This project is co-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

Disposal-Free Waste Management: Local Practices from Türkiye and the World from a Minimisation Perspective

Dr. Ahmet Cihat Kahraman | Marmara Municipalities Union

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Ankara

REPUBLIC OF TÜRKİYE MINISTRY OF ENVIRONMENT, URBANIZATION AND CLIMATE CHANGE

Environment and Climate Action Sector Operational Programme

deep Türkiye Döngüsel Ekonomi Eylem Planı

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cont

Why is waste minimisation important?

waste quantity, welfare, composition, management, etc.

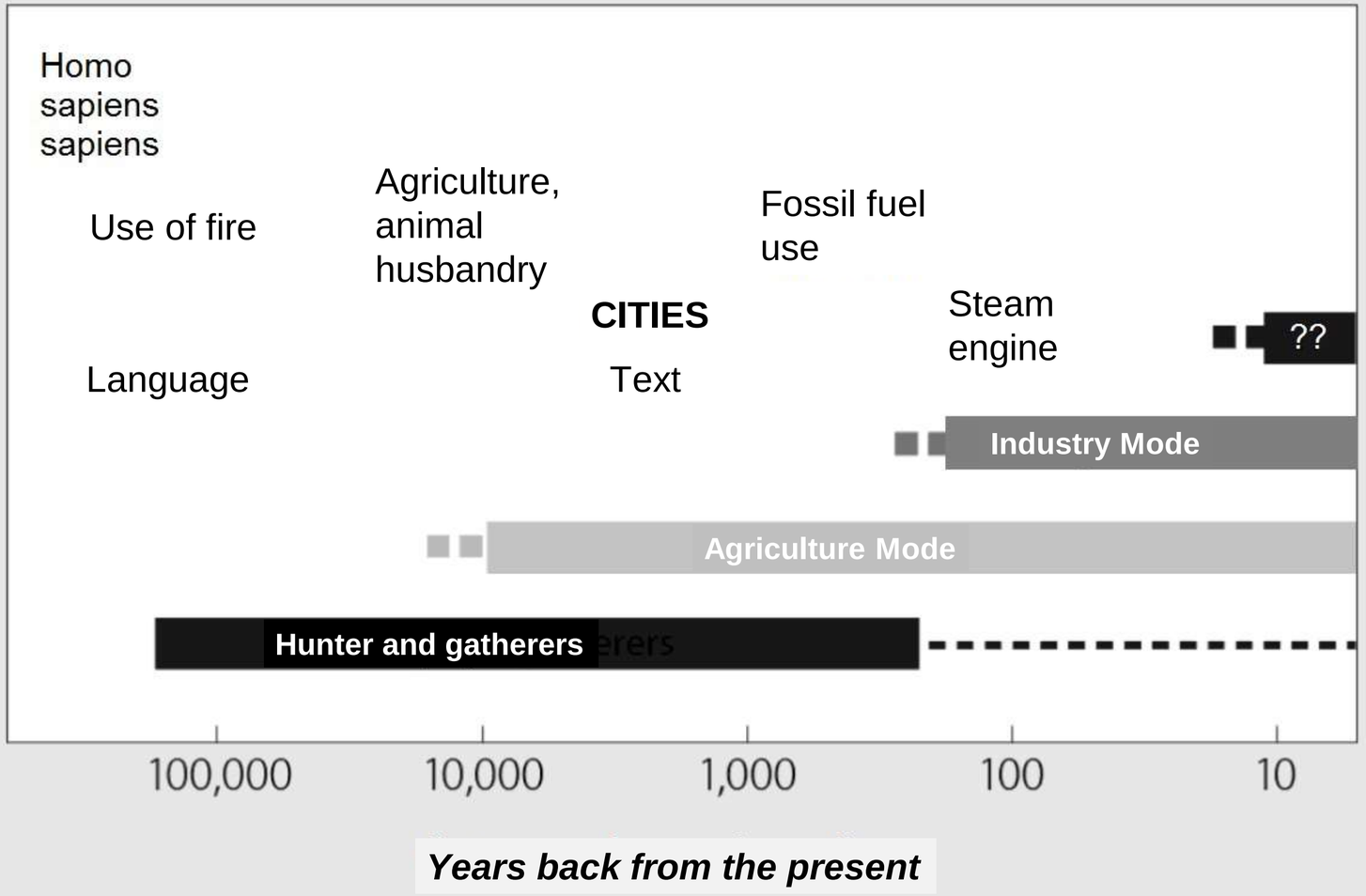
Responsibilities, practices and the last word!

Socio-metabolism (1)

reading recommendation

- *State of the World, 2016*

Sociometabolic regimes in human history



Years back from the present

Socio-metabolism (2)

reading recommendation

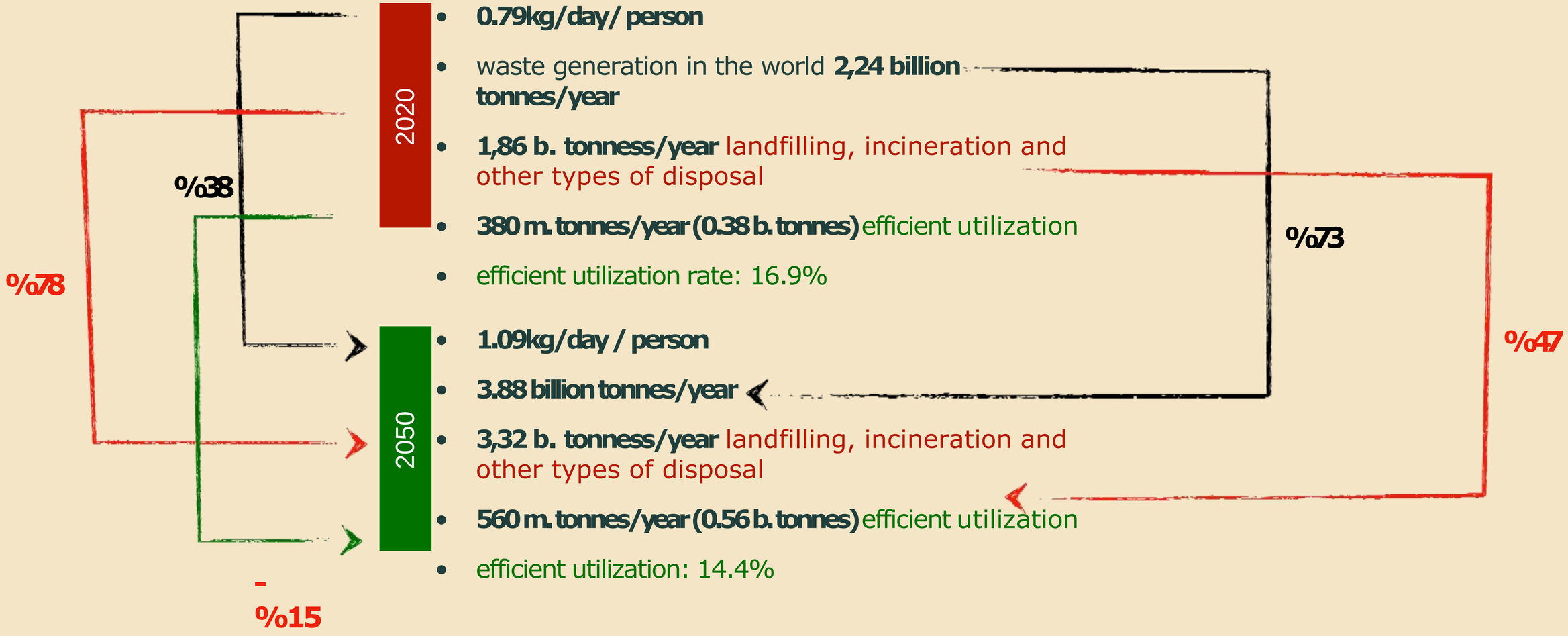
- *Socio-Metabolic Regimes and Transitions Between Them*

