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Part 4: Circular Economy & Resource Management

Developed by Parpounas Sustainability Consultants

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Consortium

Co-Ordinator: ECECT

Partners: PSC PARPOUNAS SUSTAINABILITY CONSULTANTS

ΜΙΛΕΤΙΑ ΒΙΩΣΙΜΗ ΚΟΙΝΩΝΙΚΗ ΑΝΑΠΤΥΞΗ

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What will you learn in this module?







- Part 1: Introduction
- Part 2: Global Trends and Environmental Challenges
- Part 3: Policy Framework
- Part 4: Circular Economy in practice
- Part 5: Measures promoting the circular economy
- Part 6: Benefits of the Circular Economy
- Part 7: Cyprus Action Plan and Opportunities

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Learning Outcomes

- Circular Economy definition
- Why should we transition to a Circular Economy?
- The EU Policy framework for the Circular Economy
- How to transition to a Circular Economy with examples focusing on rural and remote areas.
- Measures promoting the circular economy
- Benefits of the Circular Economy
- Circular Economy in Cyprus and opportunities

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Part 1:Introduction

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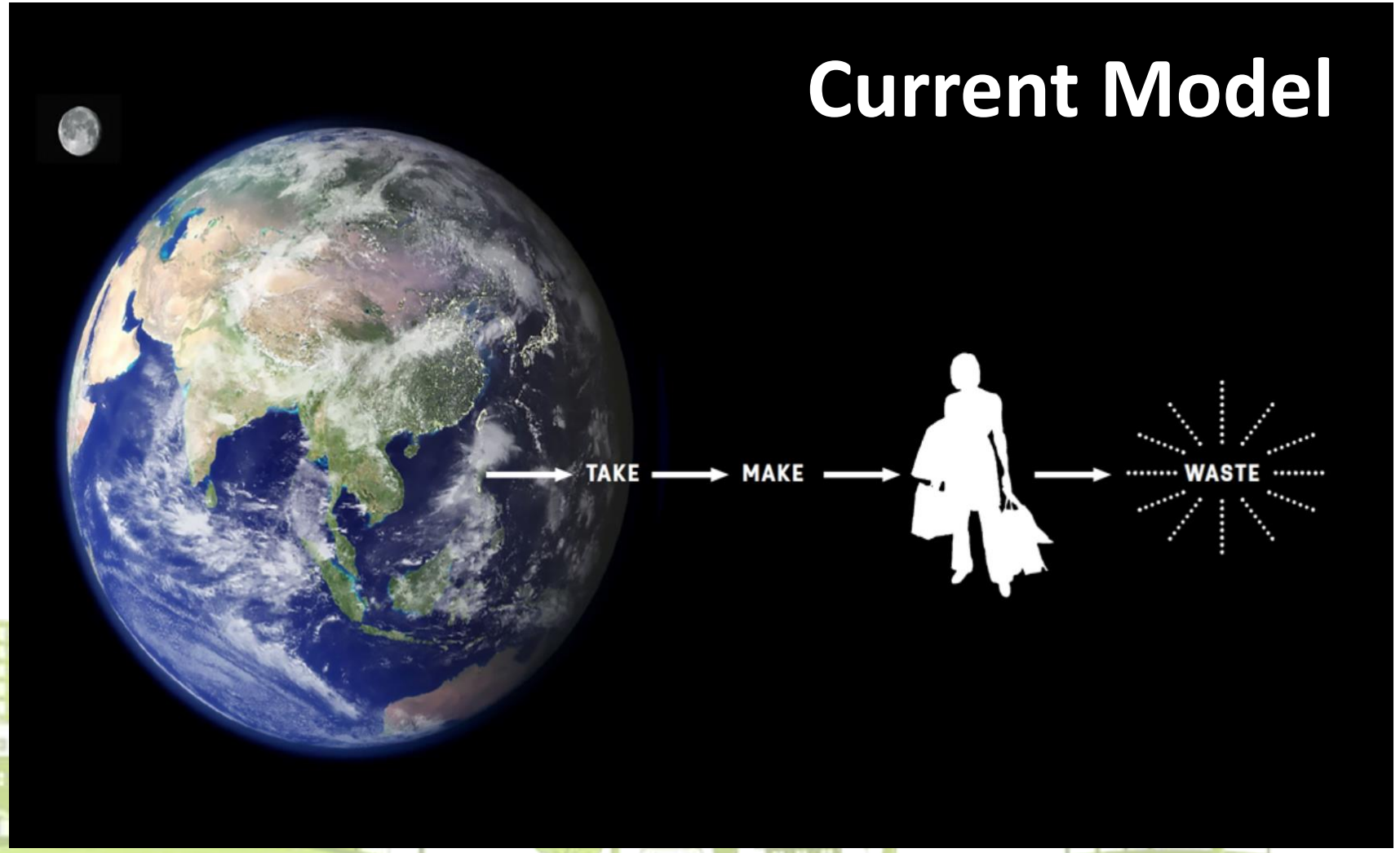
Linear Economy Model



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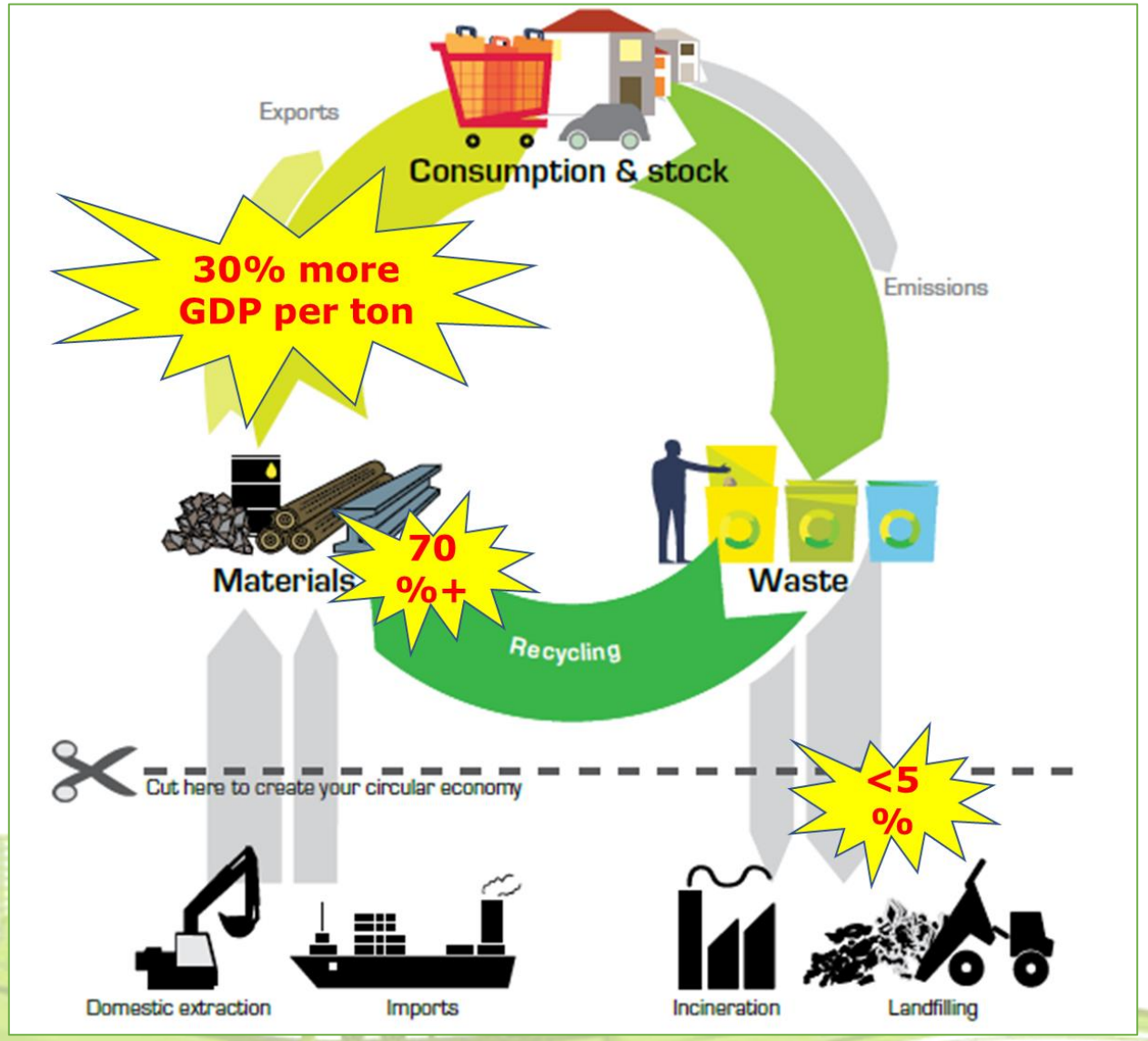
Circular economy model



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Circular Economy model

Source: http://cybc.com.cy/video-on-demand/%cf%81%ce%b9%ce%ba-1/%cf%83%cf%80%ce%af%cf%84%ce%b9-%cf%83%cf%84%ce%b7-%cf%86%cf%8d%cf%83%ce%b7/episodes/%cf%83%cf%80%ce%af%cf%84%ce%b9-%cf%83%cf%84%ce%b7-%cf%86%cf%8d%cf%83%ce%b7-23-01-22/

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Circular Economy model

The INERTIA Principle

Do not repair what is not broken

Do not remanufacture something that can be repaired

Do not recycle a product that can be remanufactured

Replace or treat only the smallest possible part in order to maintain the existing economic value

Walter Stahel

Source: http://www.product-life.org/

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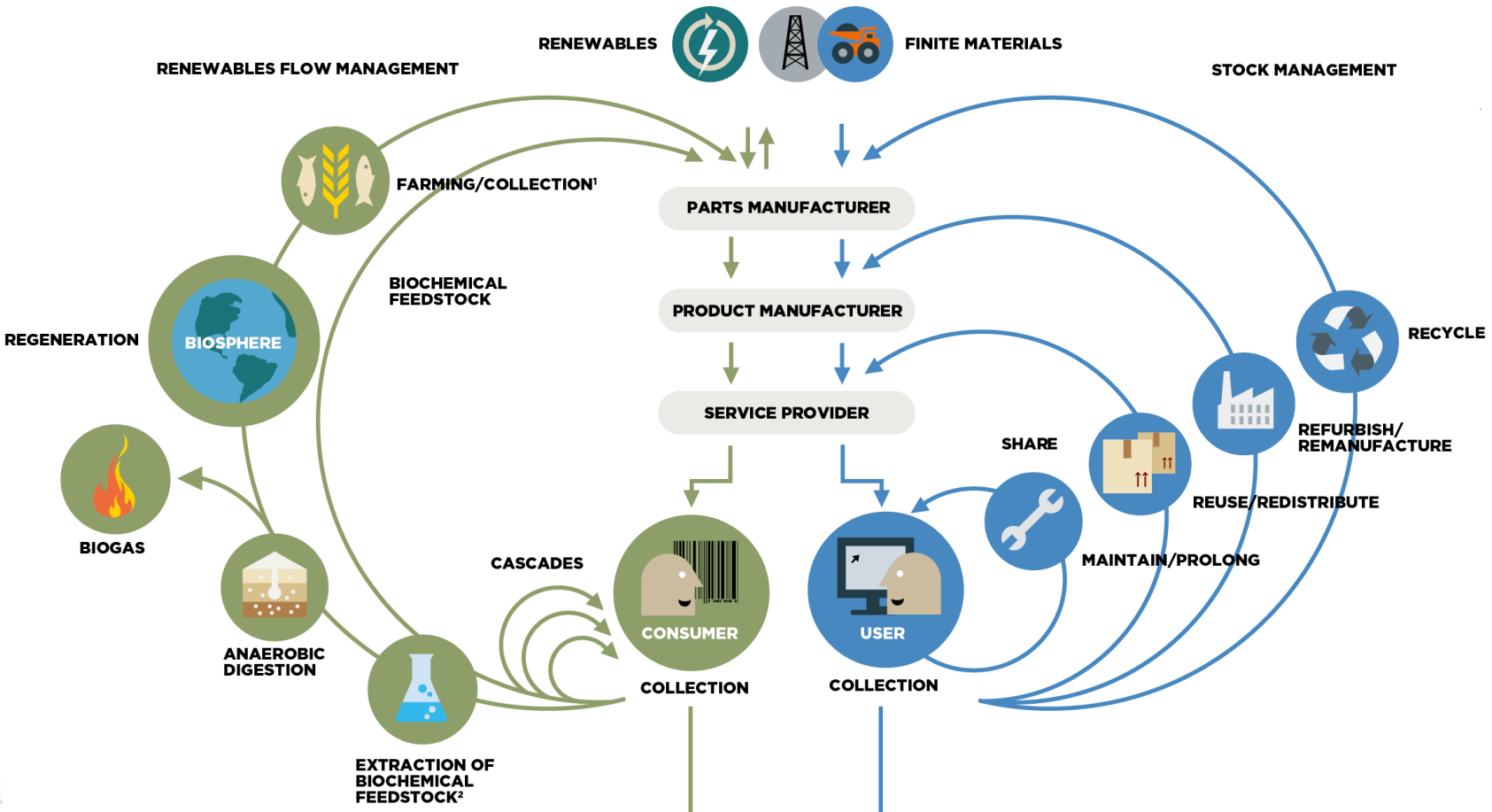
Circular economy model -The butterfly diagram



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

SOURCE
Ellen MacArthur Foundation
Circular economy systems diagram (February 2019)
www.ellenmacarthurfoundation.org
Drawing based on Braungart & McDonough, Cradle to Cradle (C2C)

ELLEN MACARTHUR FOUNDATION

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Part 2: Global Trends and Environmental Challenges

- Megatrends
- Environmental Challenges
- Demographic trends
- Increase in commodity prices
- Environmental Challenges in Cyprus

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Megatrends

The UN Economist Network has highlighted global megatrends in their September 2020 report for the UN 75th Anniversary titled Shaping the Trends of Our Time.

Climate change and environmental degradation

Emergence of digital technologies

Demographic trends (population ageing)

Inequalities

Urbanisation

Emergence of digital technologies

Demographic trends (population ageing)

Inequalities

Urbanisation

Climate Change and environmental degradation

Environmental Challenges

What are the key environmental issues in the following photographs?

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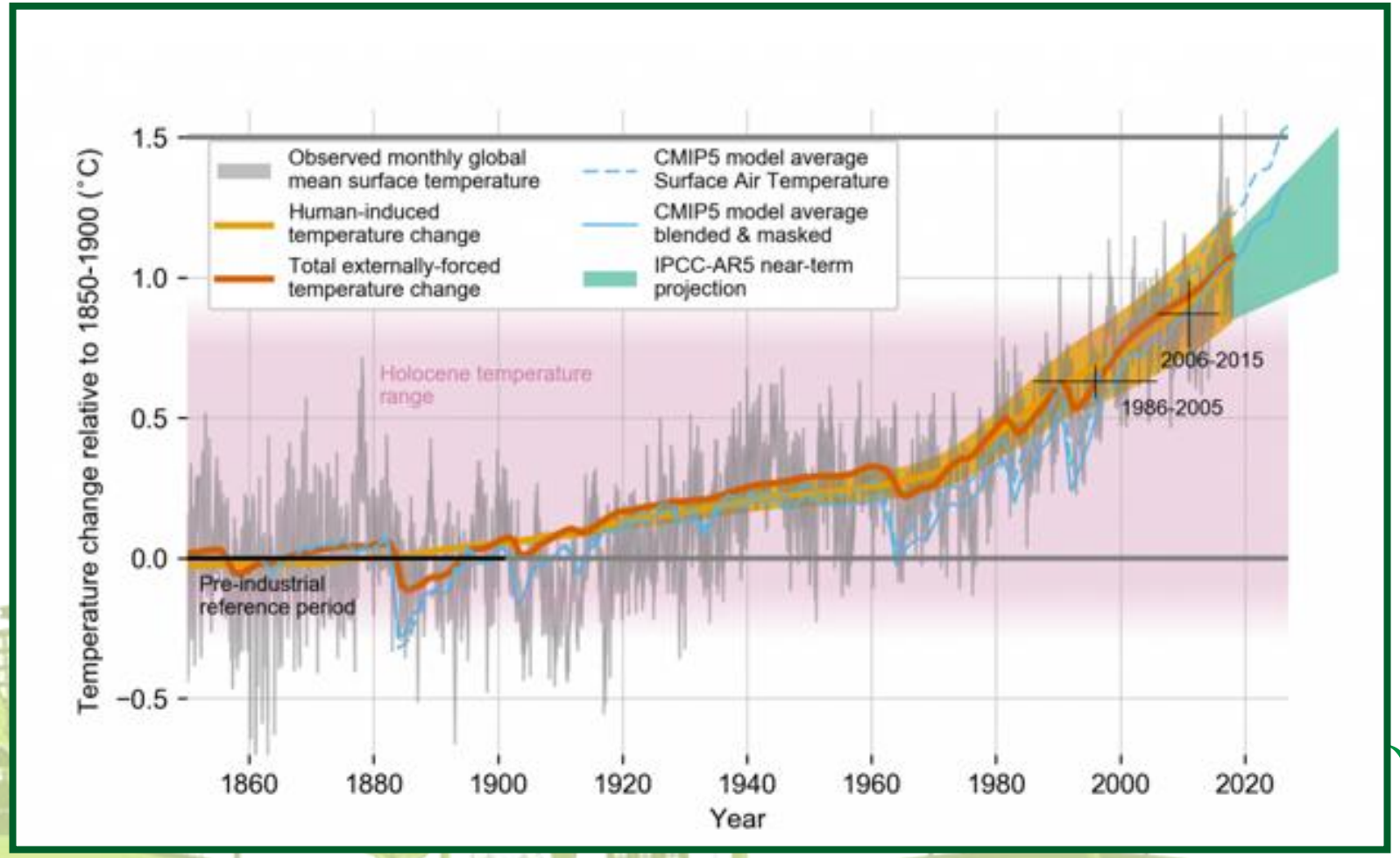
Environmental Challenges

