

# اقتصاد چرخه ای در صنعت پلاستیک

میلااد مهران پور

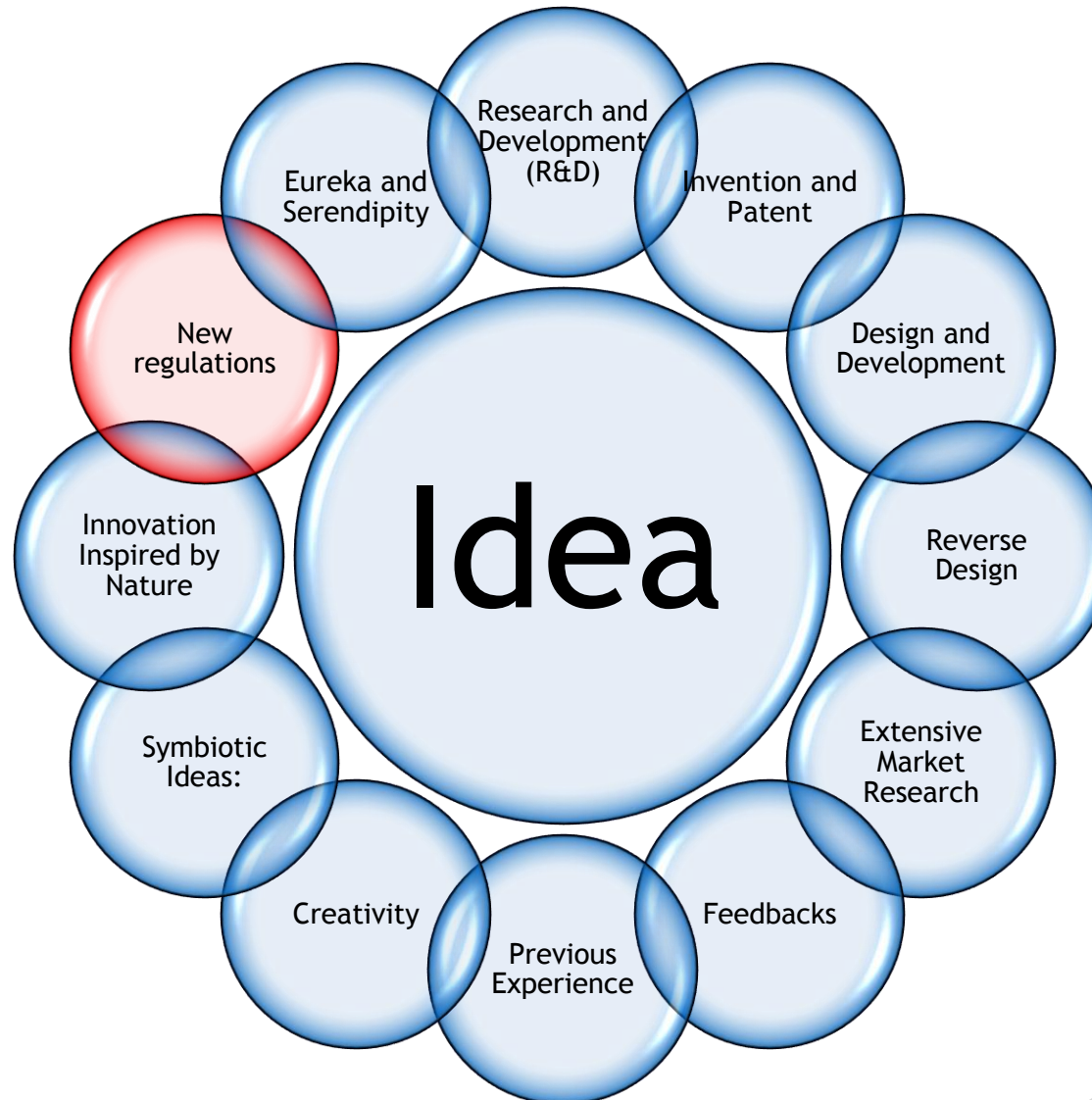


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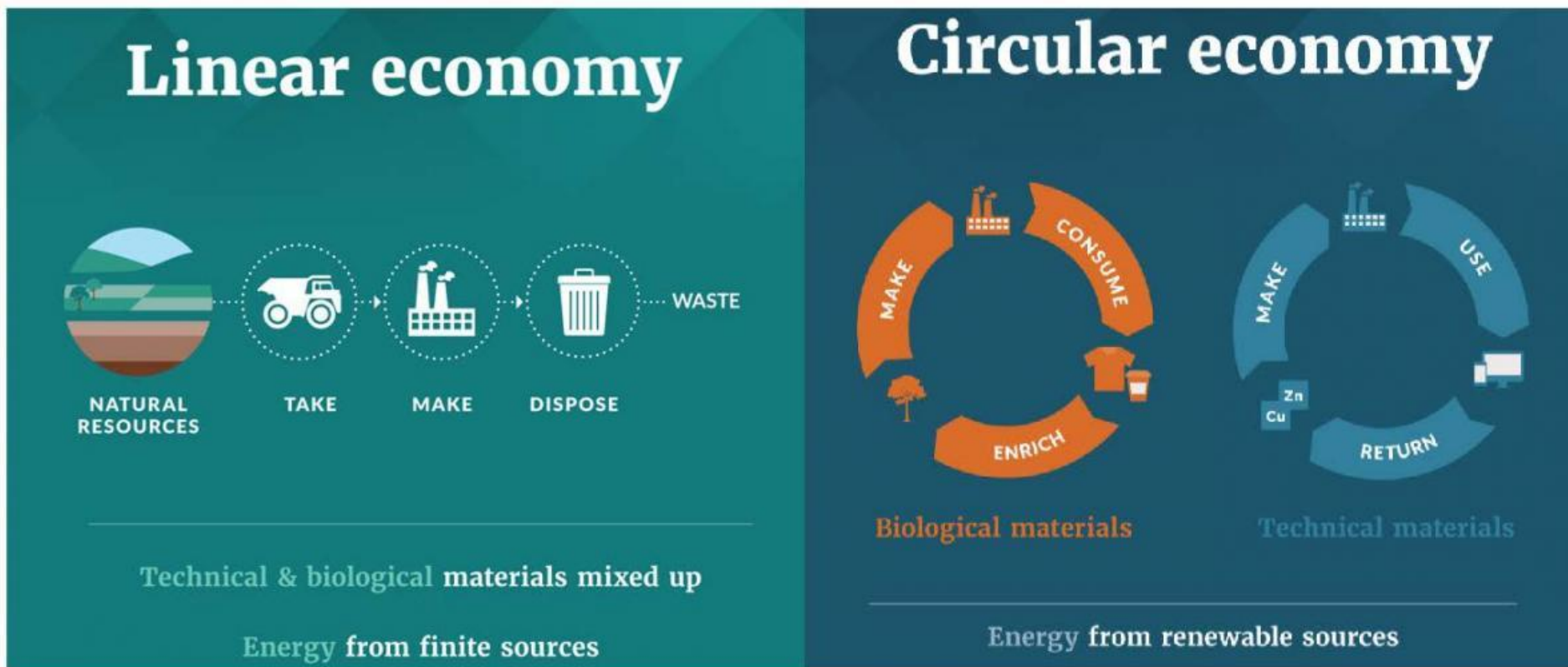
دومین همایش ملی نوآوری در صنعت پلاستیک