Sociometabolic Regimes and Their Quantities

Parameter	Hunter and Gatherer Society	Agricultural Society	Industrial Society
Source of energy	Biomass (100%)	Biomass (98%) Wind and Water (2%)	Biomass (<30%) Fossil fuels (>70%) Nuclear, Water, Photovoltaics, Wind … (<5%)
Energy consumption (GJ/person.year)	10 GJ	70 GJ	200 GJ
Materail source	Biomass (10%)	Biomass (95%) Minerals and metals	Biomass (35%) Fossil Fuels (25%) Metlas and ind. Minerals (5%) Construction materials (min.) (35%)
Material consumption (tonnes/person-year)	1 t	5 t	15 t
Material stock	< 1 t	< 10 t	> 300t
Population density (person/km2)	0.025-0.115 person	< 40 person	<400 person

Waste

2020 vs 2050

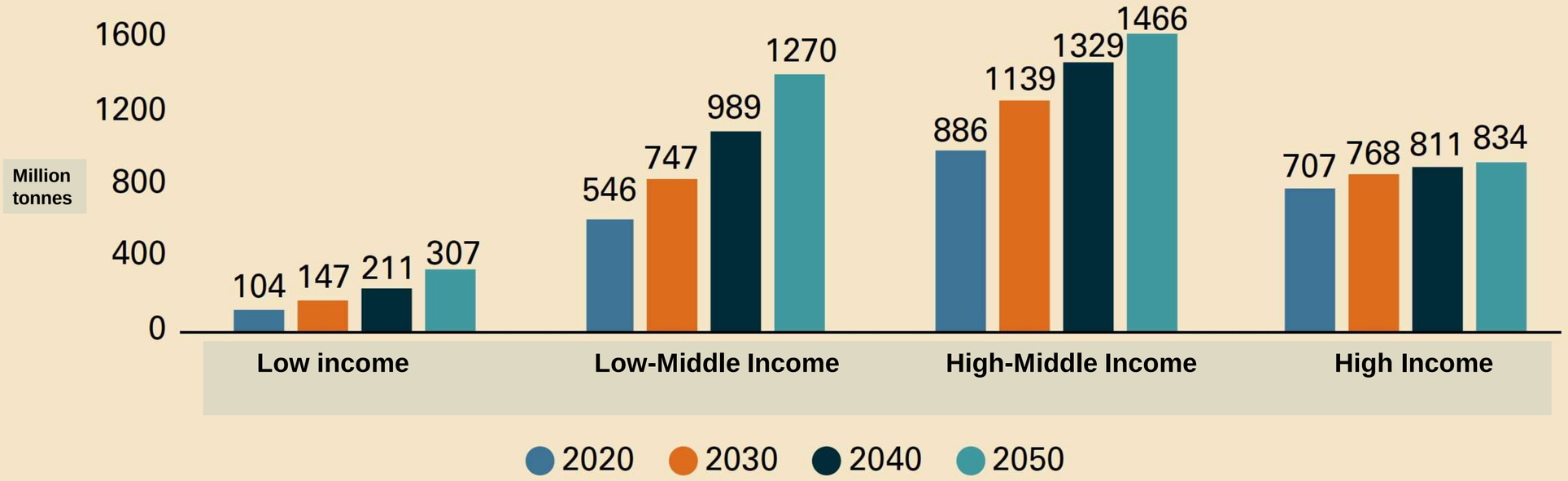


- **0.79kg/day/ person**
- waste generation in the world **2,24 billion tonnes/year**
- **1,86 b. tonness/year** landfilling, incineration and other types of disposal
- **380 m. tonnes/year (0.38 b. tonnes)** efficient utilization
- efficient utilization rate: 16.9%

- **1.09kg/day / person**
- **3.88 billion tonnes/year**
- **3,32 b. tonness/year** landfilling, incineration and other types of disposal
- **560 m. tonnes/year (0.56 b. tonnes)** efficient utilization
- efficient utilization: 14.4%

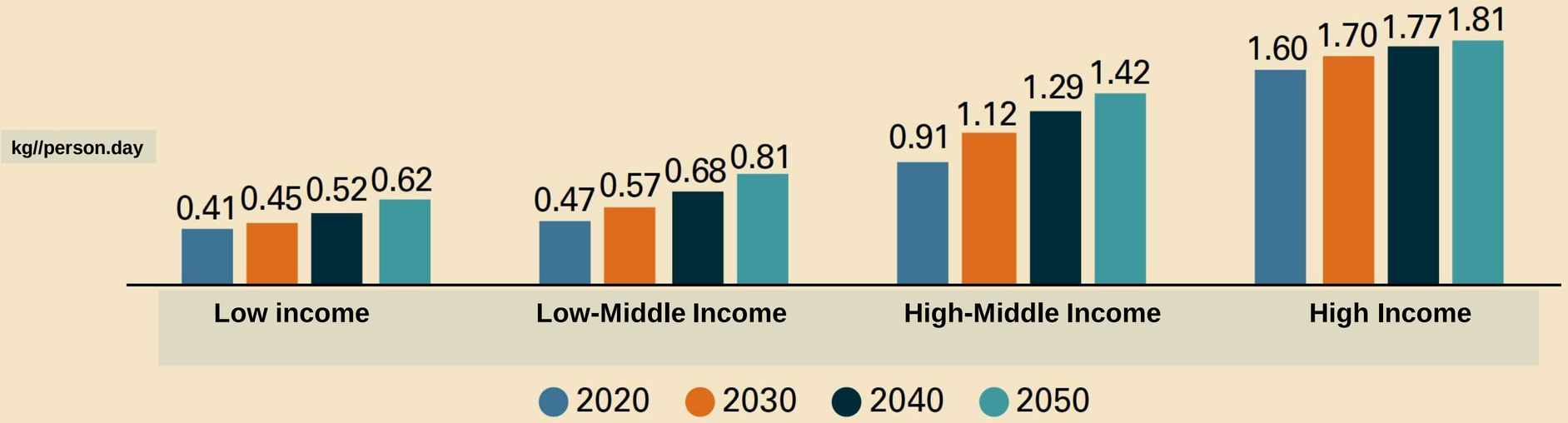
Total waste generation by income level

Waste — **Amount** vs **Welfare**



- Middle Income (low and high) waste growth is unsustainable development oriented (urbanisation, economic development, etc.).
- Low - Middle Income per capita increase 72%
- High - Middle Income per capita increase 56%
- High Income per capita increase 13 %
- Total waste generation before 2020; high income > high-middle > low-middle
- In total waste generation after 2030; high-middle > low-middle > high income

