

Hubs4Circularity Community of Practice and A.SPIRE Webinar

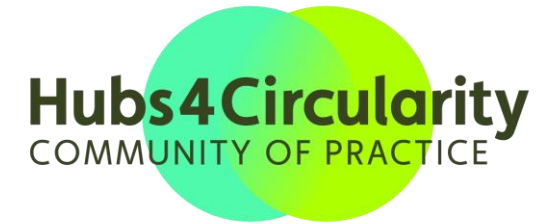
EXPLORING THE SECTORAL H4CS POTENTIAL IN EU REGIONS

26 September 2024

10h30 - 12h00 CET



Timeslot	Item #	Item	Speaker
10h30 – 10h55	Session 1	Key notes: Framing Hubs4Circularity (H4C)	
		Welcome, opening and introduction	Àngels Orduña, Executive Director at A.SPIRE
	Session 1a	Why H4Cs? The Pathways to Industrial-Urban Symbiosis and Circular Economy	Antonio Ferrandez Garcia, Industrial Transformation Unit, DG RTD, European Commission
	Session 1b	What is at stake for the process industry? The industrial perspective	Dorota Pawlucka, Global Alliances Manager, Covestro AG, A.SPIRE Board Member
		Transition to next session	Àngels Orduña
10h55 - 11h30	Session 2	Where are we now? H4Cs cases in practice	
	Session 2a	Emerging H4C from P4Planet projects: Case 1 - REDOL	Diego Redondo Taberner, Project Manager at CIRCE
	Session 2b	Emerging H4C from P4Planet projects: Case 2 - MOBICCON-PRO	Kalin Marinov, Head of International Affairs and Strategic Development, Glavbolgarstroy Holding
	Session 2c	Accelerating circular economy and industrial symbiosis through H4Cs	Ron Weerdmeester, H4C Community of Practice, PNO Consultants
		Transition to next session	Àngels Orduña
11h30 - 11h55	Session 3	Roundtable session (with questions from the audience)	
	Session 3	Sectoral potential of H4Cs in different EU regions Roundtable discussion on the potential of different regions in Europe to move to systematically close the loops	Moderation: Àngels Orduña. Panellists: <ul style="list-style-type: none"> • Antonio Ferrandez Garcia • Kalin Marinov • Dorota Pawlucka • Diego Redondo Taberner • Ron Weerdmeester
	Session 4	Conclusions	
11h55 - 12h00	Session 4	Conclusions Key ideas and directions for the future	Àngels Orduña



PROCESSES4PLANET



PROCESSES4PLANET

Session 1

Key notes: Framing Hubs4Circularity

Why H4Cs?

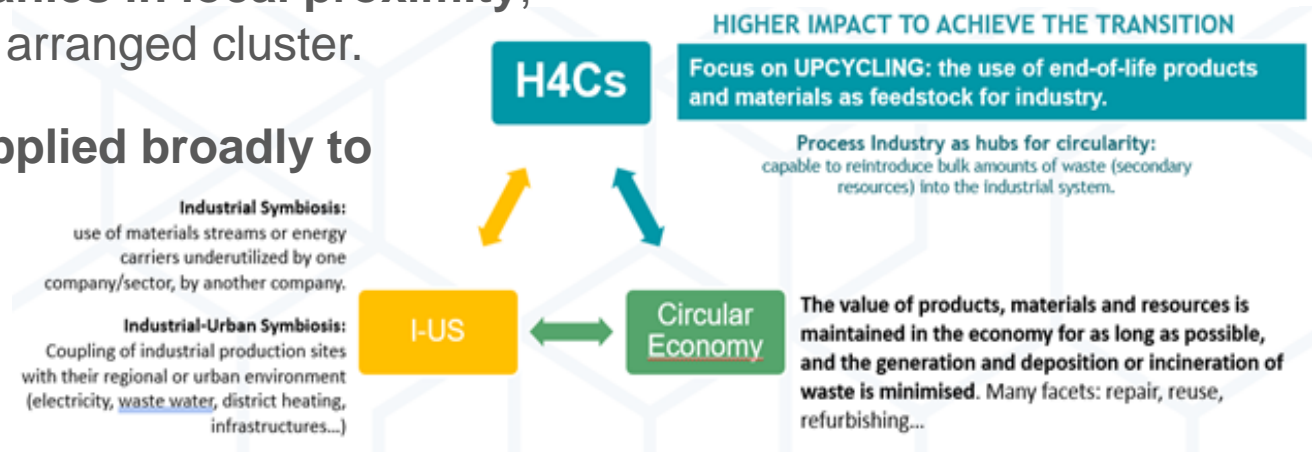
The Pathways to Industrial-Urban Symbiosis and Circular Economy

Antonio Ferrandez Garcia,
Industrial Transformation Unit, DG RTD - European Commission

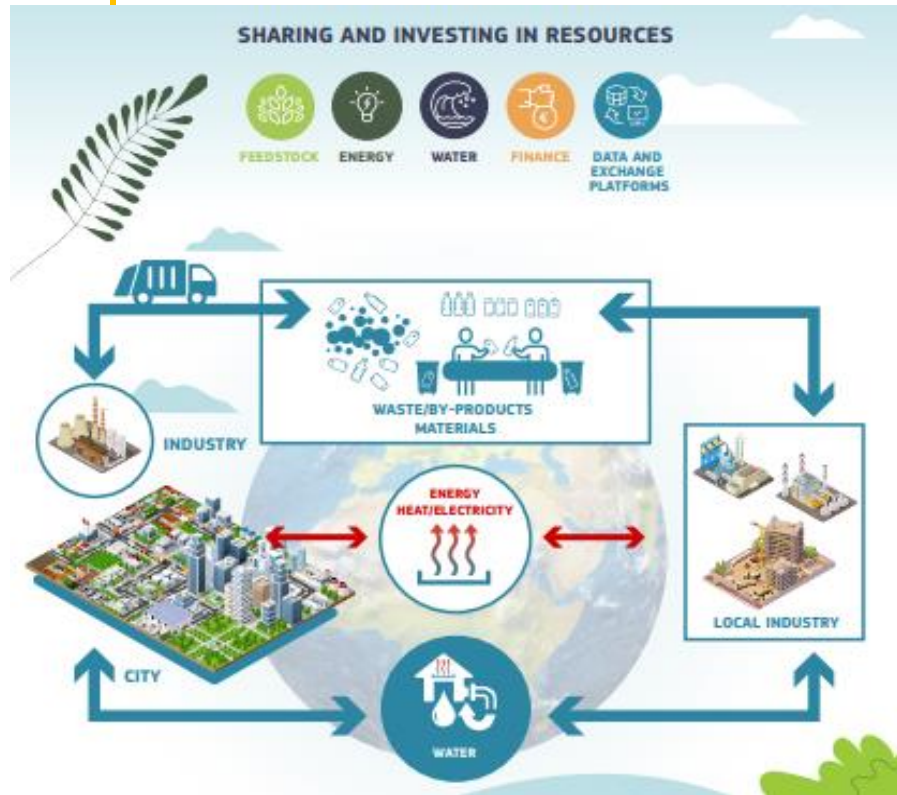
From I-US and Circular economy to H4C

- **Industrial symbiosis** engage “traditionally separate industries” in a **collective approach** to competitive advantage involving physical exchange of materials, energy, water, and by-products
- Transition towards the Hubs for Circularity:
 - From supply-driven business model towards demand-based by-design approach.
 - Start within an **existing group of companies in local proximity**, be it an industrial park or a more loosely arranged cluster.
 - Industrial Symbiosis approach **can be applied broadly to many different industrial sectors.**