۳۰ دی ۱۳۹۸ / مرکز همایش های سازمان مدیریت صنعتی

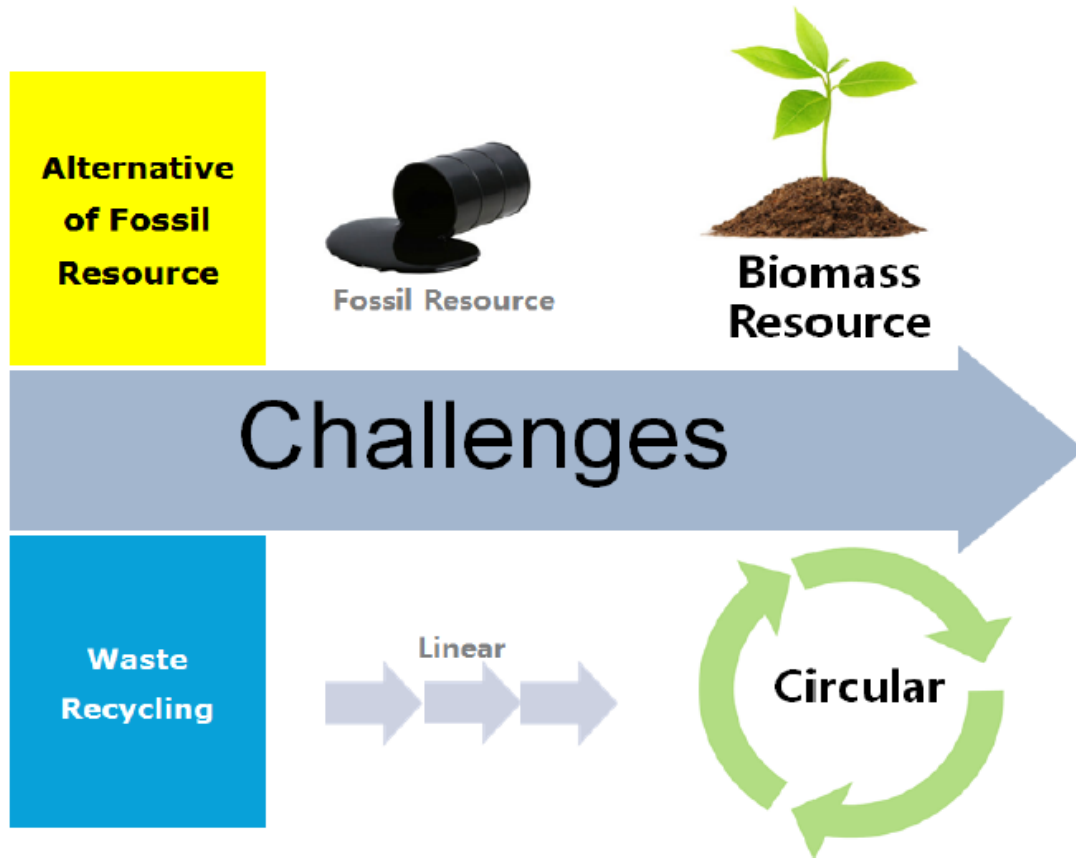
# Origin of Business Idea



# Circular economy



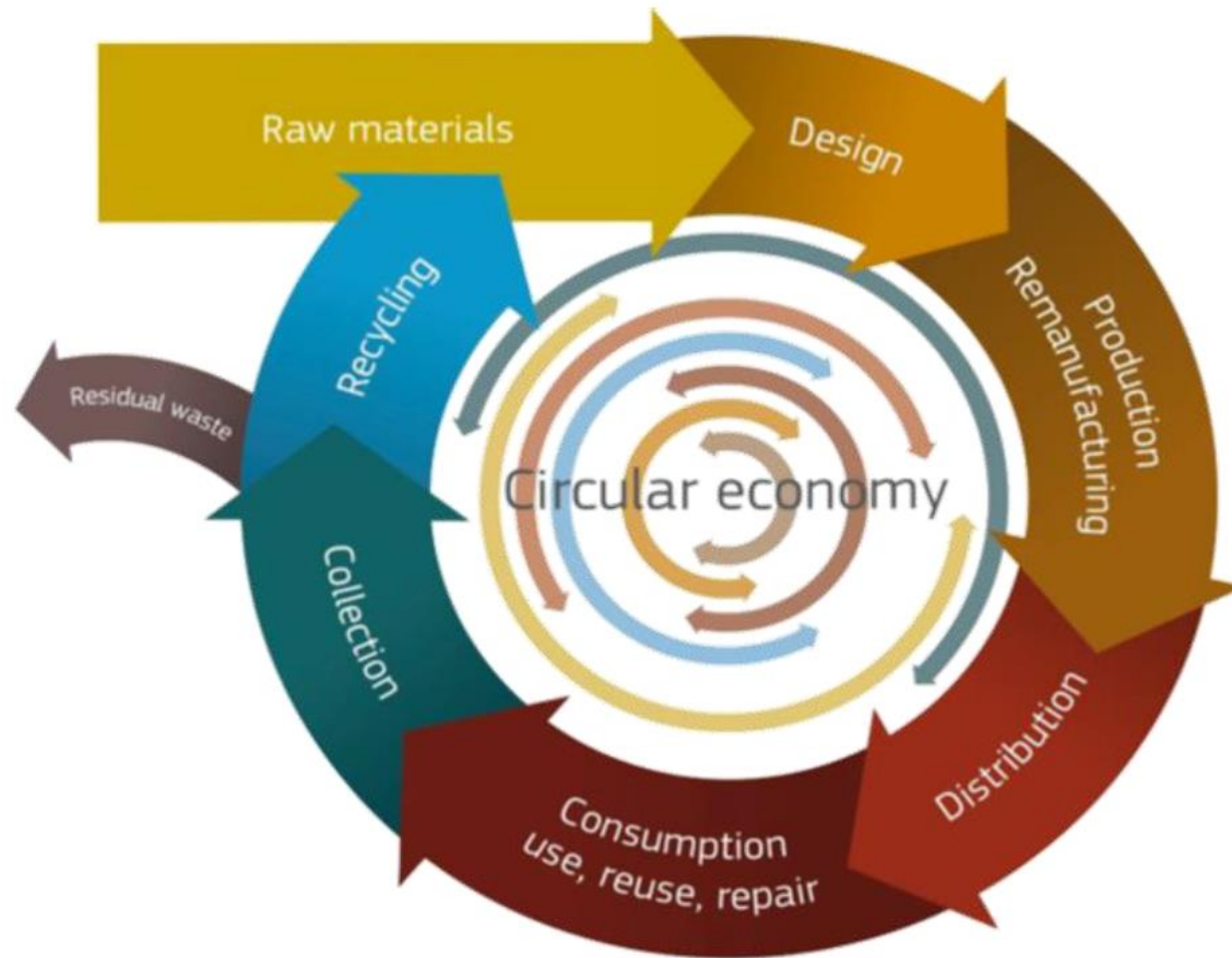
# Two challenges



## Objective

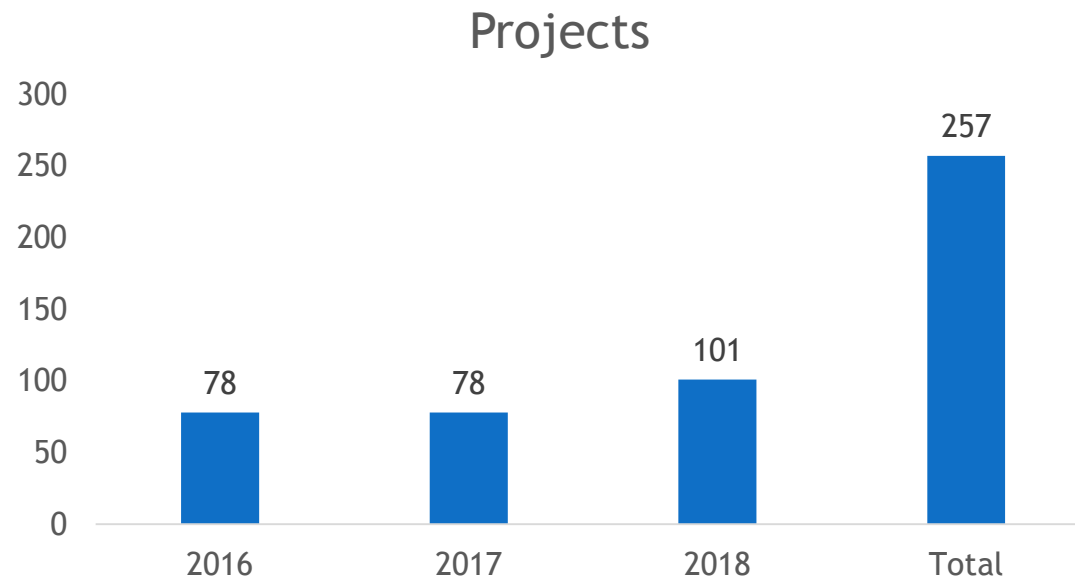
Sustainable materials  
without sacrificing  
properties

# Circular Economy



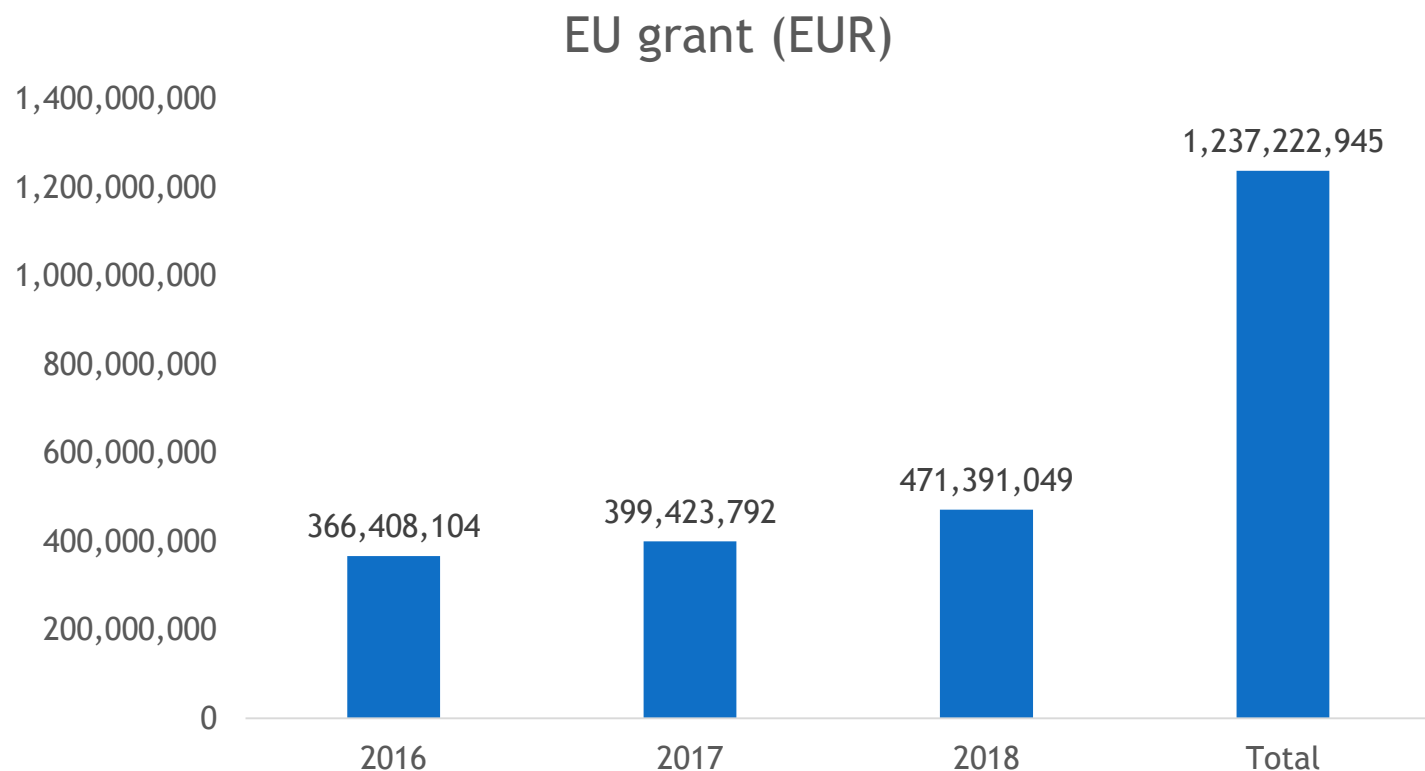
# Implementation of circular Economy

- ▶ In December 2015, the Commission adopted a Circular Economy Action Plan<sup>1</sup> to give a new boost to jobs, growth and investment and to develop a carbon neutral, resource-efficient and competitive economy.
- ▶ The 54 actions under the action plan have now been completed or are being implemented, even if work on some will continue beyond 2019.





# Research and Innovation (R&I) Europe's Responsibility



Type of Action	Projects (*)	EU grant (EUR)	Project Costs (EUR)
CSA	24	33.218.090	33.278.296
ERA-NET-Cofund	1	4.708.842	14.269.217
IA	85	626.759.080	769.972.283
PCP	1	5.000.000	6.190.075
RIA	92	482.606.093	504.422.960
SME-2	54	84.930.840	122.156.681
<b>Total</b>	<b>257</b>	<b>1.237.222.945</b>	<b>1.450.289.513</b>

