



Processes4Planet 2050

A roadmap for transformation

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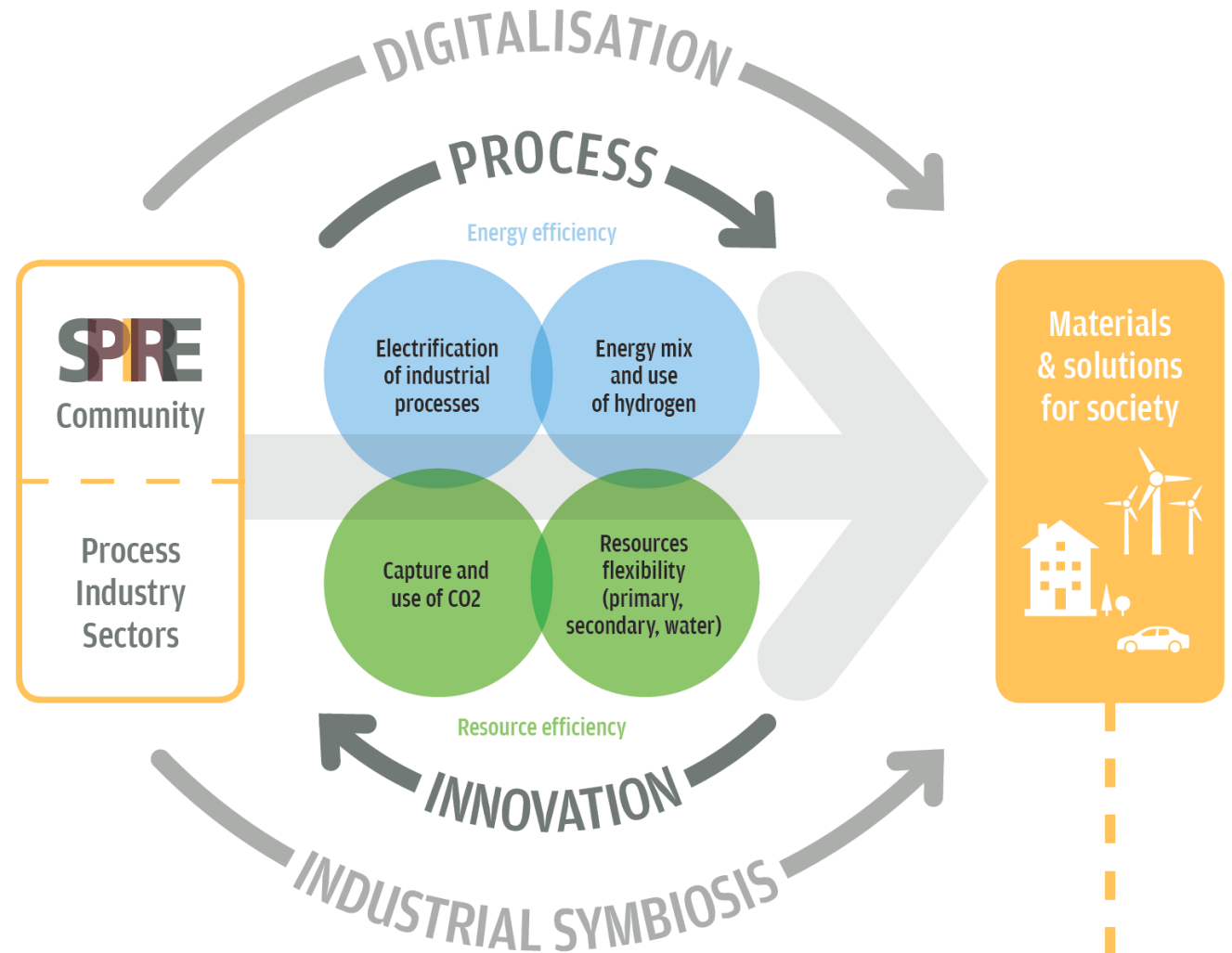
23 June 2020

Match-making webinar

A holistic approach to circular manufacturing: Exploring collaboration between European PPP initiatives and Portuguese stakeholders

Processes4Planet Vision 2050

An integrated and digital European Process Industry, fostering a "well-below 2 degrees" scenario and a fully circular future for our planet and society.

