

# SUSTAINABLE FOOD PACKAGING. CURRENT AND FUTURE CHALLENGES

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# AGENDA

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1. Sustainable food packaging
2. The 5Rs concept – Where we are?
3. Current and future challenges
4. Conclusions



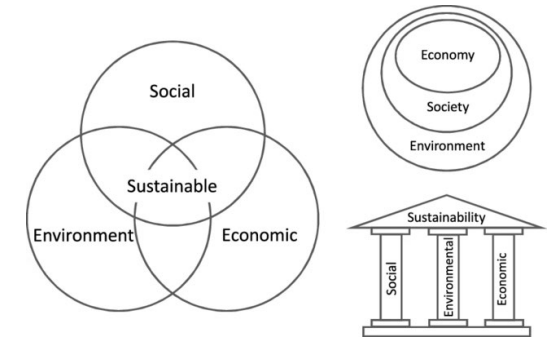
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# 1. SUSTAINABLE FOOD PACKAGING

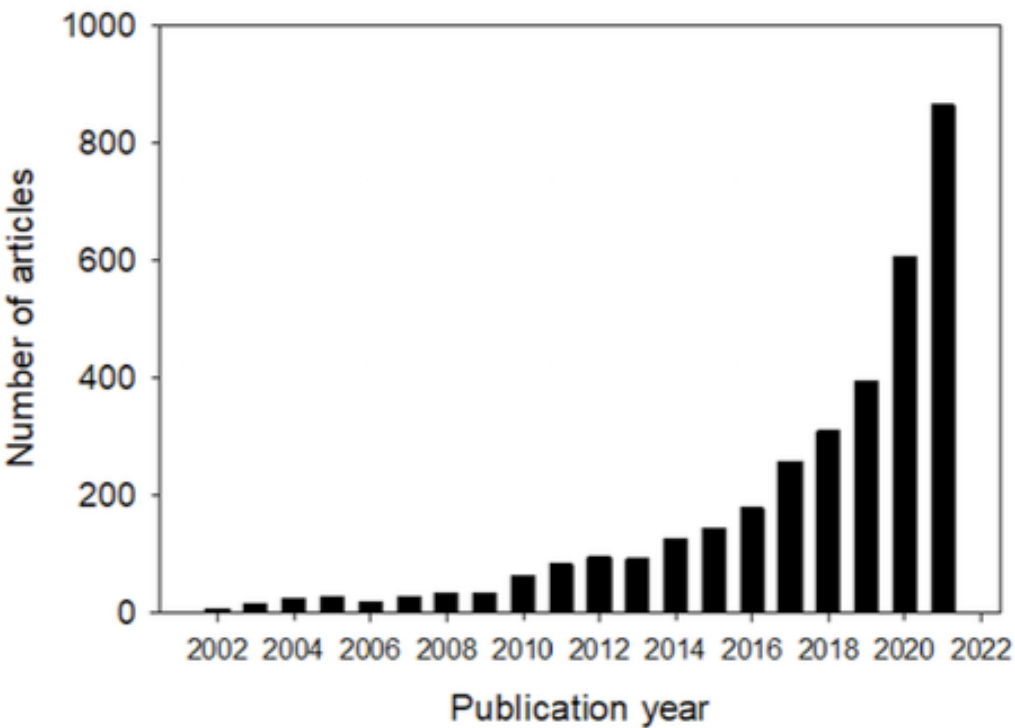
# WHAT IS SUSTAINABLE PACKAGING?

