or above 101% indicates that the overall goal of achieving the 90% threshold is not achieved. For those pollutants the calculated coverage is marked red in Table 110.

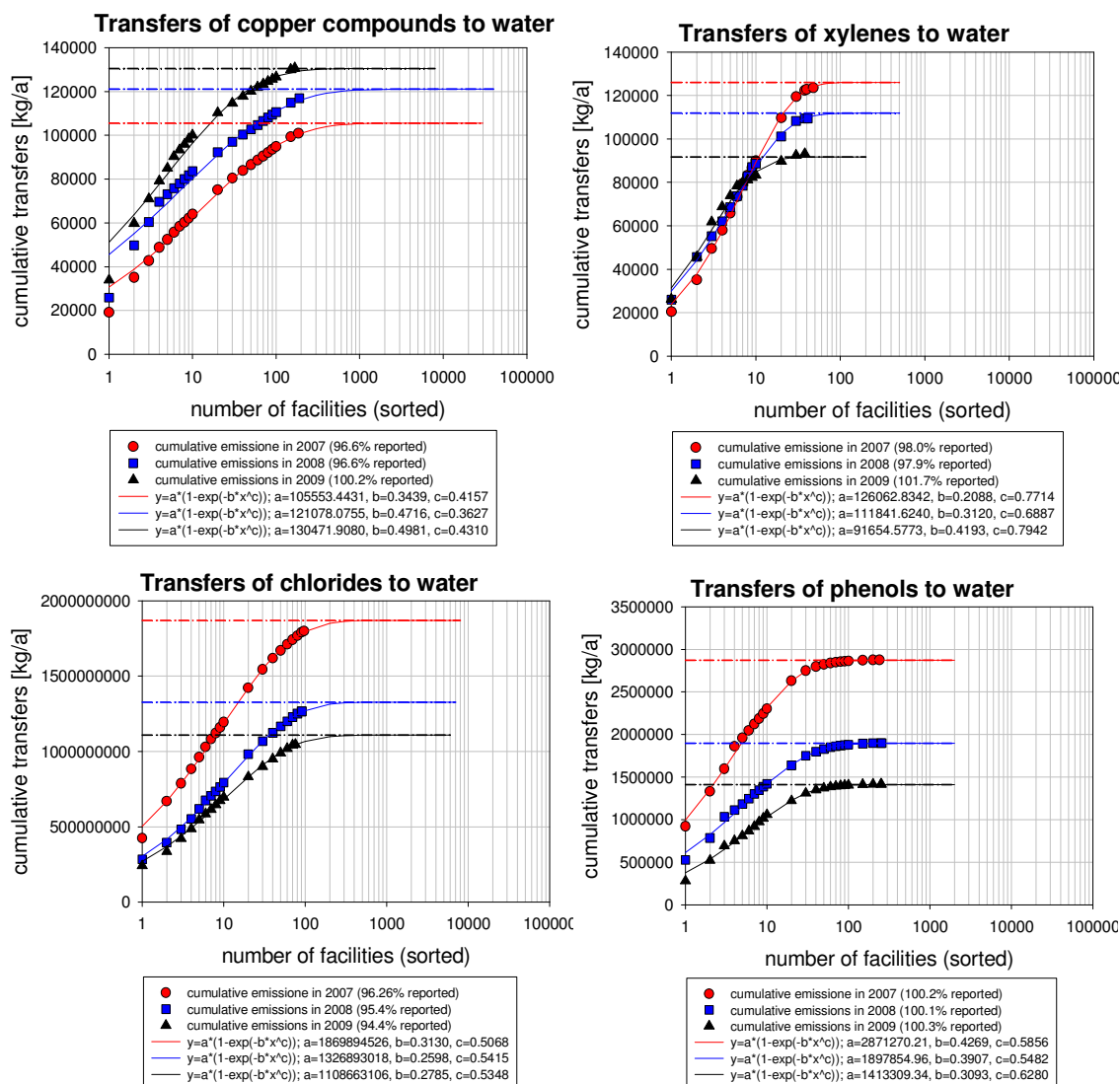
Figure 47 presents some examples of the curve fits for transfers to water for selected pollutants (copper compounds, fluorides, chlorides and phenols) for the reporting years 2007, 2008 and 2009. In each of the graphs, the values of the parameters are given in the legend to the graph. The total transfers (parameter a) for all years are represented by the dashed lines. Please note that the x-axis scale is logarithmic. The curve fitting is good for all parameters shown and also the shape parameters of the cumulative Weibull distribution are comparable.

**Table 110: Calculated E-PRTR coverage [%] for transfers into water based on the curve fitting results (NA...Weibull function not applicable)**

| Nr. | Pollutant                           | E-PRTR coverage [%] |      |      |
|-----|-------------------------------------|---------------------|------|------|
|     |                                     | 2007                | 2008 | 2009 |
| 12  | TOTAL - NITROGEN                    | 39%                 | 63%  | 6%   |
| 13  | TOTAL - PHOSPHORUS                  | 75%                 | 74%  | 71%  |
| 17  | AS AND COMPOUNDS                    | 79%                 | 88%  | 92%  |
| 18  | CD AND COMPOUNDS                    | 101%                | 101% | 101% |
| 19  | CR AND COMPOUNDS                    | 101%                | 101% | 102% |
| 20  | CU AND COMPOUNDS                    | 96%                 | 97%  | 100% |
| 21  | HG AND COMPOUNDS                    | NA                  | NA   | 102% |
| 22  | NI AND COMPOUNDS                    | 90%                 | 89%  | 79%  |
| 23  | PB AND COMPOUNDS                    | 100%                | 100% | 102% |
| 24  | ZN AND COMPOUNDS                    | 101%                | 100% | 101% |
| 34  | DICHLOROETHANE-1,2 (DCE)            | 101%                | 102% | 96%  |
| 35  | DICHLOROMETHANE (DCM)               | NA                  | 101% | NA   |
| 40  | HALOGENATED ORGANIC COMPOUNDS       | 101%                | 100% | 102% |
| 58  | TRICHLOROMETHANE                    | 99%                 | 103% | 103% |
| 60  | VINYL CHLORIDE                      | 98%                 | 99%  | 97%  |
| 62  | BENZENE                             | 100%                | 100% | NA % |
| 64  | NP/NPES                             | 100%                | 100% | 98%  |
| 65  | ETHYLBENZENE                        | 98%                 | 99%  | 100% |
| 68  | NAPHTHALENE                         | 95%                 | 97%  | 99%  |
| 71  | PHENOLS                             | 100%                | 100% | 100% |
| 72  | POLYCYCLIC AROMATIC<br>HYDROCARBONS | 101%                | NA   | 101% |
| 73  | TOLUENE                             | NA                  | 99%  | 101% |
| 76  | TOTAL ORGANIC CARBON (TOC)          | 60%                 | 71%  | 28%  |
| 78  | XYLENES                             | 98%                 | 98%  | 102% |
| 79  | CHLORIDES                           | NA                  | 95%  | 94%  |
| 82  | CYANIDES                            | 101%                | NA   | 100% |
| 83  | FLUORIDES                           | 93%                 | NA   | NA   |
| 88  | FLUORANTHENE                        | 96%                 | 95%  | 98%  |

If the 90%-threshold is exceeded in one of the three reporting years and in the other two reporting years the coverage is between 89% and 101% (e.g. dichloromethane, cyanides) the E-PRTR reporting threshold seems suitable and no change of the threshold seems necessary because the 90% threshold is achieved. A more detailed assessment is required for pollutants for which coverage below 90% or above 100% is determined for all three reporting years. Those compounds to be further analysed are listed in Table 111.

**Figure 47: Curve fitting: cumulative Weibull function fitted to cumulative transfer (kg/year) of copper compounds, xylenes, chlorides and phenols into water**



**Table 111: E-PRTR pollutants to be considered in the sectoral approach**

| Nr. | Pollutant                  | E-PRTR coverage [%] |      |      |
|-----|----------------------------|---------------------|------|------|
|     |                            | 2007                | 2008 | 2009 |
| 12  | TOTAL - NITROGEN           | 39%                 | 63%  | 6%   |
| 13  | TOTAL - PHOSPHORUS         | 75%                 | 74%  | 71%  |
| 19  | CR AND COMPOUNDS           | 101%                | 101% | 102% |
| 21  | HG AND COMPOUNDS           | NA                  | NA   | 102% |
| 76  | TOTAL ORGANIC CARBON (TOC) | 60%                 | 71%  | 28%  |

For several pollutants for which in one year the calculated coverage amounts to 89% or 101% the consideration of the standard error of the extrapolated total release (parameter a of the cumulative Weibull function) results in the fact that the coverage falls into the 90-100% range. This is the case for nickel compounds, halogenated organic compounds, polycyclic hydrocarbons and cyanides. Hence, these pollutants are not considered in the sectoral approach.

Both 1,2-Dichloroethane and trichloromethane also fulfil the criteria for a sectoral analysis, but due to the limited number of available transfer reports available the application of the Weibull function is not suitable. For both compounds sector 4 is the dominating sector and more than 95% of the total transfer amount originates from sector 4. In sector 4 the main contributing activity is activity 4.(a). A sectoral analysis by application of the cumulated Weibull function is not suitable because for both the dominating activity 4.(a) and for the remaining activities around ten or less transfer reports are available. However, as also mentioned above for other solvents, 1,2-dichloroethane and trichloromethane are high volume production chemicals and in ESIS<sup>67</sup> 34 importer/producer are listed for 1,2-DCE and twelve importers/producers are listed for trichloromethane. A higher number of transfer reports would be expected for such kind of chemicals.

### Sectoral approach

For the five pollutants listed in Table 111 the relative sectoral contribution to the total release amount for the three reporting years is summarised in Table 112. Besides mercury, all pollutants listed in Table 112 are mainly influenced by one or two sectors.

**Table 112: Relative sectoral contribution to total transfers into water for the selected pollutants**

| Pollutant                  | Year | Relative contribution from sector [%] |             |     |             |             |      |     |             |             |
|----------------------------|------|---------------------------------------|-------------|-----|-------------|-------------|------|-----|-------------|-------------|
|                            |      | 1                                     | 2           | 3   | 4           | 5           | 6    | 7   | 8           | 9           |
| CR AND COMPOUNDS           | 2007 | 0.2                                   | <b>58.8</b> | 0.0 | 4.0         | 1.3         | 0.1  | 0.0 | 0.1         | <b>35.6</b> |
|                            | 2008 | 0.3                                   | <b>20.3</b> | 0.1 | 4.9         | 2.2         | 0.3  | 0.0 | 0.2         | <b>71.7</b> |
|                            | 2009 | 0.2                                   | <b>38.4</b> | 0.2 | 1.6         | 2.5         | 0.2  | 0.0 | 0.1         | <b>56.7</b> |
| HG AND COMPOUNDS           | 2007 | <b>21.0</b>                           | 4.3         | 0.0 | <b>69.8</b> | 4.6         | 0.1  | 0.0 | 0.0         | 0.2         |
|                            | 2008 | <b>25.8</b>                           | <b>36.3</b> | 0.3 | 13.8        | <b>21.1</b> | 2.0  | 0.0 | 0.3         | 0.4         |
|                            | 2009 | 6.2                                   | <b>52.9</b> | 0.4 | 3.6         | <b>34.7</b> | 0.2  | 0.0 | 1.8         | 0.1         |
| TOTAL - NITROGEN           | 2007 | 4.6                                   | 5.2         | 4.4 | <b>48.9</b> | <b>19.3</b> | 0.5  | 0.1 | <b>15.5</b> | 1.5         |
|                            | 2008 | 5.1                                   | 8.9         | 0.0 | <b>38.8</b> | <b>20.4</b> | 0.8  | 0.6 | <b>23.2</b> | 2.2         |
|                            | 2009 | 3.9                                   | 6.0         | 0.5 | <b>29.0</b> | <b>17.2</b> | 0.5  | 0.4 | <b>40.8</b> | 1.7         |
| TOTAL - PHOSPHORUS         | 2007 | 1.4                                   | 5.5         | 2.3 | <b>38.4</b> | 7.0         | 1.2  | 0.4 | <b>43.0</b> | 0.9         |
|                            | 2008 | 0.8                                   | 4.1         | 0.0 | <b>34.8</b> | 5.4         | 1.4  | 0.1 | <b>52.6</b> | 0.8         |
|                            | 2009 | 1.7                                   | 3.6         | 0.0 | <b>34.1</b> | 4.4         | 1.2  | 0.2 | <b>53.9</b> | 0.8         |
| TOTAL ORGANIC CARBON (TOC) | 2007 | 3.1                                   | 0.2         | 0.1 | <b>46.3</b> | 1.9         | 7.7  | 0.0 | <b>39.1</b> | 3.1         |
|                            | 2008 | 2.6                                   | 0.3         | 0.1 | <b>22.6</b> | 3.1         | 14.3 | 0.1 | <b>54.8</b> | 2.6         |
|                            | 2009 | 1.3                                   | 0.4         | 0.0 | <b>19.9</b> | 2.0         | 7.8  | 0.0 | <b>66.9</b> | 1.3         |

### Total nitrogen

Transfers of total nitrogen are predominantly reported from facilities from sectors 4 and 8. For the reporting years 2007 and 2008 a comparable distribution pattern is observed with activity 4.(a) dominating. In the reporting year 2009 a completely different distribution is observed with activity 8.(a) dominating. The data for the three reporting years are summarised in Table 113.

The curve fitting was performed for the main contributing activities and the remaining activities separately and the results are presented in Figure 48. The coverage presented in Table 113 and Figure 48 represents the ratio of the sum of the reported transfers in the major contributing activities to the extrapolated totals for the respective activity. The numbers for the coverage in

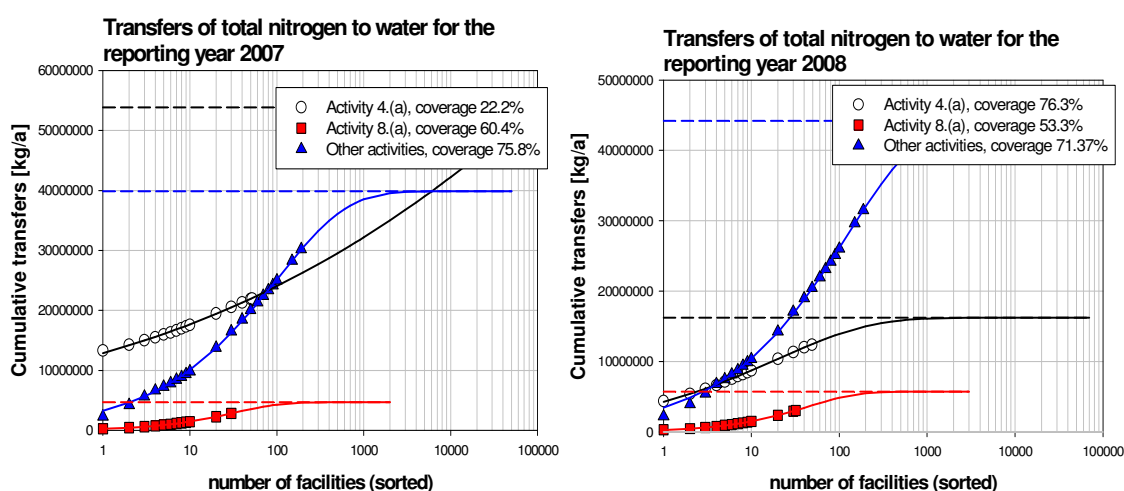
<sup>67</sup> <http://esis.jrc.ec.europa.eu/>

parenthesis indicate a high statistical uncertainty (SE > 50%) associated with the extrapolated total.

**Table 113: Identification of dominating activities for transfers of total nitrogen into water**

|                                   | Reporting year |            |            | Coverage [%] |      |      |
|-----------------------------------|----------------|------------|------------|--------------|------|------|
|                                   | 2007           | 2008       | 2009       | 2007         | 2008 | 2009 |
| Total amount [t/a]                | 54,988,444     | 46,911,588 | 49,736,346 |              |      |      |
| Contribution activity 4.(a) [%]   | 40             | 26         | 10         | (22)         | 76   | 81   |
| Contribution activity 8.(a) [%]   | 5              | 6          | 31         | 60           | 53   | (40) |
| Contribution other activities [%] | 55             | 68         | 59         | 76           | 71   | 69   |

**Figure 48: Results of the curve fitting for transfers of total nitrogen into water for the main contributing activities for the reporting years 2007 and 2008**



In all reporting years low coverage were observed and for all considered activities the threshold of 90% is not reached. The number of transfer reports is also considered to be low, considering the fact that total nitrogen is presumably contained in many wastewaters discharged into sewer systems. It is reasonable that not all facilities supposed to report total nitrogen transfers into water are reporting and that there exists a notable number of missing transfer reports.

Total phosphorus

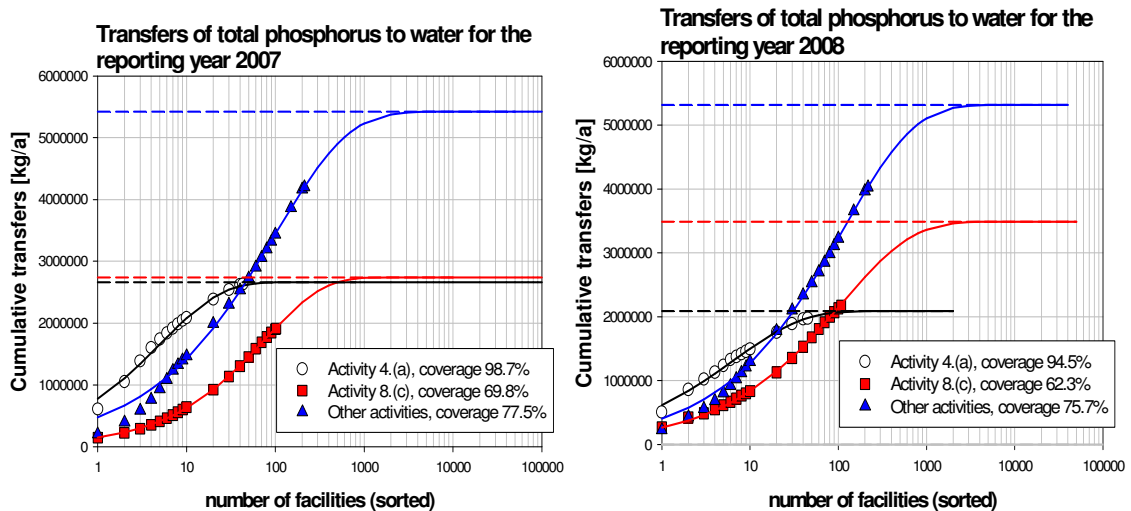
Transfers of total phosphorus are predominantly reported from facilities from sectors 4 and 8. The two dominating activities are activity 4.(a) and activity 8.(c), contributing to approx. 19-30% and 22-30%, respectively. The data for the three reporting years are summarised in Table 114.

**Table 114: Identification of dominating activities for transfers of total phosphorus into water**

|                                   | Reporting year |           |           | Coverage [%] |      |      |
|-----------------------------------|----------------|-----------|-----------|--------------|------|------|
|                                   | 2007           | 2008      | 2009      | 2007         | 2008 | 2009 |
| Total amount [t/a]                | 8,746,611      | 8,171,959 | 6,698,650 |              |      |      |
| Contribution activity 4.(a) [%]   | 30             | 24        | 19        | 99           | 95   | 89   |
| Contribution activity 8.(c) [%]   | 22             | 27        | 30        | 70           | 62   | 61   |
| Contribution other activities [%] | 48             | 49        | 51        | 78           | 76   | 74   |

The curve fitting was performed for the main contributing activities and the remaining activities separately and the results are presented in Figure 49. The coverage presented in Table 114 and in Figure 49 represents the ratio of the sum of the reported transfers in the major contributing activities to the extrapolated totals for the respective activity.

**Figure 49: Results of the curve fitting for transfers of total phosphorus into water for the main contributing activities for the reporting years 2007 and 2008**



For the major contributing activity, activity 4.(a), the 90% threshold is reached in all reporting years. This is not the case for the second dominating activity 8.(c) and for the remaining activities. It might be that if more complete reporting is achieved for activity 8.(c) the overall 90% could be reached. However, it is also clear from the evaluation that there is a lack of transfer reports also for other activities than activity 8.(c).

### Chromium and its compounds

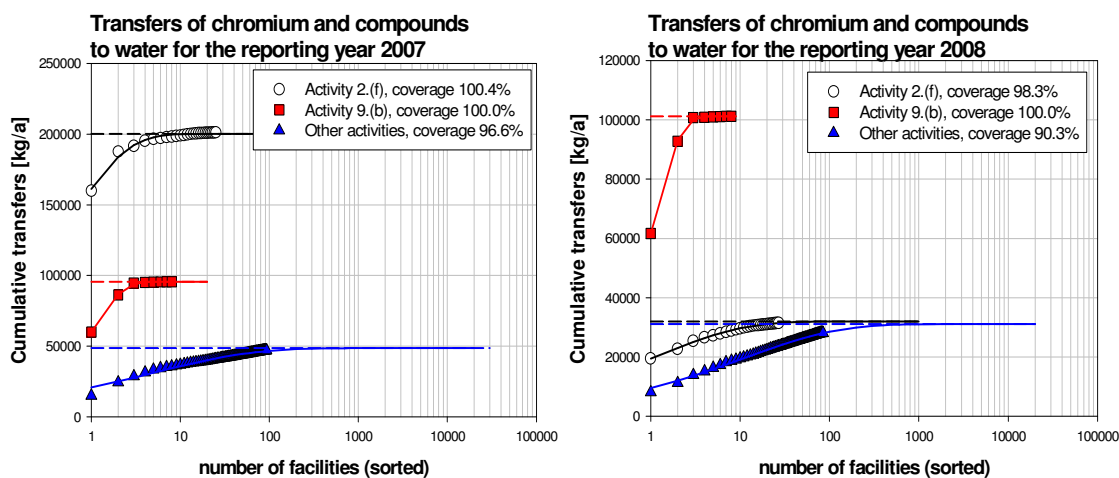
Transfers of chromium compounds are predominantly reported from facilities from sectors 2 and 9. The major contributing activity is 9.(b), contributing to approx. 28-63% of the total reported transfers into water, followed by activity 2.(f), contributing to approx. 20-59% to the total transfers, respectively. The data for the three reporting years is summarised in Table 115.

The curve fitting was performed for the main contributing activities and the remaining activities separately and the results are presented in Figure 50. The coverage presented in Table 115 and Figure 50 represents the ratio of the sum of the reported transfers in the major contributing activities to the extrapolated totals for the respective activity. The threshold is achieved for the major activities and also the evaluation of the remaining activities shows a good result. The low coverage observed for the reporting year 2009 for all activities excluding 2.(f) and 9.(b) might be due to incomplete reporting for that year.

**Table 115: Identification of dominating activities for transfers of chromium and its compounds into water**

|                                   | Reporting year |         |         | Coverage [%] |      |      |
|-----------------------------------|----------------|---------|---------|--------------|------|------|
|                                   | 2007           | 2008    | 2009    | 2007         | 2008 | 2009 |
| Total amount [t/a]                | 343,775        | 160,761 | 271,764 |              |      |      |
| Contribution activity 2.(f) [%]   | 59             | 20      | 38      | 100          | 100  | 97   |
| Contribution activity 9.(b) [%]   | 28             | 63      | 49      | 98           | 100  | 90   |
| Contribution other activities [%] | 13             | 17      | 13      | 100          | 99   | 78   |

**Figure 50: Results of the curve fitting for transfers of chromium compounds to water for the main contributing activities for the reporting years 2007 and 2008**



### Mercury and its compounds

For mercury and its compounds the distribution pattern varies between the reporting years. Whereas in 2007 the dominating activity was activity 4.(f), this activity is negligible in the other two years. As only one transfer report is available within activity 4.(f) and this report accounts to 66% of the total transfer of mercury and compounds into water, this value also could be a potential outlier. By removing this value from the evaluation three main activities can be identified in 2007 and 2008. These major contributing activities are activity 1.(c), activity 2.(e) and activity 5.(d). The data for the three reporting years are summarised in Table 116.

The curve fitting was performed only for the remaining activities, excluding the main contributors. The reasoning for this procedure is, that for none of the major contributing activities ten or more transfer reports are available and the application of the cumulative Weibull function is not suitable. Figure 51 shows the result of the curve fitting for the remaining activities for the reporting years 2007, 2008 and 2009. It is observed that the 90%-threshold is reached.



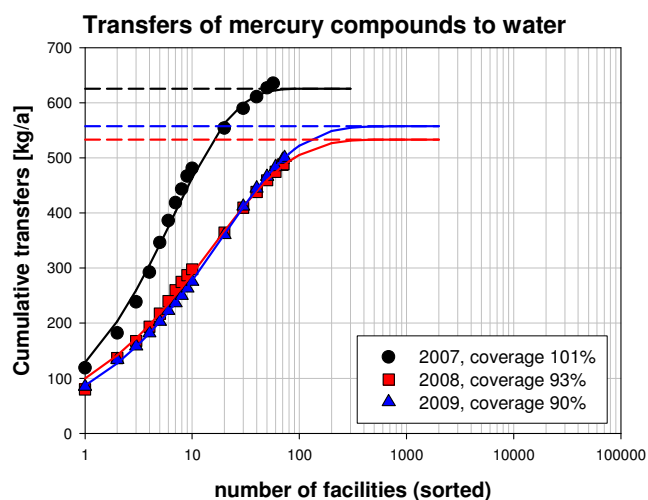
**Table 116: Identification of dominating activities for transfers of mercury and compounds to water**

|                                   | Reporting year |       |       | Coverage [%] |      |      |
|-----------------------------------|----------------|-------|-------|--------------|------|------|
|                                   | 2007           | 2008  | 2009  | 2007         | 2008 | 2009 |
| Total released amount [t/a]       | 3,290          | 2,084 | 4,230 |              |      |      |
| Contribution activity 1.(c) [%]   | 61             | 25    | 5     | -            | -    | -    |
| Contribution activity 2.(e) [%]   | 9              | 36    | 52    | -            | -    | -    |
| Contribution activity 5.(d) [%]   | 10             | 16    | 30    | -            | -    | -    |
| Contribution other activities [%] | 20             | 23    | 13    | 101          | 93   | 90   |

Based on this observation it is concluded that there are missing transfer reports for mercury compounds into water for one or more of the three major contributing activities. Especially, the transfer reports from activity 1.(c) notably decreased in the course of the three reporting years.

According to the normality test the Weibull distribution is not applicable to the entire dataset for mercury. Considering only the activities without the major contributors as shown in Figure 51 the normality test is passed and the Weibull function is applicable. For 2007 the curve shows that there are potentially missing transfer reports, whereas for the reporting years 2008 and 2009 satisfactory results are obtained.

**Figure 51: Results of the curve fitting for transfers of mercury and compounds to water for all activities excluding the main contributing activities (without activity 1.(c), 2.(e) and 5.(d)) for the reporting years 2007 and 2008**



### Total organic carbon

Transfers of total organic carbon (TOC) into water are predominantly reported from facilities from sectors 3, 4 and 5. The major contributing activity is 4.(b), contributing to approx. 34-41% of the total releases, followed by activities 3.(a) and 5.(f), contributing to approx. 16-23% and approx. 11-17% to the total releases, respectively. The data for the three reporting years is summarised in Table 117.

The curve fitting was performed for the main contributing activities and the remaining activities separately and the results are presented in Figure 52. The coverage presented in Table 117 and Figure 52 represents the ratio of the sum of the reported releases in the major contributing activities to the extrapolated totals for the respective activity. For some of the extrapolated total transfer amounts, high standard errors are observed. For activity 4.(a) the estimated maximum

in 2007 and 2009 are associated to uncertainties of approx.  $\pm 36\%$  and  $\pm 28\%$ . For activity 8.(b) in the year 2008 the parameter  $a$  determined during the regression is associated with a relative uncertainty of  $\pm 80\%$ , wherefore the calculated coverage is put into parenthesis. The high standard errors may influence notably the calculated coverage.

However, even considering the uncertainty, from the evaluation it can be concluded that there are missing transfer reports for TOC into water for all three dominating activities, but mainly for activities 4.(a) and 8.(b).

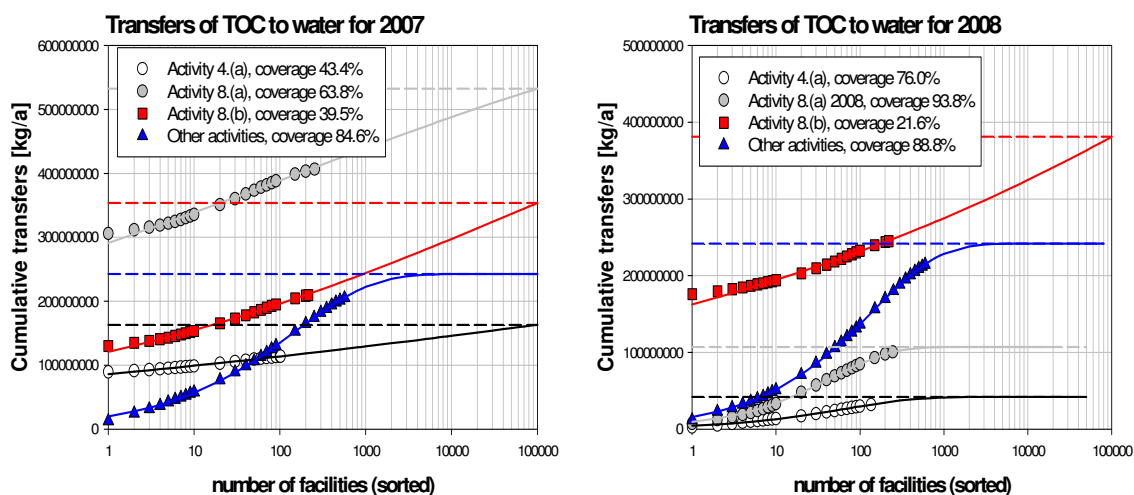
In 2008 the 90%- threshold is achieved by activity 8.(a) facilities. Considering the value for 2009 and the fact that reporting might not be complete yet, the possibility exists that the 90%-threshold could be reached also for 2009.

Reporting can be assessed as satisfactory also for the other remaining activities since the 90% threshold is approached, even if not reached yet. Reporting is not considered satisfactory for facilities under activities 4.(a) and 8.(b).

**Table 117: Identification of dominating activities for transfers of TOC to water**

|                                   | Reporting year |             |             | Coverage [%] |      |      |
|-----------------------------------|----------------|-------------|-------------|--------------|------|------|
|                                   | 2007           | 2008        | 2009        | 2007         | 2008 | 2009 |
| Total released amount [t/a]       | 935,319,200    | 592,272,389 | 658,182,808 |              |      |      |
| Contribution activity 4.(a) [%]   | 43             | 17          | 15          | 43           | 76   | 64   |
| Contribution activity 8.(a) [%]   | 12             | 5           | 48          | 64           | 94   | 79   |
| Contribution activity 8.(b) [%]   | 22             | 41          | 10          | 40           | (22) | 86   |
| Contribution other activities [%] | 23             | 37          | 27          | 85           | 89   | 88   |

**Figure 52: Results of the curve fitting for transfers of TOC to water for the main contributing activities for the reporting years 2007 and 2008**



## Conclusions

For water, a lower number of transfer reports than release reports are included in E-PRTR and the calculated coverage of E-PRTR reporting is lower. An explanation might be that small and medium sized enterprises (SMEs) are also supposed to report to E-PRTR, especially under those activities for which no capacity threshold value is defined in Annex I of the E-PRTR Regulation. Considering for example the E-PRTR reporting threshold for TOC, a COD-TOC ratio of 3 and a specific discharge of 120 g COD/pe/d the threshold of 50,000 kg/y corresponds to less than 3,500 pe.

A revision of the reporting threshold in Annex II of the E-PRTR Regulation by reducing these thresholds is not regarded suitable for improving the reporting because missing facilities will not be addressed by this measure. Furthermore, if the scope of E-PRTR focuses on big industrial facilities and SMEs should not be addressed higher thresholds for transfers into water would be reasonable.