Gelir seviyesine göre kişi başı atık üretimi projeksiyonları



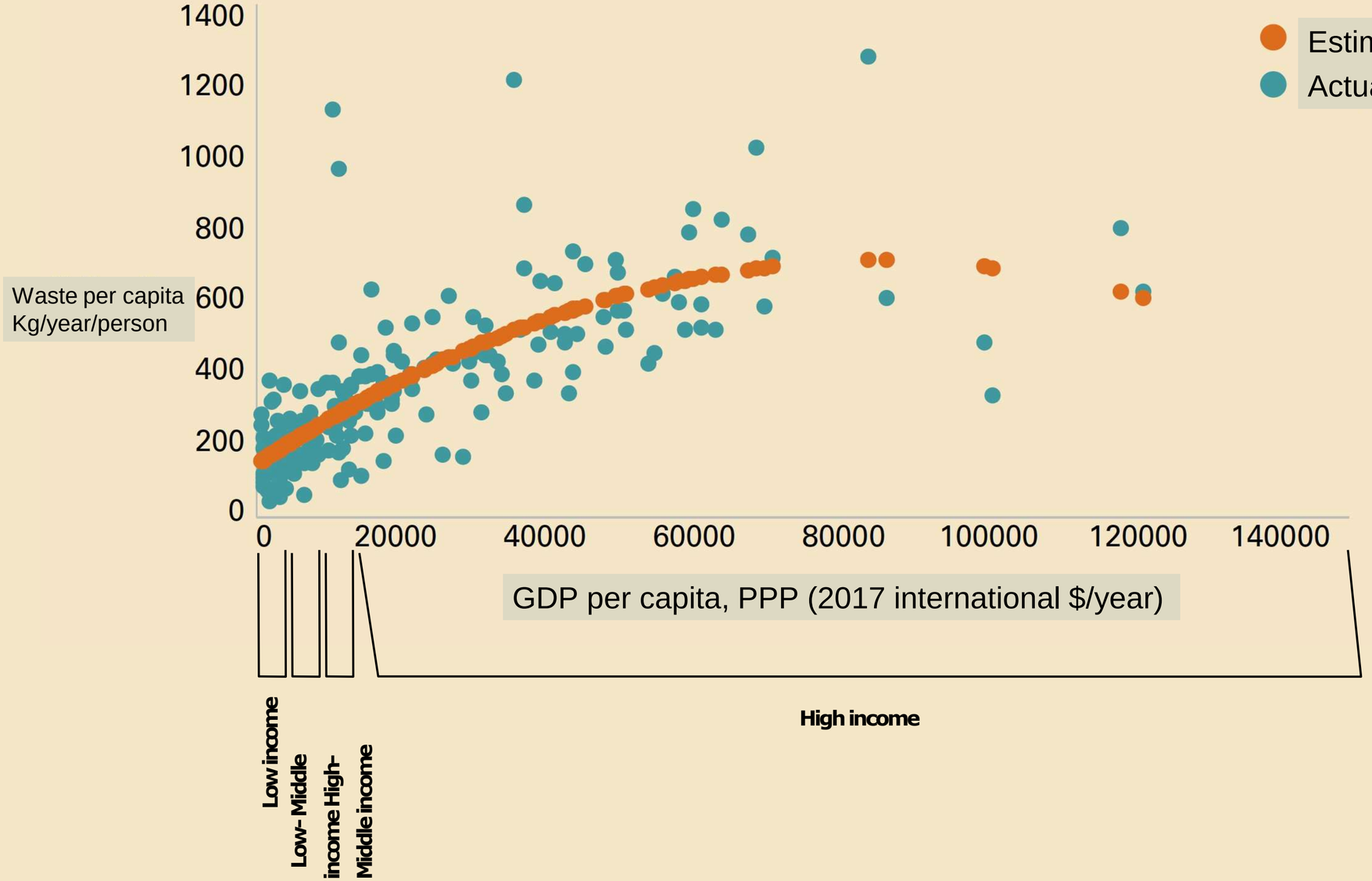
- **Low income:** $1,025 or less **Low - Middle**
- **Income:** 1.026 - 4.035 $ **High - Middle**
- **Income:** 4.036 - 12.475 $ **High Income:**
- $12,476 or more

Ref.: WB Classification, 2015

Waste

Amount vs **Welfare**

Waste generation: Actual and Model Prediction

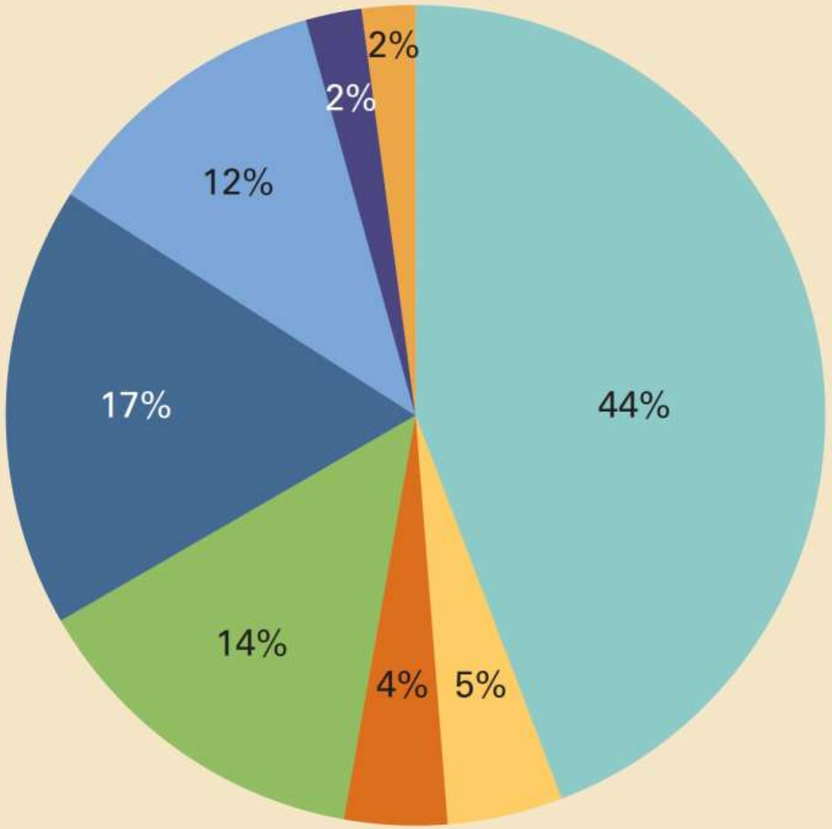


- Decoupling the direct proportion between economic development and waste generation: **Decoupling**
- Waste management for; **5xR.Y = K.Y** *(Low-Middle and High-Middle Income)*
- For High income and High-Middle Income **waste prevention** strategies
- For Low income and Low-Middle Income **waste management** for their strategies **financing**
- **Total waste generation quantities after 2030: high-middle > low-middle > high income**

Waste

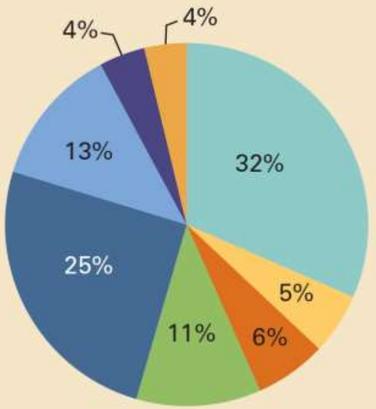
Composition

Global Waste Composition

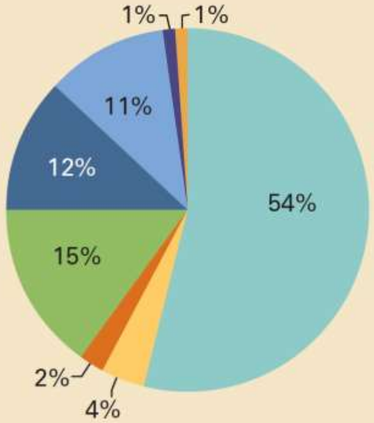


Food and garden
Glass
Metal
Other
Paper and cardboard
Plastic
Rubber/tyre and leather
Wood

