This project is funded by the European Union and the Republic of Türkiye.

Technical Assistance for Assessment of Türkiye's Potential on Transition to Circular Economy EuropeAid/140562/IH/SER/TR

Activity 3.2.3. Training of Trainers on integrated waste management in line with Circular Economy

Circular Economy and Waste Management

Ankara, 10-11 October 2024

Onur Akpulat, Deputy Team Leader

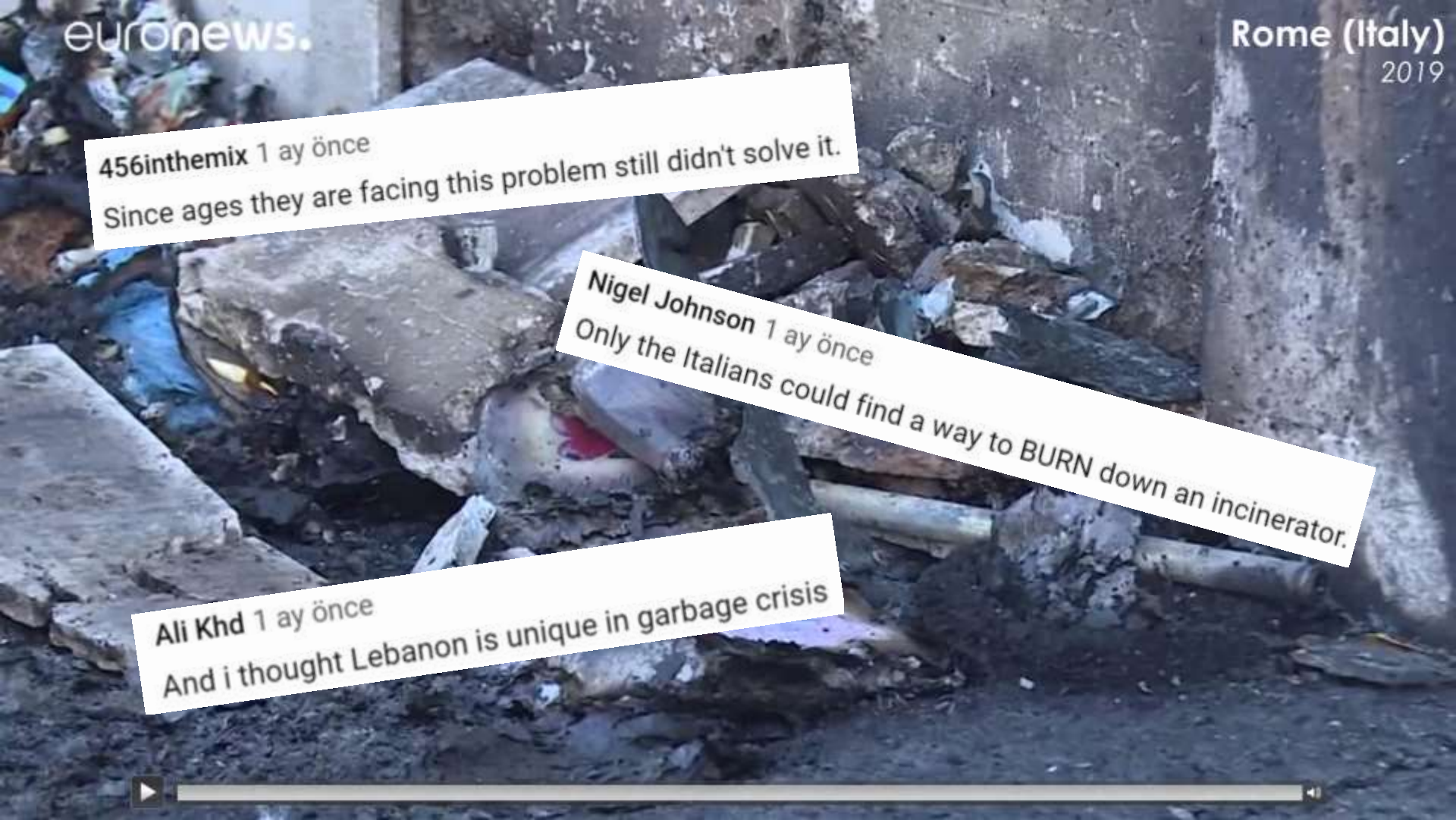

*WE CANNOT GO BACK TO NORMAL, BECAUSE OUR OLD NORMAL WAS THE PROBLEM.
我們不能回復正常
因為原來的正常就是問題

Türkiye
1987

Beirut (Lebanon)

2018


euronews.
Rome (Italy)
2019


euronews.
Rome (Italy)
2019
456inthemix 1 ay önce
Since ages they are facing this problem still didn't solve it.
Nigel Johnson 1 ay önce
Only the Italians could find a way to BURN down an incinerator.
Ali Khd 1 ay önce
And i thought Lebanon is unique in garbage crisis

Sustainability Concept and Tools

UNITED NATIONS

OECD

THE WORLD BANK
IBRD • IDA | WORLD BANK GROUP

SÜRDÜRÜLEBİLİR SİSTEMLER (SUSTAINABLE SYSTEMS)

SC: Sustainable Consumption (Sürdürülebilir Tüketim)
SP: Sustainable Production (Sürdürülebilir Uretim)
RC: Responsible Care (Uçlü Sorumluluk)

ALT SİSTEMLER (SUB – SYSTEMS)

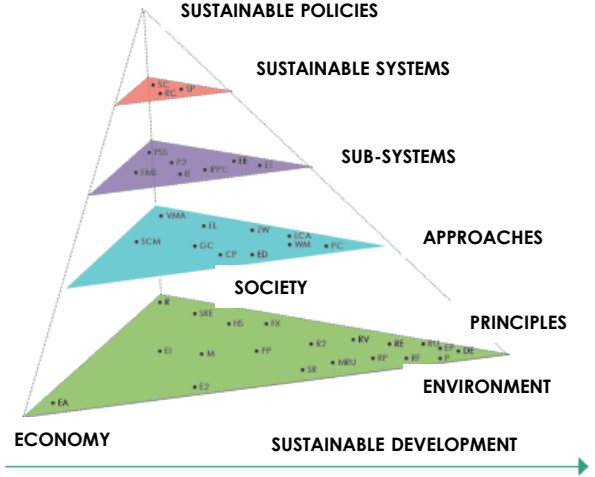
ET: Environmental Technology (Çevre Teknolojileri)
EE: Environmental Engineering (Çevre Mühendisliği)
IPPC: Integrated Pollution Prevention Control (Entegre Kirlilik Önleme ve Kontrol)
IE: Industrial Ecology (Endüstriyel Ekoloji)
P2: Pollution Prevention (Kirliliğin Önlenmesi)
PSS: Product Service System (Ürün Servis Sistemi)
EMS: Environmental Management Strategy (Çevresel Yönetim Stratejileri)

PRENSİPLER (PRINCIPLES)

DE: Degradation (Bozundurma)
P: Purification (Arıtma)
RU: Reuse (Yeniden Kullanım)
RG: Regeneration (Yenilenme)
RF: Remanufacturing (Yeniden Uretim)
RE: Recycling (Geri Dönüşüm)
RP: Repair (Onarım)
RV: Recovery (Geri Kazanım)
MRU: Minimization Resource of Usage (Kaynak Kullanımının Minimize Edilmesi)
R2: Renewable Resources (Yenilenebilir Kaynaklar)
SR: Source Reduction (Kaynakta Azaltma)
FX: Factor x (Faktör- x)
PP: "Polluter Pays" principle ("Kirleten Oder" Prensibi)
HS: Health and Safety (Sağlık ve Güvenlik)
SRE: Social Responsibility (Sosyal Sorumluluk)
M: Mutualism (Kazan-kazan)
E2: Eco- efficiency (Eko-verimlilik)
EI: Ethical investment (Etik Yatırım)
R: Reporting to the Stakeholders (Paydaşları Bilgilendirme)
EA: Environmental Accounting (Çevre Muhasebesi)

YAKLAŞIMLAR (APPROACHES)

PC: Pollution Control (Kirlilik Kontrolü)
WM: Waste Minimization (Atık Minimizasyonu)
LCA: Life Cycle Assessment (Yaşam Döngüsü Değerlendirme)
ZW: Zero Waste (Sıfır Atık)
ED: Eco-design (Eko-tasarım)
CP: Cleaner Production (Temiz Üretim)
EL: Environmental Legislation (Çevre Mevzuatı)
GC: Green Chemistry (Yeşil kimya)
VEA: Voluntary Environmental Agreement (Gönüllü Çevresel Anlaşma)
SCM: Supply Chain Management (Tedarik Zinciri Yönetimi)