## APPENDIX 13 – SCOPE ANALYSIS OF E-PRTR REGULATION – RESULTS FOR WASTE

### 1) General results - Evaluation of waste transfers related to generation

The general results of the comparison are shown in Table 118, Table 119, Table 120, Table 121 and Table 122:

- Looking at all of the 16 economic NACE sectors compared to the total amount of hazardous waste reported, E-PRTR covers 39% of the amount reported to Eurostat and 17% of non-hazardous waste. It has to be underlined that E-PRTR does not include all the activities in each of the relevant NACE 2-digit codes covered by the Eurostat data.
- The agriculture, hunting and forestry sectors; the fishing sector and the mining and quarrying sectors all have very low reported amounts for hazardous and non-hazardous waste according to E-PRTR compared with the Eurostat values. The values are under 8.1% of those reported to Eurostat.
- For the remaining 13 NACE sectors, one sector (Manufacture of wood and wood products) has an amount of hazardous waste according to E-PRTR of less than 20% of the amount reported to Eurostat. Six sectors (Manufacture of food products; beverages and tobacco; Manufacture of textile products, leather and leather products; Manufacture of coke and refined petroleum products; Manufacturing of computer, electronic and optical products, electrical equipment, motor vehicles and other transport equipment; Manufacture of furniture; jewellery, musical instruments, toys; repair and installation of machinery and equipment and Energy, gas and water supply) have an amount between 20% to 60% and three sectors (Manufacture of chemicals, rubber and plastic products; Manufacture of basic metals and fabricated metal products and Other waste management activities) have an amount between 60% to 100% of the reported amount to Eurostat. Three sectors (Manufacture of pulp, paper and paper products, publishing and printing; Manufacture of other non-metallic mineral products and Waste management activities) have amounts from 2% to 32% larger than the Eurostat amounts.
- For the same 13 sectors for non-hazardous waste, four of them (Manufacture of textile products, leather and leather products; Manufacture of wood and wood products; Manufacture of wood and wood products and Manufacture of furniture; jewellery, musical instruments, toys; repair and installation of machinery and equipment) reported amounts to E-PRTR of less than 20% of the reported amounts to Eurostat. Five sectors (Manufacture of food products; beverages and tobacco; Manufacture of pulp, paper and paper products, publishing and printing; Manufacture of chemicals, rubber and plastic products; Manufacture of basic metals and fabricated metal products and Manufacturing of computer, electronic and optical products, electrical equipment, motor vehicles and other transport equipment) have an amount between 20% to 60% and two sectors (Manufacture of coke and refined petroleum products and Energy, gas and water supply) have an amount between 60% to 100% of the reported amount to Eurostat. Two sectors (Other waste management activities and Waste management activities) have amounts from 2% to 20% larger than the Eurostat amounts.

**Table 118: Comparison between reported E-PRTR data and Eurostat data on 2 digit NACE code level and by country in 2008. Coverage stated in %**

| Country              | Agriculture, hunting and forestry |                          |                        | Fishing              |                      |                      | Mining and quarrying |                          |                        | Manufacture of food products; beverages and tobacco |                          |                        |
|----------------------|-----------------------------------|--------------------------|------------------------|----------------------|----------------------|----------------------|----------------------|--------------------------|------------------------|---|--------------------------|------------------------|
|                      | Hazardous<br>A01-A02              | Non-hazardous<br>A01-A02 | Total waste<br>A01-A02 | Hazardous<br>A03     | Non-hazardous<br>A03 | Total waste<br>A03   | Hazardous<br>B05-B09 | Non-hazardous<br>B05-B09 | Total waste<br>B05-B09 | Hazardous<br>C10-C12                                | Non-hazardous<br>C10-C12 | Total waste<br>C10-C12 |
|                      | 2008                              | 2008                     | 2008                   | 2008                 | 2008                 | 2008                 | 2008                 | 2008                     | 2008                   | 2008  | 2008                     | 2008                   |
| E-PRTR % of Eurostat | E-PRTR % of Eurostat              | E-PRTR % of Eurostat     | E-PRTR % of Eurostat   | E-PRTR % of Eurostat | E-PRTR % of Eurostat | E-PRTR % of Eurostat | E-PRTR % of Eurostat | E-PRTR % of Eurostat     | E-PRTR % of Eurostat   | E-PRTR % of Eurostat                                | E-PRTR % of Eurostat     | E-PRTR % of Eurostat   |
| Austria              | E-PRTR=0                          | E-PRTR=0                 | E-PRTR=0               | E-PRTR=0             | E-PRTR=0             | E-PRTR=0             | 72.7                 | 4.4                      | 5.4                    | 350.1   | 4.1                      | 4.3                    |
| Belgium              | 0.2                               | E-PRTR=0                 | 0.0                    | E-PRTR=0             | E-PRTR=0             | E-PRTR=0             | 17.4                 | 29.2                     | 29.1                   | 10.6  | 44.0                     | 43.6                   |
| Bulgaria             | 0.1                               | E-PRTR=0                 | 0.0                    | E-PRTR=0             | E-PRTR=0             | E-PRTR=0             | 0.0                  | 0.0                      | 0.0                    | E-PRTR=0  | 2.0                      | 2.0                    |
| Cyprus               | E-PRTR=0                          | E-PRTR=0                 | E-PRTR=0               | E-PRTR=0             | E-PRTR=0             | E-PRTR=0             | 29.2                 | E-PRTR=0                 | 0.0                    | E-PRTR=0  | 14.3                     | 14.3                   |
| Czech Republic       | 0.3                               | 10.4                     | 10.1                   | E-PRTR=0             | E-PRTR=0             | E-PRTR=0             | 40.6                 | 52.2                     | 50.2                   | 78.5  | 20.4                     | 21.3                   |
| Denmark              | E-PRTR=0                          | E-PRTR=0                 | E-PRTR=0               | E-PRTR=0             | E-PRTR=0             | E-PRTR=0             | 44.3                 | E-PRTR=0                 | 1.4                    | 58.8  | 97.1                     | 96.7                   |
| Estonia              | 0.1                               | 16.8                     | 16.2                   | E-PRTR=0             | E-PRTR=0             | E-PRTR=0             | 6.1                  | 9.6                      | 9.6                    | 104.1   | 52.1                     | 52.1                   |
| Finland              | E-PRTR=0                          | 0.4                      | 0.4                    | E-PRTR=0             | E-PRTR=0             | E-PRTR=0             | 0.0                  | 8.8                      | 8.5                    | 110.6   | 31.9                     | 32.3                   |
| France               | 0.4                               | E-PRTR=0                 | 0.1                    | E-PRTR=0             | E-PRTR=0             | E-PRTR=0             | 2.5                  | 6.0                      | 5.7                    | 87.7  | 74.2                     | 74.3                   |
| Germany              | 8.7                               | 4.3                      | 4.3                    | E-PRTR=0             | E-PRTR=0             | E-PRTR=0             | 114.9                | 1.6                      | 1.9                    | 4.0   | 92.1                     | 81.8                   |
| Greece               | Eurostat=0                        | E-PRTR=0                 | Eurostat=0             | E-PRTR=0             | E-PRTR=0             | E-PRTR=0             | 24.5                 | E-PRTR=0                 | 0.0                    | 2.8   | 12.5                     | 12.5                   |
| Hungary              | 2.8                               | 15.4                     | 15.2                   | E-PRTR=0             | E-PRTR=0             | E-PRTR=0             | 31.1                 | 0.4                      | 1.8                    | 10.9  | 20.6                     | 20.4                   |
| Iceland              | E-PRTR=0                          | E-PRTR=0                 | E-PRTR=0               | E-PRTR=0             | E-PRTR=0             | E-PRTR=0             | E-PRTR=0             | E-PRTR=0                 | E-PRTR=0               | E-PRTR=0  | E-PRTR=0                 | E-PRTR=0               |
| Ireland              | Eurostat=0                        | E-PRTR=0                 | Eurostat=0             | E-PRTR=0             | E-PRTR=0             | E-PRTR=0             | 9.3                  | E-PRTR=0                 | 0.0                    | 89.2  | 39.7                     | 39.8                   |
| Italy                | 0.2                               | 11.7                     | 11.4                   | E-PRTR=0             | E-PRTR=0             | E-PRTR=0             | 93.3                 | 10.4                     | 12.9                   | 176.8   | 4.9                      | 5.1                    |
| Latvia               | 54.3                              | 19.2                     | 19.6                   | E-PRTR=0             | E-PRTR=0             | E-PRTR=0             | E-PRTR=0             | E-PRTR=0                 | E-PRTR=0               | E-PRTR=0  | 49.6                     | 49.4                   |
| Liechtenstein        | 0.1                               | E-PRTR=0                 | 0.0                    | E-PRTR=0             | E-PRTR=0             | E-PRTR=0             | E-PRTR=0             | E-PRTR=0                 | E-PRTR=0               | 204.6   | 2.1                      | 2.3                    |
| Lithuania            | E-PRTR=0                          | E-PRTR=0                 | E-PRTR=0               | E-PRTR=0             | E-PRTR=0             | E-PRTR=0             | E-PRTR=0             | E-PRTR=0                 | E-PRTR=0               | E-PRTR=0  | Eurostat=0               | Eurostat=0             |
| Luxembourg           | E-PRTR=0                          | E-PRTR=0                 | E-PRTR=0               | E-PRTR=0             | E-PRTR=0             | E-PRTR=0             | E-PRTR=0             | E-PRTR=0                 | E-PRTR=0               | 1.1   | E-PRTR=0                 | 0.0                    |
| Malta                | E-PRTR=0                          | E-PRTR=0                 | E-PRTR=0               | E-PRTR=0             | E-PRTR=0             | E-PRTR=0             | E-PRTR=0             | E-PRTR=0                 | E-PRTR=0               | E-PRTR=0  | E-PRTR=0                 | E-PRTR=0               |
| Netherlands          | E-PRTR=0                          | E-PRTR=0                 | E-PRTR=0               | E-PRTR=0             | E-PRTR=0             | E-PRTR=0             | 3.8                  | 2.9                      | 2.9                    | 2 934.4   | 11.3                     | 12.3                   |
| Norway               | E-PRTR=0                          | E-PRTR=0                 | E-PRTR=0               | E-PRTR=0             | 4.5                  | 4.4                  | 10.8                 | 16.1                     | 14.5                   | 118.1   | 24.4                     | 24.9                   |
| Poland               | 608.1                             | 9.5                      | 10.9                   | E-PRTR=0             | E-PRTR=0             | E-PRTR=0             | 136.6                | 154.8                    | 154.8                  | 464.8   | 65.4                     | 65.7                   |
| Portugal             | 2.8                               | 3.4                      | 3.4                    | E-PRTR=0             | E-PRTR=0             | E-PRTR=0             | 0.4                  | 10.1                     | 9.6                    | 34.0  | 12.5                     | 12.7                   |
| Romania              | 6.3                               | 7.3                      | 7.3                    | E-PRTR=0             | E-PRTR=0             | E-PRTR=0             | 0.2                  | 0.3                      | 0.3                    | 23.0  | 17.2                     | 17.2                   |
| Slovakia             | 15.7                              | 25.9                     | 25.4                   | E-PRTR=0             | E-PRTR=0             | E-PRTR=0             | 7.6                  | E-PRTR=0                 | 0.0                    | 45.3  | 26.6                     | 27.1                   |
| Slovenia             | E-PRTR=0                          | 37.1                     | 37.1                   | E-PRTR=0             | E-PRTR=0             | E-PRTR=0             | 66.1                 | 8.4                      | 8.6                    | 7.1   | 13.9                     | 13.9                   |
| Spain                | 14.7                              | 5.1                      | 5.1                    | E-PRTR=0             | E-PRTR=0             | E-PRTR=0             | 40.5                 | 3.9                      | 3.9                    | 428.8   | 47.8                     | 48.9                   |
| Sweden               | E-PRTR=0                          | E-PRTR=0                 | E-PRTR=0               | E-PRTR=0             | E-PRTR=0             | E-PRTR=0             | 58.1                 | 0.0                      | 0.0                    | 46.7  | 13.1                     | 13.2                   |
| United Kingdom       | 2.3                               | 281.5                    | 114.1                  | E-PRTR=0             | 1.5                  | 1.5                  | 76.4                 | 0.0                      | 0.1                    | 132.1   | 45.8                     | 46.2                   |
| <b>TOTAL</b>         | <b>4.0</b>                        | <b>6.9</b>               | <b>6.8</b>             | <b>E-PRTR=0</b>      | <b>2.4</b>           | <b>2.3</b>           | <b>1.4</b>           | <b>8.1</b>               | <b>8.0</b>             | <b>46.9</b>   | <b>36.3</b>              | <b>36.4</b>            |



**Table 119: Comparison between reported E-PRTR data and Eurostat data on 2 digit NACE code level and by country in 2008. Coverage stated in %**

| Country              | Manufacture of textiles and textile products, leather and leather products |                        |                        | Manufacture of wood and wood products |                      |                      | Manufacture of pulp, paper and paper products; publishing and printing |                      |                 |
|----------------------|--|------------------------|------------------------|---------------------------------------|----------------------|----------------------|--|----------------------|-----------------|
|                      | Hazardous  | Non-hazardous          | Total waste            | Hazardous                             | Non-hazardous        | Total waste          | Hazardous  | Non-hazardous        | Total waste     |
|                      | C = 13, 14, 15<br>2008   | C = 13, 14, 15<br>2008 | C = 13, 14, 15<br>2008 | C = 16<br>2008                        | C = 16<br>2008       | C = 16<br>2008       | C17-C18<br>2008  | C17-C18<br>2008      | C17-C18<br>2008 |
| E-PRTR % of Eurostat | E-PRTR % of Eurostat   | E-PRTR % of Eurostat   | E-PRTR % of Eurostat   | E-PRTR % of Eurostat                  | E-PRTR % of Eurostat | E-PRTR % of Eurostat | E-PRTR % of Eurostat   | E-PRTR % of Eurostat |                 |
| Austria              | E-PRTR=0   | E-PRTR=0               | E-PRTR=0               | 25.6                                  | 0.6                  | 0.6                  | 9.9  | 27.6                 | 27.1            |
| Belgium              | 61.0   | 7.2                    | 8.8                    | 16.1                                  | 31.5                 | 31.1                 | 346.6  | 66.7                 | 74.1            |
| Bulgaria             | E-PRTR=0   | E-PRTR=0               | E-PRTR=0               | E-PRTR=0                              | 1.1                  | 1.1                  | 20.0   | 21.3                 | 21.3            |
| Cyprus               | E-PRTR=0   | E-PRTR=0               | E-PRTR=0               | E-PRTR=0                              | E-PRTR=0             | E-PRTR=0             | E-PRTR=0   | E-PRTR=0             | E-PRTR=0        |
| Czech Republic       | 2.5  | 9.4                    | 8.9                    | 1.9                                   | E-PRTR=0             | 0.2                  | 17.9   | 30.2                 | 30.0            |
| Denmark              | 1 467.9  | 91.2                   | 93.6                   | 3.3                                   | E-PRTR=0             | 0.3                  | 7.4  | 8.2                  | 8.2             |
| Estonia              | 39.5   | 22.1                   | 22.3                   | 23.1                                  | 1.4                  | 1.4                  | 0.7  | E-PRTR=0             | 0.0             |
| Finland              | E-PRTR=0   | E-PRTR=0               | E-PRTR=0               | 0.9                                   | 6.9                  | 6.8                  | 28.9   | 58.1                 | 58.0            |
| France               | 82.8   | 8.8                    | 11.3                   | 55.7                                  | 1.1                  | 1.1                  | 131.1  | 46.5                 | 47.1            |
| Germany              | 18.7   | 61.3                   | 60.0                   | 121.5                                 | 6.3                  | 7.4                  | 309.0  | 110.7                | 112.3           |
| Greece               | 6.9  | E-PRTR=0               | 0.1                    | 85.2                                  | E-PRTR=0             | 0.2                  | 14.0   | 37.8                 | 37.7            |
| Hungary              | 35.7   | E-PRTR=0               | 1.5                    | 4.4                                   | 5.8                  | 5.8                  | 10.8   | 17.4                 | 17.3            |
| Iceland              | E-PRTR=0   | E-PRTR=0               | E-PRTR=0               | E-PRTR=0                              | E-PRTR=0             | E-PRTR=0             | E-PRTR=0   | E-PRTR=0             | E-PRTR=0        |
| Ireland              | E-PRTR=0   | E-PRTR=0               | E-PRTR=0               | 37.0                                  | 1.8                  | 1.8                  | 0.3  | 3.8                  | 3.5             |
| Italy                | 34.9   | 3.5                    | 4.5                    | 12.4                                  | 12.9                 | 12.9                 | 8.5  | 47.9                 | 47.0            |
| Latvia               | E-PRTR=0   | E-PRTR=0               | E-PRTR=0               | 24.4                                  | E-PRTR=0             | 0.2                  | E-PRTR=0   | E-PRTR=0             | E-PRTR=0        |
| Liechtenstein        | E-PRTR=0   | E-PRTR=0               | E-PRTR=0               | 51.8                                  | 12.7                 | 12.8                 | 12.4   | 23.0                 | 23.0            |
| Lithuania            | E-PRTR=0   | E-PRTR=0               | E-PRTR=0               | E-PRTR=0                              | E-PRTR=0             | E-PRTR=0             | E-PRTR=0   | E-PRTR=0             | E-PRTR=0        |
| Luxembourg           | E-PRTR=0   | E-PRTR=0               | E-PRTR=0               | 8.7                                   | 126.8                | 124.6                | 260.5  | 35.0                 | 40.6            |
| Malta                | E-PRTR=0   | E-PRTR=0               | E-PRTR=0               | E-PRTR=0                              | E-PRTR=0             | E-PRTR=0             | E-PRTR=0   | E-PRTR=0             | E-PRTR=0        |
| Netherlands          | 31.0   | 7.4                    | 8.0                    | E-PRTR=0                              | E-PRTR=0             | E-PRTR=0             | 94.3   | 29.6                 | 30.3            |
| Norway               | E-PRTR=0   | E-PRTR=0               | E-PRTR=0               | E-PRTR=0                              | E-PRTR=0             | E-PRTR=0             | 71.3   | 108.3                | 108.0           |
| Poland               | E-PRTR=0   | E-PRTR=0               | E-PRTR=0               | 13.9                                  | 12.3                 | 12.3                 | 412.6  | 40.5                 | 41.8            |
| Portugal             | 3.2  | E-PRTR=0               | 0.0                    | 0.5                                   | 52.4                 | 46.3                 | 14.6   | 53.2                 | 52.7            |
| Romania              | 4.4  | E-PRTR=0               | 0.0                    | 4.6                                   | 4.5                  | 4.5                  | 37.6   | 67.9                 | 67.8            |
| Slovakia             | 4.6  | E-PRTR=0               | 0.4                    | E-PRTR=0                              | E-PRTR=0             | E-PRTR=0             | 25.9   | 61.4                 | 61.3            |
| Slovenia             | 95.1   | E-PRTR=0               | 33.2                   | 11.3                                  | E-PRTR=0             | 0.0                  | 16.3   | 36.7                 | 36.6            |
| Spain                | 17.5   | 6.6                    | 7.0                    | 24.9                                  | 23.7                 | 23.8                 | 241.1  | 79.5                 | 81.3            |
| Sweden               | 1.6  | 33.0                   | 32.7                   | 2.5                                   | E-PRTR=0             | 0.1                  | 66.0   | 20.1                 | 20.2            |
| United Kingdom       | 24.0   | 27.3                   | 27.2                   | 49.6                                  | 4.9                  | 5.3                  | 113.4  | 64.2                 | 65.3            |
| <b>TOTAL</b>         | <b>35.6</b>  | <b>7.8</b>             | <b>8.4</b>             | <b>17.2</b>                           | <b>6.3</b>           | <b>6.5</b>           | <b>119.8</b>   | <b>53.8</b>          | <b>54.4</b>     |



**Table 120: Comparison between reported E-PRTR data and Eurostat data on 2 digit NACE code level and by country in 2008. Coverage stated in %**

| Country              | Manufacture of coke, refined petroleum products |                      |                      | Manufacture of chemicals, rubber and plastic products |                      |                      | Manufacture of other non-metallic mineral products |                      |             |
|----------------------|---|----------------------|----------------------|---|----------------------|----------------------|--|----------------------|-------------|
|                      | Hazardous                                       | Non-hazardous        | Total waste          | Hazardous   | Non-hazardous        | Total waste          | Hazardous  | Non-hazardous        | Total waste |
|                      | C = 19<br>2008                                  | C = 19<br>2008       | C = 19<br>2008       | C20-C22<br>2008                                       | C20-C22<br>2008      | C20-C22<br>2008      | C23<br>2008  | C23<br>2008          | C23<br>2008 |
| E-PRTR % of Eurostat | E-PRTR % of Eurostat                            | E-PRTR % of Eurostat | E-PRTR % of Eurostat | E-PRTR % of Eurostat                                  | E-PRTR % of Eurostat | E-PRTR % of Eurostat | E-PRTR % of Eurostat                               | E-PRTR % of Eurostat |             |
| Austria              | 194.1   | 327.0                | 296.1                | 81.5  | 26.4                 | 39.5                 | 2.3  | E-PRTR=0             | 0.1         |
| Belgium              | 107.2   | 62.2                 | 82.5                 | 68.8  | 101.7                | 95.1                 | 41.9   | 15.3                 | 15.9        |
| Bulgaria             | 0.9   | 158.4                | 64.0                 | 1.4   | 18.1                 | 17.9                 | 308.7  | 30.5                 | 30.6        |
| Cyprus               | E-PRTR=0  | E-PRTR=0             | E-PRTR=0             | E-PRTR=0  | E-PRTR=0             | E-PRTR=0             | 13.5   | E-PRTR=0             | 0.0         |
| Czech Republic       | 99.7  | E-PRTR=0             | 33.0                 | 24.1  | 25.8                 | 25.3                 | 27.4   | 28.1                 | 28.1        |
| Denmark              | 96.9  | E-PRTR=0             | 34.1                 | 119.4   | 276.7                | 222.9                | 131.0  | 140.3                | 139.9       |
| Estonia              | 33.7  | 173.2                | 39.1                 | 115.5   | E-PRTR=0             | 15.2                 | 0.2  | E-PRTR=0             | 0.1         |
| Finland              | 27.3  | 223.6                | 58.5                 | 259.0   | 29.4                 | 35.7                 | 62.0   | 8.7                  | 10.2        |
| France               | 104.9   | 110.3                | 107.2                | 68.7  | 29.9                 | 49.1                 | 103.1  | 23.6                 | 26.0        |
| Germany              | 155.1   | 504.4                | 230.4                | 69.0  | 9.2                  | 14.4                 | 228.9  | 10.1                 | 18.2        |
| Greece               | 94.3  | 58.9                 | 65.8                 | 18.9  | 4.1                  | 4.2                  | 37.3   | E-PRTR=0             | 0.0         |
| Hungary              | 24.6  | 8.9                  | 14.0                 | 120.0   | 32.0                 | 61.1                 | 50.3   | 20.7                 | 20.9        |
| Iceland              | E-PRTR=0  | E-PRTR=0             | E-PRTR=0             | E-PRTR=0  | E-PRTR=0             | E-PRTR=0             | E-PRTR=0   | E-PRTR=0             | E-PRTR=0    |
| Ireland              | Eurostat=0                                      | E-PRTR=0             | Eurostat=0           | 50.9  | 15.1                 | 31.7                 | 1 086.3  | 12.3                 | 227.9       |
| Italy                | 24.9  | 21.0                 | 22.6                 | 104.2   | 39.3                 | 55.4                 | 46.0   | 16.7                 | 17.0        |
| Latvia               | E-PRTR=0  | E-PRTR=0             | E-PRTR=0             | 38.0  | E-PRTR=0             | 0.5                  | 77.0   | 11.2                 | 11.2        |
| Liechtenstein        | 5.0   | 21.5                 | 18.3                 | 48.9  | 0.1                  | 0.1                  | 336.7  | 27.8                 | 27.9        |
| Lithuania            | E-PRTR=0  | E-PRTR=0             | E-PRTR=0             | E-PRTR=0  | E-PRTR=0             | E-PRTR=0             | E-PRTR=0   | E-PRTR=0             | E-PRTR=0    |
| Luxembourg           | E-PRTR=0  | E-PRTR=0             | E-PRTR=0             | 154.7   | 25.3                 | 45.9                 | 19.6   | 156.6                | 152.2       |
| Malta                | E-PRTR=0  | E-PRTR=0             | E-PRTR=0             | Eurostat=0  | E-PRTR=0             | 628.4                | E-PRTR=0   | E-PRTR=0             | E-PRTR=0    |
| Netherlands          | 253.9   | 12.9                 | 40.1                 | 150.5   | 26.7                 | 58.0                 | 39.7   | 8.0                  | 8.3         |
| Norway               | 25.2  | 59.2                 | 29.0                 | 136.9   | 25.0                 | 90.7                 | 22.9   | 8.3                  | 8.6         |
| Poland               | 97.6  | 24.0                 | 36.4                 | 67.5  | 23.6                 | 24.9                 | 63.0   | 22.4                 | 22.6        |
| Portugal             | Eurostat=0                                      | Eurostat=0           | Eurostat=0           | 21.9  | 37.0                 | 33.6                 | 14.1   | 4.9                  | 5.1         |
| Romania              | 115.9   | 45.2                 | 71.1                 | 145.1   | 8.5                  | 17.7                 | 42.0   | 8.3                  | 8.4         |
| Slovakia             | 32.9  | 65.1                 | 40.2                 | 43.4  | 29.4                 | 30.9                 | 39.6   | 54.2                 | 53.7        |
| Slovenia             | E-PRTR=0  | E-PRTR=0             | E-PRTR=0             | 42.9  | 71.1                 | 68.8                 | 53.4   | 43.5                 | 43.6        |
| Spain                | 151.3   | 89.5                 | 118.0                | 72.9  | 35.0                 | 43.5                 | 364.9  | 37.8                 | 39.8        |
| Sweden               | 36.2  | 95.1                 | 53.3                 | 55.4  | 16.7                 | 27.5                 | 60.3   | 24.6                 | 25.3        |
| United Kingdom       | 152.5   | 168.4                | 162.6                | 74.9  | 33.2                 | 43.0                 | 12.4   | 32.5                 | 31.0        |
| <b>TOTAL</b>         | <b>48.9</b>                                     | <b>77.9</b>          | <b>60.0</b>          | <b>83.4</b>   | <b>20.9</b>          | <b>29.7</b>          | <b>102.3</b>                                       | <b>19.8</b>          | <b>21.8</b> |



**Table 121: Comparison between reported E-PRTR data and Eurostat data on 2 digit NACE code level and by country in 2008. Coverage stated in %**

| Country              | Manufacture of basic metals and fabricated metal products |                      |                      | Manufacture of computer, electronic and optical products, electrical equipment, motor vehicles and other transport equipment |                      |                      | Manufacture of furniture; jewellery, musical instruments, toys; repair and installation of machinery and equipment |                      |             |
|----------------------|---|----------------------|----------------------|--|----------------------|----------------------|--|----------------------|-------------|
|                      | Hazardous   | Non-hazardous        | Total waste          | Hazardous  | Non-hazardous        | Total waste          | Hazardous  | Non-hazardous        | Total waste |
|                      | C24-C25   | C24-C25              | C24-C25              | C26-C30  | C26-C30              | C26-C30              | C31-C33  | C31-C33              | C31-C33     |
|                      | 2008  | 2008                 | 2008                 | 2008   | 2008                 | 2008                 | 2008   | 2008                 | 2008        |
| E-PRTR % of Eurostat | E-PRTR % of Eurostat                                      | E-PRTR % of Eurostat | E-PRTR % of Eurostat | E-PRTR % of Eurostat   | E-PRTR % of Eurostat | E-PRTR % of Eurostat | E-PRTR % of Eurostat   | E-PRTR % of Eurostat |             |
| Austria              | 56.3  | 1.8                  | 6.1                  | 7.8  | 1.8                  | 2.7                  | 11.0   | E-PRTR=0             | 0.2         |
| Belgium              | 74.7  | 229.3                | 162.3                | 32.9   | 27.2                 | 27.8                 | 2.6  | 5.2                  | 4.8         |
| Bulgaria             | 26.7  | 86.0                 | 54.7                 | 23.2   | 9.1                  | 10.2                 | 84.2   | 52.6                 | 54.7        |
| Cyprus               | 0.9   | E-PRTR=0             | 0.1                  | E-PRTR=0   | E-PRTR=0             | E-PRTR=0             | E-PRTR=0   | E-PRTR=0             | E-PRTR=0    |
| Czech Republic       | 45.4  | 64.3                 | 61.3                 | 17.2   | 24.1                 | 23.3                 | 23.3   | E-PRTR=0             | 1.6         |
| Denmark              | 4.7   | 34.2                 | 20.0                 | 13.7   | 37.5                 | 25.1                 | 25.1   | 12.4                 | 13.5        |
| Estonia              | 2.9   | 13.7                 | 12.8                 | 33.3   | 25.4                 | 25.6                 | 25.6   | E-PRTR=0             | 0.1         |
| Finland              | 173.0   | 35.2                 | 80.4                 | 19.3   | 37.1                 | 35.5                 | 7.7  | E-PRTR=0             | 0.3         |
| France               | 67.6  | 180.1                | 153.6                | 68.3   | 31.8                 | 35.4                 | 36.9   | 1.8                  | 3.5         |
| Germany              | 63.4  | 75.6                 | 73.4                 | 42.4   | 19.0                 | 24.0                 | 18.4   | 3.4                  | 4.9         |
| Greece               | 10.3  | 75.4                 | 74.2                 | 65.9   | 21.9                 | 27.7                 | E-PRTR=0   | E-PRTR=0             | E-PRTR=0    |
| Hungary              | 74.8  | 57.5                 | 58.5                 | 6.7  | 11.6                 | 11.1                 | E-PRTR=0   | E-PRTR=0             | E-PRTR=0    |
| Iceland              | Eurostat=0  | Eurostat=0           | Eurostat=0           | E-PRTR=0   | E-PRTR=0             | E-PRTR=0             | E-PRTR=0   | E-PRTR=0             | E-PRTR=0    |
| Ireland              | 5.4   | E-PRTR=0             | 0.1                  | 17.7   | 5.4                  | 6.7                  | 48.7   | 11.7                 | 14.1        |
| Italy                | 91.5  | 54.3                 | 57.0                 | 7.7  | 2.9                  | 3.5                  | 3.1  | E-PRTR=0             | 0.2         |
| Latvia               | 57.1  | 12.1                 | 20.5                 | E-PRTR=0   | E-PRTR=0             | E-PRTR=0             | E-PRTR=0   | E-PRTR=0             | E-PRTR=0    |
| Liechtenstein        | E-PRTR=0  | 22.3                 | 14.4                 | E-PRTR=0   | E-PRTR=0             | Eurostat=0           | 736.8  | 39.4                 | 41.9        |
| Lithuania            | E-PRTR=0  | E-PRTR=0             | E-PRTR=0             | 8.3  | 45.7                 | 41.2                 | E-PRTR=0   | E-PRTR=0             | E-PRTR=0    |
| Luxembourg           | 270.2   | 205.0                | 211.4                | E-PRTR=0   | E-PRTR=0             | E-PRTR=0             | E-PRTR=0   | E-PRTR=0             | E-PRTR=0    |
| Malta                | Eurostat=0  | 380.0                | 2 164.3              | E-PRTR=0   | E-PRTR=0             | E-PRTR=0             | E-PRTR=0   | E-PRTR=0             | E-PRTR=0    |
| Netherlands          | 48.8  | 42.6                 | 43.1                 | 288.9  | 169.2                | 183.3                | 13.7   | E-PRTR=0             | 0.2         |
| Norway               | 92.7  | 45.7                 | 57.3                 | 4.1  | E-PRTR=0             | 0.5                  | 1.4  | E-PRTR=0             | 0.2         |
| Poland               | 53.7  | 11.3                 | 11.8                 | 21.2   | 8.7                  | 9.4                  | 137.2  | 10.5                 | 14.6        |
| Portugal             | 49.7  | 11.3                 | 13.3                 | 22.5   | 14.6                 | 15.1                 | 0.6  | 1.0                  | 1.0         |
| Romania              | 10.2  | 40.2                 | 39.4                 | 17.2   | 24.1                 | 23.6                 | 1.0  | 2.7                  | 2.7         |
| Slovakia             | 34.0  | 72.9                 | 71.3                 | 35.7   | 28.2                 | 29.2                 | 2.8  | 58.9                 | 55.9        |
| Slovenia             | 47.7  | 48.4                 | 48.4                 | 140.1  | 44.8                 | 49.7                 | 4.0  | E-PRTR=0             | 0.1         |
| Spain                | 0.9   | 94.1                 | 97.6                 | 59.9   | 30.2                 | 32.7                 | 25.3   | 5.5                  | 6.3         |
| Sweden               | 27.6  | 46.5                 | 43.8                 | 28.8   | 29.7                 | 29.6                 | 18.3   | 4.4                  | 4.9         |
| United Kingdom       | 168.0   | 101.6                | 109.0                | 88.0   | 32.9                 | 38.8                 | 17.5   | 0.5                  | 0.6         |
| <b>TOTAL</b>         | <b>67.8</b>   | <b>47.4</b>          | <b>50.1</b>          | <b>43.0</b>  | <b>23.6</b>          | <b>25.9</b>          | <b>24.8</b>  | <b>4.1</b>           | <b>5.0</b>  |

|   |            |   |   |
|---|------------|---|---|
|  | Below 20 % |  | Betw een 0 - 50% larger than eurostat   |
|  | Below 60 % |  | Betw een 50 - 100% larger than eurostat |
|   |            |  | More than 100% larger than eurostat     |



