Processes4Planet

Processes 4 Planet Roadmap: ambitions and targets

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Chair of SPIRE advisory board

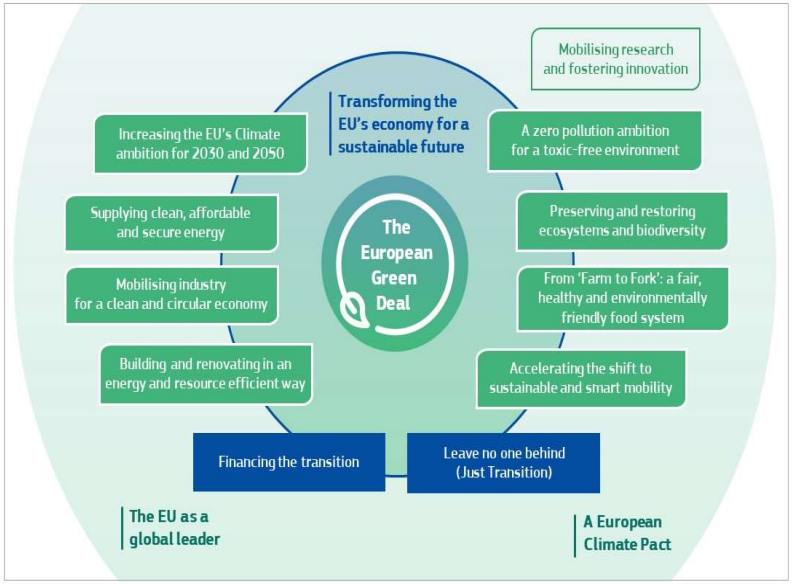
Processes 4 Planet Ideation Event
Monday 8 February 2021

2020 looked promising:
A first real policy toward climate neutrality

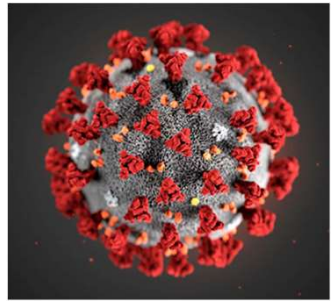
- **European Green Deal (CO2-emission reduction: 55% in 2030, 100 % in 2050)**
- **European Circularity Action Plan**
- **European Industrial Action Plan**
- **Farm to Fork Strategy**
- **European Climate Law**
- **Europe Climate Bank, Green Financing Strategy**
- **Green Taxonomy Financing**
- **Carbon Border Adjustment Mechanism (+ ETS)**
- **Just Transition Mechanism**

- **Climate Pact: give citizens a voice and role**

➔ **Global response**



If a small tiny virus can hit us so, what can we expect from climate change?



- European Economic Recovery Plan (21 July)
- Fund approved by Parliament of 750 billion €
- Next Generation EU (16 September)

- Start at 1 January 2021 (includes 27 national recovery plans)

- Strong conditions for green investments (>32%)
- Health plan for Europe

- Resilience: we realized to be very vulnerable to small changes

➔ We must go a gear higher

Process Industry ambition in line with Green Deal

SPIRE
Sustainable Process Industry through Resource and Energy Efficiency

A vibrant community with a common strategic Vision

A.SPIRE – European cross-sectorial association

10
Sectors

+20
EU Countries

+170
Members teaming up

DG R&I
DG Grow
DG ENE

PROCESSES4PLANET

2050 Process Industries

- ✓ 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

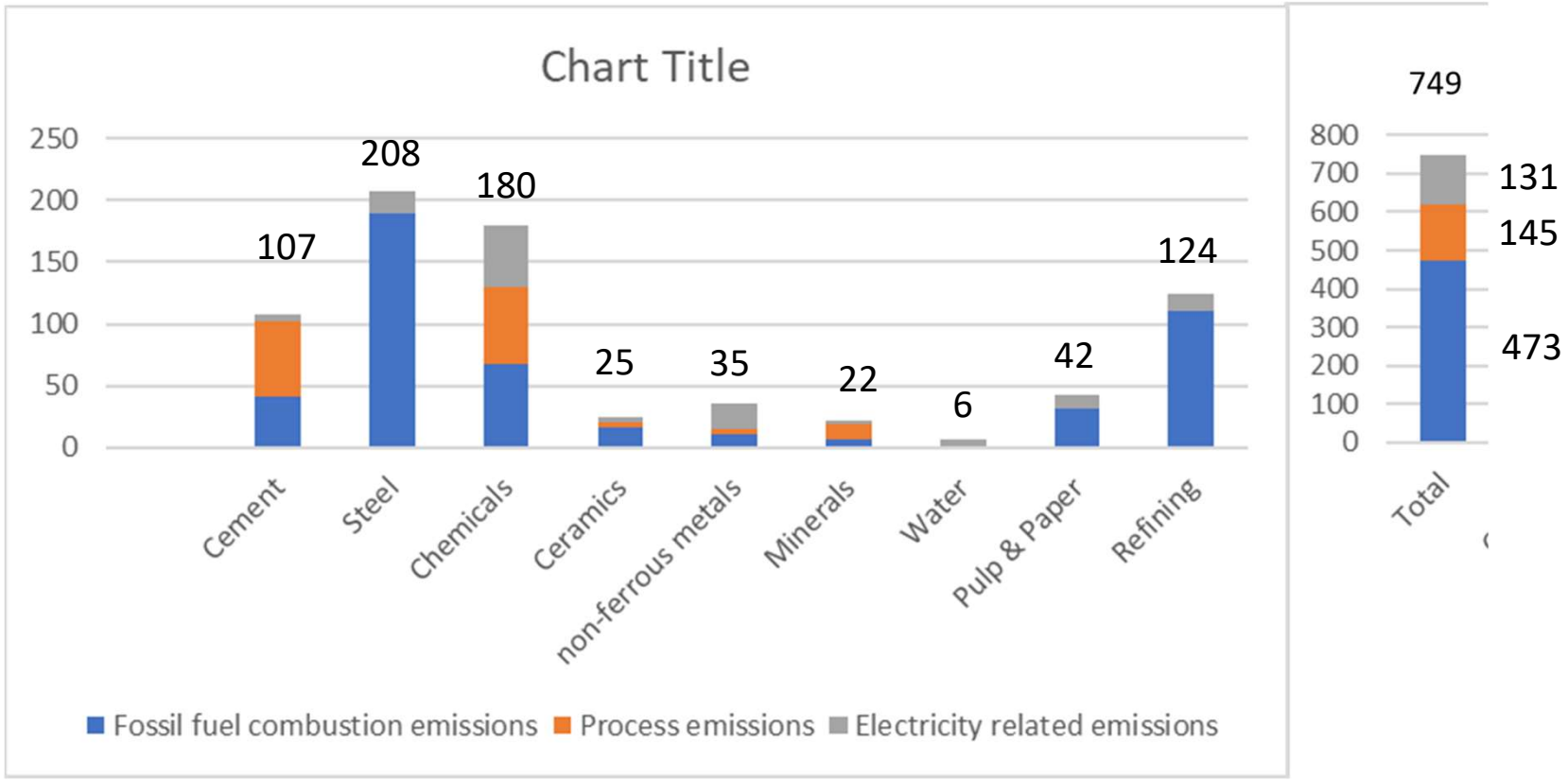
- Industries, incl. SMEs
- Industrial Associations & Clusters
- Consultancies