Global Warming



Source: https://www.ipcc.ch/sr15/graphics/#cid_457

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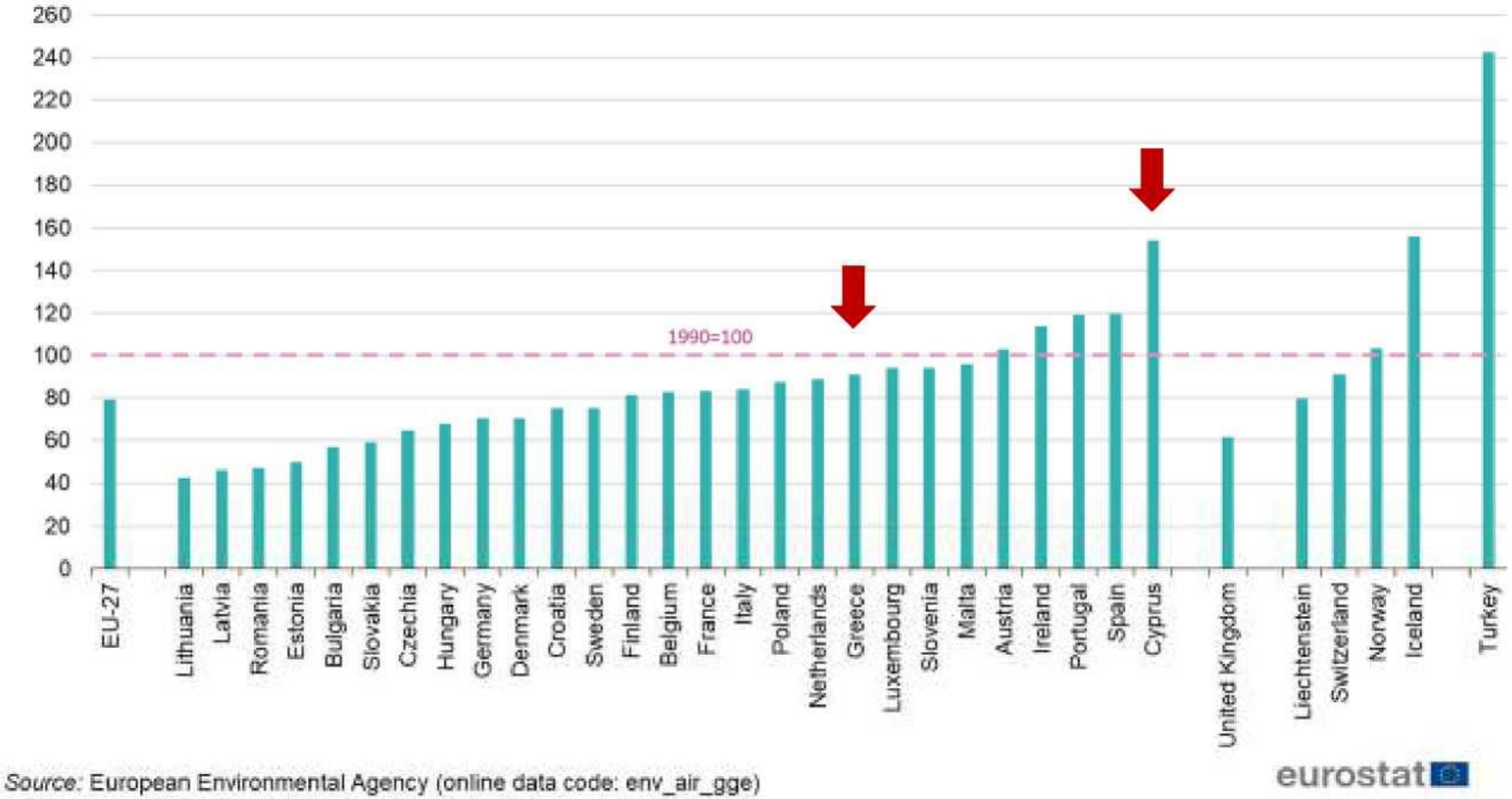
Environmental Challenges

GHG emissions per capita by country (2018)



Source: Eurostat Statistics Explained (2020): Figure 2: Total greenhouse gas emissions (including international aviation, excluding LULUCF), by country, 2018 (Index 1990 = 100)

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Environmental Challenges

Impacts of climate change in Europe

Source: https://youtu.be/jS0ZIUtsQHg

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Environmental Challenges

"Earth Overshoot Day"

Annual record of resources we should be consuming, to be considered sustainable i.e., naturally replenishable by the planet. Based on this, the Earth Overshoot Day represents the calendar date of the year we have reached the cap of the acceptable resource uptake.

1993	2003	2017	2019	2020	2021	2022
October 21st	September 22nd	August 2nd	July 29th	August 22nd	July 29th	July 28th

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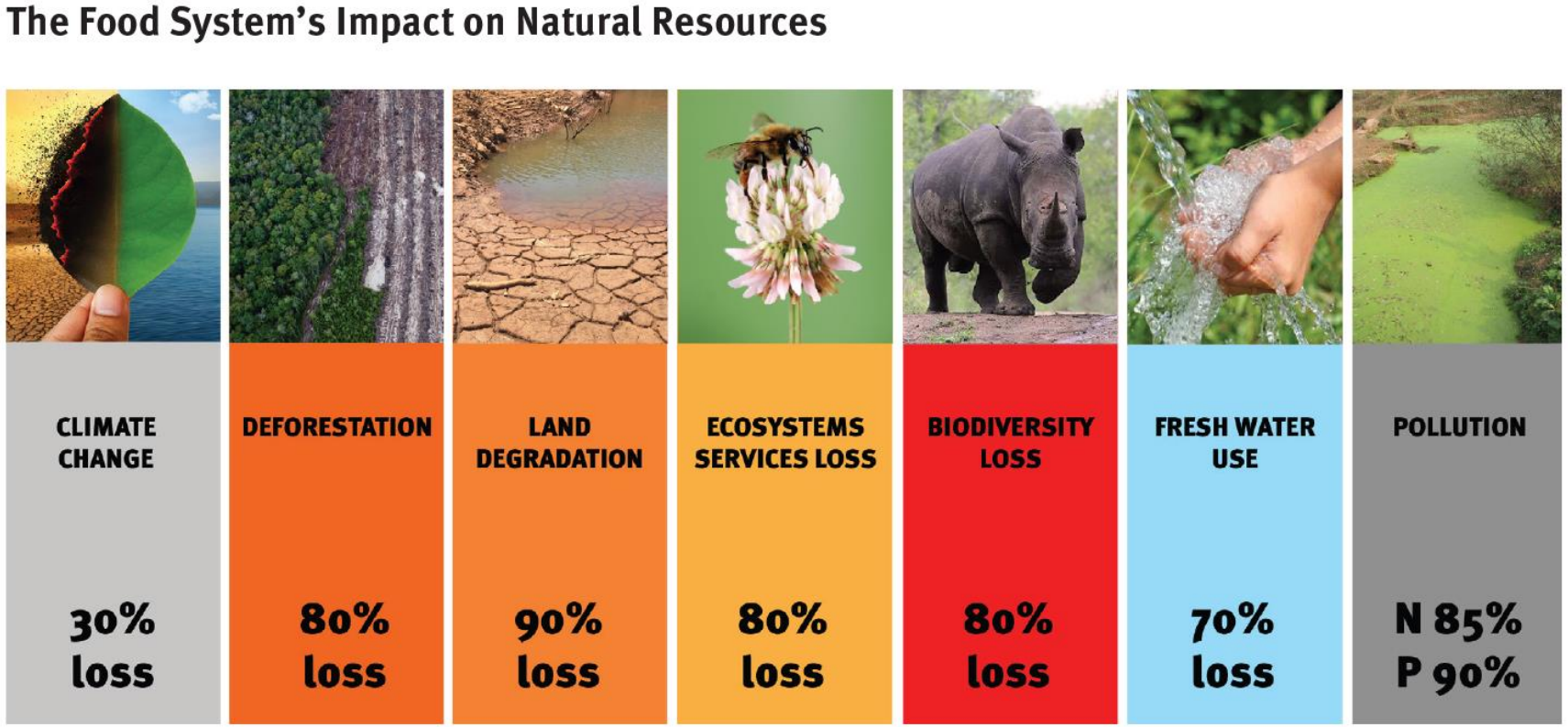
Environmental Challenges

The environmental impact of conventional agriculture



Source: https://www.unido.org/sites/default/files/files/2020-09/Circular_economy_in_AGR.pdf

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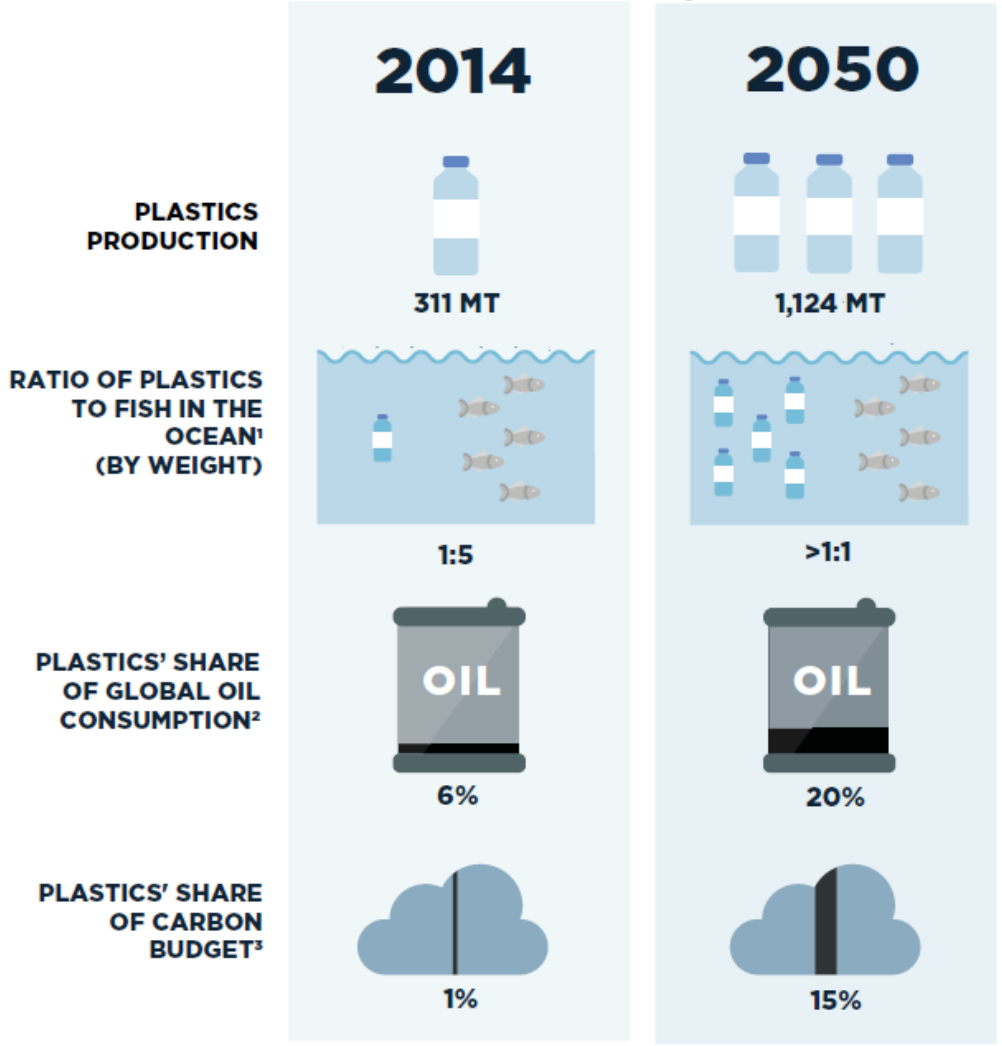
Environmental Challenges

The Plastics Challenge



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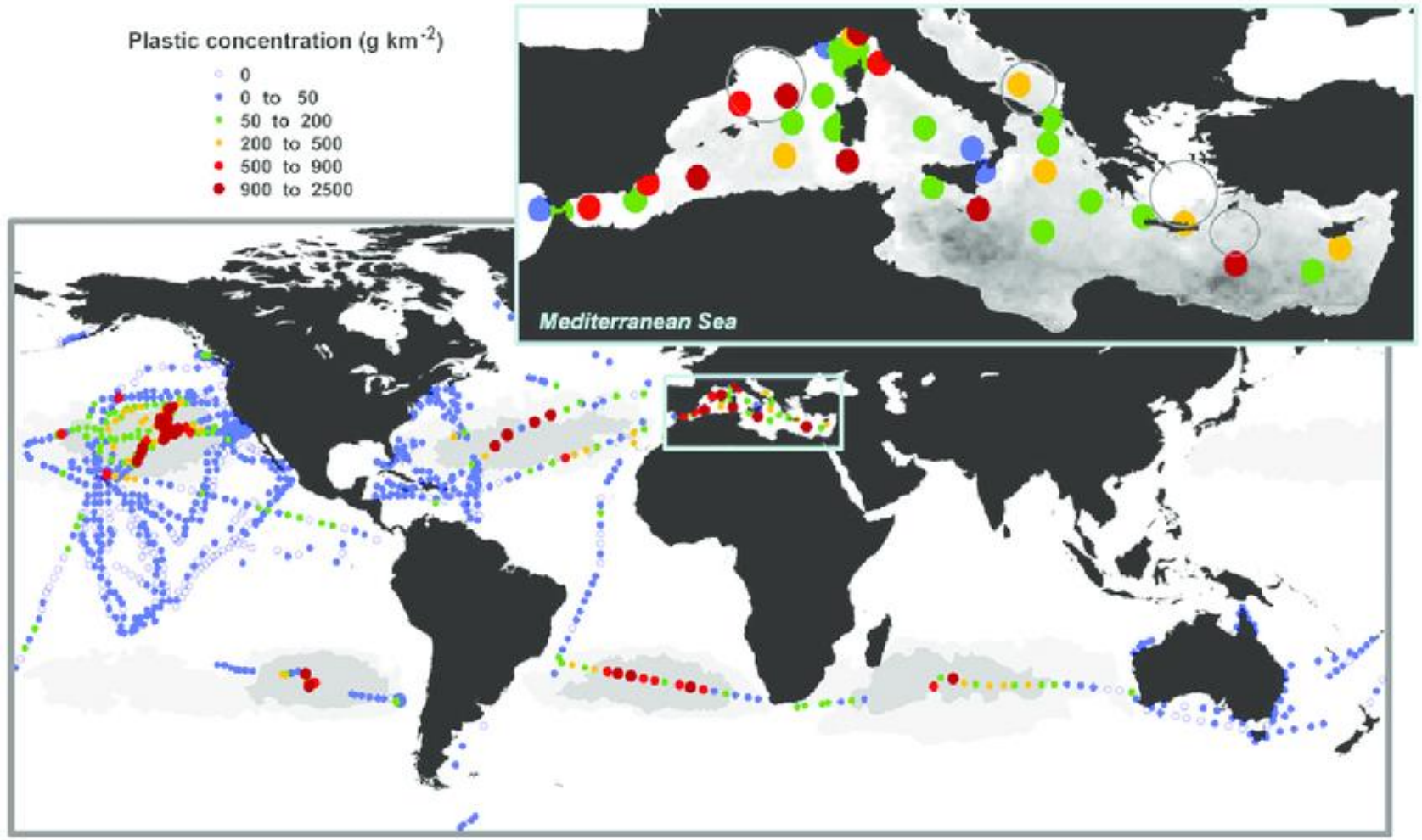
Environmental Challenges

Concentrations of plastic debris in Mediterranean surface waters compared to reported global ocean plastic concentrations



Source: Cózar, Andrés & Sanz-Martín, Marina & Marti, Elisa & González-Gordillo, Juan & Úbeda, Bárbara & Gálvez, José & Irigoien, Xabier & Duarte, Carlos. (2015). Plastic Accumulation in the Mediterranean Sea.

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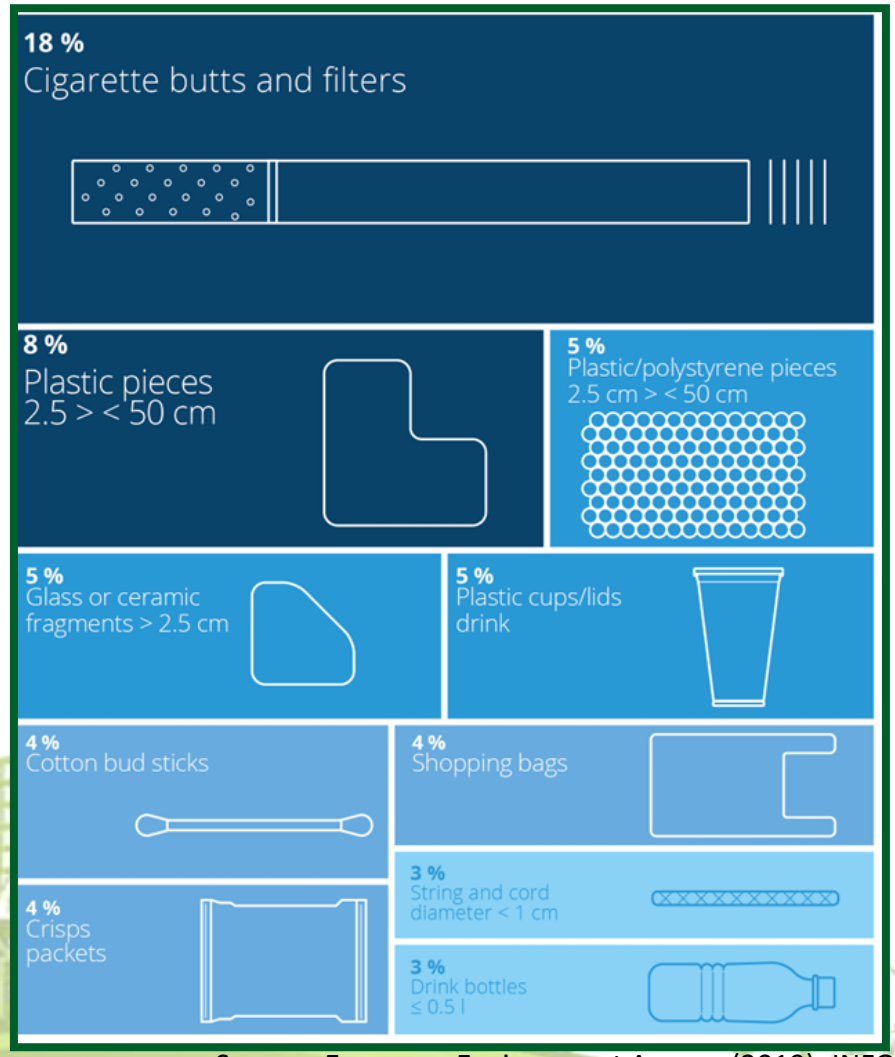
Environmental Challenges

Plastic Pollution



•Source: European Environment Agency (2019): INFOGRAPHIC Collecting marine litter and data.

•Source: European Commission (2018): A European Strategy for Plastics in a Circular Economy GRAPH Curbing plastic waste and littering.

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Environmental Challenges

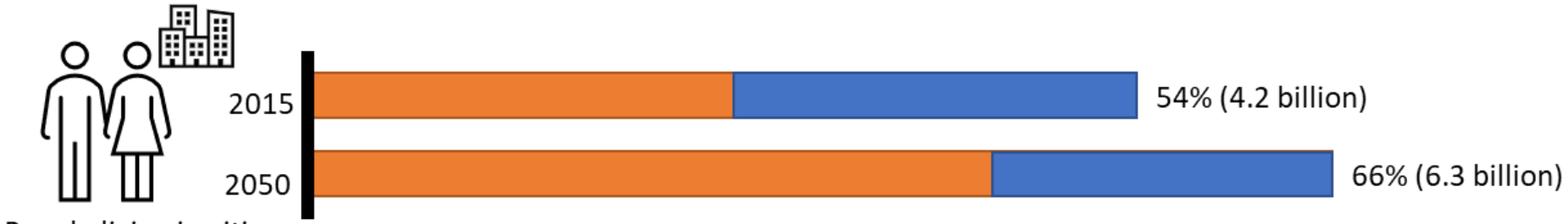
Food Waste

Source: European Parliaments News (2017): INFOGRAPHIC
Food waste: the problem in the EU in numbers.