Table 122: Comparison between reported E-PRTR data and Eurostat data on 2 digit NACE code level and by country in 2008. Coverage stated in %

| Country              | Electricity, gas and water supply |                      |                      | Waste management activities |                      |                      | Other waste management activities |                      |                      | All NACE branches - Total |                      |             |
|----------------------|-----------------------------------|----------------------|----------------------|-----------------------------|----------------------|----------------------|-----------------------------------|----------------------|----------------------|---------------------------|----------------------|-------------|
|                      | Hazardous                         | Non-hazardous        | Total waste          | Hazardous                   | Non-hazardous        | Total waste          | Hazardous                         | Non-hazardous        | Total waste          | Hazardous                 | Non-hazardous        | Total waste |
|                      | E 35                              | E 35                 | E 35                 | 38                          | 38                   | 38                   | E36-E37, E39                      | E36-E37, E39         | E36-E37, E39         | TOTAL                     | TOTAL                | TOTAL       |
|                      | 2008                              | 2008                 | 2008                 | 2008                        | 2008                 | 2008                 | 2008                              | 2008                 | 2008                 | 2008                      | 2008                 | 2008        |
| E-PRTR % of Eurostat | E-PRTR % of Eurostat              | E-PRTR % of Eurostat | E-PRTR % of Eurostat | E-PRTR % of Eurostat        | E-PRTR % of Eurostat | E-PRTR % of Eurostat | E-PRTR % of Eurostat              | E-PRTR % of Eurostat | E-PRTR % of Eurostat | E-PRTR % of Eurostat      | E-PRTR % of Eurostat |             |
| Austria              | 90.0                              | 29.5                 | 32.6                 | 106.4                       | 67.6                 | 71.4                 | 0.1                               | 47.5                 | 46.6                 | 38.4                      | 4.2                  | 5.0         |
| Belgium              | 139.1                             | 31.1                 | 32.3                 | 171.6                       | 49.0                 | 53.4                 | 326.2                             | 128.2                | 137.0                | 32.7                      | 33.0                 | 32.9        |
| Bulgaria             | 65.7                              | 91.0                 | 91.0                 | E-PRTR=0                    | 1.6                  | 1.6                  | E-PRTR=0                          | 66.0                 | 65.8                 | 1.5                       | 3.0                  | 2.9         |
| Cyprus               | 56.3                              | E-PRTR=0             | 36.3                 | E-PRTR=0                    | 3 155.7              | 2 911.6              | E-PRTR=0                          | 38.9                 | 38.9                 | 4.1                       | 1.2                  | 1.3         |
| Czech Republic       | 112.1                             | 92.0                 | 92.2                 | 13.3                        | 8.2                  | 9.3                  | 21.4                              | 35.1                 | 33.4                 | 22.2                      | 18.8                 | 19.1        |
| Denmark              | 110.7                             | 3.5                  | 9.1                  | 36 610.6                    | 3 560.4              | 4 128.9              | 6.0                               | E-PRTR=0             | 0.1                  | 123.7                     | 22.5                 | 25.9        |
| Estonia              | 1.0                               | 21.5                 | 1.4                  | 149.4                       | 81.6                 | 84.1                 | 36.4                              | 103.5                | 103.5                | 9.9                       | 11.7                 | 11.0        |
| Finland              | 65.0                              | 62.3                 | 62.3                 | 83.6                        | 144.7                | 134.4                | Eurostat=0                        | 241.7                | 261.7                | 66.1                      | 12.6                 | 14.0        |
| France               | 103.0                             | 70.3                 | 71.6                 | 89.6                        | 36.5                 | 42.9                 | 3.3                               | 36.5                 | 20.8                 | 28.0                      | 5.0                  | 5.8         |
| Germany              | 124.1                             | 129.0                | 128.8                | 101.0                       | 89.6                 | 91.5                 | 112.5                             | 637.8                | 406.3                | 48.6                      | 21.2                 | 23.0        |
| Greece               | 80.0                              | E-PRTR=0             | 0.1                  | Eurostat=0                  | 0.3                  | 4.2                  | E-PRTR=0                          | 48.5                 | 48.5                 | 24.3                      | 4.6                  | 4.7         |
| Hungary              | 136.7                             | 15.7                 | 16.2                 | 40.2                        | 40.1                 | 40.1                 | 0.4                               | 54.4                 | 40.8                 | 34.0                      | 15.3                 | 16.0        |
| Iceland              | E-PRTR=0                          | E-PRTR=0             | E-PRTR=0             | E-PRTR=0                    | E-PRTR=0             | E-PRTR=0             | E-PRTR=0                          | E-PRTR=0             | E-PRTR=0             | Eurostat=0                | Eurostat=0           | Eurostat=0  |
| Ireland              | 14.6                              | 72.2                 | 70.0                 | Eurostat=0                  | 176.3                | 186.7                | E-PRTR=0                          | 32.9                 | 32.9                 | Eurostat=0                | 13.5                 | 14.9        |
| Italy                | 41.3                              | 93.2                 | 91.3                 | 118.4                       | 34.2                 | 39.8                 | 5.4                               | 190.6                | 171.1                | 63.1                      | 18.4                 | 20.4        |
| Latvia               | 4.4                               | E-PRTR=0             | 0.1                  | 1 652.7                     | 29.1                 | 43.9                 | E-PRTR=0                          | E-PRTR=0             | E-PRTR=0             | 42.5                      | 13.2                 | 14.3        |
| Liechtenstein        | 54.6                              | 9.1                  | 9.6                  | 141.0                       | 127.6                | 127.9                | 6.5                               | 16.7                 | 16.3                 | 10.6                      | 6.4                  | 6.5         |
| Lithuania            | E-PRTR=0                          | E-PRTR=0             | E-PRTR=0             | E-PRTR=0                    | E-PRTR=0             | E-PRTR=0             | E-PRTR=0                          | E-PRTR=0             | E-PRTR=0             | E-PRTR=0                  | Eurostat=0           | Eurostat=0  |
| Luxembourg           | 3.6                               | E-PRTR=0             | 0.8                  | 1.6                         | 21.7                 | 18.1                 | E-PRTR=0                          | 13.4                 | 12.6                 | 76.7                      | 12.2                 | 13.6        |
| Malta                | Eurostat=0                        | E-PRTR=0             | Eurostat=0           | Eurostat=0                  | E-PRTR=0             | 30.7                 | E-PRTR=0                          | E-PRTR=0             | E-PRTR=0             | 28.4                      | 0.2                  | 1.4         |
| Netherlands          | 535.8                             | 63.3                 | 66.5                 | 208.8                       | 165.6                | 170.5                | 1 632.6                           | 644.0                | 652.8                | 48.7                      | 15.1                 | 16.8        |
| Norway               | 25.6                              | E-PRTR=0             | 19.0                 | 40.7                        | 14.0                 | 20.0                 | 53.6                              | E-PRTR=0             | 1.5                  | 60.8                      | 16.4                 | 22.8        |
| Poland               | 285.8                             | 52.3                 | 52.5                 | 37.1                        | 22.7                 | 23.2                 | 24.9                              | 128.9                | 118.5                | 42.4                      | 57.7                 | 57.5        |
| Portugal             | 948.3                             | 73.1                 | 106.3                | 465.7                       | 57.0                 | 78.6                 | 141.6                             | 30.6                 | 30.8                 | 11.1                      | 10.1                 | 10.2        |
| Romania              | 127.9                             | 44.2                 | 44.2                 | 328.2                       | 3 047.3              | 2 386.5              | E-PRTR=0                          | 81.7                 | 81.4                 | 51.6                      | 4.4                  | 4.6         |
| Slovakia             | 10.3                              | 75.4                 | 74.8                 | 33.3                        | 35.2                 | 35.0                 | 0.4                               | 4.3                  | 4.3                  | 25.8                      | 38.4                 | 37.8        |
| Slovenia             | 31.3                              | 81.6                 | 81.5                 | 661.0                       | 398.4                | 439.1                | E-PRTR=0                          | 30.9                 | 29.4                 | 54.1                      | 26.1                 | 27.1        |
| Spain                | 58.1                              | 68.9                 | 68.9                 | 217.8                       | 140.7                | 149.9                | 30.1                              | 31.9                 | 31.8                 | 68.8                      | 15.9                 | 17.4        |
| Sweden               | 64.1                              | 69.7                 | 68.8                 | 164.6                       | 292.9                | 287.7                | 170.4                             | 1.3                  | 1.4                  | 32.5                      | 15.5                 | 15.9        |
| United Kingdom       | 100.2                             | 120.0                | 119.6                | 440.9                       | 214.1                | 218.6                | 69 419.2                          | 520.0                | 596.4                | 90.0                      | 30.9                 | 32.2        |
| <b>TOTAL</b>         | <b>21.8</b>                       | <b>64.4</b>          | <b>61.3</b>          | <b>131.5</b>                | <b>110.9</b>         | <b>112.6</b>         | <b>61.6</b>                       | <b>149.4</b>         | <b>130.5</b>         | <b>39.3</b>               | <b>16.8</b>          | <b>17.7</b> |

Below 20 %  
 Below 60 %  
 Betw een 0 - 50% larger than eurostat  
 Betw een 50 - 100% larger than eurostat  
 More than 100% larger than eurostat



- In the following six sectors more than 25% of the countries have not reported at all regarding the generation of hazardous waste to the E-PRTR: Agriculture, hunting and forestry; Fishing; Manufacture of textiles and textile products, leather and leather products; Manufacture of wood and wood products; Manufacture of furniture; jewellery, musical instruments, toys; repair and installation of machinery and equipment and Other waste management activities. For non-hazardous waste more than 25% of the countries have not reported in the following eight sectors: Agriculture, hunting and forestry; Fishing; Mining and quarrying; Manufacture of textiles and textile products, leather and leather products; Manufacture of wood and wood products; Manufacture of coke, refined petroleum products and nuclear fuel; Manufacture of furniture; jewellery, musical instruments, toys; repair and installation of machinery and equipment and Electricity, gas and water supply.
- Large countries like France, Germany, Italy, Poland, Spain and United Kingdom have only one or two sectors each in which the generation of hazardous and non-hazardous waste is not reported, whereas very small countries like Cyprus, Iceland, Liechtenstein and Malta have more than twelve sectors where the generation of either hazardous or non-hazardous waste is not reported. Of the remaining 20 countries, 13 have not reported on the generation of non-hazardous waste in four or more sectors.

## 2) Specific sector results - Evaluation of waste transfers related to generation

For the compared sectors the following characteristics can be observed:

- Agriculture, hunting and forestry (NACE A01-02). Most countries have very low levels of reporting; overall reporting to the E-PRTR is between 0 and 30 % of Eurostat's values.
- Fishing (NACE A03). Almost no E-PRTR data is present. Those countries that have reported to the E-PRTR have also reported much lower values than to Eurostat.
- Mining industry reporting to the E-PRTR (NACE B05 – B09) does not fit very well with that reported to Eurostat. Overall, the waste transfers reported to E-PRTR compared to the amounts reported to Eurostat are only 1.4 % for non-hazardous waste and 8.1 % for hazardous waste. One important explanation for this could be that the mining sector generally stores or landfills its generated non-hazardous waste. This non-hazardous waste is therefore not transferred and subsequently does not have to be reported to E-PRTR. However, for hazardous waste it would be expected that this waste is transferred from the mining sites. Despite this fact, most countries also report very low amounts of hazardous waste. Exemptions are Germany and Poland, which both reported higher amounts to the E-PRTR than to Eurostat.
- Manufacture of food products; beverages and tobacco (NACE C10-C12) has overall a lower quantity hazardous waste for E-PRTR than that reported to Eurostat (47%), although ten countries have a higher quantity. Countries like the Netherlands, Poland and Spain have amounts which are four to 30 times larger than those reported to Eurostat. For non-hazardous waste, the E-PRTR reporting is 36% of the total amount reported to Eurostat. In these cases all countries have reported lower amounts.
- Manufacture of textile products, leather and leather products (NACE C13-C15) has in total a lower quantity of hazardous waste reported to E-PRTR (36%) than reported to Eurostat, although there is a large variation between the countries. Thirteen countries did not report hazardous waste at all. For non-hazardous waste the reported amount is even lower (8% of amount reported to Eurostat), with 19 countries not reporting any non-hazardous waste.
- For Manufacture of wood and wood products (NACE C16) the overall reported amount of hazardous waste to E-PRTR is only 17 % of the amount reported to Eurostat. Eight countries have no reporting of hazardous waste and even large wood manufacturing countries like Finland and Sweden have only reported from 1% to 3% of the amount reported to Eurostat. This

could indicate that the threshold value of 2 tonnes is too low. For non-hazardous waste the amount reported is even lower (6%) and 13 countries have no reported amounts. The very low amount of reported transferred non-hazardous waste could indicate that the threshold value of 2,000 tonnes does not ensure that the required reporting coverage of 90% is reached or that the wood waste is used as a fuel by the reporting facilities.

- Manufacture of pulp, paper and paper products, publishing and printing (NACE C17-C18) is characterised by very diverse reporting when comparing the E-PRTR reporting with the one to Eurostat. For hazardous waste, overall E-PRTR reporting is 120% of the amount reported to Eurostat, although twelve countries report less than 20 % of the amount reported to Eurostat and seven countries report more than 100 % of the amount reported to Eurostat. For non-hazardous waste, reporting improves, with only two countries reporting more than 100 % (Germany and Norway) and four reporting less than 20 %, while seven countries report more than 50 %. This is also reflected in the total, which is 54.4 % of the amount reported to Eurostat.
- Manufacture of coke and refined petroleum products (NACE C19) is of interest because even though eight countries including large countries like France, Germany, Spain and United Kingdom report larger amounts of hazardous waste to E-PRTR than to Eurostat the total reported amount is still only 49%. The reason for this is that Estonia and Italy reported far less hazardous waste to E-PRTR than to Eurostat. For non-hazardous waste, the reported total is 78% of the amount reported to Eurostat, although seven countries reported larger amounts than to Eurostat. The total figure for non-hazardous waste is greatly influenced by the fact that Portugal reported a very large amount to E-PRTR and no tonnes at all to Eurostat.
- Manufacture of chemicals, rubber and plastic products (NACE C20-C22); comparison with Eurostat values show that for hazardous waste ten countries reported more to E-PRTR than to Eurostat although the total amount is only 83%. For non-hazardous waste the total is 21 %, with 14 countries having amounts from 25% to 39% of the amount reported to Eurostat.
- For Manufacture of other non-metallic mineral products (NACE C23), comparison with the reporting to Eurostat is very diverse for hazardous waste. The total reported amount is almost even, although seven countries reported much more than 100 %. Ireland, in particular, reported a very high absolute quantity to E-PRTR compared to Eurostat with quantities of hazardous waste reported to E-PRTR 1,086 % higher than those reported to Eurostat. For non-hazardous waste, the total quantity is not very high, which is reflected in a total being only 20% of Eurostat and with many countries having low quantities
- Manufacture of basic metals and fabricated metal products (NACE C24-C25). The comparison shows that the total reported waste to E-PRTR both for hazardous waste (68%) and non-hazardous waste (47%) is reasonably high compared to the reporting to Eurostat. However, for hazardous waste seven countries have values of less than 10% and five countries, particularly Finland and United Kingdom, have larger values than those reported to Eurostat. For non-hazardous waste, eight countries have reported quantities to E-PRTR from 54% to 94% of the quantities reported to Eurostat.
- Manufacturing of computer, electronic and optical products, electrical equipment, motor vehicles and other transport equipment (NACE C26-C30). The total amount of hazardous waste reported to the E-PRTR covers 43% of the amount reported to Eurostat. However, ten countries reported less than 20% of the amount reported to Eurostat and three countries did not report although amounts were reported to Eurostat. For non-hazardous waste, the total amount covered only 23% of the amount reported to Eurostat. Eight countries reported less than 20% of the amount reported to Eurostat. Italy had for both hazardous and non-hazardous waste coverage of less than 10%.

- Manufacture of furniture; jewellery, musical instruments, toys; repair and installation of machinery and equipment (NACE C31-C33). The total amount of hazardous waste reported to the E-PRTR covers only 25% of the amount reported to Eurostat. Five countries did not report hazardous waste to E-PRTR although they reported amounts to Eurostat and 15 countries reported less than 20% to E-PRTR of what they reported to Eurostat. For non-hazardous waste the total amount reported to E-PRTR is only 4% of the amount reported to Eurostat. 14 countries did not report non-hazardous waste transferred, whereas the reporting to Eurostat includes generated amounts. Twelve countries reported less than 20% of the amounts reported to Eurostat. Only Bulgaria, Latvia and Slovakia have a reasonable coverage.
- For Energy, gas and water supply (NACE D35) the E-PRTR reporting for hazardous waste covered only 22% of the amounts reported to Eurostat. Eleven countries reported larger amounts than to Eurostat. The reason for the total percentage being only 22% is that Estonia contributed 80% (5.4 million tonnes) of the total amount reported to Eurostat but only 55,000 tonnes to the E-PRTR. The explanation could be that oil-shale waste is generated but it is not transferred out of the facilities. For non-hazardous waste the total amount reported to the E-PRTR is high in absolute terms (52 million tonnes) but it only covers 64% of the amount reported to Eurostat. However, twelve countries have coverage from 60% to 93% and two countries have higher values than those reported to Eurostat. There is a particularly large difference for Greece (11.2 million tonnes), which could indicate that the waste is not transferred.
- Other waste management activities (NACE E36-E37, E39). For hazardous waste, this sector has a high total percentage (62%) of coverage compared with the reporting to Eurostat which is due to a very high amount reported by United Kingdom. The reporting to E-PRTR is very diverse. Six countries reported much larger amounts to E-PRTR than to Eurostat (up to a factor 700 larger), whereas seven countries reported less than 20%. For non-hazardous waste the total coverage is larger than the reporting to Eurostat (50%), which is especially due to the large amounts reported by Germany, Italy, the Netherland and United Kingdom (factor two to seven). However, ten countries have coverage between 20% and 50%.
- Waste management activities (NACE E38). These sectors have for both hazardous (32%) and non-hazardous (11%) a larger amount reported to the E-PRTR than to Eurostat. For hazardous waste, most countries have reasonable coverage, although the United Kingdom has both in absolute and in percentage terms a very high amount reported to E-PRTR compared with the amount reported to Eurostat. Belgium, Denmark, the Netherlands and Spain also have relatively high amounts. For non-hazardous waste, four countries reported less than 20%. The United Kingdom has a particularly large difference with reporting to E-PRTR being 35 million tonnes larger than to Eurostat. Sweden, the Netherlands and Ireland also reported much larger amounts. This could indicate that the waste is not transferred from the facilities. Nine countries have reported between 10% and 50% of the amount of non-hazardous waste reported to Eurostat.

### 3) Results of comparison of intensities of waste transferred per economic activity and per employee

Table 123 to Table 126 show the two intensities for hazardous waste and non-hazardous waste related to GVA and per employee. **Table 127** gives an overview of how many countries have either a very high or very low factor deviation in relation to hazardous waste and non-hazardous waste in the NACE-sector.

It is a general characteristic for both hazardous waste and non-hazardous waste that in most cases the waste intensity is linked to values lower than a factor five or factor ten and not so much to values higher than a factor five or factor ten.

In general the following other characteristics can be seen from the tables:

### Waste intensity and gross value added

Table 123, Table 124 and Table 125 show that many countries have waste intensities below a factor ten or a factor five when looking at waste transferred per gross value added especially for hazardous waste but also for non-hazardous waste. The number of countries with waste intensities below a factor ten is almost double as large as the number for non-hazardous waste, whereas the number is more equal for waste intensities below a factor five.

For both hazardous waste and non-hazardous waste quite a few countries have waste intensities larger than a factor five or factor ten.

Especially in the following sectors, many countries (six or a larger number) have a low hazardous waste intensity: Agriculture, hunting and forestry; Mining and quarrying; Manufacture of pulp, paper and paper products, publishing and printing; Manufacture of other non-metallic mineral products; Manufacture of basic metals and fabricated metal products; Electricity, gas and water supply and Other waste management activities.

For hazardous waste Cyprus, Denmark, Estonia, Finland, Greece, Hungary, Ireland, Latvia, Lithuania, Luxembourg, Norway, Romania, Slovakia, Sweden and Switzerland have low intensities in two or more sectors. All of the countries except for Romania are among the smaller countries in Europe in terms of population although some of them are big industrial countries. This indicates that whereas the gross value added is registered in the reported statistic, waste generation is not reported to the E-PRTR. This could be explained in two ways:

1. These smaller countries have many smaller facilities contributing to the gross value added but the thresholds values for reporting waste according to the E-PRTR are too high.
2. These smaller countries have many facilities producing extremely low amounts of waste due to the use of cleaner technology.

**Table 123: Hazardous waste transferred in ton according to the E-PRTR related to gross value added in million Euros in 2008. Stated on two-digit NACE code level and by country**

|  | Agriculture, hunting and forestry | Fishing             | Mining and quarrying | Manufacture of food products; beverages and tobacco | Manufacture of textiles and textile products, leather and leather products | Manufacture of wood and wood products | Manufacture of pulp, paper and paper products; publishing and printing | Manufacture of coke, refined petroleum products and nuclear fuel | Manufacture of chemicals, rubber and plastic products | Manufacture of other non-metallic mineral products | Manufacture of basic metals and fabricated metal products | Manufacture of computer, electronic and optical products, electrical equipment, motor vehicles and other transport | Manufacture of furniture; jewellery, musical instruments, toys; repair and installation of machinery and equipment | Electricity, gas and water supply | Other waste management activities | Waste management activities | TOTAL |   |
|--|-----------------------------------|---------------------|----------------------|---|--|---------------------------------------|--|--|---|--|---|--|--|-----------------------------------|-----------------------------------|-----------------------------|-------|---|
| Country  | A01-A02                           | A03                 | B05-B09              | C10-C12   | C13-C15  | C16                                   | C17-C18  | C19  | C20-C22   | C23  | C24-25  | C26-C30  | C31-C33  | D35                               | E36-E37, E39                      | E38                         | TOTAL |   |
| Austria  | NA                                | NA                  | NA                   | NA  | NA   | NA                                    | NA   | NA   | NA  | NA   | NA  | 0  | 0  | NA                                | 0                                 | NA                          | NA    |   |
| Belgium  | 0                                 | >                   | NA                   | 1   | 1  | 2                                     | 18   | 17   | 15  | 2  | 78  | 3  | 0  | 2                                 | 70                                | 402                         | 6     |   |
| Bulgaria                                       | NA                                | NA                  | NA                   | NA  | NA   | NA                                    | NA   | NA   | NA  | NA   | NA  | NA   | NA   | NA                                | NA                                | NA                          | NA    |   |
| Cyprus   | >                                 | >                   | 1                    | >   | >  | >                                     | >  | >  | >   | 0  | 0   | >  | >  | 3                                 | >                                 | >                           | 0     |   |
| Czech Republic                                 | 0                                 | >                   | 6                    | 1   | 0  | 0                                     | 0  | 11   | 7   | 3  | 27  | 2  | 3  | 5                                 | 14                                | 51                          | 3     |   |
| Denmark  | >                                 | >                   | NA                   | 1   | 1  | 0                                     | 0  | 26   | 7   | 1  | 2   | 1  | 4  | 20                                | 2                                 | 223                         | 3     |   |
| Estonia  | 0                                 | >                   | 1                    | 0   | 0  | 0                                     | 0  | 8 195  | 32  | 1  | 1   | 1  | 1  | 125                               | 0                                 | 242                         | 52    |   |
| Finland  | >                                 | >                   | 0                    | 2   | >  | 1                                     | 1  | 21   | 60  | 8  | 184   | 0  | 0  | 2                                 | 45                                | 134                         | 9     |   |
| France   | 0                                 | >                   | 1                    | 1   | 1  | 1                                     | 2  | 29   | 28  | 4  | 19  | 3  | 2  | 1                                 | 5                                 | 71                          | 2     |   |
| Germany  | 0                                 | >                   | 11                   | 0   | 0  | 5                                     | 3  | 77   | 17  | 12   | 21  | 1  | 1  | 11                                | 8                                 | 344                         | 5     |   |
| Greece   | 0                                 | >                   | 0                    | 0   | 0  | 0                                     | 0  | 1  | 0   | 0  | 3   | 3  | >  | 2                                 | >                                 | 38                          | 0     |   |
| Hungary  | 0                                 | >                   | 37                   | 2   | 2  | 0                                     | 0  | 2  | 29  | 4  | 36  | 0  | >  | 6                                 | 1                                 | 50                          | 2     |   |
| Iceland  | NA                                | NA                  | NA                   | NA  | NA   | NA                                    | NA   | NA   | NA  | NA   | NA  | NA   | NA   | NA                                | NA                                | NA                          | NA    |   |
| Ireland  | 0                                 | >                   | 1                    | 0   | >  | 0                                     | 0  | 432  | 7   | 281  | 1   | 0  | NA   | 1                                 | NA                                | NA                          | 3     |   |
| Italy  | 0                                 | >                   | 7                    | 1   | 0  | 0                                     | 0  | 27   | 47  | 2  | 22  | 0  | 0  | 2                                 | 2                                 | 187                         | 3     |   |
| Latvia   | 1                                 | >                   | >                    | >   | >  | 0                                     | >  | >  | 2   | 0  | 32  | >  | >  | 0                                 | >                                 | 17                          | 1     |   |
| Liechtenstein                                  | NA                                | NA                  | NA                   | NA  | NA   | NA                                    | NA   | NA   | NA  | NA   | NA  | NA   | NA   | NA                                | NA                                | NA                          | NA    |   |
| Lithuania                                      | 0                                 | >                   | >                    | 1   | >  | 0                                     | 0  | NA   | 0   | 0  | >   | 0  | 3  | 0                                 | 1                                 | 29                          | 0     |   |
| Luxembourg                                     | >                                 | NA                  | >                    | 0   | >  | 2                                     | 7  | NA   | 16  | 1  | 122   | >  | >  | 0                                 | >                                 | 2                           | 4     |   |
| Malta  | >                                 | >                   | >                    | >   | >  | >                                     | >  | >  | 5   | >  | 533   | >  | >  | 6                                 | >                                 | 11                          | 3     |   |
| Netherlands                                    | >                                 | >                   | 0                    | 6   | 1  | >                                     | 1  | 38   | 46  | 2  | 14  | 10   | 0  | 5                                 | 20                                | 227                         | 4     |   |
| Norway   | >                                 | >                   | 0                    | 1   | >  | >                                     | 1  | NA   | 118   | 1  | 85  | 0  | NA   | 1                                 | NA                                | NA                          | 3     |   |
| Poland   | 2                                 | >                   | 1                    | NA  | NA   | NA                                    | NA   | NA   | NA  | NA   | NA  | NA   | NA   | 4                                 | NA                                | NA                          | 2     |   |
| Portugal                                       | NA                                | NA                  | NA                   | NA  | NA   | NA                                    | NA   | NA   | NA  | NA   | NA  | NA   | NA   | NA                                | NA                                | NA                          | NA    |   |
| Romania  | 0                                 | >                   | 0                    | 0   | 0  | 0                                     | 0  | 104  | 40  | 0  | 6   | 1  | 0  | 1                                 | >                                 | 700                         | 2     |   |
| Slovakia                                       | 3                                 | >                   | 0                    | 4   | 0  | >                                     | 1  | 119  | 8   | 2  | 11  | 4  | 0  | 0                                 | 0                                 | 48                          | 2     |   |
| Slovenia                                       | >                                 | >                   | 1                    | 0   | 23   | 0                                     | 0  | >  | 8   | 2  | 8   | 8  | 8  | 0                                 | 0                                 | >                           | 166   | 2 |
| Spain  | 0                                 | >                   | 1                    | 2   | 0  | 1                                     | 4  | 21   | 23  | 7  | 0   | 2  | NA   | 1                                 | NA                                | NA                          | 3     |   |
| Sweden   | >                                 | >                   | 1                    | 0   | 0  | 0                                     | 1  | 9  | 6   | 2  | 11  | 1  | 0  | 16                                | 0                                 | 162                         | 2     |   |
| Switzerland                                    | >                                 | NA                  | 0                    | 0   | 0  | 1                                     | 3  | 26   | 16  | 0  | 15  | 0  | >  | 0                                 | 14                                | 220                         | NA    |   |
| United Kingdom                                 | NA                                | NA                  | NA                   | NA  | NA   | NA                                    | NA   | NA   | NA  | NA   | NA  | NA   | NA   | NA                                | NA                                | NA                          | NA    |   |
| Average excluding the highest and lowest value | 0.2                               | 0.0                 | 2.4                  | 0.9   | 0.5  | 0.6                                   | 1.4  | 64.1   | 20.0  | 2.6  | 33.1  | 1.7  | 0.9  | 3.9                               | 8.5                               | 145.6                       | 2.9   |   |
|  |                                   | Above ± Average *10 |                      |   |  |                                       |  |  |   |  |   |  |  |                                   |                                   |                             |       |   |
|  |                                   | Above ± Average *5  |                      |   |  |                                       |  |  |   |  |   |  |  |                                   |                                   |                             |       |   |

