

CYPRUS ENVIRONMENT SYMPOSIUM

CIRCULAR ECONOMY OVERVIEW ANTHI CHARALAMBOUS

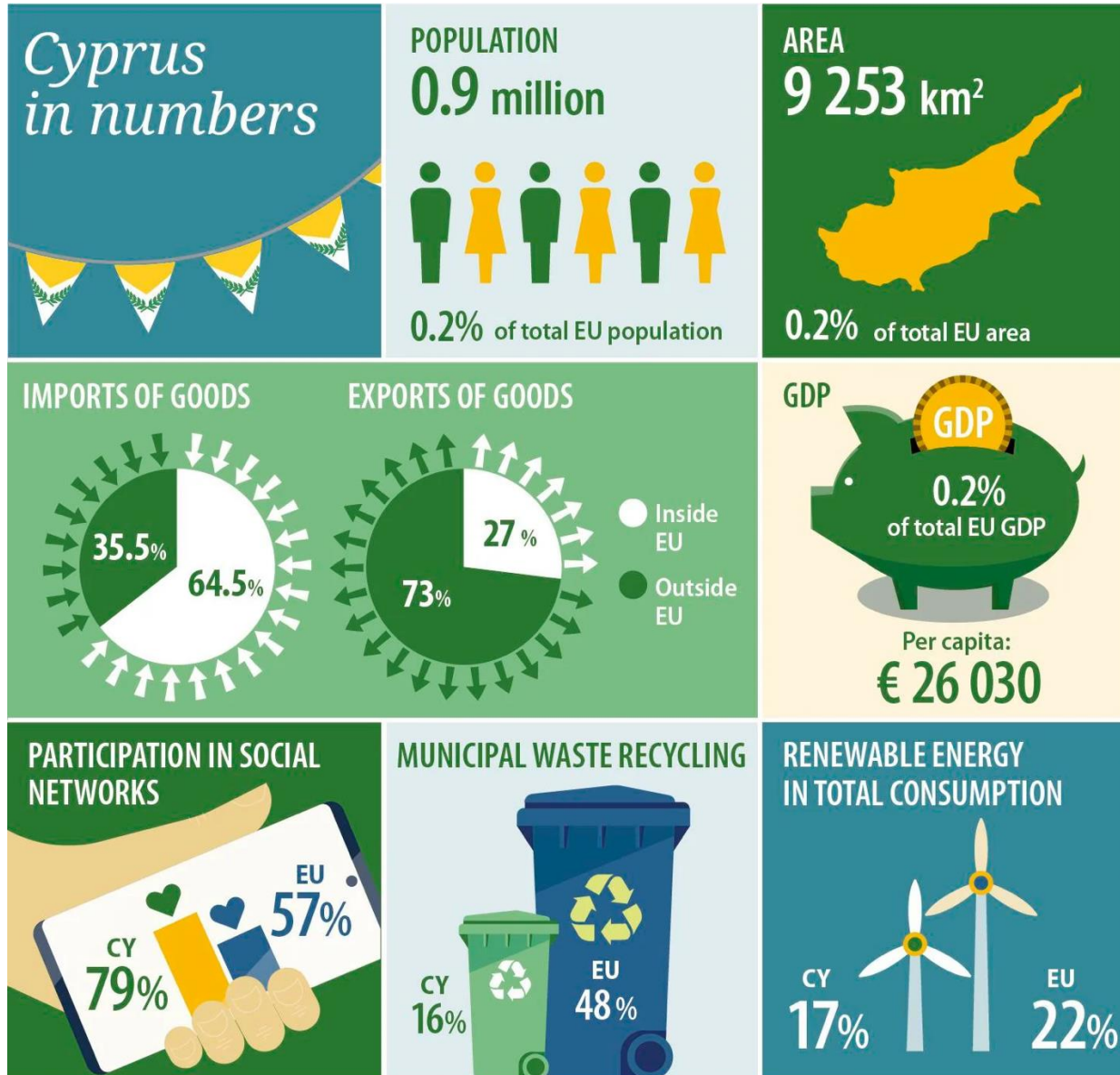
Director of ideopsis Ltd, President of MB KyklOIKOdromio

11/12/2024

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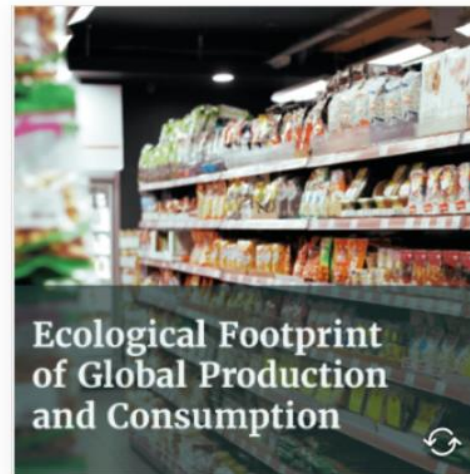


CYPRUS ENVIRONMENT SYMPOSIUM



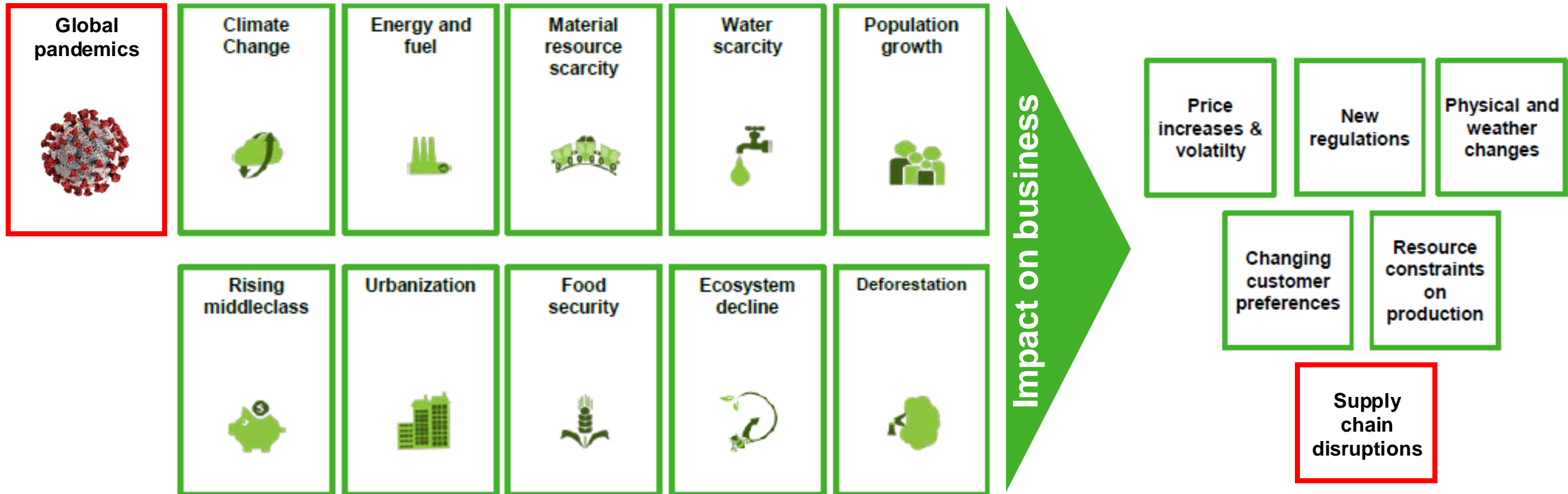
2022

What are the Mega Trends affecting our future?



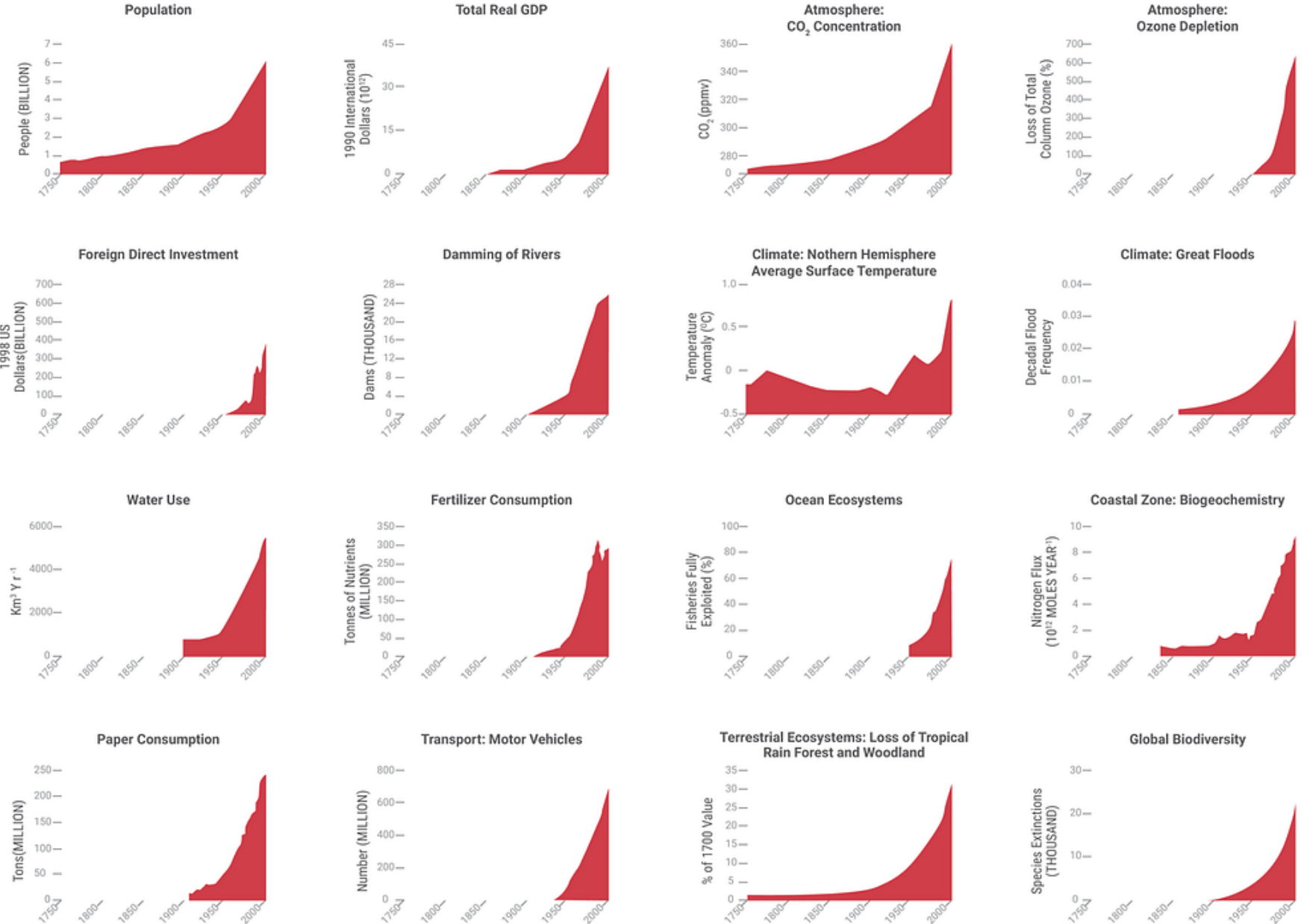
Source: United Nations System Staff College

Global megatrends affecting sustainable development



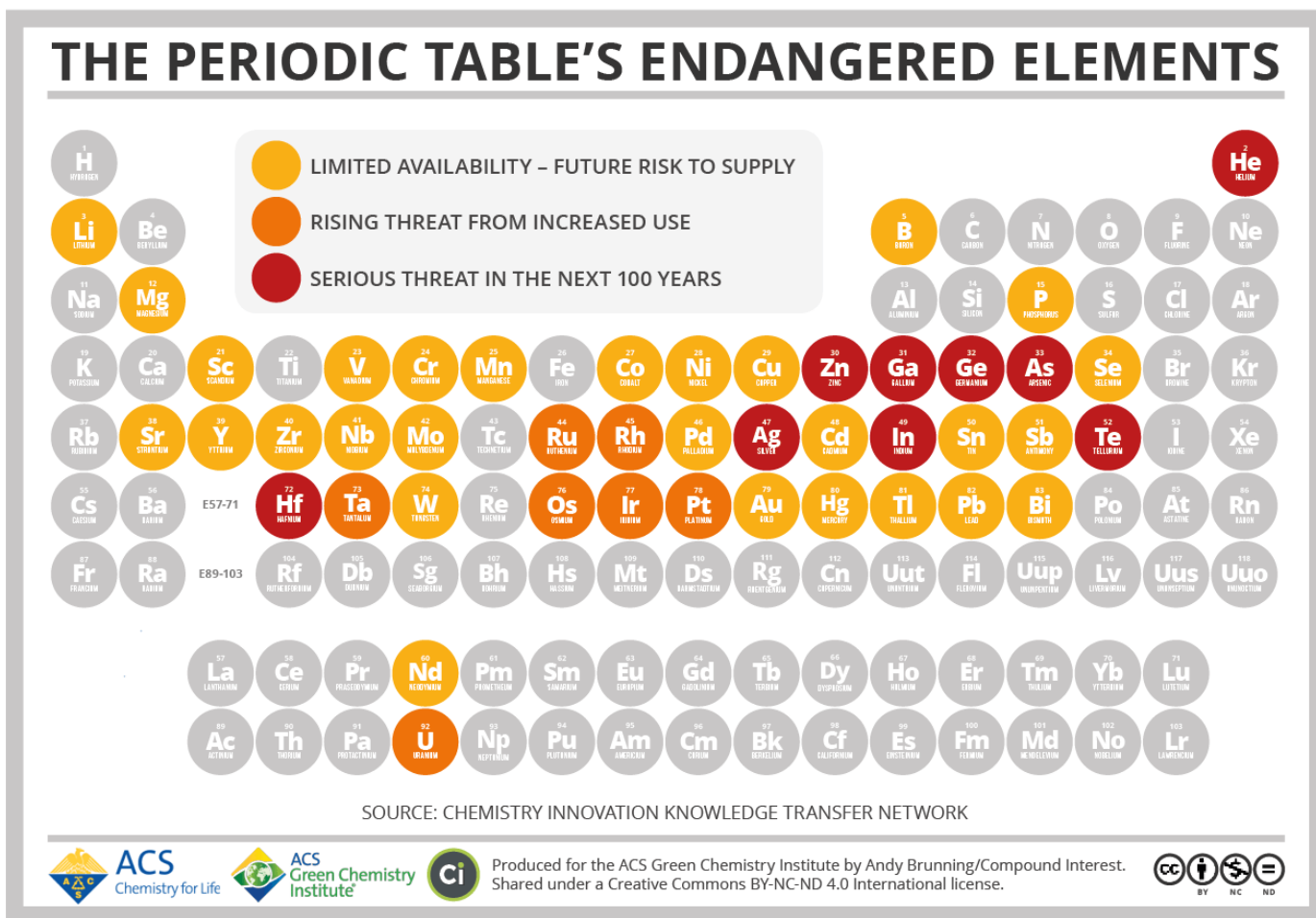
KPMG (2012): Expect the Unexpected: Building business value in a changing world. As adapted from Figure 8: Global sustainability megaforges – Addressing the risks while realizing the opportunities.