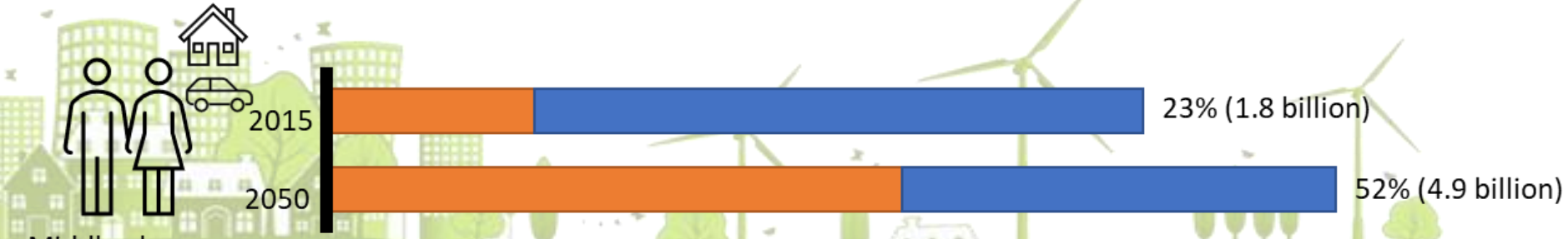
Demographic Trends

Global Population trends

World population



People living in cities



Middle class

Source: ING Economics Department (2015): Rethinking finance in a circular economy DIAGRAM The world is inhabited by more and richer people

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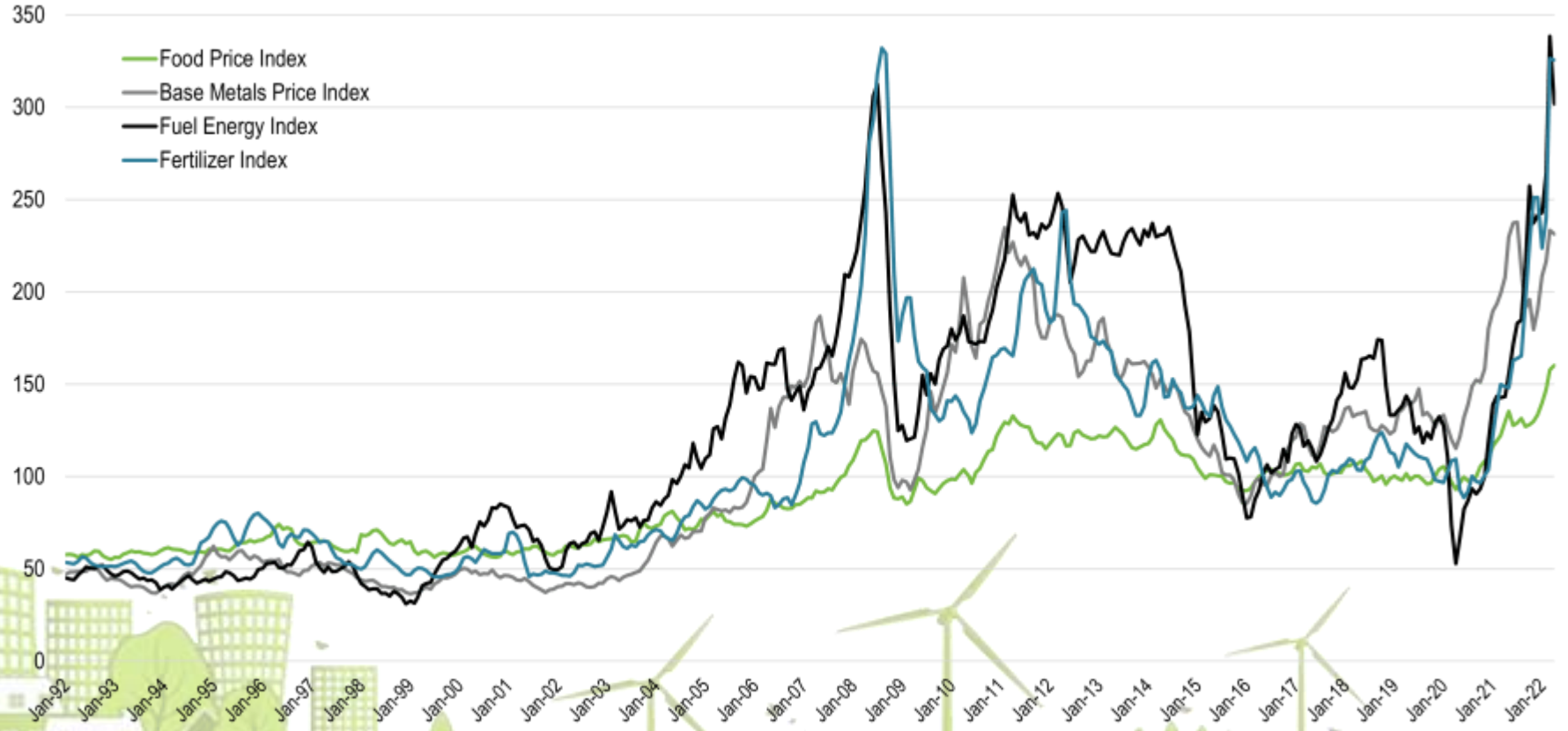
Increase in commodity prices

Price indexes for fuel, food, metals and fertilizers



Source: https://transportgeography.org/contents/chapter4/transportation-sustainability-decarbonization/commodity-prices-index/

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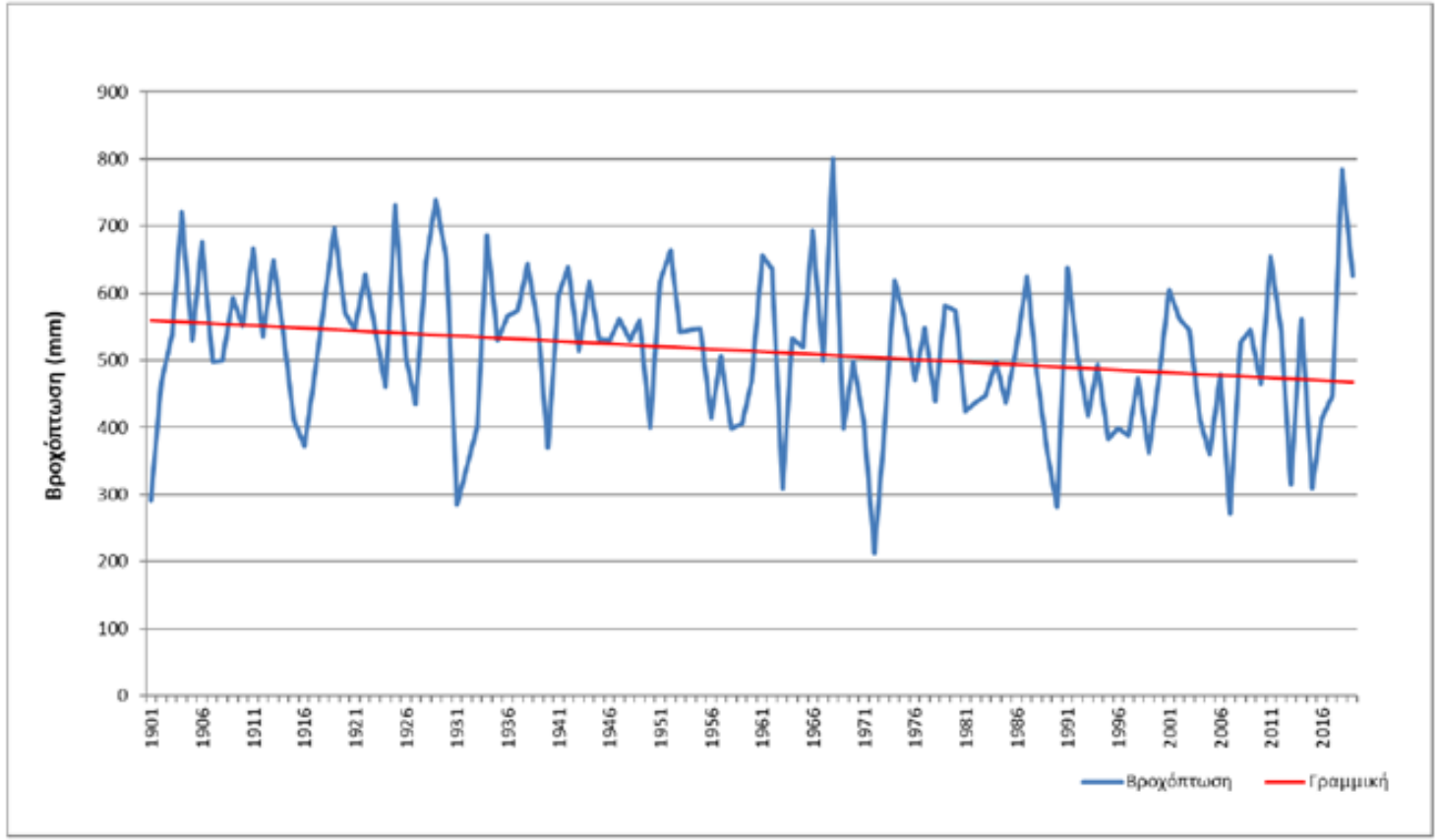
Cyprus Environmental Challenges

"Report on the state of the environment in Cyprus 2020"

Decrease in average yearly rainfall.

Predicted further decrease in the years 2021-2050 with longer drought periods.



Εικόνα 2.52. Μέση ετήσια βροχόπτωση Κύπρου για την περίοδο 1901-2019 (*Πηγή: Τμήμα Μετεωρολογίας*).

Source: http://www.moa.gov.cy/moa/environment/environmentnew.nsf/All/

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Cyprus Environmental Challenges

"Report on the state of the environment in Cyprus 2020"

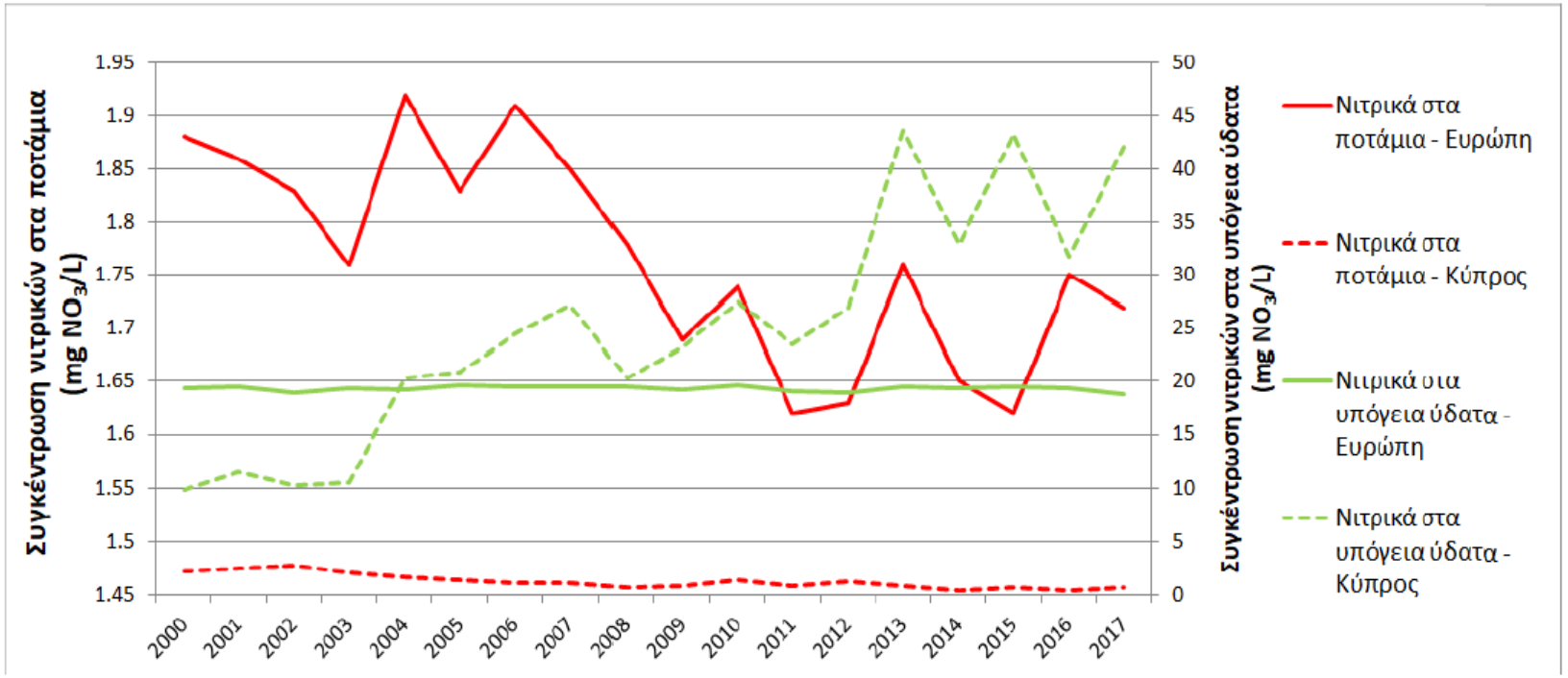
<u>Water availability and pollution:</u>

Inadequacy of water resources exacerbated by

i) Increase in water demands

ii) Pollution from human activities

iii) More intense drought periods



Εικόνα 2.16. Σύγκριση συγκέντρωσης νιτρικών σε ποτάμια και σε υπόγεια ύδατα μεταξύ Κύπρου και Ευρωπαϊκής Ένωσης (*Πηγή*: *Ευρωπαϊκός Οργανισμός Περιβάλλοντος*).

Source: http://www.moa.gov.cy/moa/environment/environmentnew.nsf/All/

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Cyprus Environmental Challenges

"Report on the state of the environment in Cyprus 2020"

The increase in temperature and the decrease in precipitation contribute to the increase and intensity of fire incidents, which, in addition to the economic disaster, are also one of the factors that can threaten biodiversity as a whole.

Source: http://www.moa.gov.cy/moa/environment/environmentnew.nsf/All/

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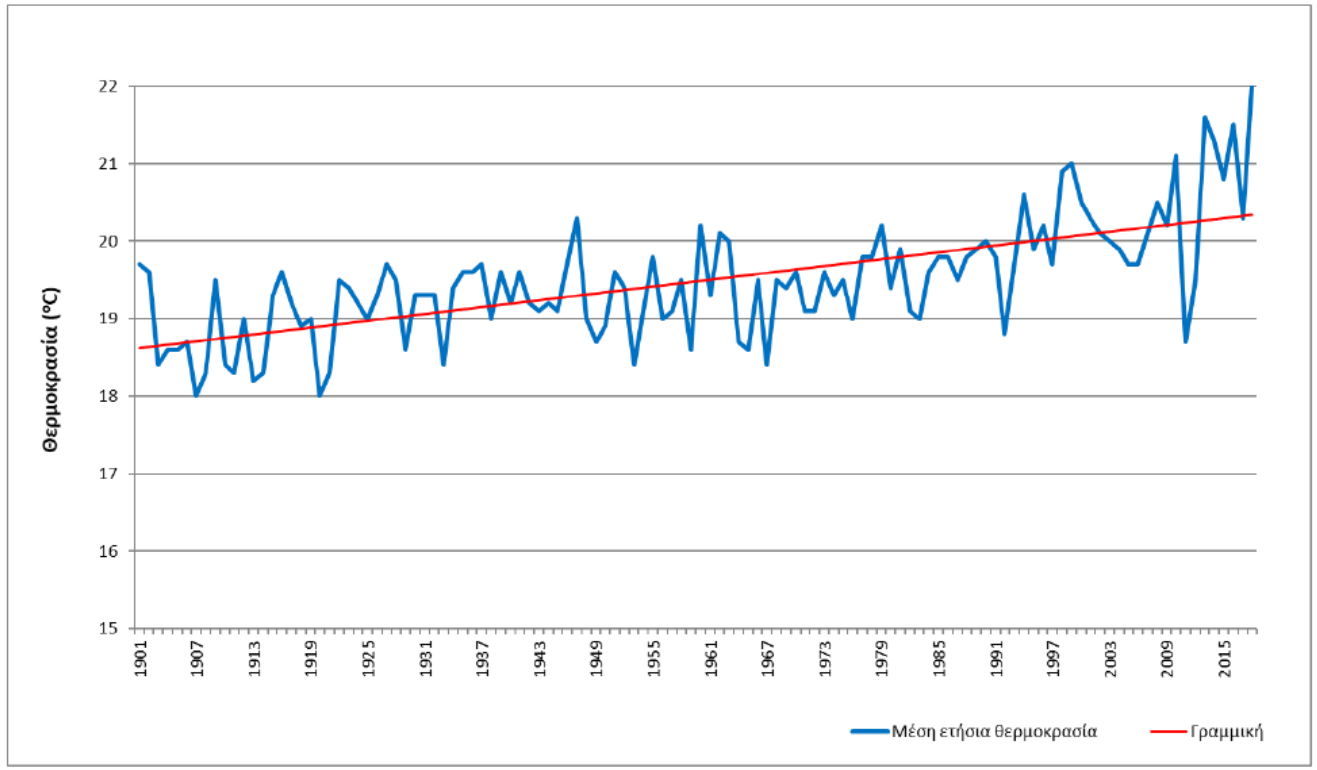
Cyprus Environmental Challenges

"Report on the state of the environment in Cyprus 2020"

Increasing trend in the average daily maximum and average minimum daily temperature throughout Cyprus.

This is occurring despite the reduction in the total gas emissions of all activities and the increase in the percentage of energy consumption from renewable sources.



Εικόνα 2.49. Μέση ετήσια θερμοκρασία αέρα Λευκωσίας, για την περίοδο 1901-2018 (*Πηγή: Τμήμα Μετεωρολογίας*).

