

Processes4Planet



Hubs for Circularity (H4C), a way to make local/regional initiatives climate neutral and circular in a more competitive way

Ludo Diels

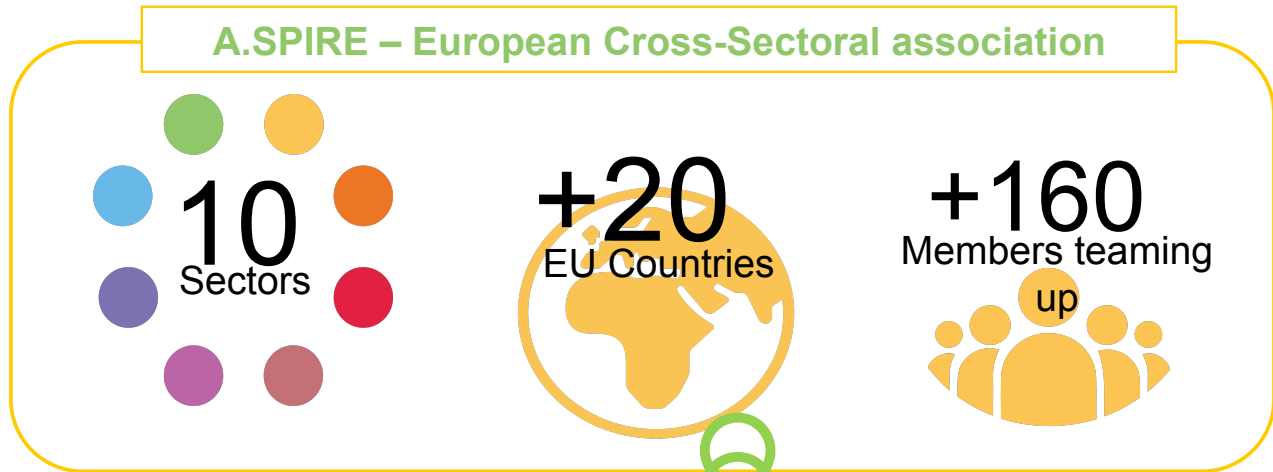
Vice-chair advisory board Process4Planet to the EC



EFCE Conference, Third European Forum on new Technologies
Toulouse, 4 September 2020

WHO ARE WE?

A vibrant community with a joint strategic Vision



2050 Process Industries

PROCESSES4PLANET

- ✓ Develop & deploy climate-neutral solutions
- ✓ Closing the energy and feedstock loops
- ✓ Achieve global leadership of the Process Industry
- ✓ Accelerate innovation & unlock public-private investments

OPEN APPROACH: inclusive of different stakeholders and welcoming Newcomers

- Industries, incl. SMEs
- Industrial Associations & Clusters
- Consultancies

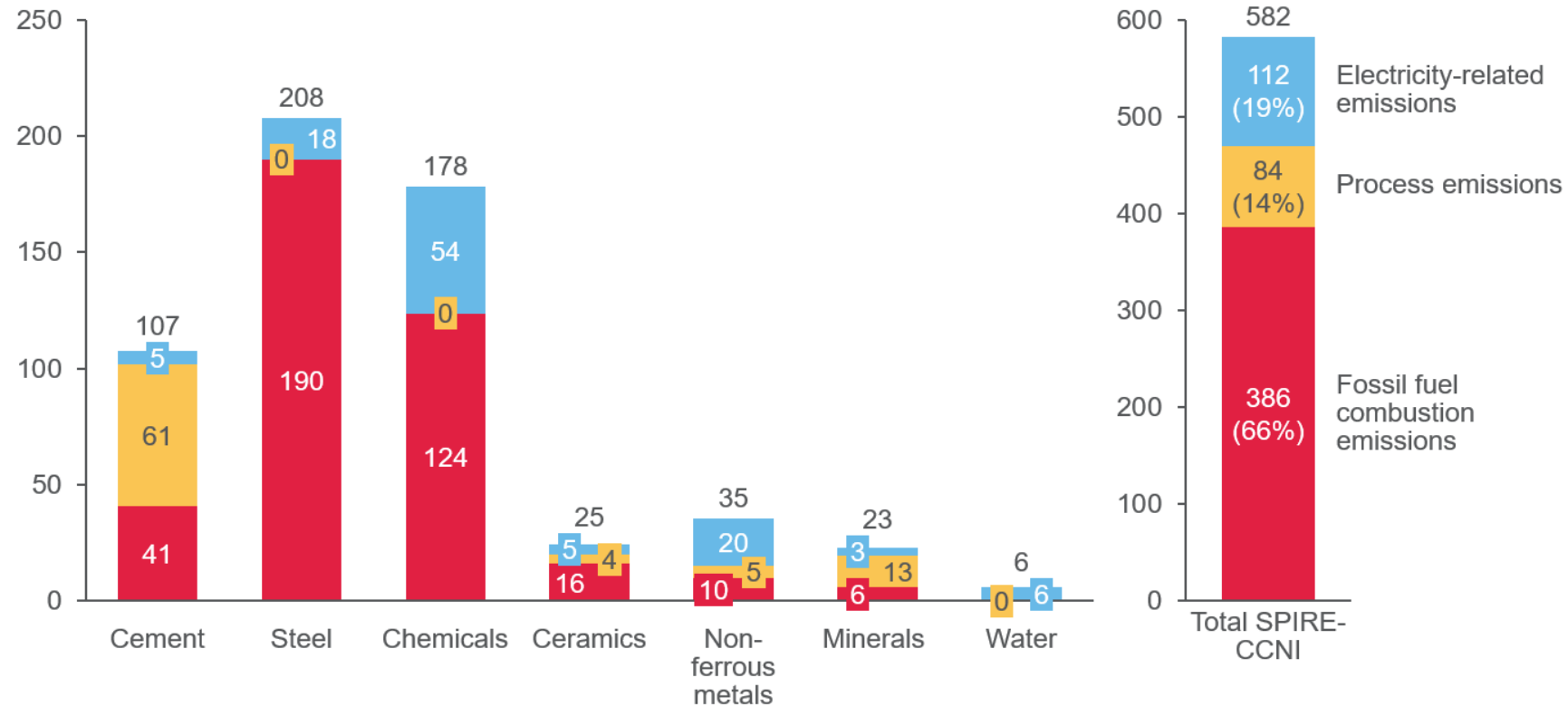
- RTOs
- Higher Education Institutions
- NGOs