- RTOs
- Higher Education Institutions
- NGOs

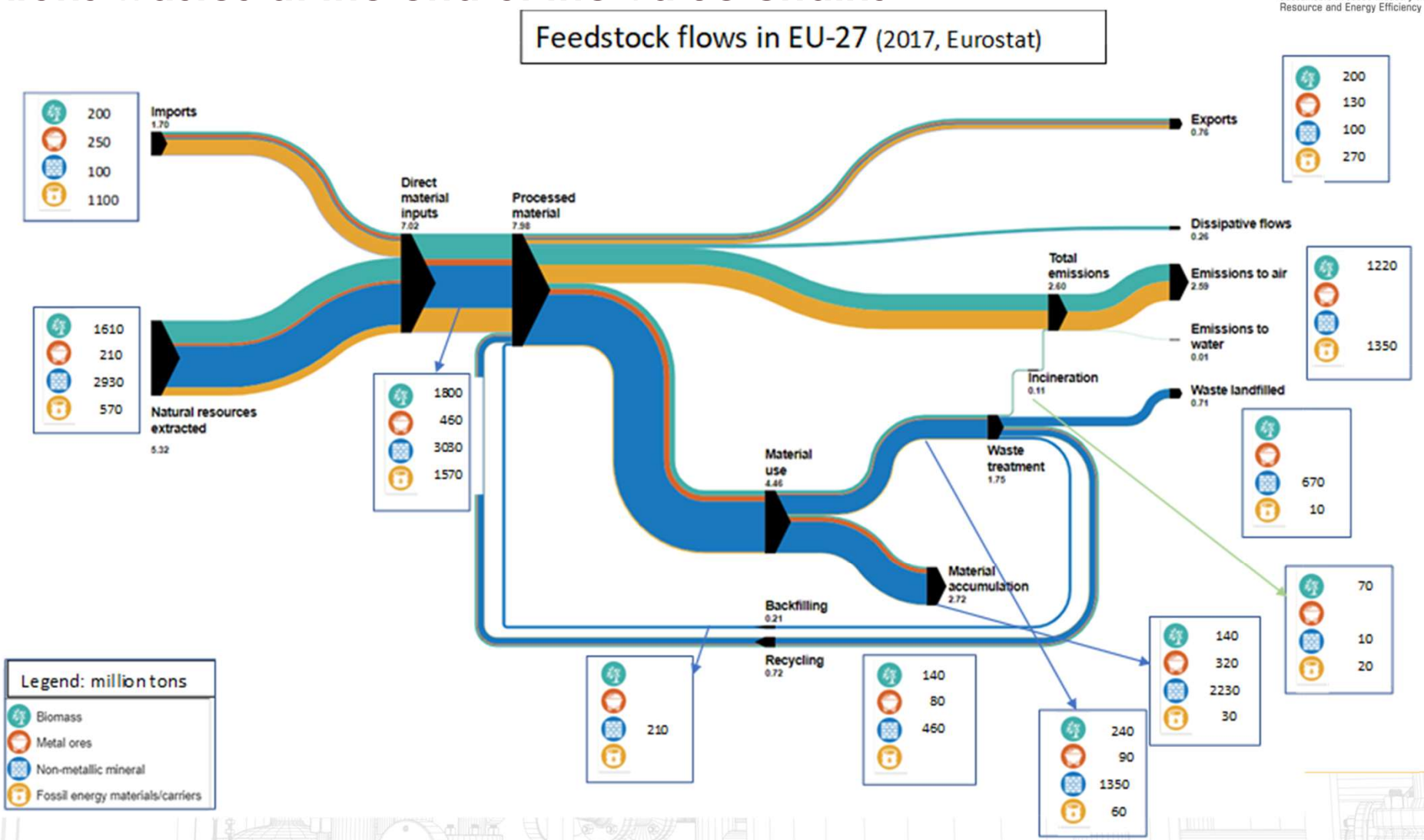
- Public institutions
- Innovation Agencies
- MS and Regional representatives

- Partnerships & EITs
- Financial parties
- New sectors

Problem: High impact on climate
> 700 Mtons CO2 emissions



Problem: Linear business models
> 1500 Mtons wastes at the end of the value chains