CSA: Coordination and support action

ERA-NET – Cofund: Actions supporting public-public partnerships

IA: Innovation Action

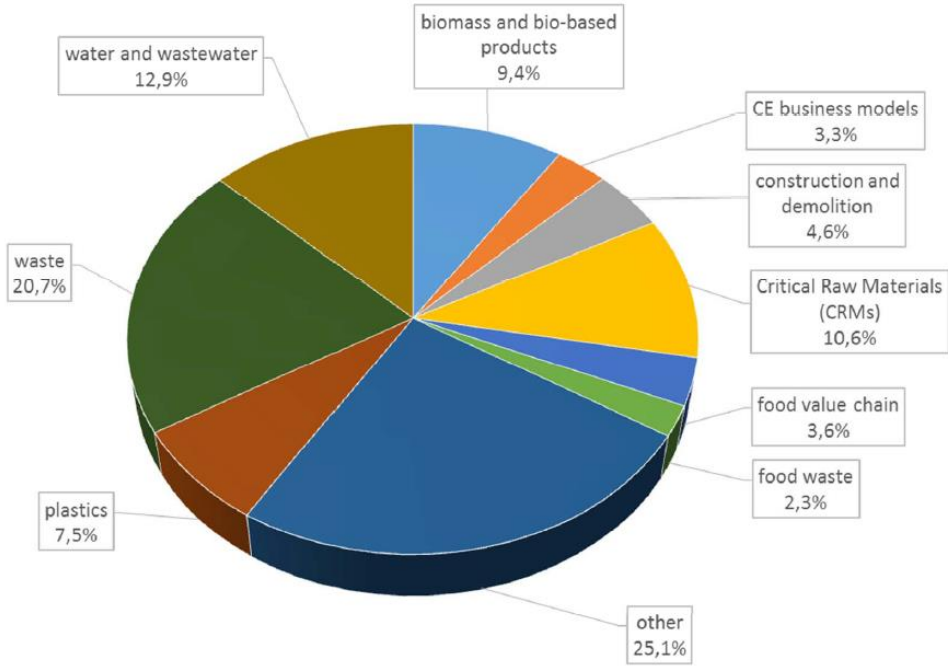
PCP: Pre-commercial procurement

RIA: Research and innovation action

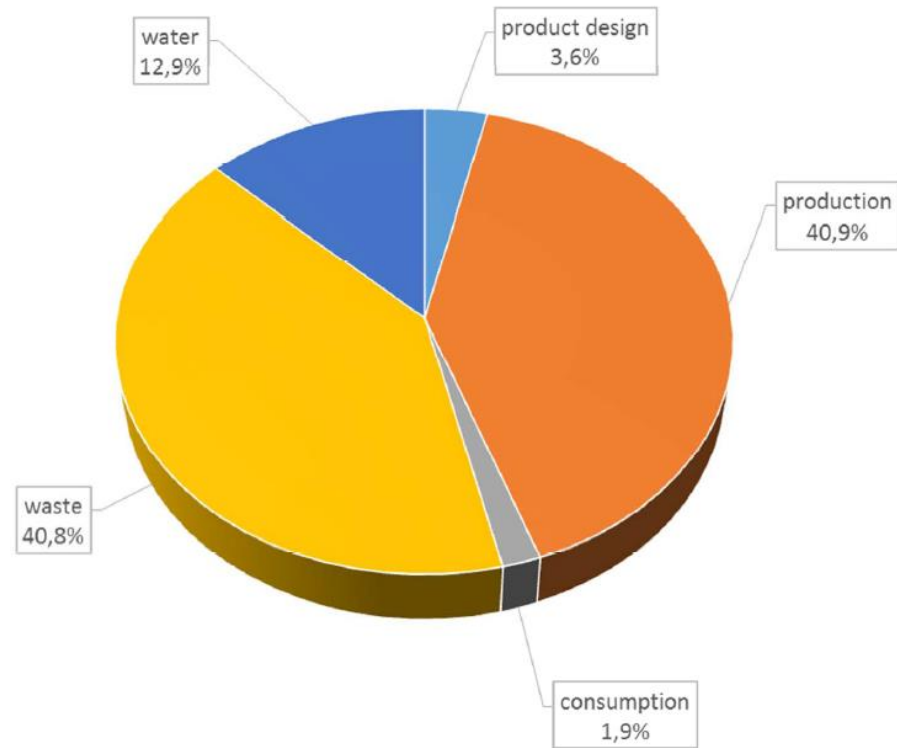
SME-2: SME instrument – phase 2



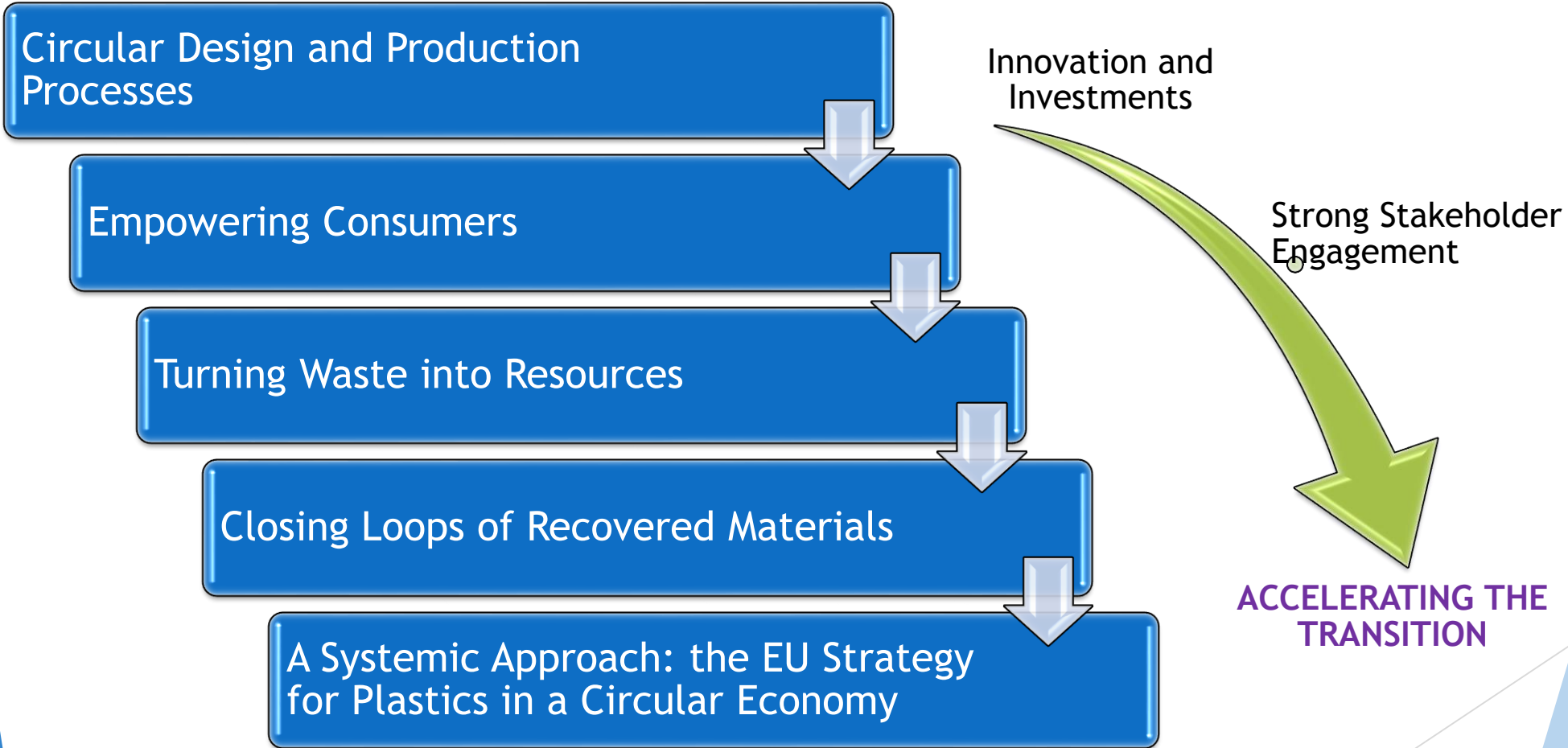
EU grant share per CE priority



EU grant share per CE stage



# BUILDING A CIRCULAR ECONOMY



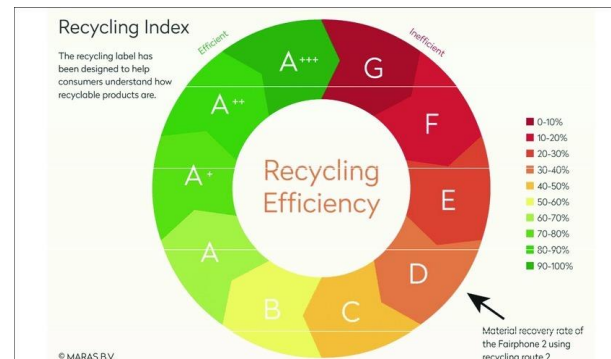
# Circular Design and Production Processes



## Ecodesign and Energy Labelling



developing horizontal criteria to measure durability, reusability, reparability, recyclability and the presence of critical raw materials.



