



Sustainability of materials & manufacturing processes in the EU

MULTI-FUN's SpeedTechForum
Bilbao (ES), 17/03/2023

Mauro CORDELLA
Project Adviser – HaDEA B.3 Industry
mauro.cordella@ec.europa.eu

Outline

1. European Health and Digital Executive Agency (HaDEA)
2. Sustainability and EU policies on R&I for materials and manufacturing

HaDEA

HaDEA:

European Health and Digital Executive Agency

Boost EU by building, from earth to space, a **healthy society, a digital economy and a competitive industry.**

Implements European programmes and initiatives on behalf of the European Commission, by managing projects that are related to **health, digital, food, industry and space** to ensure they deliver **concrete results** and benefit for citizens and provide the EC with valuable **policy input.**

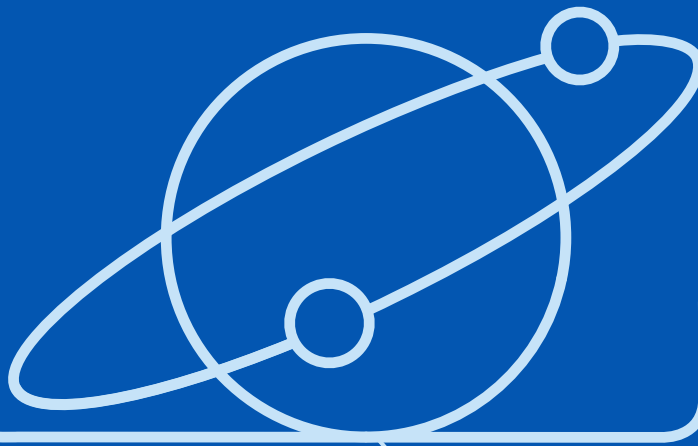
Health



Food



Industry

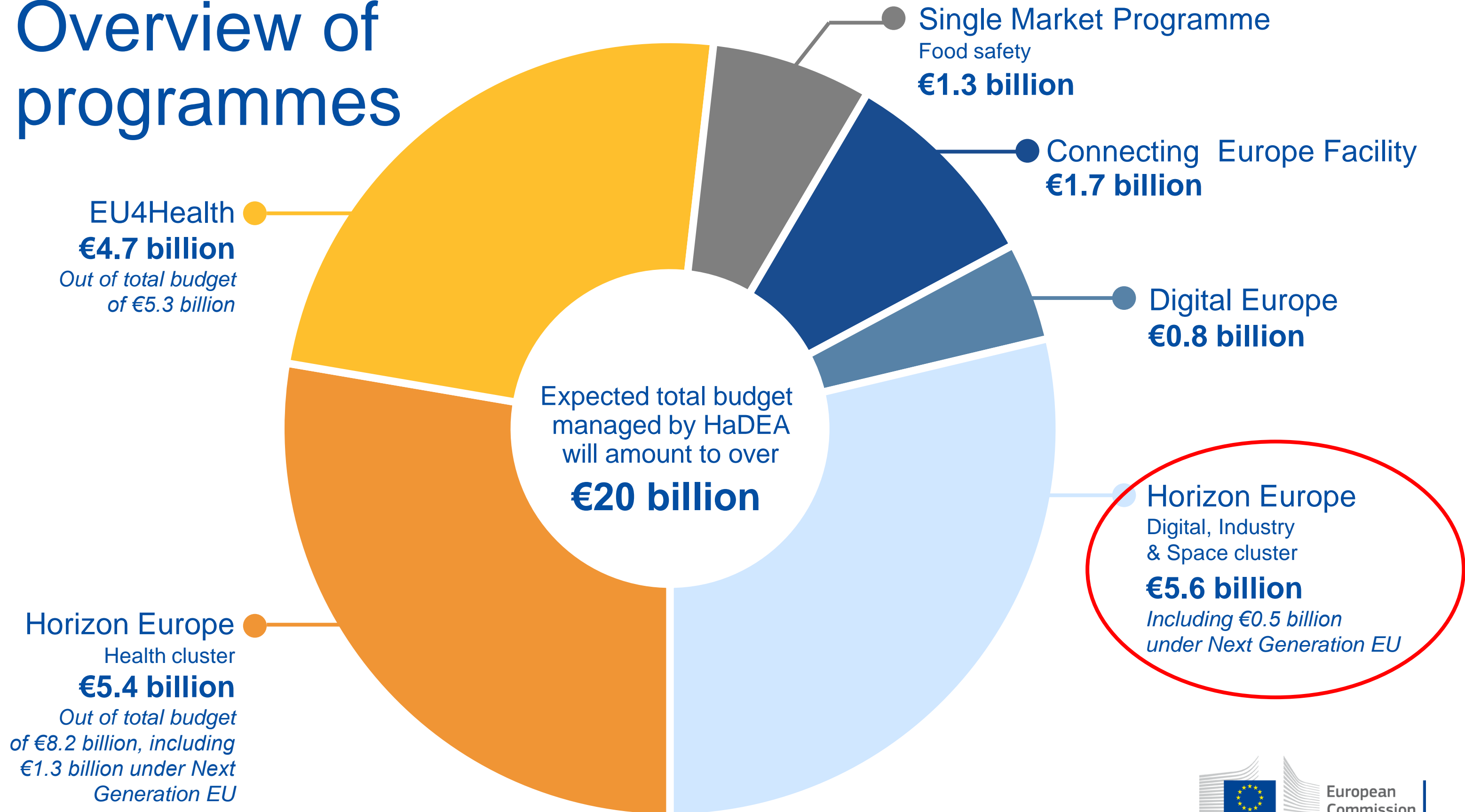


Space

Digital



Overview of programmes



Sustainability and EU policies on R&I for materials and manufacturing

Sustainability

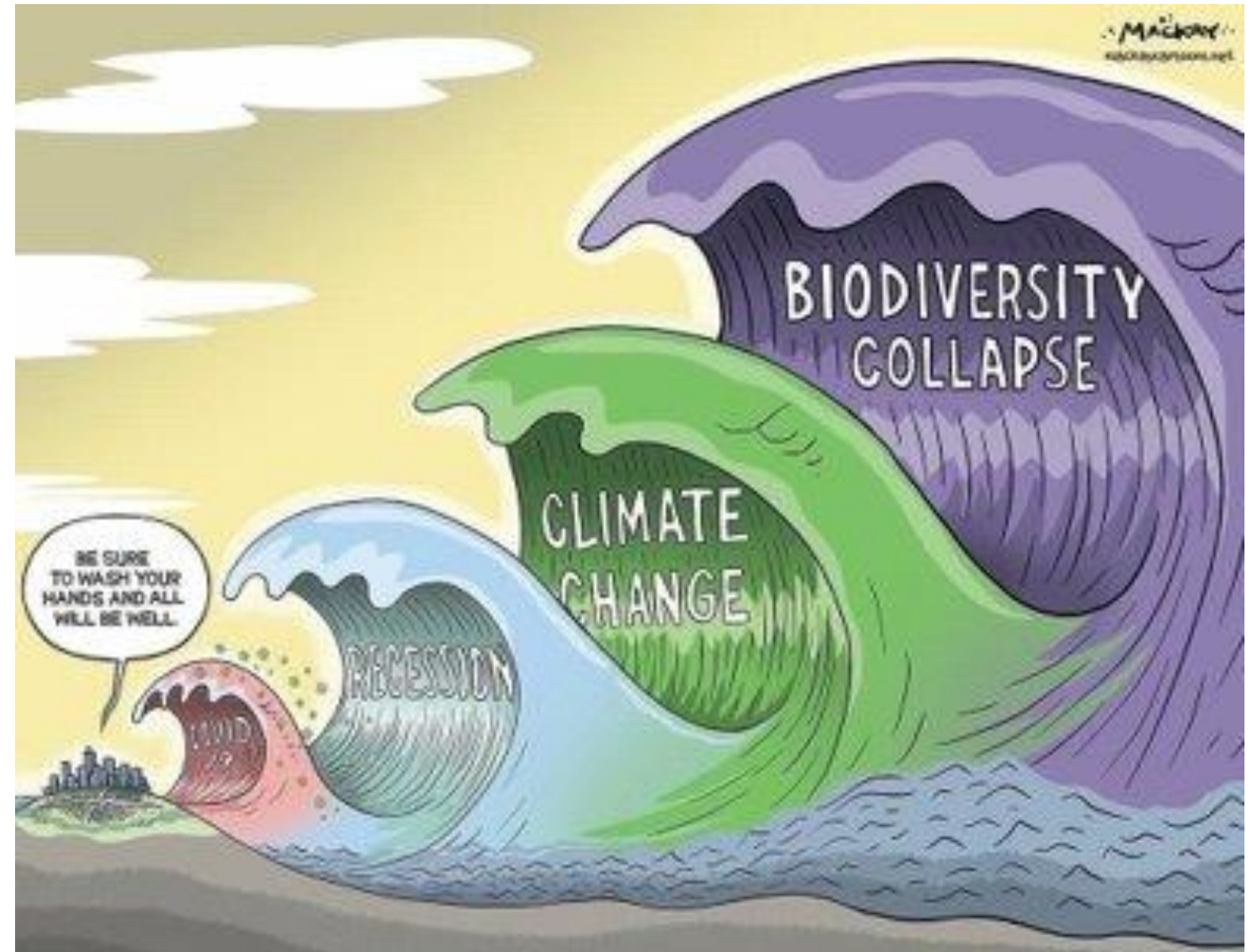
2020s: a world with crises

Sustainability:

- 1) no univocal definitions/frameworks
- 2) environmental and socio-economic issues
- 3) systemic and long-term perspective
- 4) urgent