**Table 124: Non-Hazardous waste transferred in ton according to the E-PRTR related to gross value added in million Euros in 2008. Stated on two-digit NACE code level and by country**

|  | Agriculture, hunting and forestry | Fishing             | Mining and quarrying | Manufacture of food products; beverages and tobacco | Manufacture of textiles and textile products, leather and leather products | Manufacture of wood and wood products | Manufacture of pulp, paper and paper products; publishing and printing | Manufacture of coke, refined petroleum products and nuclear fuel | Manufacture of chemicals, rubber and plastic products | Manufacture of other non-metallic mineral products | Manufacture of basic metals and fabricated metal products | Manufacture of computer, electronic and optical products, electrical equipment, motor vehicles and other transport equipment | Manufacture of furniture; jewellery, musical instruments, toys; repair and installation of machinery and equipment | Electricity, gas and water supply | Other waste management activities | Waste management activities | TOTAL |    |
|--|-----------------------------------|---------------------|----------------------|---|--|---------------------------------------|--|--|---|--|---|--|--|-----------------------------------|-----------------------------------|-----------------------------|-------|----|
| Country  | A01-A02                           | A03                 | B05-B09              | C10-C12   | C13-C15  | C16                                   | C17-C18  | C19  | C20-C22   | C23  | C24-25  | C26-C30  | C31-C33  | D35                               | E36-E37, E39                      | E38                         | TOTAL |    |
| Austria  | NA                                | NA                  | NA                   | NA  | NA   | NA                                    | NA   | NA   | NA  | NA   | NA  | 1  | >  | NA                                | 126                               | NA                          | NA    |    |
| Belgium  | >                                 | >                   | NA                   | 273   | 5  | 152                                   | 130  | 12   | 89  | 38   | 314   | 21   | 6  | 49                                | 592                               | 3 124                       | 42    |    |
| Bulgaria                                       | NA                                | NA                  | NA                   | NA  | NA   | NA                                    | NA   | NA   | NA  | NA   | NA  | NA   | NA   | NA                                | NA                                | NA                          | NA    |    |
| Cyprus   | >                                 | >                   | >                    | 18  | >  | >                                     | >  | >  | >   | >  | >   | >  | >  | >                                 | 62                                | 83                          | 1     |    |
| Czech Republic                                 | 8                                 | >                   | 36                   | 22  | 6  | >                                     | 46   | >  | 16  | 63   | 199   | 22   | >  | 271                               | 161                               | 114                         | 29    |    |
| Denmark  | >                                 | >                   | NA                   | 89  | 40   | >                                     | 8  | >  | 33  | 30   | 13  | 2  | 30   | 11                                | >                                 | 1 239                       | 14    |    |
| Estonia  | 105                               | >                   | 4 550                | 275   | 23   | 56                                    | >  | 1 684  | >   | >  | 30  | >  | 20   | >                                 | 43                                | 609                         | 3 345 | 95 |
| Finland  | 3                                 | >                   | 4 246                | 126   | >  | 322                                   | 515  | 32   | 236   | 38   | 77  | 3  | >  | 261                               | 541                               | 1 145                       | 61    |    |
| France   | >                                 | >                   | 22                   | 64  | 2  | 14                                    | 85   | 23   | 12  | 28   | 165   | 12   | 2  | 25                                | 65                                | 208                         | 9     |    |
| Germany  | 3                                 | >                   | 72                   | 74  | 13   | 27                                    | 135  | 69   | 24  | 13   | 115   | 2  | 2  | 244                               | 244                               | 1 505                       | 30    |    |
| Greece   | >                                 | >                   | >                    | 11  | >  | >                                     | 35   | 3  | 10  | >  | 1 174   | 6  | >  | >                                 | 36                                | 3                           | 14    |    |
| Hungary  | 18                                | >                   | 12                   | 106   | >  | 53                                    | 33   | 2  | 15  | 164  | 460   | 6  | >  | 175                               | 245                               | 444                         | 27    |    |
| Iceland  | NA                                | NA                  | NA                   | NA  | NA   | NA                                    | NA   | NA   | NA  | NA   | NA  | NA   | NA   | NA                                | NA                                | NA                          | NA    |    |
| Ireland  | >                                 | >                   | >                    | 115   | >  | 14                                    | 1  | >  | 2   | 13   | >   | 1  | NA   | 102                               | NA                                | NA                          | 23    |    |
| Italy  | 1                                 | >                   | 24                   | 15  | 1  | 31                                    | 68   | 33   | 54  | 73   | 160   | 1  | >  | 87                                | 546                               | 758                         | 18    |    |
| Latvia   | 23                                | >                   | >                    | 153   | >  | >                                     | >  | >  | >   | 73   | 29  | >  | >  | >                                 | >                                 | 32                          | 5     |    |
| Liechtenstein                                  | NA                                | NA                  | NA                   | NA  | NA   | NA                                    | NA   | NA   | NA  | NA   | NA  | NA   | NA   | NA                                | NA                                | NA                          | NA    |    |
| Lithuania                                      | >                                 | >                   | >                    | 10  | >  | 38                                    | 32   | NA   | 2   | 109  | 14  | 11   | 42   | 5                                 | 59                                | 996                         | 12    |    |
| Luxembourg                                     | >                                 | NA                  | >                    | >   | >  | 1 218                                 | 38   | NA   | 13  | 271  | 845   | >  | >  | >                                 | 23                                | 144                         | 31    |    |
| Malta  | >                                 | >                   | >                    | >   | >  | >                                     | >  | >  | >   | >  | 113   | >  | >  | >                                 | >                                 | >                           | 1     |    |
| Netherlands                                    | >                                 | >                   | 0                    | 63  | 6  | >                                     | 33   | 15   | 24  | 29   | 134   | 43   | >  | 80                                | 857                               | 1 394                       | 24    |    |
| Norway   | >                                 | 5                   | 0                    | 54  | >  | >                                     | 134  | NA   | 15  | 21   | 127   | >  | NA   | >                                 | NA                                | NA                          | 4     |    |
| Poland   | 11                                | >                   | 6 827                | NA  | NA   | NA                                    | NA   | NA   | NA  | NA   | NA  | NA   | NA   | 991                               | NA                                | NA                          | 240   |    |
| Portugal                                       | NA                                | NA                  | NA                   | NA  | NA   | NA                                    | NA   | NA   | NA  | NA   | NA  | NA   | NA   | NA                                | NA                                | NA                          | NA    |    |
| Romania  | 135                               | >                   | 299                  | 22  | >  | 56                                    | 88   | 70   | 32  | 67   | 729   | 24   | 4  | 1 096                             | 603                               | 20 243                      | 64    |    |
| Slovakia                                       | 79                                | >                   | >                    | 92  | >  | >                                     | 484  | 69   | 48  | 92   | 529   | 21   | 66   | 279                               | 34                                | 491                         | 60    |    |
| Slovenia                                       | 60                                | >                   | 33                   | 34  | >  | >                                     | 137  | >  | 152   | 130  | 129   | 46   | >  | 294                               | 98                                | 546                         | 33    |    |
| Spain  | 24                                | >                   | 413                  | 74  | 2  | 21                                    | 126  | 15   | 38  | 123  | 156   | 14   | NA   | 154                               | NA                                | NA                          | 19    |    |
| Sweden   | >                                 | >                   | 8                    | 35  | 21   | >                                     | 239  | 10   | 5   | 44   | 111   | 13   | 3  | 96                                | 6                                 | 6 761                       | 43    |    |
| Switzerland                                    | >                                 | NA                  | >                    | 3   | >  | >                                     | 12   | >  | 0   | 4  | 33  | >  | >  | >                                 | 35                                | 713                         | NA    |    |
| United Kingdom                                 | NA                                | NA                  | NA                   | NA  | NA   | NA                                    | NA   | NA   | NA  | NA   | NA  | NA   | NA   | NA                                | NA                                | NA                          | NA    |    |
| Average excluding the highest and lowest value | 33.2                              | 4.9                 | 809.6                | 72.5  | 9.6  | 77.1                                  | 103.5  | 31.9   | 32.6  | 63.7   | 223.5   | 13.0   | 14.4   | 197.6                             | 239.9                             | 1280.1                      | 30.0  |    |
|  |                                   | Above ± Average *10 |                      |   |  |                                       |  |  |   |  |   |  |  |                                   |                                   |                             |       |    |
|  |                                   | Above ± Average *5  |                      |   |  |                                       |  |  |   |  |   |  |  |                                   |                                   |                             |       |    |



**Table 125: Non-hazardous waste transferred in kilo according to the E-PRTR related to persons employed in 2008. Stated on two-digit NACE code level and by country**

|  | Agriculture, hunting and forestry | Fishing             | Mining and quarrying | Manufacture of food products; beverages and tobacco | Manufacture of textiles and textile products, leather and leather products | Manufacture of wood and wood products | Manufacture of pulp, paper and paper products; publishing and printing | Manufacture of coke, refined petroleum products and nuclear fuel | Manufacture of chemicals, rubber and plastic products | Manufacture of other non-metallic mineral products | Manufacture of basic metals and fabricated metal products | Manufacture of computer, electronic and optical products, electrical equipment, motor vehicles and other transport | Manufacture of furniture; jewellery, musical instruments, toys; repair and installation of machinery and equipment | Electricity, gas and water supply | Other waste management activities | Waste management activities |
|--|-----------------------------------|---------------------|----------------------|---|--|---------------------------------------|--|--|---|--|---|--|--|-----------------------------------|-----------------------------------|-----------------------------|
| Country  | A01-A02                           | A03                 | B05-B09              | C10-C12   | C13-C15  | C16                                   | C17-C18  | C19  | C20-C22   | C23  | C24-25  | C26-C30  | C31-C33  | D35                               | E36-E37, E39                      | E38                         |
| Austria  | NA                                | NA                  | 5 662                | 1 078   | NA   | 730                                   | 6 750  | NA   | 1 168   | NA   | 540   | 66   | NA   | 5 653                             | 64 320                            | 88 955                      |
| Belgium  | NA                                | NA                  | 1 100 920            | 16 719  | 249  | 9 600                                 | 12 251   | NA   | 11 512  | 23 963   | 23 729  | 2 310  | 225  | NA                                | 97 819                            | 366 643                     |
| Bulgaria                                       | NA                                | NA                  | 886                  | NA  | NA   | 118                                   | 1 783  | NA   | 3 738   | 2 781  | 6 068   | 106  | 391  | 192 367                           | 6 111                             | 325                         |
| Cyprus   | NA                                | NA                  | NA                   | 461   | NA   | NA                                    | NA   | NA   | NA  | NA   | NA  | NA   | NA   | NA                                | 7 971                             | 11 634                      |
| Czech Republic                                 | 1 298                             | NA                  | 9 436                | 618   | 73   | NA                                    | 3 806  | NA   | 473   | 1 834  | 4 681   | 680  | NA   | 53 289                            | 10 813                            | NA                          |
| Denmark  | NA                                | NA                  | NA                   | 5 250   | 2 160  | NA                                    | 950  | NA   | 5 332   | 2 232  | 838   | 210  | 1 192  | 3 362                             | NA                                | 169 692                     |
| Estonia  | 7 731                             | NA                  | 733 370              | 5 141   | 255  | 875                                   | NA   | 102 662  | NA  | NA   | 593   | 546  | NA   | 9 229                             | NA                                | 110 797                     |
| Finland  | 684                               | NA                  | 510 258              | 9 344   | NA   | 14 236                                | 58 733   | NA   | 33 649  | 2 965  | 9 116   | 327  | NA   | NA                                | 170 351                           | 182 781                     |
| France   | NA                                | NA                  | 2 877                | NA  | 2 483  | NA                                    | 8 764  | NA   | 6 285   | NA   | NA  | 107 917  | 88   | 4 254                             | 15 896                            | 32 114                      |
| Germany  | 1 600                             | NA                  | 14 587               | 3 142   | 675  | 1 373                                 | 13 130   | NA   | 1 813   | 817  | 7 491   | 180  | 38   | 65 208                            | 68 320                            | 264 656                     |
| Greece   | NA                                | NA                  | NA                   | NA  | NA   | NA                                    | NA   | NA   | NA  | NA   | NA  | NA   | NA   | NA                                | NA                                | NA                          |
| Hungary  | 6 340                             | NA                  | 458                  | 1 828   | NA   | 685                                   | 1 041  | 442  | 518   | 4 732  | 9 462   | 207  | NA   | 17 409                            | 9 446                             | 14 120                      |
| Iceland  | NA                                | NA                  | NA                   | NA  | NA   | NA                                    | NA   | NA   | NA  | NA   | NA  | NA   | NA   | NA                                | NA                                | NA                          |
| Ireland  | NA                                | NA                  | NA                   | 15 010  | NA   | 750                                   | 581  | NA   | 1 729   | 1 051  | NA  | 176  | 115  | NA                                | NA                                | 551 107                     |
| Italy  | 4 228                             | NA                  | 16 704               | 682   | 206  | 1 109                                 | 3 450  | 4 592  | 974   | 6 588  | 3 822   | 754  | NA   | 6 850                             | 8 682                             | 44 554                      |
| Latvia   | 15 818                            | NA                  | NA                   | 2 360   | NA   | NA                                    | NA   | NA   | NA  | 1 610  | 563   | NA   | NA   | NA                                | NA                                | 1 532                       |
| Liechtenstein                                  | NA                                | NA                  | NA                   | NA  | NA   | NA                                    | NA   | NA   | NA  | NA   | NA  | NA   | NA   | NA                                | NA                                | NA                          |
| Lithuania                                      | NA                                | NA                  | NA                   | 195   | NA   | 465                                   | 1 196  | NA   | 142   | 2 388  | 281   | 414  | 481  | 248                               | 2 237                             | 36 996                      |
| Luxembourg                                     | NA                                | NA                  | NA                   | NA  | NA   | NA                                    | NA   | NA   | 2 409   | 75 477   | 387 092   | NA   | NA   | NA                                | 35 164                            | 23 010                      |
| Malta  | NA                                | NA                  | NA                   | NA  | NA   | NA                                    | NA   | NA   | NA  | NA   | NA  | NA   | NA   | NA                                | NA                                | NA                          |
| Netherlands                                    | NA                                | NA                  | 974                  | 223 753   | 304  | NA                                    | 3 995  | 8 766  | 3 277   | 2 587  | 11 232  | 2 636  | 2 347  | 34 698                            | 1 211 984                         | 188 240                     |
| Norway   | NA                                | NA                  | NA                   | NA  | NA   | NA                                    | NA   | NA   | NA  | NA   | NA  | NA   | NA   | NA                                | NA                                | NA                          |
| Poland   | 2 616                             | NA                  | 316 467              | 10 206  | NA   | 1 845                                 | 5 399  | NA   | 4 800   | 1 554  | 12 387  | 237  | 201  | 113 686                           | 16 791                            | 26 511                      |
| Portugal                                       | 405                               | NA                  | 20 402               | 954   | NA   | 7 724                                 | 20 970   | NA   | 2 051   | 1 153  | 4 025   | 1 299  | 154  | 17 568                            | 10 113                            | 28 733                      |
| Romania  | 29 156                            | NA                  | 4 849                | 795   | NA   | 810                                   | 3 160  | 17 831   | 755   | 1 745  | 12 160  | 541  | 38   | 34 841                            | 3 428                             | 6 170                       |
| Slovakia                                       | 13 990                            | NA                  | NA                   | 2 469   | NA   | NA                                    | 24 227   | NA   | 1 306   | 3 408  | 29 794  | 421  | 771  | 39 721                            | 1 190                             | 16 289                      |
| Slovenia                                       | 11 307                            | NA                  | 83 091               | 914   | NA   | NA                                    | 5 112  | NA   | 10 528  | 4 654  | 4 085   | 1 596  | NA   | 36 798                            | 6 858                             | 22 264                      |
| Spain  | 116 055                           | NA                  | 100 196              | 24 985  | 51   | 747                                   | 8 712  | NA   | 2 458   | 1 307  | 22 212  | 974  | 59   | 70 016                            | 11 881                            | 22 294                      |
| Sweden   | NA                                | NA                  | 4 646                | 2 074   | 908  | NA                                    | 19 727   | NA   | 566   | 3 127  | 6 562   | 1 077  | 63   | 28 465                            | 6 503                             | 627 231                     |
| United Kingdom                                 | 51 923                            | NA                  | 419                  | 7 424   | 820  | 1 004                                 | 6 963  | 11 334   | 2 034   | 4 803  | 6 283   | 878  | 11   | 67 625                            | 116 870                           | 75 625                      |
| Average excluding the highest and lowest value | 12 224                            | 0                   | 114 054              | 5 573   | 628  | 2 132                                 | 7 968  | 10 631   | 3 186   | 3 920  | 8 782   | 778  | 294  | 35 804                            | 35 241                            | 103 851                     |
|  |                                   | Above ± Average *10 |                      |   |  |                                       |  |  |   |  |   |  |  |                                   |                                   |                             |
|  |                                   | Above ± Average *5  |                      |   |  |                                       |  |  |   |  |   |  |  |                                   |                                   |                             |

**Table 126: Hazardous waste transferred in kilo according to the E-PRTR related to persons employed in 2008. Stated on two-digit NACE code level and by country**

|  | Agriculture, hunting and forestry | Fishing             | Mining and quarrying | Manufacture of food products; beverages and tobacco | Manufacture of textiles and textile products, leather and leather products | Manufacture of wood and wood products | Manufacture of pulp, paper and paper products; publishing and printing | Manufacture of coke, refined petroleum products and nuclear fuel | Manufacture of chemicals, rubber and plastic products | Manufacture of other non-metallic mineral products | Manufacture of basic metals and fabricated metal products | Manufacture of computer, electronic and optical products, electrical equipment, motor vehicles and other transport equipment | Manufacture of furniture; jewellery, musical instruments, toys; repair and installation of machinery and equipment | Electricity, gas and water supply | Other waste management activities | Waste management activities |
|--|-----------------------------------|---------------------|----------------------|---|--|---------------------------------------|--|--|---|--|---|--|--|-----------------------------------|-----------------------------------|-----------------------------|
| Country  | A01-A02                           | A03                 | B05-B09              | C10-C12   | C13-C15  | C16                                   | C17-C18  | C19  | C20-C22   | C23  | C24-25  | C26-C30  | C31-C33  | D35                               | E36-E37, E39                      | E38                         |
| Austria  | NA                                | NA                  | 1 419                | 55  | NA   | 21                                    | 57   | NA   | 1 126   | 18   | 1 449   | 46   | 5  | 925                               | NA                                | 15 252                      |
| Belgium  | NA                                | NA                  | 2 263                | 47  | 67   | 136                                   | 1 751  | NA   | 1 931   | 218  | 5 963   | 288  | 41   | NA                                | 6 412                             | 50 303                      |
| Bulgaria                                       | 0                                 | NA                  | 18                   | NA  | NA   | NA                                    | 1  | NA   | 3   | 15   | 2 111   | 24   | 45   | 36                                | NA                                | NA                          |
| Cyprus   | NA                                | NA                  | NA                   | NA  | NA   | NA                                    | NA   | NA   | NA  | 6  | 3   | NA   | NA   | 537                               | NA                                | NA                          |
| Czech Republic                                 | 1                                 | NA                  | 1 542                | 38  | 2  | NA                                    | 34   | NA   | 205   | 83   | 630   | 66   | 56   | 947                               | 930                               | NA                          |
| Denmark  | NA                                | NA                  | 10                   | 32  | 60   | 7                                     | 5  | NA   | 1 232   | 106  | 87  | 76   | 131  | 5 937                             | NA                                | 30 502                      |
| Estonia  | 2                                 | NA                  | 141                  | 6   | 5  | 4                                     | 1  | 499 699  | 967   | 38   | 13  | 18   | 5  | 26 847                            | NA                                | 8 008                       |
| Finland  | NA                                | NA                  | 45                   | 167   | NA   | 23                                    | 123  | NA   | 8 488   | 624  | 21 837  | 17   | 1  | NA                                | NA                                | 21 351                      |
| France   | 56                                | NA                  | 105                  | NA  | 762  | NA                                    | 151  | NA   | 13 768  | NA   | NA  | 24 852   | 82   | 230                               | NA                                | 11 369                      |
| Germany  | 6                                 | NA                  | 2 233                | 18  | 6  | 246                                   | 318  | NA   | 1 532   | 710  | 1 311   | 109  | 23   | 2 892                             | 2 339                             | 59 018                      |
| Greece   | NA                                | NA                  | NA                   | NA  | NA   | NA                                    | NA   | NA   | NA  | NA   | NA  | NA   | NA   | NA                                | NA                                | NA                          |
| Hungary  | 20                                | NA                  | 1 459                | 26  | 14   | 2                                     | 12   | 587  | 962   | 106  | 739   | 15   | NA   | 612                               | NA                                | 1 601                       |
| Iceland  | NA                                | NA                  | NA                   | NA  | NA   | NA                                    | NA   | NA   | NA  | NA   | NA  | NA   | NA   | NA                                | NA                                | NA                          |
| Ireland  | NA                                | NA                  | NA                   | 55  | NA   | 18                                    | 5  | NA   | 4 779   | 23 292   | 58  | 67   | 23   | NA                                | NA                                | 32 937                      |
| Italy  | 4 166                             | NA                  | 1 673                | 9   | 46   | 12                                    | 36   | 2 182  | 1 934   | 5 507  | 588   | 96   | 4  | 203                               | NA                                | 10 808                      |
| Latvia   | 409                               | NA                  | NA                   | 11  | NA   | 5                                     | NA   | NA   | 32  | 4  | 602   | NA   | NA   | 1                                 | NA                                | 796                         |
| Liechtenstein                                  | NA                                | NA                  | NA                   | NA  | NA   | NA                                    | NA   | NA   | NA  | NA   | NA  | NA   | NA   | NA                                | NA                                | NA                          |
| Lithuania                                      | 0                                 | NA                  | NA                   | 24  | NA   | 2                                     | 4  | NA   | 7   | 4  | NA  | 10   | 32   | 17                                | 35                                | 1 071                       |
| Luxembourg                                     | NA                                | NA                  | NA                   | 1   | NA   | NA                                    | NA   | NA   | 2 804   | 316  | 55 846  | NA   | NA   | NA                                | NA                                | 358                         |
| Malta  | NA                                | NA                  | NA                   | NA  | NA   | NA                                    | NA   | NA   | NA  | NA   | NA  | NA   | NA   | NA                                | NA                                | NA                          |
| Netherlands                                    | NA                                | NA                  | 76                   | 607   | 31   | NA                                    | 145  | 21 946   | 6 232   | 141  | 1 162   | 861  | 48   | 2 015                             | 4 942                             | 201 110                     |
| Norway   | NA                                | NA                  | NA                   | NA  | NA   | NA                                    | NA   | NA   | NA  | NA   | NA  | NA   | NA   | NA                                | NA                                | NA                          |
| Poland   | 382                               | NA                  | 43                   | 59  | NA   | 3                                     | 247  | NA   | 418   | 19   | 703   | 35   | 89   | 489                               | NA                                | 1 696                       |
| Portugal                                       | 2                                 | NA                  | 32                   | 40  | 2  | 9                                     | 68   | NA   | 348   | 47   | 3 743   | 136  | 4  | 9 005                             | 104                               | 14 096                      |
| Romania  | 5                                 | NA                  | 1                    | 3   | 0  | 2                                     | 5  | 26 464   | 908   | 9  | 91  | 28   | 0  | 31                                | NA                                | 213                         |
| Slovakia                                       | 481                               | NA                  | 15                   | 189   | 1  | NA                                    | 30   | NA   | 228   | 82   | 593   | 98   | 2  | 47                                | NA                                | 1 593                       |
| Slovenia                                       | NA                                | NA                  | 2 234                | 1   | 390  | 7                                     | 7  | NA   | 553   | 68   | 264   | 271  | 3  | 28                                | NA                                | 6 767                       |
| Spain  | 171                               | NA                  | 84                   | 36  | 4  | 31                                    | 34   | NA   | 1 625   | 311  | 1 248   | 158  | 11   | 278                               | 675                               | 91 794                      |
| Sweden   | NA                                | NA                  | 533                  | 17  | 0  | 3                                     | 118  | NA   | 888   | 146  | 667   | 77   | 10   | 4 833                             | NA                                | 15 026                      |
| United Kingdom                                 | 623                               | NA                  | 916                  | 92  | 6  | 84                                    | 259  | 5 902  | 1 409   | 186  | 1 497   | 278  | 2  | 808                               | NA                                | 15 354                      |
| Average excluding the highest and lowest value | 166                               | 0                   | 699                  | 46  | 45   | 23                                    | 83   | 14 124   | 1 755   | 398  | 2 160   | 138  | 26   | 1 572                             | 1 798                             | 19 485                      |
|  |                                   | Above ± Average *10 |                      |   |  |                                       |  |  |   |  |   |  |  |                                   |                                   |                             |
|  |                                   | Above ± Average *5  |                      |   |  |                                       |  |  |   |  |   |  |  |                                   |                                   |                             |

Table 127: Number of countries with a high or low waste transfer related to gross value added in euro, per employee and NACE sector in 2008

| Waste transferred                          | Number of countries | Agriculture, hunting and forestry | Fishing  | Mining and quarrying | Manufacture of food products; beverages and tobacco | Manufacture of textiles and textile products, leather and leather products | Manufacture of wood and wood products | Manufacture of pulp, paper and paper products; publishing and printing | Manufacture of coke, refined petroleum products and nuclear fuel | Manufacture of chemicals, rubber and plastic products | Manufacture of other non-metallic mineral products | Manufacture of basic metals and fabricated metal products | Manufacture of computer, electronic and optical equipment, electrical equipment, motor vehicles and other transport equipment | Manufacture of furniture, jewellery, musical instruments, toys, repair and installation of machinery and equipment | Electricity, gas and water supply | Other waste management activities | Waste management activities | Total      |
|--|---------------------|-----------------------------------|----------|----------------------|---|--|---------------------------------------|--|--|---|--|---|---|--|-----------------------------------|-----------------------------------|-----------------------------|------------|
|  |                     | A01-A02                           | A03      | B05-B09              | C10-C12   | C13-C15  | C16                                   | C17-C18  | C19  | C20-C22   | C23  | C24-25  | C26-C30   | C31-C33  | D35                               | E36-E37,E39                       | E38                         |            |
| Per gross value added-hazardous waste      | Below a factor 10   | 9                                 |          | 6                    | 5   | 3  | 1                                     | 6  | 2  | 3   | 4  | 6   | 3   | 2  | 6                                 | 6                                 | 2                           | 64         |
|  | Below a factor 5    | 2                                 |          | 1                    |   | 1  | 1                                     | 2  | 2  |   | 2  | 1   | 1   | 3  |                                   | 2                                 | 2                           | 20         |
|  | Above a factor 10   |                                   |          | 1                    |   | 1  |                                       | 1  | 1  |   | 1  | 1   |   |  | 1                                 |                                   |                             | 7          |
|  | Above a factor 5    | 1                                 |          | 1                    |   |  | 1                                     |  | 1  | 1   |  | 1   | 1   |  |                                   | 1                                 |                             | 8          |
| Per gross value added- non-hazardous waste | Below a factor 10   | 3                                 |          | 9                    | 1   |  |                                       | 2  | 1  | 3   | 1  | 2   | 3   |  | 2                                 | 2                                 | 4                           | 33         |
|  | Below a factor 5    |                                   |          |                      | 2   | 2  | 2                                     | 1  | 1  | 1   | 2  | 3   | 2   | 3  | 1                                 | 3                                 | 2                           | 25         |
|  | Above a factor 10   |                                   |          |                      |   |  | 1                                     |  | 1  |   |  |   |   |  |                                   |                                   |                             | 2          |
|  | Above a factor 5    |                                   |          | 3                    |   |  |                                       |  |  | 1   |  |   |   |  | 2                                 |                                   | 1                           | 7          |
| Per employee-non-hazardous waste           | Below a factor 10   | 2                                 |          | 9                    | 2   | 1  | 1                                     | 1  | 1  | 1   |  | 5   | 1   | 1  | 2                                 | 3                                 | 3                           | 33         |
|  | Below a factor 5    | 2                                 |          | 3                    | 6   | 1  |                                       | 3  |  | 3   |  |   | 1   | 2  | 3                                 | 3                                 | 3                           | 30         |
|  | Above a factor 10   |                                   |          |                      | 1   |  |                                       |  |  | 1   | 1  | 1   | 1   |  |                                   | 1                                 |                             | 6          |
|  | Above a factor 5    | 1                                 |          | 2                    |   |  | 1                                     | 1  | 1  |   | 1  |   |   | 1  | 1                                 |                                   | 2                           | 11         |
| Per employee-hazardous waste               | Below a factor 10   | 7                                 |          | 7                    | 3   | 6  | 2                                     | 7  | 1  | 3   | 8  | 5   | 1   | 4  | 6                                 | 2                                 | 7                           | 69         |
|  | Below a factor 5    | 1                                 |          | 3                    | 2   | 3  | 4                                     | 1  | 1  | 3   | 2  | 1   | 4   | 5  | 3                                 |                                   |                             | 33         |
|  | Above a factor 10   |                                   |          |                      | 1   | 1  | 1                                     | 1  | 1  |   | 2  | 2   | 1   |  | 1                                 |                                   | 1                           | 12         |
|  | Above a factor 5    |                                   |          |                      |   | 1  | 1                                     |  |  | 1   |  |   | 1   | 1  | 1                                 |                                   |                             | 6          |
| <b>Total numbers</b>                       | <b>Total</b>        | <b>28</b>                         | <b>0</b> | <b>45</b>            | <b>23</b>   | <b>20</b>  | <b>16</b>                             | <b>26</b>  | <b>14</b>  | <b>21</b>   | <b>24</b>  | <b>28</b>   | <b>20</b>   | <b>22</b>  | <b>29</b>                         | <b>23</b>                         | <b>27</b>                   | <b>366</b> |



Although it is impossible to give a precise answer as to why gross value added is registered in the reported statistics whilst waste generation is not reported to E-PRTR, the most likely explanation is that the E-PRTR thresholds is too high. It is assessed that smaller countries do not have many large industrial facilities but rather have a number of smaller ones which will not pass the E-PRTR threshold value for the reporting obligation of hazardous waste. Furthermore, the use of cleaner technology is more frequently introduced by larger facilities than by smaller facilities. Since smaller countries normally do not have as many large facilities as larger countries, it is unlikely that the second possibility is the main explanation.

For non-hazardous waste intensity per gross value added, the same bias towards smaller countries in the distribution of countries with a low waste intensity is not present. 13 countries have two or more sectors with low waste intensity of non-hazardous per gross value added, with larger countries such as France, Germany and Italy also included. These three countries are all among those with most sectors (four) with a very low waste intensity. This could indicate that the threshold value of 2,000 tonnes of non-hazardous waste for certain sectors is too high regardless of whether there are a majority of large or smaller facilities. Sectors including the highest numbers of countries (six or a larger number) with a low waste intensity for non-hazardous waste are: Mining and quarrying and Other waste management activities and Waste management activities.

#### Waste intensity and number of employees

Table 125, Table 126 and Table 127 show that in particular for hazardous waste many countries have a low waste intensity of under factor ten or factor five per employee. The number of countries with hazardous waste intensities below a factor ten is more than double the number of countries with non-hazardous waste intensities below a factor ten, whereas the number of countries with waste intensities below a factor five is more similar for hazardous and non-hazardous waste.

For both hazardous waste and non-hazardous waste fewer countries have waste intensities larger than a factor five or factor ten.

In particular, the following sectors have many countries (six or a larger number) with a low hazardous waste intensity per employee: Agriculture, hunting and forestry; Mining and quarrying; Manufacture of textiles products, leather and leather products; Manufacture of wood and wood products; Manufacture of pulp, paper and paper products, publishing and printing; Manufacture of chemicals, rubber and plastic products; Manufacture of other non-metallic mineral products; Manufacture of basic metals and fabricated metal products; Manufacture of furniture, jewellery, musical instruments, toys, repair and installation of machinery and equipment; Electricity, gas and water supply and Waste management activities.

For hazardous waste, 19 countries have a low waste intensity per employee in two or more sectors. The 19 countries include both large and small countries. Although smaller countries like Bulgaria, Estonia, Hungary, Portugal, Sweden, Slovenia and Slovakia have six or more sectors with low waste intensities, larger countries like France, Italy, Poland and Spain have three to four sectors and Romania even 11 sectors included. This indicates that there is a smaller but not significant bias towards low hazardous waste intensity per employee in smaller countries compared with larger countries.

Similar to the waste intensity per gross value added, the low hazardous waste intensity per employee in certain countries can be explained by

1. These countries have many smaller facilities contributing to employee statistics but the hazardous waste generated is not reported to the E-PRTR because the thresholds values for reporting hazardous waste are too high.
2. These countries have many facilities producing extremely low amounts of waste due to the use of cleaner technology.

There is no precise answer as to which option is the most correct for hazardous waste but since the smaller countries have the most sectors included with a low intensity this could be an argument for option 1.

For non-hazardous waste, intensity per employee is missing for many countries. Only four sectors have many countries (six or a larger number) with a low waste intensity per employee: Mining and quarrying; Manufacture of food products, beverages and tobacco; Other waste management activities and Waste Management activities. 14 countries have a low non-hazardous waste intensity per employee in two or more sectors. There is no clear indication that it is either larger or smaller countries which have a low or high non-hazardous waste intensity per employee. Furthermore, this could indicate that the threshold value for the reporting of non-hazardous waste to the E-PRTR is too high.