- Public institutions
- Innovation Agencies
- MS and Regional representatives

- Partnerships & EITs
- Financial parties
- New sectors

The challenge: > 700 Mtons CO2 emissions directly contributing to climate change

CO₂ emissions in the EU-28
MtCO₂



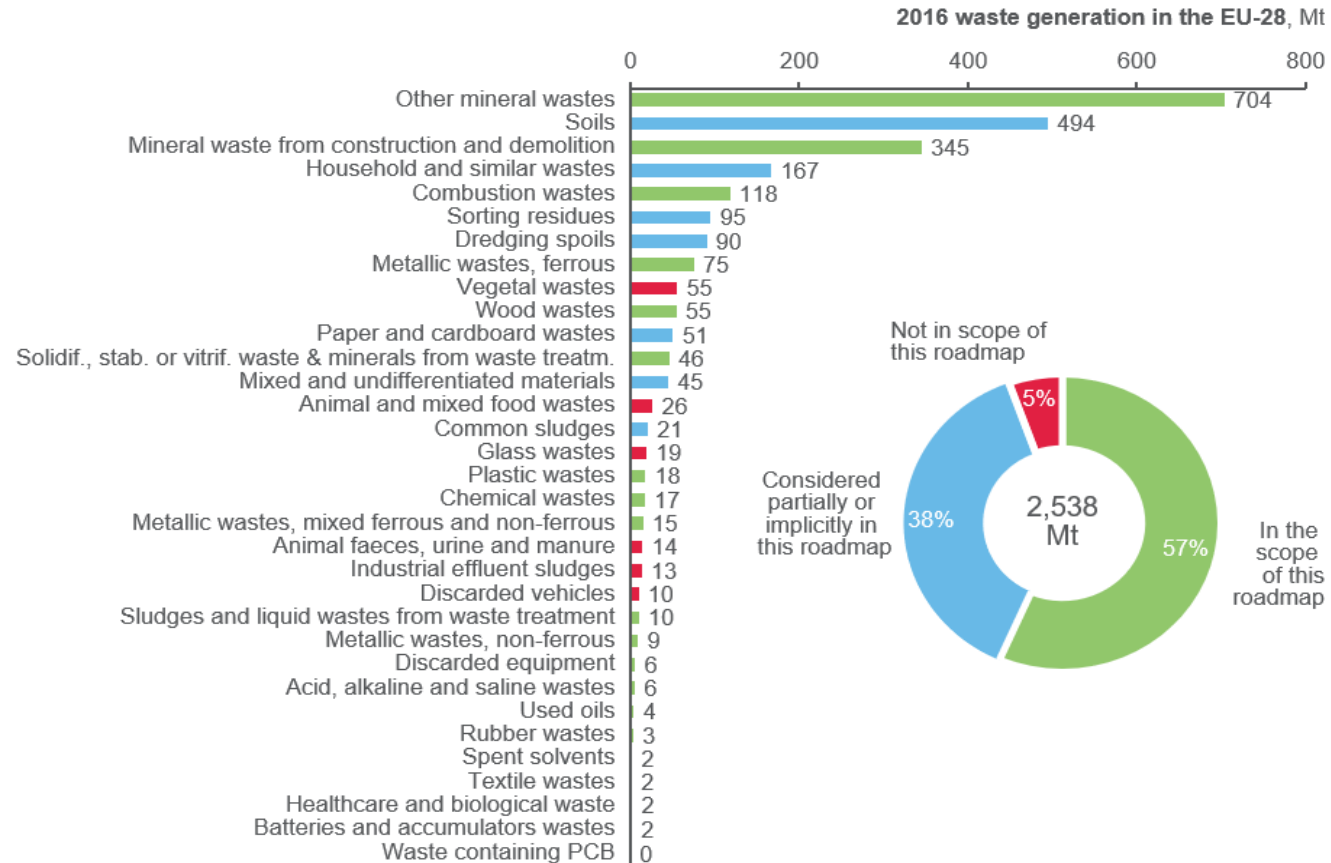
Refining and P&P sector not yet included

Sources: VUB/IES, Eurostat, EEA, Material Economics, Global Cement and Concrete Association, Cefic, Cerame-Unie & EuLA