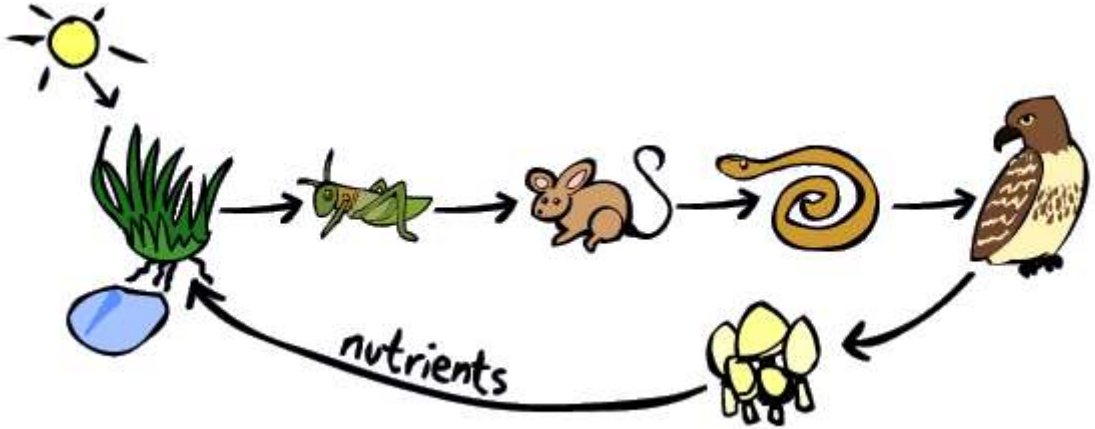
Source: Glavic P., Lukman R., 2007

EU's Waste Management Policies and Strategies

- **Çevre Eylem Programları** (Environmental Action Programs) – 1973-2013
- **Atık Önleme ve Geri Dönüşüm Tematik Stratejisi** (Thematic Strategy on Waste Prevention and Recycling) – 2005 (Rev: 2011)
- **Doğal Kaynakların Sürdürülebilir Kullanımı Tematik Stratejisi** (Thematic Strategy on the Sustainable Use of Natural Resources) – 2005
- **Entegre Ürün Politikası** (Integrated Product Policy) (IPP) – 2003
- **Sürdürülebilir Tüketim ve Üretim / Sürdürülebilir Sanayi Politikası Eylem Planı** (Sustainable Consumption and Production and Sustainable Industrial Policy (SCP/SIP) Action Plan) – 2008
- **Döngüsel Ekonomi Eylem Planı** (Circular Economy Action Plan) – 2015 ve 2020

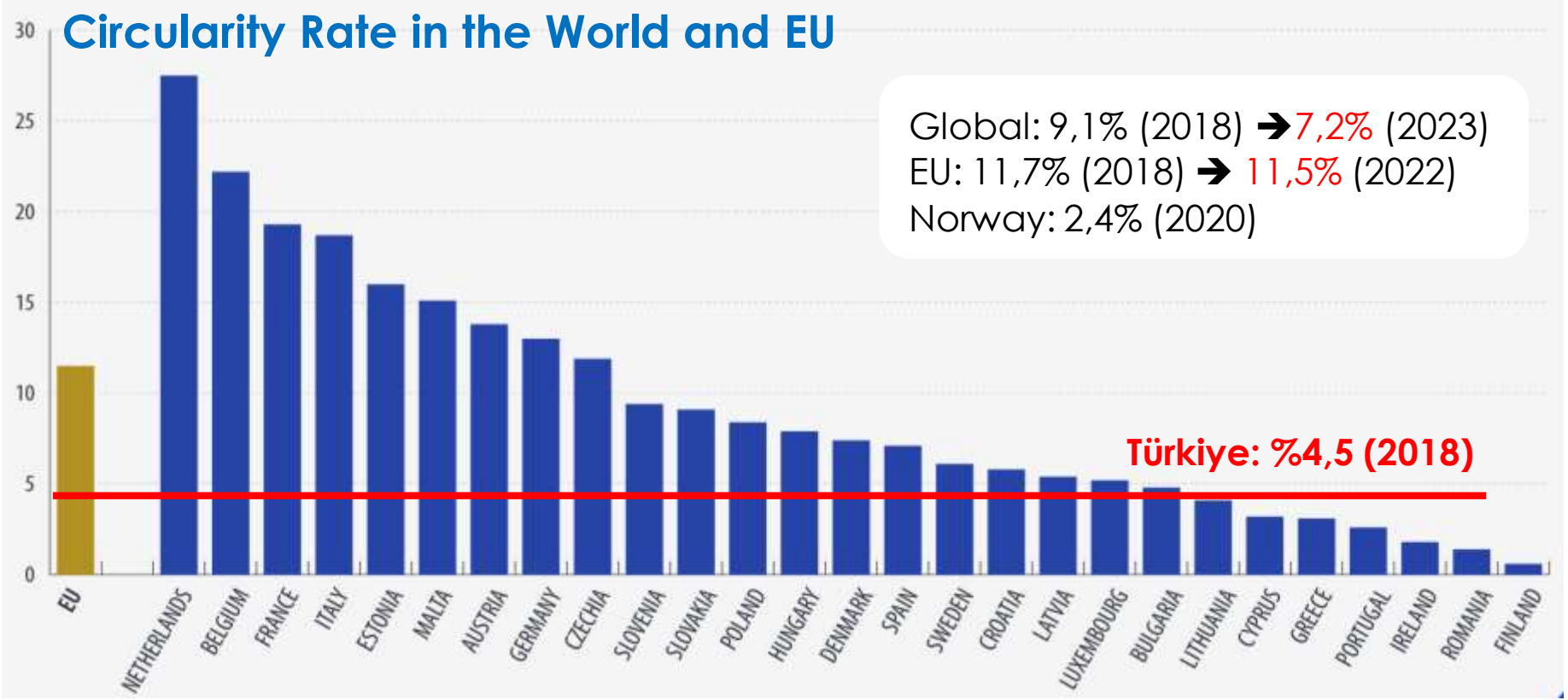
NATURE IS CIRCULAR!

In an ideal world, almost everything would be reused, recycled or valorized to produce other outputs.

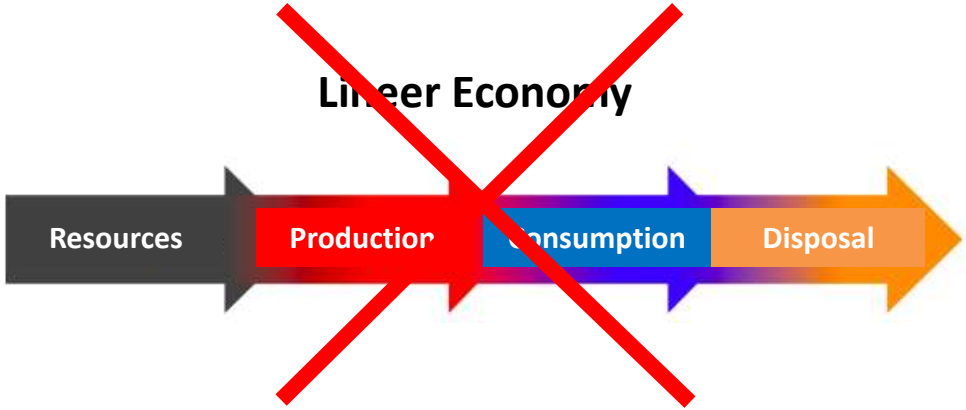


WHAT ABOUT US?

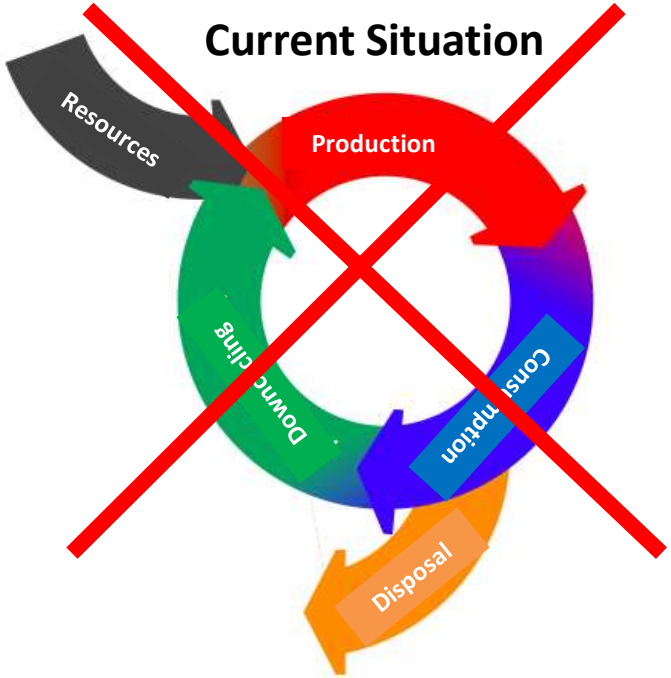
WHAT ABOUT US?