The great acceleration



Earth Overshoot Day (n.d.): Infographics & Videos.
INFOGRAPHIC How many Earths do we need.

Periodic table of elements - at risk



Of the 118 elements, **44 will face supply constraints in the coming years**, such as precious metals and even some that are essential for life, such as phosphorus.

Sustainable management of their extraction, use, reuse and distribution is therefore essential.

Research to find abundant alternatives, as well as more efficient uses of materials, recycling, reuse and recovery will help mitigate risks and drive industry to create sustainable supply chains.

ACS Chemistry for Life (2019): IMAGE Endangered Elements.



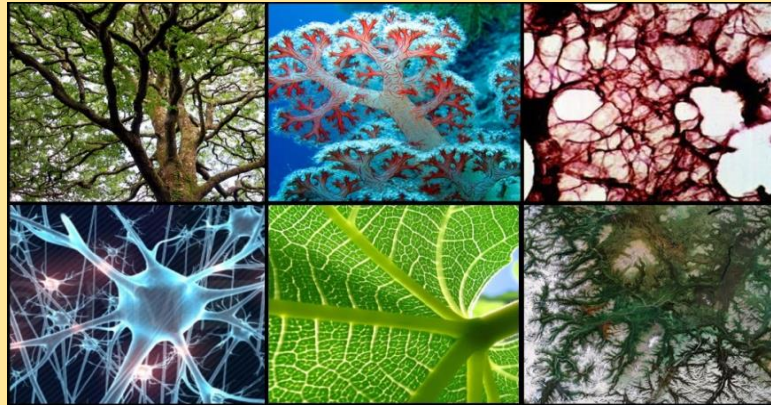
Why is wrong our world to be linear?

earth



4,5 billion years

Living systems



3,5 billion years

Humans

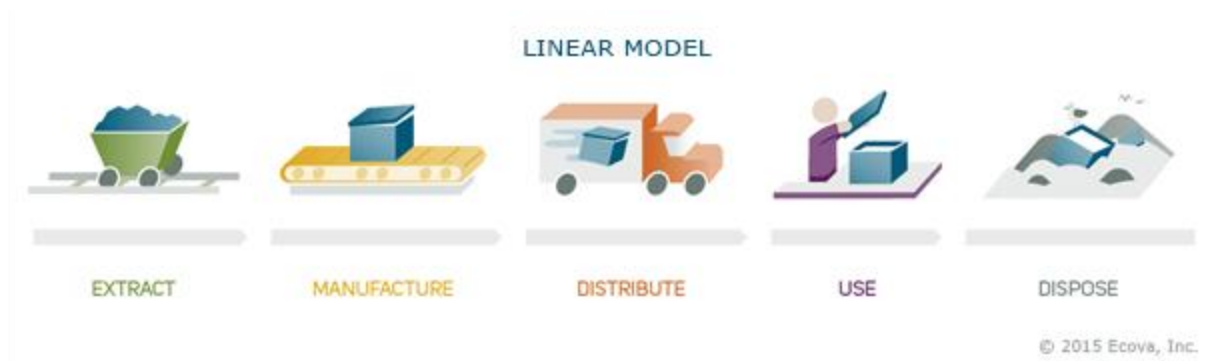


200.000 billion years





«Linear Economy»



In a linear economy, we extract, produce, consume and then dispose of what we have already used.

<https://www.youtube.com/watch?v=zCRKvDyyHml>



The Linear Economy Problem

- The linear economy problem refers to the **environmental and sustainability challenges** associated with the traditional or linear economic model.
- In a linear economy, **products are produced, used, and then discarded as waste at the end of their lifecycle.**
- This approach results in the **extraction of finite resources, high levels of waste generation, and environmental degradation.**



Challenges associated with the linear economy

- 1. Resource Depletion:** Linear economies rely heavily on the **extraction of finite natural resources**, such as minerals, fossil fuels, and forests. This unsustainable resource consumption can lead to **resource scarcity and ecosystem degradation**.
- 2. Pollution and Waste:** The linear economy generates **vast amounts of waste**, including **non-biodegradable materials like plastics, which often end up in landfills or pollute natural environments**. This contributes to pollution and negatively impacts ecosystems.
- 3. Energy Consumption:** The production, transportation, and disposal of goods in a linear economy consume significant amounts of energy, often sourced from fossil fuels, contributing to greenhouse gas emissions and **climate change**.
- 4. Economic Inefficiency:** The linear model is **economically inefficient because it does not capture the full value of products or materials**. Resources are extracted, processed, and used once before being discarded, leading to a **loss of potential economic value**.
- 5. Loss of Biodiversity:** Habitat destruction and resource extraction associated with linear economies can lead to the loss of biodiversity and disrupt ecosystems.
- 6. High Costs of Waste Management:** Managing the vast amounts of waste generated by linear economies requires significant financial resources and can strain waste management systems.
- 7. Limited Recycling and Reuse:** In linear economies, recycling and reuse are often not prioritized, leading to missed opportunities for conserving resources and reducing waste.



What are defined as the two main environmental problems

Two are the most important problems concerning the interaction between economic activity and the natural environment:

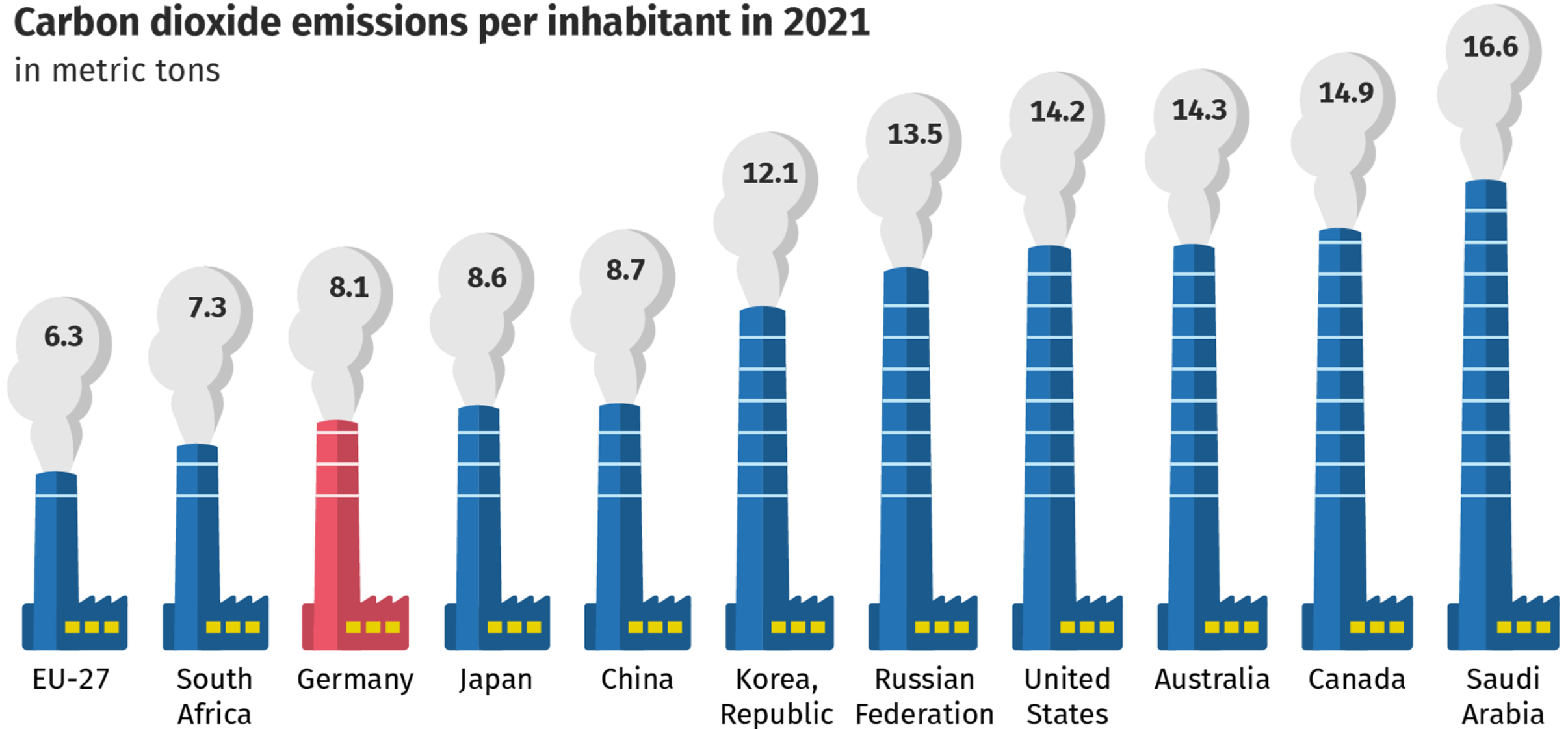
- Use of resources
 - Climate change
- **Climate change** and (**excessive**) **resource use** are closely linked: **62% of global greenhouse gas emissions** - excluding emissions from land use and forestry - **are released during the extraction, processing and manufacture of goods.**
 - These **two problems** create enormous pressure to transform economic activity and, consequently, **business behaviour**. Fundamental changes are already taking place and will continue both at the level of products and processes.



62%

Carbon dioxide emissions per inhabitant in 2021

in metric tons



Source: EDGAR/JRC

©  Statistisches Bundesamt (Destatis), 2022

Anthi Charalambous, Low carbon and circular economy senior expert © 2024

The World Is Not Enough

Number of earths/its resources needed if the world's population lived like the following countries



Selected countries. Calculated based on 2022 data estimates

Source: Global Footprint Network





Key data and projections from the OECD's Global Material Resource Outlook to 2060