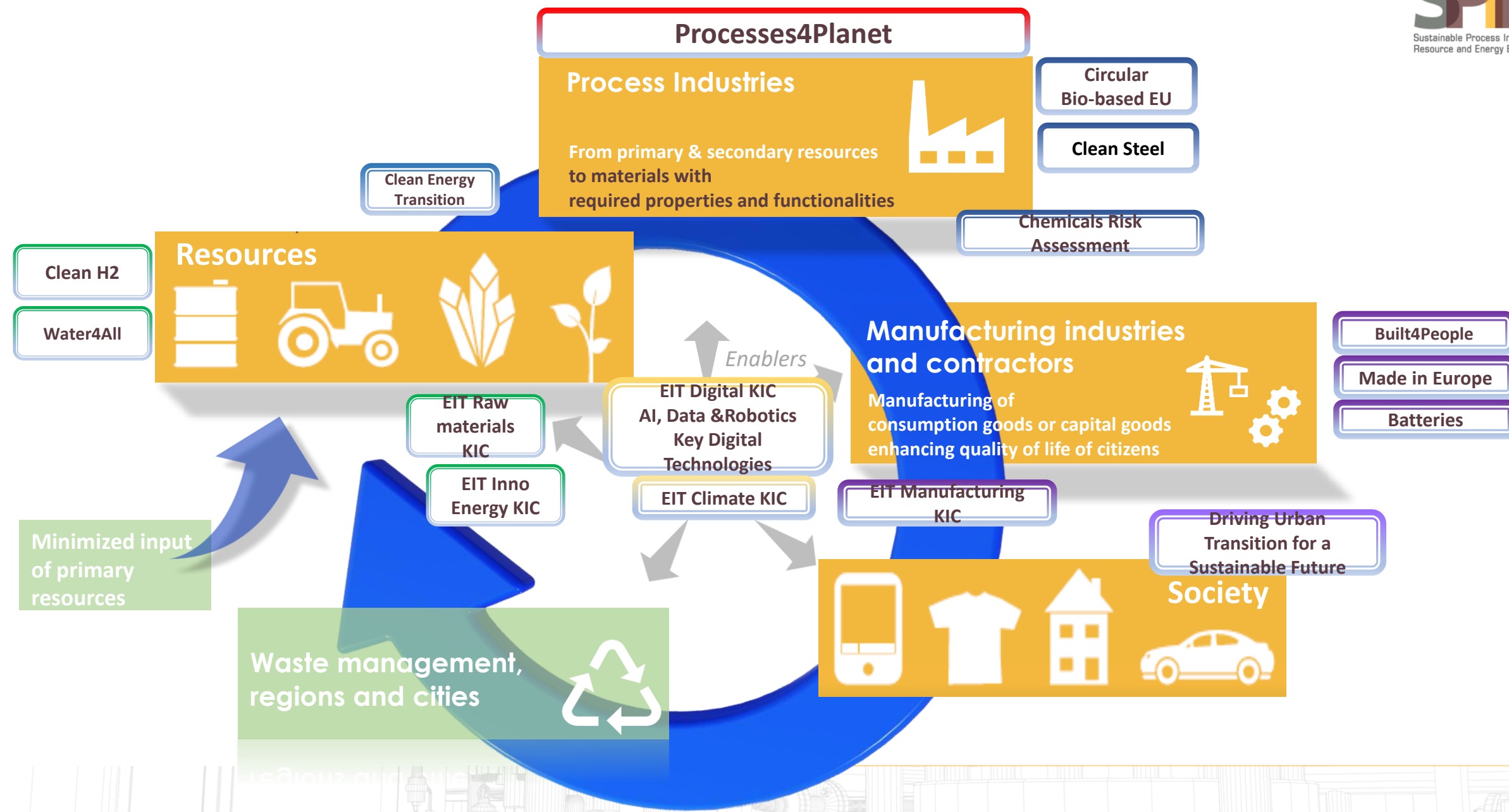


P4Planet Roadmap: Alignment with the Green Deal & Other Policies

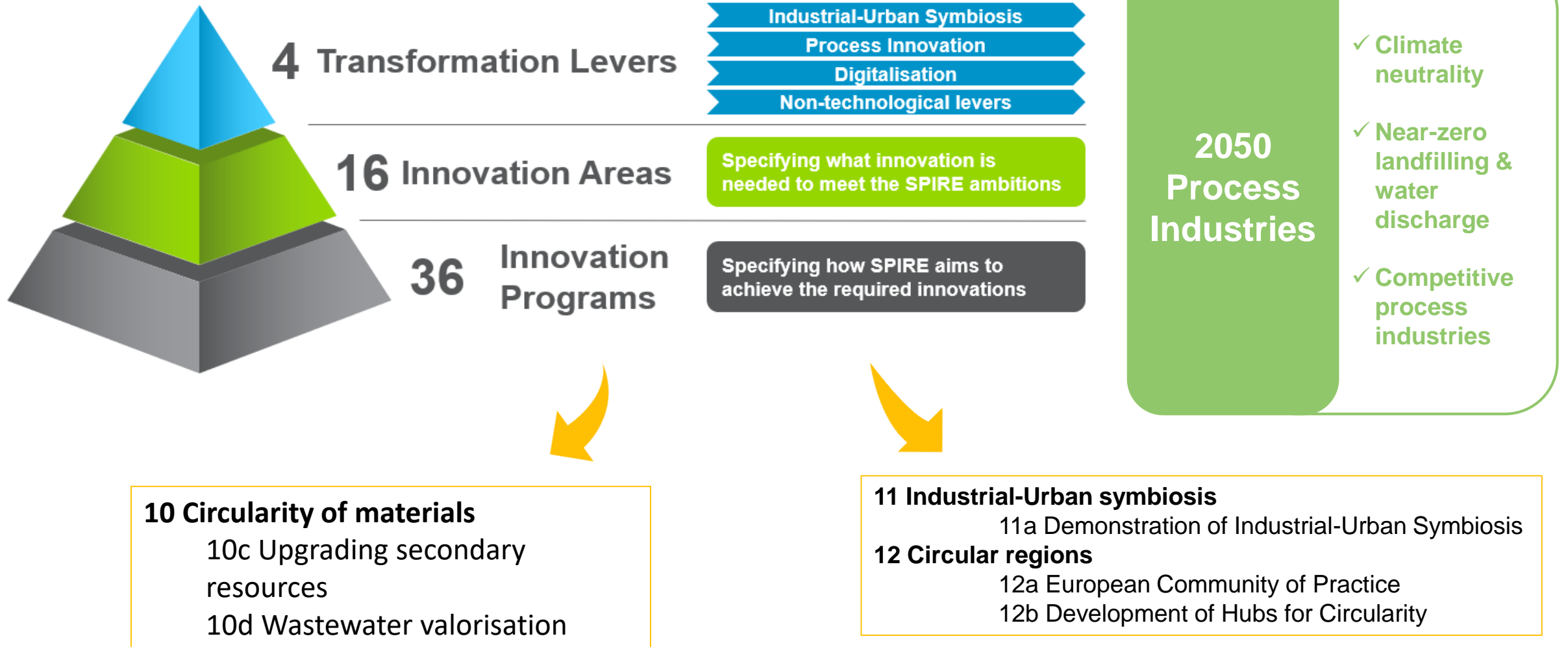
*The climate neutrality and circularity targets can only be reached jointly through the **common and cross-sectoral R&I strategy***