The challenge

Far too many wastes (> 1500 Mtons) at the end of the value chains



Source: Eurostat



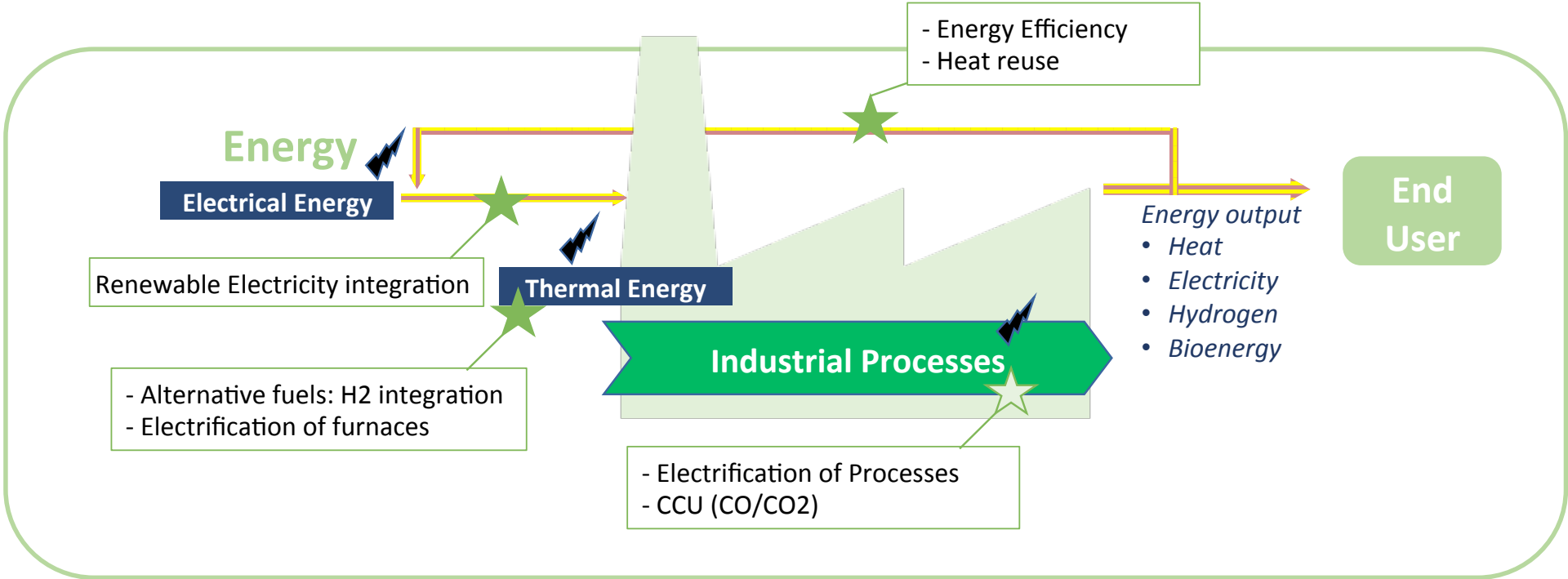
CLIMATE NEUTRALITY AMBITION

DISRUPTIVE PROCESS INNOVATION TO ABATE GHG EMISSIONS

From fossil and low energy mix

To efficient integration of renewables and valorisation of process emissions

★ P4PLANET



Towards net-zero CO₂ emissions

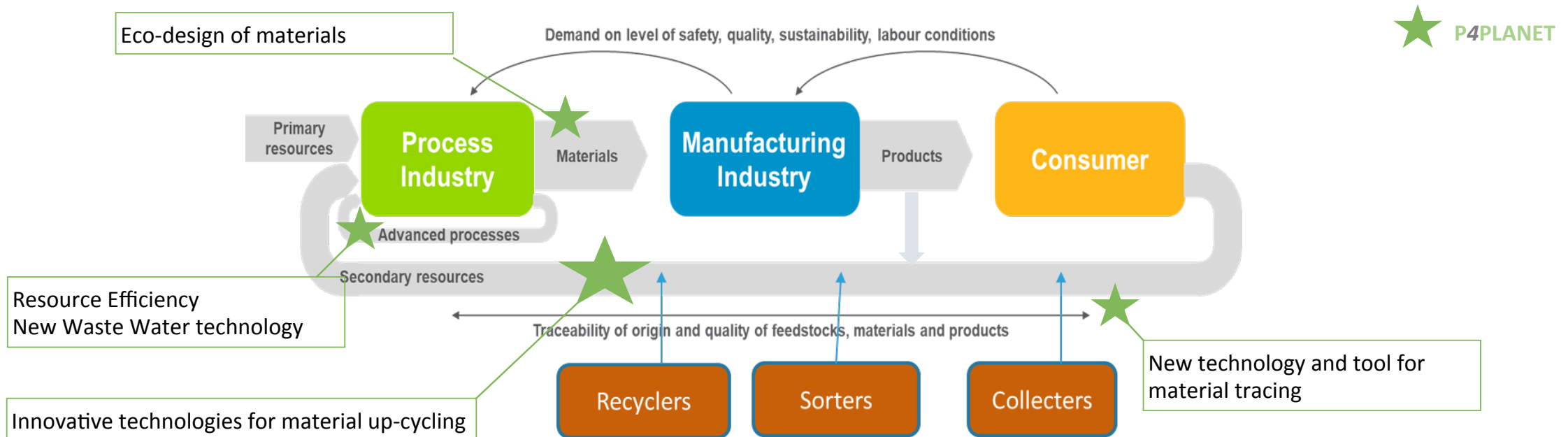


CIRCULAR RESOURCES AMBITION

DISRUPTIVE PROCESS INNOVATION TO CLOSE THE LOOPS

Moving away from: Landfilling, Incineration and Recycling at the end of a linear value chain

To UPCYCLING large volumes of secondary resources reused by the PI in a circular value chain