Materials use increase



Metals



Fossil fuels



Biomass



Non-metallic minerals

2011

2060

8Gt

20Gt

14Gt

24Gt

20Gt

37Gt

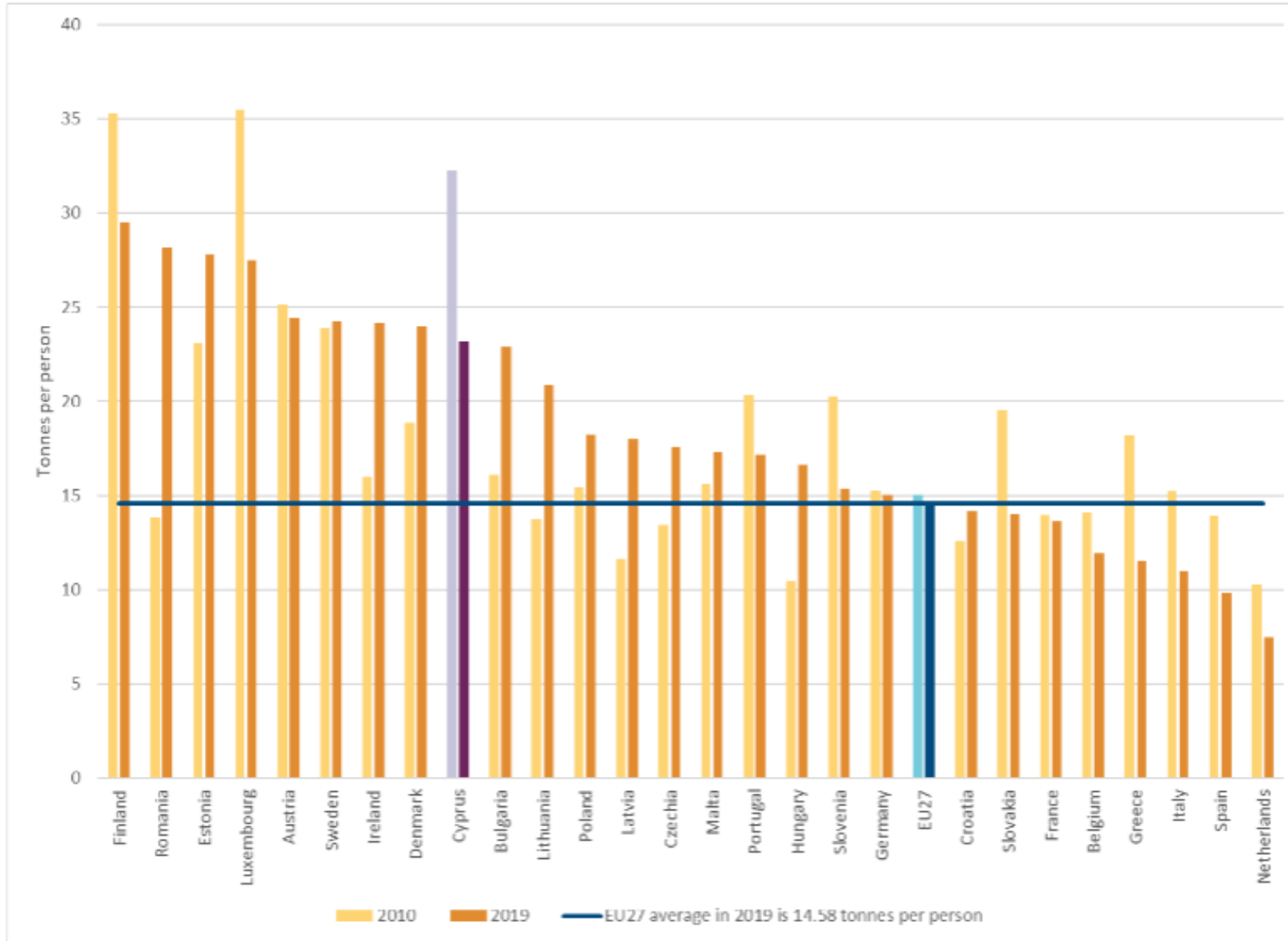
37Gt

86Gt

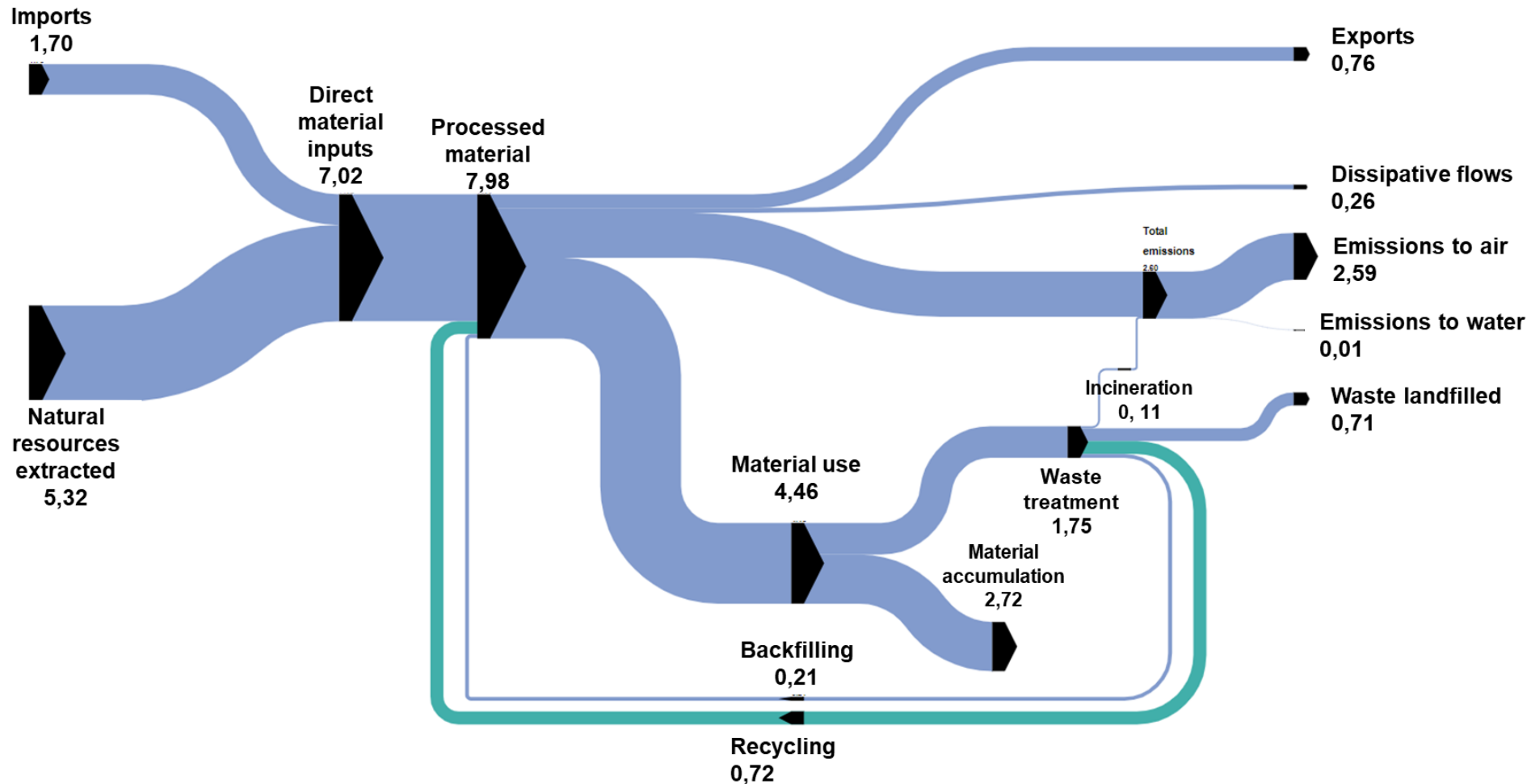
Key facts and projections from the OECD Global Material Resources Outlook to 2060 (Source: OECD, 2018)



Figure 2 Material footprint (raw material consumption), EU27, 2010 and 2019, tonnes per person



Material flow chart (in gigatons) of the 27 EU countries in 2017



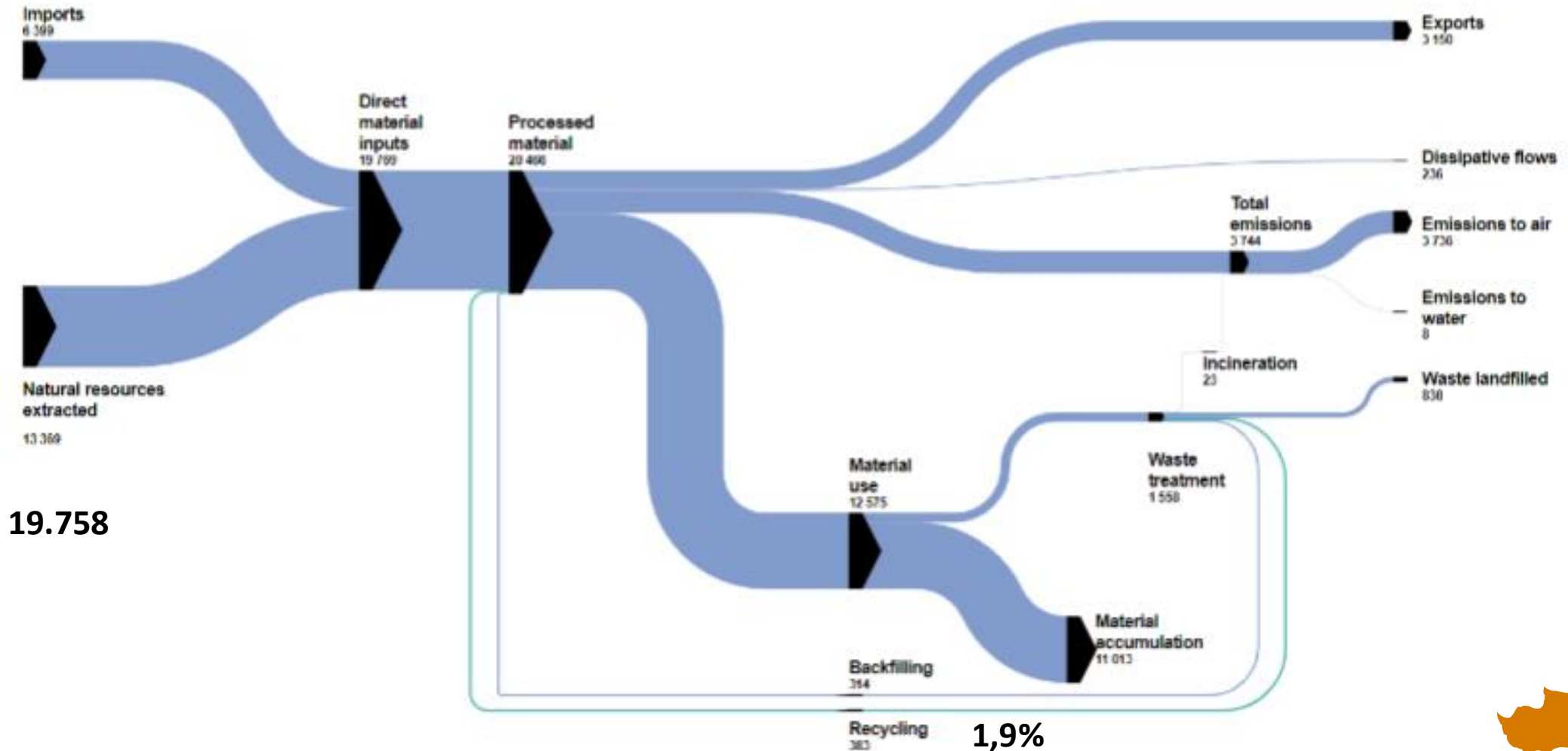
Eurostat (n.d.): INFOGRAPHIC Material flow diagram for European Union (27 countries) 2018 **Gigatonnes**.

Cyprus

CYPRUS ENVIRONMENT SYMPOSIUM



Figure 1 Material flow diagram for Cyprus in 2020, '000 tonnes



Source: Eurostat (2022) [env_ac_mfa], [en_ac_sd], [env_wassd] (accessed 20 June 2022)





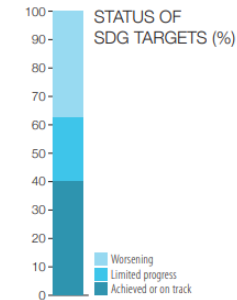
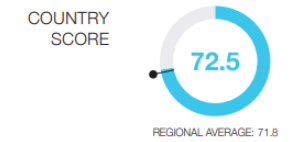
Cyprus Overall Performance - SDSN

- 59th position out of the 166 (SDSN, 2023).
- Score of 72.5 (1st position is 86.8 by Finland) (SDSN, 2023).

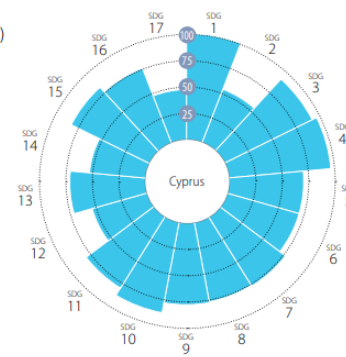
CYPRUS

Eastern Europe and Central Asia

OVERALL PERFORMANCE



AVERAGE PERFORMANCE BY SDG



SDG DASHBOARDS AND TRENDS



■ Major challenges ■ Significant challenges ■ Challenges remain ■ SDG achieved ■ Information unavailable
↓ Decreasing → Stagnating ↗ Moderately improving ↑ On track or maintaining SDG achievement ● Information unavailable



SDG12 – Responsible Consumption and Production



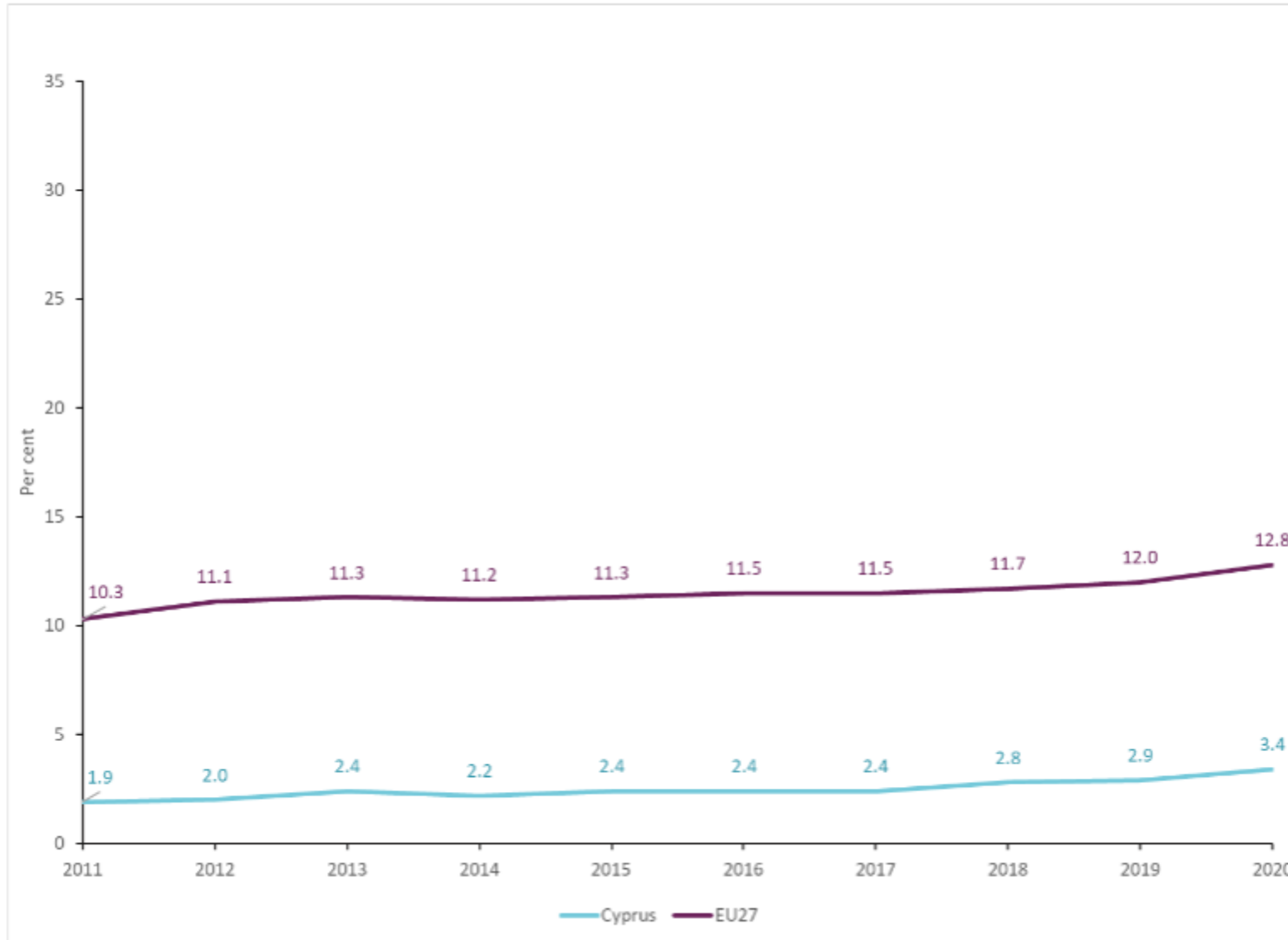
CYPRUS:

- Cyprus is facing **major challenges** in achieving SDG12 with its progress **moderately improving** (SDSN, 2023).
- **Below** the EU average (Eurostat, 2024).