CLIMATE NEUTRALITY AMBITION

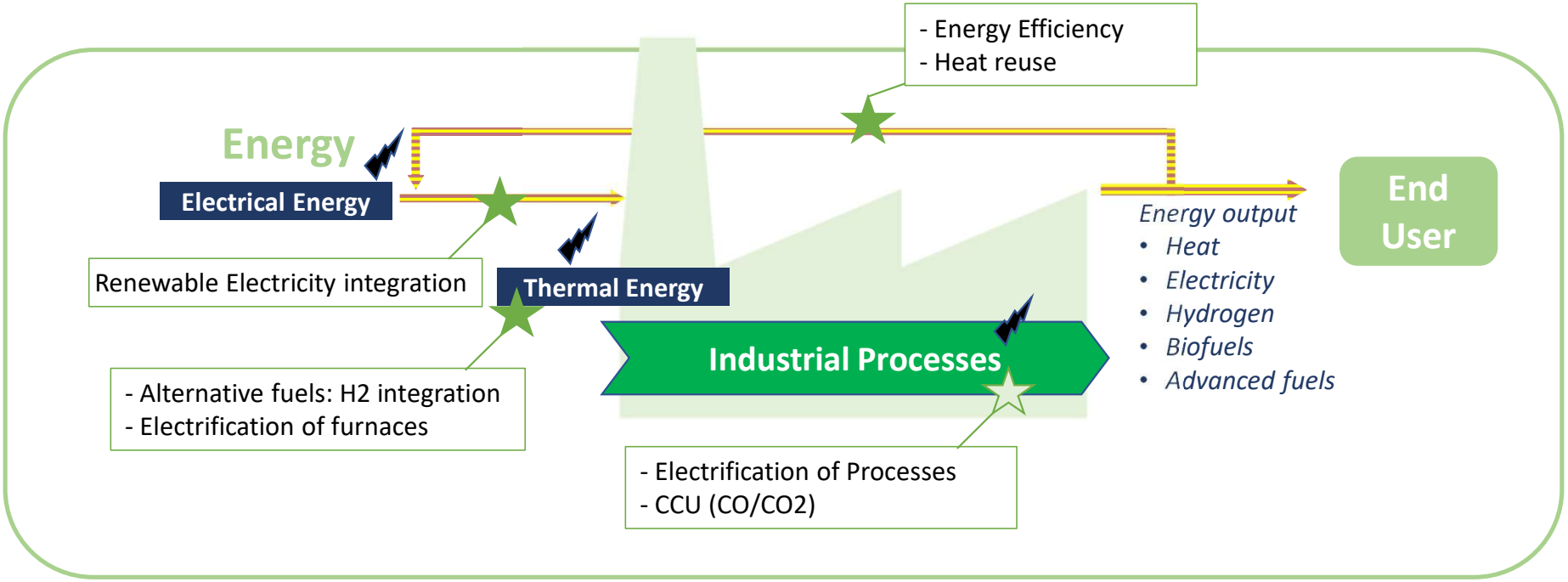
DISRUPTIVE PROCESS INNOVATION TO ABATE GHG EMISSIONS

SPIRE
Sustainable Process Industry through Resource and Energy Efficiency

From fossil and low energy mix

To efficient integration of renewables and valorisation of process emissions

P4PLANET



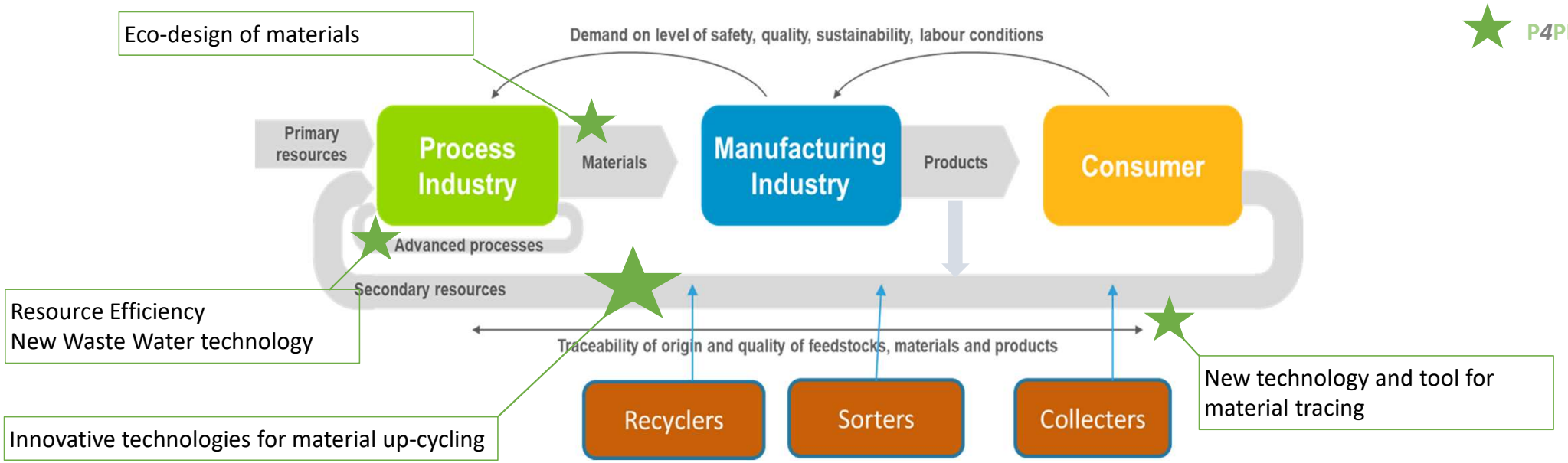
Towards net-zero CO_2 emissions

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

Sustainable Process Industry through Resource and Energy Efficiency

EU Process Industries are highly exposed to global competition

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

P4PLANET

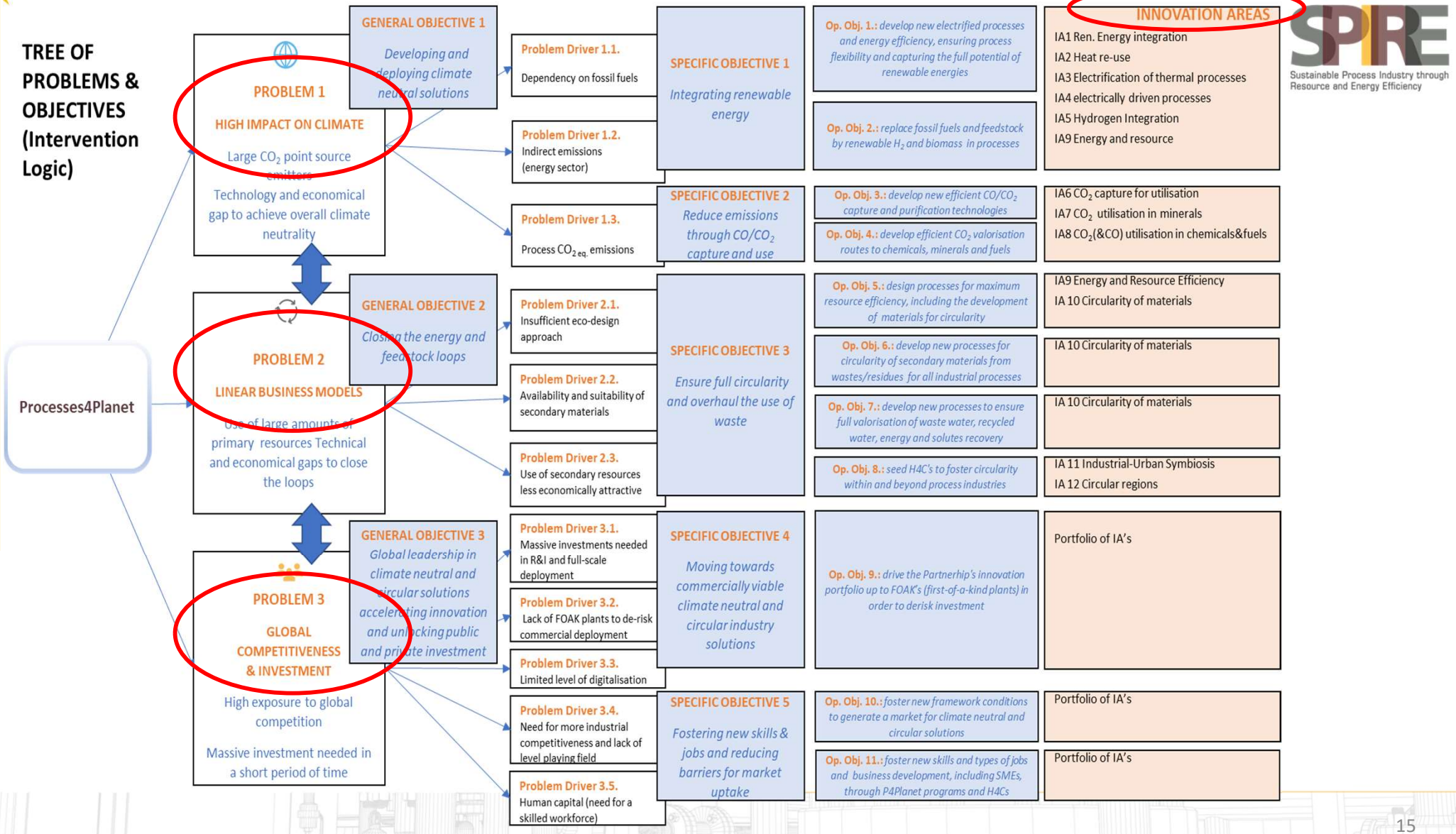
- De-risk Investments
- FINANCIAL FLOW
- Generate a market for climate neutral & circular products
- Available & Affordable Green Energy
- Digitalisation & H4Cs to accelerate innovation