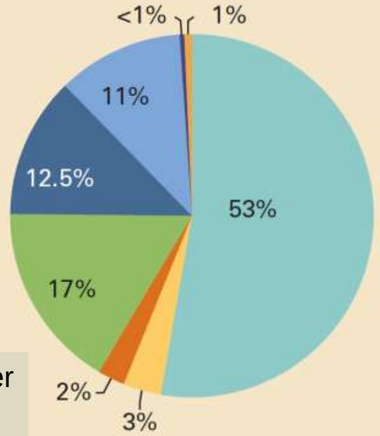
High Income



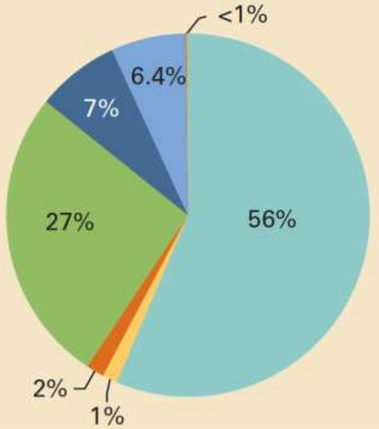
High-Middle Income



Low-Middle Income



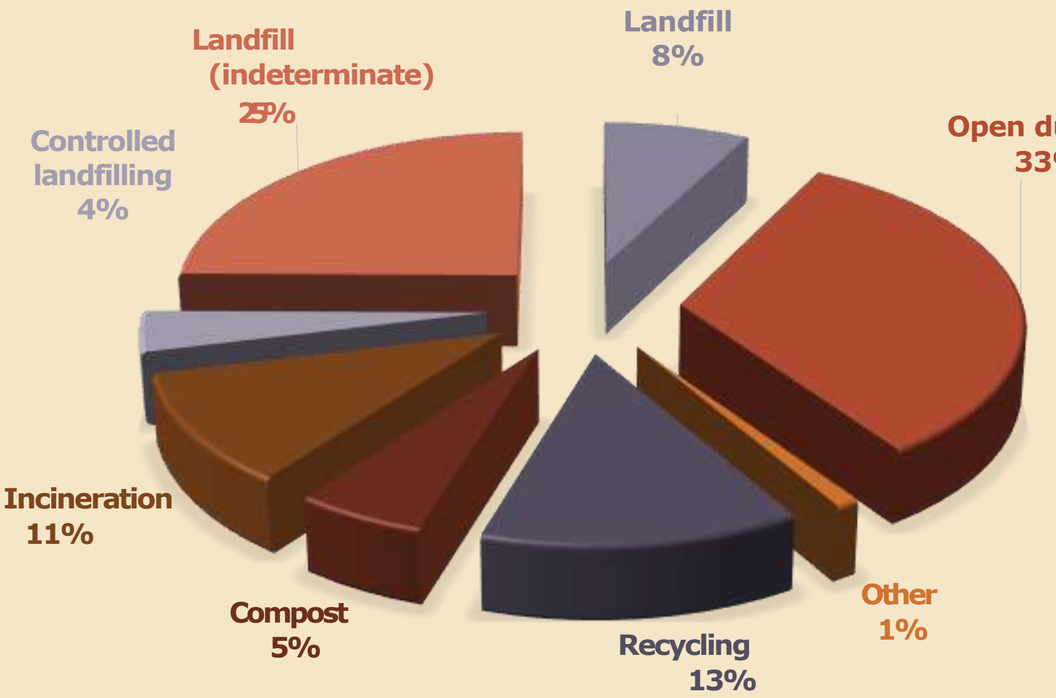
Low Income

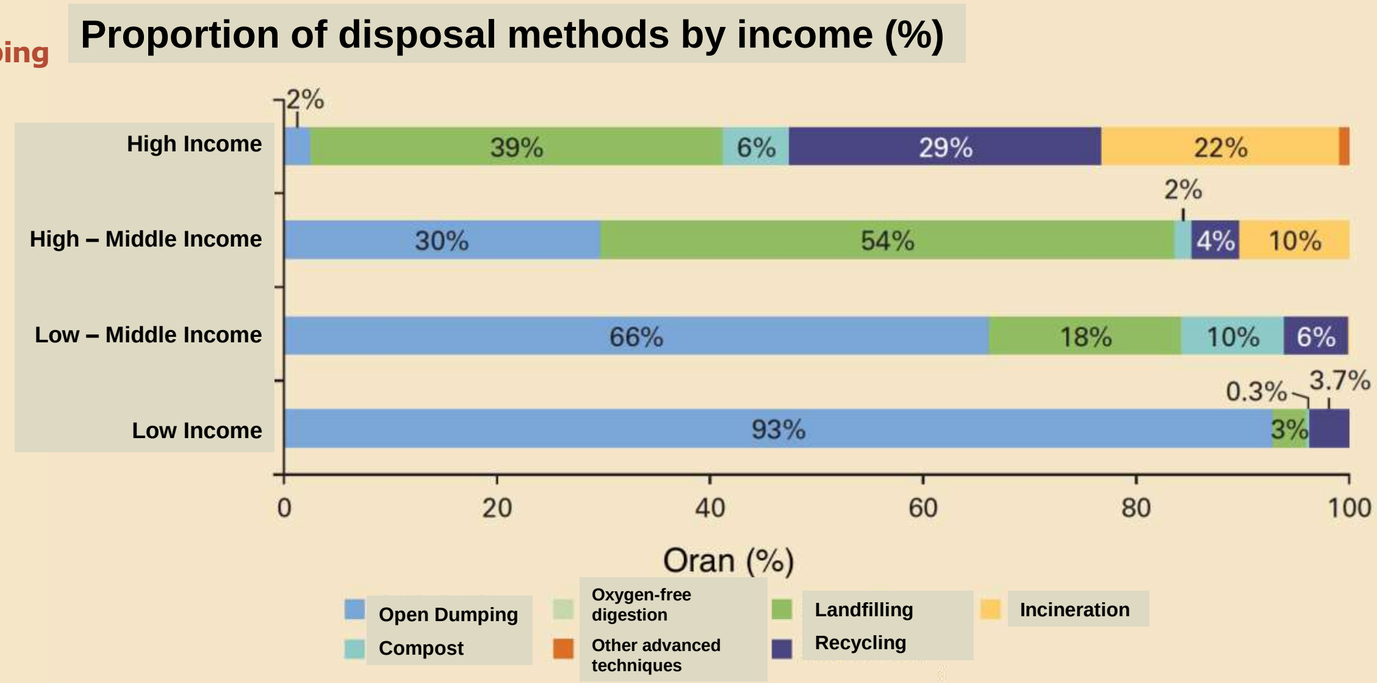


- Food and Garden waste **%44;**
- Dry recyclable waste (glass, metal, paper, plastic) **%38**
- Waste composition differs **according to income level!**
- Income level and organic waste rate are **inversely proportional**!
- **"Paper and plastic" use is** higher **per unit product in** high-income countries**!**
- **Waste composition data quality is directly** proportional to income level *(Other rates etc.)*
- **Waste collection rates proportional to income level (***high to low***:** *96, 82, 51, 39 %***)**

Waste

disposal, recycling, etc.





- **Globally, 70 % of the waste generated in any form is landfilled.**
- **12 % of the total amount of waste landfilled is subject to a control.**
- **Waste collection rates are proportional to income level** *(high to low: %96, 82, 51, 39)*

Waste management

Why?

Climate Change

The transport, processing and disposal of waste leads to the formation of CO2 and other greenhouse gases that cause climate change, as well as other air pollutants.

Loss of Biodiversity

Indiscriminate waste disposal practices can result in the introduction of hazardous chemicals into soil, water bodies and air, causing long-term and potentially irreversible damage to local flora and fauna, affect biodiversity negatively, damage entire ecosystems and enter the human food chain.