■ Major challenges
 ■ Significant challenges
 ■ Challenges remain
 ■ SDG achieved
 ■ Information unavailable
↓ Decreasing
 → Stagnating
 ↗ Moderately improving
 ↑ On track or maintaining SDG achievement
 ● Information unavailable



Figure 6 Circular material use rate in Cyprus, 2011–2020, per cent



Source: Eurostat (2022) [env_ac_cur] (accessed 20 June 2022)

1. The Problem...

- Cyprus is the 6th worst country in the EU as regards the quantities of waste generation per capita with **609 kg per capita (EU average 505 kg per capita)** .
- According to the Environmental Implementation Review for Cyprus, (2022), **waste management is probably one of the most important environmental challenges that Cyprus has to face.**
- Specifically, with regards to the target of **reuse** and recycling of 55% of municipal waste by 2025, **Cyprus is at risk of not achieving it.**
- Cyprus is progressing towards achievement of the 17 SDGs however for important SDG (such as SDG12) status is worse than EU.
- Managing waste efficiently remains an important challenge for Cyprus with Cyprus disposing most of its waste in landfills. Also, in Cyprus unfortunately exist many illegal waste dumping sites.

CYPRUS



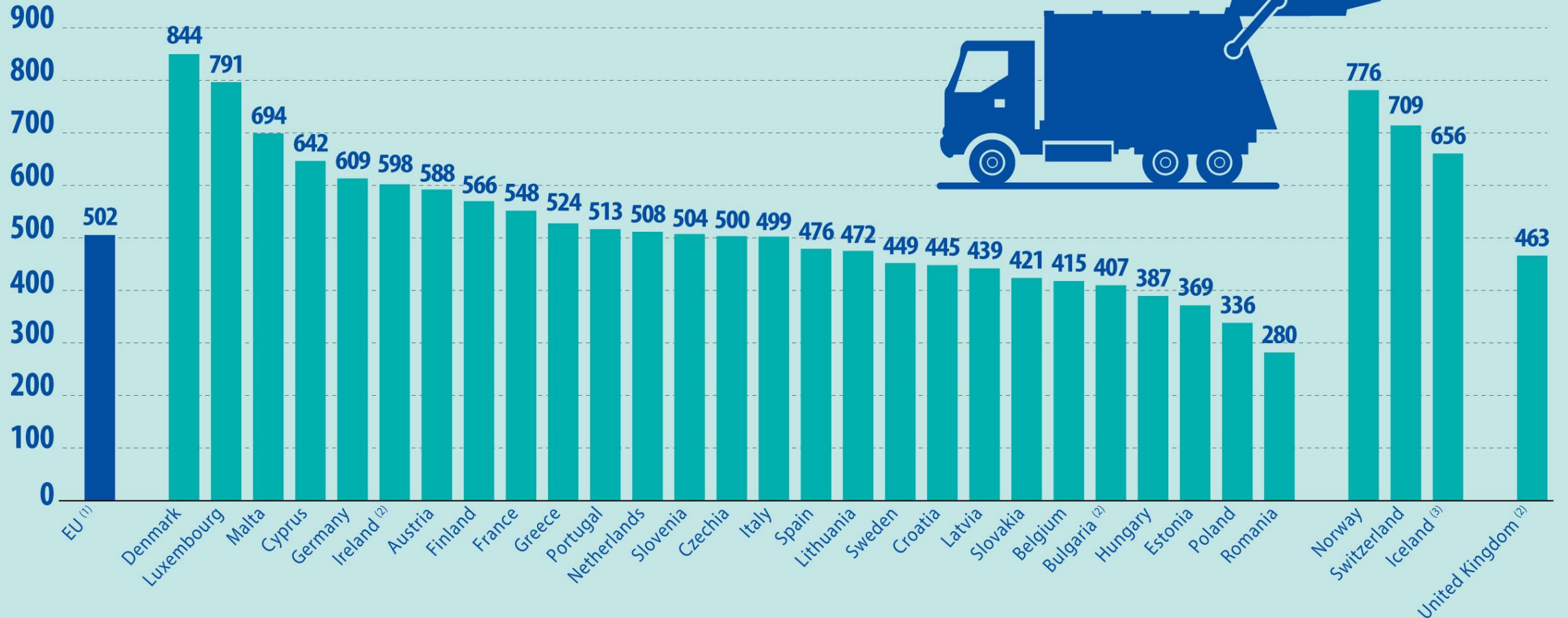
ASIUM





Municipal waste generated in 2019

(kg per person)



⁽¹⁾ Estimated

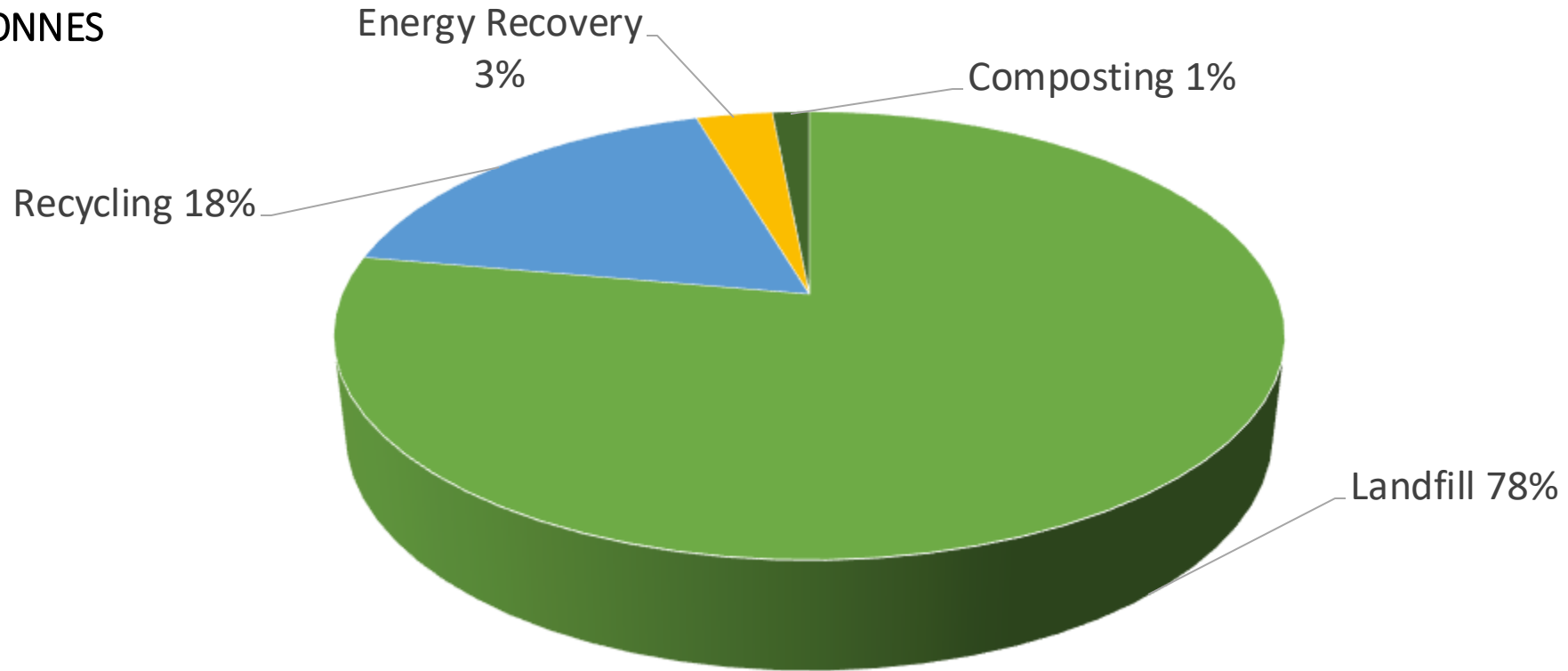
⁽²⁾ Bulgaria, Ireland, United Kingdom: 2018 data

⁽³⁾ Iceland: 2017 data



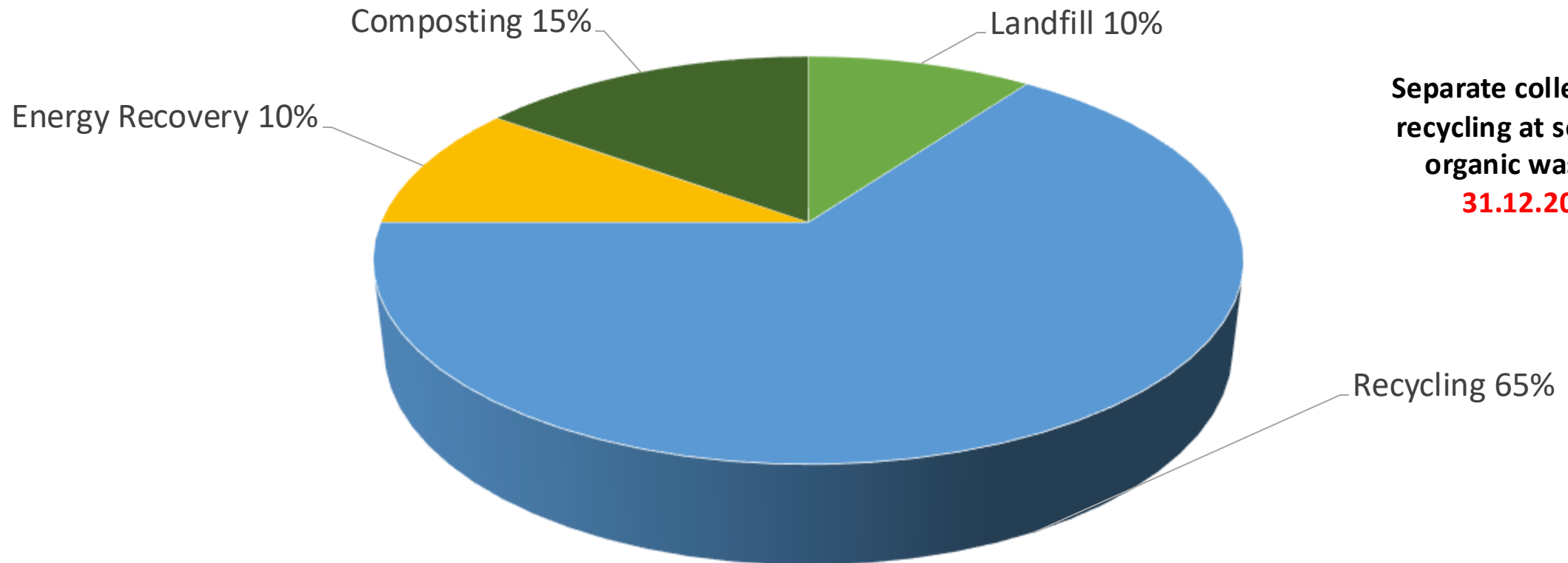
Cyprus- EXISTING SITUATION OF MUNICIPAL SOLID WASTE 2021

MSW: 570.000 TONNES





MUNICIPAL WASTE MANAGEMENT OBJECTIVES (2022-2028)



Separate collection or recycling at source of organic waste by **31.12.2023**



Solid waste generation by economic activity in the EU and Member States

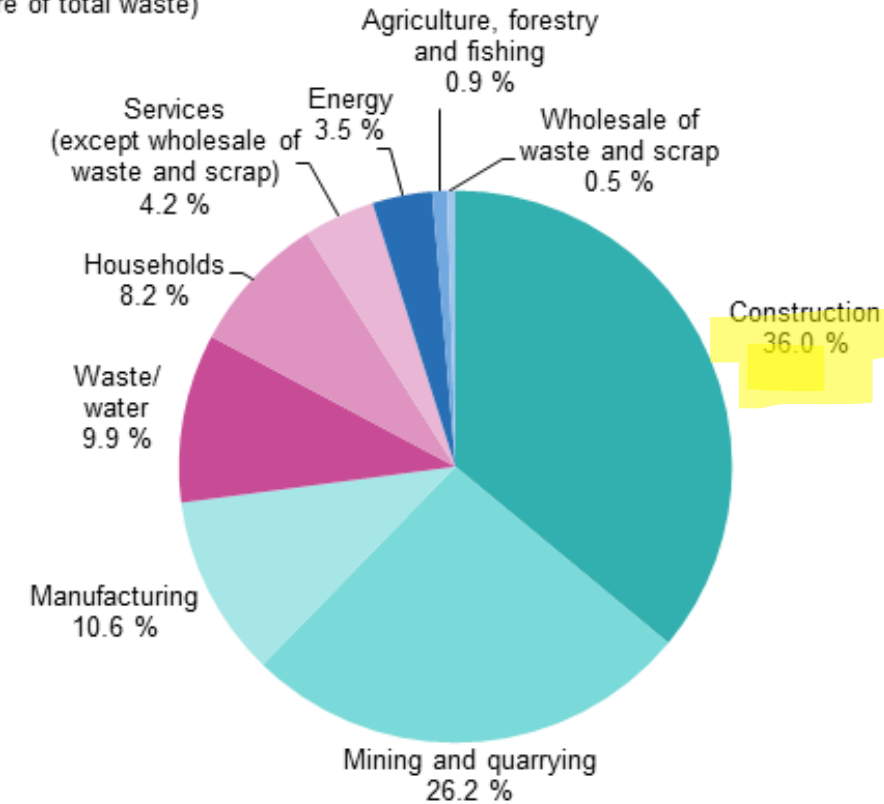
Waste generation by economic activities and households, 2018

(% share of total waste)

	Mining and quarrying	Manufacturing	Energy	Construction and demolition	Other economic activities	Households
EU-27	26.3	10.6	3.5	36.0	15.4	8.2
Belgium	0.1	24.9	1.2	33.5	33.1	7.2
Bulgaria	82.4	2.0	10.0	0.1	3.1	2.4
Czechia	0.3	18.2	1.8	41.6	24.8	13.3
Denmark	0.0	4.7	5.1	56.0	17.8	16.3
Germany	2.2	13.9	2.3	55.6	16.8	9.2
Estonia	29.5	18.8	32.3	9.5	7.6	2.4
Ireland	14.2	24.7	1.1	13.6	35.1	11.4
Greece	56.4	11.8	7.6	5.0	9.2	10.1
Spain	8.6	10.8	4.6	29.8	28.5	17.7
France	0.4	6.6	0.4	70.2	13.7	8.7
Croatia	12.0	8.9	1.3	22.7	31.7	23.3
Italy	0.8	16.5	1.3	35.3	28.7	17.5
Cyprus	6.6	16.3	0.1	45.8	14.5	16.8
Latvia	0.1	21.7	2.5	17.5	25.7	32.6
Lithuania	1.6	37.2	2.1	8.8	30.3	20.0
Luxembourg	0.0	6.9	0.1	81.2	9.7	2.1
Hungary	1.0	14.6	11.2	33.2	25.1	14.9
Malta	1.6	1.1	0.0	79.3	10.9	7.2
Netherlands	0.0	9.6	1.1	70.0	13.3	6.0
Austria	0.1	8.7	0.8	74.4	9.3	6.7
Poland	36.7	17.0	10.7	9.7	20.6	5.3
Portugal	0.2	19.0	1.1	8.8	38.1	32.8
Romania	87.9	4.0	3.4	0.3	2.4	2.1
Slovenia	0.2	20.2	11.8	8.1	51.9	7.8
Slovakia	2.2	27.5	7.9	4.4	39.8	18.2
Finland	74.9	6.7	1.0	12.3	3.5	1.6
Sweden	74.7	3.7	1.4	8.9	8.0	3.2
United Kingdom	5.2	4.0	0.2	48.8	32.4	9.4