	Technology	Business	Ecology	Management
SRL9	Commercialization	Business case continuously controlled, reported and shared	Sustainability benefits proven	Resilient partnership
SRL8	Extended operation	Finalize legal framework	Benefits routinely monitored and reported	Practical operation and management starts
SRL7	Demonstration	Partners committed	Monitoring and reporting begins	Senior management is involved and supports Ind Symb case
SRL6	Prototype demonstration "looks like"	Business case with all details	Permits applied for	Concept for joint management is developed
SRL5	Breadboard demonstration "acts like"	Evaluate competitiveness	Sustainability assessment finalized	Partners start joint evaluation of Ind. Symb. potential
SRL4	Proof of concept validation	Check resources and criteria	Sustainability assessment in execution	Partners indicate interest
SRL3	Proof of concept research (bench scale)	Check fit with strategies of partners	Thorough data collection	First contact with partners
SRL2	Academic research	Develop concept	Rough estimate	Potential partners identified
SRL1	Initial ideas			



Hubs for Circularity – The concept



- Self-sustaining economic industrial ecosystems for:
 - full scale industrial symbiosis and/or urban industrial symbiosis
 - achieving a step change in circular utilization of resources, including CO₂, within a given representative geographical area
 - strong technological focus and process industry dimension
- Specific implementation:
 - funding strategies
 - participation of all stakeholders (Industry, SMEs, local authorities, educational institutions and civil society)
- Common target :
 - collectively achieve and demonstrate at scale a leap towards circularity and carbon neutrality in the use of resources (feedstock, energy and water) in a profitable way.



H4C funding summary

- The first Industrial Symbiosis projects kicked off in 2015.
- 28 projects have been granted a total of € 168M under Horizon 2020. Success stories: CORALIS, EPOS, SYMBIOPTIMA, SHAREBOX, intelWATT
- Under Horizon Europe Cluster 4 WP 2021-22: 1 RIA on IS (3 projects), 1 IA on U-IS (3 projects) and 1 CSA (2 projects) have been granted € 72M.
- In Cluster 4 WP 2023-24: at least 4 H4Cs should be launched and running by 2026. 2023 call: 2 projects funded 1st of January 2024 (IS2H4C and HURRICANE) with € 39 M, in 2024: 6 proposals to be evaluated and 2 projects to be funded (estimated budget of € 40M).
- The initiative will continue each year with IA projects intensifying the deployment at high TRLs and larger budget till the end of the seven-year programme.
- Two European Community of Practice supporting Hubs for Circularity (H4C Ecop and H4C Europe) are now fully running. They will be the backbone of the initiative, gathering knowledge and best practices for technological and non-technological matters, supporting the networking, and offering all the necessary support services to the hubs.

H4C Topics in Horizon Europe

What are we looking for?

- **Accelerate Green industrial transition** through implementation of IS, I-US and circularity in large scale demonstrators.
- Innovative approach that **brings together companies from different business sectors** with the **aim of improving cross industry resource efficiency** through the commercial trading of materials, energy and water and sharing assets, logistics and expertise.
- Clustering industries / stakeholders / citizens around common green targets.
- Initiate a **systemic change in prosperity** for region and cities rethinking completely interactions within a business to territory view to create win- win interactions with the existing social ecosystem.
- Seed 25 light-house H4Cs by 2030

H4C – what do we need?

- **Intensify deployment** of Urban-Industrial symbiosis (IS) in industrial parks/clusters and surrounding ecosystems.
- Necessary to generalize **decarbonisation pathways** of resource intensive sectors, combination of new symbiotic businesses and management strategies with innovative technology-based enablers.
- **Opportunity** for local authorities and energy intensive industries to implement innovative **collaborative approaches** and integrated business models maximizing the circularity of resources (energy, water, and materials).
- Novel innovation dynamic within the industry participating in H4Cs, **benefitting the whole surrounding ecosystem** (region & cities).
- Necessary to Critical Raw Materials (**CRM**) and Rare Earth Elements (**REE**) **recovery**.

H4C – EC Expectations

- **Measure results & Impact**

- Align KPIs of P4Planet (waste, secondary materials, water, number of H4C) and the ECoP
- Upcoming investment review report

- **Potential for replication**

- Horizon Europe Strategic Plan 2025-2027 – 6 expected impacts in CL 4
- Updated SRIA of the Processes 4 Planet Partnership
- Critical Raw Materials Act – € 200M for 10 additional H4C – MS funding programmes?

- **Single central base**

- How to drive it towards the two above objectives?
- Link with [Horizon Results Platform | EU Funding & Tenders Portal \(europa.eu\)](https://europa.eu/eu-funding-portal/)

Thank you

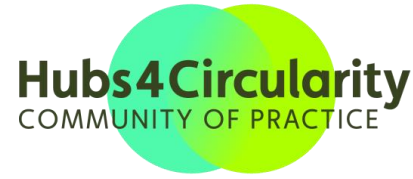
Antonio.FERRANDEZ-GARCIA@ec.europa.eu



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PROCESSES4PLANET

Session 1

Key notes: Framing Hubs4Circularity

What is at stake for the process industry?

The industrial perspective

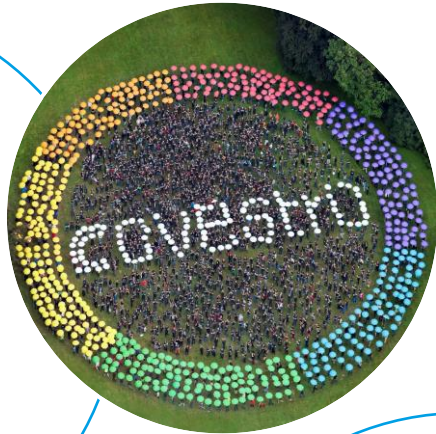
Dorota Pawlucka,
Global Alliances Manager, Covestro AG,
A.SPIRE Board Member

Covestro – leading in the world of plastics



Strong

- €15.9 bn in sales
- ~17,900 employees¹



Useful

- Plastics, pre-products and solutions
- For many industries



Global

- 50 production sites globally
- Close to customers and partners



Innovative

- ~1,500 employees in research and development
- 80 years of ideas and inventions