- JOBS
- CIRCULAR ECONOMY
- SUSTAINABLE PROCESSES & MATERIALS
- CIRCULAR REGIONS
- CLIMATE NEUTRAL CONTINENT

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

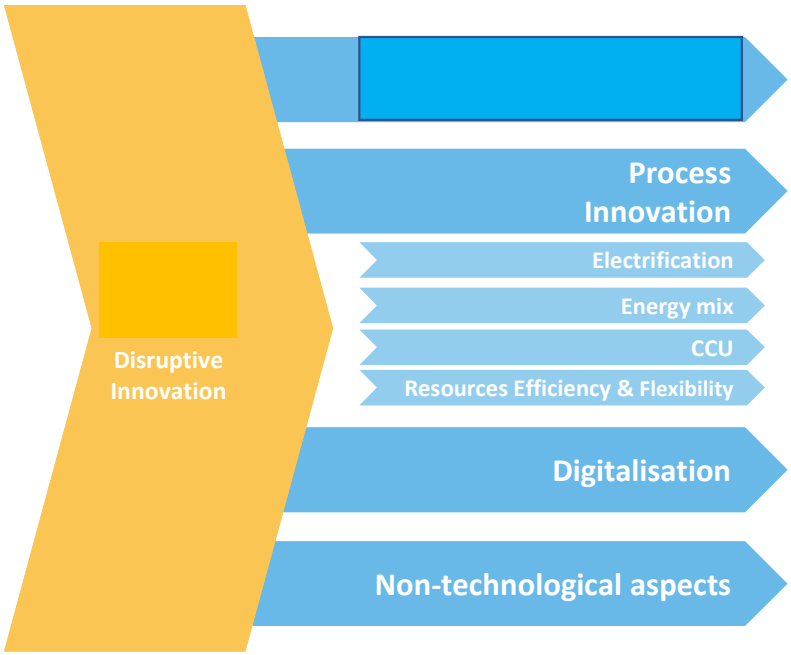
Intervention Logic

TREE OF PROBLEMS & OBJECTIVES (Intervention Logic)



Sustainable Process Industry through Resource and Energy Efficiency

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				

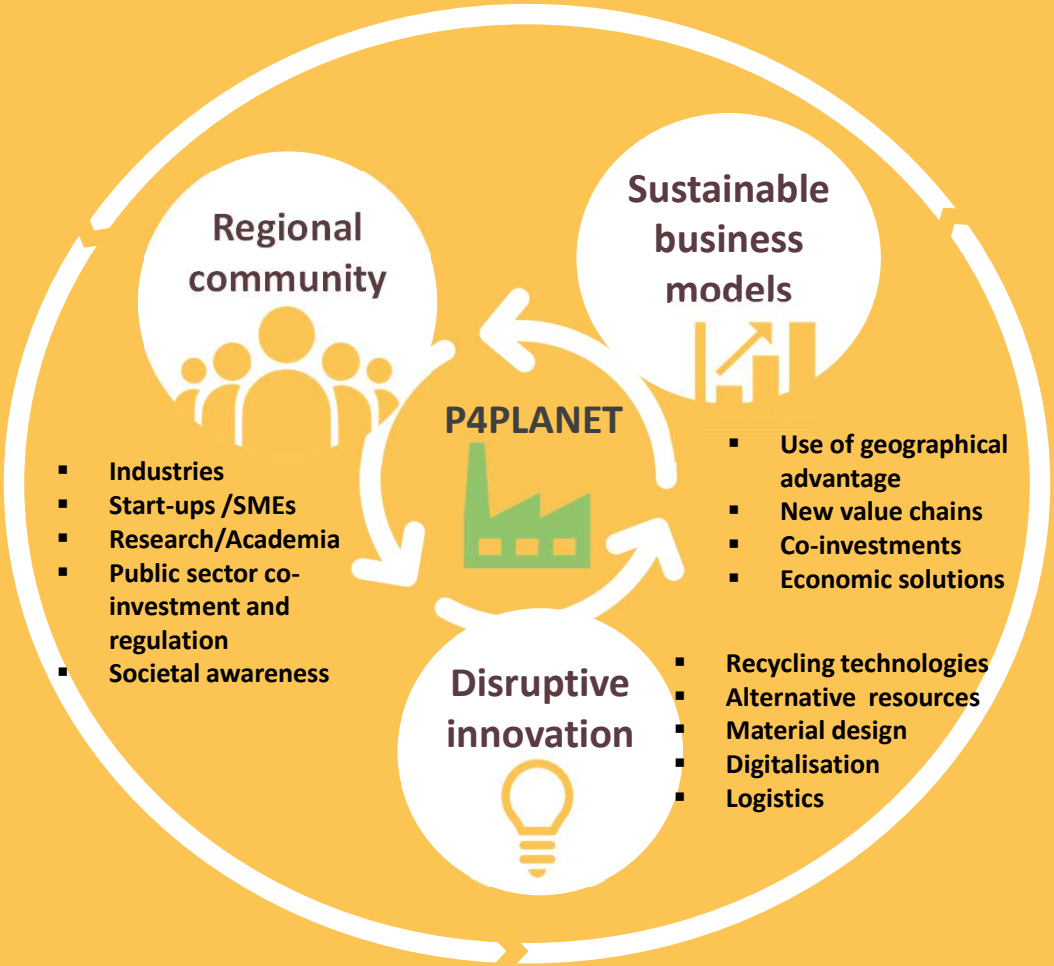
[1] Progress is depicted here as % of total TRL9 projects programmed in each area, and for circular regions, digitalisation, and non-technological aspects % of total investment needs until 2050

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 with integration of interregional recycling value chains
- → **Processes4Planet inside!**
- → Facilitation necessary to overcome non-technological barriers to symbiosis