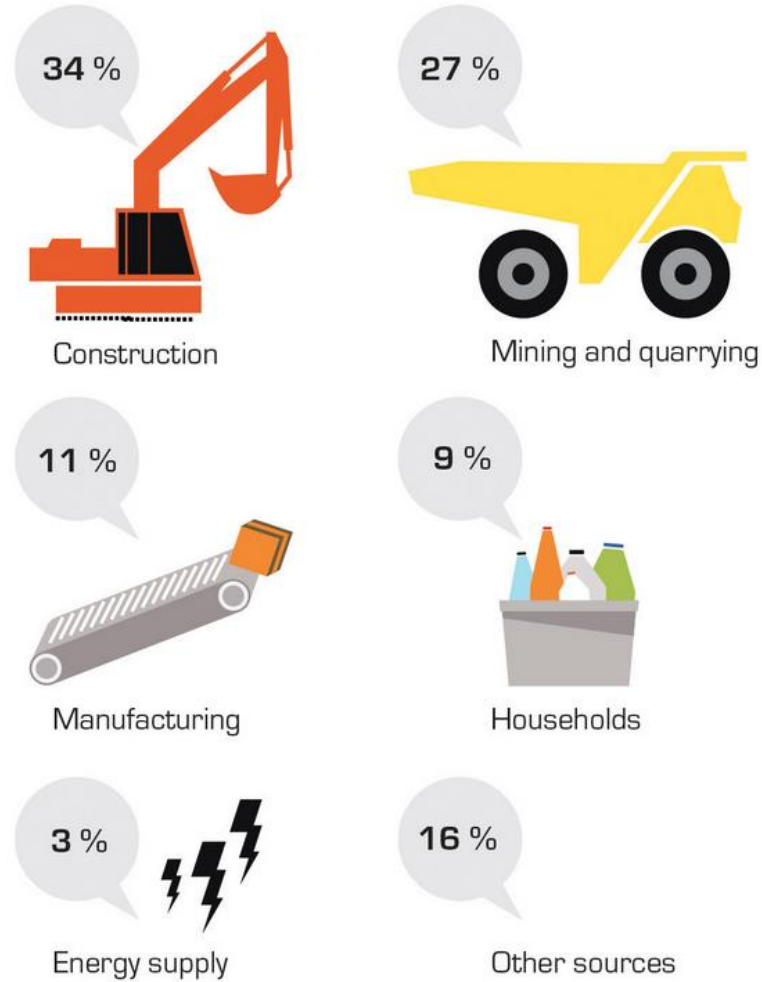
Waste generation by economic activities and households, EU-27, 2018

(% share of total waste)

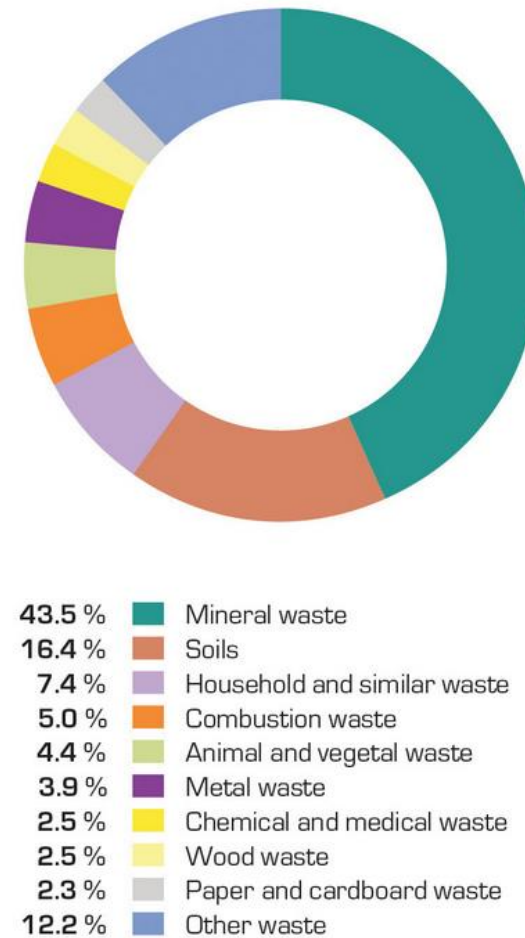




Waste streams by source



Waste streams by type of waste



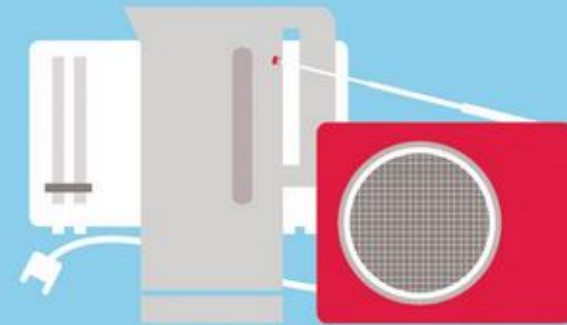
Source: Eurostat 2010 data on EU-28 and Norway



On average, we generate 157 kg of packaging waste per capita in the EU.



Every year, the generation of some 74 million tonnes of hazardous waste is reported in the EU.



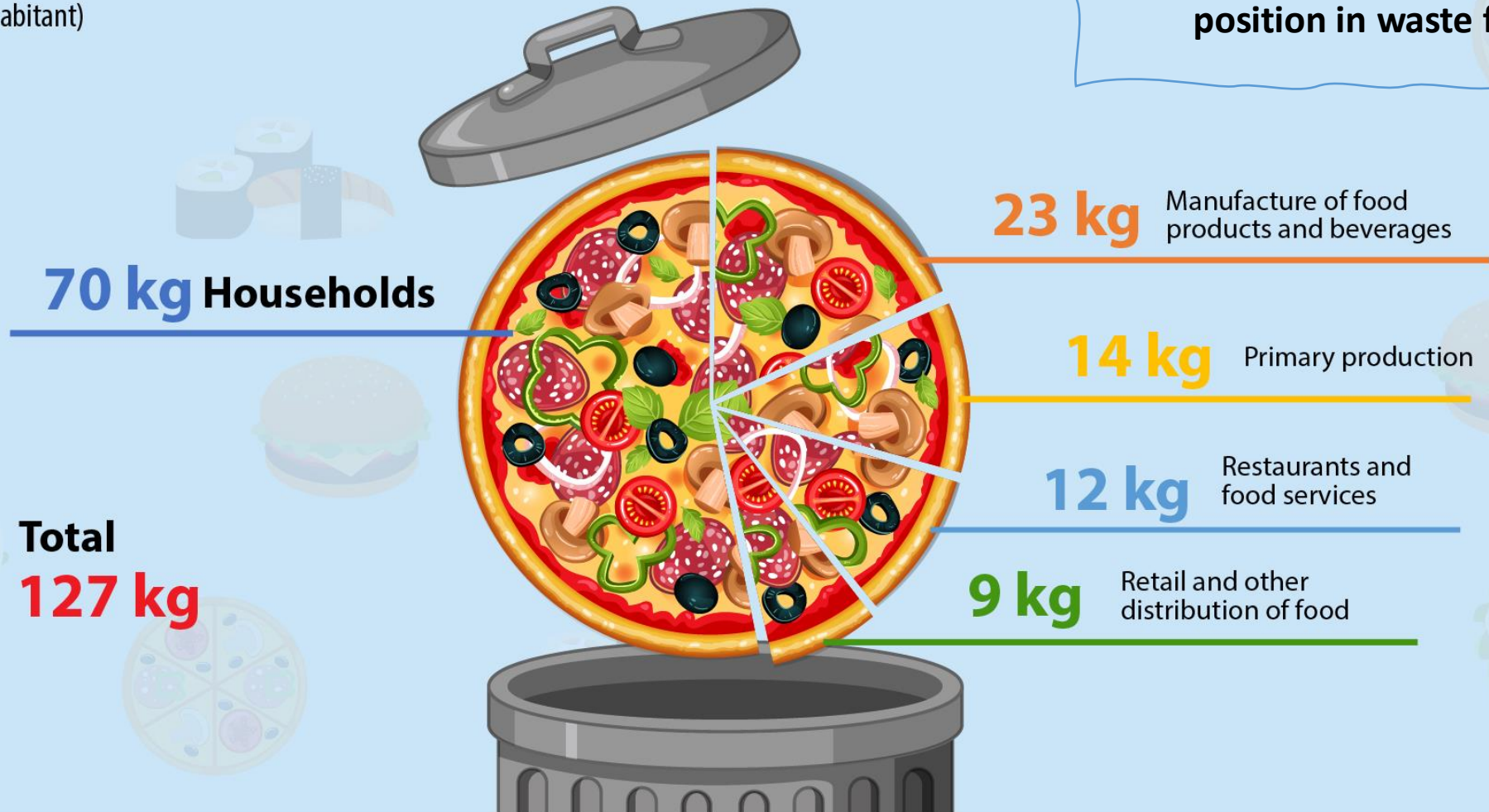
Electrical and electronic equipment is the fastest growing waste stream in the EU, estimated to reach 12 million tonnes a year by 2020.

Sources: EEA, Eurostat, European Commission
Read more: www.eea.europa.eu/waste

Food waste in the EU by main economic sectors, 2020

(kilogrammes per inhabitant)

Cyprus holds the third worst position in waste food



Belgium, Latvia, Malta and Romania: data not available. Czechia, Lithuania, Portugal and Sweden: data are estimated. Cyprus: definition differs (see metadata). As a result, the EU aggregates are estimated.

ec.europa.eu/eurostat

2. The Solution...

- **Minimizing waste**, adopting a zero-waste approach, and promoting reuse are crucial steps toward sustainable living and environmental conservation.
- **Embrace a Circular Economy**: support and advocate for a circular economy where products are designed to be reused, repaired, or recycled rather than disposed of after their use.
- **Repair** and **repurpose** items instead of discarding them.
- **Donate** items that are still in good condition but no longer needed. Participate in community swaps exchanges to **extend the life span** of items.
- Educate yourself and others about the environmental impact of waste. When an item is not useful to us, it may be for someone else.
- **Changing culture** of dismantling ownership. Especially for items that we use occasionally, why to buy when we have the option of renting them?



How can we address this?

In a circular economy, the value of products, materials and resources is retained in the economy for as long as possible and waste production is minimized.

EU (2020) Circular Economy Action Plan



Adoption (April 2020) by the European Commission of the "Circular Economy Action Plan"

New legislative & strategic challenges

The European Action Plan for the Circular Economy provides a forward-looking agenda for achieving a cleaner and more competitive Europe in co-creation with economic actors, businesses, consumers, citizens and civil society organisations.

It aims to accelerate the transformational change required by the European Green Deal and builds on circular economy actions implemented since 2015.

This plan will ensure that the regulatory framework is improved and made fit for a sustainable future, that new opportunities from the transition are maximised while minimising burdens on individuals and businesses.



European Commission (2020): EU Circular Economy Action Plan.



Understanding the current economic model

The continuation of current consumption patterns in Europe is not an option. As both population and purchasing power expand globally, resources will be overconsumed and increasingly limited. Europe must take the lead in exploring a new consumption model that does not compromise the needs of others or future generations, nor harm the environment.



EEA Executive Director Jacqueline McGlade



**European
Environment
Agency**



European Action Plan for the Circular Economy

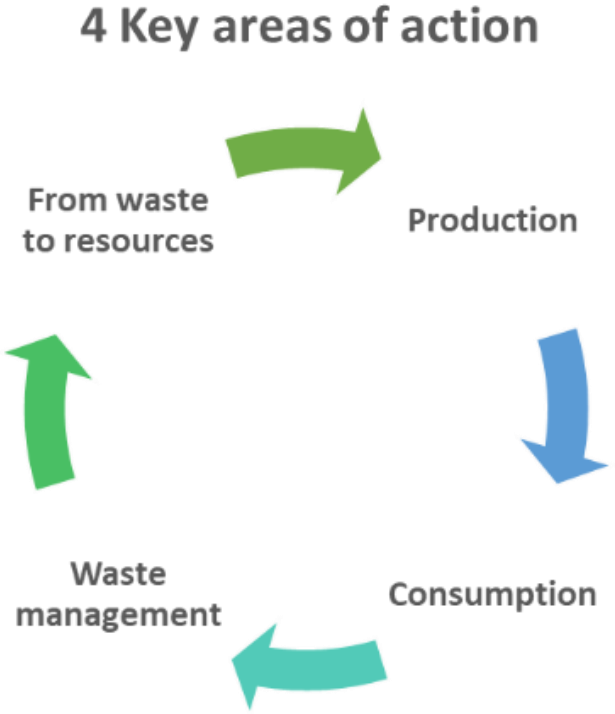
Commissioner for the Environment, Oceans and Fisheries, Virginijus Sinkevičius

"We only have one planet Earth, and by 2050 we will be consuming as if we had three. The new Action Plan for the Circular Economy will make circularity a dominant part of our lives and accelerate the green transition of our economy. We offer decisive action to change the top of the sustainability-product design chain. Future actions will create opportunities for businesses and jobs, empower European consumers, harness innovation and digitalisation and, like nature, ensure that nothing is wasted."