#### **4) The linkage between E-PRTR activities and NACE codes**

E-PRTR covers only part of the activities belonging to a NACE code on the 2-digit level. This can explain why in general the results presented in section 2 show quite a low coverage of the E-PRTR reporting compared with the Eurostat data. Results from the EEA's work undertaken as a part of the informal E-PRTR 2011 review can be used to qualify this linkage between the E-PRTR activities and NACE codes (Rev 2.0).

The linkage has been undertaken by using the different E-PRTR activity codes and NACE codes, which the facilities reported to E-PRTR. However, some of the reported NACE codes cannot reasonably be used according to the E-PRTR activity code and have therefore not been taken into account. For example, under E-PRTR, activity 1.(a) "Mineral oil and gas refineries" a facility reported that its NACE code is 20.41, which is "Manufacture of soap and detergents, cleaning and polishing preparations".

The EEA work undertaken as a part of the informal E-PRTR review shows that 45 E-PRTR activities are related to 1,041 different NACE codes on the 4-digit level. 278 of these NACE codes are assessed as being not reasonably applicable whilst 763 can be applied. The number of different NACE codes on the four-digit level varies for each E-PRTR activity. For example the E-PRTR activity 2.(f) "Installations for surface treatment of metals and plastic materials using an electrolytic or chemical process" is by the reporting facilities linked to 91 different NACE codes on the four-digit level. An opposite example is E-PRTR activity 1 (e) "Coal rolling mills", which is linked to only three NACE codes on the four-digit level, which can possibly be explained by the fact that only about 4,000 tonnes were reported.

When looking at NACE codes on a 4-digit level related to the equivalent E-PRTR activity codes the correlation is not very good since overall a large number of NACE codes on a four-digit level are assigned to a single E-PRTR code. This means that it is difficult to derive a meaningful result as many of the NACE codes on a four-digit level are related to more than one of the E-PRTR codes making the derivation of a straight correlation troublesome, meaning that subsequent direct comparisons are very uncertain.

The correlation shows that on a four-digit NACE code, eight E-PRTR activities out of 44 have one NACE code covering more than 90 % of the total amount (cf. Table 128). In 18 cases two NACE codes covered more than 90 % of the total and in eight cases more than five or more NACE codes covered the total.

It appears that at a more aggregated level, such as with NACE codes on a two-digit level, the correlation is better. However there remains uncertainty regarding the particular NACE code on a two-digit level. It appears that for many of the activities there are usually one or two NACE codes that clearly stand out and which cover almost all of the E-PRTR activity code in term of amounts as shown in Table 121. If the correlation is based solely on the two-digit NACE codes which cover most of the E-PRTR activity code it becomes simpler to make a direct correlation.

On a two-digit level in 25 cases out of the 44 E-PRTR activities one NACE code covered more than 90 % of the total amounts and in 11 cases two NACE codes covered more than 90 % of the total amounts. In no cases more than five NACE codes were needed to cover at least 90 % of the total amounts. This indicates that most of the E-PRTR activity codes when related to NACE codes are primarily related to one or two NACE codes at a two-digit level.

**Table 128: Number of different four-digit NACE codes and two-digit NACE codes needed for covering 90% of the total E-PRTR waste amount when relating the individual E-PRTR activity codes with NACE codes**

| Number of E-PRTR activities | Number of different four-digit NACE codes needed to cover at least 90 % of the amounts under a given E-PRTR activity |
|-----------------------------|--|
| 8                           | 1  |
| 18                          | 2  |
| 5                           | 3  |
| 5                           | 4  |
| 8                           | More   |
| Number of E-PRTR activities | Number of different two-digit NACE codes needed to cover at least 90 % of the amounts under a given E-PRTR activity  |
| 25                          | 1  |
| 11                          | 2  |
| 6                           | 3  |
| 2                           | 4  |
| 0                           | More   |

Altogether, the comparison of the E-PRTR activity codes and the NACE codes on four-digit or two-digit level confirms that if each facility reporting waste to E-PRTR is transferred from an E-PRTR activity code to a NACE code(s) this will create uncertainties or missing coverage when comparing the Eurostat waste data based on NACE codes with the E-PRTR data related to NACE codes.

## 5) Evaluation of waste transfers by using the Weibull function

Another way of evaluating the quality of the E-PRTR reporting including the threshold values of 2,000 tonnes non-hazardous waste and 2 tonnes hazardous waste is to make an assessment using the Weibull function. Table 129 and Table 130 show the calculated coverage percentages for 2008 and for 2009 related to 45 different E-PRTR activities, hazardous waste and non-hazardous. The number of outliers found is shown in the results together with the number of facilities reporting and the quantity of reported waste. Furthermore, the total number of facilities, which have reported to E-PRTR, is stated independently of whether waste has been reported or not. A calculated coverage percentage of 90% is regarded as an acceptable coverage. In general, the values for 2008 and 2009 do not greatly differ. The following comments are therefore only based on the 2009 figures because this reporting includes most facilities.

### General results by using the Weibull function

For hazardous waste all activities have a value larger than 90%, which indicates as a first impression a good coverage and therefore also that the threshold value of 2 tonnes is reasonable. For non-hazardous waste, 21 out of the 45 activities have values lower than 90%. This indicates either that the coverage for many activities is not good enough and that the threshold of 2,000 tonnes is

too high or that these activities handle their waste on their own sites and therefore have no reporting obligation.

### Hazardous waste

In general, very few outliers were found for facilities generating hazardous waste. In 2009, the number was 25. The following five activities all have less than 30 reporting facilities included in the calculation and this decreases the reliability of the high Weibull values found for: 1.(b) Installations for gasification and liquefaction; 1(d) Coke ovens; 1.(f) Installations for the manufacture of coal products and solid smokeless fuel; 2.(a) Metal ore roasting or sintering installations and 7.(b) Intensive aquaculture.

Although the calculated coverage value is higher than 90% for all activities it is interesting that for 18 out of the 45 activities the percentage of facilities reporting hazardous waste is under 80% if the number is related not only to the number of facilities reporting waste but to the total number of facilities reporting under the concerned E-PRTR activity. In contrast to the first impression stated above under general results, this could indicate that the threshold value of 2 tonnes is too high. This percentage is particularly low for the following activities for which the percentage is under 50: 5.(c) Installations for the disposal of non-hazardous waste; 5.(d) Landfills; 5(e) Installations for the disposal or recycling of animal carcasses and animal waste; 5.(f) Urban waste-water treatment plants; 5(g) Independently operated industrial waste-water treatment plants which serve one or more activities; 7(a) Installations for the intensive rearing of poultry or pigs ; 7.(b) Intensive aquaculture and 8.(a) Slaughterhouses.

### Non-hazardous waste

The number of outliers for non-hazardous waste is also very low. In 2009 the number was 17.

The 15 following activities all have less than 30 reporting facilities included in the calculation: 1.(b) Installations for gasification and liquefaction; 1(d) Coke ovens; 1.(e) Coal rolling mills; 1.(f) Installations for the manufacture of coal products and solid smokeless fuel; 2.(a) Metal ore roasting or sintering installations; 3.(b) Opencast mining and quarrying; 3.(f) Installations for melting mineral substances, including the production of mineral fibres; 4.(c) Chemical installations for the production on an industrial scale of phosphorous-, nitrogen- or potassium-based fertilisers (simple or compound fertilisers); 4.(d) Chemical installations for the production on an industrial scale of basic plant health products and of biocides; 4.(f) Installations for the production on an industrial scale of explosives and pyrotechnic products; 5.(g) Urban waste-water treatment plants; 6.(c) Industrial plants for the preservation of wood and wood products with chemicals; 9.(a) Plants for the pre-treatment (operations such as washing, bleaching, mercerisation) or dyeing of fibres or textiles; 9.(b) Plants for the tanning of hides and skins and 9.(d) Installations for the production of carbon (hard-burnt coal) or electro-graphite by means of incineration or graphitisation. The low number of reporting facilities decreases the reliability, where high values have been calculated for these activities, or it can explain why many activities have lower values than 90%. It has to be underlined that for activities 1.(b); 1.(e); 1.(f); 9.(b) and 9.(d) the total number of reporting facilities belonging to these activity groups independently of the type of reporting (releases/transfers to air/water, transfers of waste) in fact is low and under 40.

However, activities with a higher number of reporting facilities also have a calculated value lower than 90%. This is the case for 2.(c) Installations for the processing of ferrous metals; 2.(d) Ferrous metal foundries; 3.(e) Installations for the manufacture of glass, including glass fibre; 3.(f) Installations for melting mineral substances, including the production of mineral fibres; 3.(g) Installations for the manufacture of ceramic products by firing, in particular roofing tiles, bricks, refractory bricks, tiles, stoneware or porcelain; 4.(a) Chemical installations for the production on an industrial scale of basic organic chemicals; 4.(d) Chemical installations for the production on an industrial scale of basic plant health products and of biocides; 5.(f) Urban waste-water treatment plants; 7.(a) Installations for the intensive rearing of poultry or pigs; 7.(b) Intensive aquaculture; 8.(a) Slaughterhouses; 8.(c) Treatment and processing of milk and 9.(c) Installations for the surface treatment of sub-



stances, objects or products using organic solvents, in particular for dressing, printing, coating, degreasing, waterproofing, sizing, painting, cleaning or impregnating. This could indicate that the threshold value of 2,000 tonnes does not allow for reporting of 90% of non-hazardous waste transfers.

The indication is supported by the fact that for only eleven activities out of the 45 the percentage of facilities reporting non-hazardous waste is over 50% if the number is related to the total number of facilities reporting under the concerned activity group. Furthermore, the ratio between the number of facilities reporting hazardous waste and the number reporting non-hazardous waste higher than a factor four for 18 activities.

### Conclusions

The use of the Weibull function provides some very good indications of the completeness of the E-PRTR waste reporting. When applying this statistical tool to the E-PRTR data, the conclusion for hazardous waste is that the completeness is quite good.

However, since many facilities are not reporting hazardous waste it seems that the completeness of the reporting could be improved if the threshold value was lower than 2 tonnes. This is especially relevant for the 18 activities where under half of the total number of facilities reported.

For non-hazardous waste almost half of the activities do not reach the 90% coverage target. Furthermore, for most of the activities the majority of facilities do not report non-hazardous waste. This indicates that the threshold value of 2,000 tonnes also does not allow for reporting of 90% of non-hazardous waste transfers.



**Table 129: Evaluation of the coverage of the E-PRTR reporting in 2008 by using the Weibull function. Related to E-PRTR activity code, hazardous and non-hazardous waste**

| Code  | Activity names  | Hazardous waste | Number of Facilities | Number of outliers | Quantity Tonnes | Non-hazardous waste | Number of facilities | Number of outliers | Quantity Tonnes | Total number of facilities in activity |
|-------|---|-----------------|----------------------|--------------------|-----------------|---------------------|----------------------|--------------------|-----------------|--|
| 1.(a) | Mineral oil and gas refineries  | 97%             | 162                  | 1                  | 1,664,262       | 92%                 | 76                   | 1                  | 1,657,272       | 172                                    |
| 1.(b) | Installations for gasification and liquefaction   | 100%            | 30                   | 2                  | 33,687          | 100%                | 2                    | 0                  | 10,930          | 39                                     |
| 1.(c) | Thermal power stations and other combustion installations   | 100%            | 1270                 | 0                  | 1,065,709       | 100%                | 628                  | 0                  | 57,291,427      | 1691                                   |
| 1.(d) | Coke ovens  | 99%             | 14                   | 1                  | 6,290           | 78%                 | 5                    | 1                  | 98,518          | 21                                     |
| 1.(e) | Coal rolling mills  | 100%            | 43                   | 0                  | 8,459           | 86%                 | 8                    | 1                  | 68,838          | 46                                     |
| 1.(f) | Installations for the manufacture of coal products and solid smokeless fuel                                       | 46%             | 5                    | 2                  | 1,691           | 62%                 | 1                    | 0                  | 101,088         | 5                                      |
| 2.(a) | Metal ore (including sulphide ore) roasting or sintering installations  | 100%            | 19                   | 3                  | 818,854         | 25%                 | 10                   | 2                  | 1,252,247       | 21                                     |
| 2.(b) | Installations for the production of pig iron or steel (primary or secondary melting) including continuous casting | 96%             | 227                  | 0                  | 2,146,560       | 95%                 | 206                  | 0                  | 24,447,013      | 248                                    |
| 2.(c) | Installations for the processing of ferrous metals  | 94%             | 430                  | 0                  | 512,772         | 98%                 | 129                  | 1                  | 4,672,125       | 442                                    |
| 2.(d) | Ferrous metal foundries   | 100%            | 364                  | 0                  | 169,461         | 84%                 | 381                  | 0                  | 5,642,906       | 452                                    |
| 2.(e) | Installations:  | 100%            | 768                  | 0                  | 3,055,133       | 101%                | 212                  | 0                  | 8,616,169       | 815                                    |
| 2.(f) | Installations for surface treatment of metals and plastic materials using an electrolytic or chemical process     | 92%             | 2199                 | 0                  | 1,820,454       | 90%                 | 226                  | 0                  | 3,539,112       | 2233                                   |
| 3.(a) | Underground mining and related operations   | 100%            | 211                  | 1                  | 59,054          | 99%                 | 91                   | 1                  | 33,271,494      | 276                                    |
| 3.(b) | Opencast mining and quarrying   | 101%            | 335                  | 1                  | 40,481          | 100%                | 22                   | 0                  | 1,481,466       | 352                                    |
| 3.(c) | Installations for the production of:  | 91%             | 320                  | 0                  | 33,167          | 100%                | 57                   | 0                  | 941,600         | 421                                    |
| 3.(d) | Installations for the production of asbestos and the manufacture of asbestos based products                       | No data         | No data              | No data            | No data         | No data             | No data              | No data            | No data         | No data                                |

| Code  | Activity names   | Hazardous waste | Number of Facilities | Number of outliers | Quantity Tonnes | Non-hazardous waste | Number of facilities | Number of outliers | Quantity Tonnes | Total number of facilities in activity |
|-------|--|-----------------|----------------------|--------------------|-----------------|---------------------|----------------------|--------------------|-----------------|--|
| 3.(e) | Installations for the manufacture of glass, including glass fibre  | 96%             | 346                  | 1                  | 355,941         | 87%                 | 106                  | 0                  | 876,427         | 379                                    |
| 3.(f) | Installations for melting mineral substances, including the production of mineral fibres   | 99%             | 41                   | 0                  | 7,264           | 88%                 | 31                   | 0                  | 339,291         | 53                                     |
| 3.(g) | Installations for the manufacture of ceramic products by firing, in particular roofing tiles, bricks, refractory bricks, tiles, stoneware or porcelain                                       | 100%            | 529                  | 0                  | 78,672          | 88%                 | 233                  | 0                  | 2,508,611       | 740                                    |
| 4.(a) | Chemical installations for the production on an industrial scale of basic organic chemicals, such as:  | 98%             | 1,550                | 0                  | 3,496,860       | 87%                 | 280                  | 0                  | 3,509,620       | 1,647                                  |
| 4.(b) | Chemical installations for the production on an industrial scale of basic inorganic chemicals, such as:  | 100%            | 418                  | 0                  | 939,501         | 99%                 | 103                  | 0                  | 4,127,110       | 468                                    |
| 4.(c) | Chemical installations for the production on an industrial scale of phosphorous-, nitrogen- or potassium-based fertilisers (simple or compound fertilisers)                                  | 99%             | 60                   | 1                  | 97,651          | 103%                | 14                   | 2                  | 949,015         | 75                                     |
| 4.(d) | Chemical installations for the production on an industrial scale of basic plant health products and of biocides  | 100%            | 80                   | 0                  | 253,790         | 98%                 | 5                    | 1                  | 60,342          | 81                                     |
| 4.(e) | Installations using a chemical or biological process for the production on an industrial scale of basic pharmaceutical products  | 98%             | 414                  | 0                  | 1,226,331       | 93%                 | 69                   | 0                  | 729,217         | 425                                    |
| 4.(f) | Installations for the production on an industrial scale of explosives and pyrotechnic products   | 99%             | 55                   | 0                  | 11,856          | 100%                | 2                    | 0                  | 7,497           | 59                                     |
| 5.(a) | Installations for the recovery or disposal of hazardous waste  | 98%             | 1,820                | 0                  | 14,172,650      | 96%                 | 813                  | 2                  | 49,480,108      | 1,977                                  |
| 5.(b) | Installations for the incineration of non-hazardous waste in the scope of Directive 2000/76/EC of the European Parliament and of the Council of 4 December 2000 on the incineration of waste | 92%             | 355                  | 0                  | 2,334,932       | 91%                 | 318                  | 0                  | 13,520,597      | 381                                    |
| 5.(c) | Installations for the disposal of non-hazardous waste  | 100%            | 338                  | 1                  | 1,310,337       | 95%                 | 2135                 | 0                  | 77,663,739      | 2,276                                  |

| Code  | Activity names  | Hazardous waste | Number of Facilities | Number of outliers | Quantity Tonnes | Non-hazardous waste | Number of facilities | Number of outliers | Quantity Tonnes | Total number of facilities in activity |
|-------|---|-----------------|----------------------|--------------------|-----------------|---------------------|----------------------|--------------------|-----------------|--|
| 5.(d) | Landfills (see note in Guidance Document)   | 100%            | 441                  | 0                  | 633,637         | 92%                 | 398                  | 0                  | 13,956,319      | 1,436                                  |
| 5.(e) | Installations for the disposal or recycling of animal carcasses and animal waste  | 100%            | 67                   | 1                  | 55,336          | 89%                 | 68                   | 0                  | 1,061,847       | 139                                    |
| 5.(f) | Urban waste-water treatment plants  | 100%            | 169                  | 0                  | 178,454         | 79%                 | 713                  | 0                  | 22,443,483      | 1,037                                  |
| 5.(g) | Independently operated industrial waste-water treatment plants which serve one or more activities of this annex   | 100%            | 36                   | 1                  | 190,922         | 91%                 | 21                   | 2                  | 292,752         | 66                                     |
| 6.(a) | Industrial plants for the production of pulp from timber or similar fibrous materials   | 99%             | 161                  | 1                  | 41,097          | 93%                 | 137                  | 0                  | 5,220,816       | 184                                    |
| 6.(b) | Industrial plants for the production of paper and board and other primary wood products   | 100%            | 516                  | 1                  | 183,203         | 97%                 | 444                  | 0                  | 11,043,781      | 632                                    |
| 6.(c) | Industrial plants for the preservation of wood and wood products with chemicals   | 98%             | 51                   | 0                  | 3,750           | 90%                 | 12                   | 1                  | 290,552         | 54                                     |
| 7.(a) | Installations for the intensive rearing of poultry or pigs  | 101%            | 157                  | 1                  | 38,828          | No data             | No data              | No data            | No data         | 5,345                                  |
| 7.(b) | Intensive aquaculture   | 0%              | 1                    | 0                  | 6               | 0%                  | 0                    | 0                  | 0               | 556                                    |
| 8.(a) | Slaughterhouses   | 100%            | 172                  | 0                  | 86,741          | 79%                 | 333                  | 0                  | 4,731,158       | 496                                    |
| 8.(b) | Treatment and processing intended for the production of food and beverage products from:  | 100%            | 667                  | 1                  | 132,062         | 97%                 | 535                  | 0                  | 11,689,473      | 982                                    |
| 8.(c) | Treatment and processing of milk  | 94%             | 270                  | 1                  | 25,127          | 86%                 | 137                  | 0                  | 1,577,844       | 459                                    |
| 9.(a) | Plants for the pre-treatment (operations such as washing, bleaching, mercerisation) or dyeing of fibres or textiles   | 99%             | 170                  | 1                  | 28,433          | 87%                 | 32                   | 0                  | 215,793         | 229                                    |
| 9.(b) | Plants for the tanning of hides and skins   | 96%             | 10                   | 1                  | 663             | 86%                 | 12                   | 0                  | 83,799          | 15                                     |
| 9.(c) | Installations for the surface treatment of substances, objects or products using organic solvents, in particular for dressing, printing, coating, degreasing, waterproofing, sizing, painting, cleaning or impregnating | 95%             | 821                  | 0                  | 728,398         | 78%                 | 275                  | 0                  | 2,697,379       | 840                                    |

| Code         | Activity names  | Hazardous waste | Number of Facilities | Number of outliers | Quantity Tonnes   | Non-hazardous waste | Number of facilities | Number of outliers | Quantity Tonnes    | Total number of facilities in activity |
|--------------|---|-----------------|----------------------|--------------------|-------------------|---------------------|----------------------|--------------------|--------------------|--|
| 9.(d)        | Installations for the production of carbon (hard-burnt coal) or electro-graphite by means of incineration or graphitisation | 96%             | 32                   | 1                  | 16,987            | 3%                  | 8                    | 1                  | 62,811             | 35                                     |
| 9.(e)        | Installations for the building of, and painting or removal of paint from ships  | 97%             | 101                  | 1                  | 156,357           | 84%                 | 40                   | 1                  | 1,041,118          | 106                                    |
| <b>Total</b> |   |                 | <b>16,245</b>        | <b>25</b>          | <b>38,221,819</b> |                     | <b>9,380</b>         | <b>17</b>          | <b>373,272,703</b> |  |

**Table 130: Evaluation of the coverage of the E-PRTR reporting in 2009 by using the Weibull function. Related to E-PRTR activity code, hazardous and non-hazardous waste**

| Code  | Hazardous waste | Number of facilities | Number of outliers | Quantity Tonnes | Non-hazardous waste | Number of facilities | Number of outliers | Quantity Tonnes | Total number of facilities in activity |
|-------|-----------------|----------------------|--------------------|-----------------|---------------------|----------------------|--------------------|-----------------|--|
| 1.(a) | 98%             | 165                  | 1                  | 896,817         | 91%                 | 73                   | 0                  | 965,517         | 173                                    |
| 1.(b) | 96%             | 31                   | 2                  | 35,583          | 0%                  | 3                    | 2                  | 12,544          | 36                                     |
| 1.(c) | 100%            | 1261                 | 0                  | 1,165,763       | 100%                | 613                  | 0                  | 51,691,285      | 1,713                                  |
| 1.(d) | 97%             | 15                   | 1                  | 4,500           | 34%                 | 4                    | 1                  | 79,853          | 21                                     |
| 1.(e) | 100%            | 30                   | 0                  | 6,087           | 86%                 | 6                    | 1                  | 61,006          | 32                                     |
| 1.(f) | 101%            | 13                   | 2                  | 1,823           | 97%                 | 3                    | 2                  | 162,192         | 14                                     |
| 2.(a) | 99%             | 16                   | 2                  | 58,902          | 101%                | 8                    | 2                  | 1,445,623       | 19                                     |
| 2.(b) | 98%             | 228                  | 0                  | 1,574,568       | 96%                 | 188                  | 0                  | 16,322,953      | 241                                    |
| 2.(c) | 94%             | 430                  | 0                  | 289,874         | 87%                 | 113                  | 0                  | 2,259,998       | 441                                    |
| 2.(d) | 100%            | 342                  | 0                  | 117,587         | 81%                 | 315                  | 0                  | 3,489,808       | 425                                    |
| 2.(e) | 99%             | 801                  | 0                  | 3,332,104       | 101%                | 202                  | 1                  | 10,162,967      | 834                                    |
| 2.(f) | 92%             | 2283                 | 1                  | 1,602,080       | 96%                 | 187                  | 0                  | 2,296,939       | 2,307                                  |
| 3.(a) | 100%            | 236                  | 1                  | 60,906          | 99%                 | 90                   | 1                  | 47,253,869      | 320                                    |
| 3.(b) | 100%            | 343                  | 0                  | 22,121          | 99%                 | 20                   | 0                  | 1,696,717       | 360                                    |
| 3.(c) | 97%             | 313                  | 1                  | 81,982          | 92%                 | 36                   | 1                  | 478,609         | 398                                    |
| 3.(d) | No data         | No data              | No data            | No data         | No data             | No data              | No data            | No data         | No data                                |
| 3.(e) | 97%             | 341                  | 0                  | 81,624          | 85%                 | 94                   | 0                  | 720,500         | 369                                    |
| 3.(f) | 99%             | 45                   | 1                  | 19,573          | 80%                 | 29                   | 0                  | 257,028         | 56                                     |
| 3.(g) | 96%             | 491                  | 1                  | 43,761          | 71%                 | 191                  | 0                  | 2,157,734       | 632                                    |
| 4.(a) | 98%             | 1,595                | 0                  | 3,729,175       | 89%                 | 246                  | 0                  | 2,890,483       | 1,667                                  |
| 4.(b) | 99%             | 418                  | 0                  | 780,554         | 100%                | 84                   | 0                  | 2,846,897       | 461                                    |
| 4.(c) | 97%             | 61                   | 1                  | 89,951          | 103%                | 12                   | 1                  | 851,403         | 71                                     |
| 4.(d) | 100%            | 86                   | 0                  | 250,831         | 66%                 | 8                    | 1                  | 63,526          | 88                                     |

| Code         | Hazardous waste | Number of facilities | Number of outliers | Quantity Tonnes   | Non-hazardous waste | Number of facilities | Number of outliers | Quantity Tonnes    | Total number of facilities in activity |
|--------------|-----------------|----------------------|--------------------|-------------------|---------------------|----------------------|--------------------|--------------------|--|
| 4.(e)        | 99%             | 421                  | 0                  | 1,075,081         | 94%                 | 71                   | 0                  | 682,302            | 437                                    |
| 4.(f)        | 97%             | 63                   | 1                  | 26,188            | 100%                | 2                    | 0                  | 7,492              | 68                                     |
| 5.(a)        | 97%             | 2,006                | 0                  | 16,092,271        | 93%                 | 874                  | 1                  | 51,367,423         | 2,181                                  |
| 5.(b)        | 94%             | 379                  | 0                  | 2,438,985         | 90%                 | 338                  | 0                  | 14,096,696         | 396                                    |
| 5.(c)        | 99%             | 333                  | 0                  | 1,111,716         | 94%                 | 2155                 | 0                  | 79,068,259         | 2,285                                  |
| 5.(d)        | 100%            | 414                  | 0                  | 771,659           | 91%                 | 407                  | 0                  | 11,541,274         | 1,423                                  |
| 5.(e)        | 101%            | 72                   | 1                  | 29,428            | 92%                 | 73                   | 0                  | 1,179,316          | 149                                    |
| 5.(f)        | 101%            | 194                  | 1                  | 123,256           | 76%                 | 717                  | 0                  | 18,322,622         | 1,041                                  |
| 5.(g)        | 100%            | 35                   | 1                  | 206,544           | 89%                 | 24                   | 1                  | 303,166            | 61                                     |
| 6.(a)        | 96%             | 127                  | 0                  | 26,947            | 93%                 | 114                  | 0                  | 4,162,670          | 149                                    |
| 6.(b)        | 100%            | 537                  | 0                  | 169,144           | 96%                 | 432                  | 0                  | 11,261,614         | 634                                    |
| 6.(c)        | 100%            | 50                   | 0                  | 4,424             | 98%                 | 9                    | 1                  | 334,139            | 54                                     |
| 7.(a)        | 94%             | 166                  | 0                  | 7,755             | 80%                 | 334                  | 0                  | 3,156,923          | 5,456                                  |
| 7.(b)        | 97%             | 2                    | 1                  | 67                | 0%                  | 0                    | 0                  | 3,156,923          | 582                                    |
| 8.(a)        | 100%            | 163                  | 0                  | 108,214           | 10%                 | 340                  | 1                  | 13,497,451         | 456                                    |
| 8.(b)        | 101%            | 734                  | 1                  | 2,044,081         | 99%                 | 568                  | 0                  | 19,463,626         | 1,022                                  |
| 8.(c)        | 93%             | 302                  | 0                  | 13,840            | 82%                 | 158                  | 0                  | 1,761,016          | 475                                    |
| 9.(a)        | 97%             | 168                  | 2                  | 75,337            | 71%                 | 28                   | 1                  | 526,389            | 214                                    |
| 9.(b)        | 96%             | 11                   | 2                  | 1,198             | 84%                 | 13                   | 0                  | 82,185             | 18                                     |
| 9.(c)        | 97%             | 889                  | 0                  | 848,793           | 76%                 | 266                  | 0                  | 2,375,569          | 902                                    |
| 9.(d)        | 97%             | 30                   | 0                  | 8,166             | 60%                 | 6                    | 1                  | 46,265             | 31                                     |
| 9.(e)        | 100%            | 99                   | 0                  | 132,991           | 88%                 | 33                   | 1                  | 607,867            | 101                                    |
| <b>Total</b> |                 | <b>16,758</b>        | <b>24</b>          | <b>30,311,555</b> |                     | <b>9,823</b>         | <b>20</b>          | <b>246,788,758</b> |  |



## 6) Assessment of landfills and incineration plants - E-PRTR activity 5

The EU landfill questionnaire includes the number of landfills for hazardous waste, landfills for non-hazardous waste and landfills for inert waste. The numbers cover the year 2009.

Landfills for inert waste are not obliged to report to E-PRTR. However, the number of landfills for hazardous waste and for non-hazardous waste according to the information in the questionnaire can be added and compared with the number of landfills reporting according to E-PRTR activity 5d, which covers landfills for hazardous waste and for non-hazardous waste.

The number of incineration plants reporting to E-PRTR is compared with information provided by CEWEP (Confederation of European Waste-to-Energy Plants).

### Landfills

The comparison includes only Member States of the EU because these countries are the only ones that have reported the Landfill Directive Questionnaire. According to the Landfill Directive all landfills in the EU had to fulfil certain technical requirements including the collection of GHGs by July 2009 at latest.

Table 131 shows the number of landfills reported according to the questionnaire related to the type of landfill, the added number of landfills for hazardous waste and non-hazardous waste reporting waste transfers according to E-PRTR for 2009 and the total number of landfills reporting to E-PRTR. Table 131 also gives the percentage coverage of E-PRTR reporting.

The total number of landfills reporting waste transfers to the E-PRTR was 647 in 2009, whereas the total number of landfills reporting according to the E-PRTR was 1,423 in 2009.

The table indicates that under E-PRTR many countries report waste transfers from a small number of landfills compared with the number of landfills reporting waste transfers according to the Landfill Directive. The total coverage of E-PRTR reporting is 8 % and 21 countries have coverage lower than 50%. If the coverage is related to the total number of landfills reporting to E-PRTR the total coverage is 17 % and 16 countries have coverage lower than 50%.

There might be different explanations as to the low number of landfills reporting to E-PRTR compared with the number reported according to the Landfill Directive Questionnaire for 2009.

1. The capacity threshold for landfills according to the E-PRTR Regulation for activity 5.(d)
2. The threshold values for waste transfers according to the E-PRTR Regulation (Article 5, 1.(b))
3. The threshold values for air emissions according to the E-PRTR Regulation (Article 5, 1 (and the threshold values for waste water emissions according to the E-PRTR Regulation (Article 5, 1(c))).

Ad. 1. The capacity threshold does not seem to be the explanation for the low reporting. Landfills with a capacity of 25,000 tonnes and receiving 10 tonnes per day have to report. Ten tonnes per day is equivalent to one truck a day, which seems to be a very low criterion.

Ad. 2. The low number of landfills reporting waste transfers can be explained by using information from the informal E-PRTR review undertaken by the EEA. The informal review has shown there is an indication that leachate from some landfills has been reported as waste water transfer (reported as pollutant transfer in water) instead of waste transfer. Leachate is supposed to be reported as a waste transfers only. In the informal 2011 E-PRTR review (covering 2009) 105 cases have been identified with this mistake.