$$I = f(P, A, T)$$

R&I

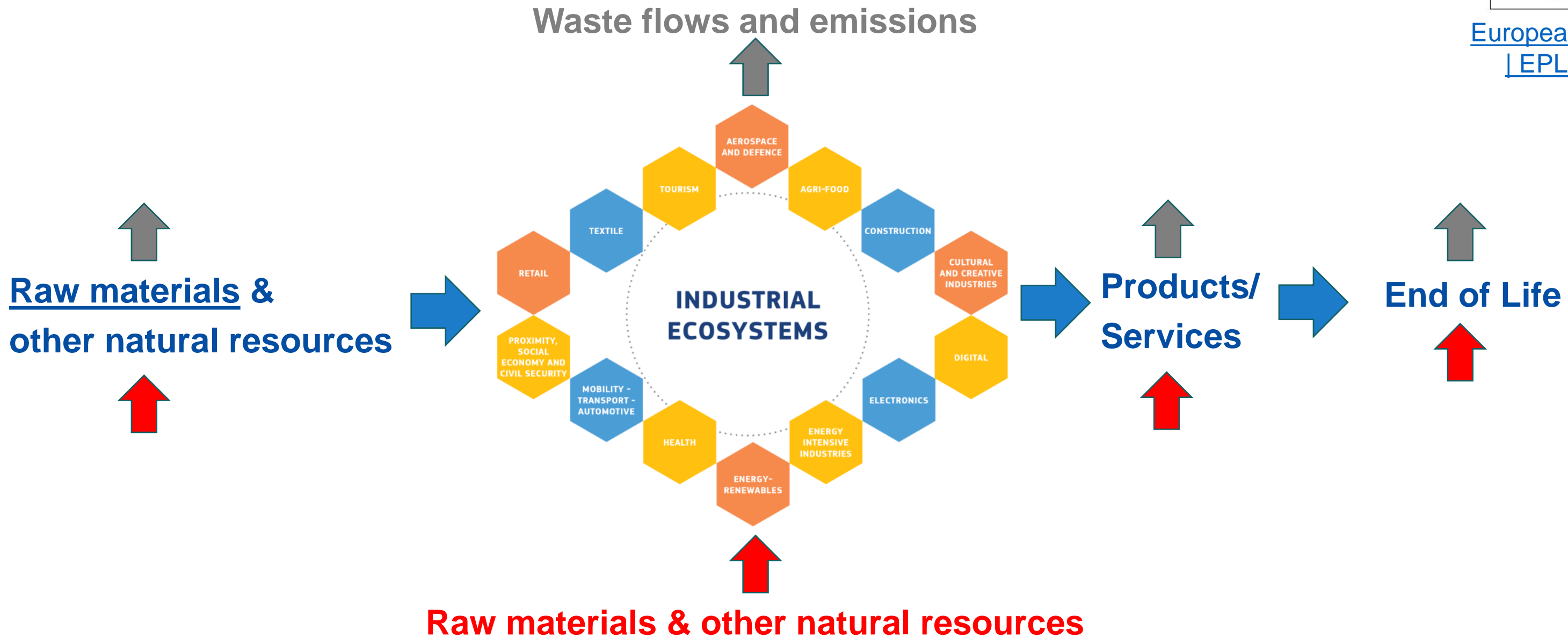


<https://mackaycartoons.net/tag/tsunami>

Life cycle approach for sustainable production and consumption systems

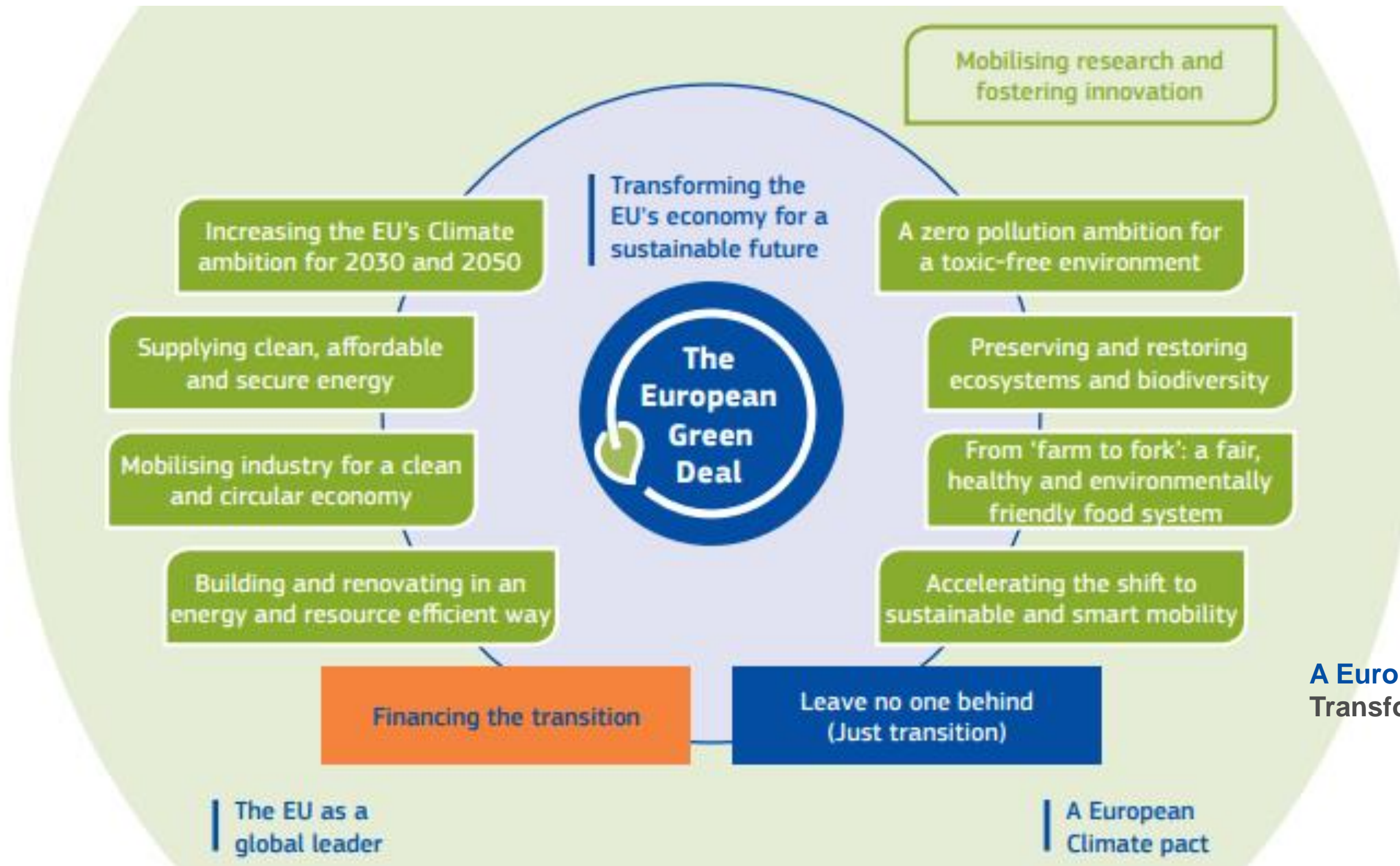


[European Platform on LCA | EPLCA \(europa.eu\)](http://EPLCA.europa.eu)



Additive Manufacturing (AM) offers novel technologies for potentially more resource-efficient design, manufacturing and business models, e.g. supporting light-weighting, maintenance, repair, upgrades, remanufacturing

The European Green Deal



A Europe Fit for the Digital Age Digital Transformation for Industry and People

The EU as a global leader

A European Climate pact



Key initiatives for R&I on materials and manufacturing (non-exhaustive list)

EU Chemicals Strategy (October 2020):

- better protect citizens and the environment,
- boost innovation for safe and sustainable chemicals by design

European Industrial Strategy Update (May 2021):

- more sustainable, digital, resilient and competitive industry