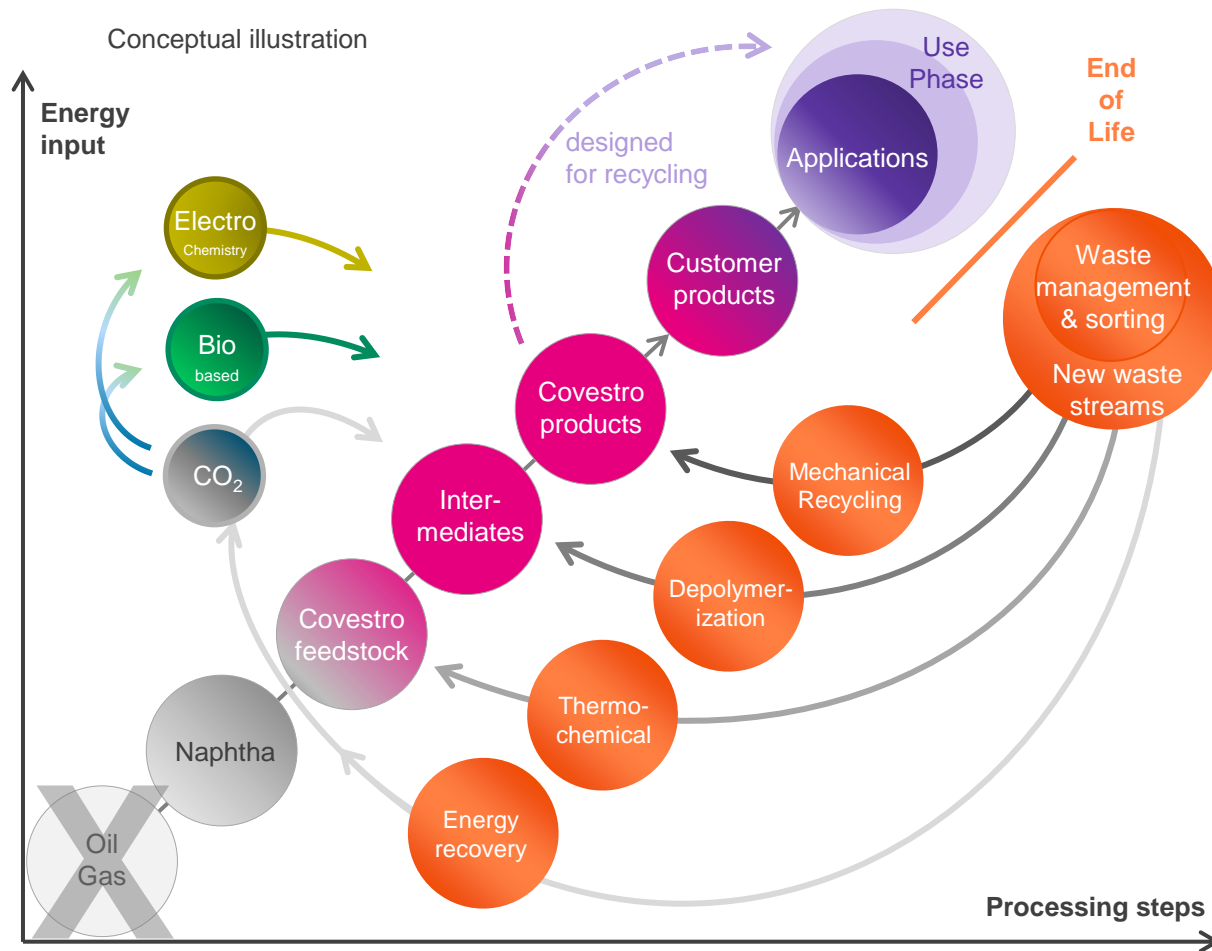
Plastics

Enabler of today's modern life



Our vision: Closing material and carbon loops

For a fully circular, climate neutral and competitive economy



COVESTRO APPROACH TO CIRCULARITY

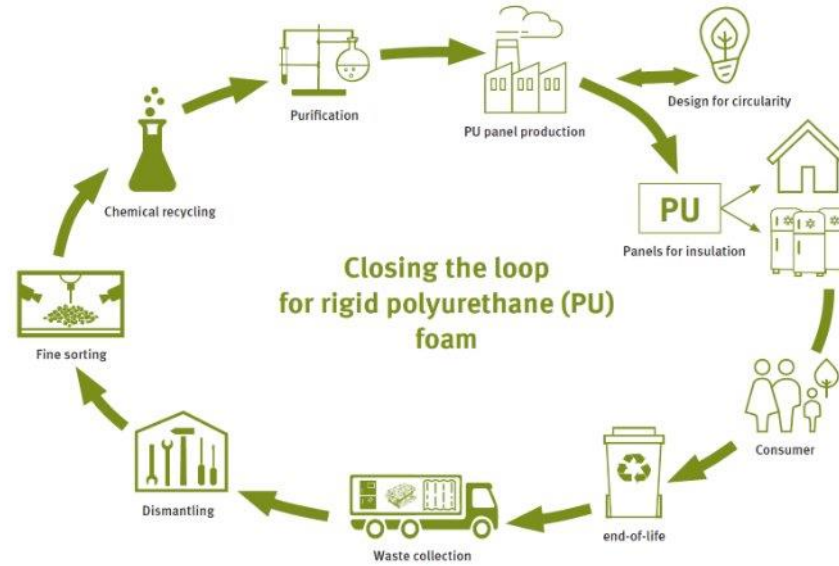
- 1 Renewable energy, energy efficiency and integration within industrial parks
- 2 Alternative raw materials to outperform fossil-based
- 3 Innovative recycling technologies and value chains for end-of-life solutions
- 4 Cross-industry collaborations and investments in regions



Industry: systemic transition from a problem to a solution



Both in own production and in symbiotic connections in industrial parks/clusters, and along value chains

