Processes4Planet Partnership

The role of Hubs4Circularity

Connecting regional Innovation valleys through circular industries

Gijón, 22 June 2023

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Executive Director
A.SPIRE

SRIA 2050: P4PLANET'S STRATEGIC RESEARCH AND INNOVATION AGENDA

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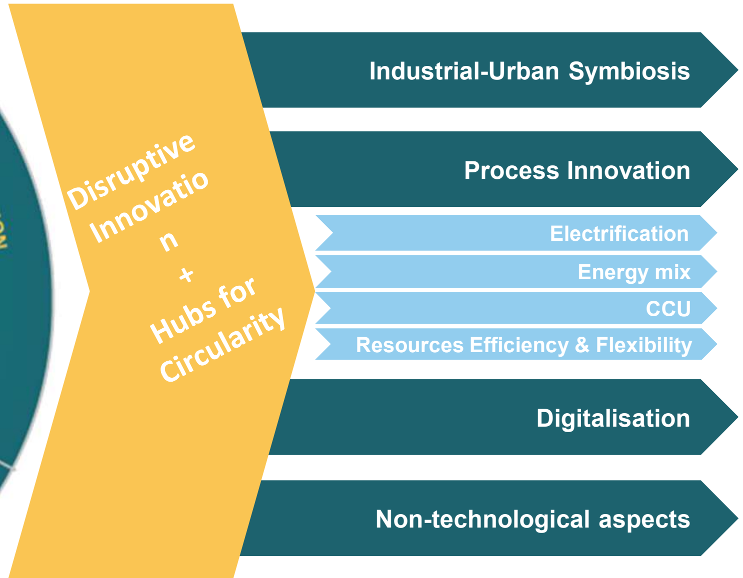
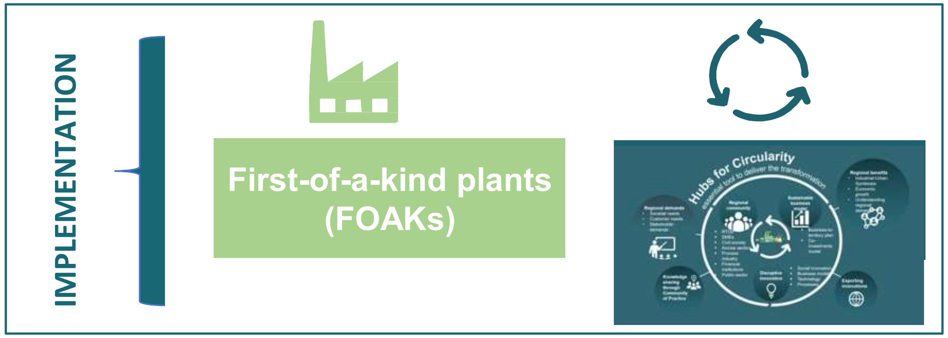


Progress up until milestone year[1]

Innovation area	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

- 100% of total CO2eq emission reduction potential,
- 80% of waste and secondary raw materials reduction potential,
- 90% of wastewater reused/recycled potential



HUBS4CIRCULARITY: The rationale

SEED: Energy Intensive Industries as H4Cs

Process Industry: capacity to reintroduce bulk amounts of resources in the industrial system

H4CS ECOSYSTEM

- **Regions with strong presence of Process Industry**
- Value chain, SMEs, Academia, Research organisations
- Civil society, Investors, Public sector
- Cooperation across regions. Facilitation

BUSINESS TO TERRITORY PLANS

Co-investment plans
Alignment of industrial and regional ambitions on climate neutrality and circularity

INNOVATIONS

- **Full Scale I-U Symbiosis**
- **Closing energy, resources and data loops**

IMPACT

PROCESS INDUSTRY

- 100% of total CO2eq emission reduction potential,
- 80% of waste and secondary raw materials reduction potential,
- 90% of wastewater reused/recycled potential
- Globally competitive Process Industry