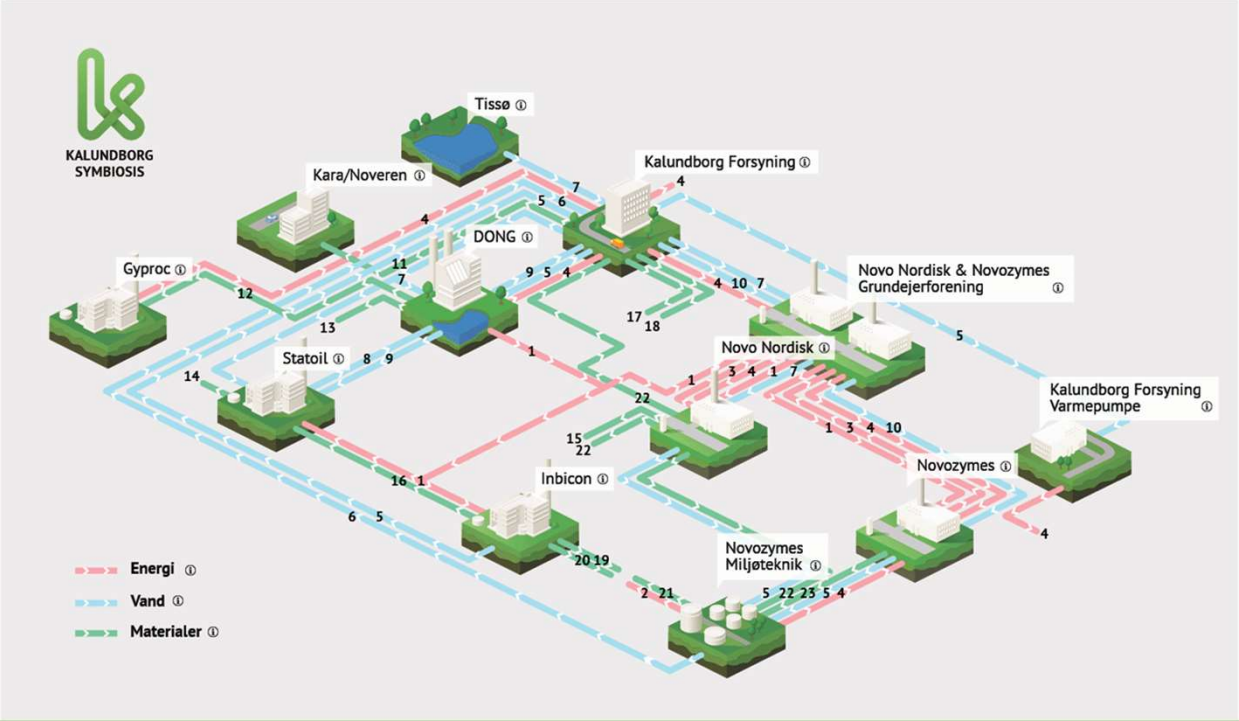
Industrial Symbiosis in a Circular Economy

Image: The Kalundborg example

Sustainable Process Industry through Resource and Energy Efficiency

Reduce waste, emissions, pollution – become climate neutral by 2050

Physically connected plants to use underutilised resources of one in another



Connection of **geographically close units** to keep resources in the loop as long as possible

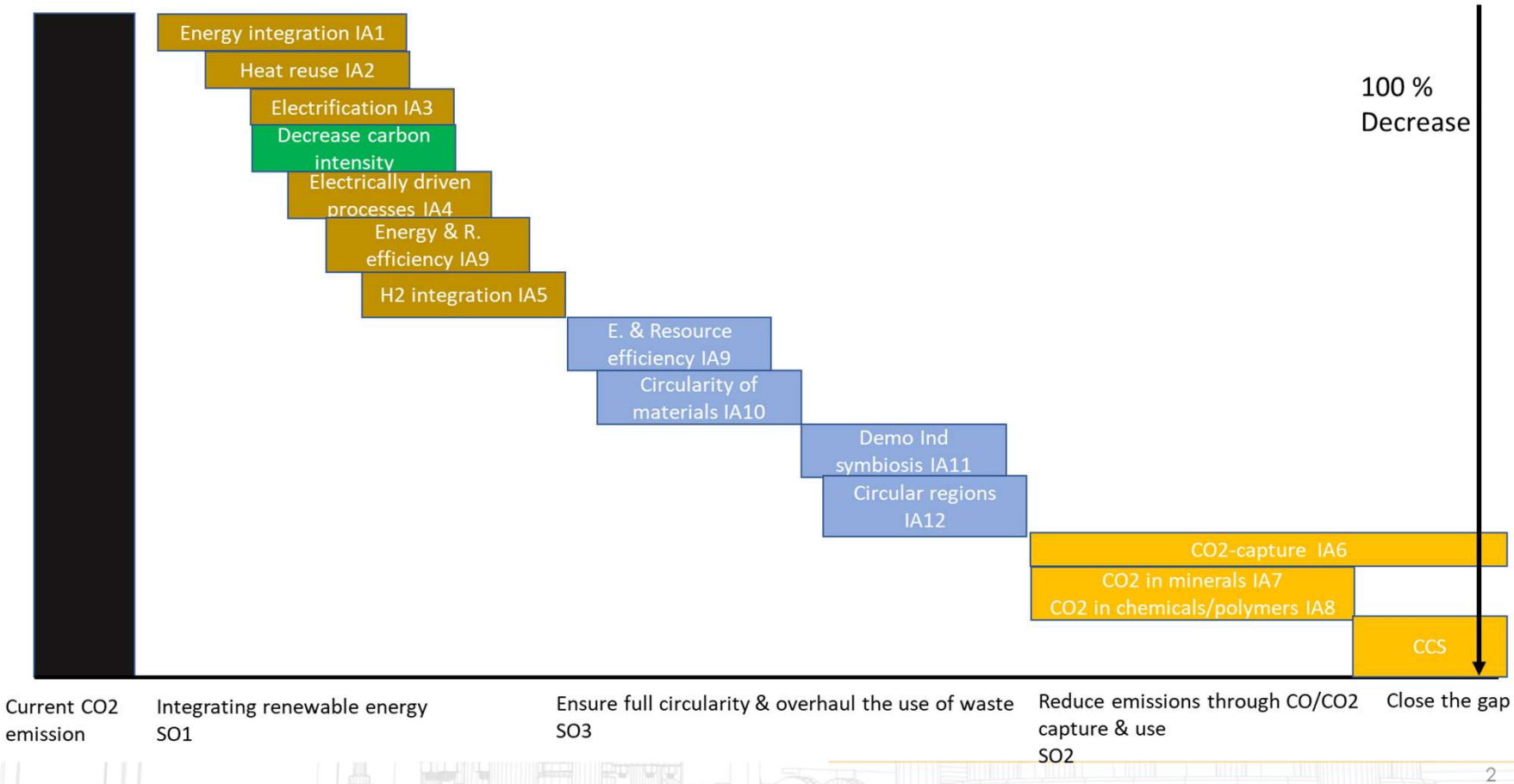
Process optimisation, downstream, electrification, hydrogen, energy mix, digitalisation, non-technological barriers

In EU, > 130 M€ have been invested in methodologies and tools facilitating the uptake of IS, mainly for the assessment of potential solutions and synergies among companies. **But still barriers exist**.