# Empowering Consumers

The transition towards a more circular economy requires an active engagement of citizens in changing consumption patterns.

The Product Environmental Footprint (PEF)  
& Organisation Environmental Footprint (OEF)

About 300 companies from 27 different sectors and more than 2,000 stakeholders worked for 5 years to test these methods

# Turning Waste into Resources

efficient waste management systems are an essential building block of a circular economy.

new ambitious yet realistic recycling rates

simplification and harmonisation of definitions and calculation methods and clarified legal status for recycled materials and by-products

reinforced rules new obligations on separate collection (bio-waste, textiles and hazardous waste produced by households, construction and demolition waste)

minimum requirements for Extended Producer Responsibility

strengthened waste prevention and waste management measures, including for marine litter and food waste

# Closing Loops of Recovered Materials

reduce significant market entry barriers for more sustainable and circular products

includes new limits on hazardous substances for all fertilisers, including from virgin raw materials, lowering the risk of material cycles containing dangerous levels of certain toxic elements;



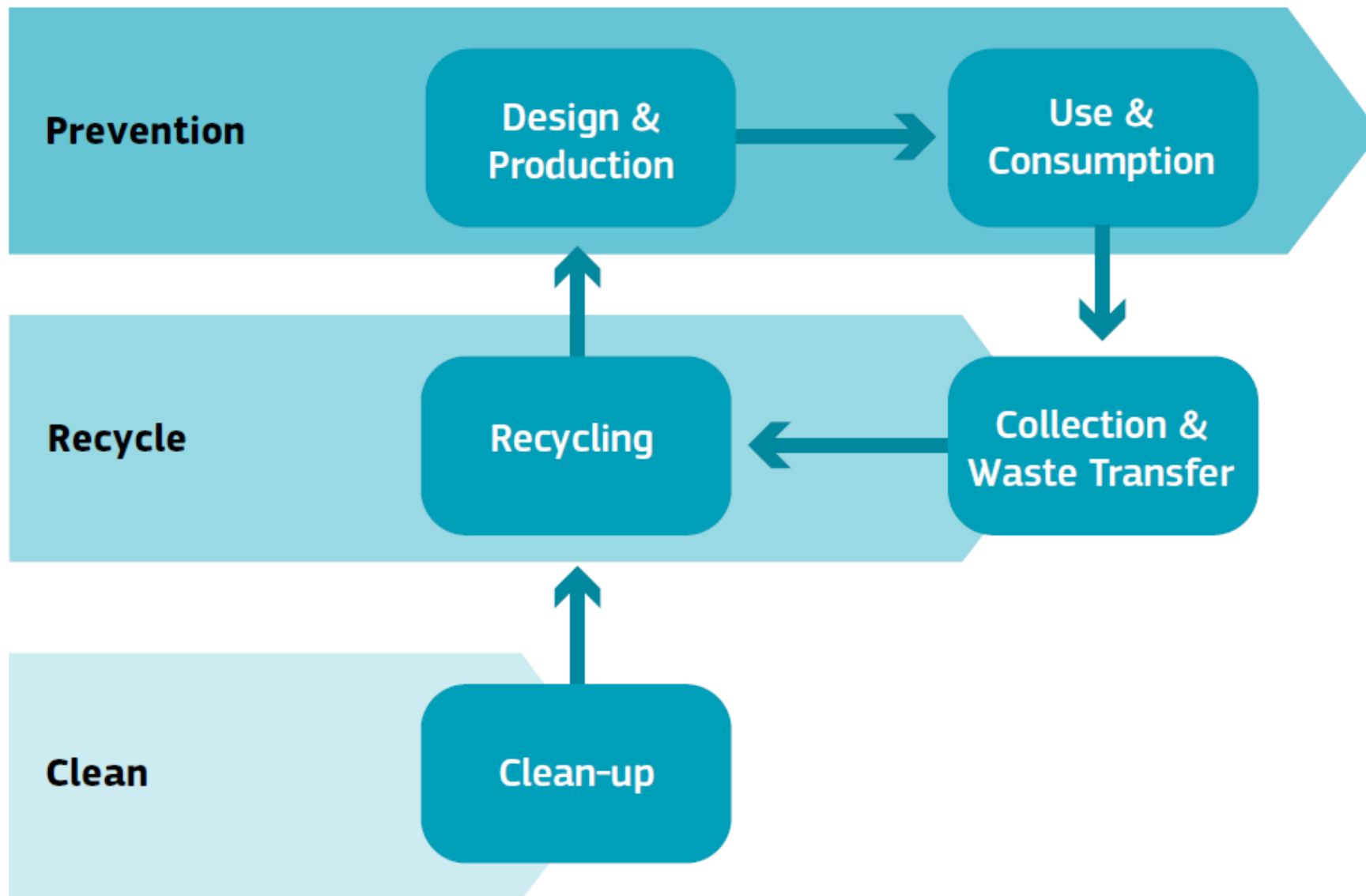
## A Systemic Approach: the EU Strategy for Plastics in a Circular Economy

A ban of single use products made of plastic and of oxo-degradable plastic.

reduce consumption of food containers and beverage cups made of plastic and specific marking and labelling of certain products

incorporate 30% of recycled plastic in beverage bottles as from 2030 & 25% for PET bottles as from 2025 as well as a 90% separate collection target of plastic bottles by 2029 and the introduction of design requirements to connect caps to bottles.

EPR schemes covering the cost to clean-up litter, applied to products such as tobacco filters and fishing gear.



# Possible measures for mitigating plastic pollution at different stages of the plastics life cycle

## Packaging

### EU Action Plan



#### Design/Production

Packaging tax

Redesign caps/lids

Eco-tax on specific plastics

Reduce packaging by selling products in bulk and reusing

#### Use/Consumption

Packaging tax

Public spots for water refills

#### Collection/Transfer

Deposit-refund scheme for drink containers and packaging

Improvement of wastewater treatment plants to retain micro-plastics from urban and industrial effluents

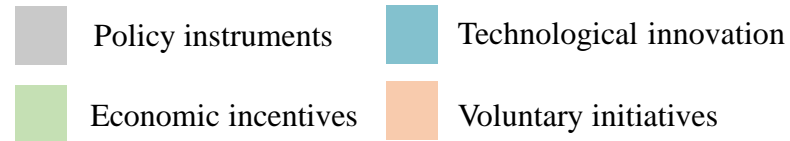
Sorting of municipal waste and incineration of non-recyclables

#### Treatment/Recycling

# Possible measures for mitigating plastic pollution at different stages of the plastics life cycle

## EU Action Plan

### Construction



#### Design/Production

#### Use/Consumption

#### Collection/Transfer

#### Treatment/Recycling

Use of alternative biodegradable building materials

Apply 'design for deconstruction' methods in materials design

Sustainable use of natural materials for insulation (e.g. seaweed)

On-site collection, sorting and valorization of Construction & Demolition (C&D) waste