European Commission (2020): EU Circular Economy Action Plan

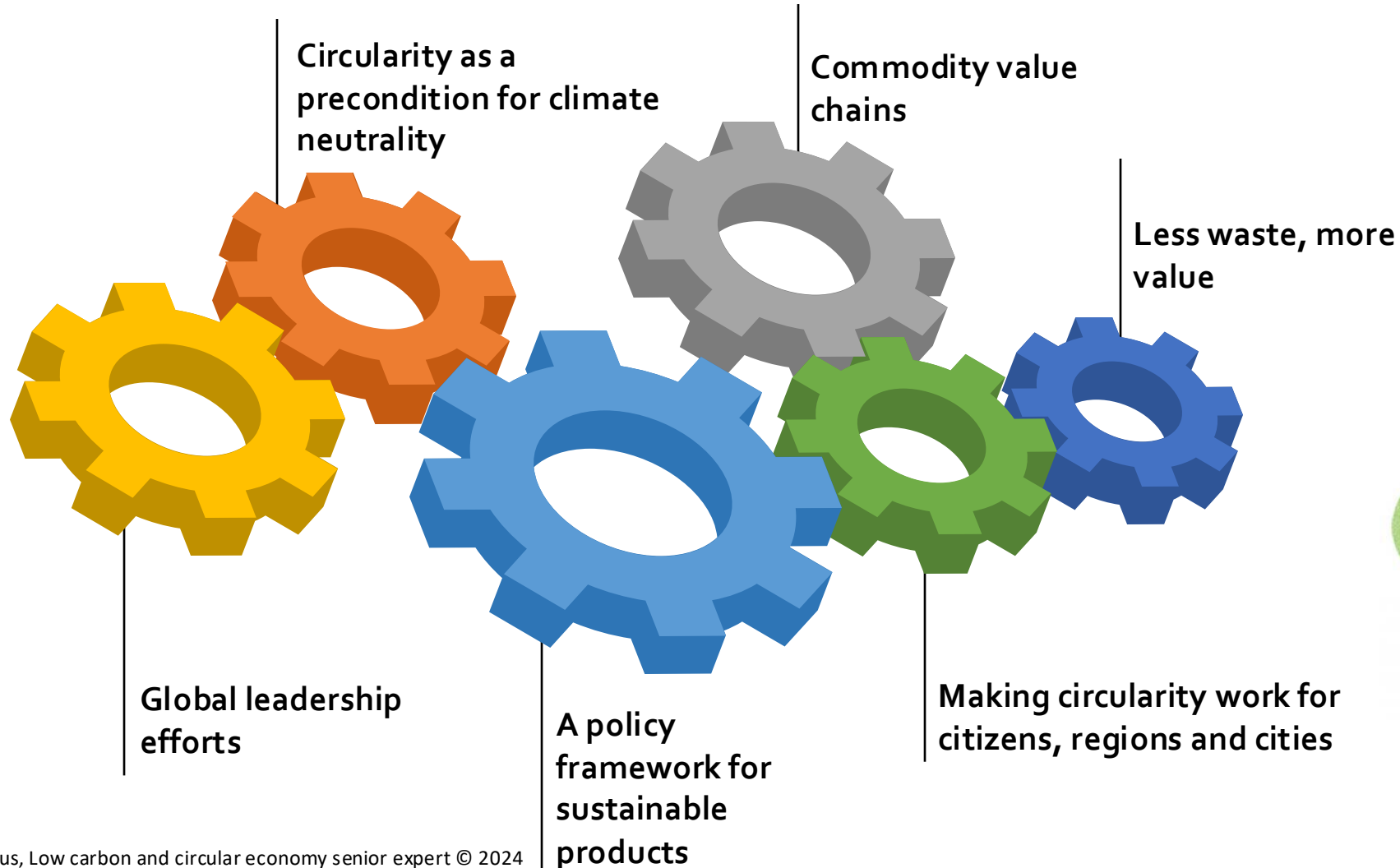
The EU's Circular Economy Action Plan prioritises 4 action lines and 7 priority areas



- Ηλεκτρονικά & ΤΠΕ
- Μπαταρίες & Οχήματα
- Συσκευασίες
- Πλαστικά
- Κλωστοϋφαντουργικά προϊόντα
- Κατασκευές & Κτίρια
- Τρόφιμα, νερό & θρεπτικές ουσίες

European Commission (2020): EU Circular Economy Action Plan.

EU Action Plan on the Circular Economy for a cleaner and more competitive Europe



Priority axes of the Circular Economy



Textiles

Only less than 1% of all textiles worldwide are recycled into new textiles. Textiles are the fourth highest pressure category in terms of primary raw material and water use, after food, housing and transport, and the fifth highest in terms of greenhouse gas emissions. 60 % of the value of clothing sold in the EU is produced in third countries.

Food, water & nutrients

The circular economy can significantly reduce the negative impact of resource extraction and use on the environment, and help restore Europe's biodiversity and natural capital. Although the food value chain is responsible for putting significant pressure on resources and the environment, it is estimated that 20 % of the total amount of food produced is lost or wasted in the EU.

Construction & Buildings

It requires huge amounts of resources and accounts for about 50 % of all mined materials. It accounts for over 35 % of total waste production in the EU.

Emissions from materials extraction, construction products, building construction and renovation are estimated to account for 5-12 % of total national greenhouse gas emissions. Increasing the efficient use of materials can save 80 % of these emissions.



Electronics & ICT

Less than 40 % of WEEE is collected and recycled in the EU. Loss of value due to battery, software, or when the materials embedded in these devices are not recovered. Almost 2/3 of Europeans would like to continue using their digital devices for longer.

Batteries & Vehicles

The mobility of the future is based on sustainable batteries and sustainable vehicles. A comprehensive European strategy for sustainable and smart mobility is needed in the light of the climate crisis.

Packaging

The amount of materials used for packaging is constantly increasing. In 2018, packaging waste in Europe reached an unprecedented level-174 kg per capita, the highest level ever. In 2018, overall in Europe 81% of packaging was recovered, but only 66% was recycled.

Plastics

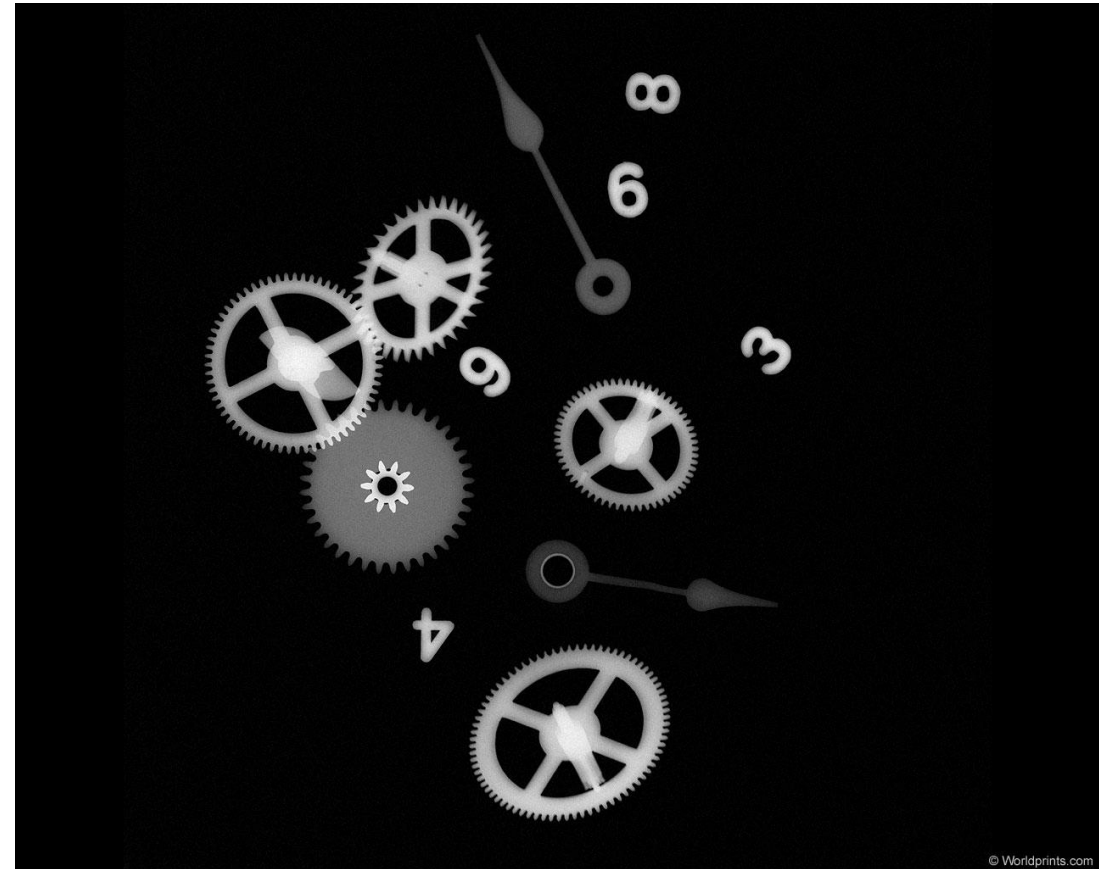
Plastic consumption is expected to double within the next 20 years. In 2019, 29 million tonnes of plastics were collected in the EU28 for processing, yet 25% are still sent to landfill.



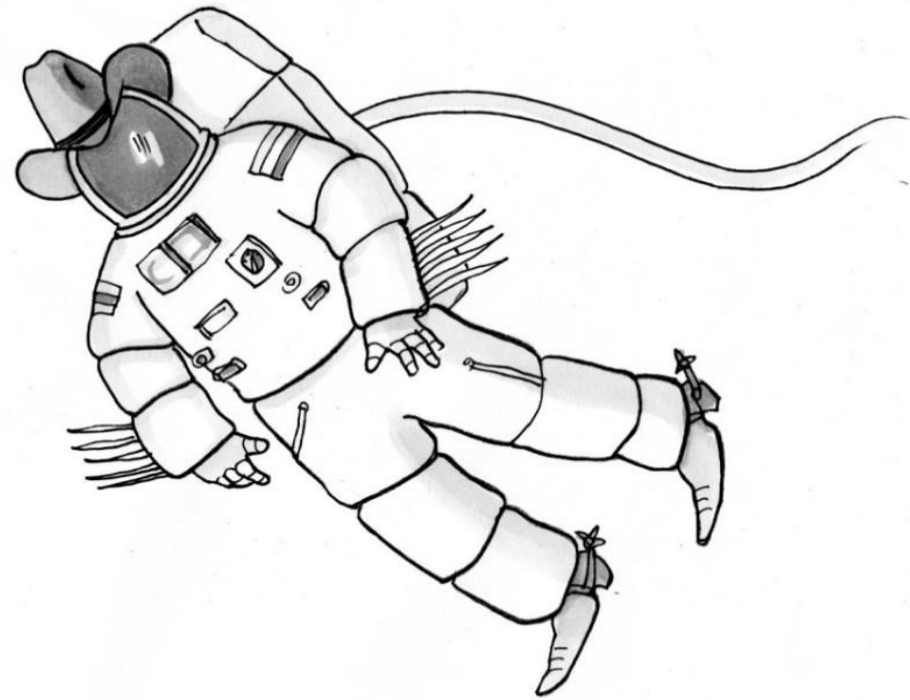
Circular Economy

Definition of the "circular economy"

The circular economy can be defined as "a model of production and consumption that involves the **exchange, leasing, reuse, repair, renovation and recycling of existing materials** and products as much as possible in order to extend their life cycle. In practice, the circular economy means reducing waste to the minimum possible level. When a product reaches the end of its life, the materials used in its manufacture are kept within the economy in any way possible to be used again and again, adding value to the product."



From «cowboy economy» to «spaceman economy»!



From «cowboy economy» to «spaceman economy»!

In **1966 Kenneth Boulding, an economist**, gave a lecture that became famous: The Economics of the Coming Spaceship Earth. He contrasted an open economy and a closed economy.

He called the open economy the "**cowboy economy**", where the cowboy is symbolic of the unnoticed plains and was also associated with reckless, exploitative, romantic, and violent behavior that is characteristic of open societies.

The closed economy of the future can similarly be called a "spaceman" economy, where the earth has become a single spaceship, with no unlimited reservoirs, either for mining or pollution.

Humans must find their place in a circular ecological system capable of continuous production of materials.

Kenneth Boulding said that economists, for the most part, have failed to address the ultimate consequences of the transition from open to closed land.

The term circular economy began to appear in the 1990s and later.