- Similar innovation challenges
- Shared learning
- Faster deployment at scale
- Efficiency in resources
- Shared costs on benefit of circularity
- Strengthen connection with others initiatives

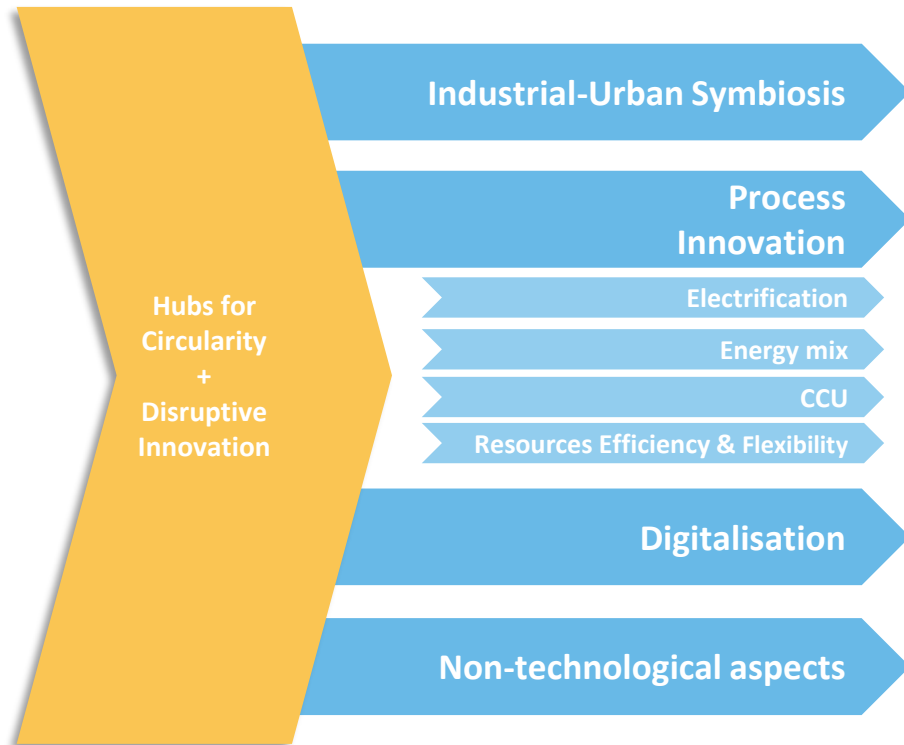




Processes4Planet Roadmap: Routes to Transformation



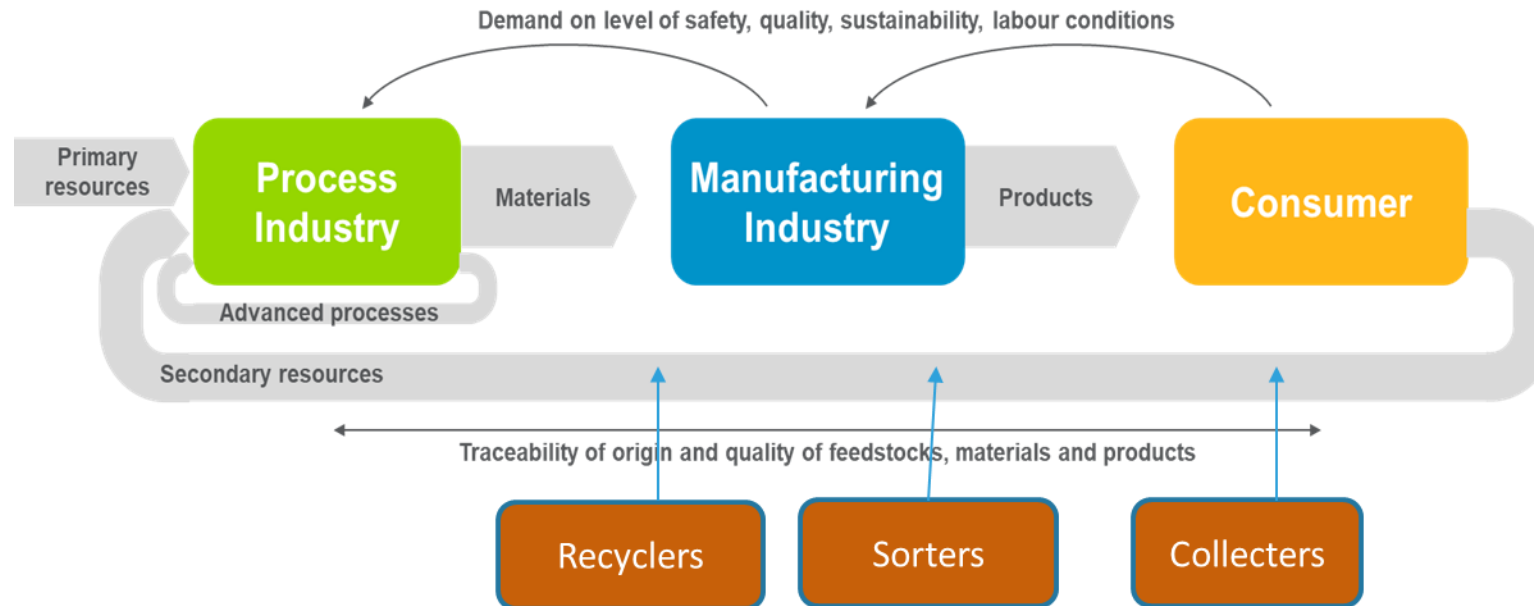
We need to start now, the way is long



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

The process industry is in a position to decarbonise many value chains and reconnect resources into a circular economy