Near zero-landfilling / Near zero-water discharge

COMPETITIVENESS AMBITION

DISRUPTIVE PROCESS INNOVATION TO TRANSFORM PROCESS INDUSTRY GLOBALLY

EU Process Industries are highly exposed to global competition

UNLOCKING PRIVATE INVESTMENTS & THE BARRIERS TO MARKET FOR CLIMATE NEUTRAL & CIRCULAR SOLUTIONS



EU Process Industry's GVA to grow quicker than the EU GDP

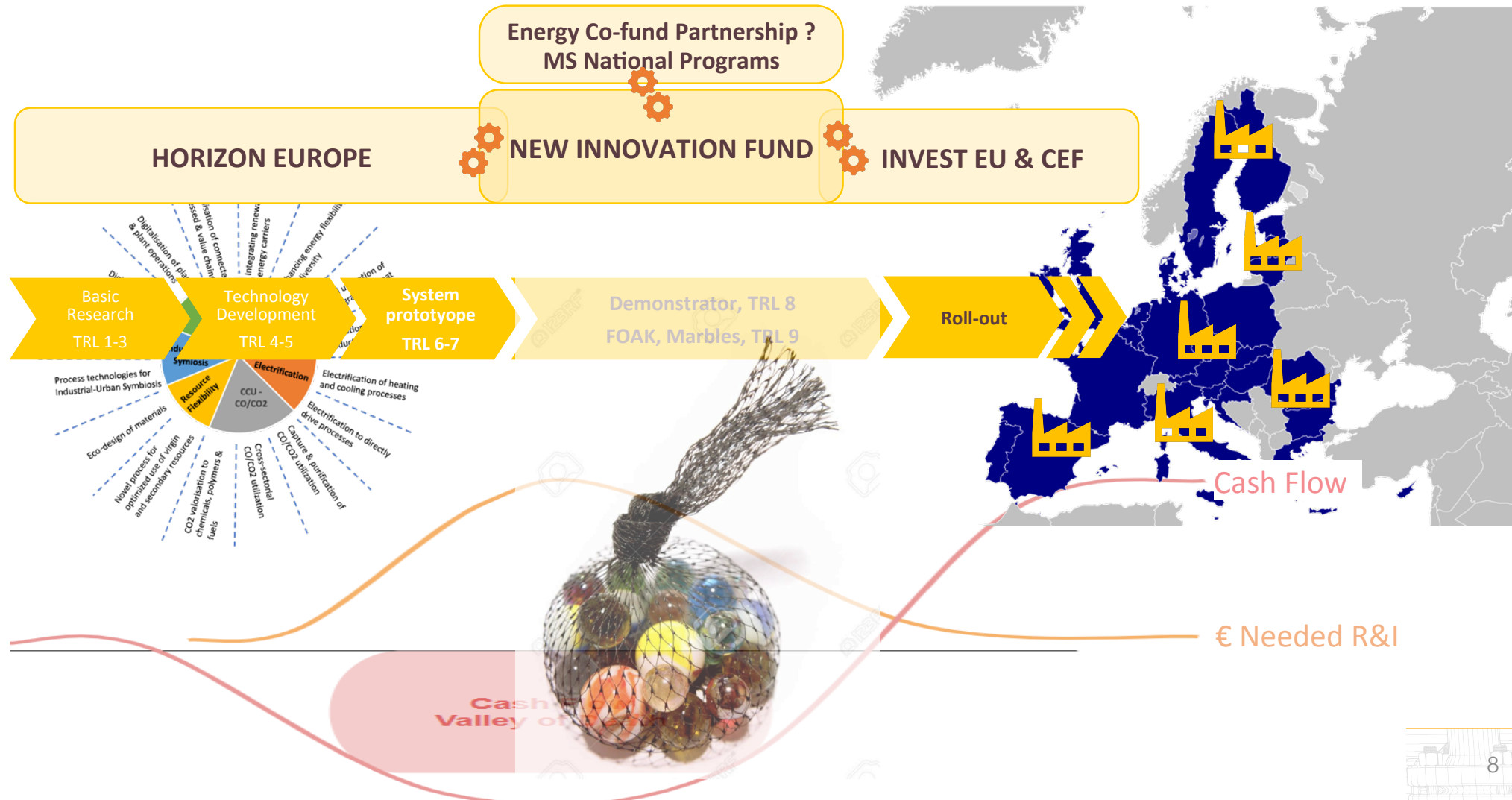
SPIRE 5050 R&I Outstanding Challenge

Comprehensive and coordinated funding & financing tools needed

Funding & Financial tools

The RDI process

The € resources GAP



CORE CHARACTERISTICS

Processes4Planet KPIs

CLIMATE KPIs

- 100% of total CO₂eq emission reduction potential by integration of renewable energy & energy efficiency demonstrated through R&I projects at TRL7
- 100% of total CO₂eq emission reduction potential through CO₂ Capture and Use demonstrated through R&I projects at TRL7

Increasing EU's Climate ambition for 2030 & 2050

A zero pollution ambition for a toxic-free environment

Supplying clean, affordable & secure energy

CIRCULARITY KPIs

- 100% (TBD) of waste reduction potential demonstrated through R&I projects at TRL7
- 90% (TBD) secondary materials re-use potential demonstrated through R&I projects at TRL7
- 90% (TBD) of wastewater re-use/recycling potential demonstrated through R&I projects at TRL7
- 15+ H4Cs launched into the process of development



Preserving and restoring ecosystems and biodiversity

Mobilising industry for a clean and circular economy

From farm to fork: healthy, environmental food system

Building & renovating in an energy and resource efficient way

Accelerating the shift to sustainable and smart mobility

COMPETITIVENESS & CROSS-CUTTING KPIs

- Launch 15+ marbles integrating solutions developed through Processes4Planet portfolio towards the 100% target+
- Leverage factor 5 to 10
- 60 significant innovations TRL 7-8
- CAPEX & OPEX reduction through the innovations
- Impact on SMEs through projects & H4Cs
- 20 new types of skills and jobs (10 integrated into academia and company programmes)