- attention on SMEs and start-ups

2030 Digital Decade (September 2021):

- human-centric digital technologies and digital transformation of businesses

Space Strategy for Europe (October 2016):

- R&I for competitive space industry, new services and infrastructure

Key initiatives for R&I on materials and manufacturing (non-exhaustive list)

Circular Economy Action Plan II (March 2020):

- circular industries, sustainable products, and no waste
- electronics and ICT, batteries and vehicles, packaging, plastics, textiles, construction and buildings, food, water and nutrients

ERA industrial technology roadmaps for low-carbon technologies in energy-intensive industries (April 2022) and for circular technologies in the textile, construction and energy-intensive industries (January 2023)

Raw Materials Action Plan (September 2020): resilient value chains; less dependency on primary critical RM

Zero Pollution Action Plan for air, water and soil (May 2021): prevent, remedy, monitor and report on pollution

Green Deal Industrial Plan (February 2023): secure and enhance net-zero industry and clean tech in EU

Materials 2030 Manifesto (February 2022) and AMI2030: systemic approach to develop innovative advanced materials to respond to EU societal challenges and opportunities

Horizon Europe

HORIZON EUROPE

EURATOM

SPECIFIC PROGRAMME: EUROPEAN DEFENCE FUND

Exclusive focus on defence research & development

Research actions

Development actions

SPECIFIC PROGRAMME IMPLEMENTING HORIZON EUROPE & EIT*

Exclusive focus on civil applications



**Pillar I
EXCELLENT SCIENCE**

European Research Council

Marie Skłodowska-Curie

Research Infrastructures



**Pillar II
GLOBAL CHALLENGES &
EUROPEAN INDUSTRIAL
COMPETITIVENESS**

Clusters

- Health
- Culture, Creativity & Inclusive Society
- Civil Security for Society
- Digital, Industry & Space
- Climate, Energy & Mobility
- Food, Bioeconomy, Natural Resources, Agriculture & Environment