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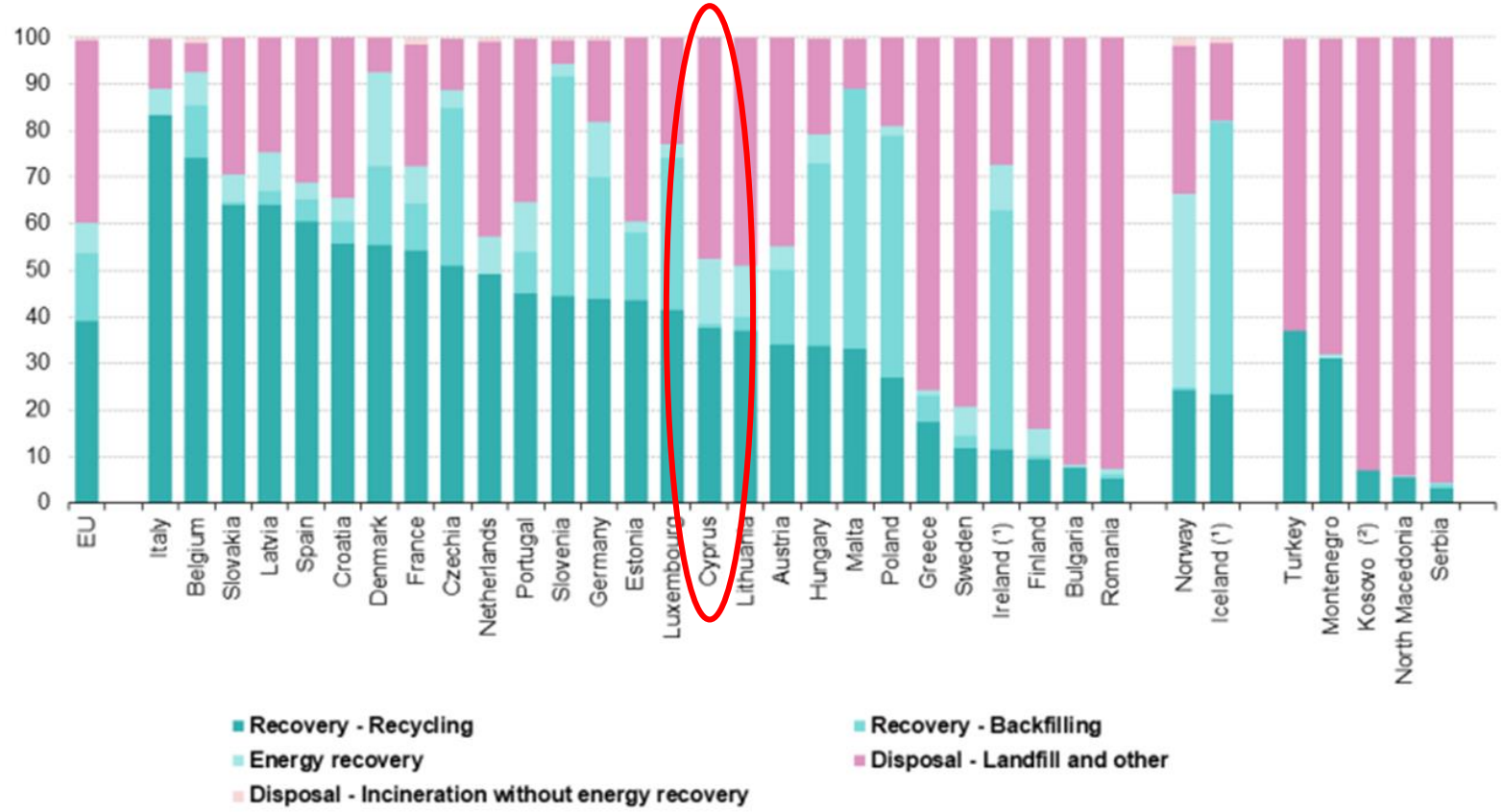
Environmental Challenges

Waste statistics in Cyprus

Waste treatment by type of recovery and disposal, 2020
(% of total treatment)



(1) 2018 data
(2) This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo Declaration of Independence.
Source: Eurostat (online data code: env_wastrt)

eurostat

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Part 3: Policy Framework

- UN – The 2030 Agenda for Sustainable Development
- EU Policy framework

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UN – The 2030 Agenda for Sustainable Development

- Sustainable development is:

‘Development which meets the needs of the present generation without compromising the ability of future generations to meet their own needs’

1987 UN Brundlandt report, Rio 1992 Definition, (part I „The Global Challenge", chapter 3 ‘Sustainable Development", article 27.

https://www.researchgate.net/figure/The-interconnection-of-the-elements-of-the-Triple-Bottom-Line-concept_fig1_329185478

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UN – The 2030 Agenda for Sustainable Development

The 17 Sustainable Development Goals

- The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future.

- At its heart are the 17 Sustainable Development Goals (SDGs), which are an urgent call for action by all countries - developed and developing - in a global partnership.

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UN – The 2030 Agenda for Sustainable Development

The 5Ps of sustainable development

- The preamble of the 2030 Agenda states that the 17 SDGs and their targets will stimulate action in the following areas of critical importance for humanity and planet: people, planet, prosperity, peace, and partnership.

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UN – The 2030 Agenda for Sustainable Development

UN SDG 12: Responsible Production and Consumption

- By 2030, achieve the sustainable management and efficient use of natural resources
- By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains
- By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle … in order to minimize their adverse impacts on human health and the environment
- By 2030 substantially reduce waste generation through prevention, reduction, recycling and reuse

Source: https://www.kit.nl/sdg12/

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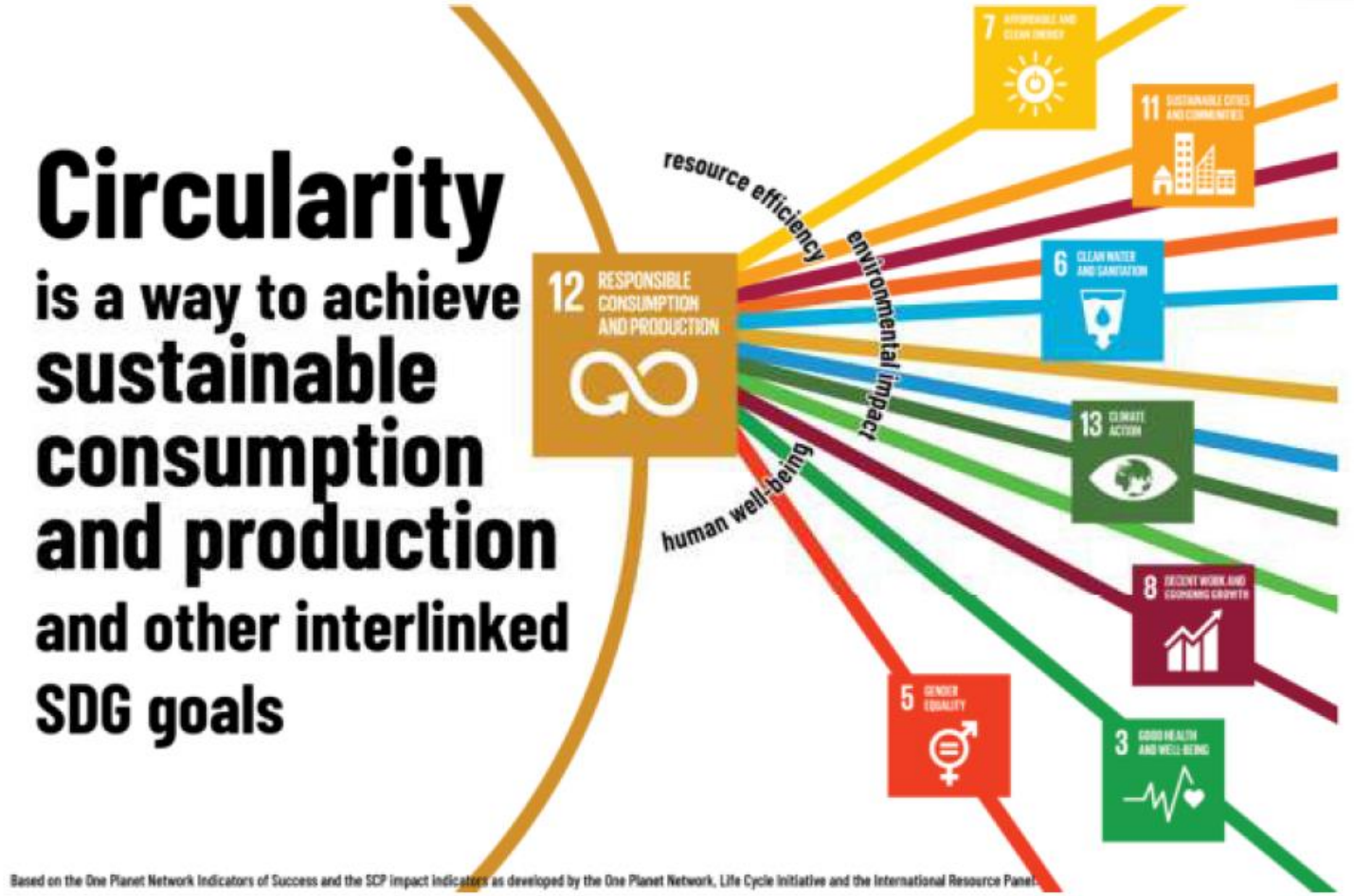
UN – The 2030 Agenda for Sustainable Development



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EU Policy framework

- The EU adopted several policies and targets towards a more circular economy.

- <u>Important milestones:</u>

✓ First circular economy action plan(Dec.2015) and the adopted Circular Economy Package during 2015-2019.

✓ EU Green Deal (Dec.2019)

✓ New circular economy action plan (Mar.2020)

Source: https://euinasean.eu/eu-green-deal/

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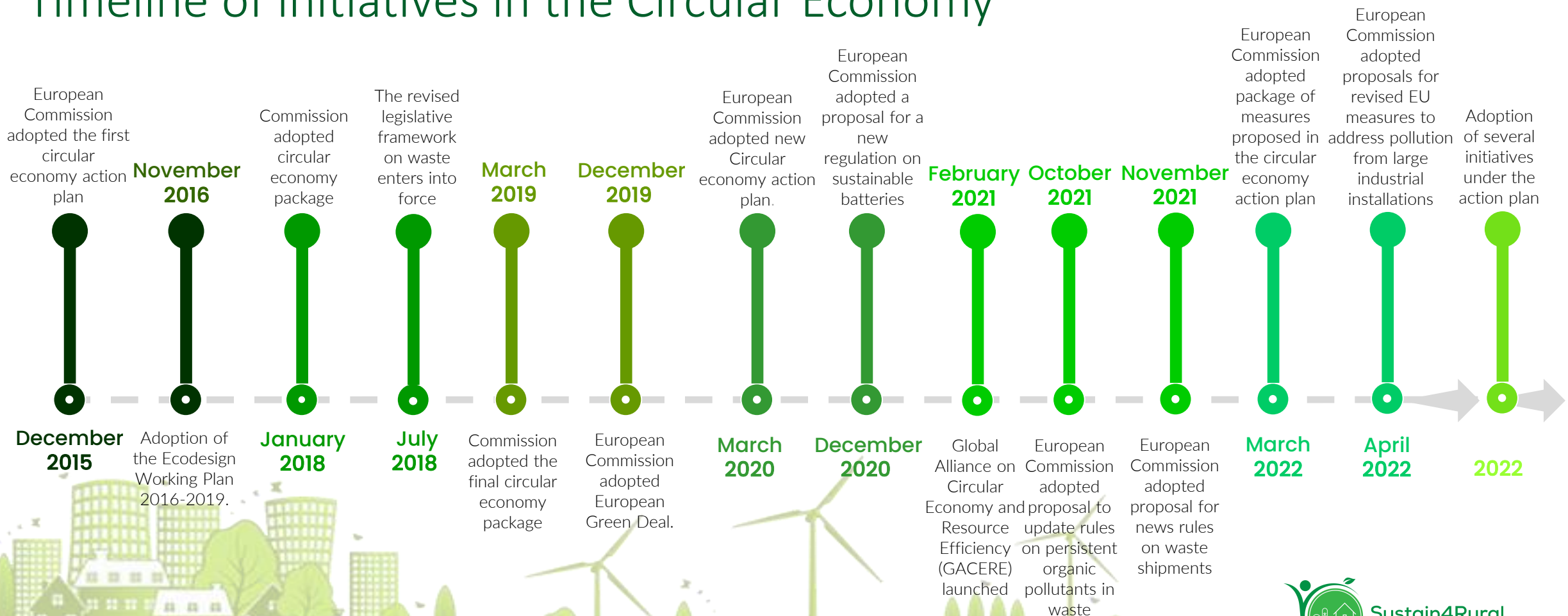
EU Policy framework

Timeline of initiatives in the Circular Economy



Source: https://environment.ec.europa.eu/strategy/circular-economy-action-plan_en

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EU Policy framework

Circular Economy Package 2019

In December 2019 the EC completed the adoption of the Circular economy package (CEP). It featured the following:

- Development of a monitoring framework for the circular economy
- Report on critical raw materials and the circular economy
- Strategy on plastics in the circular economy
- Analysis and policy options to address the interface between chemicals, products and waste legislation, including how to reduce the presence and improve the tracking of chemicals of concern in products
- Report on the implementation of the circular economy action plan
- Staff Working Document on Sustainable Products in a Circular Economy

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EU Policy Framework

Circular Economy Package Priorities

- Critical Raw Material
- Biomass & Bio-based Products
- Food Waste
- Plastics
- Consumption & Demolition

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EU Policy Framework
Amended Legislation

- The Circular Economy Package makes significant amendments to:
  - Waste Framework Directive
  - Landfill Directive
  - Packaging and Packaging Waste Directive
- It makes minor changes to directives on:
  - End-of-life vehicles
  - Waste batteries and accumulators
  - Waste electrical and electronic equipment

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EU Policy framework

2020 Circular Economy Action Plan

The EU's new circular action plan adopted in March 2020 paves the way for a cleaner and more competitive Europe.

Measures that will be introduced under the new action plan aim to:

- make sustainable products the norm in the EU
- empower consumers and public buyers
- focus on the sectors that use most resources and where the potential for circularity is high such as: electronics and ICT, batteries and vehicles, packaging, plastics, textiles, construction and buildings, food, water and nutrients
- ensure less waste
- make circularity work for people, regions and cities
- lead global efforts on circular economy

Find the Action Plan here: https://ec.europa.eu/environment/circular-economy/pdf/new_circular_economy_action_plan.pdf

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EU Policy framework
2020 Circular Economy Action Plan

Circular Economy Action Plan
The European Green Deal

The 7 key product value chains as a matter of priority in the 2020 CE Action Plan

- Electronics & ICT
- Batteries & Vehicles
- Packaging
- Plastics
- Textiles
- Construction & Buildings
- Food, water & nutrients

Source: https://cypruscircular.org.cy/eu-circular-economy-action-plan/

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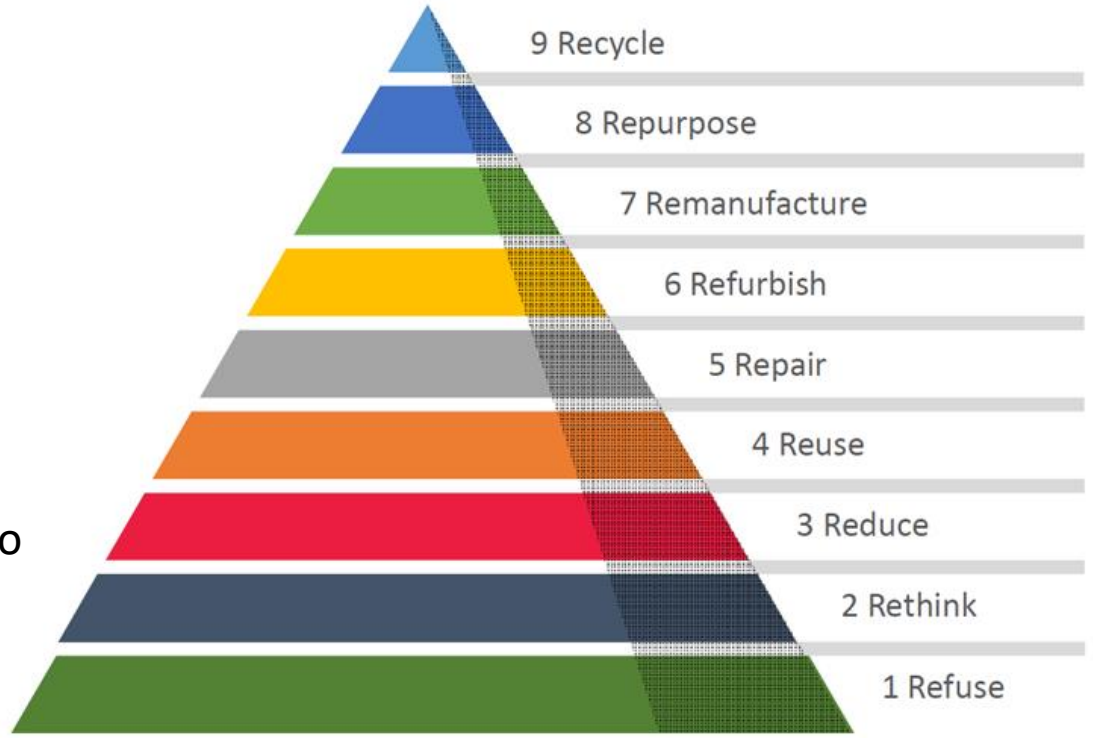
EU Policy Framework
9R's of the Circular Economy

- In March 2020 the European Commission recommended the nine principles of the circular economy (9 R's) to increase the efficiency of the use of resources.

- According to their potential to create efficiencies in the use of resources the pyramid shows that the most preferred principle is "REFUSE" and the least preferred "RECYCLE".

- Energy recovery from waste and residue sources (waste to energy) is excluded from circular economy 9 Rs strategies as it is considered a loss of economic value since potentially recyclable materials disappear through incineration.



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EU Policy Framework

9R's of the Circular Economy Definitions

	Strategies	
Smarter product use and manu-facture	R0 Refuse	Make product redundant by abandoning its function or by offering the same function with a radically different product
	R1 Rethink	Make product use more intensive (e.g. by sharing product)
	R2 Reduce	Increase efficiency in product manufacture or use by consu-ming fewer natural resources and materials
Extend lifespan of product and its parts	R3 Reuse	Reuse by another consumer of discarded product which is still in good condition and fulfils its original function
	R4 Repair	Repair and maintenance of defective product so it can be used with its original function
	R5 Refurbish	Restore an old product and bring it up to date
	R6 Remanufacture	Use parts of discarded product in a new product with the same function
	R7 Repurpose	Use discarded product or its parts in a new product with a different function
Useful application of mate-rials	R8 Recycle	Process materials to obtain the same (high grade) or lower (low grade) quality
	R9 Recover	Incineration of material with energy recovery

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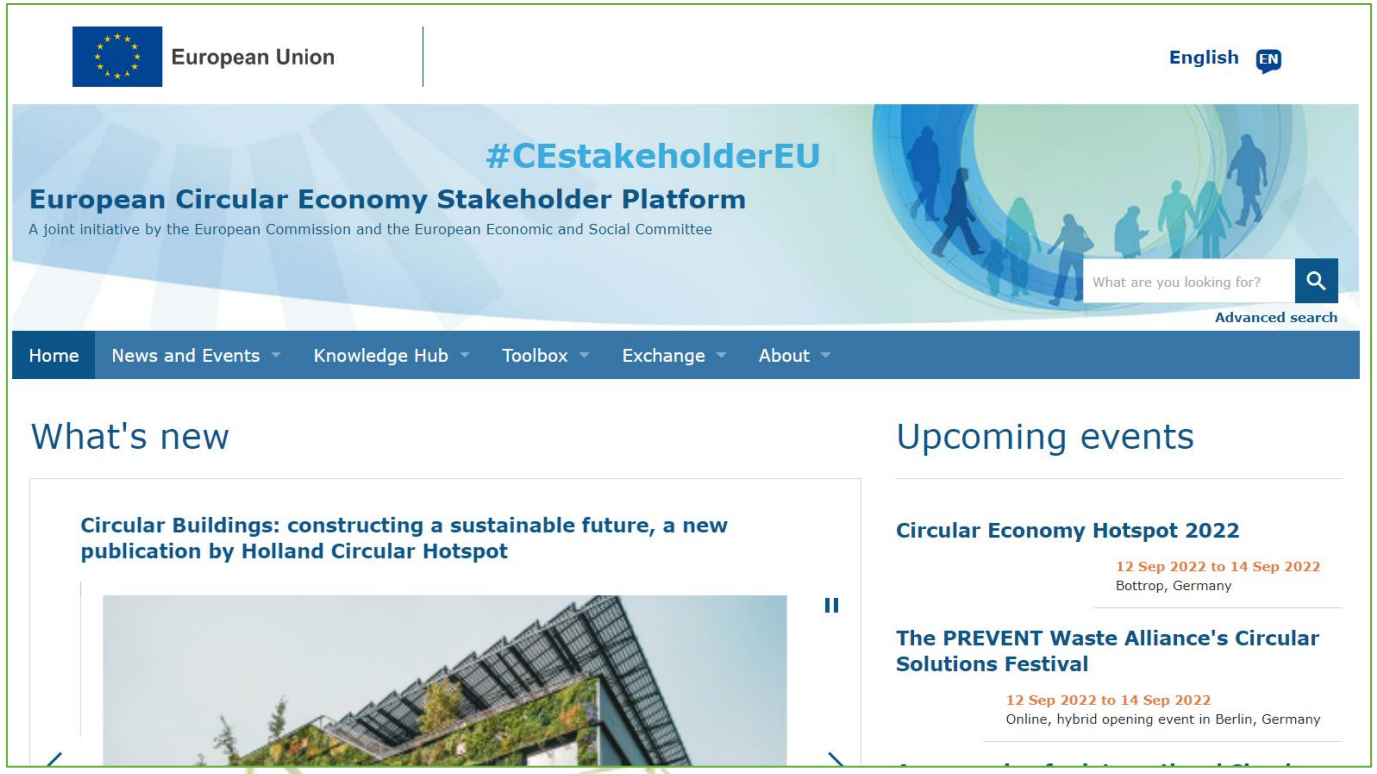
EU Policy framework

European Circular Economy Stakeholder Platform

The European Circular Economy Stakeholder Platform contains information on:

- current practices all over Europe,
- news and events relevant to the circular economy,
- educational material and training opportunities,
- Funding opportunities for new innovations and initiatives.