### Transport

Strategies for Extended Producer Responsibility (EPR), requiring producers to be responsible for the entire life cycle

Use of organic fillers in automotive plastics (e.g. tomato skins used by Ford)

Free take-back services for End-of-Life Vehicles (ELVs)

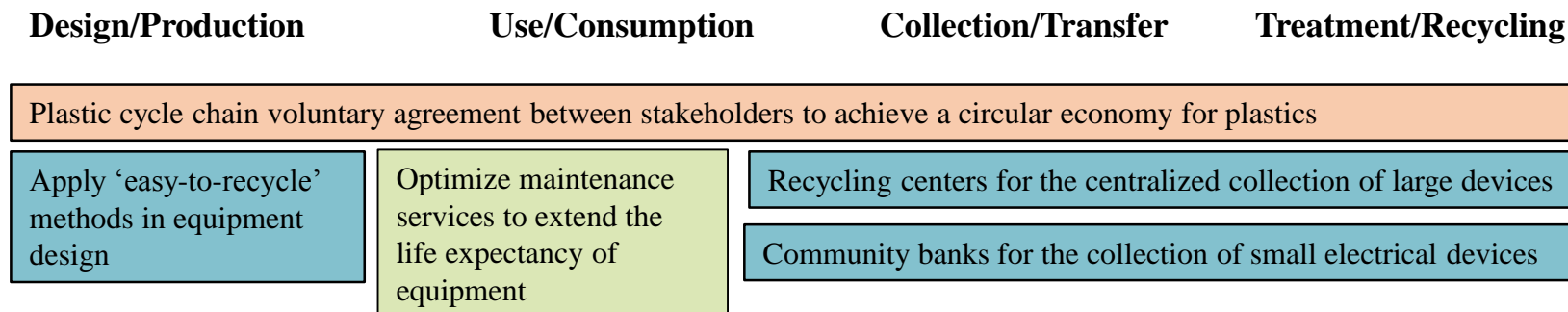
Material Recovery Facilities (MRFs) for materials found in ELVs

# Possible measures for mitigating plastic pollution at different stages of the plastics life cycle

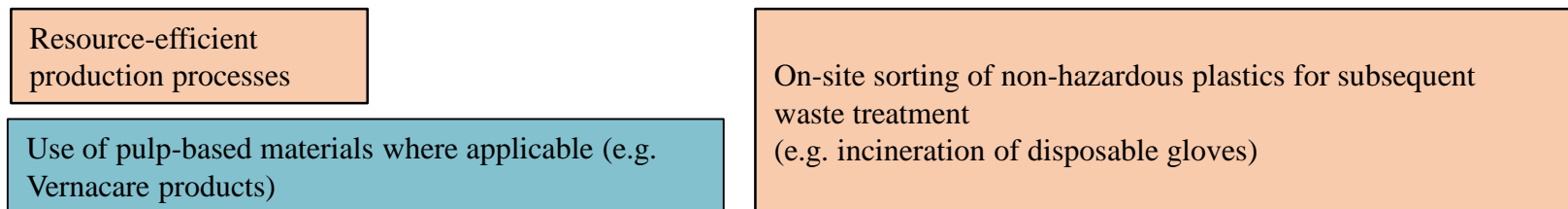
## EU Action Plan



## Electrical



## Medical



Policy  
recommendations

Develop and implement extended producer responsibility (EPR) systems with modulated fees to steer product design towards reuse and cost-effective recycling, and to establish joint value-chain responsibility.

Set up and facilitate investment mechanisms that pool public and private money to consolidate and accelerate the transition towards a circular economy for plastics.

Set up a plastics oversight board for strategic planning and long-term investments.

Provide information and business guidance on applying systems thinking in the context of the plastics value chain.

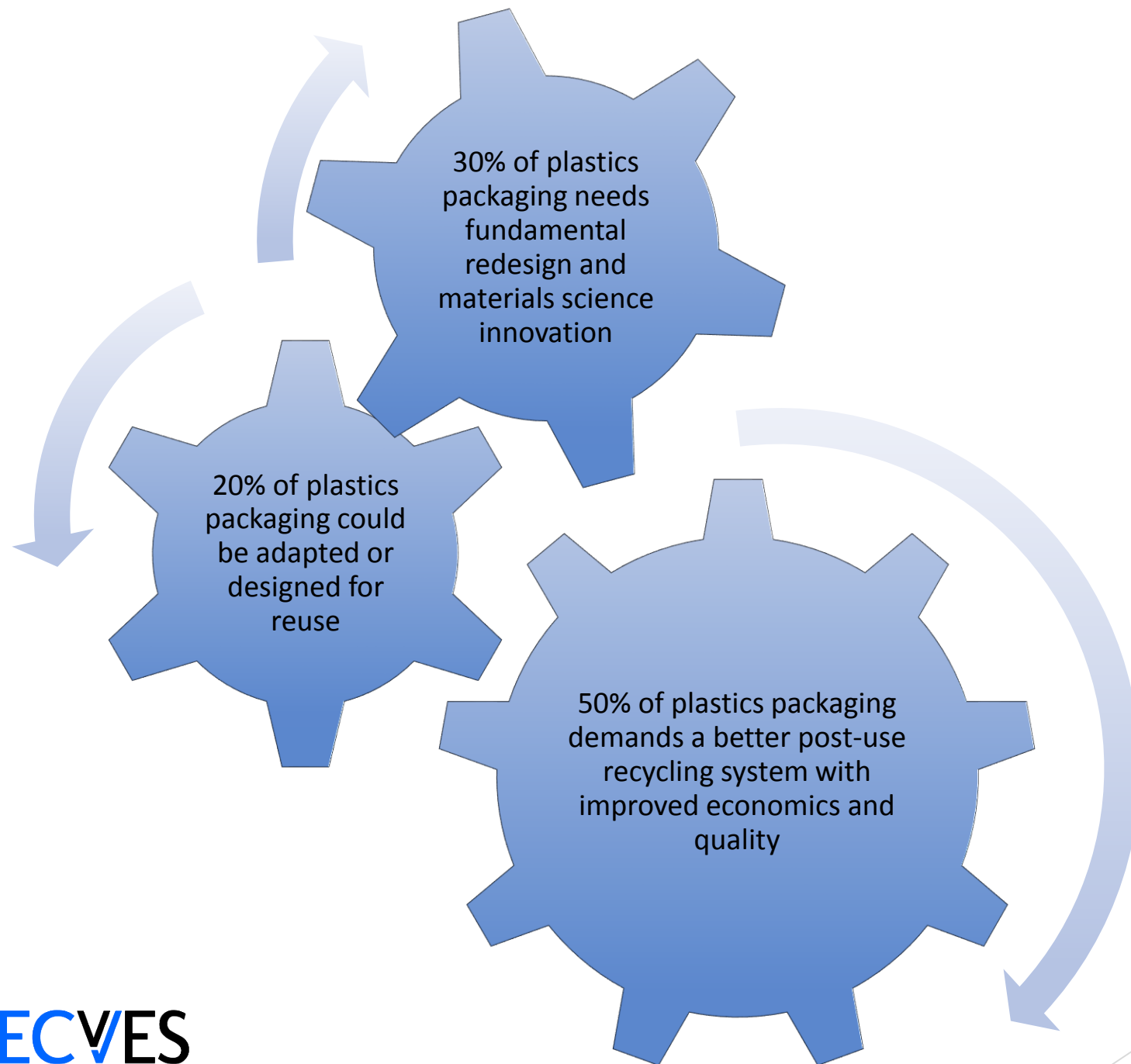
Develop and implement a plastics product information system across the value chain.