What is Circular Economy?



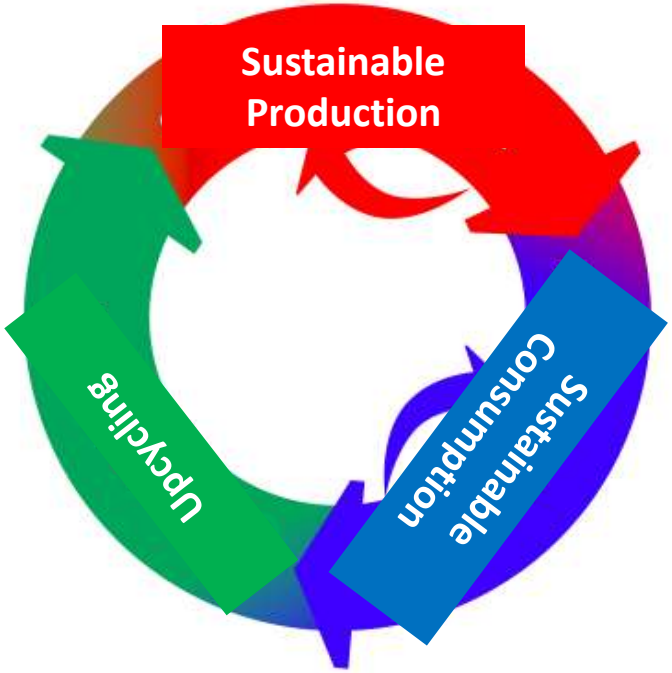
Take-Make-Waste economy
Energy entirely from fossil fuels



Recycling rates and quality are low
High disposal rates
High use and waste of natural resources
Energy largely from fossil fuels

What is Circular Economy?

Circular Economy



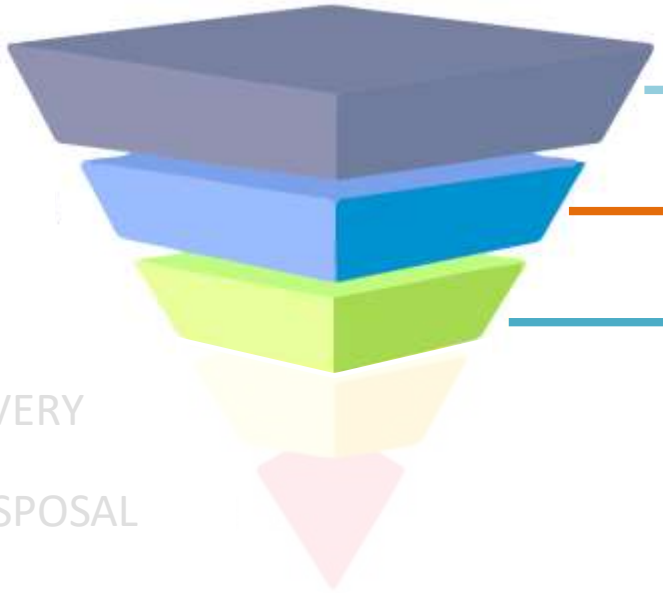
Maximizing the life of products, materials and natural resources

The Circular Economy aims to redesign products and production processes, minimize waste and turn unused materials into resources.

Recycling rates and quality are high.
Disposal is almost non-existent.
Energy from renewable sources.

From Waste Management to Circular Economy

2008



2020

- R1 Reddetmek (Refuse)
- R2 Yeniden Düşünmek (Rethink)
- R3 Azaltmak (Reduce)
- R4 Yeniden Kullanmak (Re-use)
- R5 Tamir Etmek (Repair)
- R6 Yenilemek (Refurbish)
- R7 Yeniden Üretmek (Remanufacture)
- R8 Başka bir Amaca Uygun Hale Getirmek (Repurpose)
- R9 Geri Dönüşüm (Recycle)

Source: EC, 2020c

The Return on Closing the Loop!

It is estimated that the Circular Economy could generate global growth of **$4.5 trillion by 2030.**

This is **4-5%** of the projected **global economy**, more than the entire German economy today (the 4th largest economy in the world).

New Industrial Revolution?

FMCG sector
With packaging optimization
$110 billion growth

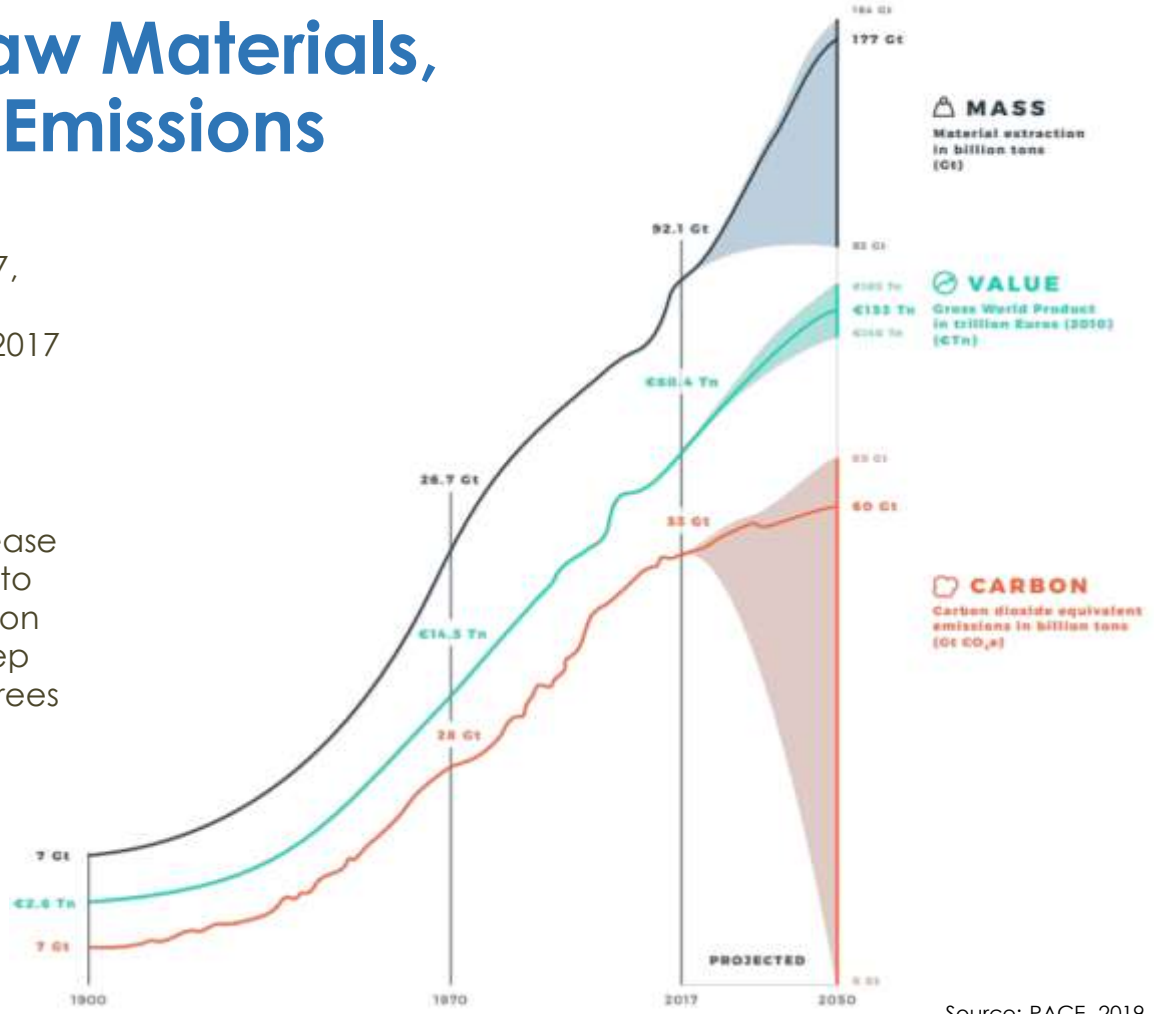
Energy sector
Switching to electricity generation with renewables
$250 billion growth

Source: WEF, 2020

Relation between Raw Materials, Economy and GHG Emissions

- Raw material extraction increased;
  from 7 Gt in 1900 to 92.1 Gt in 2017,
- Global economic size increased;
  from €2.6 Tn in 1900 to €60.4 Tn in 2017
- Greenhouse gases increased;
  from 7 Gt in 1900 to 53 Gt in 2017

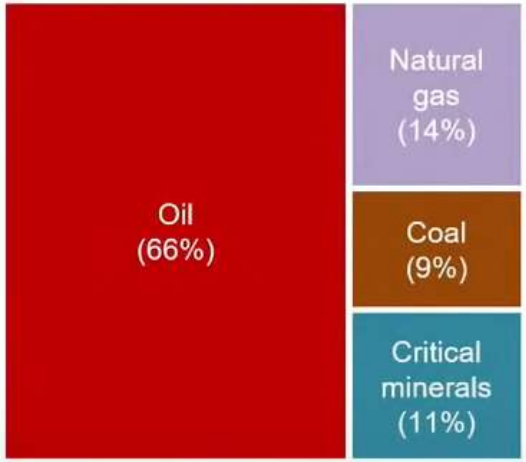
- Between 2017 and 2050, the rate of increase in greenhouse gas emissions is projected to decrease. However, the projected emission values are far above the threshold to keep the temperature increase below 1.5 degrees Celsius of the Paris Agreement.