REGIONS & CITIES

- Climate-neutral regions
- Waste-zero regions

Mapping Europe's potential for H4Cs

DIFFERENT REALITIES WILL REQUIRE DIFFERENT STRATEGIES

ACROSS EUROPE

- **West European countries**: high potential for hubs identification
- **Eastern Europe**: more scattered landscape, additional incentives needed

ACROSS SECTORS

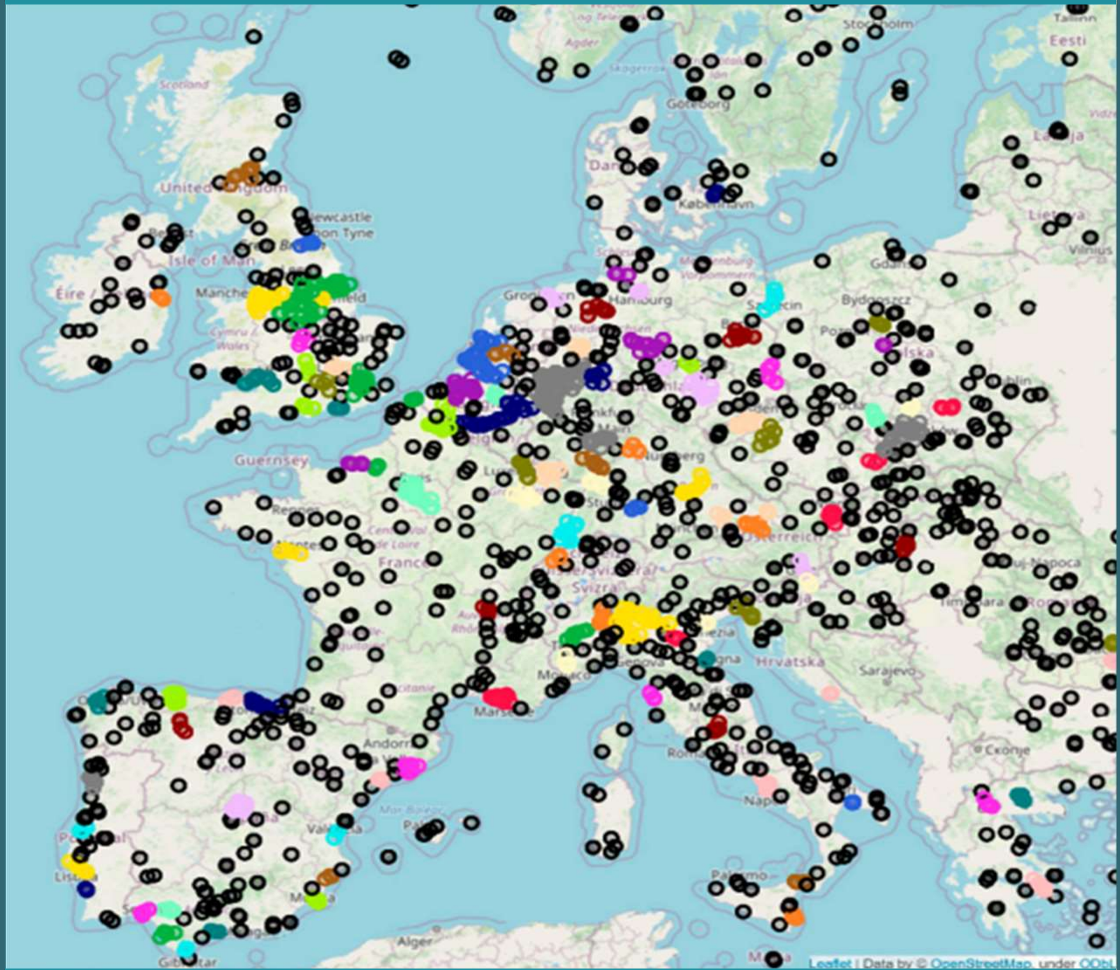
Lower level of geographical clusterisation of aluminium, cement, lime, plaster or electricity, compared to 70% for petrochemical sector

URBAN AREAS

Clusterisation increases by a third in urban districts.