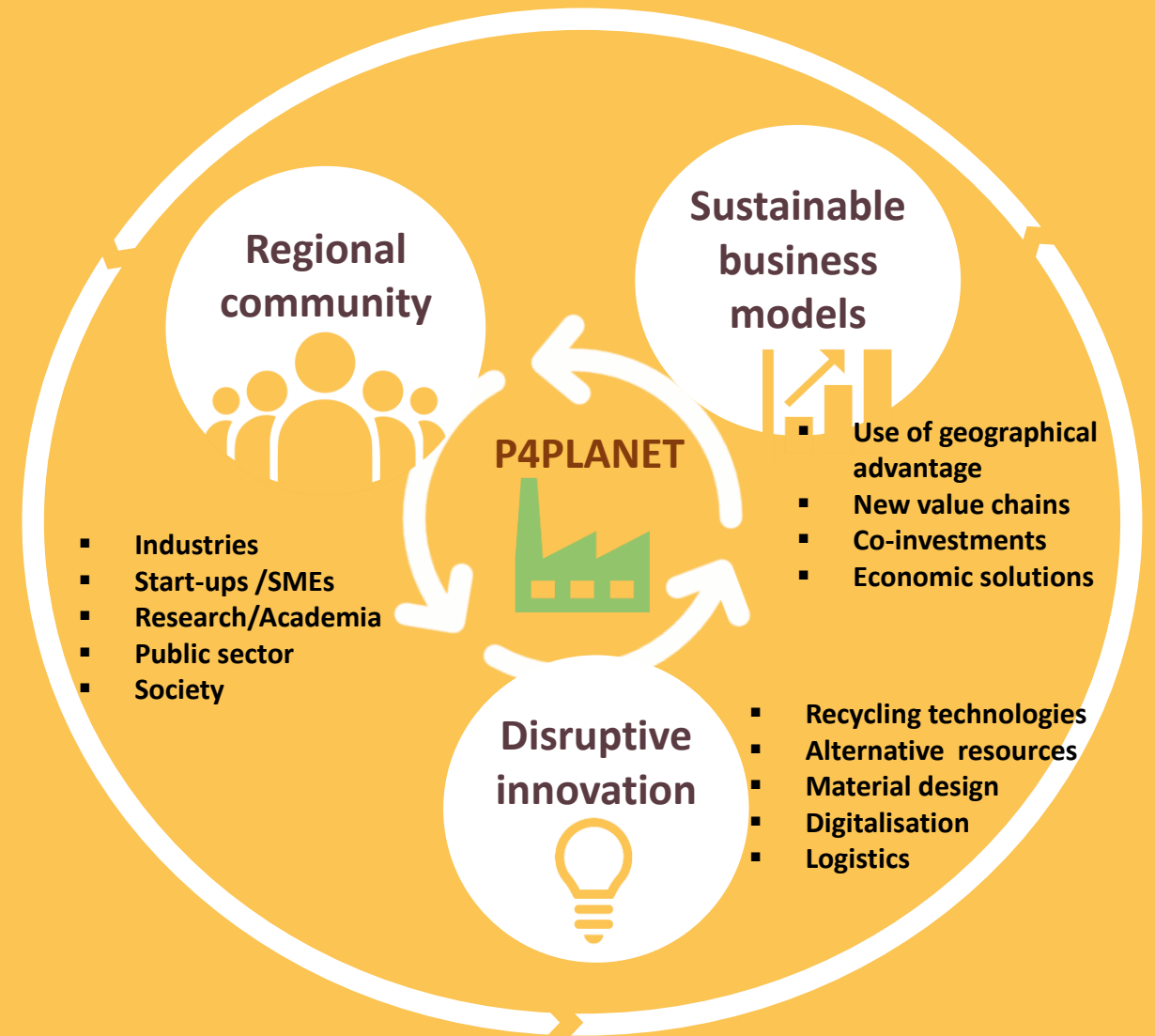


A large number of Innovations are needed to fasten a competitive process industry transformation