**Table 131: Number of landfills reported according to the E-PRTR and the EU Landfill Questionnaire for 2009**

| Questionnaire according to Commission Decision 2000/738/EC for the report of the Member States on the transposition and implementation of Directive (99/31/EC) on the landfill of waste |             |                               |                                   |                           |            | E-PRTR   |  |   |  |
|---|-------------|-------------------------------|-----------------------------------|---------------------------|------------|--|--|---|--|
| Country   | Year        | Landfills for hazardous waste | Landfills for non-hazardous waste | Landfills for inert waste | Others *   | Number of Facilities reporting waste transfer from Landfills | Total number of facilities reporting under E-PRTR activity 5.(d) | % of landfill reporting waste transfer compared to hazardous and non-hazardous waste landfills reported for 2009 in Landfill directive Columns: G/(C+D) | % of total E-PRTR 5.(d) compared to hazardous and non-hazardous waste landfills reported for 2009 in Landfill directive Columns: H/(C+D) |
| Austria   | 2009        | 0                             | 175                               | 13                        | 462        | 4  | 15   | 2%  | 9%   |
| Belgium **  | 2009        | 4                             | 22                                | 6                         |            | 22   | 23   | 85%   | 88%  |
| Bulgaria  | 2009        | 11                            | 175                               | 12                        |            | 4  | 22   | 2%  | 12%  |
| Cyprus  | 2009        | 1                             | 104                               | 2                         | 11         | 0  | 0  | 0%  | 0%   |
| Czech Republic  | 2009        | 29                            | 157                               | 62                        |            | 4  | 4  | 2%  | 2%   |
| Danmark   | 2009        | 6                             | 52                                | 6                         |            | 14   | 27   | 24%   | 47%  |
| Estonia   | 2009        | 7                             | 6                                 |                           |            | 7  | 8  | 54%   | 62%  |
| Finland   | 2009        | 21                            | 83                                | 6                         |            | 48   | 51   | 46%   | 49%  |
| France  | 2009        | 14                            | 212                               | 475                       | 9          | 46   | 162  | 20%   | 72%  |
| Germany   | 2009        | 88                            | 2989                              | 1648                      | 7          | 102  | 232  | 3%  | 8%   |
| Greece  | 2009        | 2                             | 71                                |                           | 1          | 2  | 8  | 3%  | 11%  |
| Hungary   | 2009        | 16                            | 80                                | 11                        |            | 17   | 17   | 18%   | 18%  |
| Ireland   | 2009        | 0                             | 36                                | 6                         | 45         | 19   | 29   | 53%   | 81%  |
| Italy   | 2009        | 600                           | 606                               | 13                        |            | 87   | 108  | 7%  | 9%   |
| Latvia  | 2009        | 2                             | 10                                |                           | 20         | 1  | 1  | 8%  | 8%   |
| Lithuania   | 2009        |                               | 18                                | 3                         |            | 0  | 8  | 0%  | 44%  |
| Luxembourg  | 2009        |                               | 2                                 | 11                        |            | 1  | 2  | 50%   | 100%   |
| Netherlands   | 2009        |                               | 22                                |                           |            | 16   | 29   | 73%   | 132%   |
| Poland  | 2009        | 57                            | 760                               | 20                        |            | 49   | 81   | 6%  | 10%  |
| Portugal  | 2009        | 2                             | 58                                | 12                        |            | 26   | 41   | 43%   | 68%  |
| Romania   | 2009        | 7                             | 141                               | 1                         |            | 3  | 43   | 2%  | 29%  |
| Slovakia  | 2009        | 13                            | 106                               | 17                        |            | 11   | 16   | 9%  | 13%  |
| Slovenia  | 2009        | 2                             | 69                                | 12                        |            | 20   | 39   | 28%   | 55%  |
| Spain   | 2009        | 15                            | 229                               | 180                       |            | 51   | 134  | 21%   | 55%  |
| Sweden  | 2009        | 28                            | 96                                | 33                        |            | 50   | 66   | 40%   | 53%  |
| United Kingdom ***  | 2009        | 80                            | 308                               | 244                       |            | 70   | 251  | 18%   | 65%  |
| <b>Total</b>  | <b>2009</b> | <b>1005</b>                   | <b>6587</b>                       | <b>2793</b>               | <b>555</b> | <b>674</b>   | <b>1417</b>  | <b>9%</b>   | <b>19%</b>   |

\* Where necessary, until the end of the transitional period; specify the type of landfill  
\*\* Landfill directive only covers flemish region  
\*\*\* Numbers on number of landfills are received from DEFRA as data from the landfill directive questionnaire was outdated

However, the 105 missing cases do not seem to be able to change the general impression that too few landfills report. Table 132 shows that on average 55% of the landfills reporting to E-PRTR do not report waste transfers. The missing reporting can be explained by the fact that many facilities do not report leachate as waste transfer by mistake or that in some Member States permit conditions prescribe that leachate has to be reported as waste water. This explanation is supported by the distribution of reporting between countries. In six countries more than 80% of the landfills do not report waste transfers whereas in eight countries the figure is less than 20%.

**Table 132: Number of landfills reporting waste transfer to the E-PRTR in 2009, per country and stated in % of the total number of landfills reporting to the E-PRTR**

| Country        | Total       | Not reported waste transfer | Percentage not reporting waste transfer: (C/B)*100% |
|----------------|-------------|-----------------------------|---|
| A              | B           | C                           | D   |
| AUSTRIA        | 8           | 7                           | 88%   |
| BELGIUM        | 20          | 1                           | 5%  |
| BULGARIA       | 22          | 18                          | 82%   |
| CZECH REPUBLIC | 4           | 0                           | 0%  |
| DENMARK        | 8           | 6                           | 75%   |
| ESTONIA        | 8           | 1                           | 13%   |
| FINLAND        | 51          | 3                           | 6%  |
| FRANCE         | 162         | 116                         | 72%   |
| GERMANY        | 220         | 125                         | 57%   |
| GREECE         | 8           | 6                           | 75%   |
| HUNGARY        | 17          | 0                           | 0%  |
| ICELAND        | 2           | 2                           | 100%  |
| IRELAND        | 29          | 10                          | 34%   |
| ITALY          | 108         | 21                          | 19%   |
| LATVIA         | 1           | 0                           | 0%  |
| LITHUANIA      | 8           | 8                           | 100%  |
| LUXEMBOURG     | 2           | 1                           | 50%   |
| NETHERLANDS    | 29          | 13                          | 45%   |
| NORWAY         | 50          | 49                          | 98%   |
| POLAND         | 81          | 31                          | 38%   |
| PORTUGAL       | 41          | 15                          | 37%   |
| ROMANIA        | 43          | 40                          | 93%   |
| SLOVAKIA       | 16          | 5                           | 31%   |
| SLOVENIA       | 38          | 19                          | 50%   |
| SPAIN          | 134         | 83                          | 62%   |
| SWEDEN         | 66          | 16                          | 24%   |
| SWITZERLAND    | 1           | 0                           | 0%  |
| UNITED KINGDOM | 246         | 180                         | 73%   |
| <b>TOTAL</b>   | <b>1423</b> | <b>776</b>                  | <b>55%</b>  |

The number of landfills not reporting waste transfers has also been assessed on a regional level in each country by using the so called NUTS codes (Nomenclature of Territorial Units for Statistics). There are some percentage differences between the regions in each country. However, it is difficult to conclude that there is a more systematic difference between the regions in each country. If such

a difference existed this could indicate different interpretations within the countries of the reporting obligation of transfer of leachate.

Leachate is normally non-hazardous waste and another explanation for the missing reporting might be that the threshold for non-hazardous waste of 2,000 tonnes per year appears to cause problems in ensuring that appropriate levels of reporting for leachate are reported.

The amount of leachate depends on different parameters such as, e.g., the size of the landfill, the precipitation and the net precipitation<sup>68</sup>. A general rule-of-thumb is that approximately half of the net precipitation will be generated as leachate. If a non-hazardous landfill, e.g., has a size of one hectare and the net precipitation is, e.g., 200 millimetres per year, this implies a generation of 2,000 tonnes leachate. Since one hectare is not a very large landfill and although the precipitation conditions vary across Europe it should be expected that more landfills should report leachate to the E-PRTR, unless the leachate is treated inside the landfill.

Ad.3. In 2009, there was a total of 1,009 landfills reporting emissions to air to E-PRTR of which 985 were related to greenhouse gases. 186 landfills reported releases or transfers to water. The threshold values for air and releases to water appear to be too high if the number of landfills that reported to E-PRTR should be approximately in the same scale as the number that reported according to the Landfill Directive Questionnaire.

#### *Conclusions on landfills*

Altogether, it seems that a limited number of landfills report to E-PRTR compared with the number that report according to the Landfill Directive Questionnaire. This issue needs further investigation. More landfills are expected to report to E-PRTR in particular because of the generation of leachate. The missing reporting can either be explained by the fact that many facilities mistakenly do not report leachate as waste or that the reporting obligation for leachate is interpreted differently by the countries. Another explanation might be that the threshold value for non-hazardous waste of 2,000 tonnes per year does not allow for reporting of 90% of waste transfers.

#### *Incineration plants (E-PRTR activity 5b)*

The comparison does not include all countries because CEWEP can only provide information for 16 countries. CEWEP provides information about the number of dedicated incineration plants for municipal waste and the number of Refused Derived Fuels (RDF) Plants in each country and about the number of plants belonging to the national branch of CEWEP. Dedicated incineration plants are assessed to be comparable with E-PRTR activity 5.(b). Activity 5.(b) covers plants with a capacity of three tonnes per hour equivalent to approximately 25,000 tonnes per year. Refused Derived Plants are normally not registered as dedicated incineration plans but as, e.g., E-PRTR activity 1.(c) (Thermal power stations and other combustion activities) or activity 3.(c) (Cement kilns).

Table 133 shows the number of incineration facilities according to E-PRTR reporting compared with number of the dedicated incineration plants according to CEWEP's 2010-country report on waste management. The CEWEP numbers typically cover the years 2008 and 2009. The number of Refused Derived Fuels Plants are also provided but not compared with E-PRTR activity 5.(b). The comparison shows that for Belgium, Denmark, Italy, Norway and Sweden there is a major negative difference when the E-PRTR numbers are compared with the CEWEP numbers. For Germany, the number of E-PRTR facilities belonging to activity 5.(b) is larger than the number reported by CEWEP.

The large negative discrepancy for certain countries might be explained in the following ways:

1. The CEWEB number includes minor dedicated incineration plants with a capacity lower than 25,000 tonnes per year. That could indicate that the capacity threshold for incinerators according to the E-PRTR Regulation for activity 5.(b) is too high.

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<sup>68</sup> Christensen, Thomas H.: Waste technology (Affaldsteknologi), 1998.

2. The threshold values for waste transfers according to the E-PRTR Regulation (Article 5, 1.(b)) is too high.
3. The E-PRTR reporting has the concerned dedicated incinerators included in its reporting but the facilities are not registered under E-PRTR activity 5.(b) but under another E-PRTR activity.
4. The E-PRTR reporting does not include all dedicated incinerators for non-hazardous waste with a capacity larger than 25,000 tonnes.

Ad.1. At the present time, it is rare to encounter small incinerators operating with a capacity of only 25,000 tonnes. Such a low capacity makes it very costly from an economic point of view to operate the plant. Almost all new plants have a capacity of at least 100,000 tonnes. It is therefore concluded that it is not likely that the capacity threshold should be the main reason for the missing E-PRTR reporting.

Ad.2. The threshold values for the transfer of waste are too high (2 tonnes for hazardous waste and 2,000 tonnes for non-hazardous waste respectively).

All incineration plants generate hazardous waste from flue gas cleaning. Taking into account that this waste fraction amounts to approximately 1 % to 5 % of the original waste mass, the reporting threshold for E-PRTR (2 tonnes hazardous waste) would be reached for a waste incineration plant with an annual load between 40 and 200 tonnes (at 5 % and 1 % respectively). Therefore it could be assumed that all waste incineration plants under activity code 5 (b) should report hazardous waste unless there is a hazardous waste disposal site at the site of the facility. The informal EEA review for 2011 covering the reporting for year 2009 has indicated that nine plants in 2011 which reported non-hazardous waste did not report hazardous waste transfer. However, this is more an indication of missing reporting than that the threshold value for hazardous waste is too low.

For non-hazardous waste the residual waste fraction after incineration will normally amount to 25 - 30% of the original waste mass. The threshold value for non-hazardous waste (2,000 tonnes) would be reached for a waste incineration plant with an annual load between 6,600 and 8,000 tonnes (at 30% and 25% respectively). Therefore it could be assumed that incineration plants under activity 5.(b) should report non-hazardous waste unless there is a non-hazardous waste disposal site at the site of the facility. The reporting for 2011 covering the year 2009 has indicated that 58 plants did not report non-hazardous waste transfers.

It does not seem that the threshold values for activity 5.(b) are the decisive reason for the missing reporting of incineration plants. It seems more likely that plants have their own disposal sites and therefore do not have to report.

Ad. 3. It appears that some dedicated incinerators are registered under another E-PRTR activity than 5.(b). For example, Denmark has not reported the incineration plant in the city of Odense under activity 5(b) but it seems that it has been reported under 1(c). The incineration plant has three lines and is a part of the power plant Odense Kraftvarmeværk (Vattenfall A/S), which has reported to the E-PRTR under activity 1(c) (Thermal power stations and other combustions activities) because this is the company's main activity. It is not possible to how many of these cases exist as this assessment would require detailed knowledge of each reporting facility.

Ad.4. A possible explanation could be that certain dedicated incinerators are simply not reporting even though the facilities in fact should have an obligation to report to E-PRTR. It is not possible to quantify the extent of this possibility.

#### *Conclusions on incineration plants for non-hazardous waste*

It is concluded that not all incineration plants for non-hazardous waste report to E-PRTR. The reason does not seem to be due to the capacity threshold value of 25,000 tonnes or the thresholds of 2 tonnes transferred hazardous waste and 2,000 tonnes non-hazardous waste, but rather due to the fact that the hazardous waste and the non-hazardous waste have to be transferred from the incineration plant to be covered by E-PRTR and not just be generated. Some incineration plants seem to have their own disposal facilities for the generated waste. Furthermore, there is some indi-

cation that some dedicated incineration plants for non-hazardous waste report under another E-PRTR activity than 5.(b) or they do not report despite their reporting obligation.

**Table 133: Number of incinerations plants for non-hazardous waste according to E-PRTR and municipal waste according to CEWEP**

| Country        | Number of 5 (b) facilities (E-PRTR) | Number of dedicated incineration facilities according to CEWEP | Number of Re-fused Derived Fuel Plants according to CEWEP | Reported number of facilities to the E-PRTR in % of number of dedicated incinerations according to CEWEP |
|----------------|-------------------------------------|--|---|--|
| Austria        | 10                                  | 8  |   | 88   |
| Belgium        | 15                                  | 16   | 1   | 63   |
| Czech Republic | 2                                   | 3  |   | 67   |
| Denmark        | 20                                  | 29   |   | 59   |
| Finland        | 2                                   | 3  | 25  | 67   |
| France         | 134                                 | 129  |   | 103  |
| Germany        | 91                                  | 69   | 34  | 130  |
| Hungary        | 1                                   | 1  | 4   | 100  |
| Ireland        |                                     |  | 1   |  |
| Italy          | 27                                  | 49   | 8   | 55   |
| Netherlands    | 12                                  | 11   | 6   | 109  |
| Norway         | 13                                  | 20   | 2   | 55   |
| Portugal       | 3                                   | 3  |   | 67   |
| Spain          | 9                                   | 10   |   | 80   |
| Sweden         | 15                                  | 30   |   | 50   |
| Switzerland    | 30                                  | 29   | 1   | 103  |
| Total          | 384                                 | 410  | 82  | 90   |

## 7) Assessment of power stations with a special focus on coal-fired power plants

One sector with large differences between the amounts reported to the E-PRTR and to Eurostat is the electricity, gas and water supply sector (NACE code 35). For hazardous waste, the 2008 generation in the EU was 6.7 million tonnes according to Eurostat and 1.4 million according to E-PRTR. This is equivalent to an E-PRTR coverage of 21%. For non-hazardous waste the amounts were 84 million tonnes according to Eurostat and 54 million tonnes according to E-PRTR. This is equivalent to a coverage of 64%. It is therefore relevant to see whether it is possible to verify and explain why these large differences occur.

It is assumed that from NACE code 35 the coal- and brown coal (lignite) fired power stations generate the largest amounts of waste residues including flue gas cleaning products. However, when looking at the facilities reporting to E-PRTR with NACE code 35 it can be seen from Table 134 and Table 135 that many different E-PRTR activity codes are linked to NACE code 35.

**Table 134: Overview of how facilities reporting hazardous waste under an E-PRTR activity are linked to NACE code 35 (2008).**

| NACE code   | E-PRTR Code | Tonnes           | % of Total     |
|---|-------------|------------------|----------------|
| 35  | 1.(a)       | 15,391           | 1.06%          |
| 35  | 1.(b)       | 2,284            | 0.16%          |
| 35  | 1.(c)       | 820,245          | 56.64%         |
| 35  | 2.(f)       | 1,898            | 0.13%          |
| 35  | 3.(a)       | 29               | 0.00%          |
| 35  | 4.(a)       | 20               | 0.00%          |
| 35  | 4.(b)       | 21               | 0.00%          |
| 35  | 5.(a)       | 239,703          | 16.55%         |
| 35  | 5.(b)       | 333,159          | 23.01%         |
| 35  | 5.(c)       | 1,014            | 0.07%          |
| 35  | 5.(d)       | 32,945           | 2.28%          |
| 35  | 5.(e)       | 833              | 0.06%          |
| 35  | 6.(a)       | 515              | 0.04%          |
| 35  | 5.(g)       | 3.12             | 0.00%          |
| 35  | 8.(b)       | 20               | 0.00%          |
| <b>Total NACE 35</b>                              |             | <b>1,448,081</b> | <b>100.00%</b> |
| <b>EU-15 excl. Luxembourg and Sweden. NACE 35</b> |             | <b>1,136,066</b> | <b>78%</b>     |

**Table 135: Overview of how facilities reporting non-hazardous waste under an E-PRTR activity are linked to NACE code 35 (2008).**

| NACE code   | E-PRTR Code | Tonnes            | % of Total     |
|---|-------------|-------------------|----------------|
| 35  | 1.(a)       | 4,125             | 0.01%          |
| 35  | 1.(c)       | 51,901,120        | 95.54%         |
| 35  | 5.(a)       | 646,424           | 1.19%          |
| 35  | 5.(b)       | 1,425,366         | 2.62%          |
| 35  | 5.(c)       | 26,080            | 0.05%          |
| 35  | 5.(d)       | 259,100           | 0.48%          |
| 35  | 5.(e)       | 44,300            | 0.08%          |
| 35  | 5.(f)       | 2,370             | 0.00%          |
| 35  | 6.(a)       | 13,530            | 0.02%          |
| <b>Total NACE 35</b>                              |             | <b>54,322,416</b> | <b>100.00%</b> |
| <b>EU-15 excl. Luxembourg and Sweden. NACE 35</b> |             | <b>29,749,198</b> | <b>55%</b>     |

In particular for hazardous waste there is a large number of E-PRTR activities that are linked to NACE code 35 whereas for non-hazardous waste E-PRTR-activity 1(c) dominates.

A request was sent to ECOBA (European Coal Combustion Products Association) to provide access to ECOBA's country data regarding ashes and slag from coal fired power plants. However, due to confidentiality it was only possible to get information at an aggregated level. In 2008, the generation of non-hazardous waste from coal-fired power plants was approximately 56.4 million in the EU-15 excluding Luxembourg and Sweden. There is no specific data for the new EU Member States and Norway, but all together ECOBA estimates that about 100 million tonnes of coal combustion waste is generated in the EU per year.

Facilities from the EU-15 excluding Luxembourg and Sweden belonging to NACE code 35 reported the transfer of 29.7 million tonnes of non-hazardous waste to E-PRTR in 2008. This amount also covers waste transfers from non-coal-fired power-plants belonging to NACE code 35. This comparison indicates that the E-PRTR reporting covers a maximum of 53% (29.7/56.4) of what is reported to ECOBA covering the EU-15 (excluding Luxembourg and Sweden). Looking directly at the EU-27, the coverage reaches a maximum of 54% (54.3/100).

The comparison of the E-PRTR data with the Eurostat figures and ECOBA's figures indicates that the very high coverage found for E-PRTR activity 1.(c) by using the Weibull function is possibly not as reliable as assumed. This could be explained by the capacity criteria for 1.(c) (heat input of 50 megawatts) being too high or by the waste threshold of 2 tonnes hazardous waste and 2,000 tonnes non-hazardous waste being too high.

Section 5 of this Appendix showed that for E-PRTR activity 1.(c) only about one third of the plants reported non-hazardous waste whereas two thirds of the plants reported hazardous waste. This could indicate that the threshold values do not allow reporting of 90% of waste transfers.

One important explanation for the low number of facilities under activity 1.(c) reporting waste could be that the power stations do not always transfer waste from their plants but rather have their own disposal facilities. These plants therefore do not have an obligation to report to E-PRTR. However, it is not possible to say whether this can explain missing amounts in the reporting to E-PRTR.

Conclusions on power stations with a special focus on coal-fired power plants

It seems that the E-PRTR reporting for power stations and especially for coal-fired power stations is not as reliable as indicated by the use of the Weibull function in section 5 of this Appendix. It also appears that the threshold values especially on non-hazardous waste do not allow reporting of 90% of transfers or that many plants have their own disposal sites and therefore do not have to report to the E-PRTR.

## **8) Recovery and disposal**

Table 136 and Table 137 show the development in recovery in percentage for all E-PRTR activities related to hazardous waste and non-hazardous waste, to intervals and to the number of countries included for the period 2007 to 2009. For hazardous waste the information includes both waste transferred inside the country and outside the country.

### Non-hazardous waste

The total increase in non-hazardous waste going to recovery is only 2 % from 2007 to 2009, cf. Table 136. When comparing all of the activities, in 149 cases the countries had an increase below 10 %, and in 120 cases the countries had a decrease below 10 %, while in 100 and 58 cases an increase of 10-30 %-points and >30 %-points, respectively, was found. In 120 cases a small decrease of less than 10 % was calculated while in 65 cases there was a decrease between 10-30 % and in 43 cases a decrease of more than 30 %. This indicates that in most countries the share of waste going to recovery has not changed significantly from 2007 to 2009.

If the development in each interval covers a large portion of the total reporting of the country this has been indicated, as shown in Table 136. The normal coverage is between 20% and 50% and in these cases more than three countries normally reported a change. This indicates that only in a few cases are the overall increases or decreases biased by the reporting from one or two countries.

The countries that have a large change in the share of recovery are very diverse. There does not seem to be any trend on whether it is smaller or larger countries which are showing the largest changes, although some smaller countries have changes above 30 due to a lack of reporting in 2007.



The sectors with the largest changes above 30 % are 1 (d) "Coke ovens" with 45 % and 9 (a) "Plants for the pre-treatment (operations such as washing, bleaching, mercerisation) or dyeing of fibres or textiles" with -30 %.

#### Hazardous waste

In total, most countries did not show any large differences in the share of hazardous waste going to recovery. This is also reflected by the fact that the total change in waste going to recovery is 5 %.

In general, the changes in the share of waste going to recovery, when comparing all activities, show that in most cases (135 cases) there was a small increase in the share in the period from 2007 to 2009 while in 117 and 123 cases there was an increase of 10-30 % and larger than 30 %, respectively. In 123 cases there was a small decrease in countries of less than 10 % while in 98 cases there was a decrease between 10-30 % and in 89 cases larger than 30 %.

The sectors with the largest changes above 30 % are 3.(c) "Installations for the processing of ferrous metals" with -39 %; 5.(f) "Urban waste-water treatment plants" with 52 %; 8.(b) "Treatment and processing intended for the production of food and beverage products" with -31 % and 8.(c) "Treatment and processing of milk" with 55 %. Activity 7.(b) "Intensive aquaculture" does not have enough data to evaluate the changes from 2007 to 2009 indicating that the facilities in the countries are do not transfer enough waste to reach the threshold for E-PRTR reporting. The same applies to activity 1.(f) "Installations for the manufacture of coal products and solid smokeless fuel" although to a slightly lesser extent.

#### General conclusions on disposal and recovery

It is not possible to compare the E-PRTR data with other official data on the recovery and disposal of hazardous and non-hazardous waste. It is therefore not possible to draw any conclusion on the quality of the E-PRTR data. However, based on the assessment of the development of the E-PRTR data from 2007 to 2009 it generally seems that only minor changes between disposal and recovery took place. For hazardous waste, the amount sent to recovery compared with the amount sent to disposal increased by 5% from 2007 to 2009. For non-hazardous waste the share of recovery increased but only by 2% in the same period.

However, the generally low changes at the E-PRTR level cover some quite diverse trends at the country level with some countries that reported an increase in recovery for a certain E-PRTR activity while others reported a decrease.

Based on this it must be concluded that it is very difficult to make more precise statements on the quality of the E-PRTR data regarding the treatment of the waste.




**Table 136: Number of countries with a certain change in recovery in percentage points from 2007 to 2009 shown per activity for non-hazardous waste**

| Activity code | Increase   |            |           | No change | Decrease   |           |           | Total      |
|---------------|------------|------------|-----------|-----------|------------|-----------|-----------|------------|
|               | < 10%      | 10% - 30%  | > 30%     | 0%        | < 10%      | 10% - 30% | > 30%     |            |
| 1.(a)         | 2          | 3          | 4         | 2         | 1          | 6         | 1         | 19         |
| 1.(b)         | 0          | 0          | 0         | 0         | 1          | 0         | 0         | 1          |
| 1.(c)         | 4          | 5          | 1         | 0         | 6          | 4         | 2         | 22         |
| 1.(d)         | 0          | 1          | 1         | 0         | 0          | 0         | 0         | 2          |
| 1.(e)         | 0          | 0          | 0         | 0         | 0          | 0         | 0         | 0          |
| 1.(f)         | 0          | 0          | 0         | 0         | 1          | 0         | 0         | 1          |
| 2.(a)         | 2          | 1          | 1         | 1         | 0          | 0         | 1         | 6          |
| 2.(b)         | 7          | 6          | 2         | 1         | 3          | 1         | 1         | 21         |
| 2.(c)         | 7          | 2          | 0         | 0         | 5          | 1         | 0         | 15         |
| 2.(d)         | 6          | 7          | 4         | 0         | 3          | 0         | 0         | 20         |
| 2.(e)         | 7          | 2          | 2         | 1         | 4          | 2         | 5         | 23         |
| 2.(f)         | 4          | 5          | 0         | 0         | 5          | 4         | 0         | 18         |
| 3.(a)         | 1          | 3          | 2         | 0         | 3          | 1         | 0         | 10         |
| 3.(b)         | 1          | 0          | 2         | 2         | 4          | 0         | 0         | 9          |
| 3.(c)         | 2          | 2          | 4         | 0         | 3          | 2         | 1         | 14         |
| 3.(e)         | 6          | 1          | 2         | 0         | 6          | 1         | 3         | 19         |
| 3.(f)         | 3          | 2          | 2         | 1         | 6          | 0         | 1         | 15         |
| 3.(g)         | 5          | 1          | 1         | 0         | 3          | 3         | 1         | 14         |
| 4.(a)         | 3          | 5          | 2         | 0         | 5          | 2         | 1         | 18         |
| 4.(b)         | 3          | 2          | 4         | 1         | 1          | 2         | 1         | 14         |
| 4.(c)         | 2          | 2          | 0         | 2         | 2          | 0         | 0         | 8          |
| 4.(d)         | 0          | 0          | 0         | 0         | 3          | 1         | 1         | 5          |
| 4.(e)         | 6          | 1          | 2         | 0         | 0          | 5         | 2         | 16         |
| 4.(f)         | 1          | 0          | 0         | 1         | 0          | 0         | 0         | 2          |
| 5.(a)         | 6          | 6          | 0         | 1         | 3          | 3         | 1         | 20         |
| 5.(b)         | 6          | 4          | 1         | 1         | 3          | 0         | 2         | 17         |
| 5.(c)         | 4          | 3          | 0         | 1         | 2          | 2         | 1         | 13         |
| 5.(d)         | 3          | 3          | 1         | 3         | 4          | 3         | 1         | 18         |
| 5.(e)         | 4          | 1          | 2         | 4         | 3          | 2         | 3         | 19         |
| 5.(f)         | 5          | 6          | 3         | 1         | 6          | 0         | 3         | 24         |
| 5.(g)         | 2          | 0          | 0         | 1         | 2          | 1         | 1         | 7          |
| 6.(a)         | 6          | 3          | 1         | 0         | 3          | 1         | 0         | 14         |
| 6.(b)         | 6          | 6          | 2         | 0         | 6          | 4         | 0         | 24         |
| 6.(c)         | 1          | 0          | 0         | 1         | 2          | 1         | 0         | 5          |
| 7.(a)         | 3          | 3          | 2         | 2         | 1          | 1         | 1         | 13         |
| 7.(b)         | 0          | 0          | 0         | 0         | 0          | 0         | 0         | 0          |
| 8.(a)         | 3          | 4          | 3         | 0         | 5          | 5         | 1         | 21         |
| 8.(b)         | 7          | 3          | 2         | 1         | 5          | 2         | 2         | 22         |
| 8.(c)         | 3          | 4          | 2         | 0         | 4          | 2         | 0         | 15         |
| 9.(a)         | 1          | 0          | 1         | 1         | 2          | 1         | 1         | 7          |
| 9.(b)         | 2          | 0          | 0         | 1         | 0          | 0         | 1         | 4          |
| 9.(c)         | 8          | 3          | 0         | 1         | 5          | 3         | 1         | 21         |
| 9.(d)         | 1          | 0          | 0         | 0         | 0          | 1         | 0         | 2          |
| 9.(e)         | 3          | 2          | 1         | 0         | 1          | 2         | 1         | 10         |
| <b>Total</b>  | <b>146</b> | <b>102</b> | <b>57</b> | <b>31</b> | <b>122</b> | <b>69</b> | <b>41</b> | <b>568</b> |

Covers more than **80%** of total  
 Covers more than **50%** of total  
 Covers more than **20%** of total

**Table 137: Number of countries with a certain change in recovery in percentage points from 2007 to 2009 shown per activity for hazardous waste**

| Activity code | Increase   |            |            | No change | Decrease   |            |           | Total      |
|---------------|------------|------------|------------|-----------|------------|------------|-----------|------------|
|               | < 10%      | 10% - 30%  | > 30%      | 0%        | < 10%      | 10% - 30%  | > 30%     |            |
| 1.(a)         | 6          | 9          | 2          | 1         | 4          | 2          | 0         | 24         |
| 1.(b)         | 0          | 0          | 0          | 0         | 2          | 1          | 0         | 3          |
| 1.(c)         | 3          | 5          | 3          | 2         | 8          | 3          | 3         | 27         |
| 1.(d)         | 3          | 2          | 1          | 0         | 2          | 0          | 0         | 8          |
| 1.(e)         | 1          | 0          | 1          | 0         | 0          | 0          | 0         | 2          |
| 1.(f)         | 0          | 0          | 1          | 0         | 0          | 0          | 0         | 1          |
| 2.(a)         | 1          | 3          | 0          | 1         | 1          | 0          | 0         | 6          |
| 2.(b)         | 5          | 2          | 5          | 1         | 4          | 6          | 0         | 23         |
| 2.(c)         | 4          | 6          | 5          | 1         | 2          | 4          | 2         | 24         |
| 2.(d)         | 3          | 3          | 6          | 0         | 4          | 1          | 3         | 20         |
| 2.(e)         | 4          | 5          | 7          | 1         | 3          | 4          | 3         | 27         |
| 2.(f)         | 6          | 3          | 1          | 1         | 6          | 7          | 1         | 25         |
| 3.(a)         | 4          | 3          | 1          | 0         | 1          | 2          | 4         | 15         |
| 3.(b)         | 3          | 3          | 2          | 3         | 1          | 6          | 2         | 20         |
| 3.(c)         | 1          | 5          | 6          | 1         | 4          | 3          | 5         | 25         |
| 3.(e)         | 3          | 7          | 2          | 2         | 6          | 4          | 1         | 25         |
| 3.(f)         | 3          | 1          | 4          | 2         | 2          | 0          | 3         | 15         |
| 3.(g)         | 7          | 4          | 1          | 2         | 2          | 2          | 4         | 22         |
| 4.(a)         | 5          | 4          | 4          | 1         | 6          | 4          | 1         | 25         |
| 4.(b)         | 5          | 4          | 1          | 0         | 4          | 3          | 4         | 21         |
| 4.(c)         | 6          | 2          | 2          | 2         | 0          | 4          | 2         | 18         |
| 4.(d)         | 2          | 3          | 2          | 2         | 1          | 3          | 1         | 14         |
| 4.(e)         | 8          | 5          | 3          | 1         | 3          | 3          | 1         | 24         |
| 4.(f)         | 1          | 0          | 2          | 3         | 3          | 4          | 1         | 14         |
| 5.(a)         | 5          | 4          | 1          | 2         | 9          | 2          | 3         | 26         |
| 5.(b)         | 6          | 2          | 3          | 2         | 2          | 2          | 0         | 17         |
| 5.(c)         | 3          | 5          | 3          | 1         | 1          | 2          | 1         | 16         |
| 5.(d)         | 2          | 1          | 5          | 3         | 7          | 3          | 3         | 24         |
| 5.(e)         | 1          | 2          | 4          | 3         | 4          | 1          | 1         | 16         |
| 5.(f)         | 3          | 1          | 6          | 1         | 3          | 0          | 2         | 16         |
| 5.(g)         | 1          | 2          | 1          | 2         | 1          | 0          | 1         | 8          |
| 6.(a)         | 2          | 4          | 1          | 0         | 5          | 1          | 2         | 15         |
| 6.(b)         | 4          | 3          | 5          | 0         | 2          | 7          | 3         | 24         |
| 6.(c)         | 0          | 2          | 1          | 1         | 3          | 0          | 2         | 9          |
| 7.(a)         | 0          | 1          | 2          | 1         | 3          | 2          | 4         | 13         |
| 7.(b)         | 0          | 0          | 0          | 0         | 0          | 0          | 0         | 0          |
| 8.(a)         | 3          | 1          | 3          | 1         | 3          | 3          | 4         | 18         |
| 8.(b)         | 2          | 4          | 4          | 0         | 3          | 4          | 5         | 22         |
| 8.(c)         | 9          | 2          | 5          | 1         | 1          | 2          | 2         | 22         |
| 9.(a)         | 2          | 1          | 3          | 0         | 4          | 0          | 4         | 14         |
| 9.(b)         | 0          | 0          | 2          | 2         | 0          | 1          | 0         | 5          |
| 9.(c)         | 2          | 4          | 5          | 1         | 5          | 4          | 2         | 23         |
| 9.(d)         | 1          | 0          | 2          | 2         | 2          | 0          | 2         | 9          |
| 9.(e)         | 4          | 3          | 1          | 0         | 1          | 2          | 2         | 13         |
| <b>Total</b>  | <b>134</b> | <b>121</b> | <b>119</b> | <b>50</b> | <b>128</b> | <b>102</b> | <b>84</b> | <b>738</b> |

 Covers more than 80% of total  
 Covers more than 50% of total  
 Covers more than 20% of total

## 9) Evaluation of waste transfers related to transfers inside a country and transboundary shipments

The E-PRTR reporting can be compared with the transboundary shipments of waste reported to the EU Commission according to the EU Waste Shipment Regulation. It has to be underlined that the reporting according to the EU Waste Shipment Regulation includes both hazardous waste and other wastes (non-hazardous) which have to be notified before shipment according to either the Basel Convention or additional requirements according to the EU Waste Shipment Regulation. The comparison includes notified hazardous waste because only hazardous waste has to be reported according to E-PRTR. Furthermore, the comparison includes only EU Member States because these countries are the only ones which have to report to the European Commission.