## Indicative existing definitions:

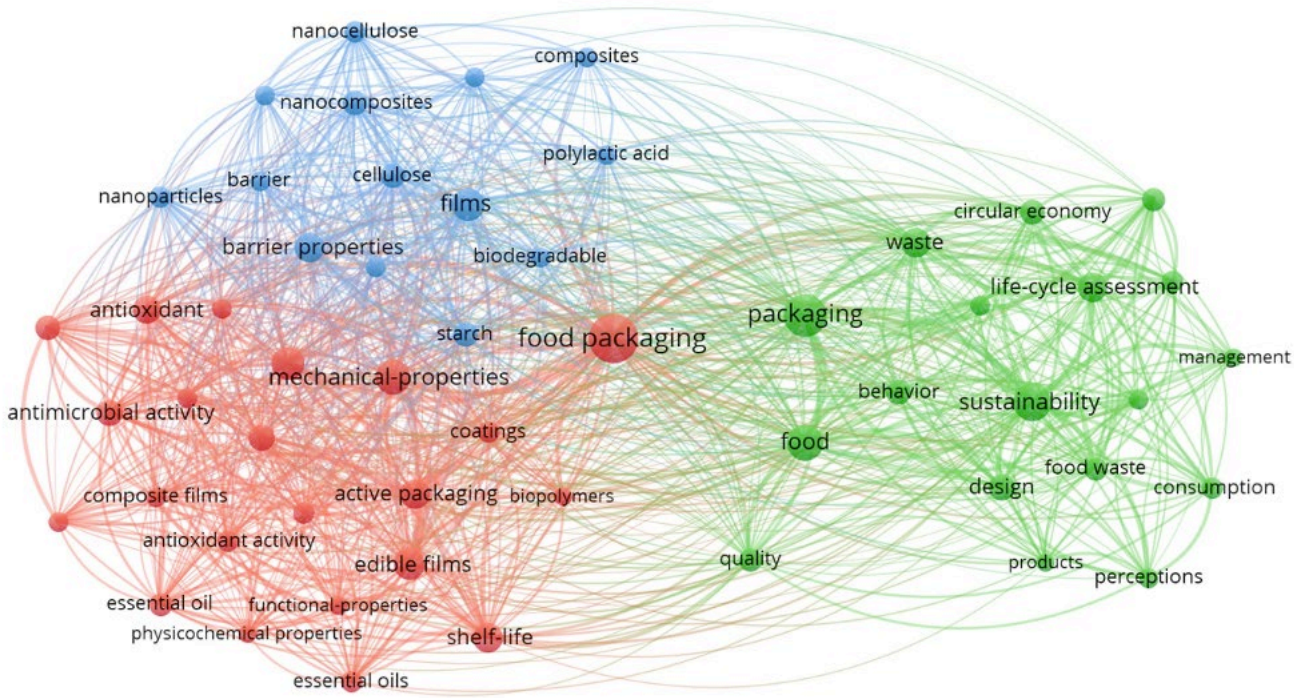
- **Brundtland Report (Keeble, 1988):** Sustainable packaging is defined as a “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”.
- **Wikipedia: Sustainable packaging** is the development and use of packaging which results in improved sustainability.
- **On the web:** Sustainable packaging is packaging that produces the most negligible impact on the natural environment (??)
- **Sustainable Packaging Coalition® (SPC) (2011):** *Sustainable packaging is beneficial, safe and healthy for individuals and communities throughout its life cycle; meets market criteria for performance and cost; is sourced, manufactured, transported, and recycled using renewable energy; maximises the use of renewable or recycled source materials; is manufactured using clean production technologies and best practices; is made from materials healthy in all probable end of life scenarios; is physically designed to optimise materials and energy; and is effectively recovered and utilised in biological and/or industrial cradle-to-cradle cycles.*
- ....
- **COST ACTION Circulability (2023):** *Sustainable food packaging is an optimized, measured (quantified) and validated solution, which takes into consideration the balance of social, economic, ecological and safe implementations of the circular value chain, based on the entire history (life cycle) of the food product-package unit.*



# ON-GOING-RESEARCH



Number of publications on sustainable food packaging between 2002 and July 2022.



Frequently used terms for publications on sustainable food packaging

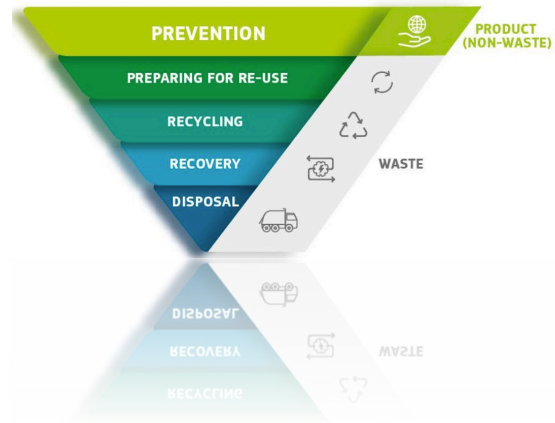
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## 2. THE 5Rs CONCEPT – WHERE WE ARE?