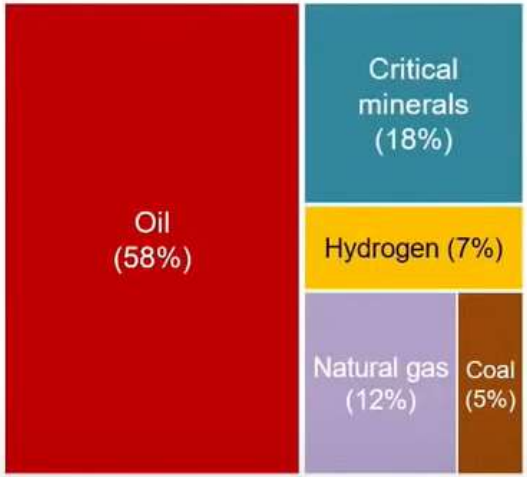
Source: PACE, 2019

Value of Energy Related Raw Material Trade
(2019 – 2050)

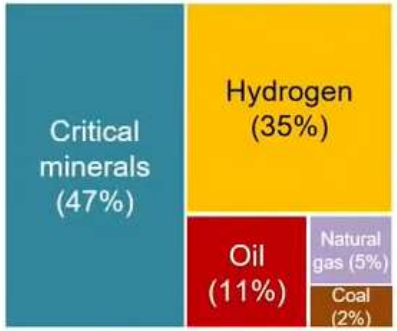
2019
$1,5 trillion



2050: Existing Commitments
$1,5 trillion



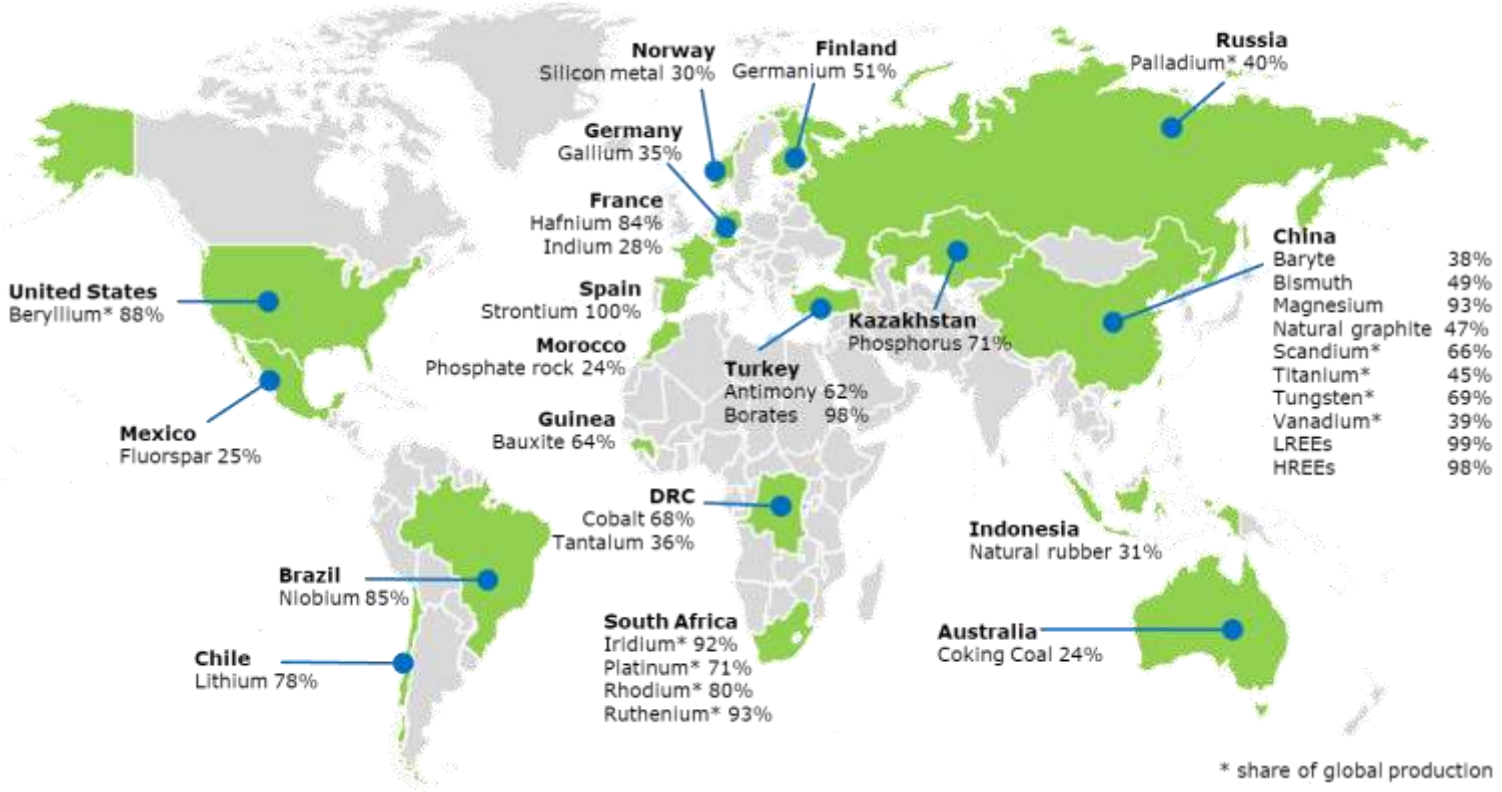
2050: Net Zero Scenario
$0,9 trillion



Source: IEA, 2021

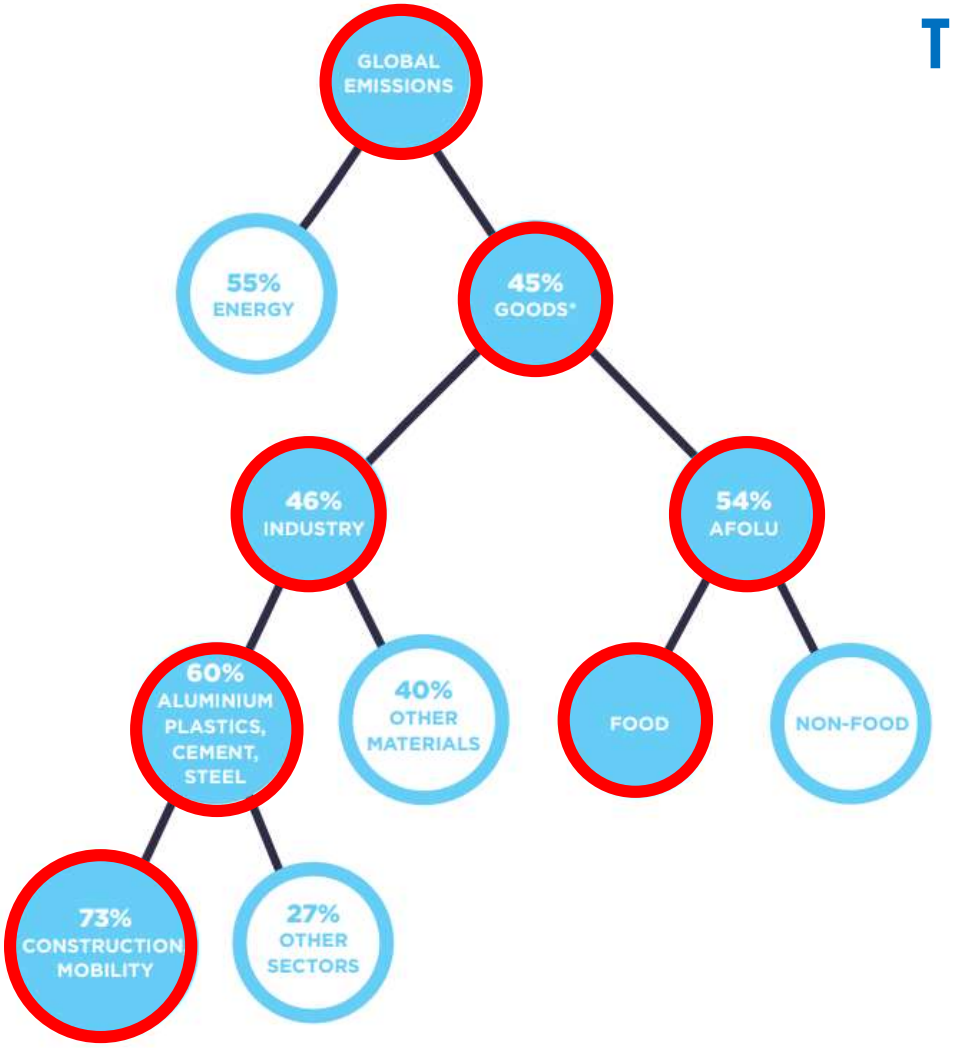
Critical Raw Material

EU's top suppliers of critical raw materials

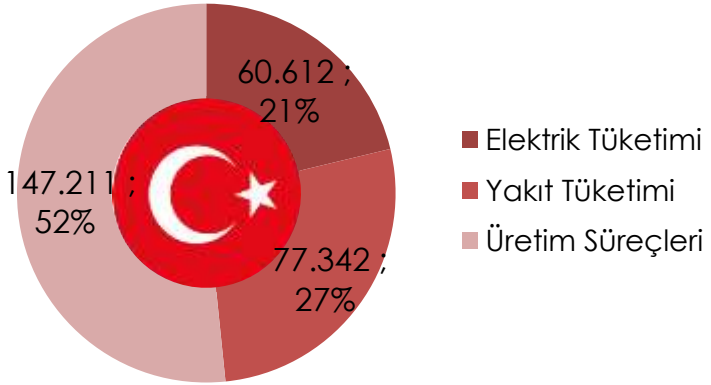


Source: EC, 2020a

Tackling Climate Change & Circular Economy



Türkiye'nin 2021 yılı ulusal sera gazı emisyonlarına bakıldığında toplam 564.390 ton CO_2eş emisyonun yaklaşık **%51**'ine denk gelen **285.165 ton**luk kısmı ürün üretiminden kaynaklanmakta ve **döngüsel ekonomi ile azaltım potansiyeli** barındırmaktadır.



Source: EMF, 2019
UNFCCC, 2023

What Does the EU Circular Economy Strategy Bring?

Maximizing the life of products, materials and natural resources

At EU scale;

- **€600 billion** in annual economic gains (8% of EU turnover)
- **500 million tons of CO_2e** emission recovery in 2035
- Create **170,000 jobs** in waste management in 2035, totalling **580,000 jobs**
- **€465 annual savings** per household on **electricity bills** in 2020
- **20% reduction of raw material requirement** in production
- **3% increase in GDP**

Source: EC, 2018

Challenging Targets!

Recycling 65% of household waste by 2035,

(Interim Targets: 2025 - 55%, 2030 - 60%)

Landfilling of maximum 10% of household waste by 2035,

Recycling 70% of packaging waste by 2030,

- 55% of plastic packaging waste,
- 30% of wood packaging waste,
- 80% of ferrous metal packaging waste,
- 60% of aluminium packaging waste,
- 75% of glass packaging waste,
- 85% of paper/cardboard packaging waste

Source: EC, 2018

2018 EU Circular Economy Package Revisions

Published on June 14, 2018, entered into force 20 days later.

Directives

2018/851 →  Waste Framework Directive (2008/98/EC)

2018/850 →  Landfilling Directive (1999/31/EC)

2018/852 →  Packaging Waste Directive (94/62/EC)

2018/849 →  WEEE Directive (2012/19/EC)

 Waste Batteries and Accus Directive (2006/66/EC)

 End of Life Vehicles Directive (2000/53/EC)

} Amended

Regulation

2018/848 → Labeling of Organic Products → 834/2007 } Repealed

Decision

2018/853 → Environmental Reporting → 1257/2013, 94/63/EC, 2009/31/EC, 86/278/EEC, 87/217/EEC } Amended

91/692/EEC } Repealed