Source: https://circulareconomy.europa.eu/platform/

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Part 4: Circular Economy in practice

- Transitioning to a circular economy
- Circular Economy in practice – Biological cycle
- Circular Economy in practice – Technical cycle

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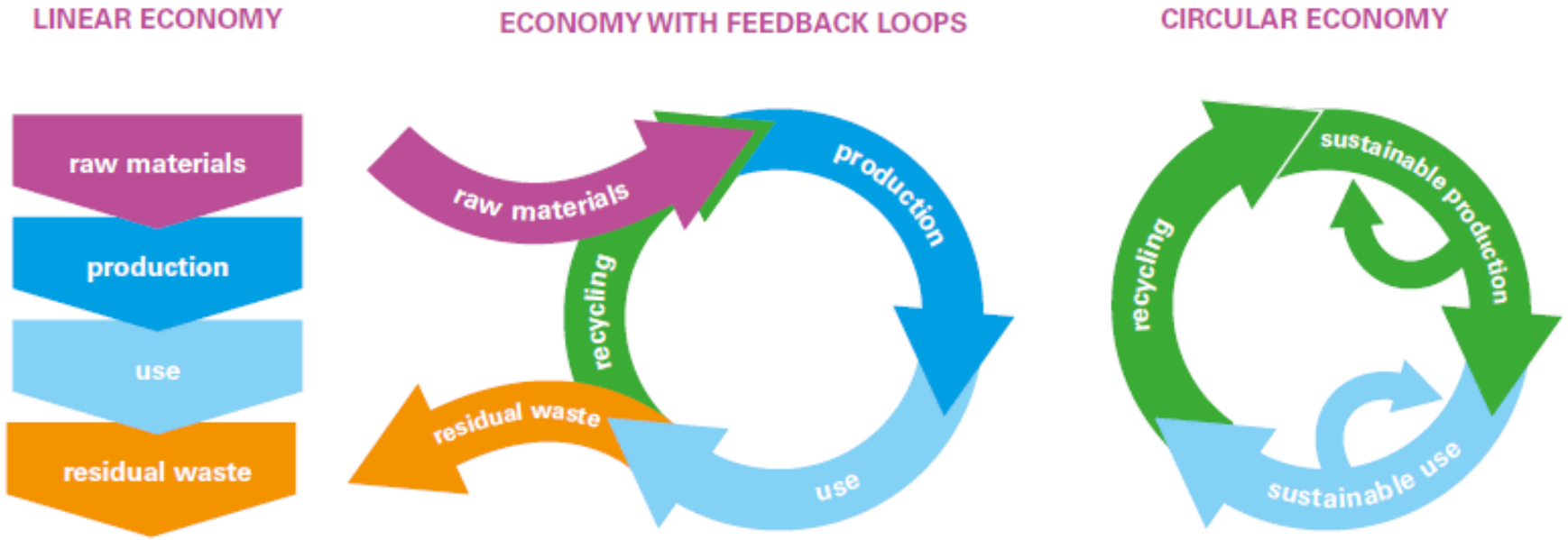
Circular Economy in practice

Transitioning to a Circular Economy



Source: CONSTRUCTING A GREEN CIRCULAR SOCIETY - Scientific Figure on ResearchGate. Available from: https://www.researchgate.net/figure/Characterizing-linear-economy-economy-with-feedback-loops-and-circular-economy-RLi_fig1_325417234 [accessed 8 Sep, 2022]

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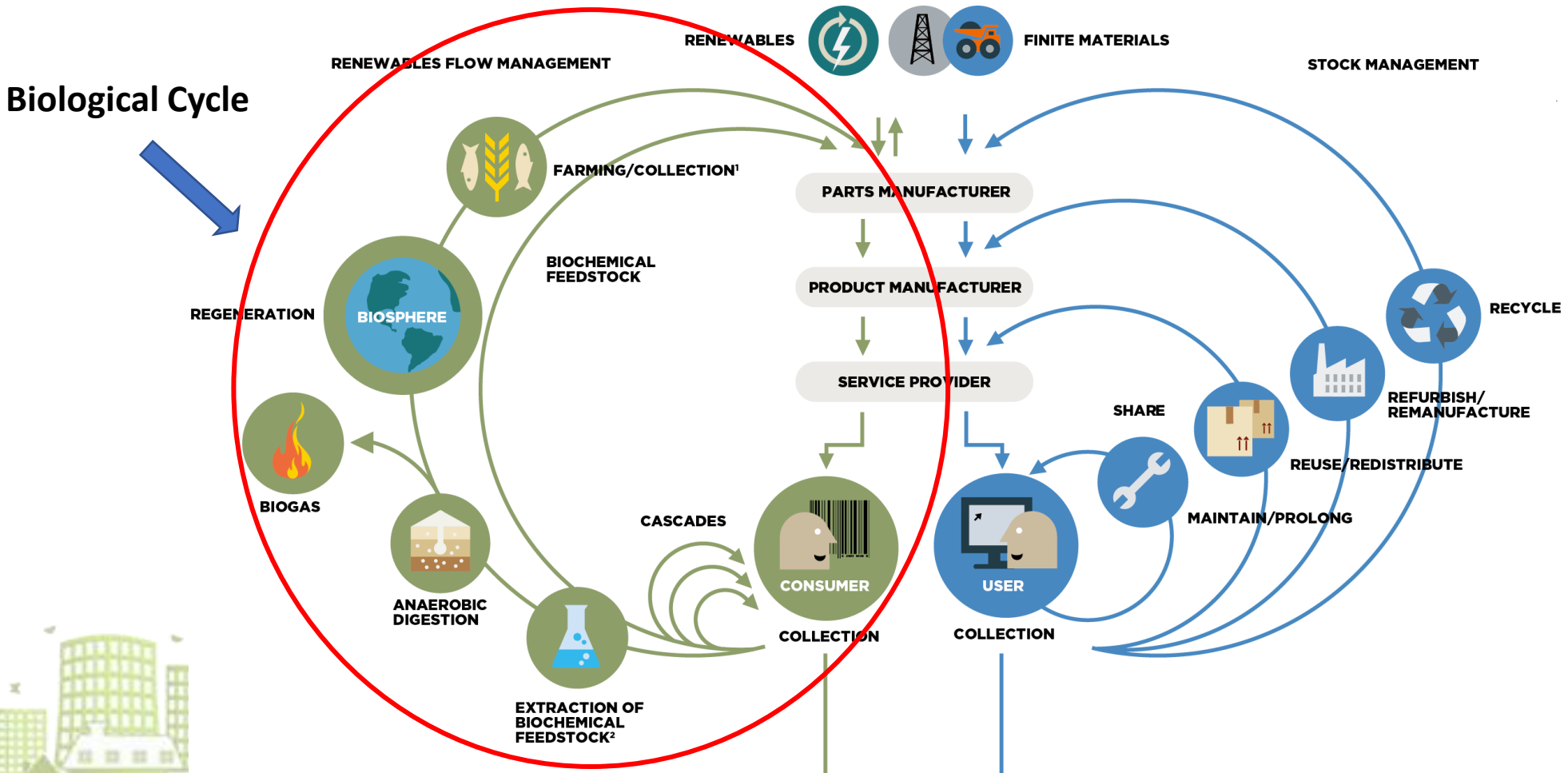
Circular economy in practice – Biological cycle



1 Hunting and fishing
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SOURCE
Ellen MacArthur Foundation
Circular economy systems diagram (February 2019)
www.ellenmacarthurfoundation.org
Drawing based on Braungart & McDonough, Cradle to Cradle (C2C)

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Circular Economy in practice – Biological cycle

Composting

Utilisation of organic materials such as food, wasted crop parts and tree cuttings.

- Used as a fertiliser to improve soil quality.
- Compost can be created at any scale. In our home and in our farm.
- Simple and without the need for expensive machinery.

Source: https://www.youtube.com/watch?v=_RIgOT1gQzk&ab_channel=%CE%95%CE%BA%CF%80%CE%BF%CE%BC%CF%80%CE%AE-%CE%A3%CF%80%CE%AF%CF%84%CE%B9%CF%83%CF%84%CE%B7%CE%A6%CF%8D%CF%83%CE%B7-%CE%A1%CE%99%CE%9A

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Circular Economy in practice – Biological cycle

Composting - Key Technologies

- Open-air windrow composting (aerobic)
- In-vessel composting (aerobic)
- Anaerobic Digestion
- Others:
  - (Home / community composting)
  - (Advanced thermophilic aerobic digestion)
  - (Biochar)

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Circular Economy in practice – Biological cycle

Use of insects to turn food waste into protein and fertiliser

Source: https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.pinterest.com%2Fpin%2F403213591531816 90%2F&psig=AOvVaw3j-hZV7_SMngdDt6mhZjR4&ust=1665666106382000&source=images&cd=vfe&ved=2ahUKEwia8Pn139r6AhULKd8KHQsGBVoQ3YkBegQIABAN

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Circular Economy in practice – Biological cycle

Mixed farming system in Uganda

Mixing Livestock and plants in a small 1 acre farm

Waste products are shared and re-used

Outcomes:

Reduction of environmental impact

Multiple income streams

Source: https://www.youtube.com/watch?v=gQZ6S8OyzHM&t=276s

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Circular Economy in practice – Biological Cycle

Agroforestry

Growing trees alongside crops and/or livestock

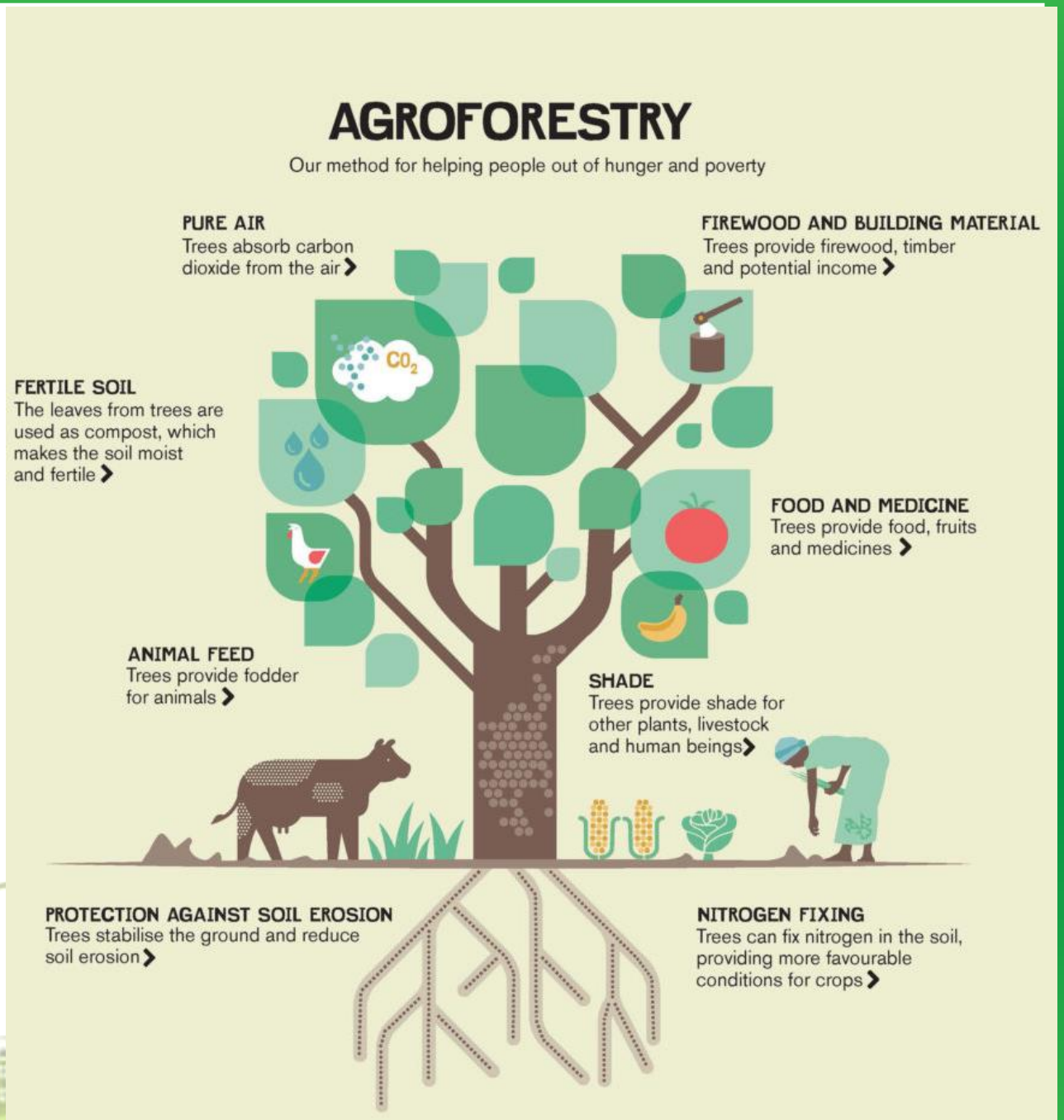
<u>Benefits:</u>

Increase in biodiversity, soil humidity and fertility

Enabling diversified food production

Increased yields

Improved resilience to climate changes



Source: https://viagroforestry.org/what-we-do/agroforestry/

Circular Economy in practice – Biological Cycle

Planty Cyprus - Hydroponic farming with NFT technique

Nutrition film technique (NFT) is a method of hydroponic growing in which the plant roots are placed in a shallow stream of re-calculating solution that contains all the elements required for maximum productivity.

Unlike traditional growing methods, there is no solid rooting medium with NFT.

<u>Advantages of using NFT include:</u>

Exceptionally high production yields.

Significantly lower operating costs.

Extremely efficient production facilities.

Major savings in water and fertilizers.

Longer lifecycles for equipment.

Clean Fresh and tasty products.

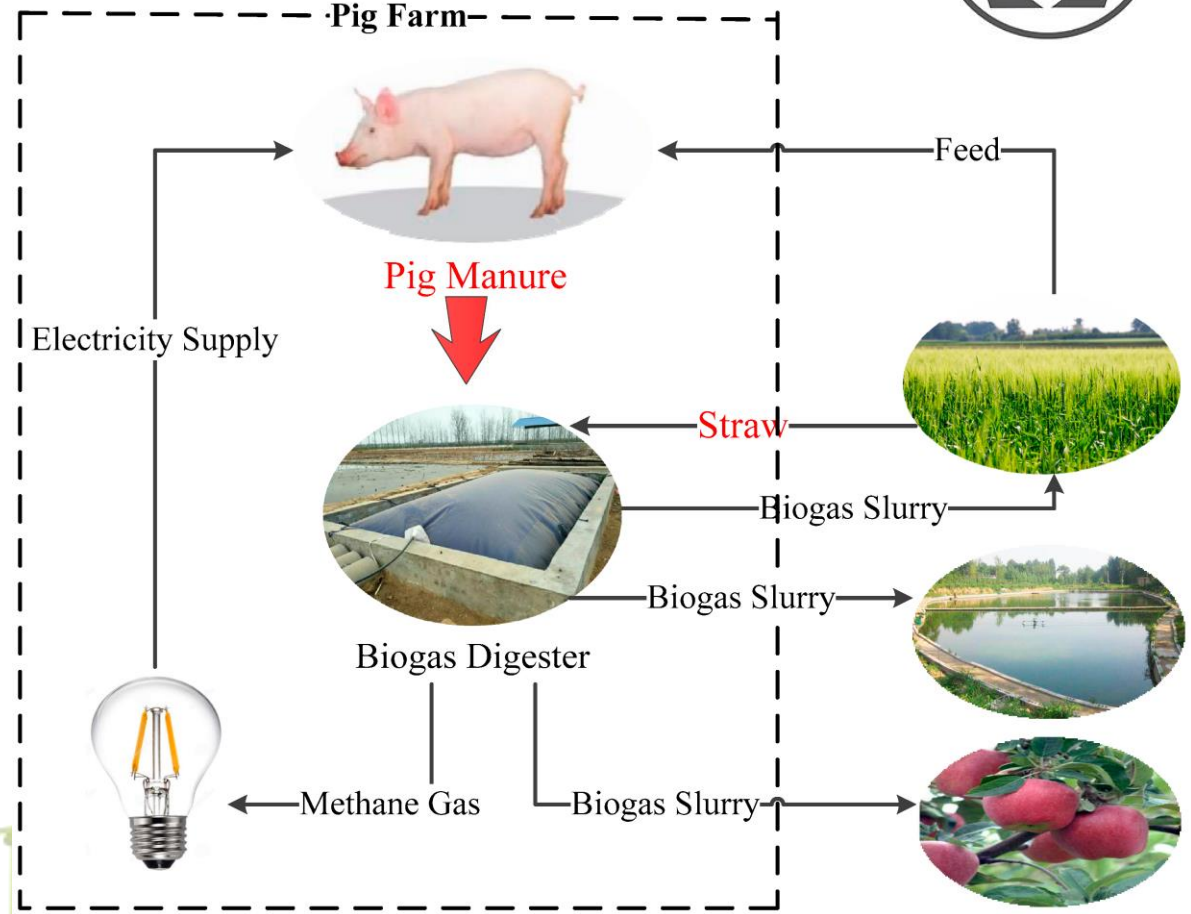
Source: https://planty.eu/

Circular Economy in practice – Biological Cycle

Biogas production from pig farm waste - A/foi Andreou Xoirostasia

Operation of 2 waste treatment plants for the production of biogas and the subsequent electricity and heat generation.

The company is self-sufficient in both electrical and thermal energy with a Plant Capacity of 1 MWe and 1 MWth. 80% of produced electricity is exported to the Grid as green energy.



Sources: http://andreou.com/en/group/divisions/farm/
https://www.mdpi.com/2071-1050/13/10/5515/htm

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Circular Economy in practice – Biological Cycle

Reducing food waste

The ugly or wonky veggies

- Several initiatives across Europe have been launched in recent years to combat pre-consumer food waste by selling discarded fruit and vegetables before they even reach the shops.
- Examples of Cypriot initiatives are RescuedBox and Quasimodo.