Financing the transition

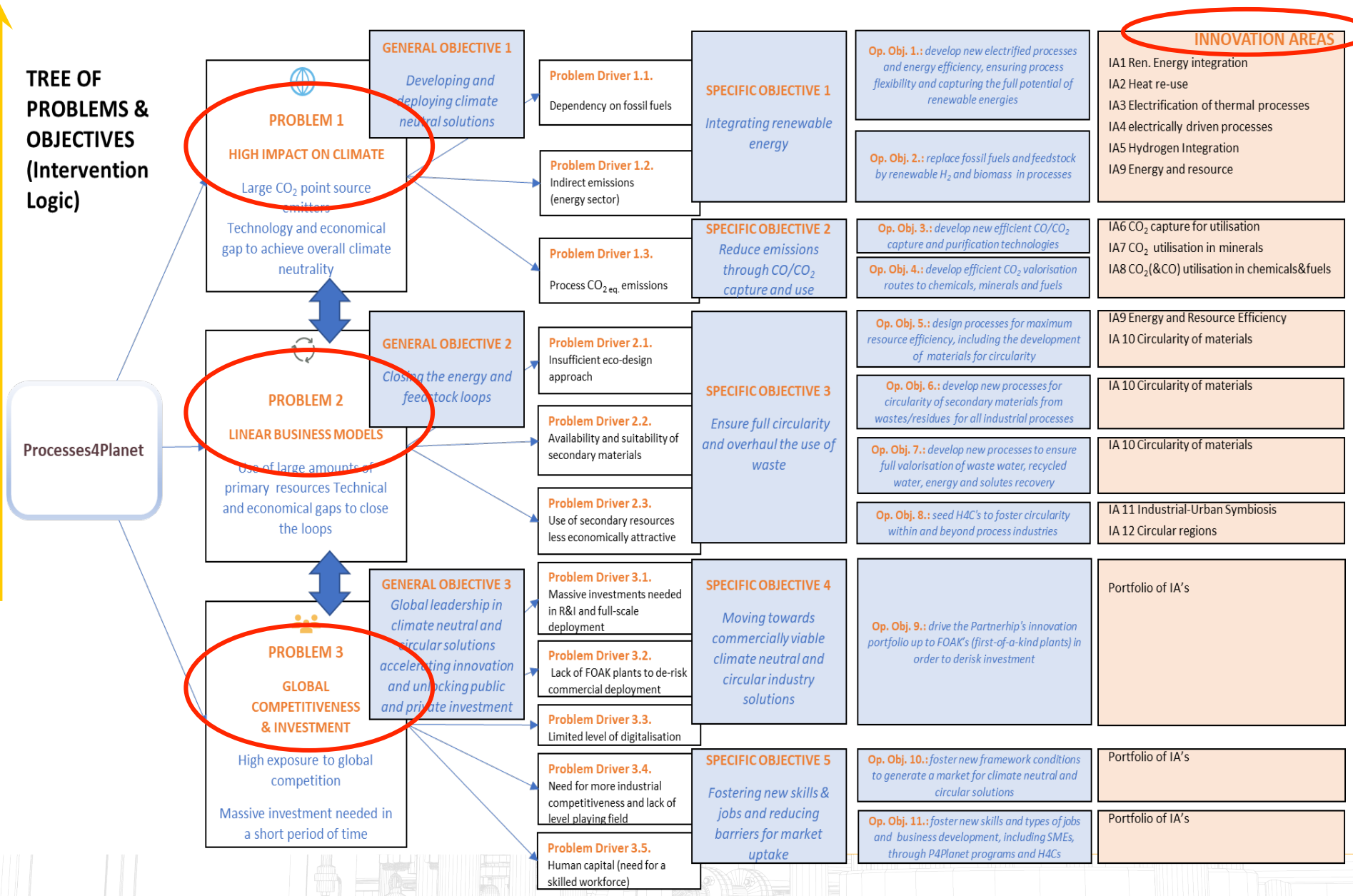
Leave no one behind (Just Transition)

DIRECTIONALITY

- Joint cross-sectoral roadmap towards common objectives
- Jointly share and develop knowledge and solutions.

Intervention Logic

TREE OF PROBLEMS & OBJECTIVES (Intervention Logic)



INNOVATION AREAS

- IA1 Ren. Energy integration
- IA2 Heat re-use
- IA3 Electrification of thermal processes
- IA4 electrically driven processes
- IA5 Hydrogen Integration
- IA9 Energy and resource

- IA6 CO₂ capture for utilisation
- IA7 CO₂ utilisation in minerals
- IA8 CO₂{&CO} utilisation in chemicals&fuels

- IA9 Energy and Resource Efficiency
- IA 10 Circularity of materials

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- IA 11 Industrial-Urban Symbiosis
- IA 12 Circular regions

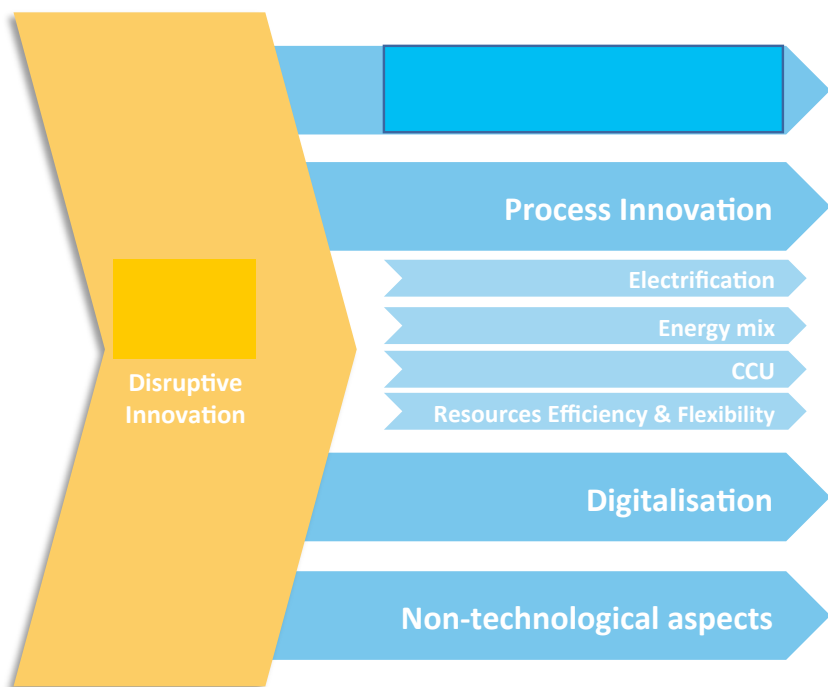
Portfolio of IA's

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We need to start now, the way is long