Source: EC, 2018

Single Use Plastics Directive (2019)

By 2030, implementation of the single-use plastics directive will save **2.6 million tons of CO_2e**

The equivalent of **€11 billion** of environmental damage avoided.

For **consumers**, savings of around **€6.5 billion**.

Around **€2 billion in compliance** and **€0.5 million in waste management costs** for businesses

As an additional measure, the integration of a **Deposit Return** or equivalent system would further reduce the amount of plastic waste going to sea at an acceptable extra cost (**around €1.4 billion**).

Source: EC, 2018b

EU Ecodesign Regulations

10 EU Eco-Design Regulation
October 1, 2019

- C(2019) 2120 – ecodesign for household refrigerators and annexes
- C(2019) 2121 – ecodesign for light sources and annexes
- C(2019) 2122 – ecodesign for electronic displays and annexes
- C(2019) 2123 – ecodesign for dishwashers and annexes
- C(2019) 2124 – ecodesign for washing machines and washer-driers and annexes
- C(2019) 2125 – ecodesign for motors and annexes
- C(2019) 2126 – ecodesign for external power supplies and annexes
- C(2019) 2127– ecodesign for refrigerators with a direct sales function and annexes
- C(2019) 5380 – ecodesign for power transformers and annexes
- C(2019) 6843 – ecodesign for welding equipment and annexes

- **7 or 10 years** spare parts production obligation
- Obligation to supply spare parts **in 15 days**
- Parts can be replaced with **ordinary repair tools** without damaging the device

By 2030;

- **167 TWh energy savings** (Denmark's annual energy consumption)
- **46 million tons of CO_2e** emission reduction
- **727 million m^3/year** water savings
- Annual savings of **€150** per household

Source: EC, 2019

Green Deal and New CEAP

New Circular Economy Action Plan (CEAP) - March 2020

- Plan, 2019 yılı sonunda Madrid'de düzenlenen COP 25'te açıklanan Avrupa'nın **"Yeşil Mutabakat"** isimli büyüme stratejisinin temel bileşenlerinden birini oluşturmaktadır.
- Komisyon, **küresel sera gazı salımlarının yarısının hammadde çıkarma ve üretim kaynaklı** olduğunu, Avrupa'nın karbon-nötr hedefine 2050'de ulaşmasının, **döngüsel bir ekonomiye geçmeden mümkün olmadığını** belirtmektedir.
- Plan, Yeşil Düzenin öngördüğü radikal dönüşümü hızlandırmayı ve 2015'ten bu yana uygulanan eylemleri ileri taşımayı hedeflemektedir. Buna yönelik olarak birbiriyle ilişkili **bir dizi girişim** sunmaktadır.