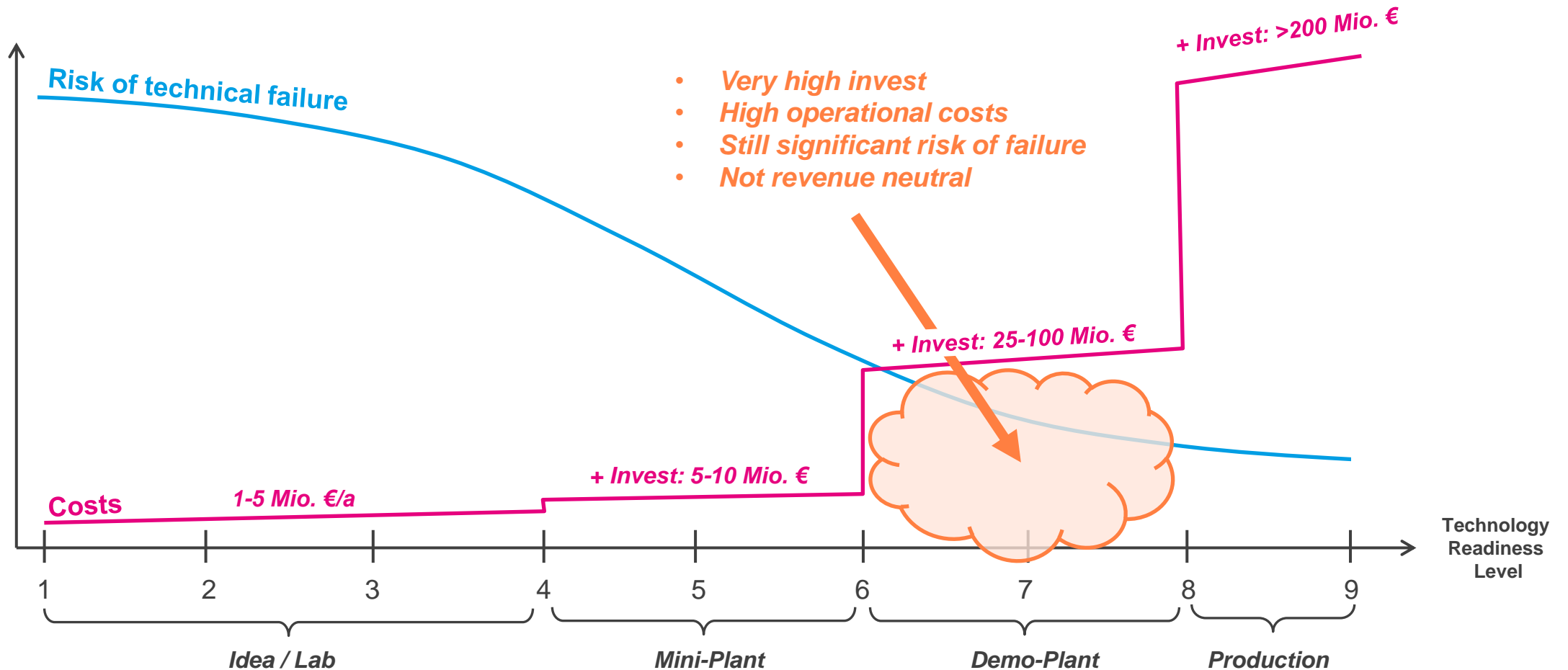


Funded from the European Union's Horizon 2020 under grant agreement No 101036854

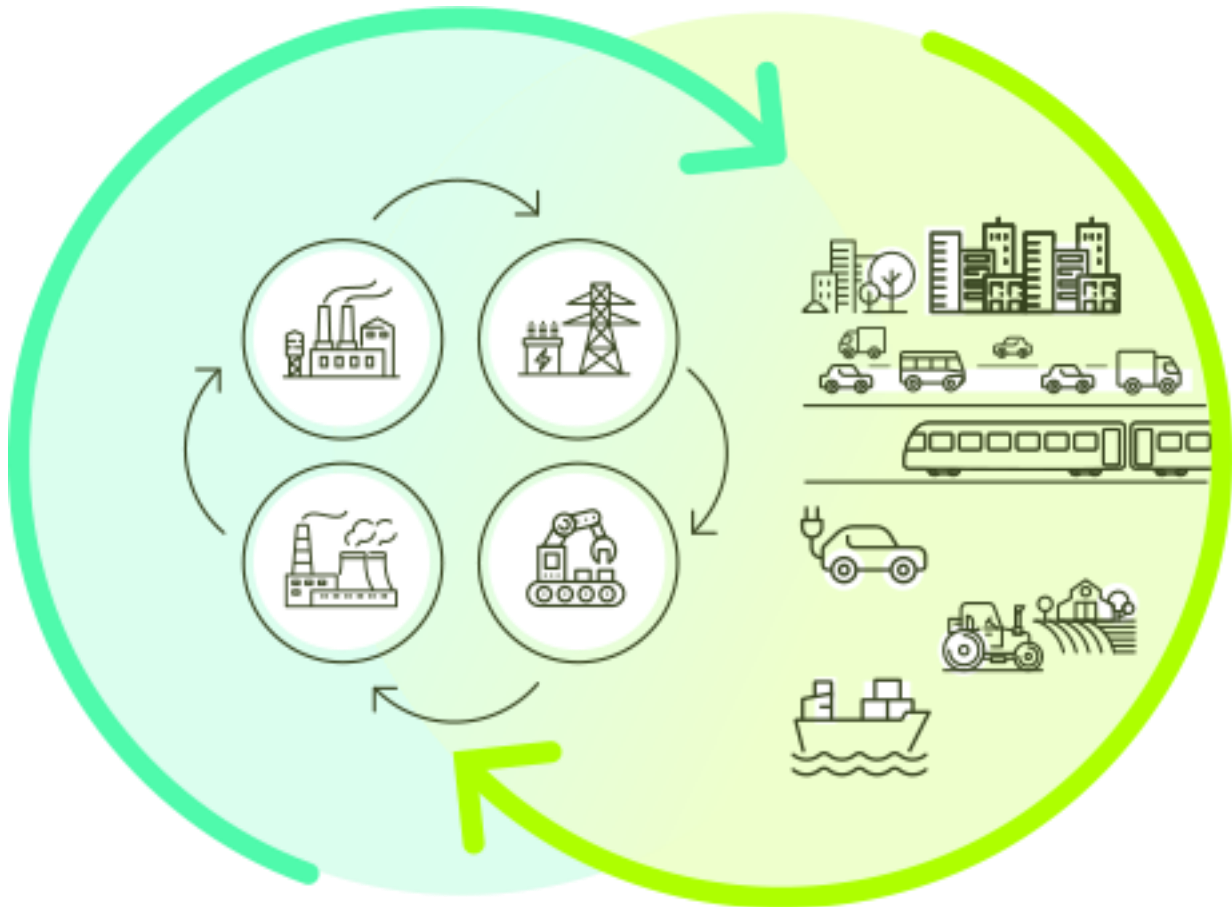


Technology development

Realization is the real challenge



- Tech development requires significant resources and are risky
- Multiple value chains need to be transformed all at the same time
- Infrastructural synergies, funding programmes and co-investments at later TRLs needed



Socio-technical ecosystems for full scale **industrial symbiosis, industrial-urban symbiosis and circular economy** closing energy, resource and data loops at regional scale

Accelerating the scale-up of local and cross-regional industrial-urban ecosystems across Europe

Engaging with all relevant stakeholders to align in co-investing into sustainability

What we need and H4Cs can help with...



- 1** Develop a portfolio of dedicated technological circular solutions to address the variety of products, materials, energy, CO₂, water and electricity etc. as there will be no “one-size fits all” (address both Industrial Symbiosis between companies in industrial parks vs. longer value chains for End of Life)
- 2** Provide shared / managed / supported demonstration facilities for circular technologies and solutions and trustful collaboration spaces.
- 3** Help to build collaborative circular value chains to get access to the right alternative resource in the right quantity and quality, rooted in regions, but partly cross-regional, able to collect higher-value materials, exploiting synergies in solutions, capacities, infrastructures, networks
- 4** Promote framework conditions for stable long-term business models: regulation, faster permits and availability of finance (aligned EU and regional), regional support/co-investments
- 5** Consumer and customer transformation towards circular economy to support sustainable solutions



Thank you!

dorota.pawlucka@covestro.com



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Session 2

Where are we now? H4Cs cases in practice

Emerging H4C from P4Planet projects: Case 1 – REDOL

Diego Redondo Taberner,
Project Manager at CIRCE

Problem and significance



500 kg per capita
of SUW in the EU

2020



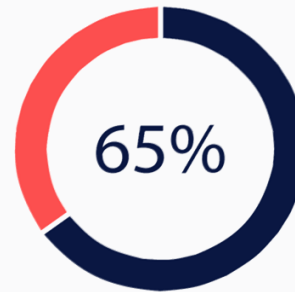
CE Action Plan
(COM/2020/98)