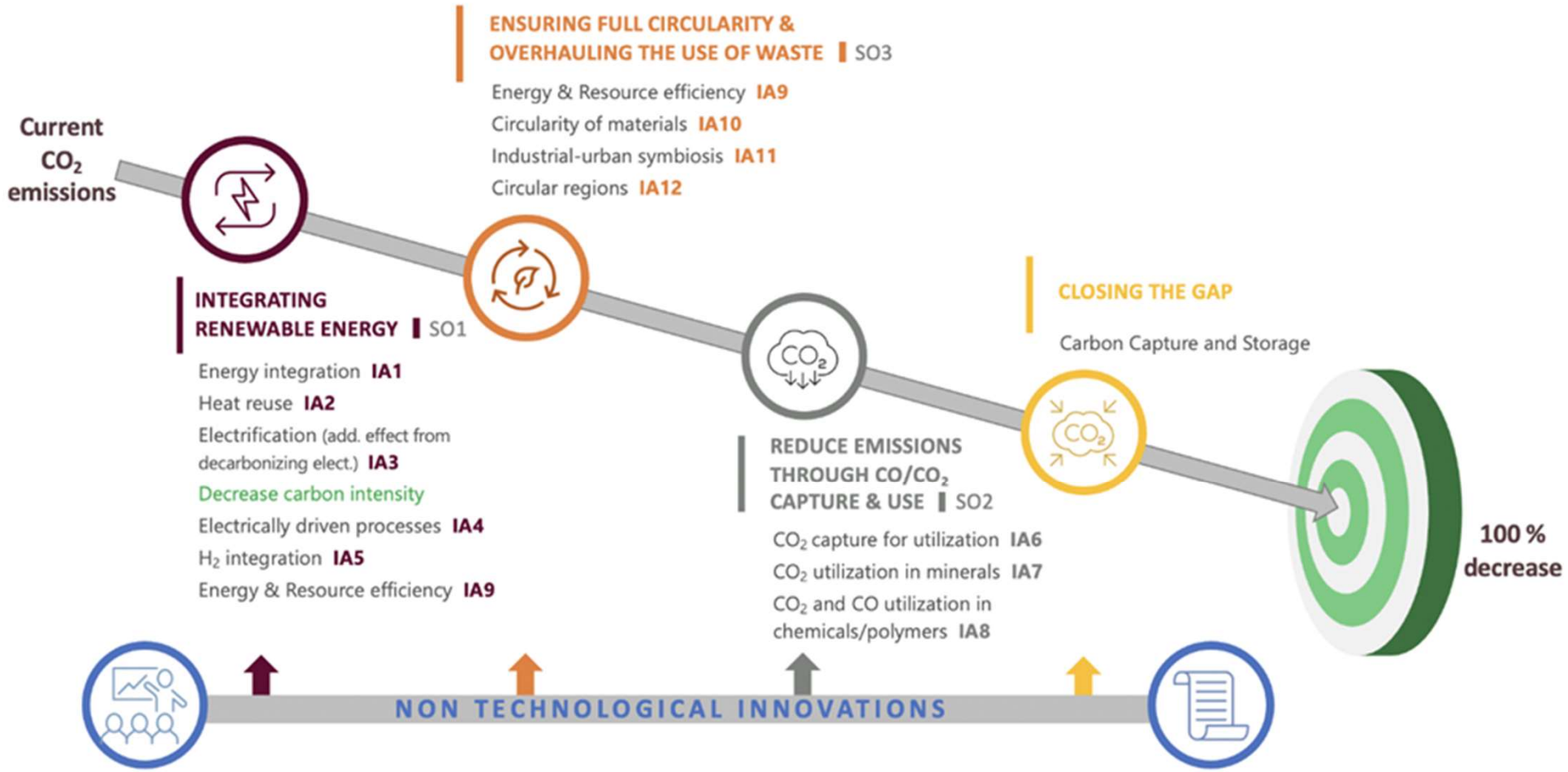
Near zero waste / Near zero emissions / Near zero water discharge

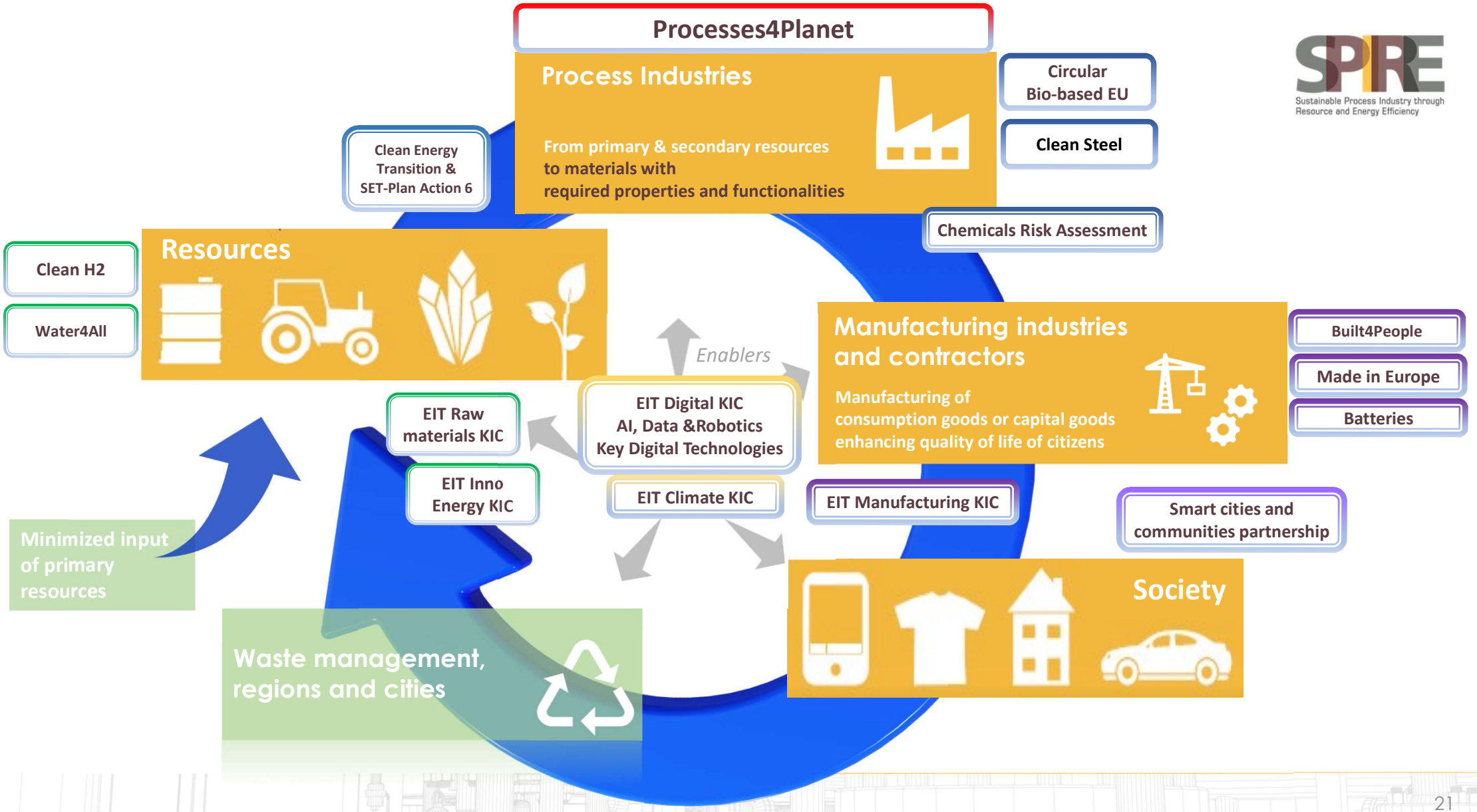
Source of image: http://www.energycrossroads.org/industrial-symbiosis-circular-economy