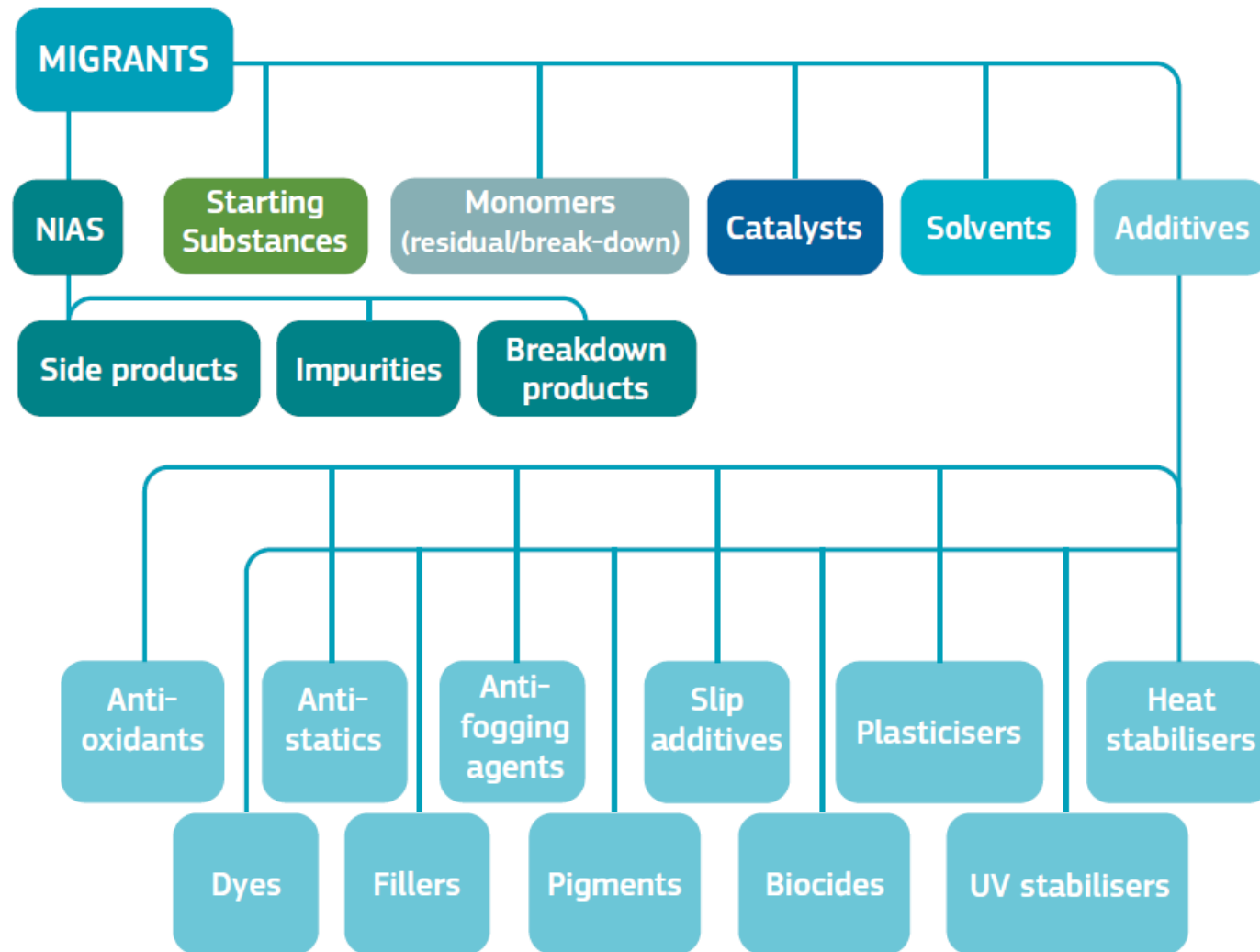


## Research & Innovation priorities

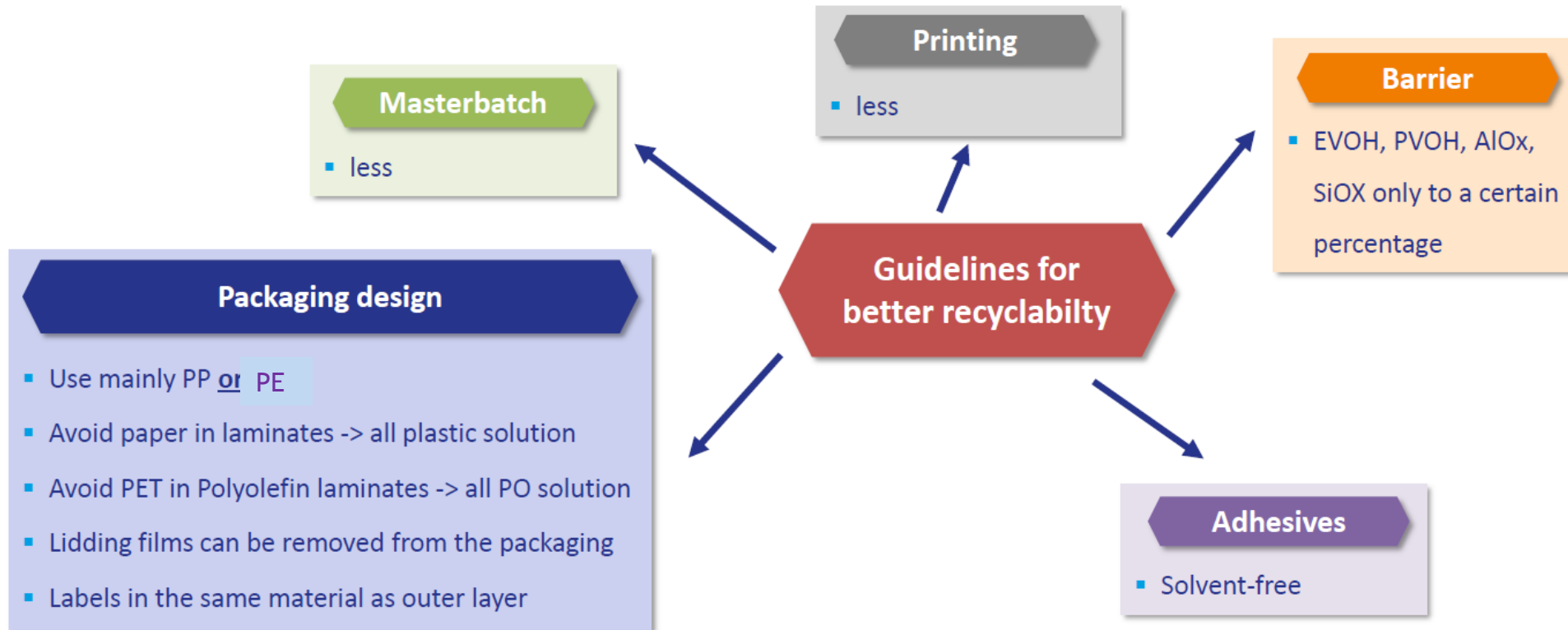
- Provide financial incentives to redesign plastic products to facilitate reuse, collection, sorting and recycling.
- Provide funding for research to develop alternative materials based on the same mechanisms as natural polymers.
- Provide funding to develop infrastructures and technologies that maximise plastics value retention.