When the data work for this report was finalised in August 2011, France and Malta had not reported 2007 data to the Commission according to the Waste Shipment Regulation. Cyprus and France had not reported 2008 data, while Cyprus, Greece and France had neither reported for 2009.

### Results of comparison of transboundary shipment of waste data

A general rule is that the sum of hazardous waste transferred outside the country according to the E-PRTR cannot be higher than the amount reported under the transboundary shipment of waste regulation. This is not possible since under the E-PRTR Regulation only industrial sources report waste and waste transfers are reported only if they exceed a certain threshold (2 tonnes per year). Therefore, the waste reported under E-PRTR is by definition less than the waste reported in the transboundary shipment database.

Table 138 and Table 139 show that five countries (Bulgaria, Denmark, Latvia, Portugal and Slovakia) reported higher amounts of hazardous waste to E-PRTR than according to the Waste Shipment Regulation in 2007. In 2008, the number of countries with a higher reporting to the E-PRTR was also five (Bulgaria, Latvia, Luxembourg, Portugal and Slovakia). In 2009, the preliminary assessment indicates that three countries (Bulgaria, Slovakia and Slovenia) reported larger amounts. These 14 cases therefore indicate a reporting inconsistency. Any possible reporting error is not necessarily located in the E-PRTR reporting, but could possibly be under the transboundary shipment reporting.

Table 138 and Table 139 also show that some countries have reported extremely low amounts of transboundary shipped waste compared to the reporting according to the Waste Shipment Regulation. Four countries had an E-PRTR coverage of less than 10% in 2007 (Cyprus, Finland, Hungary and Romania). In 2008, four countries had very low coverage (Cyprus, Finland, Greece and Hungary) and in 2009 three countries had a low coverage (Finland, Hungary and Romania). In principle, such a low coverage is possible but it indicates that there might be incomplete reporting to E-PRTR.

Looking at the countries reporting less than 50% of the amount of hazardous waste transboundary shipped to E-PRTR compared with the reporting to the Waste Shipment Regulation, 16 countries reported less than 50% in 2007, twelve countries did so in 2008 and nine countries in 2009.

### Conclusions on transboundary shipments of waste

Although it seems that the E-PRTR coverage has increased from 2007 to 2009 the comparison indicates that too many countries have a too low coverage compared with the amounts reported according to the Waste Shipment Regulation. When the number of countries with a too high coverage and countries in which a comparison has not been possible are taken into account it seems that the quality of the E-PRTR reporting is not very high and could be improved.

The reasons for this low quality are not clear. However, some explanations for the lower amounts reported to E-PRTR could be:

- Many facilities generate less than 2 tonnes hazardous waste per year and are therefore not included in E-PRTR.
- Many facilities generating more than 2 tonnes of hazardous waste deliver it to a collector. The facilities are therefore not always aware of the fact that the hazardous waste is transboundary shipped. Since collectors are not included in the E-PRTR reporting this type of hazardous waste trans-

boundary shipped will not be reported to E-EPTR although it is reported according to the Waste Shipment Regulation.

- In the same way, if the generator of the hazardous waste uses a dealer or a broker to arrange the transboundary shipment there might be a risk that the amounts shipped abroad are not reported to E-PRTR.

**Table 138: Comparison of transboundary shipments of hazardous waste reported according to E-PRTR and according to the EU Waste Shipment Regulation in the years 2007, 2008 and 2009 [tonnes/y].**

| Country        | Absolute values in tonnes |                                   |                  |                                   |                  |                                   |
|----------------|---------------------------|-----------------------------------|------------------|-----------------------------------|------------------|-----------------------------------|
|                | 2007                      |                                   | 2008             |                                   | 2009             |                                   |
|                | E-PRTR                    | Transboundary Shipment Regulation | E-PRTR           | Transboundary Shipment Regulation | E-PRTR           | Transboundary Shipment Regulation |
| Austria        | 161,071                   | 284,941                           | 181,049          | 339,305                           | 127,183          | 346,550                           |
| Belgium        | 333,541                   | 1,029,282                         | 264,671          | 862,020                           | 278,135          | 672,596                           |
| Bulgaria       | 1,208                     | 293                               | 3,870            | 908                               | 1,975            | 395                               |
| Cyprus         | 27                        | 4,075                             |                  | 0                                 | 0                | 0                                 |
| Czech Republic | 421                       | 3,542                             | 1,158            | 5,937                             | 6,367            | 7,286                             |
| Denmark        | 103,765                   | 78,251                            | 79,146           | 125,824                           | 73,599           | 101,816                           |
| Estonia        | 907                       | 2,663                             | 601              | 714                               | 878              | 4,664                             |
| Finland        |                           | 74,201                            |                  | 113,545                           | 31,530           | 106,971                           |
| France         | 261,745                   | 0                                 | 254,115          | 0                                 | 184,331          | 0                                 |
| Germany        | 150,112                   | 234,576                           | 151,080          | 244,796                           | 132,087          | 163,259                           |
| Greece         | 2,451                     | 8,423                             | 461              | 25,381                            | 4,614            | 0                                 |
| Hungary        | 6,235                     | 72,170                            | 673              | 76,633                            | 685              | 69,257                            |
| Iceland        | 218                       | 0                                 | 3,320            | 0                                 | 5,170            | 0                                 |
| Ireland        | 264,178                   | 320,115                           | 452,146          | 576,218                           | 152,199          | 190,860                           |
| Italy          | 441,343                   | 1,038,676                         | 659,387          | 1,130,115                         | 744,771          | 1,247,975                         |
| Latvia         | 11,340                    | 7,178                             | 5,410            | 2,316                             | 1,890            | 10,895                            |
| Lithuania      | 2,238                     | 4,064                             | 2,881            | 6,466                             | 9,393            | 17,258                            |
| Luxembourg     | 7,607                     | 72,686                            | 46,502           | 44,296                            | 27,541           | 114,067                           |
| Malta          | 642                       | 0                                 | 916              | 1,966                             | 987              | 1,853                             |
| Netherlands    | 346,776                   | 3,120,561                         | 410,611          | 3,030,893                         | 413,412          | 2,767,458                         |
| Norway         |                           | 0                                 | 34,745           | 0                                 | 94,445           | 0                                 |
| Poland         | 10,644                    | 66,423                            | 12,299           | 12,961                            | 17,496           | 25,589                            |
| Portugal       | 85,269                    | 7,520                             | 174,559          | 6,363                             | 43,830           | 61,365                            |
| Romania        | 60                        | 37,220                            | 301              | 2,361                             | 78               | 23,431                            |
| Slovakia       | 5,626                     | 2,192                             | 5,080            | 3,428                             | 4,815            | 2,979                             |
| Slovenia       | 21,874                    | 42,710                            | 27,934           | 35,244                            | 41,308           | 27,968                            |
| Spain          | 31,722                    | 60,179                            | 12,175           | 52,135                            | 10,775           | 53,999                            |
| Sweden         | 85,826                    | 175,953                           | 94,032           | 255,592                           | 122,074          | 183,605                           |
| Switzerland    | 46,314                    | 0                                 | 91,242           | 0                                 | 167,349          | 0                                 |
| United Kingdom | 77,019                    | 149,297                           | 103,800          | 171,408                           | 0                | 164,214                           |
| <b>Total</b>   | <b>2,401,226</b>          | <b>7,612,050</b>                  | <b>3,065,745</b> | <b>7,725,993</b>                  | <b>2,698,917</b> | <b>5,461,724</b>                  |

**Table 139: E-PRTR reporting of transboundary shipments of hazardous waste as coverage of the amounts reported according to the EU Waste Shipment Regulation in the years 2007, 2008 and 2009. Stated in %.**

| Country        | 2007              | 2008       | 2009       |
|----------------|-------------------|------------|------------|
| Austria        | 57%               | 53%        | 37%        |
| Belgium        | 32%               | 31%        | 41%        |
| Bulgaria       | 412%              | 426%       | 500%       |
| Cyprus         | 1%                | No TS data | No TS data |
| Czech Republic | 12%               | 19%        | 87%        |
| Denmark        | 133%              | 63%        | 72%        |
| Estonia        | 34%               | 84%        | 19%        |
| Finland        | 0%                | 0%         | 29%        |
| France         | No TS data        | No TS data | No TS data |
| Germany        | 64%               | 62%        | 81%        |
| Greece         | 29%               | 2%         | No TS data |
| Hungary        | 9%                | 1%         | 1%         |
| Iceland        | No TS data        | No TS data | No TS data |
| Ireland        | 83%               | 78%        | 80%        |
| Italy          | 42%               | 58%        | 60%        |
| Latvia         | 158%              | 234%       | 17%        |
| Lithuania      | 55%               | 45%        | 54%        |
| Luxembourg     | 10%               | 105%       | 24%        |
| Malta          | No TS data        | 47%        | 53%        |
| Netherlands    | 11%               | 14%        | 15%        |
| Norway         | No TS data        | No TS data | No TS data |
| Poland         | 16%               | 95%        | 68%        |
| Portugal       | 1,134%            | 2743%      | 71%        |
| Romania        | 0%                | 13%        | 0%         |
| Slovakia       | 257%              | 148%       | 162%       |
| Slovenia       | 51%               | 79%        | 148%       |
| Spain          | 53%               | 23%        | 20%        |
| Sweden         | 49%               | 37%        | 66%        |
| Switzerland    | No TS data        | No TS data | No TS data |
| United Kingdom | 52%               | 61%        | 0%         |
| <b>Total</b>   | <b>32%</b>        | <b>40%</b> | <b>49%</b> |
|                | Value above 100 % |            |            |
|                | Value below 10 %  |            |            |

## 10) General conclusions on waste

### Comparison of NACE code activities

By using the NACE code information from the reporting facilities it has been possible to compare the E-PRTR reporting with other official data from Eurostat regarding the generation of waste/transfer of waste for 2008 although the E-PRTR activities do not normally include all activities covered by the Eurostat data. The comparison has been undertaken for the generation/transfer of waste, waste amount per number of employee and per gross value added.

#### *Waste generation*

Taking into account all of the 16 economic sectors, the total amount of hazardous waste reported to E-PRTR covers 39% of the amount reported to Eurostat. The percentage for non-hazardous waste is 17%. However, there are large differences between the different economic sectors, which are shown in Table 118 to Table 122. The main conclusions are:

- For all sectors the E-PRTR coverage is higher for hazardous waste than for non-hazardous waste
- The agriculture, hunting and forestry sectors; the fishing sector and the mining and quarrying sectors all have very low reported amounts for hazardous and non-hazardous waste according to the E-PRTR compared with the Eurostat values. The values are under 8.1% of the reported values to Eurostat.
- For hazardous waste it seems that especially “Manufacture of wood and wood products” has a low coverage with E-PRTR coverage less than 20%, whereas six sectors have coverage of 20% to 60%.
- For non-hazardous waste four sectors have an E-PRTR coverage of less than 20% of the amounts reported to Eurostat (Manufacture of textile products, leather and leather products; Manufacture of wood and wood products; Manufacture of wood and wood products and Manufacture of furniture; jewellery, musical instruments, toys; repair and installation of machinery and equipment), whereas five sectors have a coverage of 20% to 60%.
- Large countries like France, Germany, Italy, Poland, Spain and United Kingdom each have only one or two sectors without the reported generation of hazardous and non-hazardous waste, whereas very small countries like Cyprus, Iceland, Liechtenstein and Malta have more than twelve sectors with no reporting of the generation of either hazardous or non-hazardous waste. Of the remaining 20 countries 13 countries have not reported generation of non-hazardous waste in four sectors or a larger number of sectors.
- All together, the generation comparison by NACE activity indicates that the coverage is much too low for non-hazardous waste and can be improved by lowering the threshold of 2,000 tonnes. The coverage regarding hazardous waste is better than regarding non-hazardous waste, but it also holds true for hazardous waste that the coverage will be better if the threshold of 2 tonnes is lowered.

### Waste intensities related to gross value added and number of employees

Some sectors have a low waste intensity per gross value added or per employee, cf. Table 123 to Table 127. The low intensities indicate that whereas the gross value added or the number of employees are reported for certain economic sectors or for certain countries, the waste generation is not reported to E-PRTR. The main conclusions are:

- For hazardous waste related to gross value added the following sectors have a low intensity in many countries (six or a larger number): Agriculture, hunting and forestry; Mining and quarrying; Manufacture of pulp, paper and paper products, publishing and printing; Manufacture of other non-metallic mineral products; Manufacture of basic metals and fabricated metal products; Electricity, gas and water supply and Other waste management activities. Related to per employee the intensity is low in the same sectors plus Manufacture of textiles products, leather and leather products; Manufacture of wood and wood products; Manufacture of chemicals, rubber and plastic products; Manufacture of basic metals and fabricated metal products; Manufacture of furniture, jewellery, musical instruments, toys, repair and installation of machinery and equipment; and Waste management activities.

- It seems that especially smaller countries have a low hazardous waste intensity in relation to gross value added in two or more sectors (Cyprus, Denmark, Estonia, Finland, Greece, Hungary, Ireland, Latvia, Lithuania, Luxembourg, Norway, Slovakia, Sweden and Switzerland). It is assessed that smaller countries do not have as many large industrial facilities but rather smaller sized facilities, which will not pass the E-PRTR threshold value of 2 tonnes. Related to the number of employees, 19 countries including both large and small countries have a low waste intensity in two or more sectors, although there is a small but not significant bias towards low hazardous waste intensity per employee in smaller countries compared with larger countries.
- The intensity results often do not show any reporting of hazardous waste in smaller countries and in certain economic sectors, indicating that the coverage could be improved if the current E-PRTR threshold of 2 tonnes hazardous waste was lowered.
- For non-hazardous waste intensity per gross value added is low in many countries (six or a larger number) in the following sectors: Mining and quarrying and Waste management activities. For many countries it is not possible to calculate data on waste intensity per employee due to missing waste data. The waste intensity per employee is low in many countries (six or a larger number) only in the following four sectors: Mining and quarrying; Manufacture of food products, beverages and tobacco; Other waste management activities and Waste Management activities.
- There is no clear indication that it is either larger or smaller countries which have a low non-hazardous waste intensity per gross value added or per employee.
- The intensity results indicate that in general the E-PRTR threshold of 2,000 tonnes does not allow for reaching the 90% coverage of non-hazardous waste in most countries and most sectors.

The Weibull function used on the E-PRTR activity codes

By using the Weibull function to assess the coverage of the E-PRTR reporting it is also possible to obtain an indication of the quality of reporting. Most of the 45 E-PRTR activities reporting hazardous waste include reporting from more than 30 facilities, which ensures that sufficient data is available for using the Weibull function. The reliability of the assessment of non-hazardous waste is lower due to the fact that 15 E-PRTR activities having fewer than 30 reporting facilities. The main results of the assessments are shown in Table 129 and Table 130, which also include the total number of facilities reporting to E-PRTR per activity code:

- For hazardous waste all activities have a Weibull value larger than 90% in 2009, which indicates a good coverage and that the threshold value of 2 tonnes could be regarded as reasonable.
- The Weibull value is calculated based on the number of facilities reporting hazardous waste. However, it is interesting that for 17 out of the 45 E-PRTR activities the percentage of facilities reporting hazardous waste is under 80% if the number of facilities reporting hazardous waste is related to the total number of facilities reporting a specific activity (releases/transfers to all media). This lower coverage of reporting facilities for many E-PRTR activities could indicate that even if the Weibull equation results in a high value, coverage could be improved by changing the threshold.
- It is assessed that in particular for the following E-PRTR activities the coverage would be improved if the threshold value was lower than 2 tonnes hazardous waste: 1.(c); 1.(d); 3.(a); 3.(c); 3.(g); 5.(c); 5.(d); 5.(e); 5.(f); 5.(g); 7.(a); 7.(b); 8.(a); 8.(b); 8.(c); 9.(a) and 9.(b).
- For non-hazardous waste 21 out of the 45 activities had coverage of less than 90% in 2009. The low Weibull value for many activities is also supported by the fact that for 42 out of the 45 E-PRTR activities the percentage of facilities reporting non-hazardous waste is under 80% if the number of reporting facilities is related to the total number of facilities reporting under the specific activity. Therefore, it appears necessary to reconsider the threshold of 2,000 tonnes.



## Assessment of landfills, incineration plants and power stations

### *Landfills*

The number of landfills reporting to E-PRTR was compared with other information reported to the Commission according to the Landfill Directive questionnaire (Table 131).

Generally speaking it seems that a limited number of landfills report to E-PRTR under activity 5(d) compared with the number of landfills reporting according to the Landfill Directive Questionnaire. The number of landfills reporting to E-PRTR was compared for each country with the total number of landfills for hazardous waste and non-hazardous waste reported according to the EU questionnaire. This implies that landfills for inert waste are not included. The main results are:

- On average, the number of landfills reporting the transfer of waste according to the E-PRTR reporting covers only 8% of the numbers reported according to the EU questionnaire.
- 13 countries out of the 26 included in the comparison have a coverage of less than 10% and 21 countries have a coverage of less than 50%
- If the total number of landfills reporting to E-PRTR (reporting releases/transfers to all media) are related to the numbers reported according to the EU questionnaire the average coverage is 18%.
- The generation of leachate should mean that more landfills are expected to report to E-PRTR. The missing reporting can either be explained by the fact that too many facilities do not report by mistake or that the threshold value for non-hazardous waste of 2,000 tonnes per year is too high.
- If the threshold value is reduced to, e.g., 1,000 tonnes non-hazardous waste it is expected that almost all landfills will exceed that threshold unless the landfill has its own waste water purification plant.

### *Incineration plants for non-hazardous waste*

For 16 countries it has been possible to compare the number of incineration plants with the numbers which are available through CEWEP (Confederation of European Waste-to-Energy Plants), cf. Table 133.

The comparison shows that for Belgium, Denmark, Italy, Norway and Sweden there is a major negative difference when the E-PRTR numbers are compared with the CEWEP numbers. For Germany the number of E-PRTR facilities belonging to activity 5.(b) is larger than the number reported by CEWEP.

It does not seem that the threshold values for activity 5.(b) are the decisive reason for the incomplete reporting by incineration plants. It seems more likely that plants have their own disposal sites and therefore do not have to report. Furthermore, it seems that some dedicated incinerators are registered under a different E-PRTR activity than 5.(b), e.g., 1.(c). It is not possible to say how many of these cases exist as this requires very detailed knowledge about each reporting facility.

### *Power stations and especially coal-fired power plants*

It seems that the E-PRTR reporting for power stations and especially for coal-fired power stations is not as reliable as indicated by the use of the Weibull function. The main two reasons for this are likely to be the threshold value, especially for non-hazardous waste, and the fact that many plants have their own disposal sites and therefore do not have to report to E-PRTR.

ECOBA (European Coal Combustion Products Association) was approached about the possibility of gaining access to ECOBA's country data regarding ashes and slag from coal fired power plants. However, due to confidentiality it is only possible to get information at an aggregated level. In 2008, the generation of non-hazardous waste from coal-fired power-plants was approximately 56.4 million in the old EU Member States excluding Luxembourg and Sweden. There is no specific data for the new EU Member States and Norway, but altogether ECOBA estimates that about 100 million tonnes of coal combustion waste is generated in the EU per year.

According to E-PRTR, facilities from the EU-15 excluding Luxembourg and Sweden belonging to activity NACE code 35 reported 29.7 million tonnes of non-hazardous waste in 2008. This amount also covers

waste transfers from non-coal-fired power-plants belonging to NACE activity 35. In other words the comparison indicates that the E-PRTR reporting covers a maximum of 53% of what is reported to ECOBA covering the old EU-Member States (excluding Luxembourg and Sweden). Looking at the EU-27 as such the coverage is a maximum of 54%.

### **Evaluation of recovery and disposal**

It is not possible to compare the reported E-PRTR data with other official data about the recovery and disposal of hazardous and non-hazardous waste. It is therefore not possible to make any conclusions on the quality of the reported E-PRTR data. However, based on the assessment of the development from 2007 to 2009 in the E-PRTR data itself it seems that overall only minor changes took place, cf. table Table 136 and Table 137. There was a small increase of 5% in the amount of hazardous waste sent to recovery compared with the amount sent to disposal. For non-hazardous waste there was also an increase in the direction of recovery but only by 2%.

However, the low changes at the total E-PRTR level stand in contrast with some quite diverse trends at the country level. Some countries have reported the increase of recovery for a certain E-PRTR activity while others have reported a decrease for the same activity.

Based on this fact it is very difficult to draw any precise conclusions on the quality of the reported data regarding the treatment of the waste.

### **Transboundary shipments of waste**

The E-PRTR reporting has been compared with the transboundary shipments of waste reported to the EU Commission according to the EU Waste Shipment Regulation. The latter reporting obligation is not related to an economic activity (NACE code) or to an E-PRTR activity code. This means that it is only possible to relate a country's total amount of hazardous waste transboundary shipped according to the E-PRTR Regulation with the total hazardous part of the notified waste according to the Waste Shipment Regulation.

The checks included 2007, 2008 and 2009 data and show the main results. It seems that the E-PRTR coverage increased from 2007 to 2009. The comparison indicates that too many countries have a too low coverage compared with the amounts reported according to the Waste Shipment Regulation. When assessing the number of countries with a too high coverage and countries for which a comparison has not been possible it seems that the quality of the E-PRTR reporting is not very high and could be improved.

The reasons for this low quality are not clear. Possible explanations could be:

- Many facilities generate less than 2 tonnes hazardous waste per year and are therefore not included in E-PRTR.
- Many facilities generating more than 2 tonnes hazardous deliver the waste to a collector. The facilities are therefore not always aware of the fact that the hazardous waste is transboundary shipped. Since collectors are not included in the E-PRTR reporting, this type of hazardous waste transboundary shipped will not be reported to E-PRTR but will be reported according to the Waste Shipment Regulation.
- In the same way, if the generator of the hazardous waste uses a dealer or a broker to arrange the transboundary shipment there might be a risk that the amounts transboundary shipped are not reported to E-PRTR.

## **Conclusions**

### **Non-hazardous waste**

Although the E-PRTR only includes off-site waste transfers and not generation as such, the undertaken assessments indicate that the threshold value of 2,000 tonnes of non-hazardous does not allow for reaching the 90% coverage of non-hazardous waste transfers. Therefore, changing the threshold should be considered in order to increase the reported percentages for the E-PRTR activities belonging to manufacture production (economic activities from code C10 to code C33 according to NACE) because in these economic

activities the largest differences in the coverage between facilities reporting hazardous waste and non-hazardous waste can be found. Alternatively, instead of having a lower threshold value for the manufacturing activities, it could be considered to introduce a criterion that if a facility exceeds the 2 tonnes threshold for hazardous waste the facility will also have to report non-hazardous waste regardless of any threshold. In this case no new facilities would be added to E-PRTR.

### **Hazardous waste**

The different assessments of hazardous waste resulted in a better coverage than for non-hazardous waste. However, the waste intensity results indicate that the E-PRTR threshold of 2 tonnes for hazardous waste is too low for many facilities, in particular in smaller countries and in certain economic sectors. It is concluded that in particular the following E-PRTR activities would have better coverage if the threshold value for hazardous waste was lower than 2 tonnes: 1.(c); 1.(d); 3.(a); 3.(c); 3.(g); 5.(c); 5.(d); 5.(e); 5.(f); 5.(g); 7.(a); 7.(b); 8.(a); 8.(b); 8.(c); 9.(a) and 9.(b). It is not possible to argue for a specific lower threshold value or values, but the value could be lowered to 1 tonne as a starting point.

E-PRTR includes a number of landfills with releases/transfers to the different media. Most landfills are assumed to generate leachate, but the threshold value of 2,000 tonnes for non-hazardous waste may be too high to cover the leachate. A threshold of 1,000 tonnes for non-hazardous waste would be more appropriate in this context. However, before lowering the threshold value it is recommended to clarify whether leachate from landfills really has to be reported as a waste transfer, which is the current legal status, or as transfers of pollutants in water, which would include more information about the pollutants in the leachate. In any case, the issue of the number of landfills reporting to E-PRTR compared with the number stated in the Landfill Directive Questionnaire needs to be investigated further.

The number of dedicated incineration plants for non-hazardous waste included in E-PRTR is reasonable but less than according to CEWEP data. The coverage could be improved if all dedicated incineration plants had to report under E-PRTR activity 5.(b) although the incineration plant belongs to a company whose main activity is different than activity 5.(b).