# THE 5Rs CONCEPT !!

## EU Waste Framework Directive

### Waste hierarchy



Less focused (now of particular research interest)

Still remains a challenge (waste management)

Mostly focusing on (bio)renewable resources

Biopolymers/bioplastics

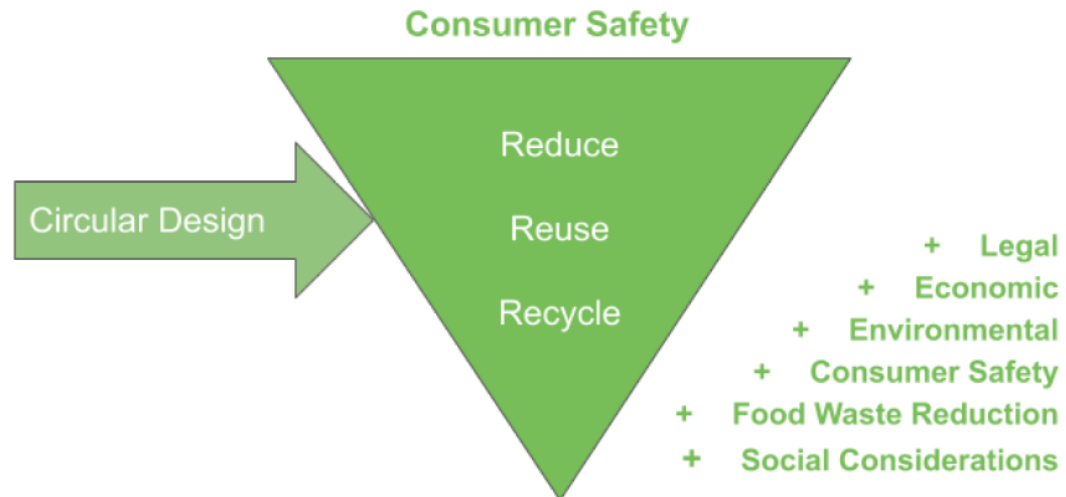
At the moment, in EU, only for polyethylene terephthalate (PET)

# LEGISLATIVE REQUIREMENTS



EU plastics strategy **ALL PLASTIC PACKAGING** placed on the EU market to be **REUSABLE** or **EASILY RECYCLED** by **2030**.

Guiding Principles:  
Consumer Safety, Circular Economy





# EU Regulation is in-progress!



The screenshot shows the European Commission website. At the top left is the European Commission logo. To its right is a language selector set to "English" and a search bar with the word "Search". Below this is a navigation bar with the text "Energy, Climate change, Environment". A dark blue banner below the navigation bar contains the word "Environment" in white. Underneath the banner is a breadcrumb trail: "Home > All Environment Publications > Proposal Packaging and Packaging Waste". Below the breadcrumb trail, the text "PROPOSAL FOR A REGULATION" is displayed. The main heading of the page is "Proposal for a revision of EU legislation on Packaging and Packaging Waste".

[https://environment.ec.europa.eu/publications/proposal-packaging-and-packaging-waste\\_en](https://environment.ec.europa.eu/publications/proposal-packaging-and-packaging-waste_en)