Source: SLATE (2015): Groceries Often Reject Ugly Carrots and Grotesque Apples. This Campaign Celebrates Them.

https://rescuedbox.com/
https://quasimodo.com.cy/

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Circular Economy in practice – Biological Cycle

Utilising coffee waste

3 Ways the Coffee Industry Is Turning Waste Into a Resource:

1. Coffee to Compost (coffee waste into soil improver)
2. Mushrooms Food Businesses (coffee waste for growing mushrooms)
3. Waste to Energy (conversion to energy)

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Circular economy in practice – Biological cycle

Using renewable raw materials to produce biodegradable products

Vegeplast produces biodegradable items from agricultural material. They developed two products that are used widely, every day, all over the world: packing traysfood (Vegepack) and coffee capsules (eco capsule) which are compatible with Nespresso machines.

- These bioplastics offer a real alternative to plastics produced from the petrochemical industry.
- Made from plant matter, they will end the cycle their lifetime as a soil conditioner. Based in Bazet, in the south of France, Vegeplast uses local maize and wheat as raw materials.

https://www.vegeplast.com/en/

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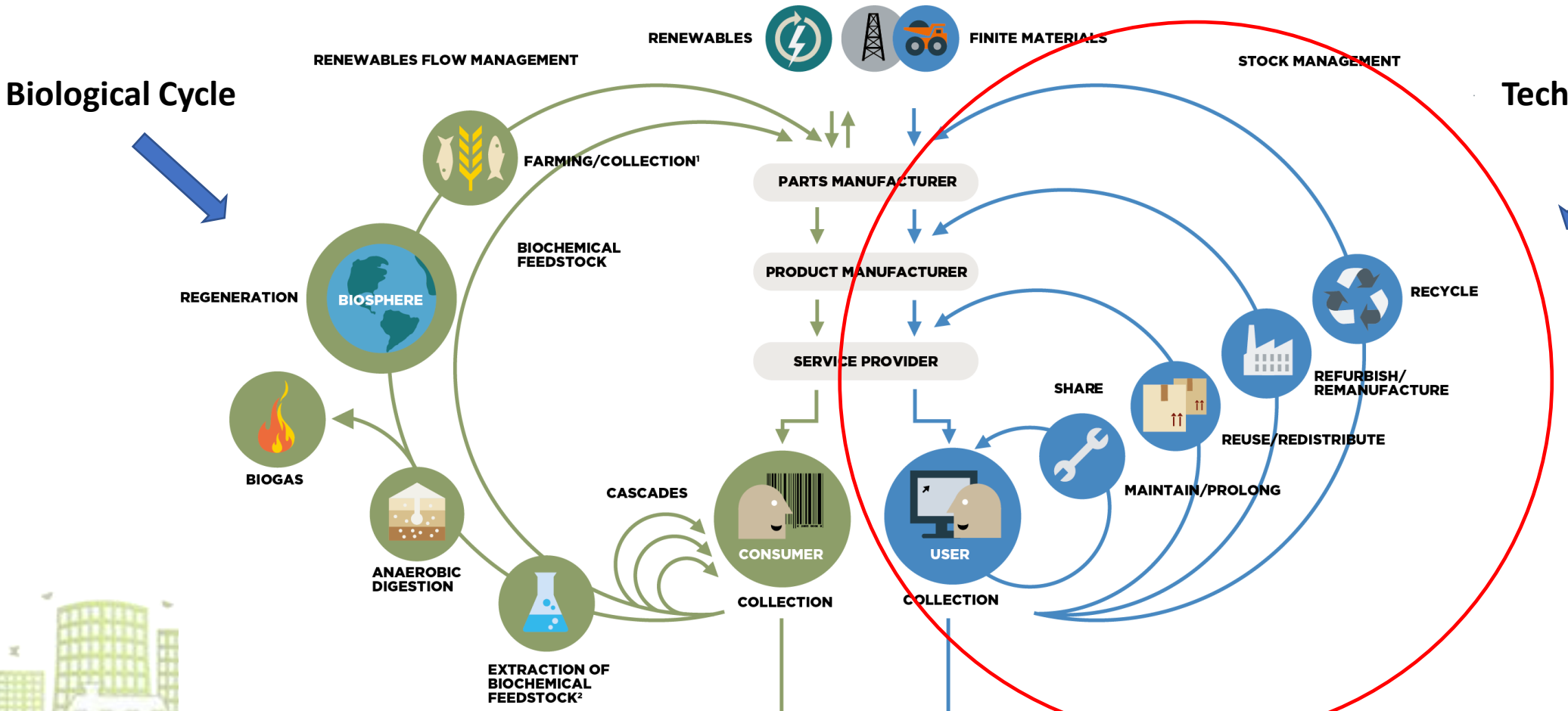
Circular economy in practice – Technical cycle



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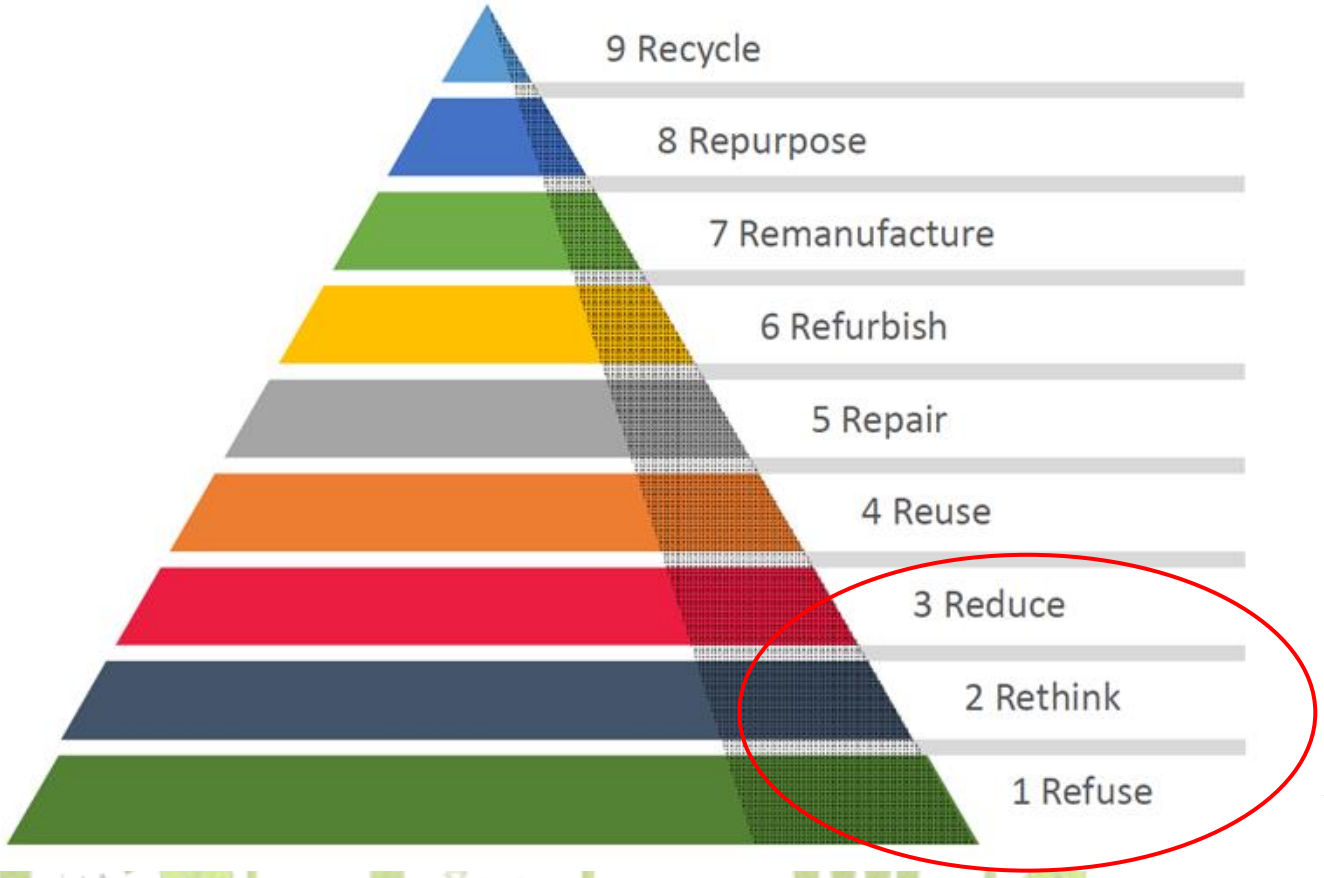
Circular economy in practice – Technical cycle

9R's of the Circular Economy



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Circular Economy in practice – Technical cycle

Refuse: Make product redundant by abandoning its function or by offering the same function by a radically different (e.g. digital) product or service.

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Circular Economy in practice

Rethinking how we currently use resources

The EU Commission introduced the “common charging” solution.

Promotes the use of common chargers for mobile phones and other portable electronic devices.

- Requirements of the ‘common charging’ solution will apply to all handheld mobile phones, tablets, digital cameras, headphones, headsets, portable speakers, handheld videogame consoles, e-readers, earbuds, keyboards, mice, and portable navigation systems as of 2024.
- Will also apply to laptops as of 2026.
- The interoperability of the external power supply will be ensured by the revision of the Commission’s EcoDesign Regulation in the near future.

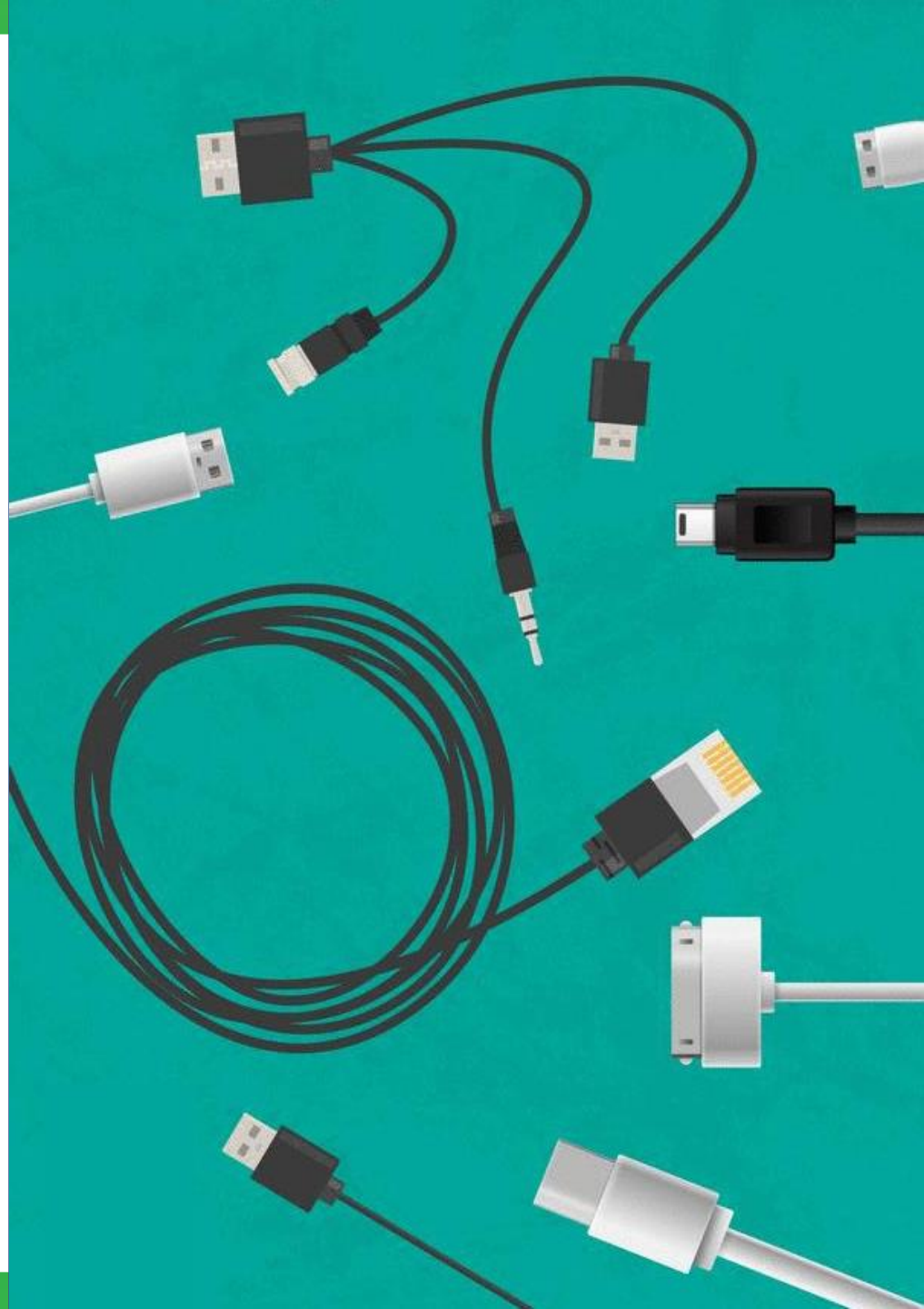
A common charger will:

CONSUMERS

help consumers save
€250 million a year
on unnecessary
charger purchases

ENVIRONMENT

reduce e-waste by
almost a thousand tonnes
annually



Source:
https://ec.europa.eu/docsroom/documents/50321/attachments/1/translations/en/renditions/native

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Circular Economy in practice – Technical cycle

Reduce: Increase efficiency in product manufacture or use by consuming fewer natural resources and materials

- Resource efficiency is an idea that is closely linked to the circular economy
- Resource efficiency can mean:
  - Products that use the necessary minimum of material and energy
    - Both in production and in use
  - Production processes that minimise waste
  - Durable products that can easily be maintained/ reused
  - Products that are designed to be easy to dismantle (for parts) or recycle

Sharp zero effluent manufacturing site Japan

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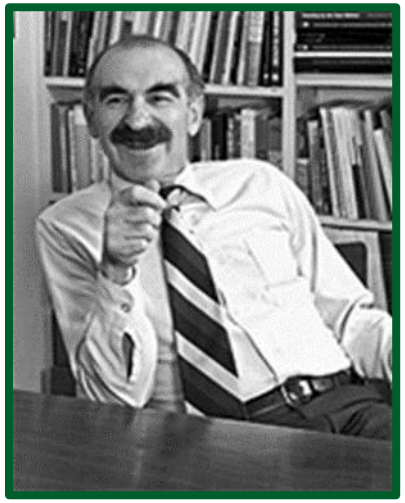
Circular Economy in practice – Technical cycle

Reduce: Product as a service



"People don't want to buy a quarter-inch drill, they want a quarter-inch hole." Theodore Levitt (1972)

Rental of agriculture/farming equipment in Uganda

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Circular Economy in practice – Technical Cycle

Reduce: Sharing – Library of Things

Why buy when you can borrow?

A ‘library of things’, a project that loans items such as drills, pressure washers and gardening equipment at affordable rates.

Why not apply this concept for agricultural and farming equipment in rural communities?

Source: https://www.positive.news/society/library-of-things-borrow-power-tools-ukuleles-and-ice-cream-makers-alongside-books/

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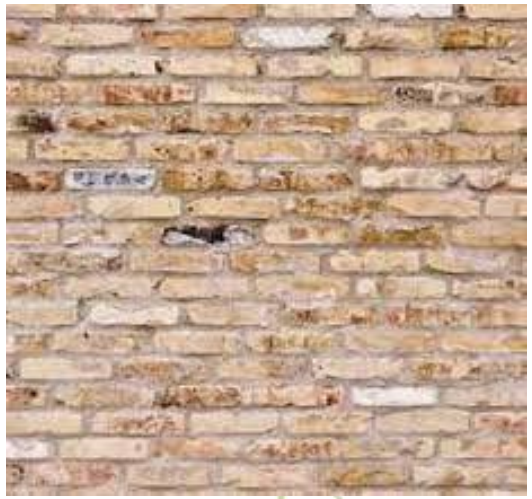
Circular Economy in practice – Technical cycle

Re-using old bricks to build a greener future

- Old bricks go through patented cleaning process to prepare for re-use
- Saving more than 95% of the energy otherwise used to manufacture new bricks
- By applying its method to two thousand bricks, “the emission of one tonne of CO_2 is prevented
- They can then be re-used in other buildings in the future.



Source: http://gamlemursten.dk/

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Circular Economy in practice – Technical cycle

Repairing

- Community DIY repair spaces/workshops in Sweden by the NGO “fixa.grejen”
- Set of tools available for visitors to use to repair their items
- Strengthens community ties and engages citizens
- Campaigning about the ‘right to repair’

- In November 2020, the European Parliament voted to support a new resolution in favour of consumer repair, which included calling for the Commission to introduce mandatory labelling concerning the estimated lifetime of a product as well as a reparability index (Wiens 2020).

Sources: https://www.tandfonline.com/doi/full/10.1080/13549839.2022.2041580
https://www.fixagrejen.nu/tips/hem-mobler/

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Circular Economy in practice – Technical cycle

Refurbishing - Restore an old product and bring it up to date (to specified quality level) vehicles

- Tata Motors sells reconditioned products ranging from reconditioned Engine Long Block, Gear Box, and Power Steering Gear Box etc. as part of its new business vertical ‘Prolife’. Tata’s Prolife business is a pioneering after-market product support strategy. Use of Tata Motors Prolife aggregate ensures Original Equipment-like vehicle performance even after the first life cycle.

https://www.ceguide.org/Strategies-and-examples/Make/Refurbishing

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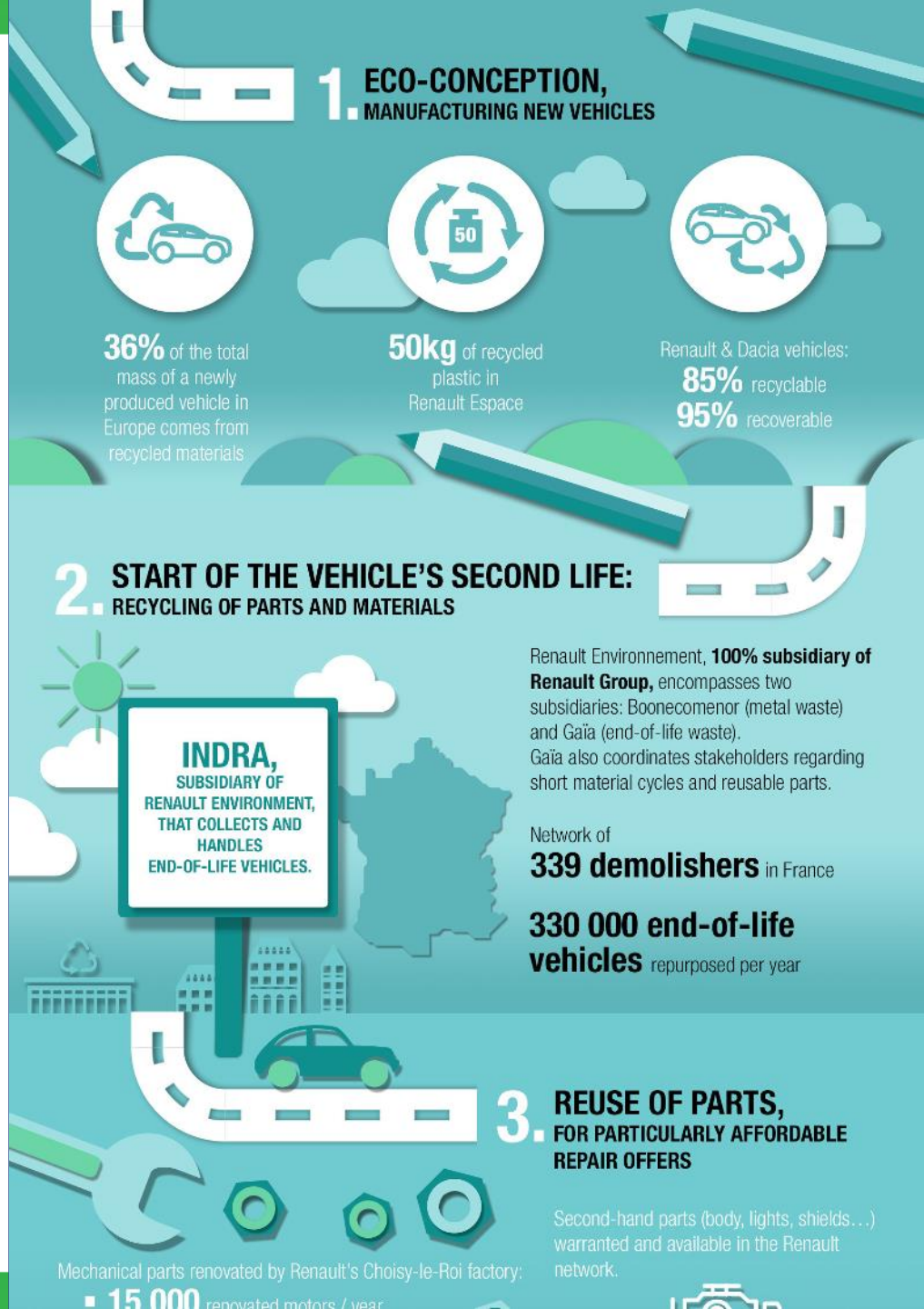
Circular Economy in practice – Technical cycle

Recycling /remanufacturing - Renault

- Renault applies the circular economy to all stages of the group's product life cycle, turning end-of-life components and vehicles into a vehicle production and maintenance resource, with the aim of reducing the consumption of raw materials.



https://group.renault.com/en/news/blog-renault/renault-actively-developing-circular-economy-throughout-vehicles-life-cycle/

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Circular Economy in practice – Technical cycle

Repurposing redundant products

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

Finding new uses: Pallets and impregnated wood are suitable, with some treatment, to meet the necessary safety and health requirements, to be used again in the manufacture of various materials and products, such as external wood cladding (e.g. canopies, fences, parquet), furniture , etc.