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



A patchwork of innovations to achieve climate neutrality




Processes4Planet
Process Industries
From primary & secondary resources
to materials with
required properties and functionalities
Circular
Bio-based EU
Clean Steel
Chemicals Risk Assessment
Clean Energy
Transition &
SET-Plan Action 6
Resources
Clean H2
Water4All
Enablers
EIT Digital KIC
AI, Data &Robotics
Key Digital Technologies
EIT Raw
materials KIC
EIT Inno
Energy KIC
EIT Climate KIC
Manufacturing industries
and contractors
Manufacturing of
consumption goods or capital goods
enhancing quality of life of citizens
Built4People
Made in Europe
Batteries
EIT Manufacturing KIC
Smart cities and
communities partnership
Society
Minimized input
of primary
resources
Waste management,
regions and cities

SPIRE 5050 R&I Outstanding Challenge

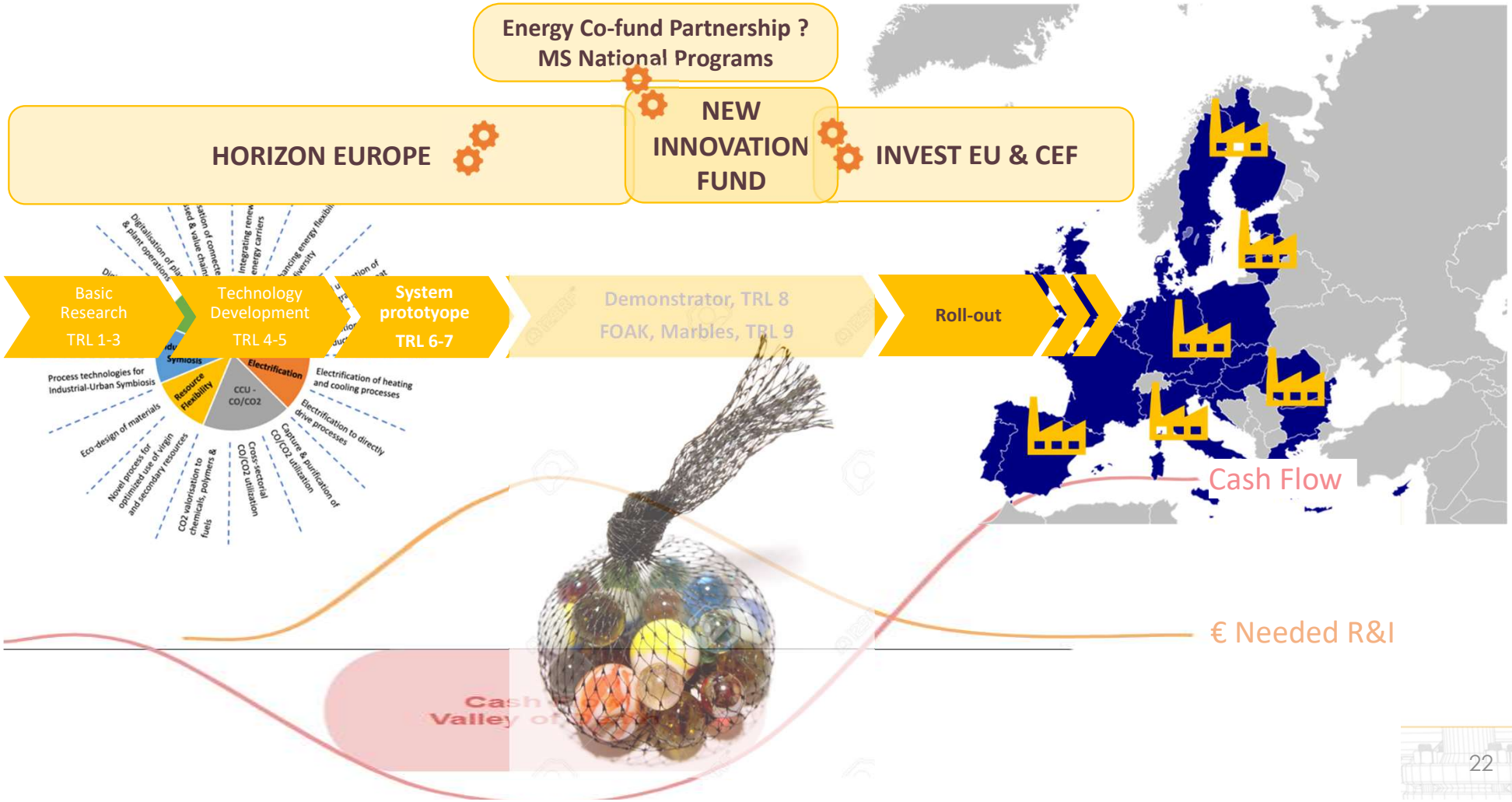
Comprehensive and coordinated funding & financing tools needed