# LEGISLATIVE CHANGES FOR RECYCLING OF FCM

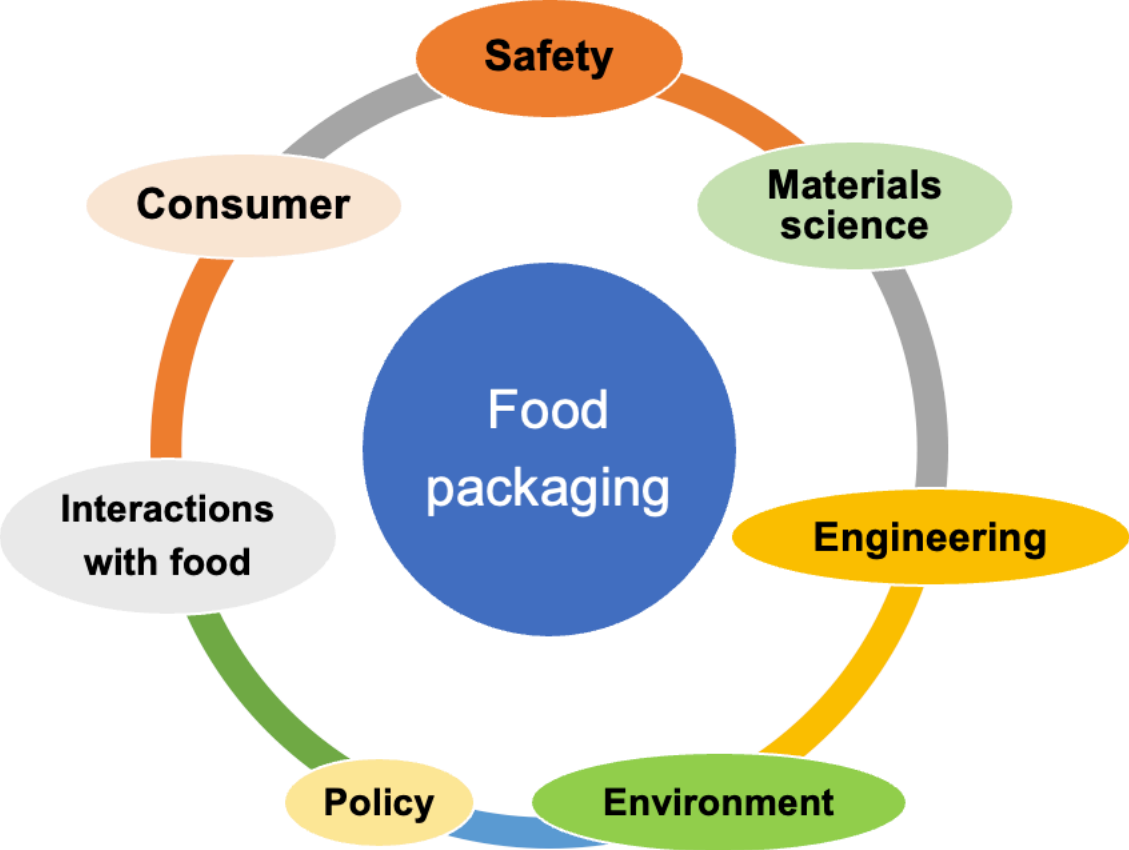
- Regulation (EC) No. 1935/2004, on materials and articles intended to come into contact with food.
- Regulation (EU) No. 1907/2006, on the Registration, Evaluation, Authorisation and Restriction of Chemicals (EU Chemicals Legislation, REACH)
- ~~• Regulation (EC) No. 282/2008, on recycled plastic materials and articles intended to come into contact with foods~~
- Regulation (EU) No. 2022/1616, on recycled plastic materials and articles intended to come into contact with foods, and repealing Regulation (EC) 282/2008 (as of 10/10/2022)



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# 3. CURRENT AND FUTURE CHALLENGES

# MULTI-DISCIPLINARITY



**A FOCUS on SAFETY**

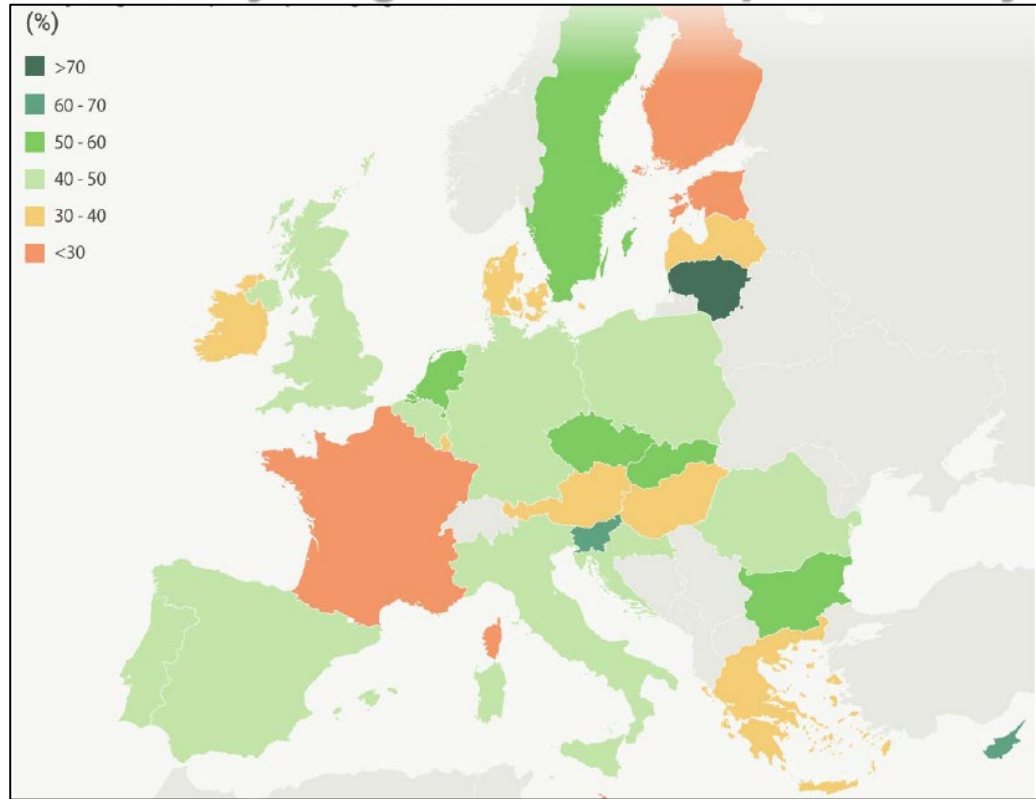
**ANALYTICAL CHALLENGES/HARMONISATION is lacking  
(harmonisation highly needed for IAS\* and NIAS\*\*)**