Polution

Every year, 400,000 - 1 million people worldwide die from diarrhoea, malaria, heart disease and cancer due to mismanaged waste (Williams et al., 2019).

Waste management

How?

Environmentally friendly

Economic

Community orientated

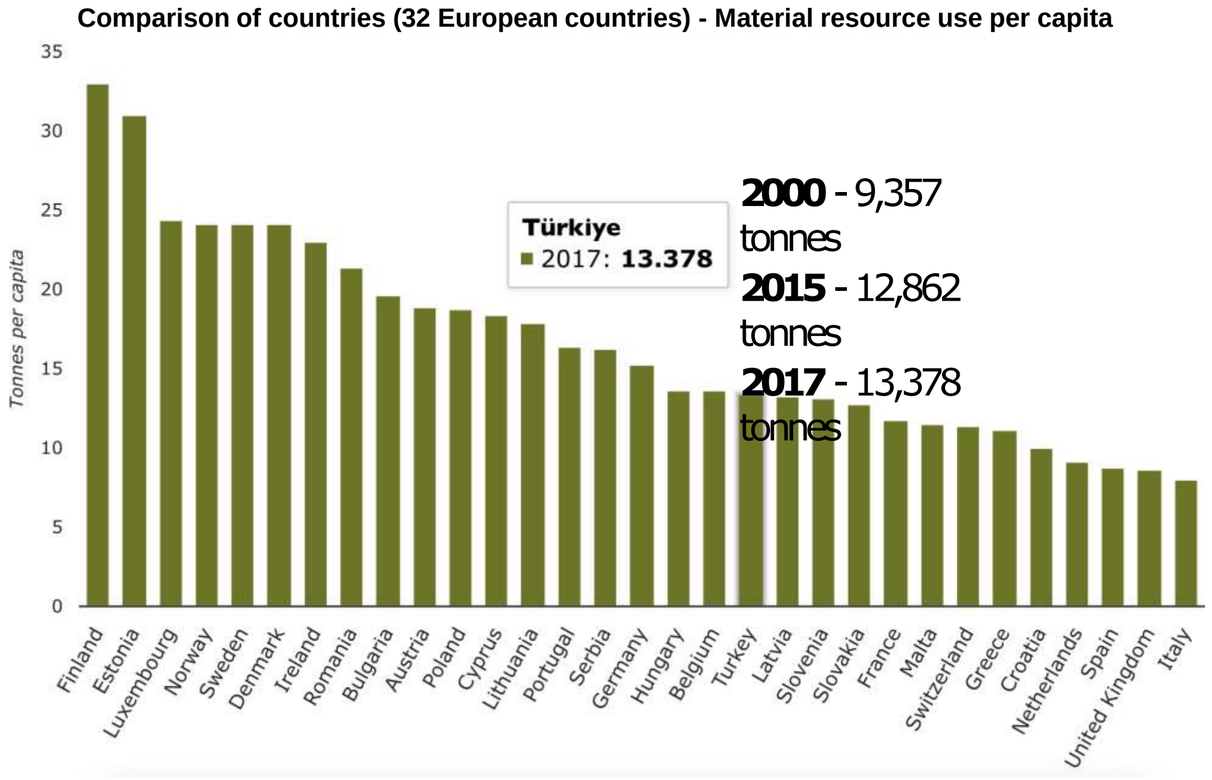
Environmentally friendly

Economic

Community orientated

Waste Minimisation

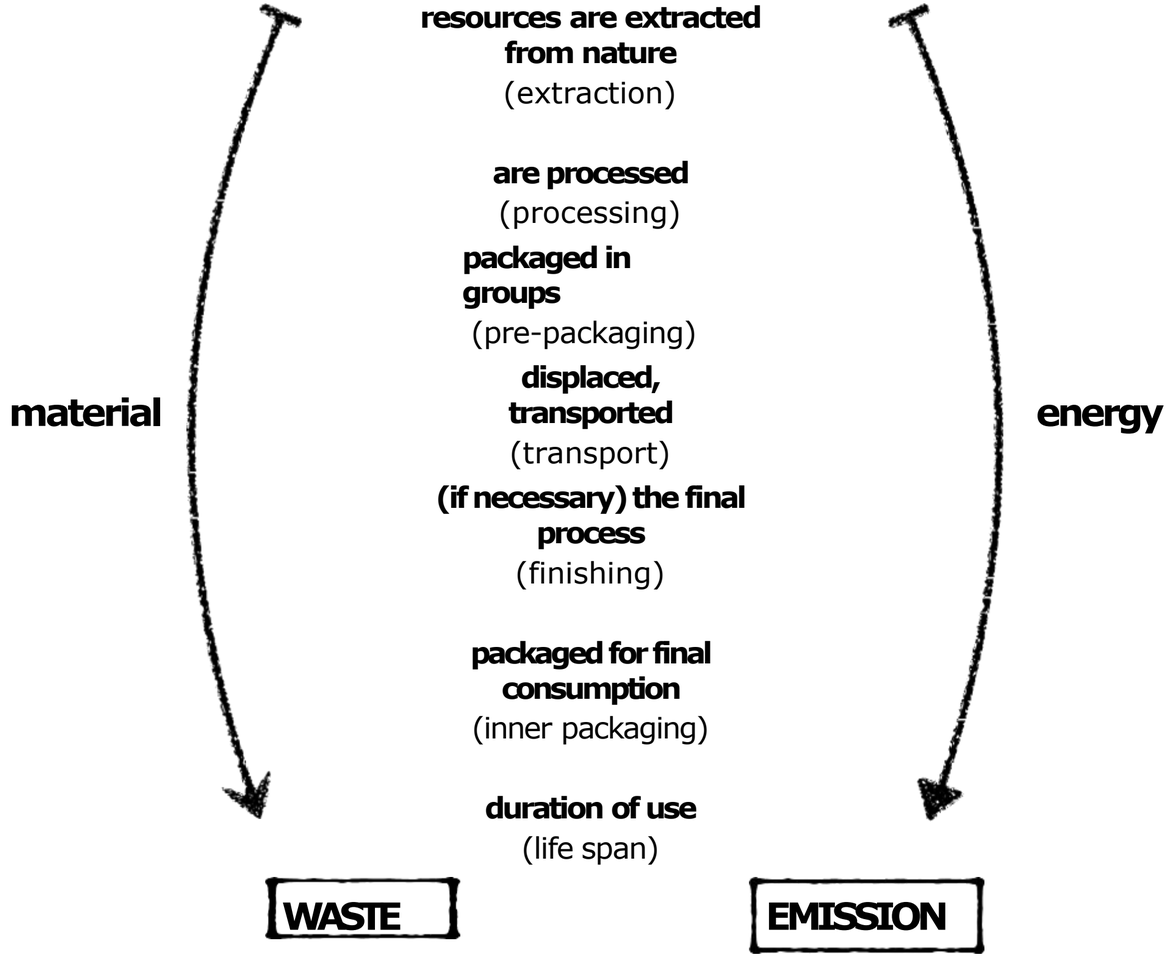
Waste minimization Why? | *Material - Energy Consumption*



2000 - 9,357 tonnes

2015 - 12,862 tonnes

2017 - 13,378 tonnes



Waste management Costs?