Most cities clustered in: Belgium, Germany and The Netherlands

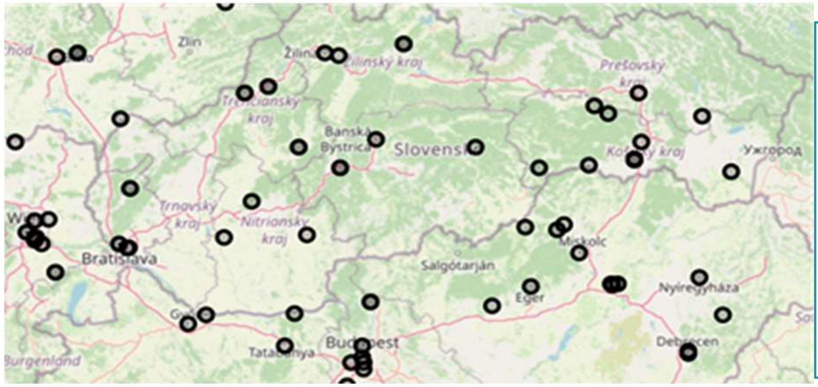
Based on DBSCAN clustering algorithm:
Radius 25 km and 5 minimum points. Hubs in color, Non-clustered installations in black



***References**: Ghent University master thesis, Rob De Boever; and journal article in Sustainability (Elsevier) 'Hubs for circularity: geo-based industrial clustering towards urban symbiosis in Europe' by Francisco Mendez Alva, Rob De Boever and Greet Van Eetvelde*