Joint Research Centre



**Pillar III
INNOVATIVE EUROPE**

European Innovation Council

European Innovation Ecosystems

European Institute of Innovation & Technology*

WIDENING PARTICIPATION AND STRENGTHENING THE EUROPEAN RESEARCH AREA

Widening participation & spreading excellence

Reforming & Enhancing the European R&I system

Fusion

Fission

Joint Research Center

Intervention Logic of Cluster 4

Key Strategic Orientation in the Strategic Plan 2021 - 2024	Destination	Strategies
C- Making Europe the first digitally enabled, circular, climate-neutral and sustainable economy	Climate neutral, circular and digitised production TWIN-TRANSITION	Fit for 55 Digital Decade Industrial Strategy
A - Promoting an open strategic autonomy by leading the development of key digital, and enabling and emerging technologies, sectors and value chains	A digitised, resource efficient, and resilient industry RESILIENCE	Fit for 55 EU Chemical Strategy Industrial Strategy
	World-leading data and computing technologies DATA	Digital Decade Industrial Strategy
	Digital and emerging technologies for competitiveness and fit for the green deal DIGITAL-EMERGING	
	Open Strategic Autonomy in developing, deploying and using global space-based infrastructures, services, applications and data SPACE	EU Space Strategy
D - Creating a more resilient, inclusive and democratic European society	A human-centred and ethical development of digital and industrial technologies HUMAN	Digital Decade Industrial Strategy

KSO B “Restoring Europe’s eco-systems and biodiversity” is becoming increasingly important for Cluster 4

WP2018-2020 activities on AM

Call - TRANSFORMING EUROPEAN INDUSTRY

2.1. FACTORIES OF THE FUTURE (FOF)

- **DT-FOF-01-2018: Skills needed for new Manufacturing jobs (CSA)**
- **DT-FOF-04-2018: Pilot lines for metal Additive Manufacturing (IA 50%)**
- **DT-NMBP-19-2019: Advanced materials for additive manufacturing (IA)**

2.2 BIOTECHNOLOGY / 2.3. MEDICAL TECHNOLOGY INNOVATIONS

- **NMBP-22-2018: Osteoarticular tissues regeneration (RIA)**

ZEOCAT-3D (#814548)

- **CE-NMBP-24-2018 - Catalytic transformation of hydrocarbons (RIA)**

M3DLoC (#760662)

- **PILOTS-04-2017 - Pilot Lines for 3D printed and/or injection moulded polymeric or ceramic microfluidic MEMS**

CARMOF (#760884)

- **NMBP-20-2017 - High-performance materials for optimizing carbon dioxide capture**

WP2021-2022 & WP2023-2024 activities on AM

Call - TWIN GREEN AND DIGITAL TRANSITION

Green, flexible and advanced manufacturing

- **HORIZON-CL4-2021-TWIN-TRANSITION-01-03: Laser-based technologies for green manufacturing (Photonics - Made in Europe Partnerships) (RIA)**
- **HORIZON-CL4-2022-TWIN-TRANSITION-01-02: Products with complex functional surfaces (Made in Europe Partnership) (RIA)**

A new way to build, accelerating disruptive change in construction

- **HORIZON-CL4-2021-TWIN-TRANSITION-01-12: Breakthrough technologies supporting technological sovereignty in construction (RIA)**

Enabling circularity of resources in the process industries, including waste and CO2/CO

- **HORIZON-CL4-2021-TWIN-TRANSITION-01-19: Improvement of the yield of the iron and steel making (Clean Steel Partnership) (IA)**