World

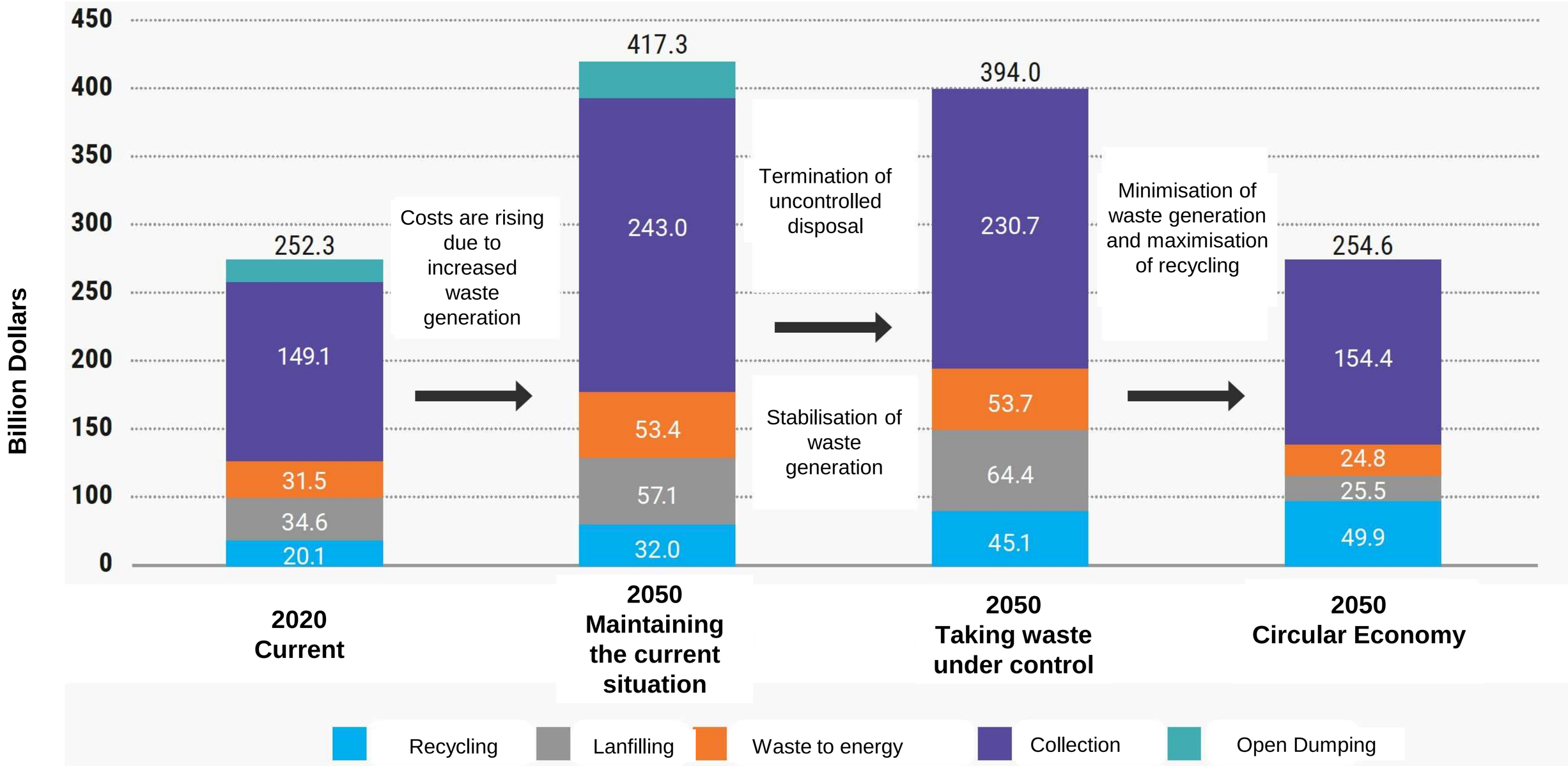
ref. World Bank, 2018; Kaza et al., 2020

İstanbul

ref. Karadağ, D.; Sakar, S.; 2003

- Unit collection cost between **12,2 and 50,7 $/ton** .
- Average cost of collection for Istanbul **24,4 $/ton**.
- The **cost** of the **collection service** is about **70%** of the total cost of solid waste management.
- **Together with Collection and Transfer, the** cost rate rises to **87 %.**
- The cost of regular disposal **%13**.
- Solid waste management accounts **for 12 - 25 %** of **total municipal expenditure.**

Global waste management direct costs in 2050 according to 3 basic scenarios



Waste minimization Why? | *Waste Management Operations*

Separate collection at source

87%

collectio
n

transportation to transfer points

transfer in larger volumes

landfill/incineration

CH4/thermal power acquisition

collectio
n

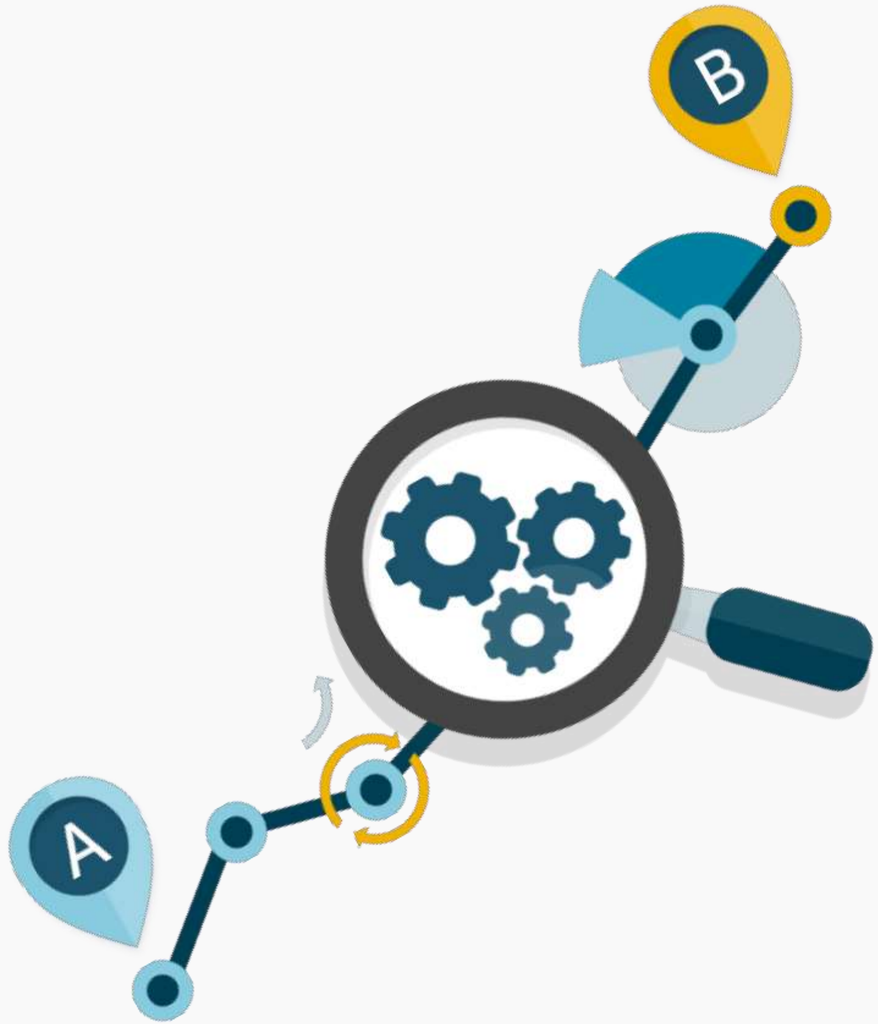
transportation to transfer points

sorting according to material types

recycling processes

recovery processes

energy utlization, labor force, land use



Waste hierarchy

		Public Administrations	Manufacturers	Retailers	Waste Management Sector	Consumers
BEFORE WASTE	Prevention	✓	✓	-	-	✓
	Reduction	✓	✓	✓	-	✓
	Reuse	✓	✓	✓	-	✓
AFTER WASTE	Recycle	✓	✓	-	✓	✓
	Recovery	✓	-	-	✓	✓
	Disposal	✓	-	-	✓	✓

direct

indirect

ref. UNEP, ISWA, 2015; Lansink, 2018

Waste minimisation Responsibilities!