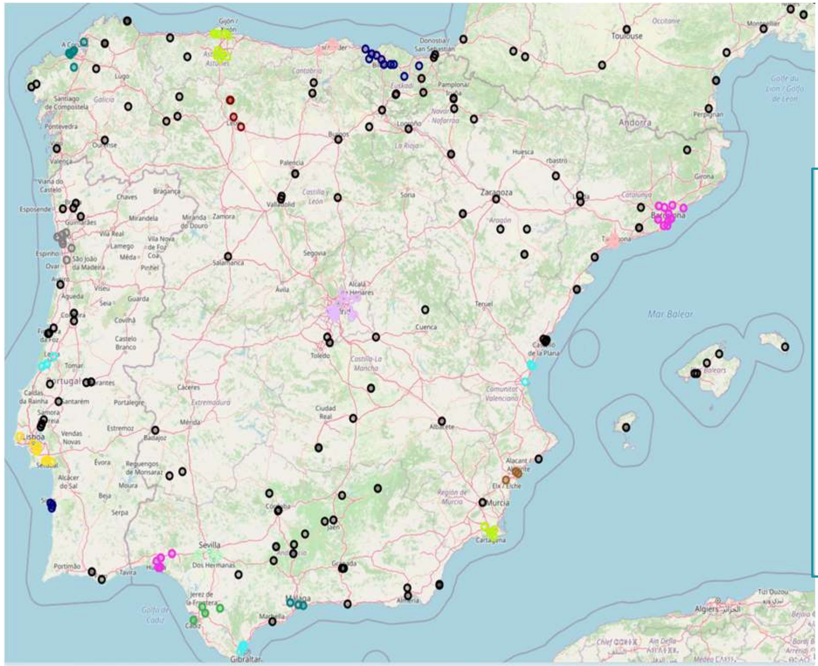
Mapping Europe’s potential for H4Cs

ASPIRE



Slovenia

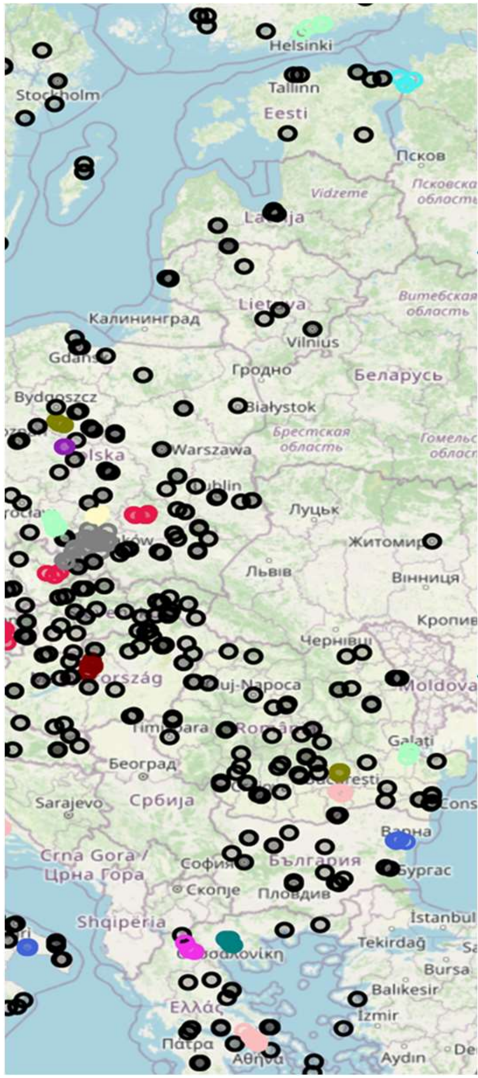
No cluster identified. Wider geographical areas H4Cs, based on value chain to be considered.



Spain:

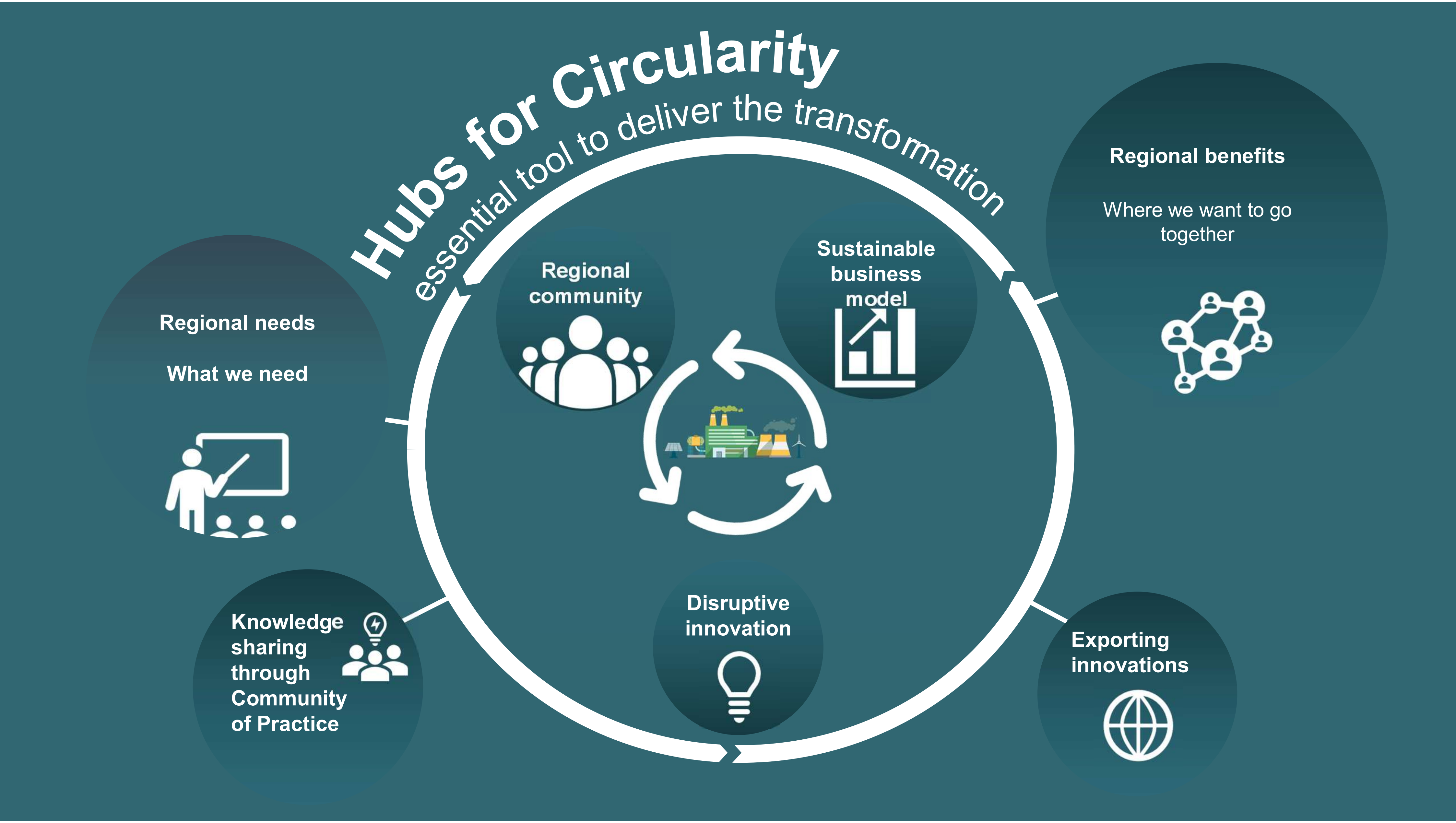
Cluster close to Santander (Cantabria)