# Design for circular economy products



# Design for circular economy products

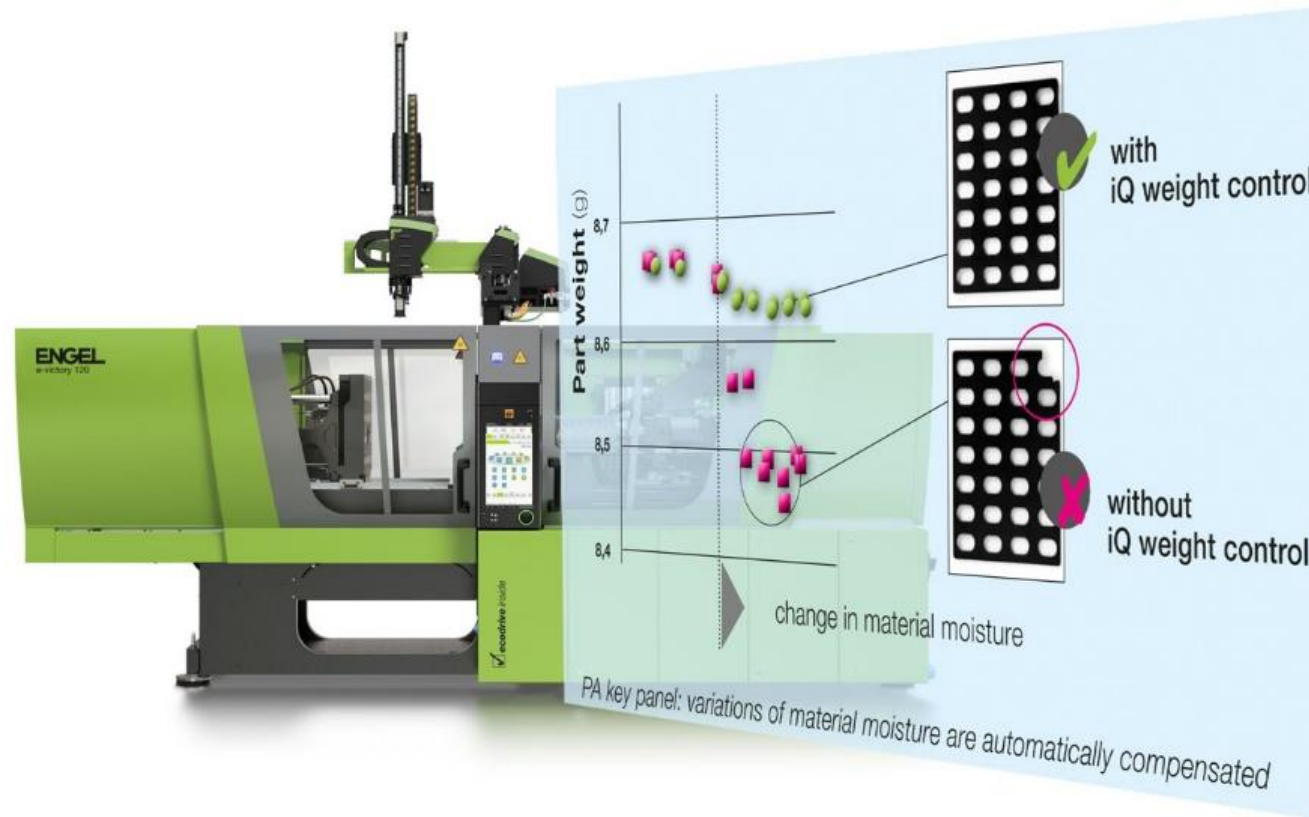


# Recent Innovation - online rheometry

- online quality control
- Sustainable production
- Smart compounding

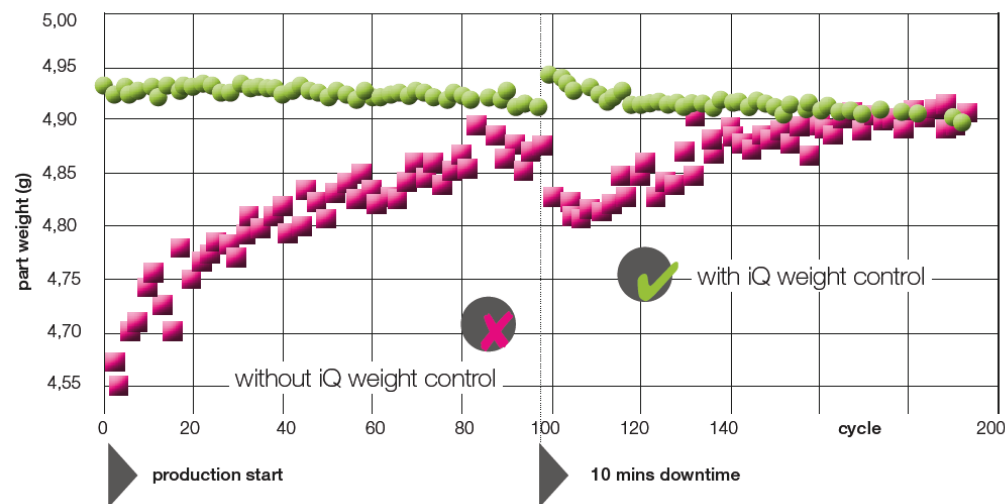
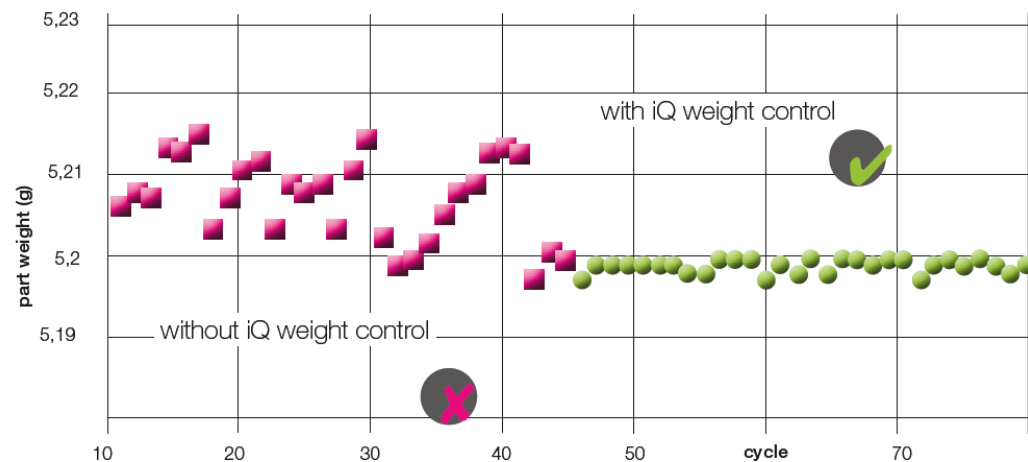


# Recent Innovation - Intelligent quality control (IQ)





# Recent Innovation - Intelligent quality control (IQ)



# Packaging PVC Shrink Labels

## Problems:

- ▶ Similar Density Compared to PET
- ▶ Its Impossible to Completely Remove PVC from Recycled PET
- ▶ PVC Impurities Deteriorate the Quality of Recycled PET

## Solution

- Use Adhesives with Easily Hot De-seam Properties in Initial Washing Steps
- Replace PETG with PVC in Shrink Labels
- Shift to LLDPE/COC Shrink Labels



**با تشکر از توجه شما**

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