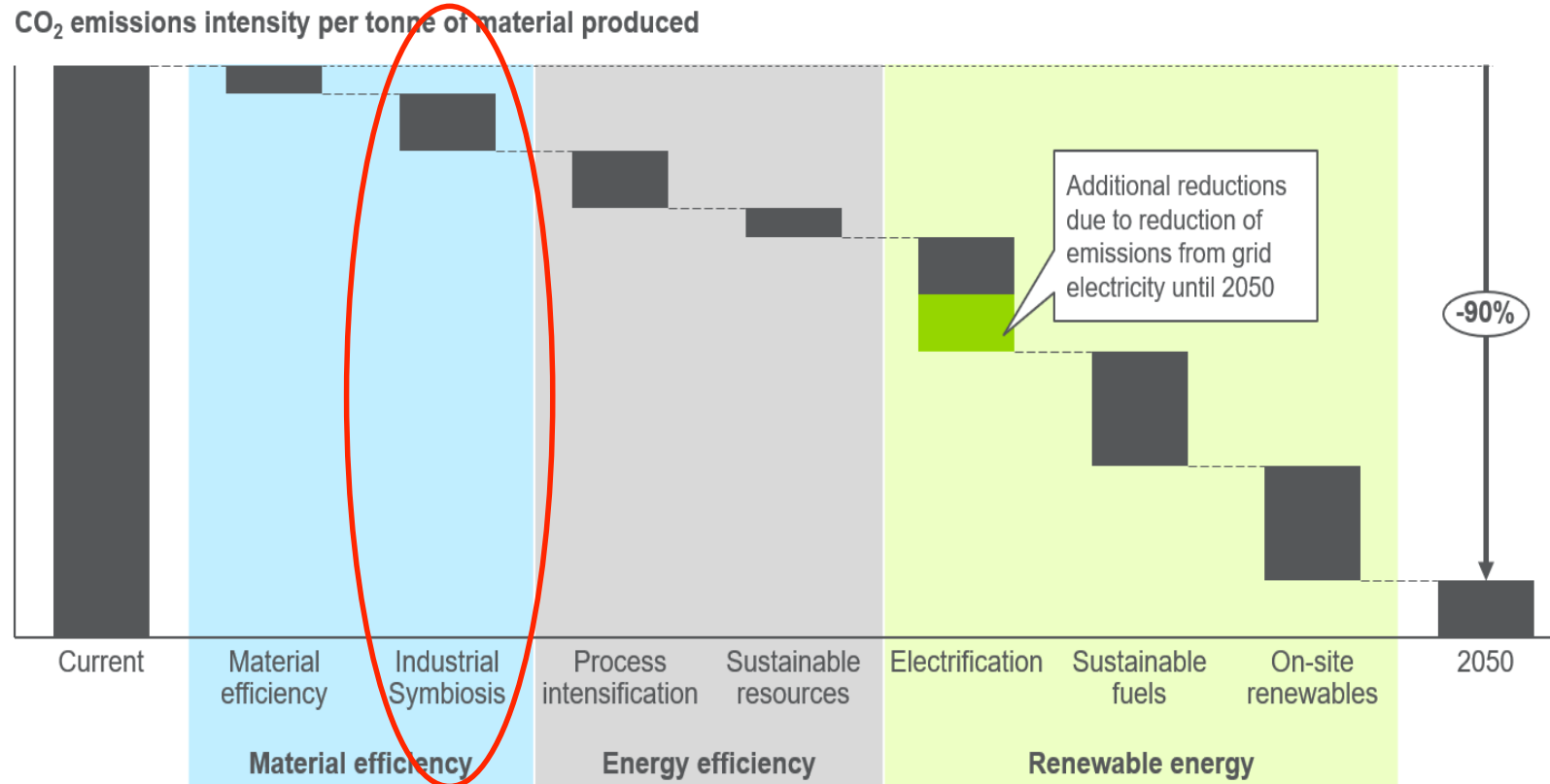


Innovation area	Progress up until milestone year ¹			
	2024	2030	2040	2050
Renewable energy integration				
Heat reuse				
Electrification of thermal processes				
Electrically-driven processes				
Hydrogen integration				
CO ₂ capture for utilisation				
CO ₂ utilisation in minerals				
CO ₂ & CO utilisation in chemicals and fuels				
Energy and resource efficiency				
Circularity of materials				
Industrial-Urban symbiosis				
Circular regions				
Digitalisation				
Non-technological aspects				

¹ Progress is depicted here as % of total TRL9 projects programmed in each area, and for circular regions, digitalisation, and non-technological aspects % of total investment needs until 2050