Source: EC, 2020b

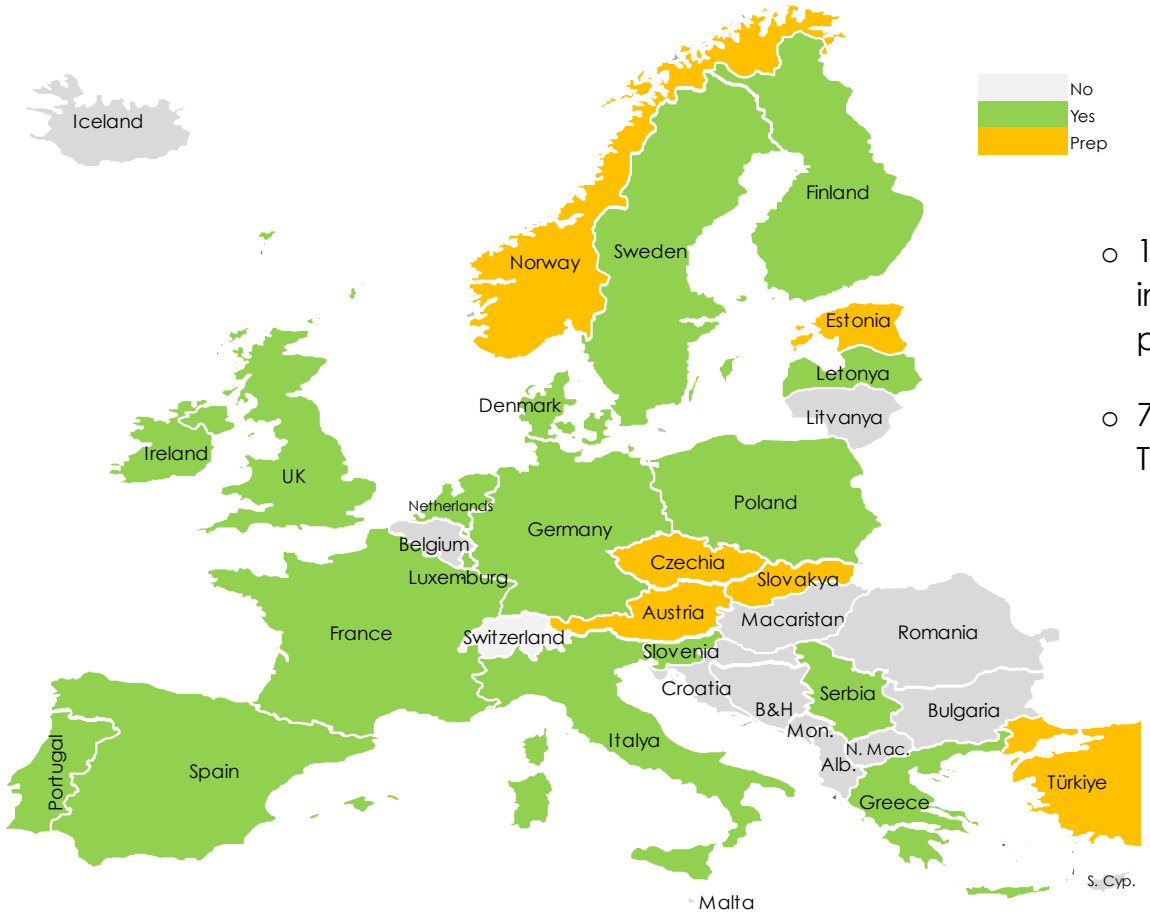
New EU Circular Economy Action Plan

7 Action Areas - 35 Actions

1. **Sustainable Product Poilcy** (right to repair, product as a service, digital product passport etc.)
2. **Key Product Value Chains**
   - Electronic and ICT
   - Battery and Vehicle
   - Packaging
   - Plastic
   - Textile
   - Construction and Building
   - Food, Water and Nutrition
3. **Less Waste, More Value** (reduction targets, ending waste exports etc.)
4. **Horizontal Actions** (Climate Change, Economic Instruments, Digitalization etc.)
5. **Circular Jobs, Regions and Cities** (4 million jobs, up 5% from 2012-18)
6. **Küresel Ölçekte Öncü Çabalar** (Global Plastics Agreement etc.)
7. **Monitoring** (National CEAP, Resource Utilization Indicators etc.)

Source: EC, 2020b

National CEAP and Strategies in the EU



- 15 countries have prepared and started to implement their national strategies and action plans.
- 7 countries are continuing their work including Türkiye

Source: EC, 2022; UNECE, 2021

National Circular Economy Strategy and Action Plan

PROCESS

- **Market Survey and Institutional Visits (gaps, needs, solutions)**
  - Bilateral meetings with **86** and surveys to **133** institutions/organizations/units
- **Circular Economy Workshops**
  - Participation from the public and private sectors **198** physically and **175** remotely
- **Benchmarking Analysis and General Assessment Report**
- **Sectoral Impact Assessment (SIA) Study**
- **Strategy and Action Plan Development Workshops**
  - **125** representatives of institutions/organizations
- **Specialized Working Group (SWG) Meetings**

VISION

Türkiye with net zero emissions by 2053 through a Türkiye-specific circular economy model that extends product life, reduces raw material use and waste generation

6 Strategic Areas, 23 Key Objectives, 56 Actions

Source: DEEP, 2024

National Circular Economy Strategy and Action Plan

6 Strategic Areas

Source: DEEP, 2024

National Circular Economy Strategy and Action Plan

23 Key Objectives

- Eco-design
- New Initiatives
- Industrial production processes
- Packaging
- Battery and Vehicle
- Building
- Electronic and ICT
- Food and Biomass
- Plastic
- Textile
- Waste shipment
- Economic instruments
- National legislation
- SRM and Industrial Symbiosis
- Digitalization
- Zero Waste
- Professional skills and qualifications
- Circular regions and cities
- Collaboration and awareness
- Fair transition
- Taxonomy and financing
- Institutional and technical infrastructure
- Investment and incentive mechanisms
- Circular economy indicators

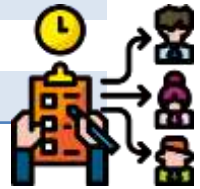
Source: DEEP, 2024

National Circular Economy Strategy and Action Plan

56 Actions

Of the **56 actions** under the action plan, **25 are legislative** and **31 are non-legislative** (infrastructure, technology and innovation, institutional structure and cooperation, and financing and economic instruments).

Name of the Institution (40 Institutions/Stakeholders)	**Number of Actions**	
	Responsible/Coordinating Organization	Related Institutions and Stakeholders
Ministry of Environment, Urbanization and Climate Change	22	28
Ministry of Industry and Technology	9	31
Ministry of Agriculture and Forestry	6	13
Ministry of Trade	5	36



Source: DEEP, 2024

Circular Economy Standards (59000 Family)

ISO 59004 - Vocabulary, principles and guidance for implementation
ISO 59010 - Guidance on the transition of business models and value networks
ISO 59020 - Measuring and assessing circularity performance
ISO 59040 - Product circularity data sheet
ISO 59014 - Sustainability and traceability of the recovery of secondary materials - Principles, requirements and guidance
ISO 59031 - Performance-based approach – Analysis of cases studies
ISO 59032 - Review of existing value networks

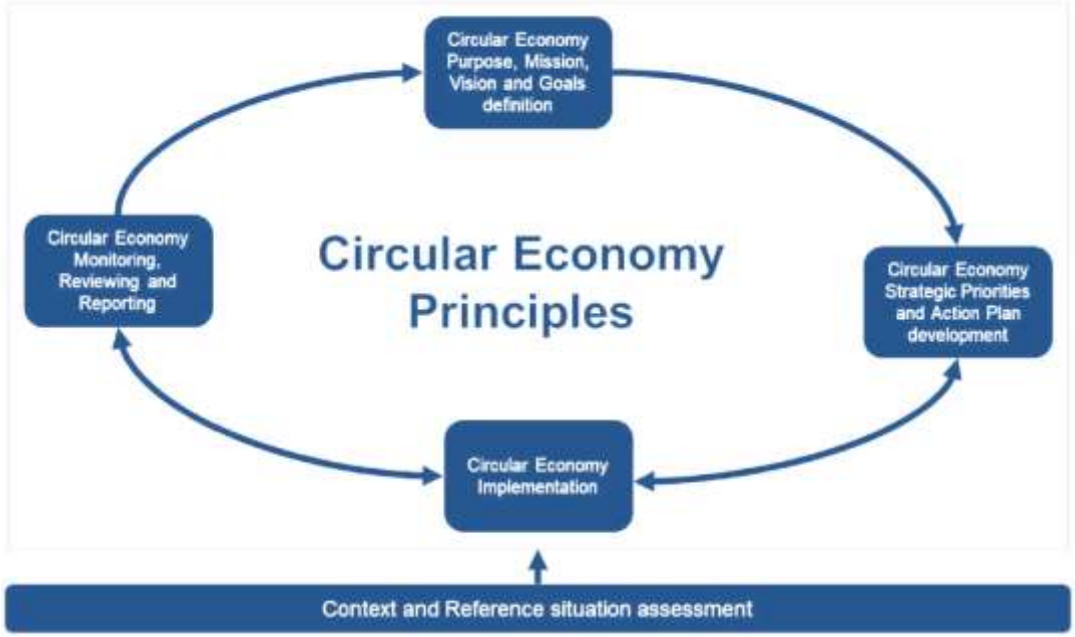
Lack of information and standards will no longer be an excuse for organizations still using the linear production and consumption model.

Source: ISO, 2024

Circular Economy Standards (59000 Family)

ISO 59004 - Vocabulary, principles and guidance for implementation

Circular economy: Economic system that uses a systemic approach to maintain a circular flow of resources by recovering, retaining or adding to their value, while contributing to sustainable development.



Source: ISO, 2024

Monitoring Circularity

- **EU Eurostat** | 28 Indicators since 2018
- **France** | 11 Indicators since 2017
- **The Netherlands** | 21 Indicators since 2018
- **Türkiye** | Planned to be developed in 2027 (22 Indicators?)