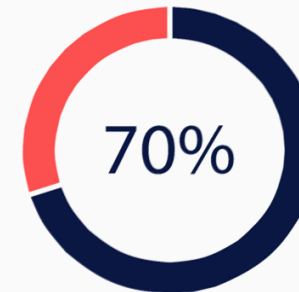
2030



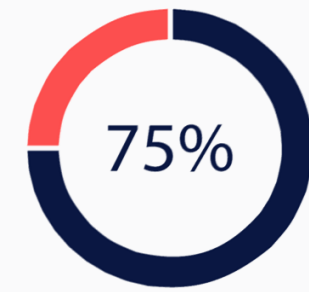
2030 targets for recycling



Solid urban waste
(SUW)



Construction
demolition waste
(CDW)



Packaging

REDOL Objectives

1

To develop and demonstrate novel management systems and processing technologies for the valorisation of SUW to be used as feedstock for other sectors and/or across value chains.

3

To enable the achievement of a zero SUW landfilling approach in Zaragoza by accomplishing 55-100% recycling rates in REDOL value chains while creating new sustainable economic activity in the Aragon region.

5

To assure a successful dissemination and exploitation of the project, through a strategic and I-US oriented commercialization plan, dedicated business models and key stakeholders' engagement

2

To obtain recycled secondary materials from SUW ready to be fed in downstream processes for the further production of circular products, closing the production loop.

4

To establish a roadmap for the implementation of REDOL solutions in other urban environments and industrial areas, tackling technical and non-technical barriers.

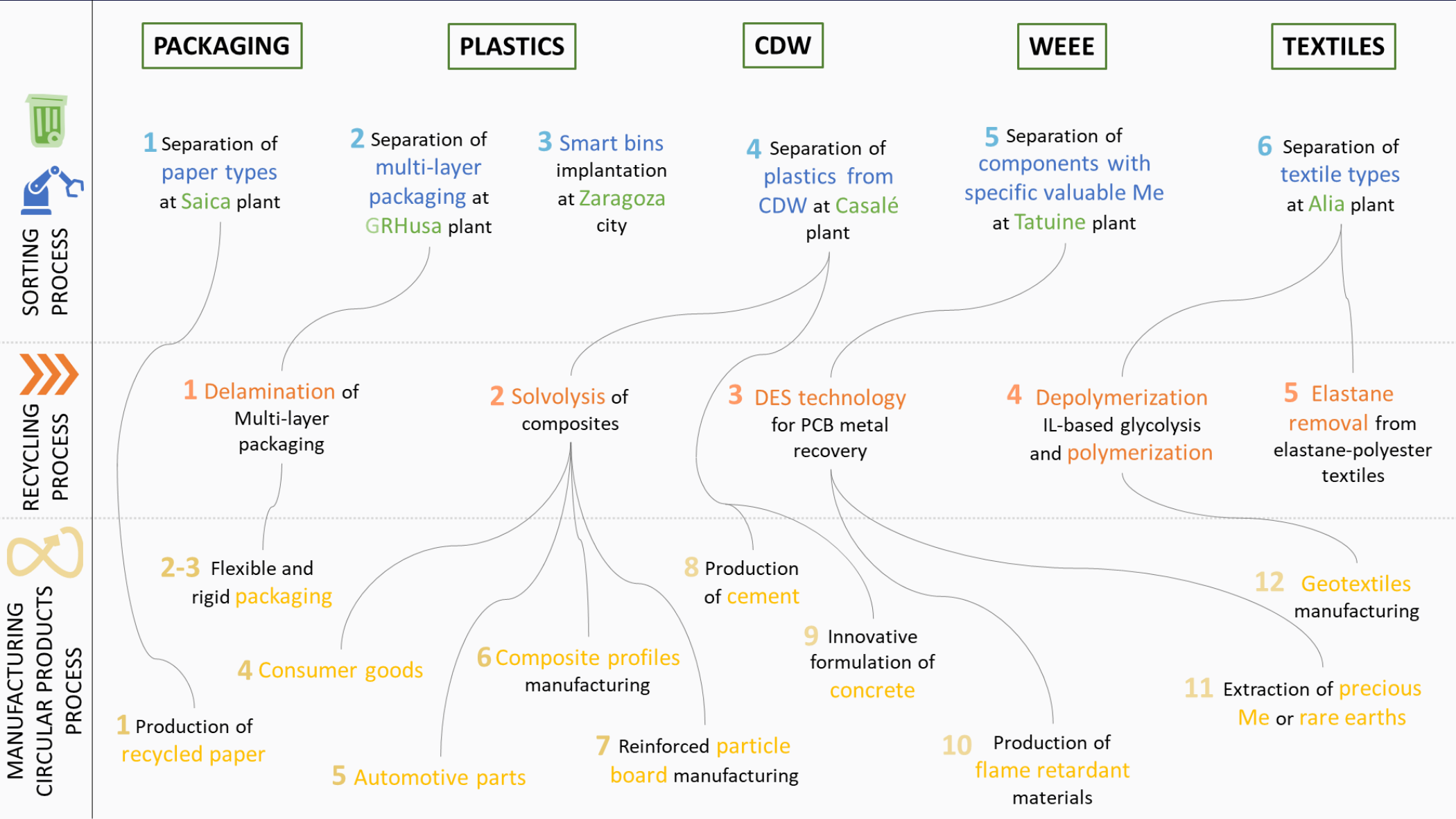
REDOL: First steps for creating a new HUB



- 1 | Characterization of value chains and key players interaction
- 2 | Addressing non-technical barriers for the valorisation of SUW and their use as industrial feedstocks
- 3 | Definition of the KPIs and impact evaluation methodology
- 4 | Design of the governance structure for I-US interaction management