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Circular Economy in practice – Technical Cycle

Recycling agricultural plastic waste in Cyprus

Source: http://cybc.com.cy/video-on-demand/circ

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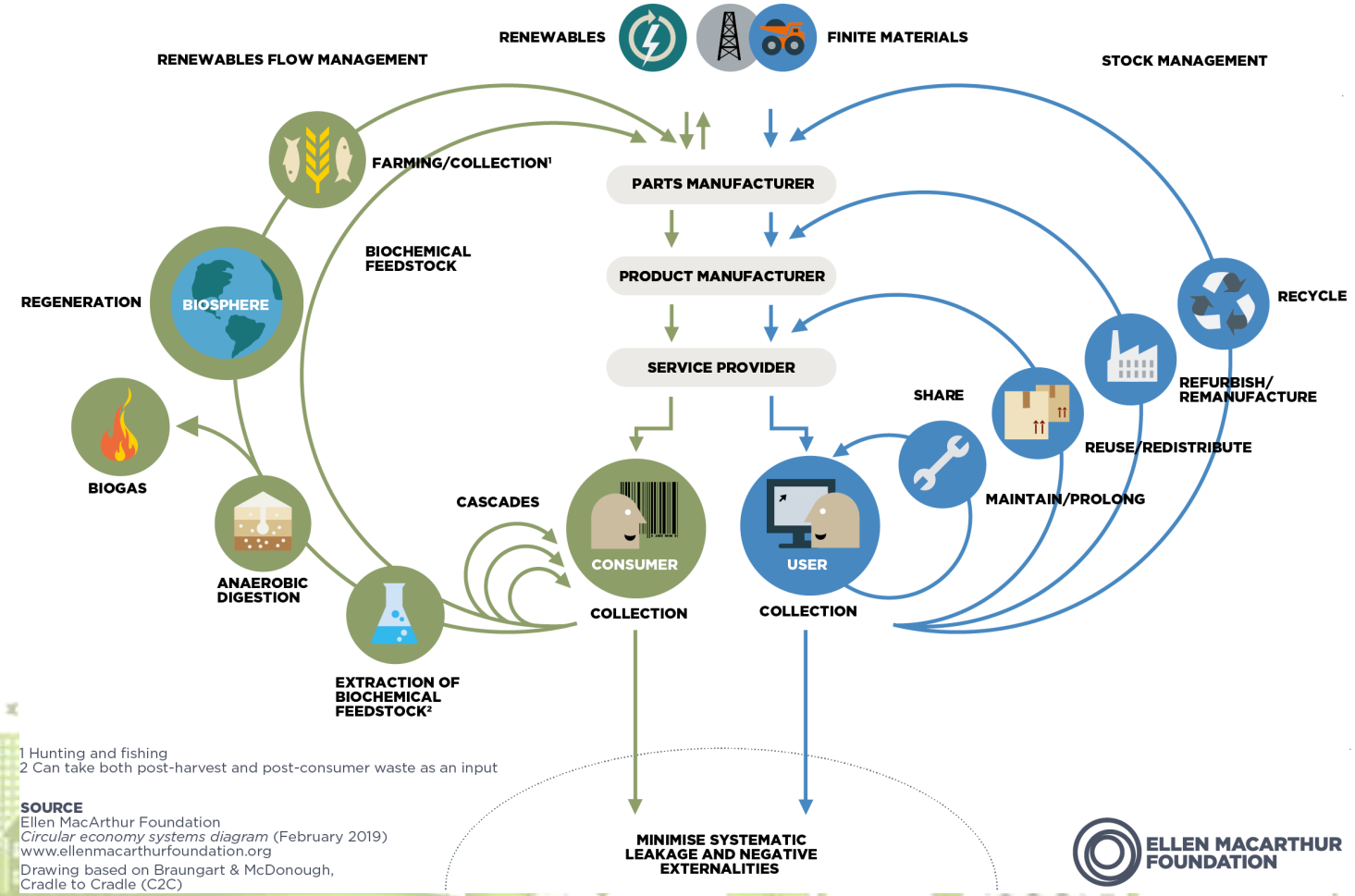
Circular economy in practice



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Exercise/Discussion: 10 minutes to think of circular processes in Cyprus

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Part 5: Measures aiding the transition to a circular economy

Eco Design and Technology

Integrated Management Systems – Primary sector

Green Public procurement

Waste Management

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Eco-design and Technology

The role of Design & Technology in the Circular Economy

- Eco-design – for durability, disassembly/reassembly – to extend life and ease repair and remanufacture – and of course recyclability
- 3D printing (additive manufacture) to enable repair
- Smart device Apps – to allow resource sharing and resale
- Internet of Things – e.g. for asset tracking / condition monitoring
- Data analytics – to better optimise processes

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Eco-design

- **What is Eco-Design?**
- “Ecodesign means the integration of environmental aspects into product design with the aim of improving the environmental performance of the product throughout its whole life cycle.” (EU Directive on Eco-Design)

- And from a business perspective we could add … “whilst maintaining or improving performance and value for money.”

Source: 218g/330ml bottle designed using FEA methods, narrow-neck press-blow manufacture

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Eco-design
Eco-Design Directive

- The Eco-design Directive provides consistent EU-wide rules for improving the environmental performance of products
- To date the Directive focuses on minimum mandatory requirements for the energy efficiency of Energy Related Products (ErPs).
- The Eco-design Directive is implemented through product-specific Regulations, directly applicable in all EU countries.

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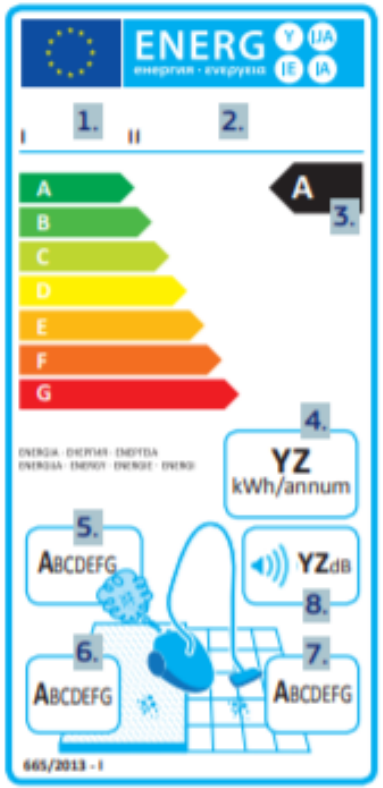
Eco-design

EU Energy Label and eco-design

- The energy label is to aid consumers in choosing more efficient appliances, but ..
- Some labels now also describe performance
- The vacuum cleaner is a good example regarding dust and noise – and there is a durability requirement under the eco-design regulation:
  - The hose shall be considered useable after 40,000 oscillations under strain
  - The mandatory minimum operational motor lifetime is 500 hours of use
- And the general safety regulation EN 60335-1 for main switch testing under mains power, requires 10,000 cycles.



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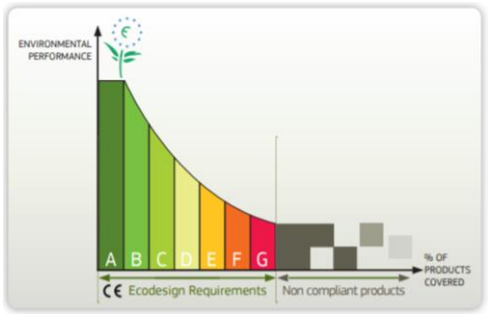
Eco-design
EU Eco-label



- Voluntary EU Eco labelling scheme
- Component of EC's Action Plan on Sustainable Consumption and Production and Sustainable Industrial Policy
- Established in 1992 – now over 40,000 products and services in 30 groups
- Encourages manufacturers to produce more environmentally friendly goods and services
- Strict criteria, updated regularly, consider the whole product life-cycle
- Expert verification by national bodies
- Easy recognition of green products and services for buyers
- Should represent the 'gold standard'!

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Eco-design

The Link to Circular Economy

- Eco-labels have the potential to drive the market towards greater circularity – but only if the criteria are well chosen
- Most eco-labels only consider hazardous materials and the number of years of spare parts availability in regards to CE, however this is beginning to change:
- The recent EU Eco-label for PCs requires use of post-consumer recycled content, life extension, and ease of repair, upgrade and recycling.

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Eco-design
Ecolabels

- Some key examples include:
  - EU Ecolabel (the flower) – used in 30 countries
  - Nordic Swan eco-label (www.nordic-ecolabel.org)
  - Blue Angel – German eco-label (www.blauer-engel.de/en)
  - Energy Star – US energy label
  - IEC standards for electrical and electronic goods
  - EPEAT – ICT environmentally preferable products criteria
  - All have useful criteria and standards for numerous product groups

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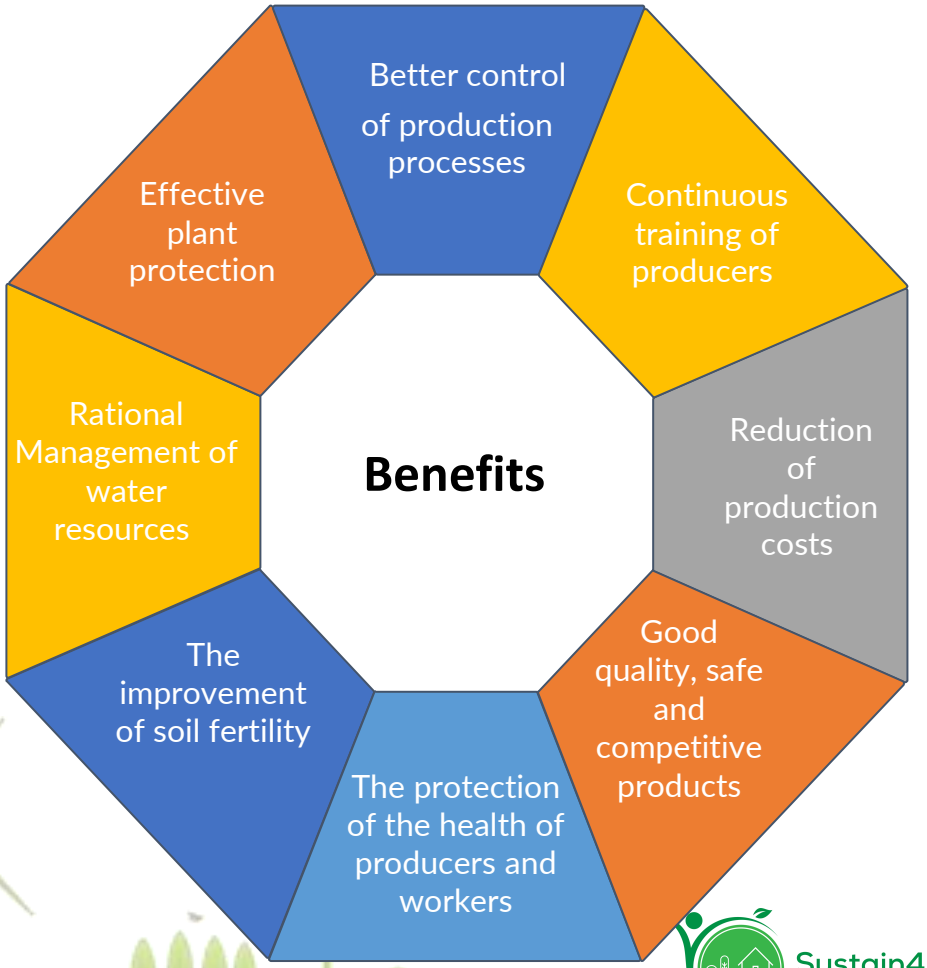
Integrated Management systems - Primary sector

Adoption and role in the Circular Economy

Integrated Management Systems aim to improve intensive production methods with food safety and the environment in mind. They target Quality, Sustainability and Environment issues.

With the implementation of an Integrated Management System, the following goals are achieved, among others, with a direct impact on the creation of circularity in the Cypriot agricultural sector.



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Integrated Management systems – Primary Sector

Adoption and role in the Circular Economy

Certification of Integrated Management Standards in the Agricultural and Livestock Sector such as:

- LEAF Marque
- GLOBALG.A.P (EUREPGAP)
- SQF Certification
- IFOAM Certification
- AB agriculture assurance
- ISO 9001
- ISO 22000
- EN 16636 – PEST MANAGEMENT SERVICES – CERTIFICATION

Certificates for Quality, Sustainability and Environment objectives, such as:

- Social Accountability Standard (SA 8000)
- GRASP – GLOBAL.G.A.P. Risk Assessment on Social Practice
- IFS food standard

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Green Public Procurement (GPP)

What is GPP?

- Also referred to as green purchasing
- Aimed at public authorities who are major consumers (€1.8 trillion annually; ~14% of EU's GDP)
- Aim is to use their purchasing power to drive the market for environmentally friendly goods, services and works
- Voluntary
  - BUT made mandatory across the Italian public sector in 2016
- Environmental criteria for products and services derived from the EU Eco-label process
- As per the Eco-Label, the criteria need to address life extension and recyclability to be of relevance to the CE

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Green Public Procurement (GPP)
Procurement Law

Procurement

- Procurement by public bodies has to follow EU procurement law.
  - Directive 2014/24/EU on public procurement
  - Principles:
    - Treat economic operators equally and without discrimination.
    - Act in a transparent and proportionate manner.
    - Ensure economic operators comply with obligations in the fields of environmental, social and labour law.
- But green principles can be incorporated.

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Green Public Procurement (GPP)
Range of Products Covered by GPP

- Cleaning products and services
- Computers and monitors
- Copying and graphic paper
- Electrical and electronic equipment used in the health care sector
- Electricity
- Food and catering services
- Furniture
- Gardening products and services
- Imaging equipment
- Office building design, construction and management
- Paints, varnishes and road markings
- Road design, construction and maintenance
- Sanitary tapware
- Street lighting and traffic signals
- Textiles
- Toilets and urinals
- Transport
- Waste-water infrastructure
- Water-based heaters

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Waste Management

- Waste management has an important role to play
- Managing the shift from Take – Make – Use – Dispose … to more resource efficient, ‘circular’ solutions
- And that means designing and implementing cost-effective:
  - Waste prevention programmes
  - Reuse and recycling programmes
  - Driving demand – for example industry being required to substitute virgin materials with recyclable materials
  - And improving supply – Sustainable and high quality materials that meet market demands

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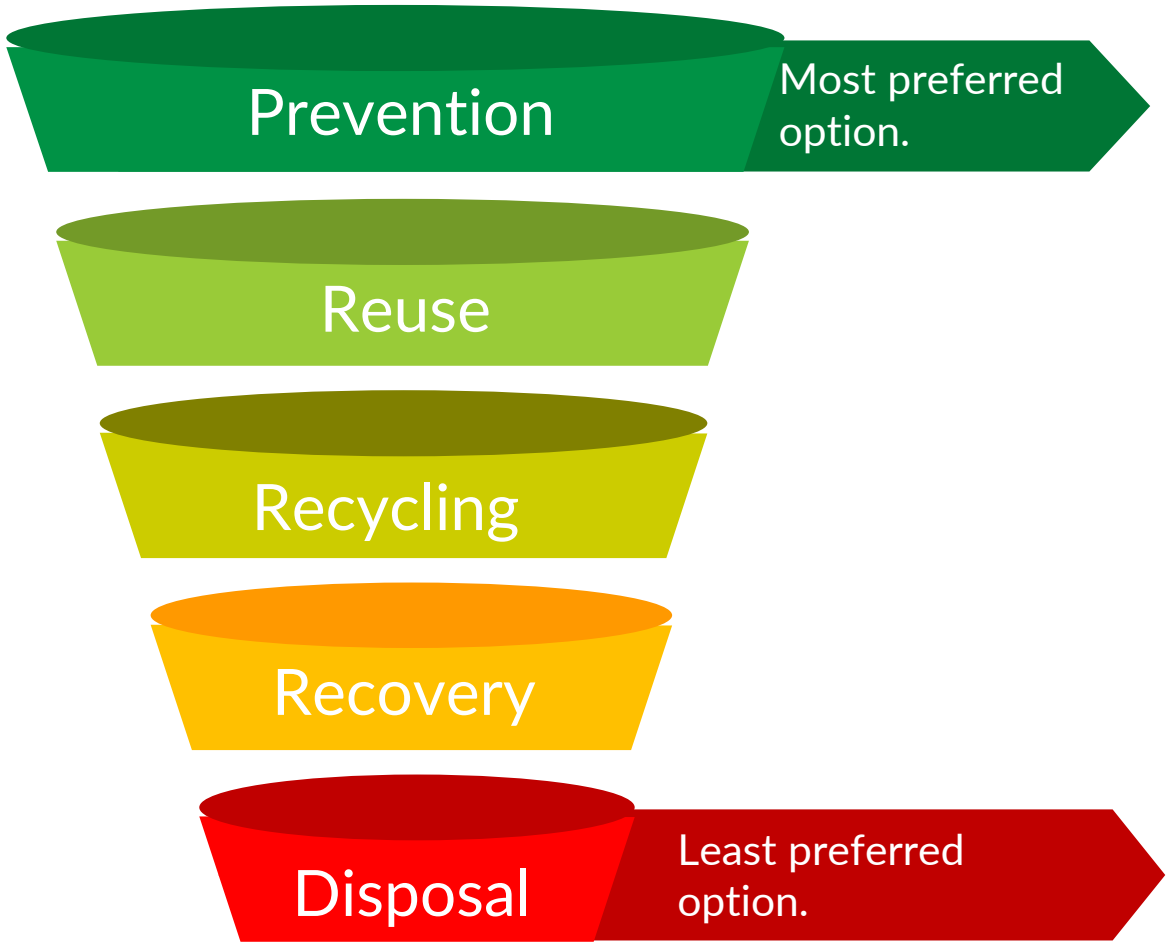
Waste Management