Manufacturing Industry

- **HORIZON-CL4-2023-TWIN-TRANSITION-01-02: High-precision OR complex product manufacturing – potentially including the use of photonics (Made in Europe and Photonics Partnerships) (IA)**

Call - A DIGITISED, RESOURCE-EFFICIENT AND RESILIENT INDUSTRY

Green and Sustainable Materials

- **HORIZON-CL4-2022-RESILIENCE-01-12: Functional multi-material components and structures (RIA)** (DISCO2030, MADE-3D, MULTHEM, MIMOSA, MultiMag)

Call - STRATEGIC AUTONOMY IN DEVELOPING, DEPLOYING AND USING GLOBAL SPACE-BASED INFRASTRUCTURES, SERVICES, APPLICATIONS AND DATA

Foster competitiveness of space systems / Reinforce EU capacity to access to space

- **HORIZON-CL4-2021-SPACE-01-22 (and **HORIZON-CL4-2023-SPACE-01-21**): Low cost high thrust propulsion for European strategic space launchers - technologies maturation including ground tests**

Conclusions

- Urgent need to implement EGD and shift towards sustainability in the EU and beyond
- Act on production (materials, manufacturing) and consumption systems
- Advanced materials and additive manufacturing as technologies to support circularity and sustainability of industry and economies
- R&I, contribution of SMEs and clustering is fundamental
- Embrace a holistic life cycle approach
- Policy-related initiatives (e.g. SSbD, AMI2030) and finance opportunities in CL4 of HEU and other

Stay in touch

HaDEA

 hadea.ec.europa.eu

 [@EU_HaDEA](https://twitter.com/EU_HaDEA)

 [European Health and Digital Executive Agency](https://www.linkedin.com/company/european-health-and-digital-executive-agency)

European Commission

 ec.europa.eu

 [@EU_Commission](https://twitter.com/EU_Commission)

 [European Commission](https://www.linkedin.com/company/european-commission)

 [EuropeanCommission](https://medium.com/european-commission)

 [europeancommission](https://www.instagram.com/europeancommission)

 [EUTube](https://www.youtube.com/EUTube)

 [EuropeanCommission](https://www.facebook.com/EuropeanCommission)

 [EU Spotify](https://open.spotify.com/eu-spotify)

Thank you



© European Union 2020

Unless otherwise noted the reuse of this presentation is authorised under the [CC BY 4.0](https://creativecommons.org/licenses/by/4.0/) license. For any use or reproduction of elements that are not owned by the EU, permission may need to be sought directly from the respective right holders.

Photos, source: iStock and Unsplash – Icons, source: Noun Project

Materials 2030 Manifesto

- Submitted to Commissioner Gabriel on 7 February 2022.
- DG Research and Innovation is committed to follow-up in engagement with stakeholders.

Vision:

A **strong European Materials ecosystem** drives the **green and digital transition** as well as a sustainable **inclusive European society** through a **systemic collaboration** of upstream developers, downstream users and citizens and all stakeholders in between.