Circular economy monitoring framework

1 A-B MATERIAL CONSUMPTION
Material footprint and resource productivity

2 GREEN PUBLIC PROCUREMENT
Share of major public procurement that includes environmental requirements

3 A-F WASTE GENERATION
Total waste generation, total waste generation (excluding major mineral waste) per GDP unit, municipal waste generation, food waste, generation of packaging waste and of plastic packaging waste

6 A-B CONTRIBUTION OF RECYCLED MATERIALS TO RAW MATERIAL DEMAND
Secondary raw materials share of overall materials demand – for the whole economy and for specific materials

7 A-C TRADE IN RECYCLABLE RAW MATERIALS
Imports, exports and intra EU trade of selected recyclable raw materials

4 A-B OVERALL RECYCLING RATES
Recycling rate of municipal waste and of all waste except major mineral waste

5 A-C RECYCLING RATES FOR SPECIFIC WASTE STREAMS
Recycling rate of overall packaging waste, of plastic packaging waste and of WEEE separately collected

8 A-C PRIVATE INVESTMENTS, JOBS AND VALUE ADDED RELATED TO CIRCULAR ECONOMY SECTORS
Private investments, number of persons employed and gross value added related to the circular economy

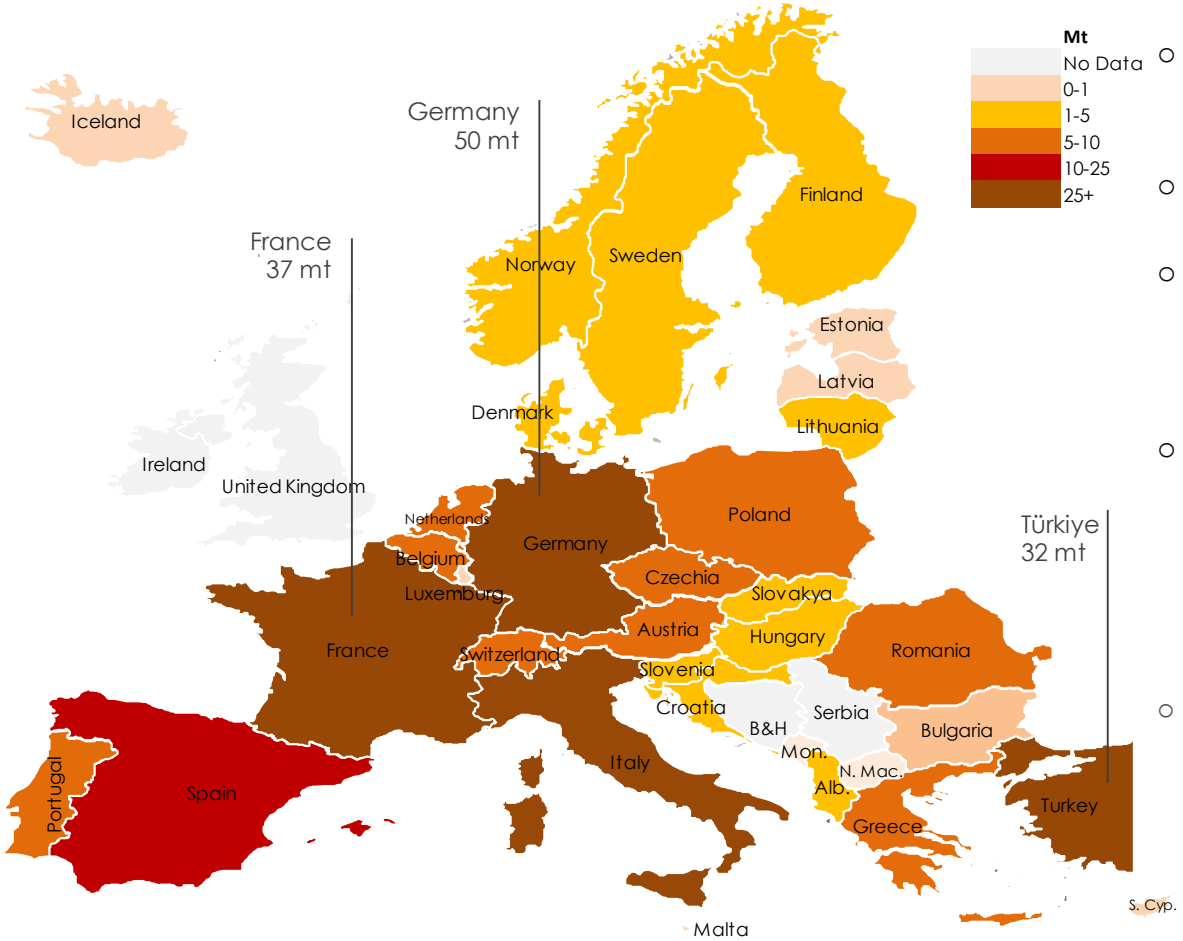
9 INNOVATION
Patents on waste and recycling

10 A-B GLOBAL SUSTAINABILITY
Consumption footprint and GHG emissions from production activities

11 A-B RESILIENCE
Material import dependency and EU self-sufficiency for raw materials

Source: EC, 2023; MoET, 2021

Municipal Waste Generation in the EU and Türkiye (2022)

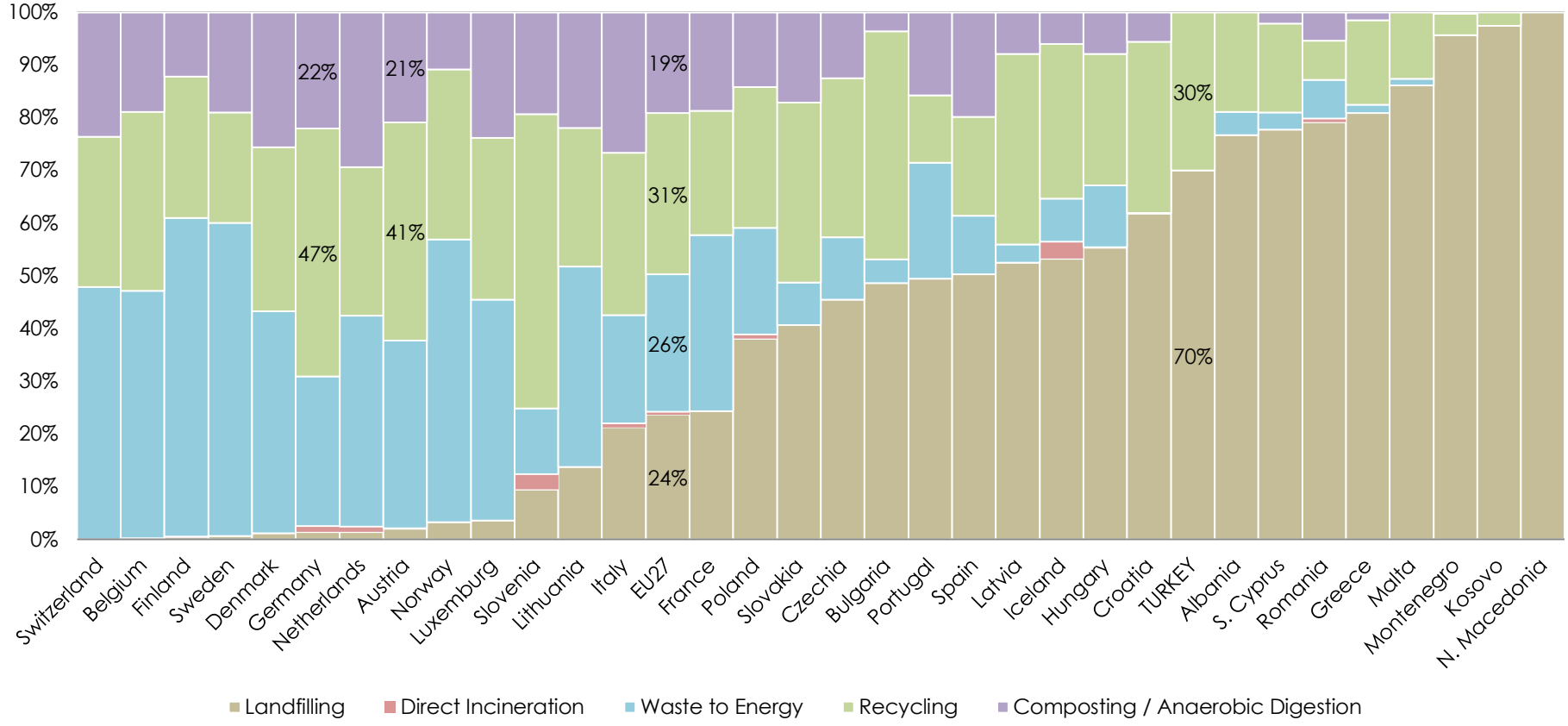


- In 2022, a total of **229 million tons (mt) of household waste** was generated in the EU27.
- In the EU, there was a **3.4% reduction** in 2021 to 2022.
- EU countries with the highest waste generation
  - Germany 50 mt
  - France 37 mt.
- In the same year, **32 millon tons of household waste** was generated in Türkiye. In the same period, the amount of household waste generated in Türkiye decreased by **7.4%**.