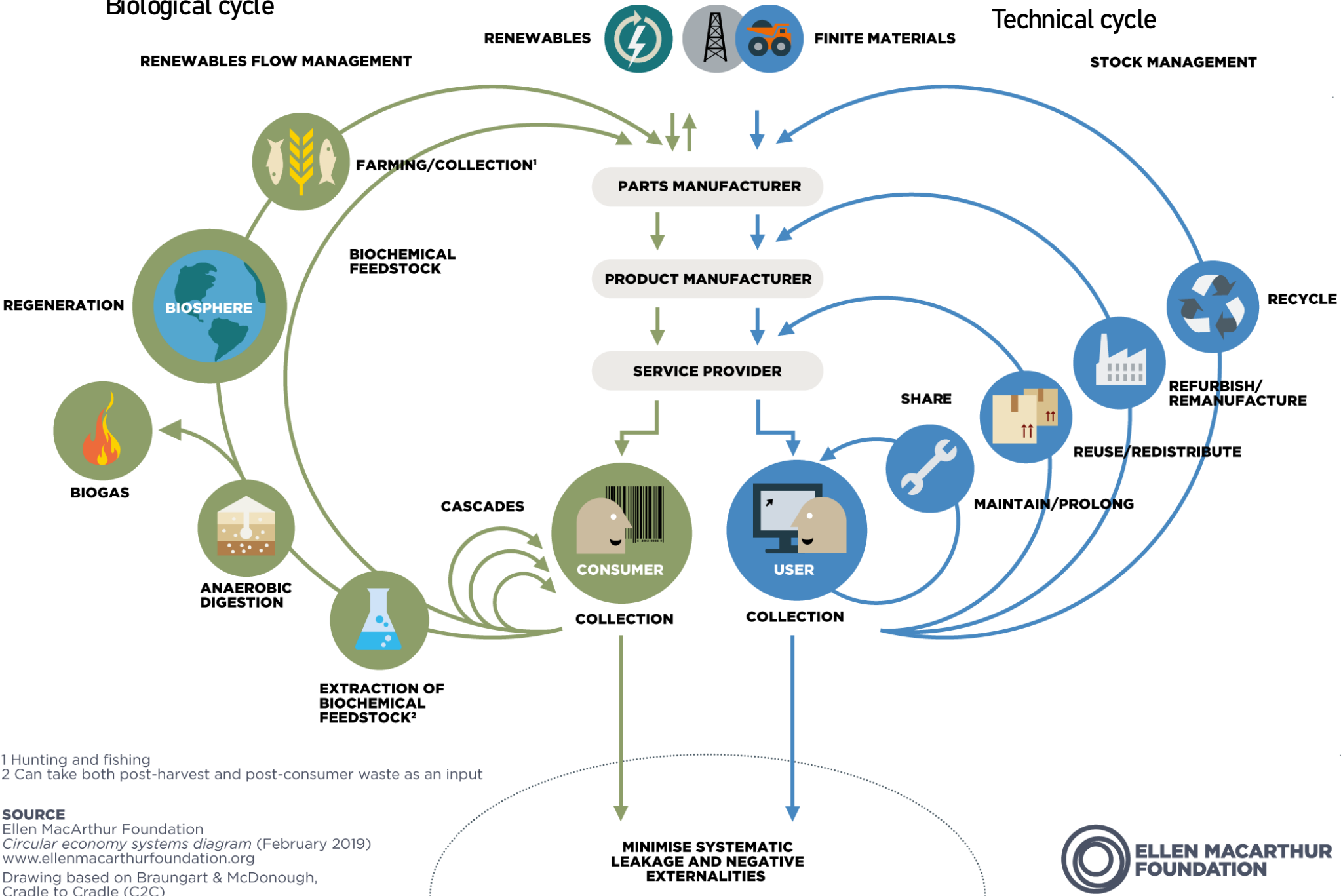




Σχεδιάγραμμα της πεταλούδας

Biological cycle

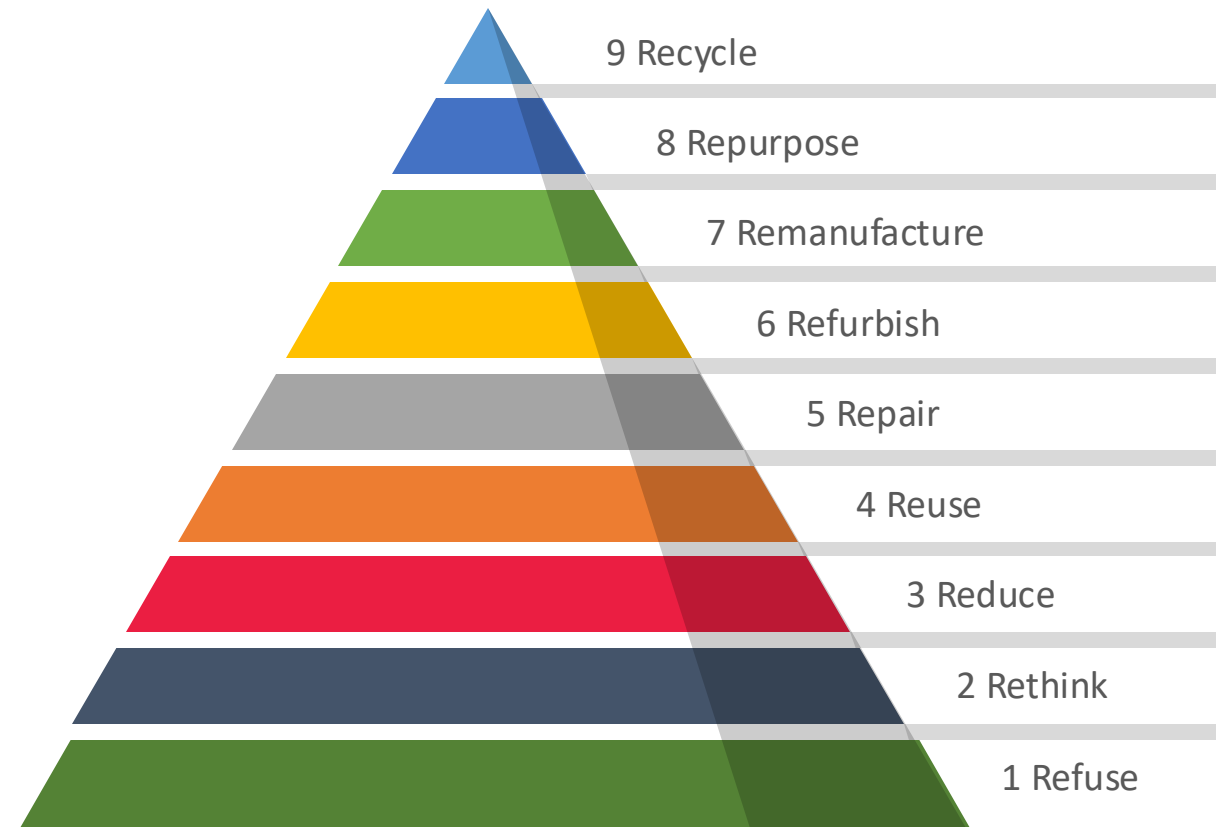
Technical cycle



Σε μία κυκλική οικονομία, ο κύριος στόχος είναι να διατηρηθεί όσον το δυνατόν περισσότερη αξία από πόρους, υλικά και προϊόντα. Τα προϊόντα και τα υλικά διατηρούνται σε παραγωγική χρήση για όσο το δυνατόν περισσότερο, και όταν φτάσουν στο τέλος της χρήσης, επιστρέφουν αποτελεσματικά (ή ανατροφοδοτούνται) πίσω στο σύστημα. Η κυκλική και συνεχής ροή τόσο των τεχνικών όσο και των βιολογικών υλικών μέσω των «κύκλων αξίας» απεικονίζεται στο Διάγραμμα Συστημάτων Κυκλικής Οικονομίας.

1 Hunting and fishing
2 Can take both post-harvest and post-consumer waste as an input

Nine principles of the circular economy - 9R's



1 Refuse: I make products redundant by removing their usefulness or replacing the same function with a radically different (e.g. digital) product or service.

2 Rethink: Intensify the use of products (e.g., through product-as-a-service models, sharing, reuse, etc.)

3 Reduce: Increase efficiency in the manufacture or use of products by consuming fewer natural resources and materials.

4 Reuse: I reuse a product that is still in good condition and fulfils its original function for the same purpose for which it was designed.

5 Repair: Repair and maintain defective products so that they can be used according to their original function.

6 Refurbish: Restore an old product and bring it up to date (to specified quality level).

7 Remanufacture: Use parts of a discarded product in a new product with the same function (and as-new-condition).

8 Repurpose: Use a redundant product or its parts in a new product with different function.

9 Recycle: Recover materials from waste to be reprocessed into new products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations.

Collaboration

The transition cannot be achieved by **one** organization alone.

It requires **collaborative efforts** across the value chain, involving private sector stakeholders, different government agencies, NGOs and citizens.

Companies must re-design products with circularity principles and ensure the closing of production loops.

All stakeholders have a key role to play in creating demand.

The public sector must play its role in providing the necessary infrastructure and shaping the policies and regulations that incentivize innovation.





Collaborations and partnerships

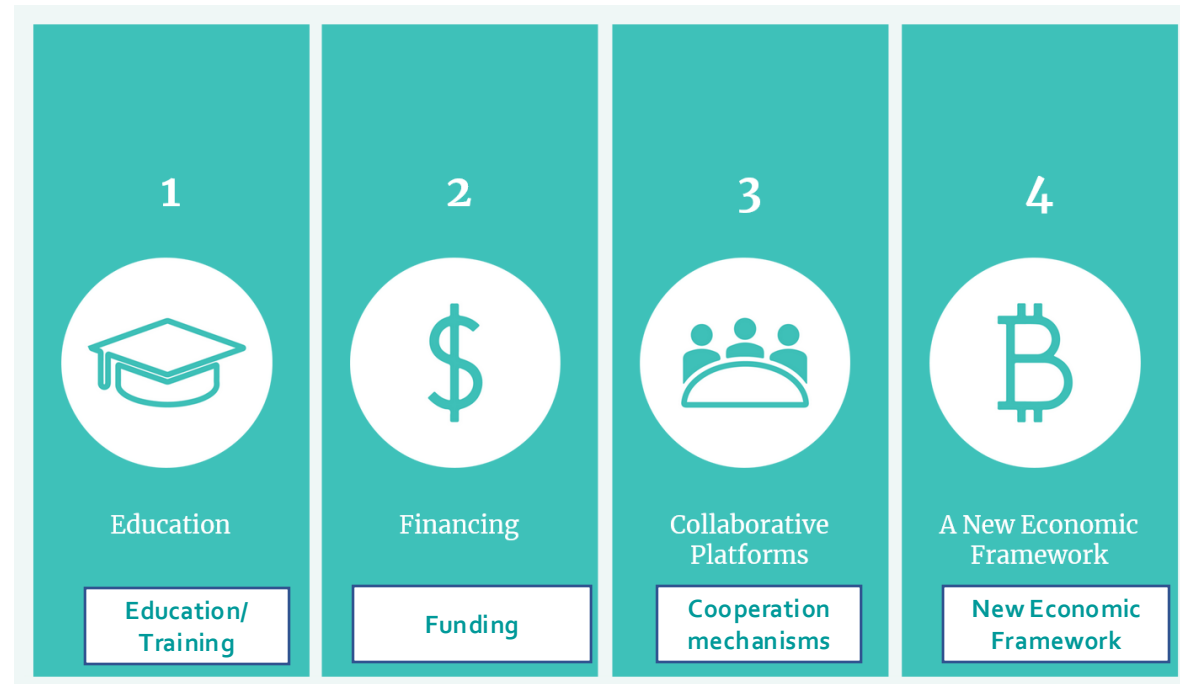
- Collaboration and partnerships with a wide range of stakeholders is essential to make systematic changes and create a circular city.
- Local governments are key to establishing, facilitating and guiding multilateral partnerships.
- However, everyone involved has something to bring to the table. A truly circular city can only be achieved when everyone works closely together and pulls in the same direction.





Creating the right environment for the circular economy

Policy makers play a key role in creating an appropriate environment to accelerate the transition to a circular economy at the systemic level. Four factors are key:



Source: UNEP circularity platform



Creating the right environment for the circular economy



Education can play an important role in preparing future professionals for a new economic model, in particular in building the knowledge and skills base to promote circular innovation. Governments should encourage the integration of circular economy and systems thinking into school and university curricula in view of awareness raising and mindset change.

Source: UNEP circularity platform



Creating the right environment for the circular economy



All players across the value chain will need access and risk management tools to support capital investment and R&D. Government grants and public procurement can play a key role in incentivising circular enterprises. A favourable investment climate can further help mobilise capital, with governments potentially taking on some of the risks associated with innovative business models.

Source: UNEP circularity platform



Creating the right environment for the circular economy



Effective cross-sectoral and intersectoral cooperation is imperative for the creation of a large-scale circular system. Joint product development, transparency and IT-enabled information sharing, common collection systems, industry standards, aligned incentives and matching mechanisms are key strategies to facilitate collaboration across sectors or between firms and policy makers.

Source: UNEP circularity platform



Creating the right environment for the circular economy



Broader changes to the existing fiscal system, the regulatory environment and the measurement of economic performance could contribute to a systemic transition towards a circular economy. All policy instruments are needed to develop a new economic framework that would support the transition to a circular economy.