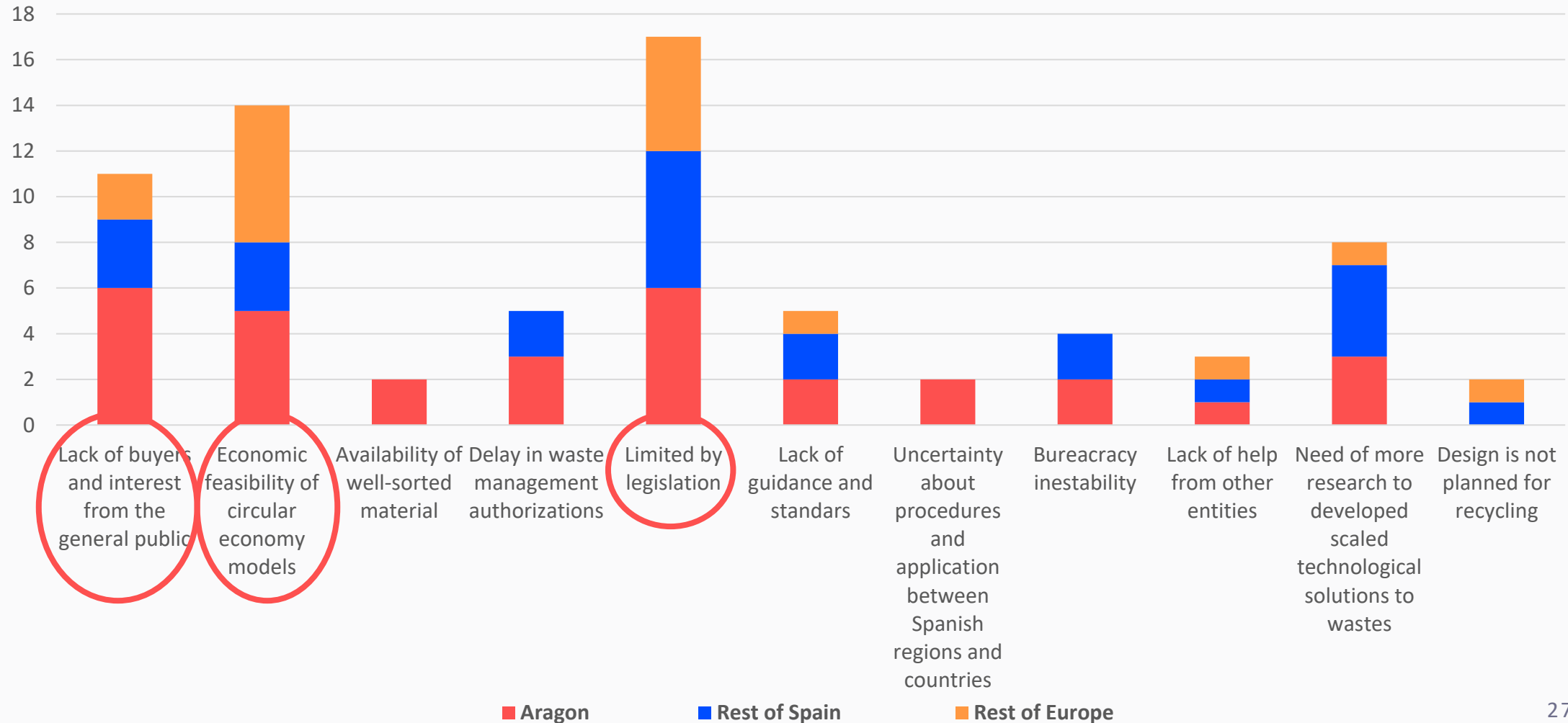
1.- Characterization of value chains and key players interaction



2.- Addressing non-technical barriers for the valorisation of SUW and their use as industrial feedstocks



Main barriers





3.- Definition of the KPIs and impact evaluation methodology

Define main variables to be monitored and/or calculated for measuring the progress of REDOL activities and analyse the project main results

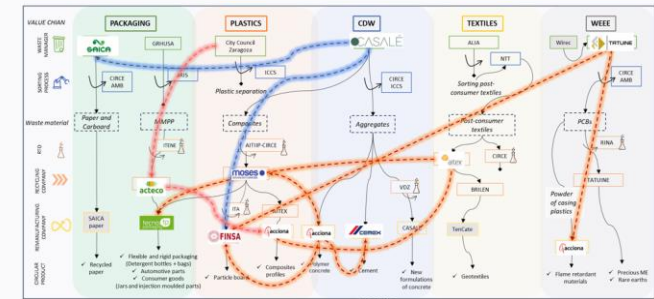
Criteria	KPIs
Environmental	Landfilling avoided
	Hazardous waste (Substances of concern in material outflow)
	Climate change – total, fossil, biogenic and land use
	Use of secondary material
Technical	Recycling rate
	Product obtained
	Valorising rate of waste
	Recycling rate of waste
Economic	Number of revenue streams incorporated
	Increase in revenue from the production of new circular products
	Reduction of waste management costs (costs avoided €)
	Number of successful business models implemented/developed
Social	Recycling policies affected by solutions
	Local employment
	Technology development
	Knowledge creation
	Publications published



4.- Design of the governance structure for I-US interaction management

Phase 1 **Characterization** of each value chain and the role that each partner plays within it.

Phase 2 Promote the exploration of **innovative collaboration opportunities** among consortium partners that extend beyond the scope of REDOL activities.



Phase 3 Strengthening **integration and collaboration** across value chains also with external stakeholders

GOVERNANCE MODEL
Strategic alliance
+
Long-term agreements with mechanisms for continuous review and adaptation

Next steps



- 1 | Guidelines of recommendations, regulations and barriers
- 2 | Social, industrial and political awareness
- 3 | Digitalisation and GDPR: REDOL platform
- 4 | Understanding the potential of I-US: REDOL impact quantification
- 5 | Roadmap for replicability of solid urban waste value chains across EU



Thank you!

Diego Redondo – CIRCE

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www.redolproject.eu



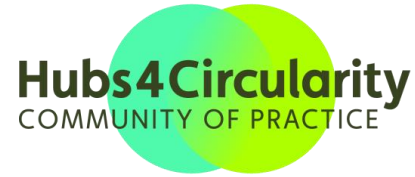
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Session 2

Where are we now? H4Cs cases in practice

Emerging H4C from P4Planet projects: Case 2 - MOBICCON-PRO

Kalin Marinov,
Head of International Affairs and Strategic Development,
Glavbolgarstroy Holding



GLAVBOLGARSTROY (GBS)

Who are we:

- One of the largest construction corporate groups in Bulgaria and South Eastern Europe
- **54 years of experience**
- ≈ 0,5 bln USD annual turnover
- 2000 employees (30% women)

Full spectrum of construction works/services (civil engineering, residential, industrial, energy & transport infrastructure)

Where we stand:

- Projects in Europe, Central/North Asia and the Middle East

CONSTRUCTION SECTOR & ENVIRONMENT

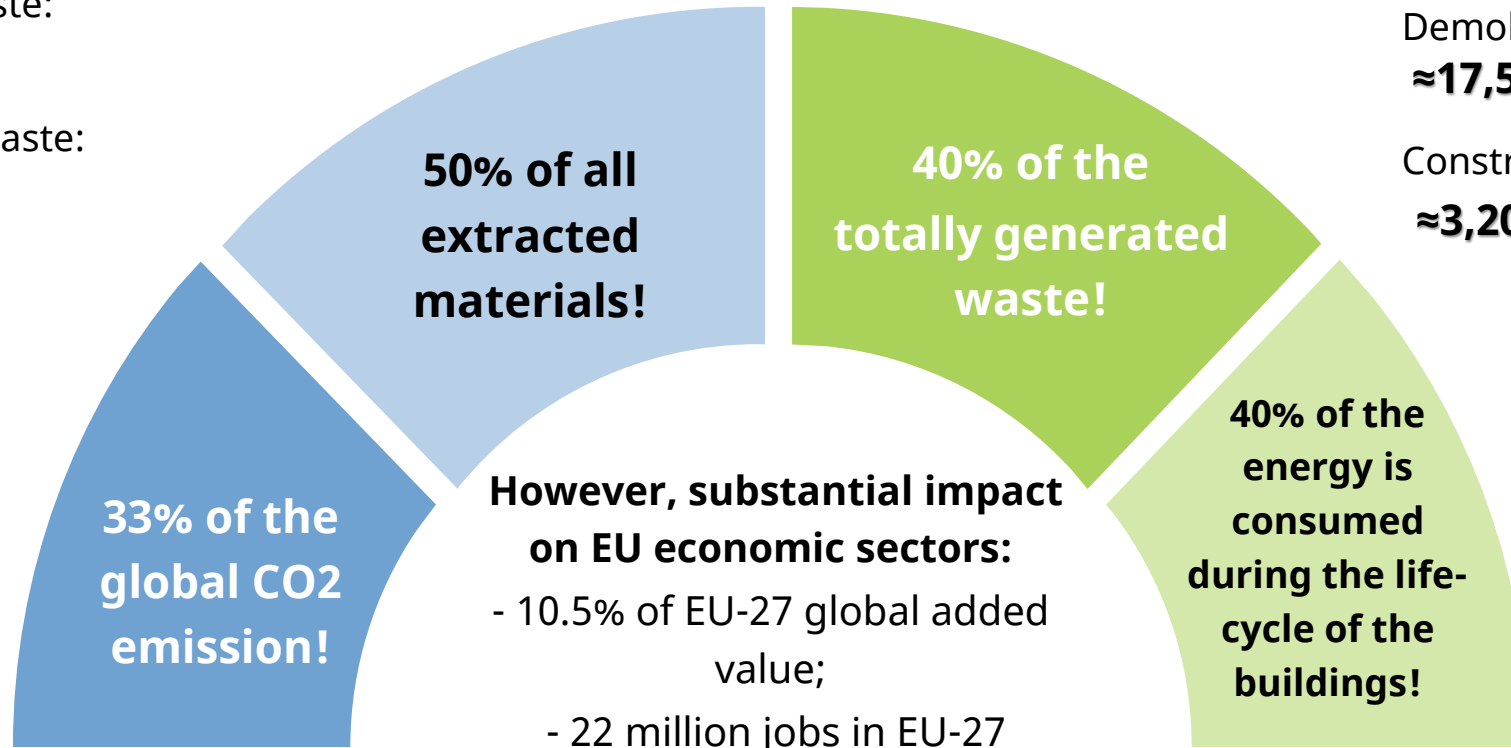
“By 2050, the world will be consuming as if there were three, while annual waste generation is projected to increase by 70%” – * EU Circular Economy Action Plan

A Monolithic Building:

Demolition Stage / Waste:
≈51,000 tones!

Construction Stage / Waste:
≈6,500 tones!

Construction sector footprint:



A Conventional Factory:

Demolition Stage / Waste:
≈17,500 tones!

Construction Stage / Waste:
≈3,200 tones!



Project: MOBICCON-PRO

Consortium:

- ◆ 10 partners
- ◆ 4 EU Member states (Belgium, Bulgaria, Denmark and France)
- ◆ 1 EU Candidate Country – Serbia

Financing Programme

HORIZON EUROPE

Project Timeline



Budget



13,000,000 **EUR**







MOBICCON-PRO
MOBILE AND INNOVATIVE CIRCULARITY FOR CONSTRUCTION PRODUCTS



Co-funded by the
European Union



MOBICCON-PRO: Technology novelties & innovations

- ◆ A mobile pilot plant for production of innovative recycled construction materials.
- ◆ Prototyping of innovative equipment and deployment of SWS.
- ◆ **NO waste water** – complete water recycling.
- ◆ Drying and innovative milling.

MOBICCON-PRO: Icebreaking & Smashing Stereotypes

- ◆ Establishment of Territorial Circular Cluster (TCC) – providing solid foundations for joint initiatives – enhancing collaboration – public authorities/ business/ academia.
- ◆ Pushing for optimization of the legislative frameworks – construction waste management.
- ◆ Pushing for optimization of the legislative frameworks – recycled construction materials.



Scale up the production and use of high-quality recycled construction materials in the region of South-Eastern Europe!



MOBICCON-PRO

Goals:



MOBICCON-PRO
MOBILE AND INNOVATIVE CIRCULARITY FOR CONSTRUCTION PRODUCTS



Co-funded by the
European Union

GHG Emissions Reductions:



Processing of C&D Waste

55,000 - 115,000 tones/year



% Emissions savings vs. virgin materials

67,6% – 91,9%



Resource Efficiency:



Recycled products & materials

49,500 – 103,500 tones/year



Emissions savings due to use of recycled
& recovered products

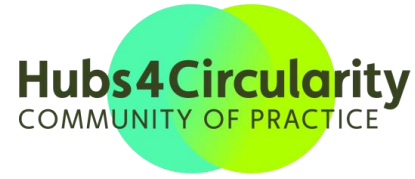
Transport Emissions Savings (Mobile plant concept):



Emissions savings from transport (-35 km)

Mobile plant - reduces transport
of both waste & recycled materials.





PROCESSES4PLANET

Session 2

Where are we now? H4Cs cases in practice

Accelerating circular economy and industrial symbiosis through H4Cs

Ron Weerdmeester,
H4C Community of Practice, PNO Consultants

Up-to-date H4C and I(U)S
Resources - Curated
Knowledge, Guidelines,
Essential Tools, and Valuable
Links

2.590 Patents
20.693 Papers
2.698 Projects

1000+ registered users

Discussion Forum

Challenges (*upcoming*)