- *Data for Bulgaria, Czechia, Greece, Italy, Latvia, Austria, Portugal, Finland, Iceland, are for 2021.*

Source: Eurostat, 2022

Municipal Waste Management in the EU and Turkey (2022)



**Data for Bulgaria, Czechia, Greece, Italy, Latvia, Austria, Portugal, Finland, Iceland, are for 2021.*

Source: Eurostat, 2022; MoEUCC, 2022

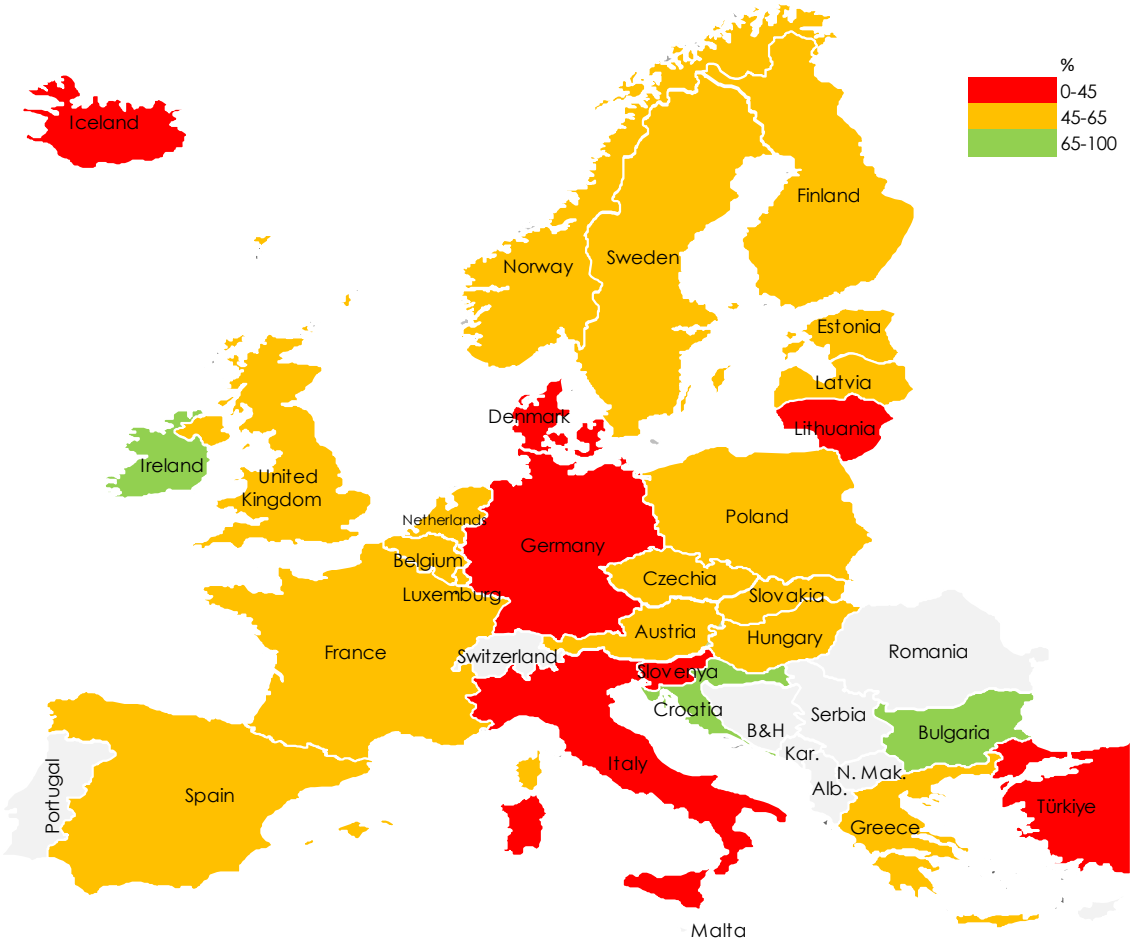
WEEE Collection Rates in the EU (2018➔2021)

- The EU collected a total of 4 million tons of WEEE, **47%** of the total, **barely meeting the pre-2019 target (45%)**.
- The target for 2019 and beyond **(65%)** is **expected to be difficult**.

- Croatia 83%, Bulgaria 73%, Ireland 65
- France 46%, Poland 45%, Greece 45
- Denmark 44%, Germany 43%, Italy 43
- **Türkiye 3%**

Based on EU WEEE Directive WEEE Collection Rate Calculation Methodology;

WEEE Collection Rate = Amount of WEEE Put on the Market (2015, 2016, 2017 average) / Amount of WEEE Collected (2018)



Source: Eurostat, 2018

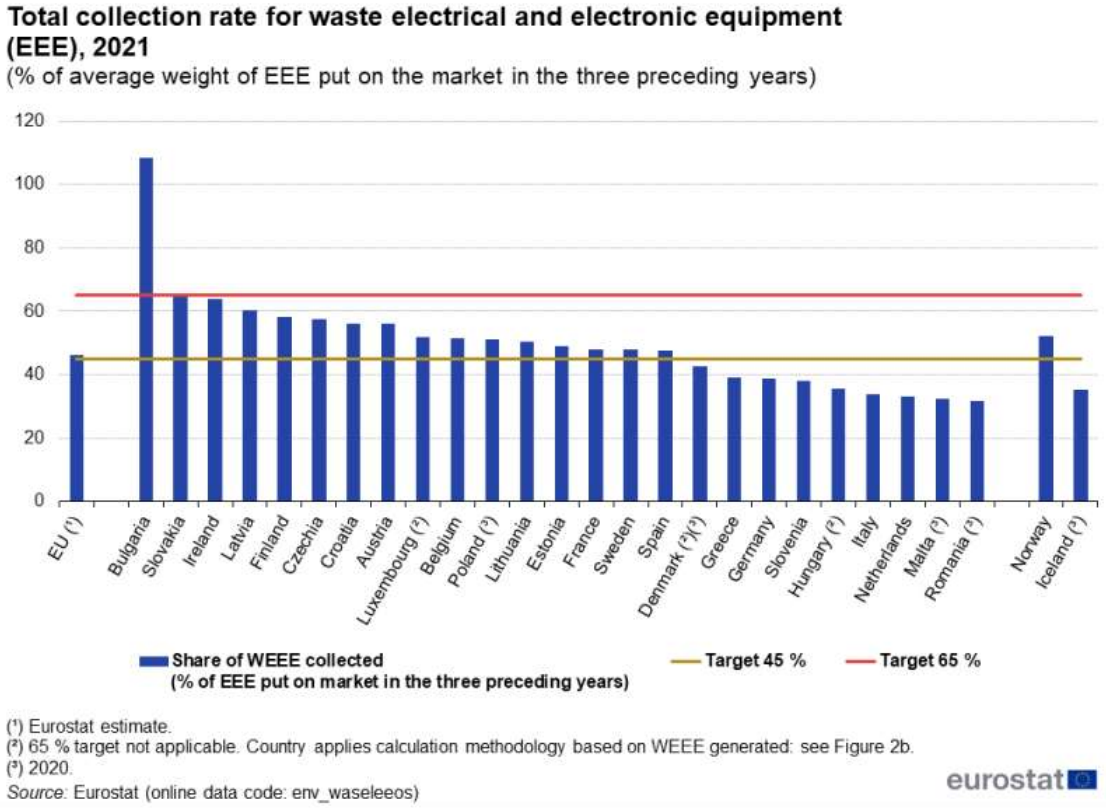
WEEE Collection Rates in the EU (2018➔2021)

- The EU collected a total of 4 million tons of WEEE, **47%** of the total, **barely meeting the pre-2019 target (45%)**.
- The target for 2019 and beyond **(65%)** is **expected to be difficult**.

- Croatia 83%, Bulgaria 73%, Ireland 65
- France 46%, Poland 45%, Greece 45
- Denmark 44%, Germany 43%, Italy 43
- **Türkiye 3%**

Based on EU WEEE Directive WEEE Collection Rate Calculation Methodology;

WEEE Collection Rate = Amount of WEEE Put on the Market (2015, 2016, 2017 average) / Amount of WEEE Collected (2018)



Source: Eurostat, 2018

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Thank You

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