Sustainable Process Industry through Resource and Energy Efficiency

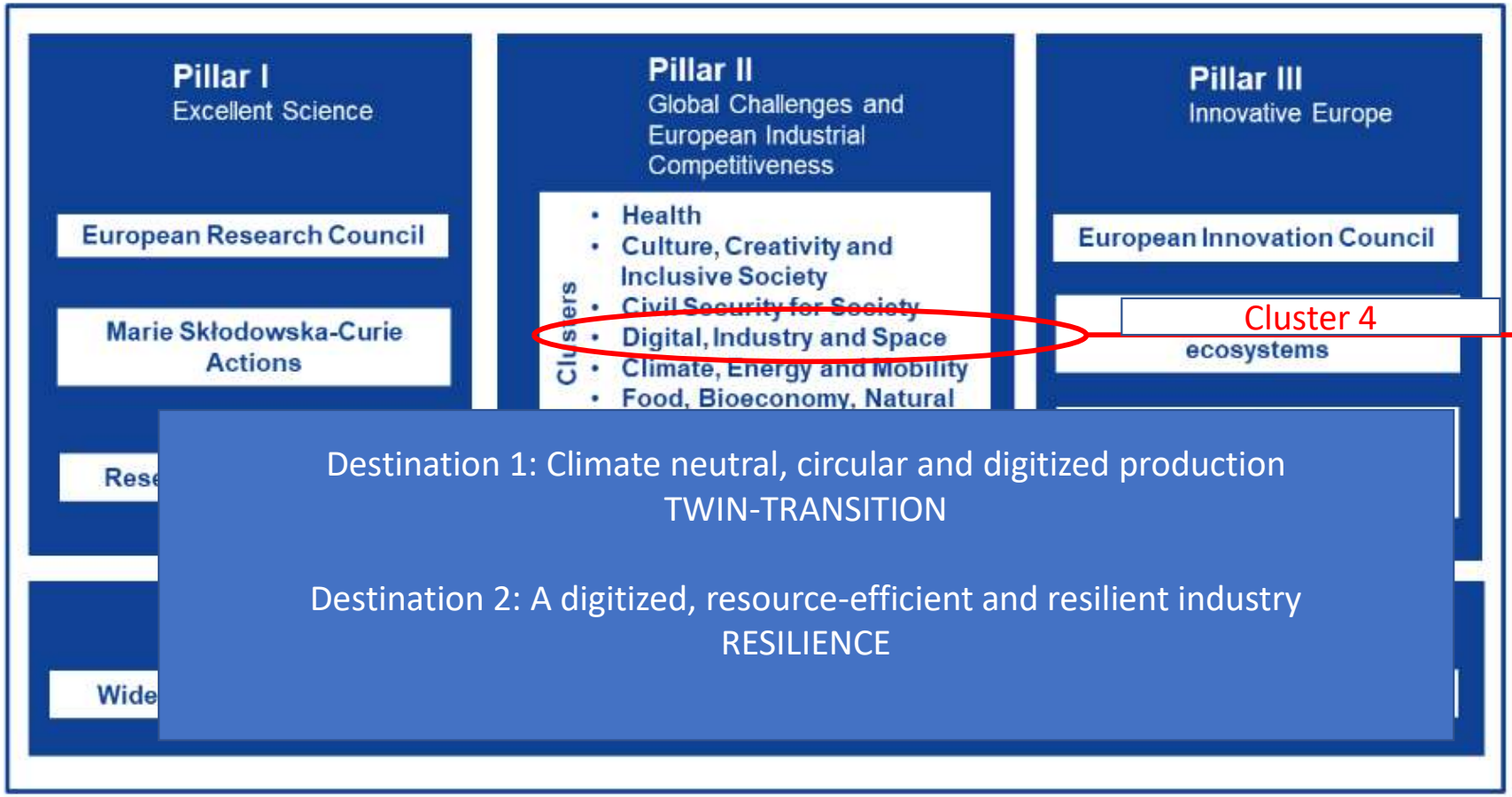
Funding & Financial tools

The RDI process

The € resources GAP



Horizon Europe Structure



HEU-calls beyond 2021 - 2022

- HORIZON-CL4-202?-TWIN-TRANSITION: Technologies for a more efficient utilisation and management of industrial waste waters (RIA)

- HORIZON-CL4-202?-RESILIENCE: Innovative business models for circular value chains (IA)

Conclusions: CORE CHARACTERISTICS

DIRECTIONALITY

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

Processes4Planet KPIs

CLIMATE KPIs

- **60 - 100% of total CO2eq emission reduction** potential by integration of renewable energy & energy efficiency demonstrated through R&I projects at TRL7
- **60 - 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

Preserving and restoring ecosystems and biodiversity

CIRCULARITY KPIs

- **40 - 80% (TBD) of waste reduction** potential demonstrated through R&I projects at TRL7
- **40 - 80% (TBD) secondary materials re-use** potential demonstrated through R&I projects at TRL7
- **40 - 90% (TBD) of wastewater re-use/recycling** potential demonstrated through R&I projects at TRL7
- **7 – 15 H4Cs** launched into the process of development

The European Green Deal

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 **2 - 15 marbles** integrating solutions developed through Processes4Planet portfolio towards the 100% target+
- **12 - 60 significant innovations** TRL 7-8
- **CAPEX & OPEX reduction** through the innovations
- **Increase in turnover of SMEs** through projects & H4Cs
- **20 new types of skills and jobs** (10 integrated into academia and company programs)

Financing the transition

Leave no one behind (Just Transition)

Connected across borders and to citizens

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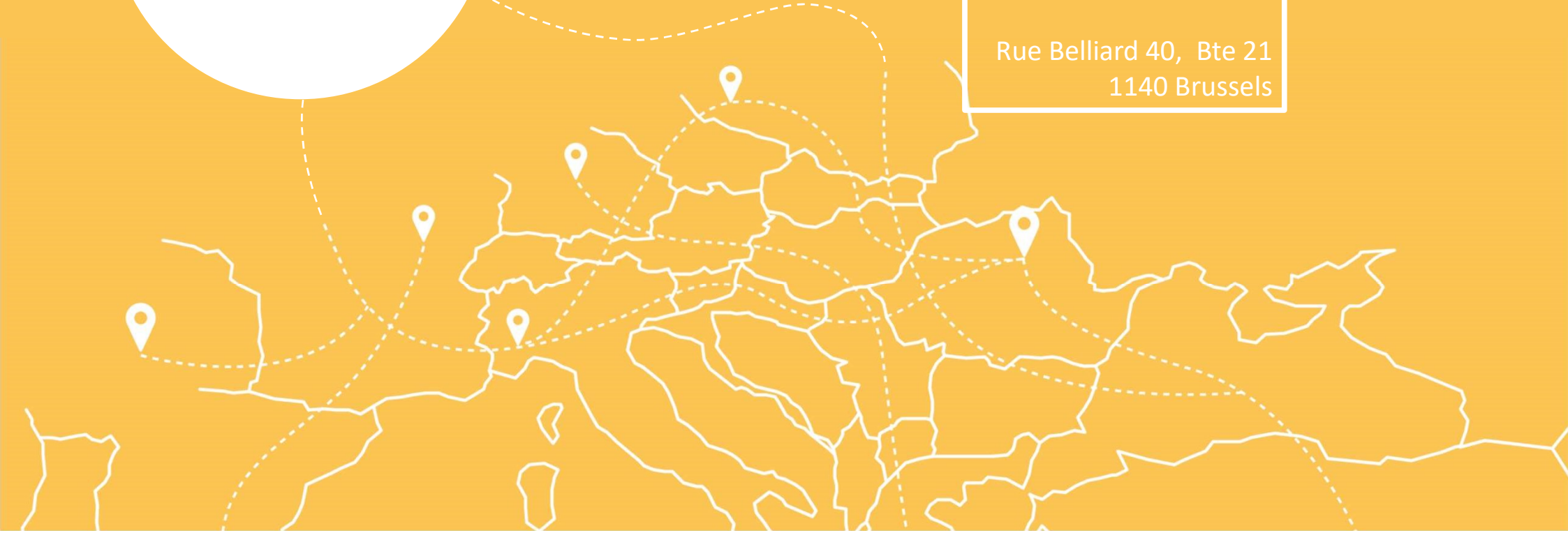
www.spire2030.eu

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