The EU Waste Hierarchy in the EU

- Invented by Dutch politician Ad Lansink, and introduced in Holland in 1979
- Became EU law in the Waste Framework Directive 2008
- A “priority order” for how to manage resources
- Deviation from the waste hierarchy can be justified by lifecycle analysis



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Waste Management

Extended Producer Responsibility

"A policy approach where producers (manufacturers and retailers) are given a significant responsibility – financial and/or physical – for the treatment or disposal of post-consumer products" (OECD)

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Waste Management

Extended Producer Responsibility

- Incentivises producers to:
  - Prevent waste at the source
    - Design out waste
    - Use recycled materials
  - Promote environmentally beneficial product design
    - Reusability
    - Repairability
    - Recyclability
  - Support the achievement of public recycling and materials management goals.
    - Provide or financially support waste collections
    - Support systems such as separate collection/ Deposit Refunds

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Waste Management
Rural areas

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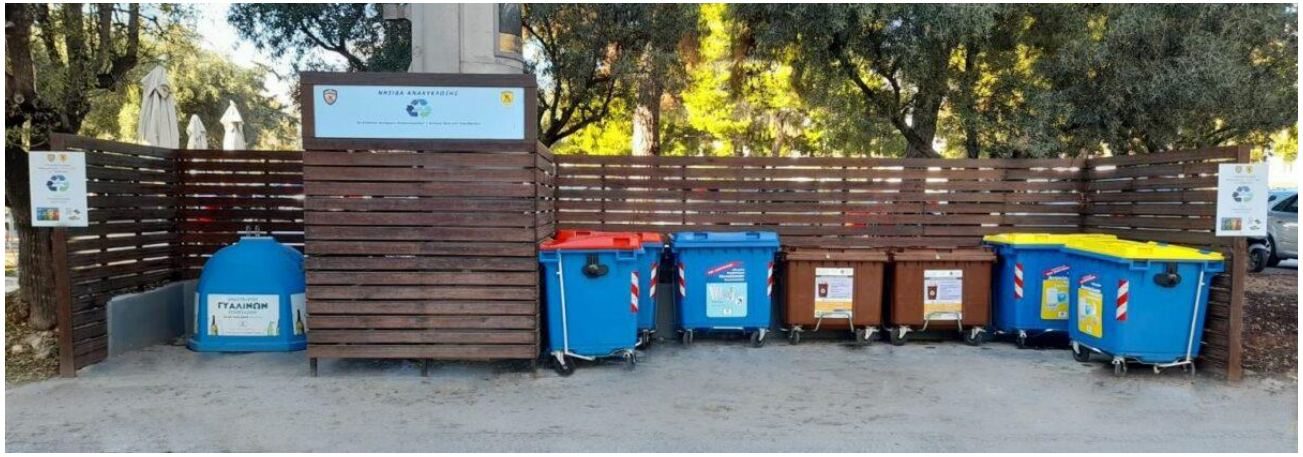
Waste Management
Rural areas - Municipal waste



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Waste Management Rural areas

How Can Farmers Contribute to Waste Management?

Farmers play an integral role in controlling the wastes released by their work.

It begins by knowing your capacity and not buying more than your need.

That means you should analyze what products you use or do not use and are usually left behind.

Limit the amount of product you need so that you do not need to dump it.

Furthermore, whenever you have leftover pesticides or insecticides, do not sump them in waterways.

In fact, consider selling it or giving it to another farmer.

The same goes for surplus food products.

Either sell them in bulk at a lower price or donate them to charities and food banks.

But by all means, do not render them useless.

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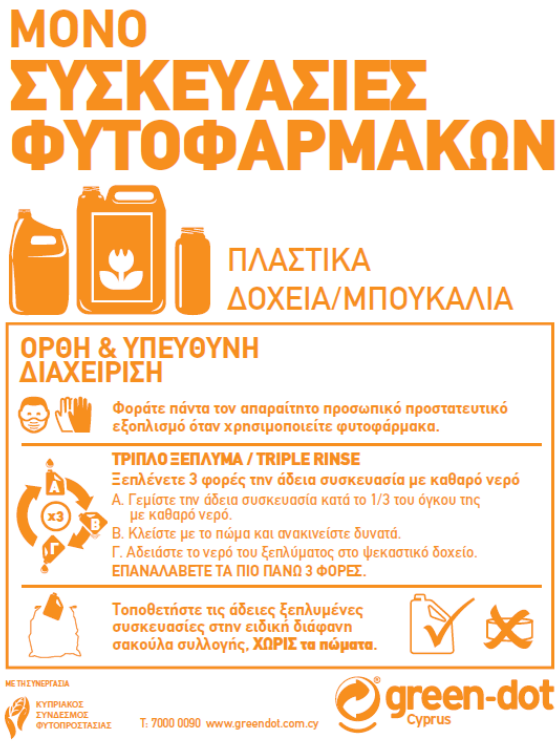
Waste Management

Rural areas - Bins and Bags for pesticides' packaging



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Part 6: Benefits of the Circular Economy

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Benefits of the Circular Economy

The macroeconomic and environmental benefits of a circular economy

Economic Development	• Increased revenues from emerging cyclical activities. • Lower production costs through resource efficiency.
Material cost savings	• For complex mid-life products (e.g. cell phones, washing machines) in the EU, the annual cost savings opportunities amount to $630 billion. • For fast-moving consumer goods (e.g. household cleaning products), there is potential for cost savings of up to $700 billion worldwide.
Reduced consumption of raw materials	• Reduce (i.e. car materials, building materials, development land, synthetic fertilizers, agricultural water use, fuels and non-renewable electricity) by 32% by 2030.

Source: Ellen MacArthur. Foundation (n.d.): Learning path, the circular economy in detail

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Benefits of the Circular Economy

The macroeconomic and environmental benefits of a circular economy

Reduced exposure to fluctuations in raw materials	• Non-renewable natural resources (eg fossil fuels, metals and hydrocarbons) are becoming increasingly scarce resulting in rising resource prices and price volatility. • Circular economy strategies and practices can reduce the amount of materials needed to produce / meet the needs of their production and their customers. • In this way they reduce their exposure to the risk of rising and volatile prices.
Innovation	• Higher rates of technological development • Improved innovative materials • Energy efficiency
Soil productivity and health	• Returning organic material to the soil will reduce the need for replenishment with additional nutrients and fertilizers (ie almost 2.7 times the nutrients contained in the chemical fertilizers used today).

Source: Ellen MacArthur. Foundation (n.d.): Learning path, the circular economy in detail

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Benefits of the Circular Economy

Skills needs for CE

Potential skill needs by circular economy activity

Activity	Low skilled	Skilled	Professional
Closed loop recycling	4	4	1
Open loop recycling	4	2	1
Servitisation	3	3	3
Remanufacturing	2	5	2
Reuse	4	2	1
Biorefining	1	4	4

Source: WRAP (2015)

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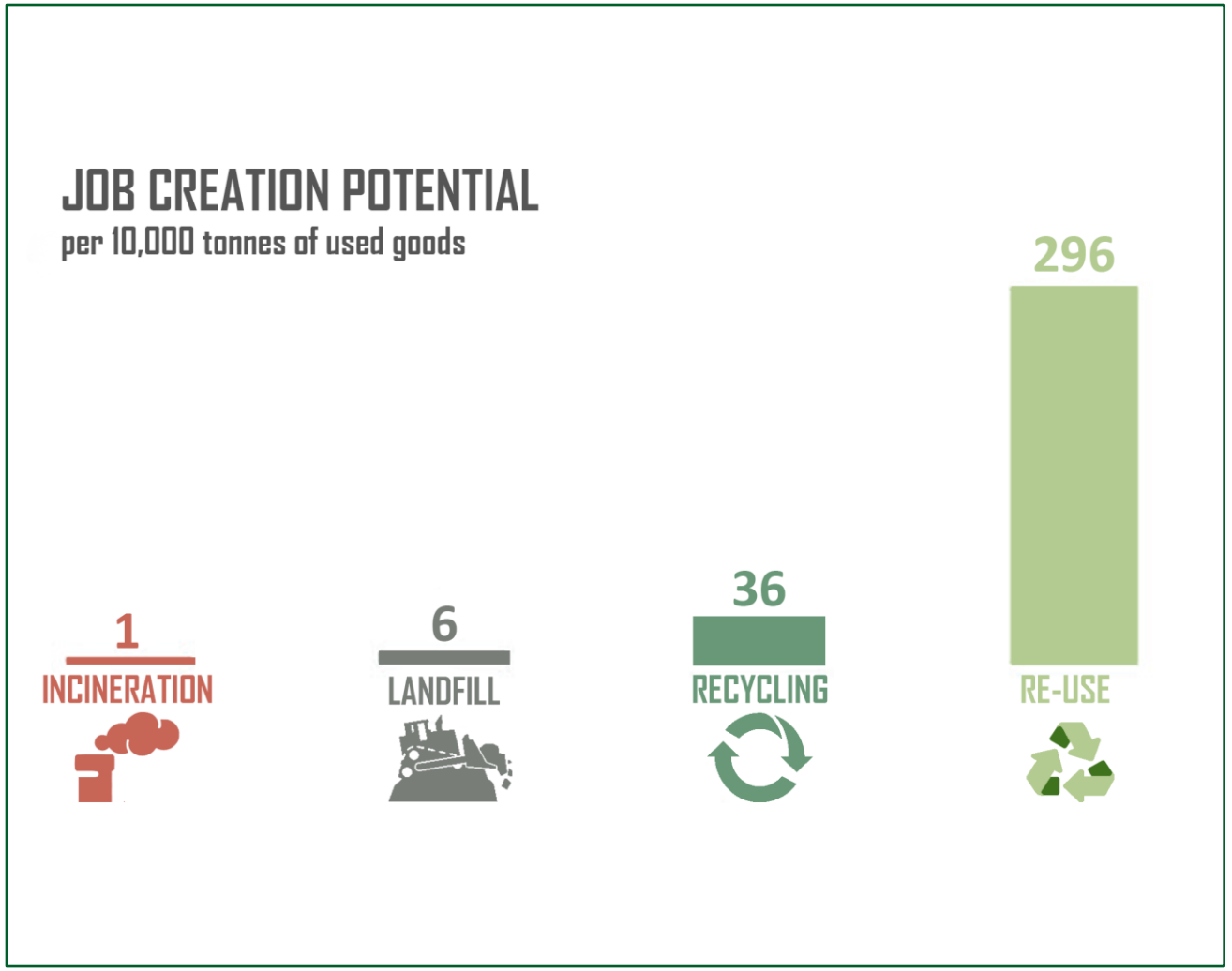
Benefits of the Circular Economy

Job creation

New jobs will be created to fill niches created by the circular economy, through resource recovery and remanufacturing.

The US Environmental Protection Agency estimates that for every 10,000 tonnes of used goods, re-use creates more jobs than traditional solutions.



Source: https://www.unido.org/sites/default/files/files/2020-09/Circular_economy_in_AGR.pdf

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Part 7: Cyprus Action Plan and Opportunities

National Action Plan for strengthening the Circular Economy

Study on the promotion and development of the circular economy in Cyprus, 2020

Cyprus Circular Economy Network

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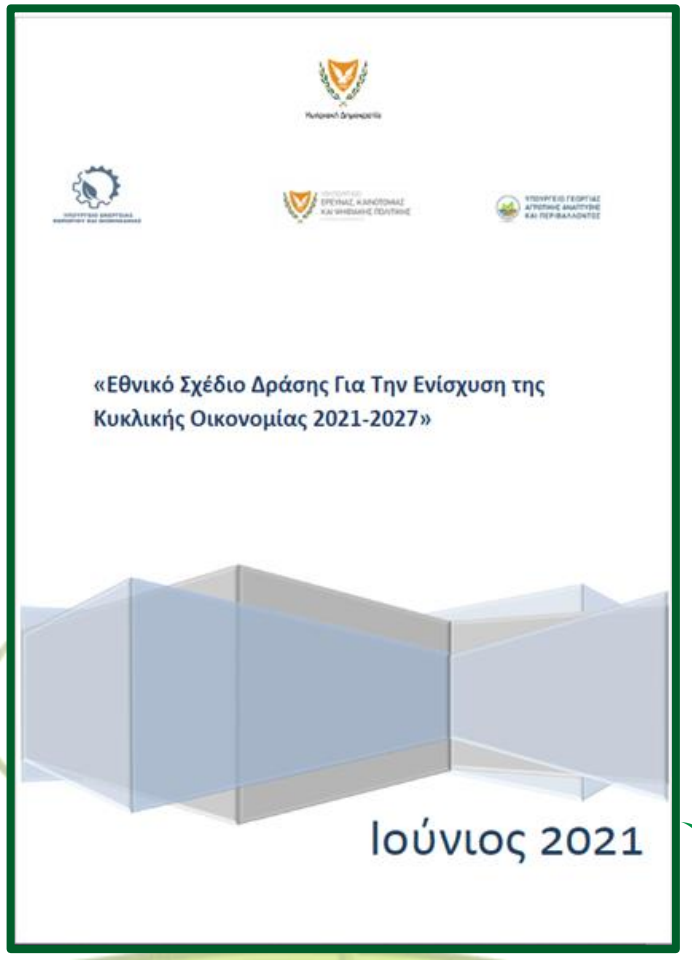
National Action Plan for strengthening the Circular Economy 2021-2027

- Based on the direction given in the EU Green Deal, on 13th November 2020 the Council of Ministers approved the new National Development Strategy Governance System
- May 6th 2019, the Council of Ministers approved the New Industrial Policy 2019-2030 and its Action Plan for 2019-2022
- The Action Plan of the New Industrial Policy includes measures concerning, among others, the promotion and promotion of the Circular Economy.
- Taking into account all of the above, the Government decided to prepare a National Action Plan for the promotion and strengthening of the circular economy.



Source: Cyprus Action Plan for the CE 2021-27

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National Action Plan for strengthening the Circular Economy 2021-2027

Characteristics of Cyprus that hinder the creation of a Circular economy:

- small scale,
- dependence of the economy on the import of raw materials,
- disproportionate focus on specific sectors of the industry such as Tourism,
- limited manufacturing infrastructure,
    - lack of support for existing and new creative development initiatives,
    - industry's cultural resistance to change and favoritism of status-quo

Prioritisation of industries for the CE 2021-27:

- Primary sector
- Food and beverages
- Hotels (HoReCa)
- Large individual industrial units

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National Action Plan for strengthening the Circular Economy 2021-2027

The actions and policy measures for the promotion and development of the circular economy in Cyprus concern four main pillars as follows:

1. CREATING A CIRCULAR ECONOMY CULTURE
2. INCENTIVES FOR INVESTMENT IN THE CIRCULAR ECONOMY AND SUPPORTING THE TRANSITION
3. CIRCULAR ECONOMY INFRASTRUCTURES
4. MUNICIPAL WASTE MANAGEMENT

Information on open funding opportunities can be found here: https://www.fundingprogrammesportal.gov.cy

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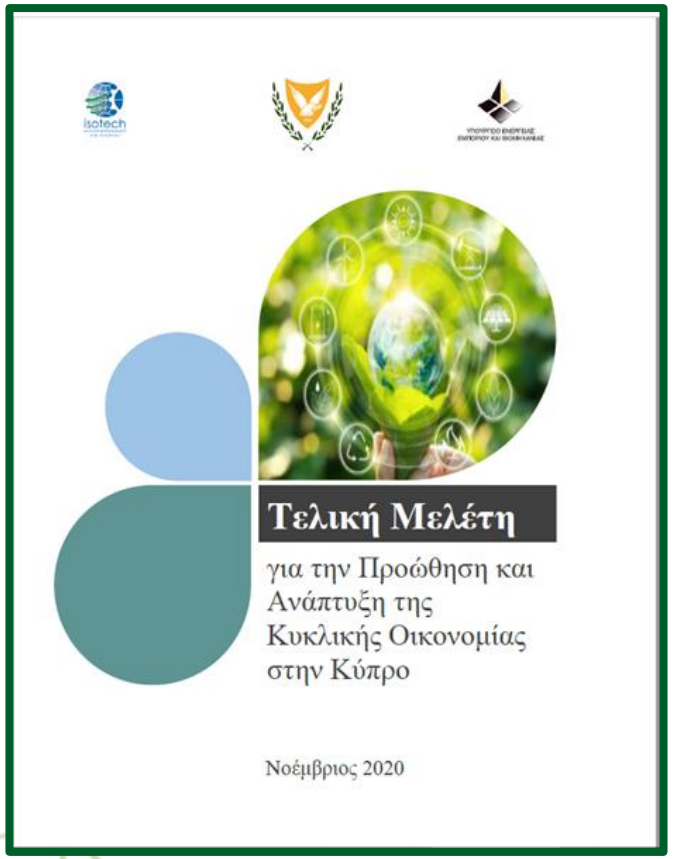
Study on the promotion and development of the circular economy in Cyprus, 2020



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Cyprus Circular Economy Network

The Cyprus Circular Economy Network (CCEN) is a network of 5 strategic partners in Cyprus, International and European Collaborators, Supporters and Members.

The ultimate goal of the CCEN is to enable and accelerate the transition of Cyprus economy to a circular and green economy, especially after the COVID-19 pandemic, offering its services in a multilevel stakeholder approach; businesses, academia and public sector, contributing to the achievement of the economic and social resilience of Cyprus, for a sustainable future.

Visit the site here:
https://cypruscircular.org.cy/

Source: https://cypruscircular.org.cy/

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Other Sources of information and possible funding opportunities:

Ministry of Energy, Commerce and Industry

https://meci.gov.cy/gr/sxediaxorigion

Kyprostoavrio funding opportunities

http://www.cyprus-tomorrow.gov.cy/cypresidency/kyprostoavrio.nsf/funding_el/funding_el?OpenDocument

Green Cluster

https://www.greenclustercy.org/

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Further Reading

Additional source / reading material

- https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/publication/PB_105.pdf
- https://www.unido.org/sites/default/files/files/2020-09/Circular_economy_in_AGR.pdf
- https://ellenmacarthurfoundation.org/
- https://meci.gov.cy/assets/modules/wnp/articles/202109/290/docs/sxedio_drasiskikliki.pdf
- https://www.learnaboutcap.com/index.html
- https://cypruscircular.org.cy/cyprus-action-plan-circular-economy/
- https://cypruscircular.org.cy/wp-content/uploads/2021/08/27.7.2021.MECI_.Circular-Economy-Minister-Presentation.pdf

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Thank you!

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