Process industry relies on many measures to reduce its carbon emission intensity

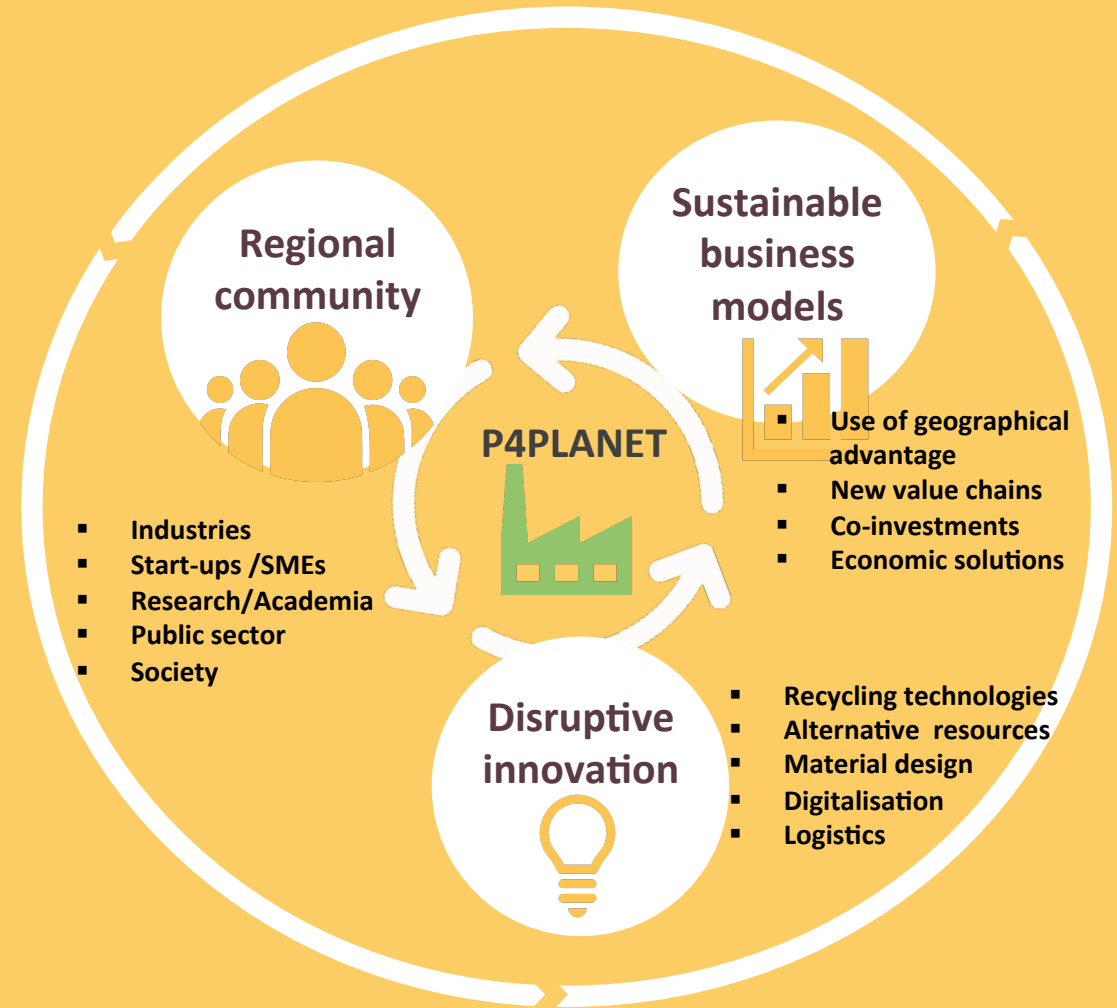


HUBS FOR CIRCULARITY

THE CONCEPT

Self-sustaining economic industrial ecosystems for full-scale Industrial-Urban Symbiosis and Circular Economy, closing energy, resource and data loops and bringing together all relevant stakeholders, technologies, infrastructures, tools and instruments necessary for their incubation, implementation, evolution and management.

- Territorial systemic solutions (regional approach)
- **Processes4Planet inside!**
- Facilitation necessary to overcome non-technological barriers to symbiosis



Starting Hubs

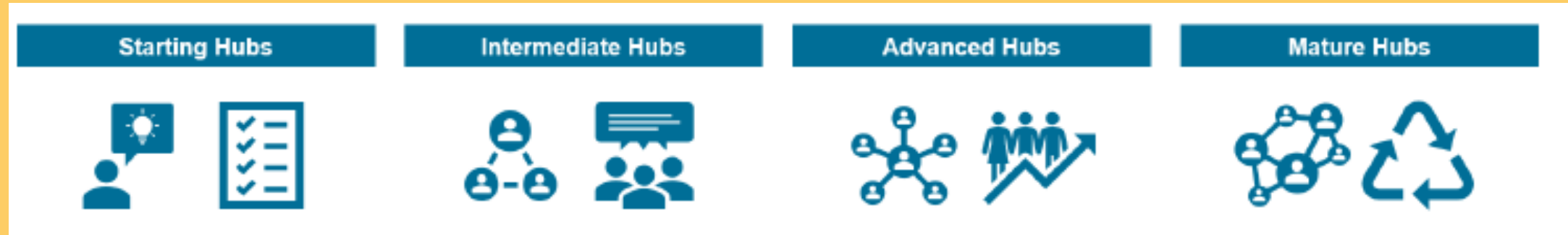
Intermediate Hubs

Advanced Hubs

Mature Hubs



Different levels of symbiosis in regions



A portfolio of projects (SPIRE and beyond)

- Technologies
- IT platforms and tools
- LCA & LCCA
- Success factors
- Barriers

Calls for proposals

- SPIRE 1 2020
- Green Deal
- Circular Industries
- ...and more

HUBS FOR CIRCULARITY (H4C)

RATIONALE

- Process industries can **reintroduce bulk amounts of resources into the industrial process**, avoiding waste-to-landfill
- **Objectives alignment** of EU regions and SPIRE 2050 Vision: zero-waste, climate neutrality and competitiveness.
- **High potential for synergies** by connecting the local stakeholders (process industries, other sectors, public sector and civil society) within the regions and across regions.