Urban districts attract more industry



Eastern Europe:

Clusters identified in Poland, Hungary and Romania


Hubs for Circularity
essential tool to deliver the transformation
Regional needs
What we need
Regional community
Sustainable business model
Regional benefits
Where we want to go together
Disruptive innovation
Knowledge sharing through Community of Practice
Exporting innovations

WHAT WILL MAKE YOU BECOME A H4C

BUSINESS2TERRITORY PLAN

Regional needs

What you need

Disruptive innovation

Sustainable Business Model

Regional benefits
What do you want to achieve?
What positive impact you aim at

IDENTIFY
- Waste streams to tackle & prioritise
- Solutions to avoid landfilling
- The local conditions that determine the setting and hurdles (e.g industrial plants nearby an agro area)
- Other conditions (e.g. how much green electricity will be needed by when)

DEFINE
- A roadmap or strategy
- Main areas (e.g. plastics, construction waste, urban waste, heat surplus)
- Main innovations needed
- Flagship initiatives on I-US or other (e.g. district heating/cooling)
- Facilities that can help connecting the flagships
- Milestones: what techs ready by when?

How to get there
- Co-investments plan: who will invest on what and when
- Private and public investments
- Keep it alive.
- Define joint benefit for the investments

What will have changed by when. E.g.:
KPIs & MILESTONES
- % waste reduction (2030,2040,2050)
- % CO_2 emissions reduction (2030, 2040, 2050)

What will the changes represent for the industry and society.

WHAT WILL MAKE YOU BECOME A H4C

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Governance models

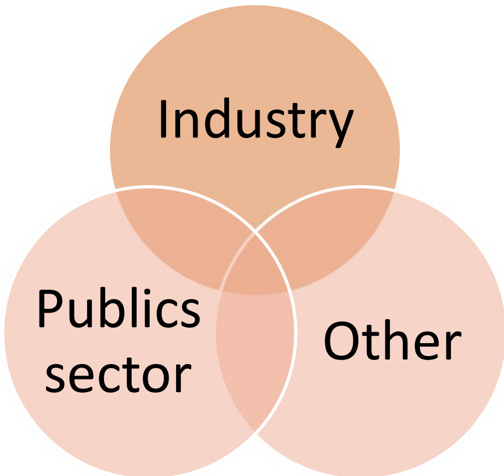
Ecosystem

- Process Industry, SMEs, value chain
- Research
- Civil society
- Financial institutions
- Public sector