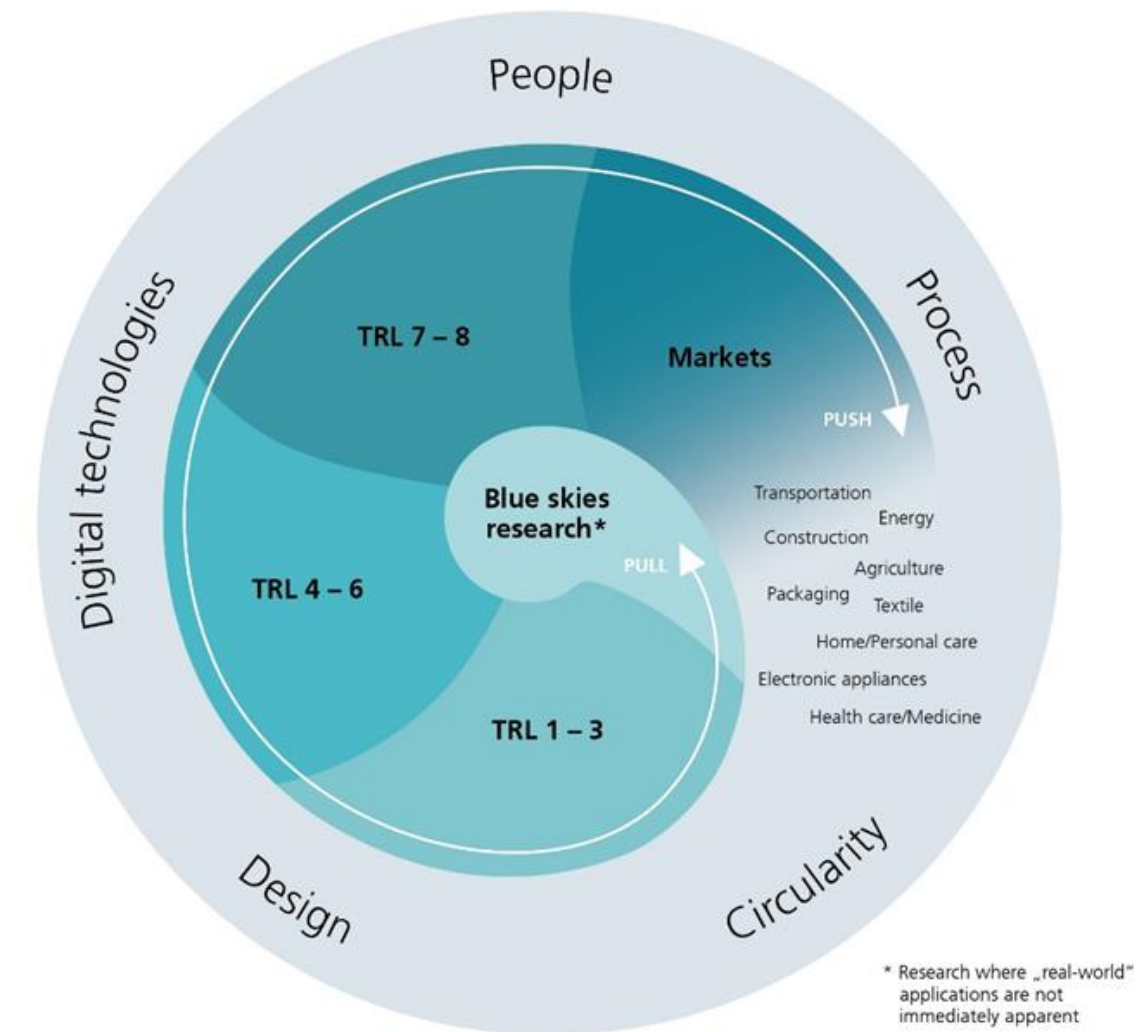
Materials 2030 Manifesto - Mission

Europe must support the evolution of materials research underway, by:

- Uniting Digital and Material capacities and competences
- Combining technology push and market pull
- United EU – all MS contributing, no one left behind

A systemic approach is needed to develop the next generation solution-oriented advanced materials which will offer faster, scalable and efficient responses to the challenges and thus turn them into opportunities for Europe's society, economy and environment today and in the future.

Working together is key!



Four fundamental pillars

1. Safeguarding Europe's technology leadership

Need to access more performant, cost-competitive and sustainable advanced materials, whilst mastering their integration into technologies for European strategic value chains

2. Reducing the environmental footprint by using advanced materials

Reducing net GHG emissions by 55% by 2030, and ensuring responsible and ethical sourcing, requires new technological and smart approaches

3. Securing strategic autonomy

Strategic importance of advanced materials for strategic value chains

4. Targeting advanced materials innovation markets

Advanced materials innovation markets are opportunities that should provide solutions for the societal challenges