Source: UNEP circularity platform

Barriers to Mainstreaming Circularity

Market
Barriers

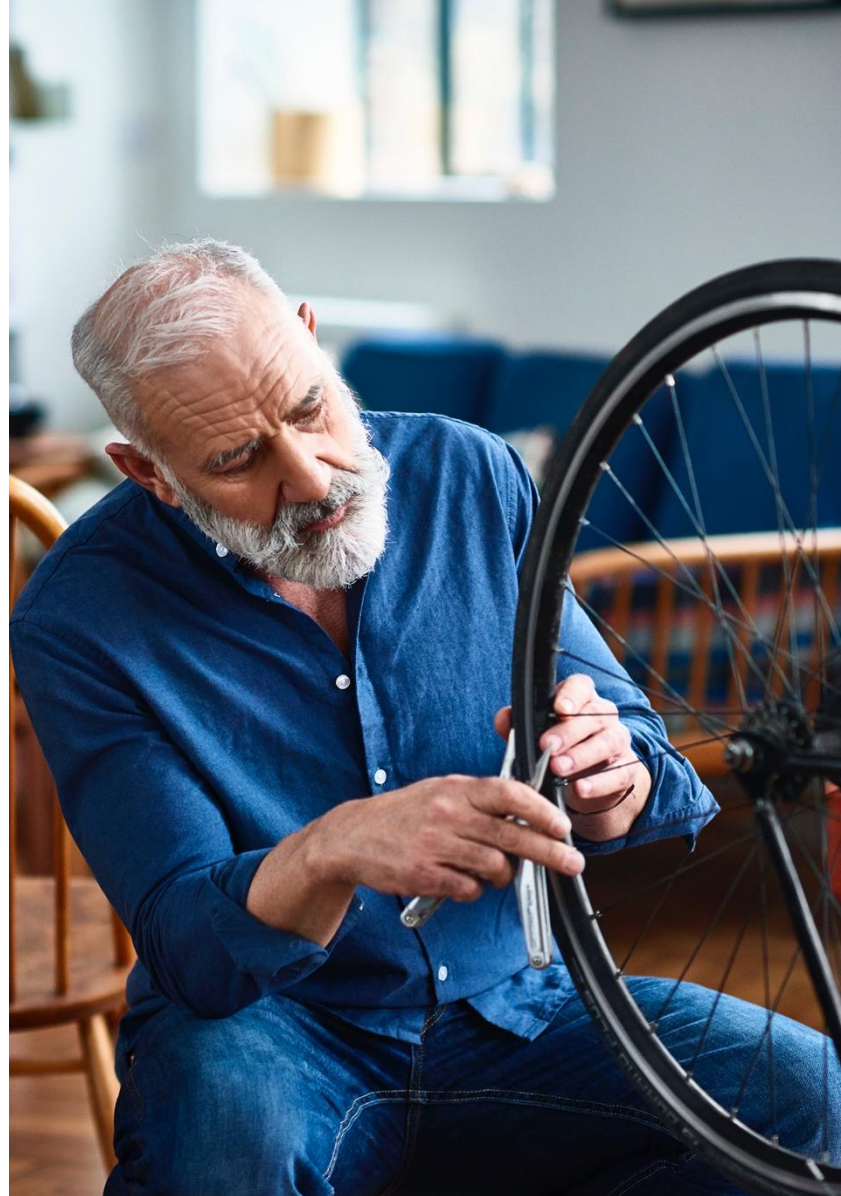
Consumer
Barriers

Technological
Barriers

Financial
Barriers

Regulatory
Barriers

1. Planning to avoid waste and pollution in cities.

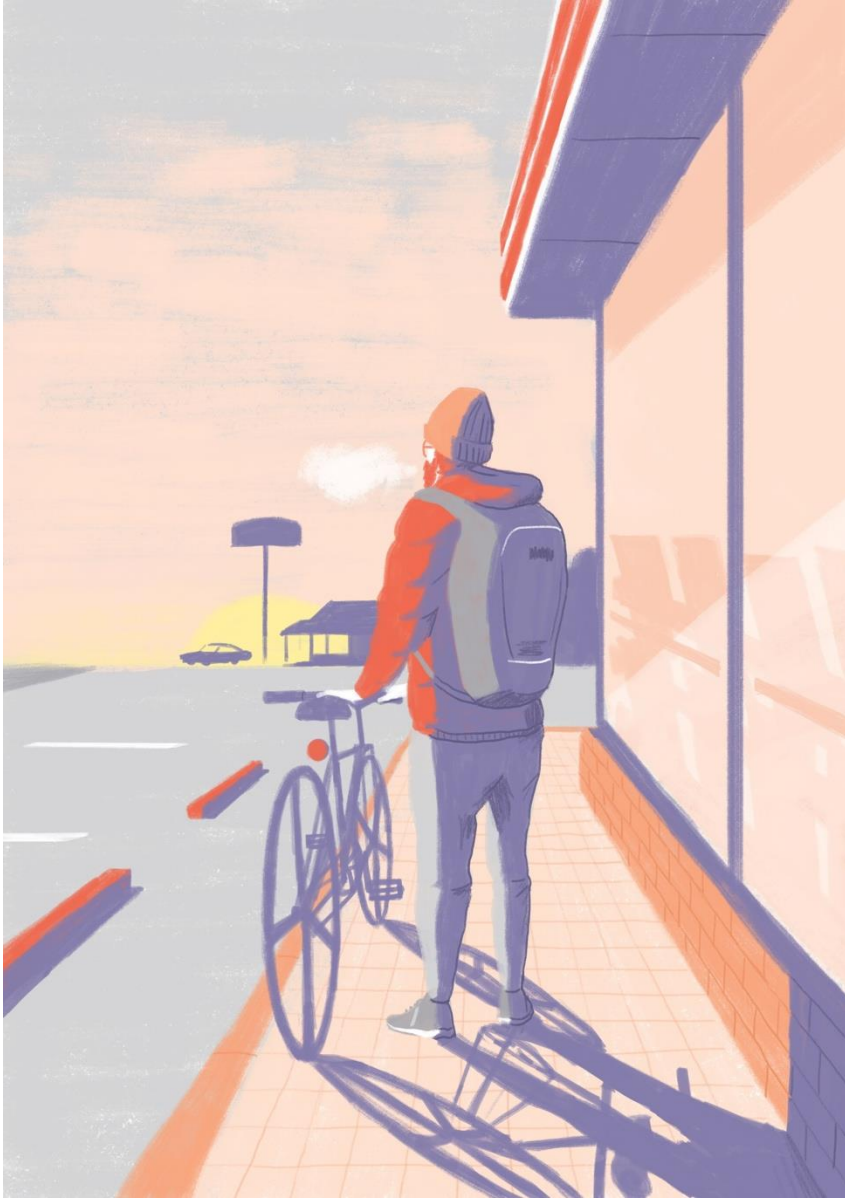


2. Retaining products and materials in use, and maintaining their value.

3. Regeneration of natural systems in and around cities.



4. Systemic change in the build environment



5. Sustainable transportation and mobility

3. Regeneration of natural systems in and around cities and food management.



Online Platform www.circularforall.org with two main functions

1

Connect with other people to **repair** used items in a seamless and sustainable way

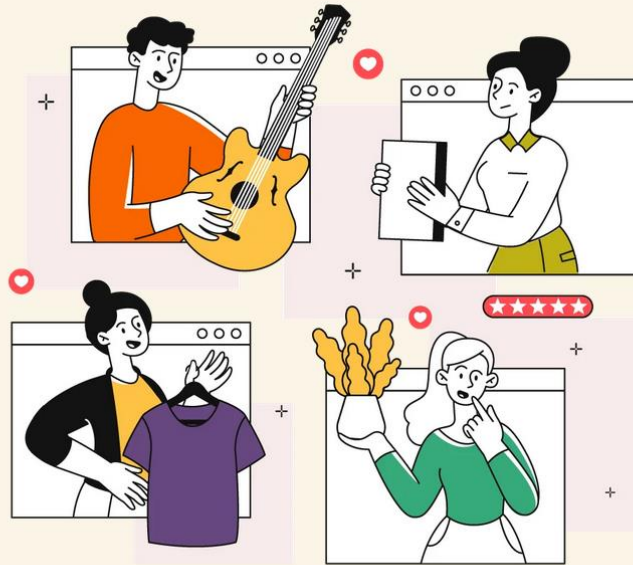
Whether you are looking to remove clutter from your spaces, find a new home for your belongings, or contribute to a greater cause by donating items, you've come to the right place!

General Items Repair Shops

Enter a location Search by repair shop name

Search for Repair Shops

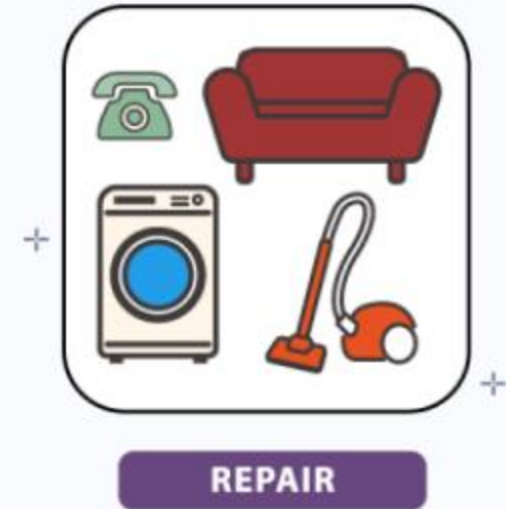
Search



Sell, Buy, Exchange or Donate your used items with someone

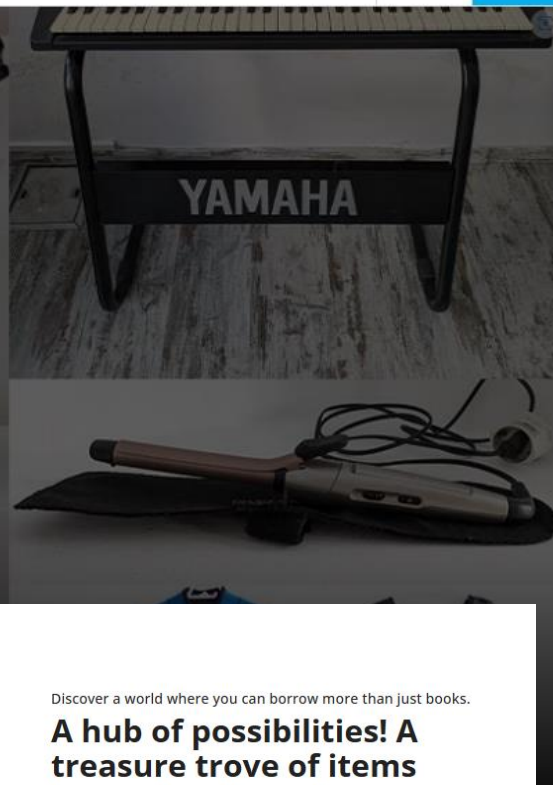
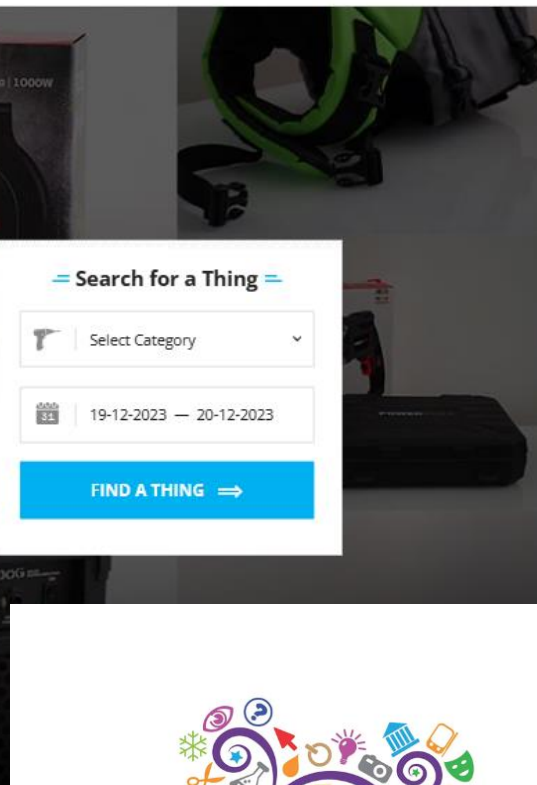
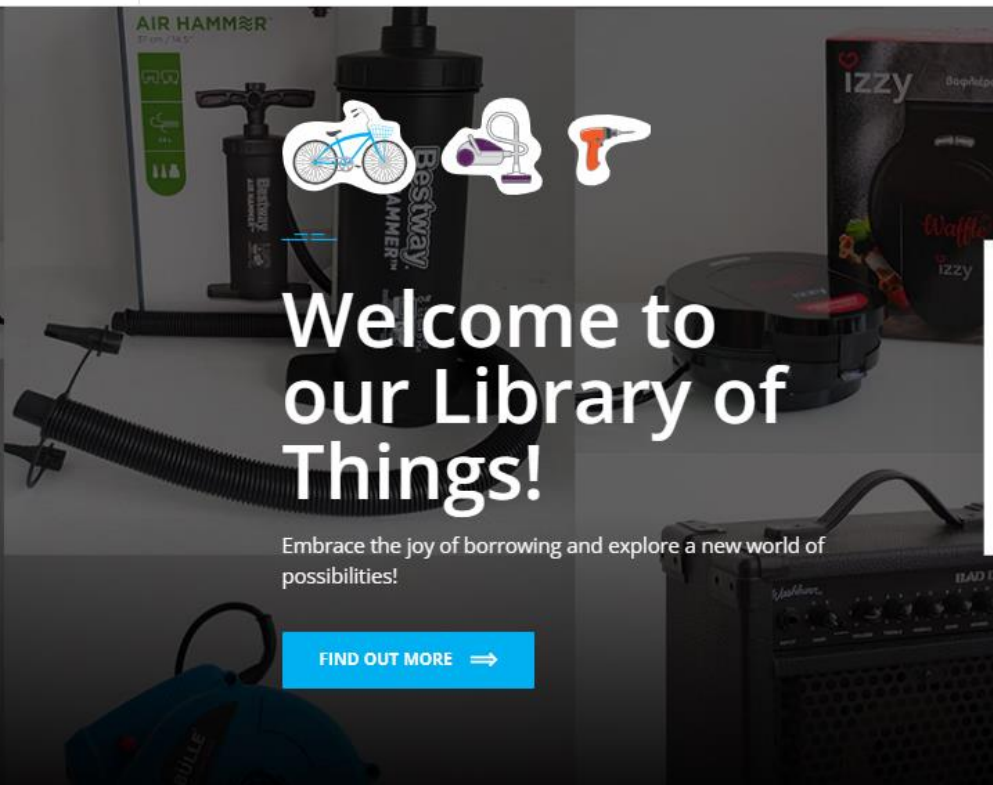
USER TO USER ACTIONS

2



Find **professionals** to fix your item

USER TO BUSINESS ACTIONS



Welcome to our Library of Things!

Embrace the joy of borrowing and explore a new world of possibilities!

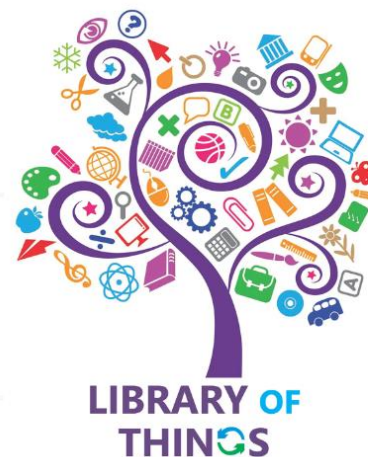
FIND OUT MORE →

Search for a Thing

Select Category

19-12-2023 — 20-12-2023

FIND A THING →



Discover a world where you can borrow more than just books.

A hub of possibilities! A treasure trove of items beyond ordinary!

From power tools for your DIY adventures, to board games for family fun, to camping gear for your outdoor escapades, or kitchen appliances for culinary experiments; our collection is here to enrich your experiences without breaking the bank or the burden of ownership.

Through borrowing, you can save money, space in your home, develop new skills for which the equipment needed is too expensive, whilst also enhancing a sense of community and embracing circular economy practices by fostering a culture of sharing, by preventing the purchase of products with idling capacity, reducing resource extraction and landfill waste.

Let's make borrowing the new buying! Join us in fostering a sustainable and resourceful community where borrowing opens the doors to new experiences and adventures.

National Action Plan for the Circular Economy





National Action Plan for the strengthening of the circular economy 2021-2027

- Creating a culture of circular economy
 - Communication Plan, Implementation of training, education and skills development programmes, Information on financial instruments.
- Incentives for investment in the circular economy and assisting the transition
 - Business mentoring, "Go Circular" Support Schemes to support circular economy investments in businesses, Support Scheme to support circular economy investments in businesses, Implementation of circular economy in the hotel sector.
- Infrastructure of the circular economy
 - Waste Declassification, Creation of an online resource exchange platform (sharing marketplace for circular economy), Integrated management, information, communication and project monitoring system, Standardisation and certification based on management systems and/or products/services standards, Pilot projects in relation to circularity standards.
- Municipal waste management



CYPRUS ENVIRONMENT SYMPOSIUM



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