Politics

- Determination of the National Waste Minimisation Strategy,
- Strengthening the waste declaration and auditing system to develop the principles of polluter pays and pay-as-you-pollute mechanisms,
- Ensuring the effective operation of and utilisation of the Extended Producer Responsibility mechanism and the fund collected for waste minimisation and management strategies...
- Use of economic instruments and incentives for waste minimisation...

Local

- Local Waste Minimisation Strategy to be "uniquely" determined in line with the national strategy,
- Strengthening the infrastructure for separate collection at source and minimising the frequency of waste collection,
- Determination of urban development dynamics in accordance with waste management (zoning, licence, land use, etc.)
- Keeping the waste composition up-to-date spatially,

Individual

- Supply of continuous requirements in as large volumes as possible, multipackaged,
- Avoiding the use of single-use plastics,
- Demanding an effective waste management infrastructure from municipalities,
- Criticising producers for efficient resource use and waste management,
- Preference for local products,
- Separate collection at source...

Büşra Yılmaz - Instagram

Waste minimisation How?

- **Is there a magic wand?**

No, this is a long-term process.

- **What's the method?**

There is no one or a number of clear methods suitable for all places and conditions.

Process

- knowledge of waste and other conditions
- planning
- setting goals
- implementation
- measurement
- monitoring
- stability
- receiving feedback
- update
- measuring again
- monitoring again
- not giving up
- reporting

Structure

- atık türü odaklı
- target audience-oriented, original
- suitable for spatial texture

Vehicles

- the power of economic regulation
- campaign, awareness
- human resource
- the power to manage visible areas
- the power of cooperation
- the power of being an example

Actions, Example applications and Impacts

Information campaigns, etc.

Minimisation of resource utilisation

Food Wastage and Waste Minimisation

Information campaigns, etc.

Behavior change

- Setting up **exhibitions or information stands** to **provide information on** the environmental, social and economic impacts of waste and the need for waste minimisation.
- Organisation **of round tables or conferences** to inform and discuss the topic.
- **Making videos** about the impact of the waste we produce and the need to minimise waste, and all available channels

  To be broadcast through (YouTube, Facebook, Twitter, TV, Cinema previews).
- Organisation of **site visits** (e.g. composting, bicycle, tool, clothes, furniture or electronic repair workshops) followed by **discussions**.

Long-term impacts

- **Showing of awareness-raising films** (Trashed, Plastic Paradise, Bag it!, Waste Land) followed by **discussion** and sharing **concrete daily tips** for the audience.
- Planning **competitions** (short films/games/posters etc.) on waste reduction.
- Demonstrate through various channels **that your municipality's impact on the environment has been reduced as a result of** waste prevention measures.

Community engagement

- **Carrying out activities** to interact **with children about their** waste generation and their **real awareness** of their daily school activities and enabling children **to question**.
- Organising **brainstorming** sessions in schools**: How can we reduce the waste we generate at school?**
- Introduce an "**eco-citizen loyalty card**" that rewards eco-behaviour or incentivises sustainable business.

What good will these information events be?

Sample projects and measured impacts

- **Recycle Now:** A study in the United Kingdom evaluated the effects of information campaigns aimed at raising recycling awareness in households. This research **showed that recycling rates increased from 7 % to 17 % when only information was sent by postal mail. The project was initiated in 2004, continued steadily and achieved effective results** *in 2010 (WRAP, 2011)*.

- **Green Dot Norway:** In Norway, education programmes and local information initiatives to raise individuals' awareness of waste reduction have been found to **reduce the amount of organic waste in households by 10%**. **Launched in 1997, the project only started to make significant progress** *in 2005 (Norwegian Environment* **Agency, 2011).**

- **StopWaste:** A campaign called "StopWaste" in California aimed to raise awareness about waste minimisation in communities. Within the framework of the program, a wide-ranging information was provided in schools, public spaces and via social media. **At the end of the 2-year period, it was found that organic and recyclable waste was reduced by 15% in the communities** involved **in the campaign**.

- **European Union LIFE Project:** In a study carried out **in Spain and Portugal** under the EU LIFE Programme, a campaign was organised to educate the public on waste minimisation. As a result of the campaign, **organic waste** was **reduced by 20%** in the **target communities and this behavioural change was sustained after the end of the campaign.** In the research, it was emphasised that the trainings carried out in cooperation with schools and local administrations have a lasting effect.

Minimisation of resource utilisation

Direct projects

- Establishment of waste minimisation actions in offices (double-sided printing, reuse of single-sided paper, use of water from water dispenser, use of cups/mugs instead of plastic cups, use of bulk tea instead of tea bags, etc.).
- Inviting offices in your city to support waste minimisation action.

Co-operations

- Opening an eco-design store and/or launching a product of your municipality. - Kadıköy Municipality, Waste-Free Life Street
- Adoption of a sustainable purchasing policy for office/school/kitchen supplies and production lines. Transforming this policy into a mechanism to involve external stakeholders.

Calls for participation

- Reducing the use of bottled water with water dispensers. Cooperation with tradesmen and/or non-governmental organisations for this purpose.
- Installing coffee machines that accept mugs instead of plastic cups and/or co-operating with coffee shops with campaigns to encourage the use of mugs.

Resource utilisation minimisation directly or through co-operation

Sample projects and measured impacts

- **It has been observed that practices such as double-sided printing, electronic document use, reusable cups, etc.** implemented in public and private sector offices in Australia **have reduced paper and plastic waste by 25 %**. *(Sustainable Practices in Australian Office Workplaces: A Case Study of Waste Reduction, Melbourne University, 2012)*.

- **Zero Waste Design**, This project in New York aimed to optimise waste management in the city using an eco-design approach. **A 30 % reduction in waste generation was achieved.** In addition, with eco-design solutions compatible with reuse and recycling infrastructure **in sustainable building and product use %15 increase** was observed *(New York City Department of Sanitation, 2018)*.

- **Eco-design and Circular Economy**, This project ran in Barcelona and involved supporting small businesses and designers in the city to develop environmentally sustainable products. During the one-year implementation phase of the project, it was reported that **25% of the raw materials used in the products of** the **participating enterprises were recyclable and the amount of waste was reduced by 18%**. *(Circular Economy in Design and Production: Barcelona Pilot Project, Ajuntament de Barcelona, 2021)*.

- **ECOBULK Project,** The EU-funded project aimed to increase waste minimisation and material recycling through eco-design practices in the automotive, furniture and construction sectors. Within the scope of the project, implementations were realised in 7 different countries. **As a result of the** project , **20% of the waste was** converted **into recyclable products and a 25% reduction in the total amount of waste was achieved** *(ECOBULK Final Report, European Commission, Horizon 2020, 2022)*.

- **European Green Procurement Initiative**, analysed the sustainable procurement policies of various public institutions in Europe between 2015 and 2018. The study found that thanks to sustainable office materials and environmentally friendly supply chains, **the amount of waste in offices was reduced by 30 % and the carbon footprint was reduced by 25 %** *(Green Public Procurement Study: Environmental Impact and Resource Efficiency, EC, 2019)*.