European Community of Practice

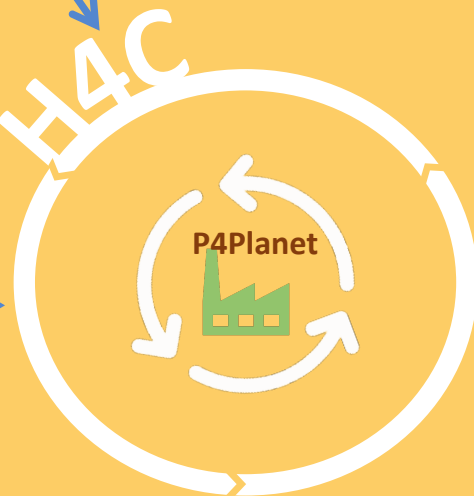
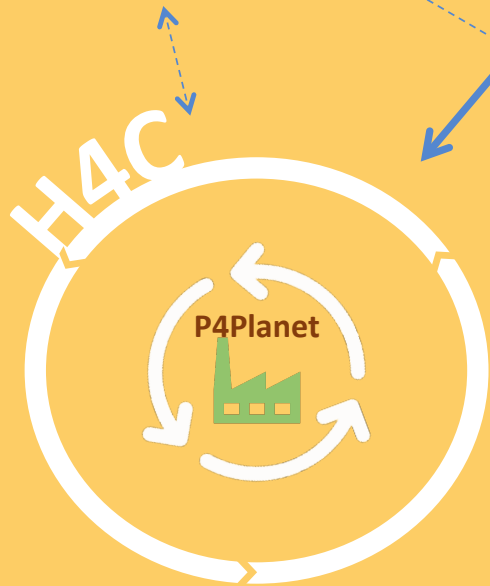
H4C



Expert
Community

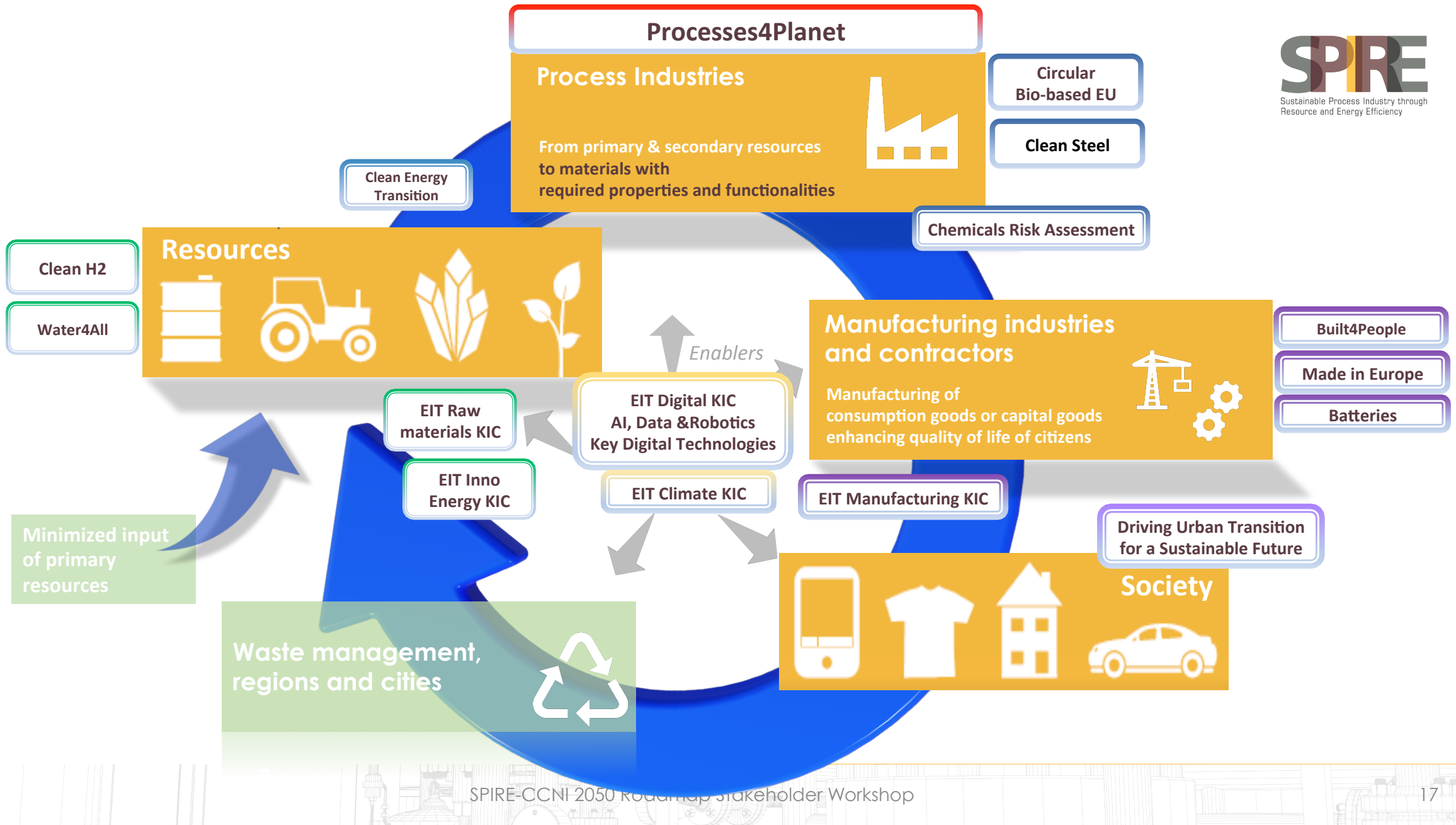
6-7 October 2020 A workshop to discuss on H4C and a brokerage on HEU topics with industries and experts across sectors

12-15 October 2020 The 18th European Week of Regions and Cities in Brussels
– side event (TBC)



the missing pieces in the puzzle of symbiosis

- **Modelling** circular concepts and plants of the future
- Enhancing **replicability**
- Communication and **policy outreach**
- Education and training
- **Sustainability** of the network



H4C



Connecting the H4C across borders and to citizens

- H4C: connected to other stakeholders & hubs
- Circular flows: widespread reality across Europe
- Critical mass of knowledge, solutions & unexpected ideas
- Innovative brains and talent working together across regions

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