\* IAS: Intentionally added substances  
\*\*NIAS: Non-Intentionally Added Substances

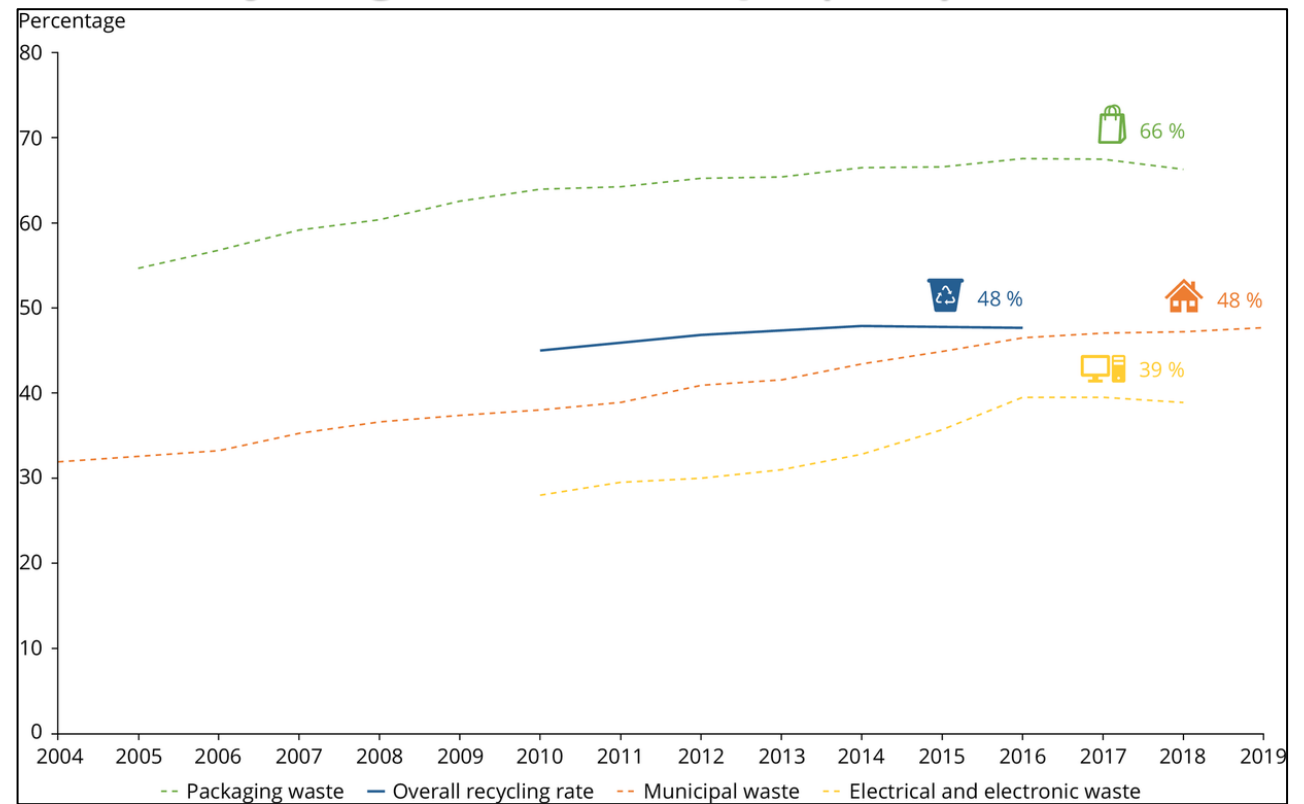


# FCM RECYCLING AT EU

## Recycling rates in Europe/ country

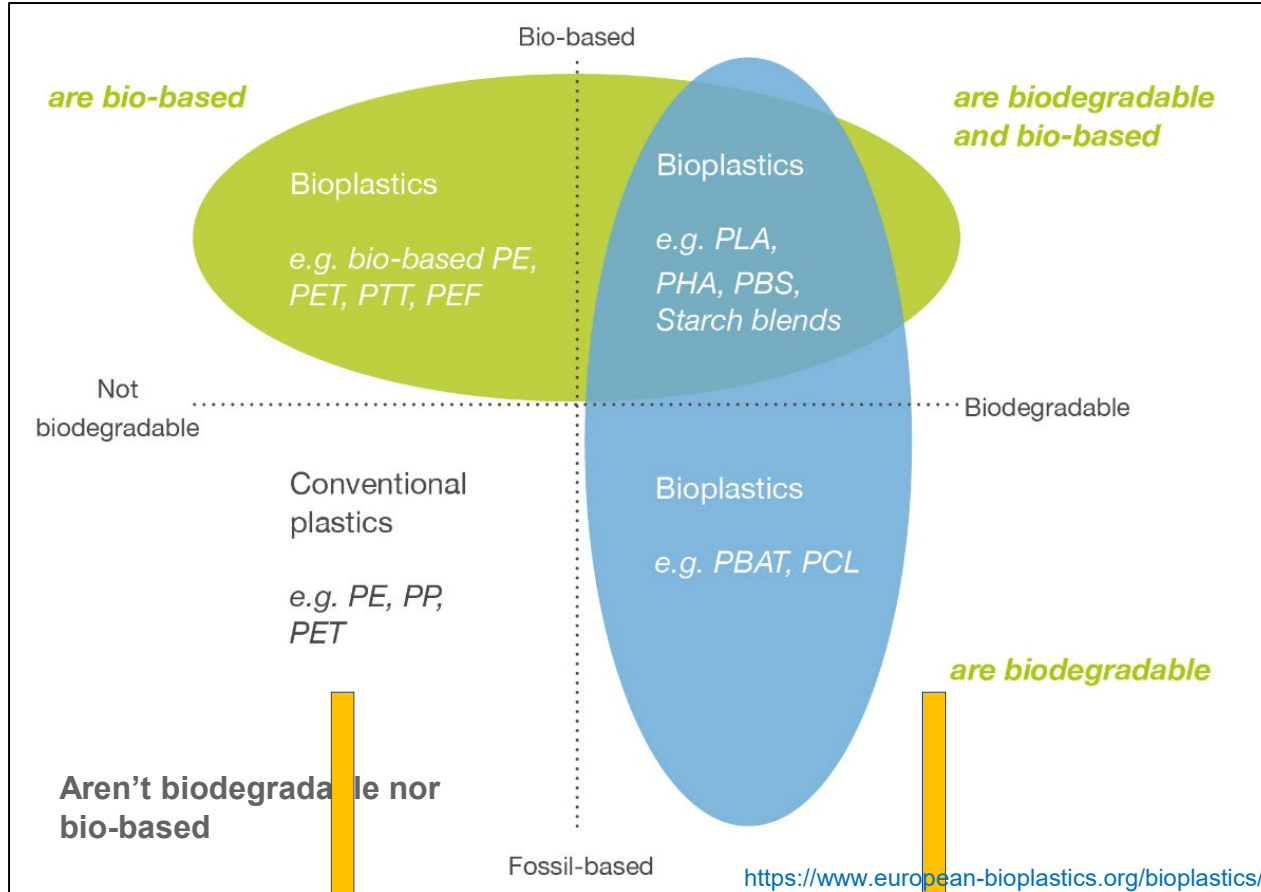


## Recycling rates in Europe (EEA)



**Sources:** - European Commission (2018) A European Strategy for Plastics in a Circular Economy, COM/2018/028 ;  
- <https://www.eea.europa.eu/ims/waste-recycling-in-europe> (accessed 10/06/2022).

# SOLUTION?



## MAIN FACTORS:

- Resources (raw materials)
- Quality of resources
- Waste management (new EU Regulation is coming!)
- Safety assessment
- Analysis (chemical) and characterisation (risks).
- .....

**More materials to be recycled**



Safety assessment of mixtures of natural origin  
to manufacture food contact materials

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## 4. CONCLUSIONS

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- Many on-going developments/research to support the “5Rs” but still....
  - Sustainability is a “multi-disciplinary” issue
  - There is NO unique solution
  - Biopolymers (biodegradable/compostable) present “big” advances BUT.....
  - Biopolymers are NOT the SOLUTION but PART of the solution
  - Harmonisation still missing (not yet there)
  - Rules for safety of resources/quality of natural origin for food packaging are needed
  - Legislative developments are on-going (a BIG challenge!!)





“Thank you for your attention”

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