Food Wastage and

Prevent wastage
Reduce **waste**

- Organising zero waste lunch/picnic/dinner campaigns.
- Workshop: planning a cooking workshop with leftovers.
- A short film screening on food wastage. You can get in touch with the Love Food Hate Waste campaign or Recycle Devon, or check out the Love Food Film Competition.
- Supporting composting in homes or workplaces and organising competitions on this subject
- Preparation and distribution of shopping lists in appropriate project areas to help consumers better plan their shopping to help them avoid unnecessary purchases.
- Planning of workshops: How to avoid food wastage when shopping and/or cooking?
- Developing original concepts in cooperation with school or office cafeterias to reduce wasted food.

Food Wastage and

Sample projects and measured impacts

- **Love Food, Hate Waste:** It is one of the largest national campaigns aimed at reducing food wastage by the UK-based **WRAP**. The campaign organised various media tools, workshops and educational programmes to teach consumers how to reduce food wastage. Thanks to the campaign, **food wastage was reduced by 18%**, which contributed to the prevention of approximately 1.4 million tonnes of food waste. The campaign also resulted in **an average annual saving of GBP 60 per household** *(Love Food Hate Waste: Final Report, WRAP, 2012)*.
- **Recycle Devon:** A food wastage reduction campaign run by Devon County Council in the UK offered strategies to reduce food waste, such as training to support home composting, food planning and the use of shopping lists. In addition, cooking workshops were organised with leftover food. Between 2017 and 2019, food waste was found to have reduced by 25 % **in households participating in the campaign in Devon** *(Recycle Devon: Reducing Food Wastage Report, Devon County Council, 2019)*.
- **Food Rescue:** This project, initiated by OzHarvest, aims to collect leftover food from businesses and distribute it to those in need in order to prevent food wastage in Australia. The project was also supported by community awareness campaigns, workshops and trainings. As a result of the project, **a** 22**% reduction in food wastage was achieved between 2015-2020.** In Total **20 million meals were rescued** and distributed to those in need *(OzHarvest Food Rescue The Report, OzHarvest, 2020)*.
- **Compost Challenge:** The City of San Francisco organised a competition and education campaign to promote composting in homes and businesses. Proje kapsamında, yerel işletmeler ve sakinler kompost yapmaya teşvik edildi ve kompost eğitimi verildi. 2018-2019 yıllarında uygulanan bu proje, **katılan evlerde ve iş yerlerinde organik atıkların %30 oranında azaltılması**nı sağladı. In addition, **80% of the participants continued to compost after the campaign***(San Francisco Compost Challenge Final Report, San Francisco Municipality, 2019)*.
- **Eat Smart Waste Less:** Launched by the Oregon Waste Prevention and Recycling Programme, the campaign offered **shopping lists**, **meal planning guides and awareness campaigns** to help consumers avoid unnecessary purchases and reduce food wastage. As a result of the project, **a 20 % reduction in food wastage** by participating households was detected *(Eat Smart Waste Less: Campaign Outcomes, Oregon Waste Prevention, 2020)*.

EUROPEAN WEEK FOR WASTE REDUCTION

AVRUPA ATIK AZALTIM HAFTASI

16-24 Kasım 2024

GIDA ATIKLARININ TADI KAÇTI!

#EWWR2024
#GIDAATIĞI

#GIDAATIKLARININTADIKAÇTI

05.09.2024

European Week for Waste Reduction 2024 to be organised with the theme of Food Waste

Applications for the European Week for Waste Reduction (EWWR) 2024, of which Marmara Municipalities Union is the Türkiye Coordinator, have started. Awareness raising events will be held worldwide on 16-24 November 2024 within the scope of the 2024 European Week for Waste Reduction, which will be held with the motto ‘Food Waste is Out of Taste’. Application deadline: 6 November 2024

What is the European Week for Waste Reduction (EWWR)?

It is an initiative aimed at raising awareness on waste prevention in Europe. Encourages a broad audience (including public administrations, private companies, civil society and citizens) to get involved in sustainable resource and waste management and implement awareness-raising activities during a single week.

Everything is here — https://www.marmara.gov.tr/tr/ewwr2024

What is this

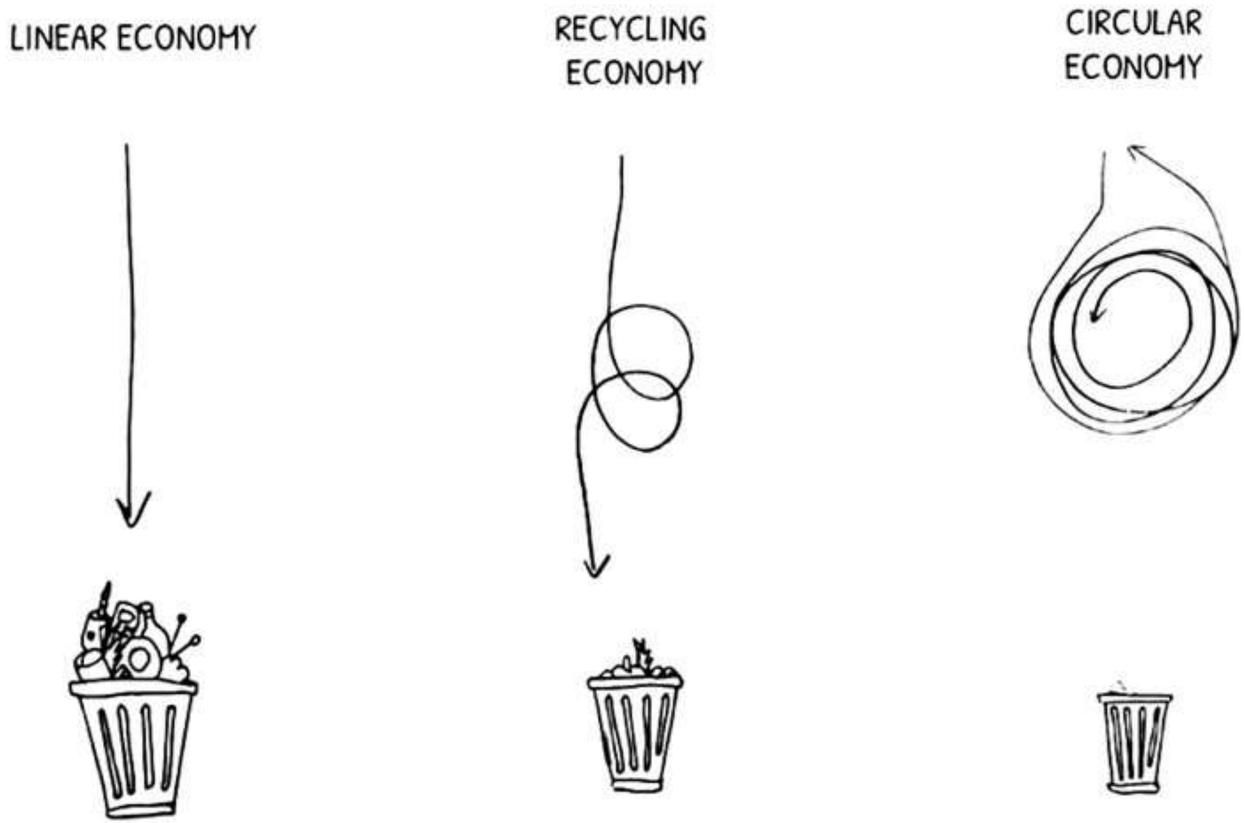
Taş Tepeler Project

Excavation Site, Sefertepe, Şanlıurfa

‘We can say that the calendar is a means of calculating forward and backward time and often has an economic dimension. However, **in prehistoric societies**, **the perception** of **time was circular.** This perception is **specific to societies integrated with nature**; they know the cycles, but it would be wrong to claim that they need a calendar to calculate the day, month and year.’

Prof. Necmi Karul

the last **word**



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

Thanks for your attention.

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