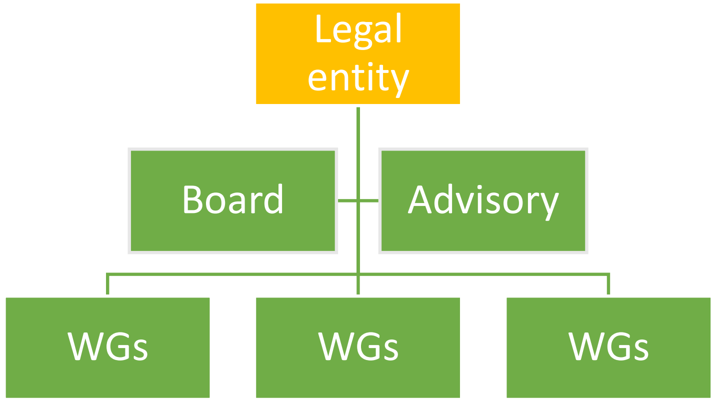
Simple structure

Ecosystem Roundtable

Distributed



Hierarchical



Governance model: Private & non-profit legal entity

Example of Business development CHO specialized in IS/I-US

SPIN Business Model Canvas

Key partners

Strategic partners: process industry, **Nordic cluster**, National symbiosis network

Financiers: EU public fundings and **national funding, members** (both **cash in and in kind)**

Policy Makers: country adminstrations.

Stakeholders: includes various initiatves that intersted in IS/I-US.

Key activities

Communication&dissemniation: **events /conferences**. **training, study tours** to spread circular approach.

Day-to-day operation: **coordinaton, project devloping, planning and communication**.

Governance: **private & non-profit organization.**

Liaison: networking with other IS/I-US/CE inititatives at global level.

Value Proposition

- **Transferring the IS knowledge** and **best practices**.
- **Raising awareness** of **untapped potential in IS/ I-US**.
- **Discovering novel symbiotic relationships** that advance the journey towards climate neutrality.

Impact

- **Advocating the IS mindset** at a global scale.
- **Evolution of IS into a new level**.

Innovation Services

Ecosystem	Business	Skills
-**Community building** - **Strategy development** -**Representation**	-**Incubator/ accelerator support** - **Project development**	- **Training for industries**

Customer Segments

- **Industries** including both national and international
- **Public bodies.**

Key Assets

Expertise

Brand image

Networks

Innovation Portfolio

- **Broaden the scope of the symbiosis framework.**
- **Evolution of environmental legislation,** policy recommendation.

Cost

-**Personnel cost** (the main cost).
- Cost of offices.

Revenues

- **Funding 50%** (includes EU and national funding)
- **Memebership fee (30%)**
- **Offering services** to comapnies (e.g. workshops) **(20%)**

P4Planet: governance and external consultation

ASPIRE

PRIVATE PARTNER

Board of Directors
5 representatives

Executive Director
1 representative

APG
15 representatives
(Incl. **Ambassadors Group Leader**)

Co-chair of PB →

PARTNERSHIP BOARD

PROCESSES4PLANET

- Signatories
- Commitment
- Decision making

← Co-chair of PB

PUBLIC PARTNER

European Commission

***€1,3 bn** funding for projects from HEU – C4*

Advisory and Programming Group (APG)

- Process Innovation for Climate Neutrality
- Circularity Innovation
- Competitiveness
- Digitalisation
- Portfolio
- Foresight
- Collaborations

A.SPIRE PWGs / Experts

- PWG1 ENERGY
- PWG2 PROCESS OPTIMIZATION & CCU
- PWG3 I-US / H4Cs
- PWG4 RESOURCES & CIRCULARITY
- PWG5 FRAMEWORK CONDITIONS
- PWG6 SOCIETAL INNOVATION
- Special WGs

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