H4Cs 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

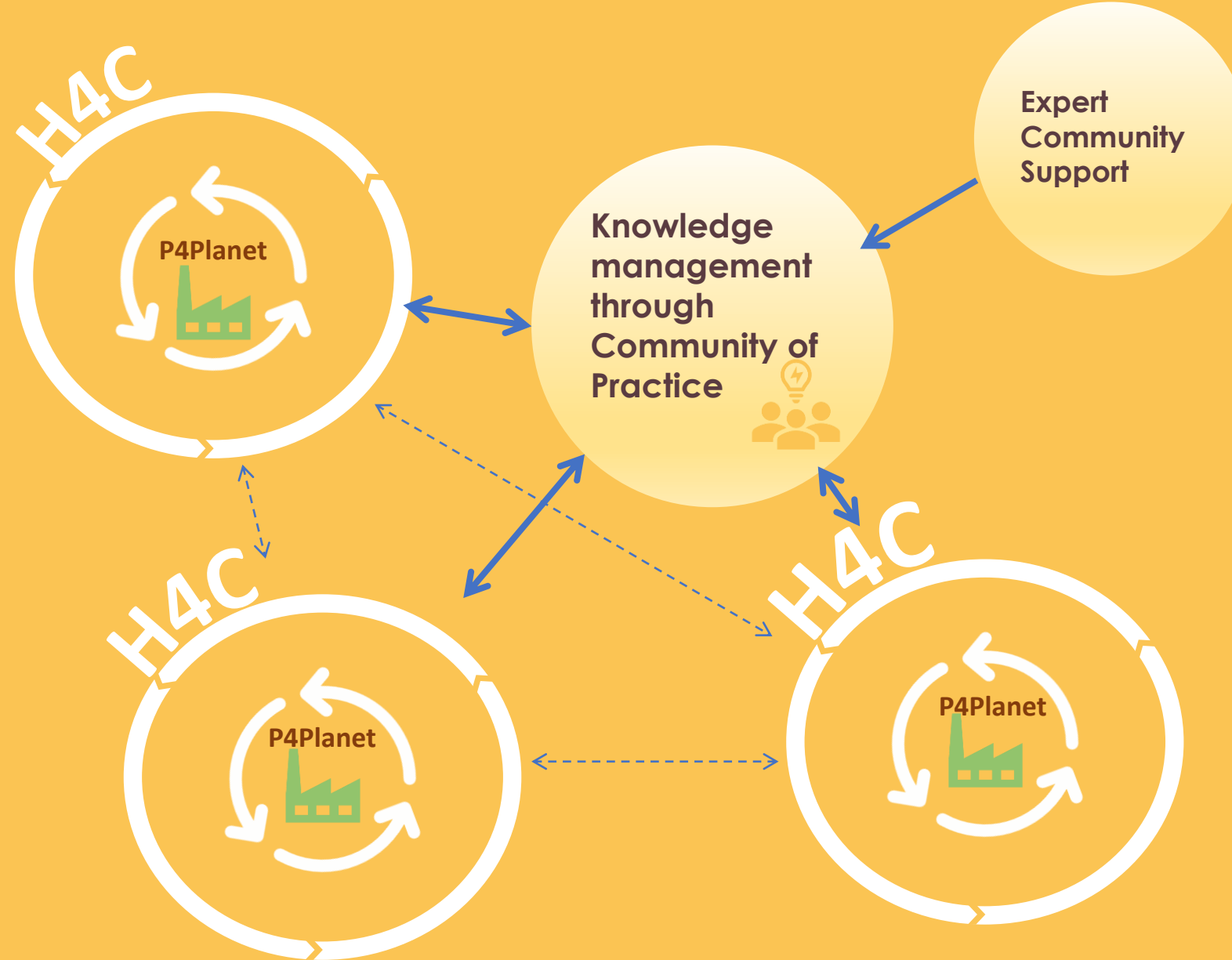
Intermediate Hubs

Advanced Hubs

Mature Hubs



European Community of Practice



Platform for non-competitive exchange of **knowledge** and best practices

- Practical **toolbox**: technologies and tools
- **Innovation** programmes for finding the missing pieces in the puzzle of symbiosis
- **Modelling** circular concepts and plants of the future
- Enhancing **replicability**
- Communication and **transfer of technologies and solutions**
- Education and training
- **Sustainability** of the network

SPIRE Projects related to Circular Economy

Title	Goal	P4Planet's Roadmap link
SCALER: Scaling European resources with industrial symbiosis	<ul style="list-style-type: none"> • Increase the uptake of industrial symbiosis in Europe by producing a set of best practices, guidelines and business systems. 	IA 11a IS and 12 Circular regions Valorization of 100 promising synergies at EU level.
MULTICYCLE: Advanced & sustainable recycling processes and value chains for plastic-based multi-materials	<ul style="list-style-type: none"> • Develop a solvent-based and unique recycling technology for fossil- and bio-based thermoplastic multilayer packaging and fibre reinforced composites at TRL7 • Potential to continue to TRL9 by 2025. • It can be clustered with PLASTICRICLE and POLYCE. 	IA 10c Upgrading secondary resources Circular economy (recycling of multilayer packaging and fibre) Process is able to recover all target polymers and fibres from different post-consumer and post-industrial packaging and composite waste streams.
INCUBIS An Industrial Symbiosis Incubator for Maximizing Waste Heat/Cold Efficiency in Industrial Parks and Districts	<ul style="list-style-type: none"> • Unlocking the market potential of ENERGY SYMBIOSIS to decarbonise EU industry by 2050 • Developing and deploying five (5) Energy Symbiosis Incubators across Europe, + a digital Cloud Incubator, 	IP11a Demo of Ind Urban Symbiosis 12a European Community of Practice 12b Development of Hubs for Circularity I-US, first H4C pilots example and example of ECOP with 5 incubators + virtual incubator platform



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