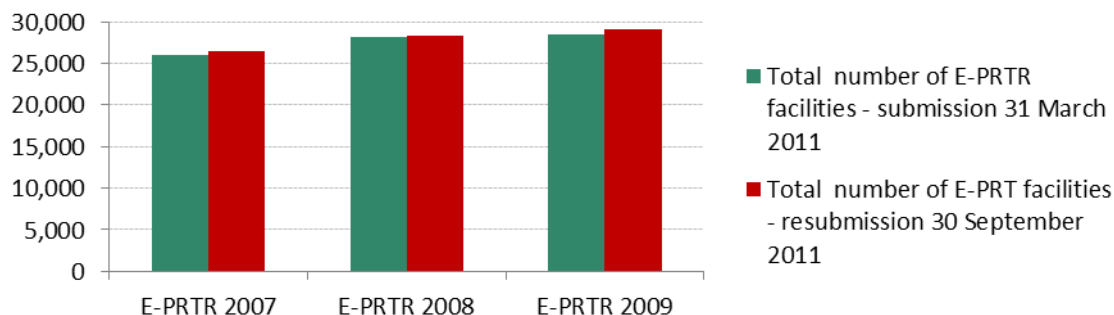
## APPENDIX 14 – COMPARISON OF MARCH AND SEPTEMBER 2011 E-PRTR SUBMISSIONS

Table 140: Difference in total number of facilities reported under E-PRTR in submissions by 31 March and by 30 September 2011

| Country        | 2007                   |                      |                        |                 |  | 2008                   |                      |                        |                 |  | 2009                   |                      |                        |                 |  |
|----------------|------------------------|----------------------|------------------------|-----------------|--|------------------------|----------------------|------------------------|-----------------|--|------------------------|----------------------|------------------------|-----------------|--|
|                | Submission<br>31 March | Submission<br>30 Sep | Difference<br>absolute | Difference<br>% |  | Submission<br>31 March | Submission<br>30 Sep | Difference<br>absolute | Difference<br>% |  | Submission<br>31 March | Submission<br>30 Sep | Difference<br>absolute | Difference<br>% |  |
| France         | 3,238                  | 3,238                | 0                      | 0.0%            |  | 3,578                  | 3,578                | 0                      | 0.0%            |  | 3,583                  | 3,583                | 0                      | 0.0%            |  |
| Austria        | 247                    | 260                  | 13                     | 5.3%            |  | 253                    | 272                  | 19                     | 7.5%            |  | 170                    | 240                  | 70                     | 41.2%           |  |
| Belgium        | 795                    | 793                  | -2                     | -0.3%           |  | 788                    | 785                  | -3                     | -0.4%           |  | 925                    | 921                  | -4                     | -0.4%           |  |
| Bulgaria       | 153                    | 153                  | 0                      | 0.0%            |  | 169                    | 169                  | 0                      | 0.0%            |  | 188                    | 188                  | 0                      | 0.0%            |  |
| Switzerland    | 194                    | 194                  | 0                      | 0.0%            |  | 219                    | 219                  | 0                      | 0.0%            |  | 219                    | 230                  | 11                     | 5.0%            |  |
| Cyprus         | 74                     | 74                   | 0                      | 0.0%            |  | 65                     | 65                   | 0                      | 0.0%            |  | 66                     | 66                   | 0                      | 0.0%            |  |
| Czech Republic | 683                    | 683                  | 0                      | 0.0%            |  | 715                    | 715                  | 0                      | 0.0%            |  | 801                    | 801                  | 0                      | 0.0%            |  |
| Germany        | 4,278                  | 4,368                | 90                     | 2.1%            |  | 4,610                  | 4,661                | 51                     | 1.1%            |  | 4,586                  | 4,700                | 114                    | 2.5%            |  |
| Denmark        | 501                    | 501                  | 0                      | 0.0%            |  | 448                    | 448                  | 0                      | 0.0%            |  | 347                    | 429                  | 82                     | 23.6%           |  |
| Estonia        | 86                     | 86                   | 0                      | 0.0%            |  | 105                    | 105                  | 0                      | 0.0%            |  | 101                    | 101                  | 0                      | 0.0%            |  |
| Spain          | 3,391                  | 3,391                | 0                      | 0.0%            |  | 3,510                  | 3,510                | 0                      | 0.0%            |  | 3,660                  | 3,660                | 0                      | 0.0%            |  |
| Finland        | 500                    | 500                  | 0                      | 0.0%            |  | 494                    | 494                  | 0                      | 0.0%            |  | 481                    | 481                  | 0                      | 0.0%            |  |
| Greece         | 144                    | 144                  | 0                      | 0.0%            |  | 150                    | 150                  | 0                      | 0.0%            |  | 125                    | 125                  | 0                      | 0.0%            |  |
| Hungary        | 662                    | 662                  | 0                      | 0.0%            |  | 694                    | 510                  | -184                   | -26.5%          |  | 731                    | 733                  | 2                      | 0.3%            |  |
| Ireland        | 345                    | 345                  | 0                      | 0.0%            |  | 351                    | 351                  | 0                      | 0.0%            |  | 339                    | 339                  | 0                      | 0.0%            |  |
| Iceland        | 8                      | 8                    | 0                      | 0.0%            |  | 26                     | 26                   | 0                      | 0.0%            |  | 22                     | 22                   | 0                      | 0.0%            |  |
| Italy          | 2,315                  | 2,315                | 0                      | 0.0%            |  | 2,491                  | 2,491                | 0                      | 0.0%            |  | 2,598                  | 2,598                | 0                      | 0.0%            |  |
| Liechtenstein  | 1                      | 1                    | 0                      | 0.0%            |  | 1                      | 1                    | 0                      | 0.0%            |  | 1                      | 1                    | 0                      | 0.0%            |  |
| Lithuania      | 97                     | 97                   | 0                      | 0.0%            |  | 118                    | 118                  | 0                      | 0.0%            |  | 99                     | 99                   | 0                      | 0.0%            |  |
| Luxembourg     | 26                     | 26                   | 0                      | 0.0%            |  | 28                     | 28                   | 0                      | 0.0%            |  | 30                     | 30                   | 0                      | 0.0%            |  |
| Latvia         | 36                     | 36                   | 0                      | 0.0%            |  | 36                     | 36                   | 0                      | 0.0%            |  | 34                     | 34                   | 0                      | 0.0%            |  |
| Malta          | 11                     | 11                   | 0                      | 0.0%            |  | 13                     | 13                   | 0                      | 0.0%            |  | 15                     | 15                   | 0                      | 0.0%            |  |
| Netherlands    | 587                    | 587                  | 0                      | 0.0%            |  | 731                    | 731                  | 0                      | 0.0%            |  | 797                    | 797                  | 0                      | 0.0%            |  |
| Norway         | 489                    | 723                  | 234                    | 47.9%           |  | 514                    | 792                  | 278                    | 54.1%           |  | 457                    | 835                  | 378                    | 82.7%           |  |
| Poland         | 1,238                  | 1,237                | -1                     | -0.1%           |  | 1,304                  | 1,307                | 3                      | 0.2%            |  | 1,278                  | 1,297                | 19                     | 1.5%            |  |
| Portugal       | 550                    | 550                  | 0                      | 0.0%            |  | 568                    | 568                  | 0                      | 0.0%            |  | 581                    | 581                  | 0                      | 0.0%            |  |
| Romania        | 464                    | 464                  | 0                      | 0.0%            |  | 490                    | 491                  | 1                      | 0.2%            |  | 484                    | 486                  | 2                      | 0.4%            |  |
| Sweden         | 456                    | 456                  | 0                      | 0.0%            |  | 517                    | 518                  | 1                      | 0.2%            |  | 551                    | 552                  | 1                      | 0.2%            |  |
| Slovenia       | 153                    | 153                  | 0                      | 0.0%            |  | 188                    | 188                  | 0                      | 0.0%            |  | 195                    | 199                  | 4                      | 2.1%            |  |
| Slovakia       | 207                    | 207                  | 0                      | 0.0%            |  | 245                    | 245                  | 0                      | 0.0%            |  | 259                    | 259                  | 0                      | 0.0%            |  |
| United Kingdom | 4,130                  | 4,132                | 2                      | 0.0%            |  | 4,751                  | 4,773                | 22                     | 0.5%            |  | 4,748                  | 4,755                | 7                      | 0.1%            |  |
| <b>TOTAL</b>   | <b>26,059</b>          | <b>26,395</b>        | <b>336</b>             | <b>1.3%</b>     |  | <b>28,170</b>          | <b>28,358</b>        | <b>188</b>             | <b>0.7%</b>     |  | <b>28,471</b>          | <b>29,157</b>        | <b>686</b>             | <b>2.4%</b>     |  |

The total number of E-PRTR facilities reported by countries by 30 September 2011 slightly increased compared to the data submitted by 31 March 2011, but the differences are minimal (plus 1.3%, 0.7% and 2.4% for years 2007, 2008 and 2009, respectively) and do not influence the results of the completeness and scope analysis (Table 140).

**Figure 53: Total number of E-PRTR facilities as reported in March and September 2011**



## Air

The total number of E-PRTR release reports to air in the resubmitted dataset did not change by more than 2.1% for any year. In only four countries, the number of release reports in E-PRTR 2009 as submitted in September 2011 rose by more than 3% (Austria 70%, Norway 19 %, Denmark 8% and Switzerland 5%) compared to the March 2011 submission (Table 141). These changes are not significant for the overall E-PRTR dataset and do not influence the results of the completeness and scope analysis which was based on the March 2011 dataset (e.g. for Austria the March 2011 dataset was incomplete, Norway reported a number of new off-shore activities in September 2011).

The differences in total 2009 E-PRTR releases between to air between the March and September 2011 submission lie in range between 0.0% and 3% for all reported pollutants except Cd (-8%), NMVOC (+10%), PCDD/PCDF (-36%), TCB (+84%) and Zn (-7%). The results of the Weibull analysis indicate that the reporting of these pollutants except for Cd and TCB is still complete (Table 97 in [Appendix 11](#)).

**Table 141: Difference in total number of E-PRTR release reports to air between submission by 31 March and by 30 September 2011**

| Country        | 2007                |                   |                     |              | 2008                |                   |                     |              | 2009                |                   |                     |              |
|----------------|---------------------|-------------------|---------------------|--------------|---------------------|-------------------|---------------------|--------------|---------------------|-------------------|---------------------|--------------|
|                | Submission 31 March | Submission 30 Sep | Difference absolute | Difference % | Submission 31 March | Submission 30 Sep | Difference absolute | Difference % | Submission 31 March | Submission 30 Sep | Difference absolute | Difference % |
| France         | 2,971               | 2,971             | 0                   | 0.0%         | 2,873               | 2,873             | 0                   | 0.0%         | 2,724               | 2,724             | 0                   | 0.0%         |
| Austria        | 203                 | 208               | 5                   | 2.5%         | 177                 | 196               | 19                  | 10.7%        | 91                  | 155               | 64                  | 70.3%        |
| Belgium        | 838                 | 832               | -6                  | -0.7%        | 826                 | 821               | -5                  | -0.6%        | 702                 | 696               | -6                  | -0.9%        |
| Bulgaria       | 213                 | 213               | 0                   | 0.0%         | 230                 | 230               | 0                   | 0.0%         | 221                 | 221               | 0                   | 0.0%         |
| Switzerland    | 272                 | 272               | 0                   | 0.0%         | 301                 | 301               | 0                   | 0.0%         | 311                 | 326               | 15                  | 4.8%         |
| Cyprus         | 113                 | 113               | 0                   | 0.0%         | 97                  | 97                | 0                   | 0.0%         | 95                  | 95                | 0                   | 0.0%         |
| Czech Republic | 799                 | 799               | 0                   | 0.0%         | 781                 | 781               | 0                   | 0.0%         | 701                 | 698               | -3                  | -0.4%        |
| Germany        | 2,780               | 2,880             | 100                 | 3.6%         | 2,915               | 2,964             | 49                  | 1.7%         | 3,110               | 3,201             | 91                  | 2.9%         |
| Denmark        | 364                 | 364               | 0                   | 0.0%         | 302                 | 302               | 0                   | 0.0%         | 256                 | 276               | 20                  | 7.8%         |
| Estonia        | 92                  | 92                | 0                   | 0.0%         | 95                  | 95                | 0                   | 0.0%         | 82                  | 82                | 0                   | 0.0%         |
| Spain          | 3,590               | 3,591             | 1                   | 0.0%         | 3,504               | 3,504             | 0                   | 0.0%         | 3,296               | 3,296             | 0                   | 0.0%         |
| Finland        | 600                 | 600               | 0                   | 0.0%         | 558                 | 558               | 0                   | 0.0%         | 575                 | 575               | 0                   | 0.0%         |

| Country        | 2007                   |                      |                        |              | 2008                   |                      |                        |              | 2009                   |                      |                        |              |
|----------------|------------------------|----------------------|------------------------|--------------|------------------------|----------------------|------------------------|--------------|------------------------|----------------------|------------------------|--------------|
|                | Submission<br>31 March | Submission<br>30 Sep | Difference<br>absolute | Difference % | Submission<br>31 March | Submission<br>30 Sep | Difference<br>absolute | Difference % | Submission<br>31 March | Submission<br>30 Sep | Difference<br>absolute | Difference % |
| Greece         | 298                    | 298                  | 0                      | 0.0%         | 304                    | 304                  | 0                      | 0.0%         | 282                    | 282                  | 0                      | 0.0%         |
| Hungary        | 511                    | 511                  | 0                      | 0.0%         | 539                    | 388                  | -151                   | -28.0%       | 517                    | 522                  | 5                      | 1.0%         |
| Ireland        | 250                    | 248                  | -2                     | -0.8%        | 242                    | 245                  | 3                      | 1.2%         | 234                    | 240                  | 6                      | 2.6%         |
| Iceland        | 19                     | 19                   | 0                      | 0.0%         | 57                     | 57                   | 0                      | 0.0%         | 46                     | 46                   | 0                      | 0.0%         |
| Italy          | 1,938                  | 1,938                | 0                      | 0.0%         | 1,872                  | 1,872                | 0                      | 0.0%         | 1,821                  | 1,821                | 0                      | 0.0%         |
| Liechtenstein  | 0                      | 0                    | 0                      | na           | 0                      | 0                    | 0                      | n.a.         | 0                      | 0                    | 0                      | n.a.         |
| Lithuania      | 98                     | 98                   | 0                      | 0.0%         | 103                    | 103                  | 0                      | 0.0%         | 81                     | 81                   | 0                      | 0.0%         |
| Luxembourg     | 46                     | 46                   | 0                      | 0.0%         | 44                     | 44                   | 0                      | 0.0%         | 41                     | 41                   | 0                      | 0.0%         |
| Latvia         | 30                     | 30                   | 0                      | 0.0%         | 31                     | 31                   | 0                      | 0.0%         | 35                     | 35                   | 0                      | 0.0%         |
| Malta          | 20                     | 20                   | 0                      | 0.0%         | 22                     | 22                   | 0                      | 0.0%         | 21                     | 21                   | 0                      | 0.0%         |
| Netherlands    | 671                    | 671                  | 0                      | 0.0%         | 719                    | 719                  | 0                      | 0.0%         | 703                    | 704                  | 1                      | 0.1%         |
| Norway         | 1,192                  | 1,423                | 231                    | 19.4%        | 1,361                  | 1,606                | 245                    | 18.0%        | 1,347                  | 1,602                | 255                    | 18.9%        |
| Poland         | 1,460                  | 1,459                | -1                     | -0.1%        | 1,473                  | 1,463                | -10                    | -0.7%        | 1,347                  | 1,367                | 20                     | 1.5%         |
| Portugal       | 656                    | 656                  | 0                      | 0.0%         | 688                    | 689                  | 1                      | 0.1%         | 620                    | 620                  | 0                      | 0.0%         |
| Romania        | 611                    | 611                  | 0                      | 0.0%         | 578                    | 582                  | 4                      | 0.7%         | 552                    | 558                  | 6                      | 1.1%         |
| Sweden         | 608                    | 614                  | 6                      | 1.0%         | 619                    | 619                  | 0                      | 0.0%         | 597                    | 597                  | 0                      | 0.0%         |
| Slovenia       | 129                    | 129                  | 0                      | 0.0%         | 137                    | 137                  | 0                      | 0.0%         | 127                    | 130                  | 3                      | 2.4%         |
| Slovakia       | 198                    | 198                  | 0                      | 0.0%         | 213                    | 213                  | 0                      | 0.0%         | 195                    | 195                  | 0                      | 0.0%         |
| United Kingdom | 3,040                  | 3,047                | 7                      | 0.2%         | 3,021                  | 3,023                | 2                      | 0.1%         | 2,915                  | 2,925                | 10                     | 0.3%         |
| <b>TOTAL</b>   | <b>24,610</b>          | <b>24,951</b>        | <b>341</b>             | <b>1.4%</b>  | <b>24,682</b>          | <b>24,839</b>        | <b>157</b>             | <b>0.6%</b>  | <b>23,645</b>          | <b>24,132</b>        | <b>487</b>             | <b>2.1%</b>  |

## Water

The total number of release reports to water increased by more than 10% for all years in the September 2011 resubmission, which possibly indicates that completeness of reported water releases improved. The most significant changes between 2007 and 2009 were observed for Norway (+117%) and Slovenia (+33%).

Reporting of pollutant transfers into waters followed a different trend: the total number of reports for the years 2007, 2008 and 2009 decreased by 5% , 4.6% and 3.3%, respectively, in the resubmitted September 2011 dataset.

**Table 142: Difference in total number of release reports to water between submission by 31 March and by 30 September 2011**

| Country        | 2007                |                   |                     |              | 2008                |                   |                     |              | 2009                |                   |                     |              |
|----------------|---------------------|-------------------|---------------------|--------------|---------------------|-------------------|---------------------|--------------|---------------------|-------------------|---------------------|--------------|
|                | Submission 31 March | Submission 30 Sep | Difference absolute | Difference % | Submission 31 March | Submission 30 Sep | Difference absolute | Difference % | Submission 31 March | Submission 30 Sep | Difference absolute | Difference % |
| France         | 1,234               | 1,234             | 0                   | 0.0%         | 1,299               | 1,299             | 0                   | 0.0%         | 1,293               | 1,293             | 0                   | 0.0%         |
| Austria        | 156                 | 172               | 16                  | 10.3%        | 145                 | 178               | 33                  | 22.8%        | 112                 | 138               | 26                  | 23.2%        |
| Belgium        | 408                 | 408               | 0                   | 0.0%         | 441                 | 427               | -14                 | -3.2%        | 405                 | 405               | 0                   | 0.0%         |
| Bulgaria       | 78                  | 78                | 0                   | 0.0%         | 116                 | 116               | 0                   | 0.0%         | 127                 | 131               | 4                   | 3.1%         |
| Switzerland    | 131                 | 131               | 0                   | 0.0%         | 144                 | 144               | 0                   | 0.0%         | 156                 | 167               | 11                  | 7.1%         |
| Cyprus         | 2                   | 2                 | 0                   | 0.0%         | 4                   | 4                 | 0                   | 0.0%         | 5                   | 5                 | 0                   | 0.0%         |
| Czech Republic | 204                 | 204               | 0                   | 0.0%         | 207                 | 207               | 0                   | 0.0%         | 262                 | 262               | 0                   | 0.0%         |
| Germany        | 1,758               | 1,796             | 38                  | 2.2%         | 1,827               | 1,837             | 10                  | 0.5%         | 1,712               | 1,730             | 18                  | 1.1%         |
| Denmark        | 97                  | 97                | 0                   | 0.0%         | 326                 | 326               | 0                   | 0.0%         | 149                 | 152               | 3                   | 2.0%         |
| Estonia        | 18                  | 18                | 0                   | 0.0%         | 31                  | 31                | 0                   | 0.0%         | 16                  | 16                | 0                   | 0.0%         |
| Spain          | 710                 | 710               | 0                   | 0.0%         | 853                 | 853               | 0                   | 0.0%         | 882                 | 882               | 0                   | 0.0%         |
| Finland        | 342                 | 342               | 0                   | 0.0%         | 355                 | 355               | 0                   | 0.0%         | 314                 | 314               | 0                   | 0.0%         |
| Greece         | 60                  | 60                | 0                   | 0.0%         | 64                  | 64                | 0                   | 0.0%         | 46                  | 46                | 0                   | 0.0%         |
| Hungary        | 115                 | 115               | 0                   | 0.0%         | 96                  | 89                | -7                  | -7.3%        | 84                  | 89                | 5                   | 6.0%         |
| Ireland        | 151                 | 148               | -3                  | -2.0%        | 121                 | 119               | -2                  | -1.7%        | 135                 | 124               | -11                 | -8.1%        |
| Iceland        | 7                   | 7                 | 0                   | 0.0%         | 44                  | 44                | 0                   | 0.0%         | 20                  | 20                | 0                   | 0.0%         |
| Italy          | 1,210               | 1,210             | 0                   | 0.0%         | 1,251               | 1,252             | 1                   | 0.1%         | 1,259               | 1,259             | 0                   | 0.0%         |
| Liechtenstein  | 0                   | 0                 | 0                   | 0.0%         | 0                   | 0                 | 0                   | 0.0%         | 0                   | 0                 | 0                   | 0.0%         |
| Lithuania      | 40                  | 40                | 0                   | 0.0%         | 35                  | 35                | 0                   | 0.0%         | 40                  | 40                | 0                   | 0.0%         |
| Luxembourg     | 11                  | 11                | 0                   | 0.0%         | 14                  | 14                | 0                   | 0.0%         | 14                  | 14                | 0                   | 0.0%         |
| Latvia         | 24                  | 24                | 0                   | 0.0%         | 12                  | 12                | 0                   | 0.0%         | 13                  | 13                | 0                   | 0.0%         |
| Malta          | 20                  | 20                | 0                   | 0.0%         | 22                  | 22                | 0                   | 0.0%         | 21                  | 21                | 0                   | 0.0%         |
| Netherlands    | 602                 | 602               | 0                   | 0.0%         | 701                 | 701               | 0                   | 0.0%         | 706                 | 706               | 0                   | 0.0%         |
| Norway         | 2,099               | 3,672             | 1,573               | 74.9%        | 2,118               | 3,858             | 1,740               | 82.2%        | 1,905               | 4,142             | 2,237               | 117.4%       |
| Poland         | 840                 | 841               | 1                   | 0.1%         | 818                 | 841               | 23                  | 2.8%         | 793                 | 825               | 32                  | 4.0%         |
| Portugal       | 276                 | 276               | 0                   | 0.0%         | 352                 | 352               | 0                   | 0.0%         | 366                 | 366               | 0                   | 0.0%         |
| Romania        | 238                 | 238               | 0                   | 0.0%         | 229                 | 229               | 0                   | 0.0%         | 170                 | 170               | 0                   | 0.0%         |
| Sweden         | 551                 | 551               | 0                   | 0.0%         | 516                 | 515               | -1                  | -0.2%        | 495                 | 495               | 0                   | 0.0%         |
| Slovenia       | 66                  | 66                | 0                   | 0.0%         | 59                  | 59                | 0                   | 0.0%         | 42                  | 56                | 14                  | 33.3%        |
| Slovakia       | 100                 | 100               | 0                   | 0.0%         | 98                  | 98                | 0                   | 0.0%         | 96                  | 96                | 0                   | 0.0%         |
| United Kingdom | 3,228               | 3,235             | 7                   | 0.2%         | 3,480               | 3,590             | 110                 | 3.2%         | 2,939               | 3,038             | 99                  | 3.4%         |
| <b>TOTAL</b>   | <b>14,776</b>       | <b>16,408</b>     | <b>1,632</b>        | <b>11.0%</b> | <b>15,778</b>       | <b>17,671</b>     | <b>1,893</b>        | <b>12.0%</b> | <b>14,577</b>       | <b>17,015</b>     | <b>2,438</b>        | <b>16.7%</b> |

**Table 143: Difference in total number of pollutant transfer reports into water between submission by 31 March and by 30 September 2011**

| Country        | 2007                |                   |                     |              | 2008                |                   |                     |              | 2009                |                   |                     |              |
|----------------|---------------------|-------------------|---------------------|--------------|---------------------|-------------------|---------------------|--------------|---------------------|-------------------|---------------------|--------------|
|                | Submission 31 March | Submission 30 Sep | Difference absolute | Difference % | Submission 31 March | Submission 30 Sep | Difference absolute | Difference % | Submission 31 March | Submission 30 Sep | Difference absolute | Difference % |
| France         | 416                 | 416               | 0                   | 0.0%         | 493                 | 493               | 0                   | 0.0%         | 426                 | 426               | 0                   | 0.0%         |
| Austria        | 72                  | 81                | 9                   | 13%          | 81                  | 86                | 5                   | 6.2%         | 56                  | 83                | 27                  | 48%          |
| Belgium        | 77                  | 77                | 0                   | 0.0%         | 90                  | 90                | 0                   | 0.0%         | 88                  | 88                | 0                   | 0.0%         |
| Bulgaria       | 28                  | 28                | 0                   | 0.0%         | 18                  | 18                | 0                   | 0.0%         | 22                  | 20                | -2                  | -9.1%        |
| Switzerland    | 171                 | 171               | 0                   | 0.0%         | 187                 | 187               | 0                   | 0.0%         | 157                 | 182               | 25                  | 16%          |
| Cyprus         | 4                   | 4                 | 0                   | 0.0%         | 5                   | 5                 | 0                   | 0.0%         | 4                   | 4                 | 0                   | 0.0%         |
| Czech Republic | 93                  | 93                | 0                   | 0.0%         | 92                  | 92                | 0                   | 0.0%         | 121                 | 121               | 0                   | 0.0%         |
| Germany        | 941                 | 951               | 10                  | 1.1%         | 889                 | 891               | 2                   | 0.2%         | 862                 | 864               | 2                   | 0.2%         |
| Denmark        | 91                  | 91                | 0                   | 0.0%         | 78                  | 78                | 0                   | 0.0%         | 33                  | 56                | 23                  | 70%          |
| Estonia        | 1                   | 1                 | 0                   | 0.0%         | 2                   | 2                 | 0                   | 0.0%         | 0                   | 0                 | 0                   |              |
| Spain          | 405                 | 405               | 0                   | 0.0%         | 383                 | 383               | 0                   | 0.0%         | 340                 | 340               | 0                   | 0.0%         |
| Finland        | 68                  | 68                | 0                   | 0.0%         | 83                  | 83                | 0                   | 0.0%         | 83                  | 83                | 0                   | 0.0%         |
| Greece         | 5                   | 5                 | 0                   | 0.0%         | 4                   | 4                 | 0                   | 0.0%         | 0                   | 0                 | 0                   |              |
| Hungary        | 34                  | 34                | 0                   | 0.0%         | 35                  | 35                | 0                   | 0.0%         | 23                  | 23                | 0                   | 0.0%         |
| Ireland        | 30                  | 30                | 0                   | 0.0%         | 31                  | 28                | -3                  | -9.7%        | 27                  | 27                | 0                   | 0.0%         |
| Iceland        | 0                   | 0                 | 0                   |              | 0                   | 0                 | 0                   |              | 0                   | 0                 | 0                   |              |
| Italy          | 397                 | 397               | 0                   | 0.0%         | 402                 | 402               | 0                   | 0.0%         | 466                 | 466               | 0                   | 0.0%         |
| Liechtenstein  |                     | 0                 | 0                   |              | 0                   | 0                 | 0                   |              | 0                   | 0                 | 0                   |              |
| Lithuania      | 2                   | 2                 | 0                   | 0.0%         | 2                   | 2                 | 0                   | 0.0%         | 3                   | 3                 | 0                   | 0.0%         |
| Luxembourg     | 1                   | 1                 | 0                   | 0.0%         | 0                   | 0                 | 0                   |              | 0                   | 0                 | 0                   |              |
| Latvia         | 0                   | 0                 | 0                   |              | 0                   | 0                 | 0                   |              | 0                   | 0                 | 0                   |              |
| Malta          | 0                   | 0                 | 0                   |              | 0                   | 0                 | 0                   |              | 0                   | 0                 | 0                   |              |
| Netherlands    | 190                 | 190               | 0                   | 0.0%         | 222                 | 222               | 0                   | 0.0%         | 229                 | 229               | 0                   | 0.0%         |
| Norway         | 0                   | 0                 | 0                   |              | 0                   | 0                 | 0                   |              | 0                   | 0                 | 0                   |              |
| Poland         | 267                 | 258               | -9                  | -3%          | 268                 | 267               | -1                  | -0.4%        | 230                 | 231               | 1                   | 0.4%         |
| Portugal       | 116                 | 116               | 0                   | 0.0%         | 152                 | 152               | 0                   | 0.0%         | 135                 | 135               | 0                   | 0.0%         |
| Romania        | 27                  | 27                | 0                   | 0.0%         | 22                  | 22                | 0                   | 0.0%         | 22                  | 22                | 0                   | 0.0%         |
| Sweden         | 69                  | 69                | 0                   | 0.0%         | 66                  | 66                | 0                   | 0.0%         | 61                  | 61                | 0                   | 0.0%         |
| Slovenia       | 27                  | 27                | 0                   | 0.0%         | 30                  | 30                | 0                   | 0.0%         | 21                  | 22                | 1                   | 4.8%         |
| Slovakia       | 20                  | 20                | 0                   | 0.0%         | 19                  | 19                | 0                   | 0.0%         | 17                  | 17                | 0                   | 0.0%         |
| United Kingdom | 527                 | 313               | -214                | -41%         | 498                 | 305               | -193                | -39%         | 461                 | 256               | -205                | -44.5%       |
| <b>TOTAL</b>   | <b>4,079</b>        | <b>3,875</b>      | <b>-204</b>         | <b>-5.0%</b> | <b>4,152</b>        | <b>3,962</b>      | <b>-190</b>         | <b>-4.6%</b> | <b>3,887</b>        | <b>3,759</b>      | <b>-128</b>         | <b>-3.3%</b> |



## Land

The reporting of releases to land slightly increased by about 2 to 4% in the years 2007 to 2009 in the re-submitted September 2011 dataset (Table 144), but still seem to be rather inconsistent and incomplete. Altogether, only eleven countries reported releases to land for at least one year.

**Table 144: Difference in total number of release reports to land between submission by 31 March and by 30 September 2011**

| Country name   | 2007                |                   |                     |              | 2008                |                   |                     |              | 2009                |                   |                     |              |
|----------------|---------------------|-------------------|---------------------|--------------|---------------------|-------------------|---------------------|--------------|---------------------|-------------------|---------------------|--------------|
|                | Submission 31 March | Submission 30 Sep | Difference absolute | Difference % | Submission 31 March | Submission 30 Sep | Difference absolute | Difference % | Submission 31 March | Submission 30 Sep | Difference absolute | Difference % |
| France         | 370                 | 370               | 0                   | 0.0%         | 459                 | 459               | 0                   | 0.0%         | 483                 | 483               | 0                   | 0.0%         |
| Bulgaria       | 2                   | 2                 | 0                   | 0.0%         | 4                   | 4                 | 0                   | 0.0%         |                     | 1                 | 1                   |              |
| Czech republic |                     |                   | 0                   |              |                     |                   | 0                   |              | 7                   | 7                 | 0                   | 0.0%         |
| Denmark        | 18                  | 18                | 0                   | 0.0%         | 28                  | 28                | 0                   | 0.0%         | 21                  | 12                | -9                  | -43 %        |
| Spain          |                     |                   | 0                   |              | 6                   | 6                 | 0                   | 0.0%         | 4                   | 4                 | 0                   | 0.0%         |
| Ireland        | 3                   | 2                 | -1                  | -33%         | 0                   | 0                 | 0                   |              | 2                   |                   | -2                  | -100 %       |
| Norway         | 36                  | 48                | 12                  | 33 %         | 47                  | 71                | 24                  | 51 %         | 57                  | 88                | 31                  | 54 %         |
| Poland         |                     |                   | 0                   |              | 1                   | 1                 | 0                   | 0.0%         | 1                   | 1                 | 0                   | 0.0%         |
| Portugal       | 1                   | 1                 | 0                   | 0.0%         |                     |                   | 0                   |              |                     |                   | 0                   |              |
| Slovakia       | 3                   | 3                 | 0                   | 0.0%         | 15                  | 15                | 0                   | 0.0%         | 10                  | 10                | 0                   | 0.0%         |
| United Kingdom | 78                  | 78                | 0                   | 0.0%         | 44                  | 44                | 0                   | 0.0%         | 41                  | 41                | 0                   | 0.0%         |
| <b>TOTAL</b>   | <b>511</b>          | <b>522</b>        | <b>11</b>           | <b>2.2%</b>  | <b>604</b>          | <b>628</b>        | <b>24</b>           | <b>4.0%</b>  | <b>626</b>          | <b>647</b>        | <b>21</b>           | <b>3.4%</b>  |

## Waste

The resubmitted September 2011 dataset for 2009 did not result in large changes in the reported quantities of transferred waste. Austria submitted some changes in reported waste quantities for all waste types, although only hazardous waste transferred outside the country shows a larger percentage change. These changes occurred for E-PRTR activity code 2.(c), 2.(e), 5.(a) and 5.(b). However, these changes do not have an impact on the conclusions made in the review. Denmark, Germany and Switzerland also resubmitted updated quantities of non-hazardous waste, but the changes were small. The Netherlands, Slovenia, Germany, Norway and Switzerland all submitted updated quantities of hazardous waste transferred inside the country. However, the changes were only significant for the Netherlands and only affected activity 5.(a). Consequently, the results of the completeness and threshold analysis for waste transfers, which are based on the analysis of the March 2011 dataset, did not have to be updated.

However, it should also be noted that the decrease in hazardous waste transferred outside the country (transboundary shipment) was due to the lack of reporting by the United Kingdom in the resubmitted September 2011 dataset. The table comparing the reporting of hazardous waste outside the country for 2009 with the Transboundary Shipment Regulation was therefore updated to account for this change. The United Kingdom reported 1,988 million tonnes of hazardous waste transferred outside the country in its March 2011 submission, but zero hazardous waste transfers outside the country in its September 2011 resubmission.

**Table 145: Difference in total number of waste transfers between submission by 31 March and by 30 September 2011**

|                | 2009                           |                                 |                     |
|----------------|--------------------------------|---------------------------------|---------------------|
|                | Hazardous waste inside country | Hazardous waste outside country | Non-hazardous waste |
| Austria        | 24%                            | 44%                             | 30%                 |
| Belgium        | 0%                             | 0%                              | 0%                  |
| Bulgaria       | 0%                             | 0%                              | 0%                  |
| Cyprus         | 0%                             | 0%                              | 0%                  |
| Czech Republic | -4%                            | 0%                              | 0%                  |
| Denmark        | 8%                             | 6%                              | 39%                 |
| Estonia        | 0%                             | 0%                              | 0%                  |
| Finland        | 0%                             | 0 in old dataset                | 0%                  |
| France         | 0%                             | 0%                              | 0%                  |
| Germany        | -22%                           | 2%                              | -23%                |
| Greece         | 0%                             | 0%                              | 0%                  |
| Hungary        | 0%                             | 0%                              | 5%                  |
| Iceland        | 0%                             | 0%                              | 0%                  |
| Ireland        | 0%                             | 4%                              | 0%                  |
| Italy          | 0%                             | 0%                              | 0%                  |
| Latvia         | 0%                             | 0%                              | 0%                  |
| Liechtenstein  | 0%                             | 0%                              | 0%                  |
| Lithuania      | 0%                             | 0%                              | 0%                  |
| Luxembourg     | 0%                             | 0%                              | 0%                  |
| Malta          | 0%                             | 0%                              | 0%                  |
| Netherlands    | -45%                           | 0%                              | -6%                 |
| Norway         | 13%                            | 0%                              | 0%                  |
| Poland         | -8%                            | 0%                              | -6%                 |
| Portugal       | 0%                             | 0%                              | 0%                  |
| Romania        | 2%                             | 0%                              | 0%                  |
| Slovakia       | 0%                             | 0%                              | 0%                  |
| Slovenia       | 27%                            | 4%                              | 0%                  |
| Spain          | 0%                             | 0%                              | 0%                  |
| Sweden         | -1%                            | 0%                              | 0%                  |
| Switzerland    | 10%                            | 7%                              | 11%                 |
| United Kingdom | -5%                            | 0 in updated dataset            | 0%                  |
| <b>TOTAL</b>   | <b>-10%</b>                    | <b>-69%</b>                     | <b>-5%</b>          |