Community access

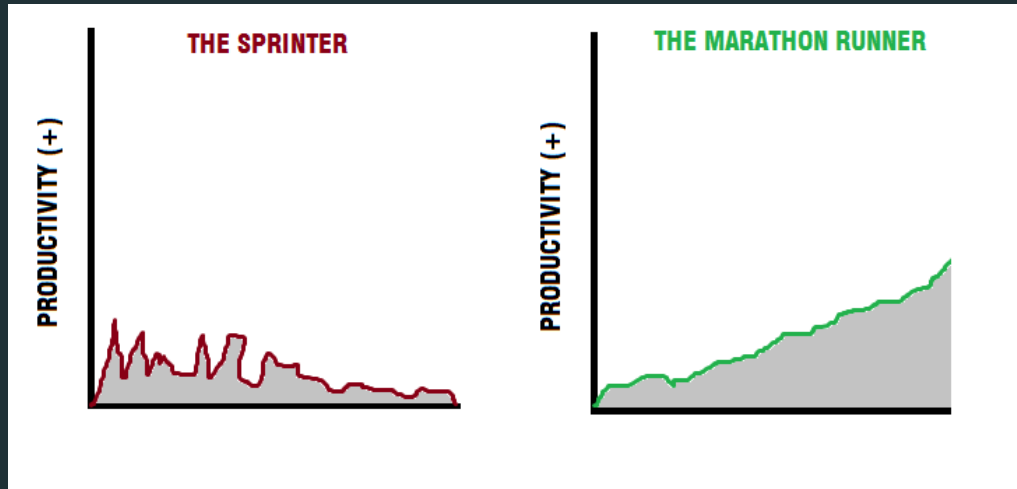
Hubs4Circularity
COMMUNITY OF PRACTICE

The screenshot displays the Hubs4Circularity website interface. At the top, there is a navigation bar with 'Home', 'Administration', and 'Contact Us' links, and a user profile for 'Taira Colah PNO'. A left sidebar contains a menu with categories like 'Results of IS/I-US/CE Projects', 'Technologies', 'Knowledge', 'Tools', 'SCALER's 100 most promising IS synergies', 'Skills and education', 'Community members', 'External Contents', 'Patents', 'Papers', 'Funded projects', 'Funding opportunities', and 'Results of IS/I-US/CE Projects'. The main content area features a circular diagram of a circular economy, a search bar, and a 'Last Updates' section with three featured articles: 'DryFiciency - Waste Heat Recovery in Industrial Drying Processes', 'Plastics Waste Reprocessing', and 'Plastic Packaging Transport Optimisation'. A 'Our Stakeholders' section includes icons for Technology Providers, Public Authorities, Facilitators, Industries, and Educational Organisations. A large green banner at the bottom of the screen reads 'REGISTER AT: www.h4c-community.eu'. The footer contains the Hubs4Circularity logo, the European Union flag, and the text 'Funded by the European Union'.

REGISTER AT:
www.h4c-community.eu

REQUIREMENTS TO ACCELERATE H4Cs

Facilitating Long-Term Programmes vs. Projects



- H4Cs CORE PURPOSE:
Develop and implement a portfolio of technology and industrial innovations with the capacity to deliver circularity at scale
- Build sustainable H4C programmes that incubate MANY IS and CE projects to generate impact

REQUIREMENTS TO ACCELERATE H4Cs Supporting the different phases of facilitated H4C development

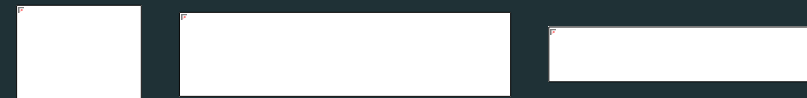


<p>1</p> <p>Seed H4C</p> <p>Starting from scratch with 1-3 organisations to setup a starting hub</p> <p>Approx. €50k/year investment available, seeking €500k+ funding for 2 years of starting hub stage</p>	<p>2</p> <p>Starting H4C</p> <p>Governance structure + business plan for setting up FOAK value chains</p> <p>Commit partners to develop initial B2T strategy.</p> <p>Seeking €1.5+ million invest/year to establish IUS demonstrators</p>	<p>3</p> <p>Intermediate H4C</p> <p>At least 1 FOAK value chain demonstrator (TRL7)</p> <p>Focus on advancing B2T strategy, FOAK value chain demonstration.</p> <p>Seeking €10+ million invest/year for scaling to TRL8</p>	<p>4</p> <p>Advanced H4C</p> <p>At least 1 FOAK operational value chain (TRL8)</p> <p>Actively implementing B2T plan to accelerate IUS network and implementing their TRL8 FOAK value chains</p> <p>Seeking €30+ million invest/year for scaling to TRL9.</p>	<p>5</p> <p>Mature H4C</p> <p>Multiple FOAK commercial value chains (TRL9).</p> <p>Continuous IUS network improvement, lighthouse for export replication to other regions.</p> <p>Seeking €100+ million invest/year for expansion + export</p>
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Source: United Circles – Horizon Europe H4C call 2024

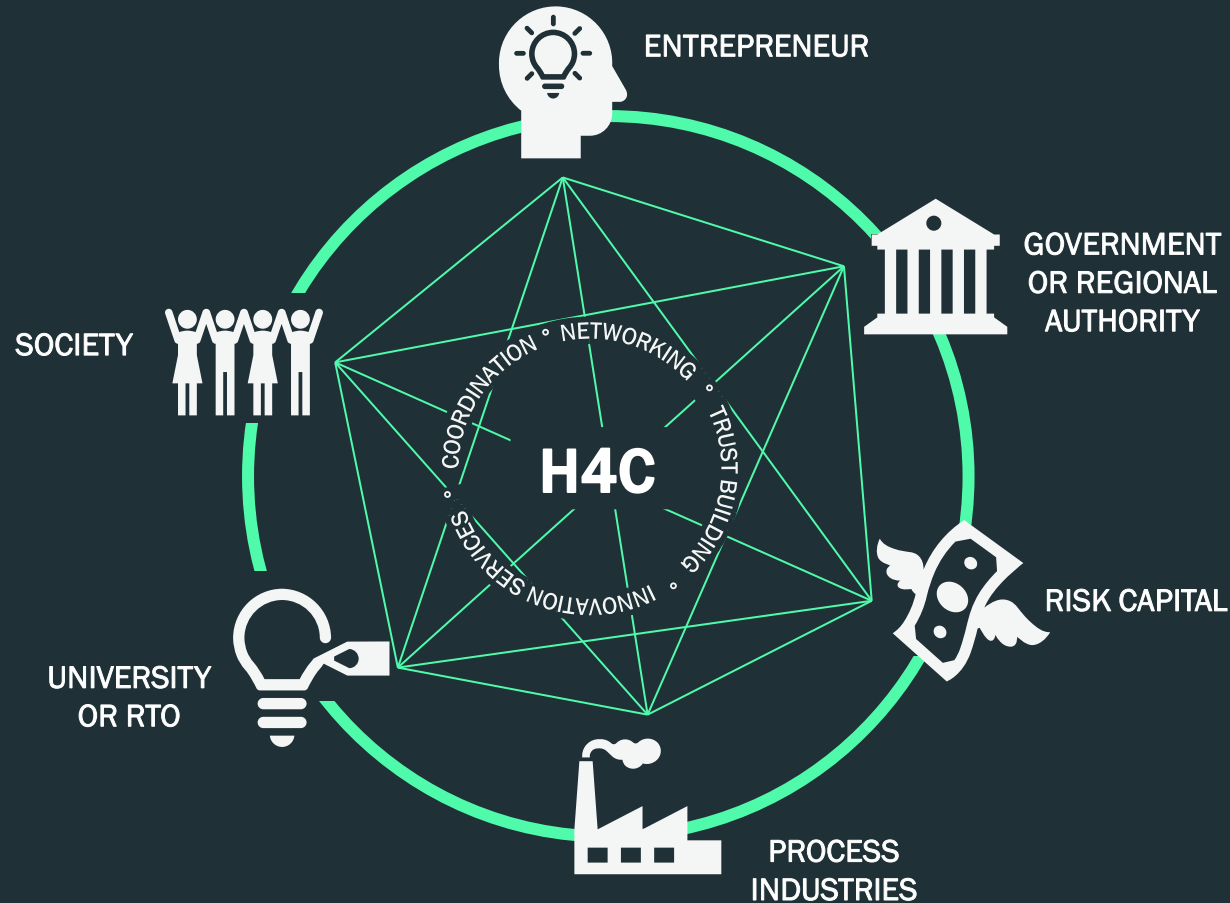
Support for:

- Business2Territory plans
- Facilitating Organisations (FO)
- Long-term financial stability for running H4C



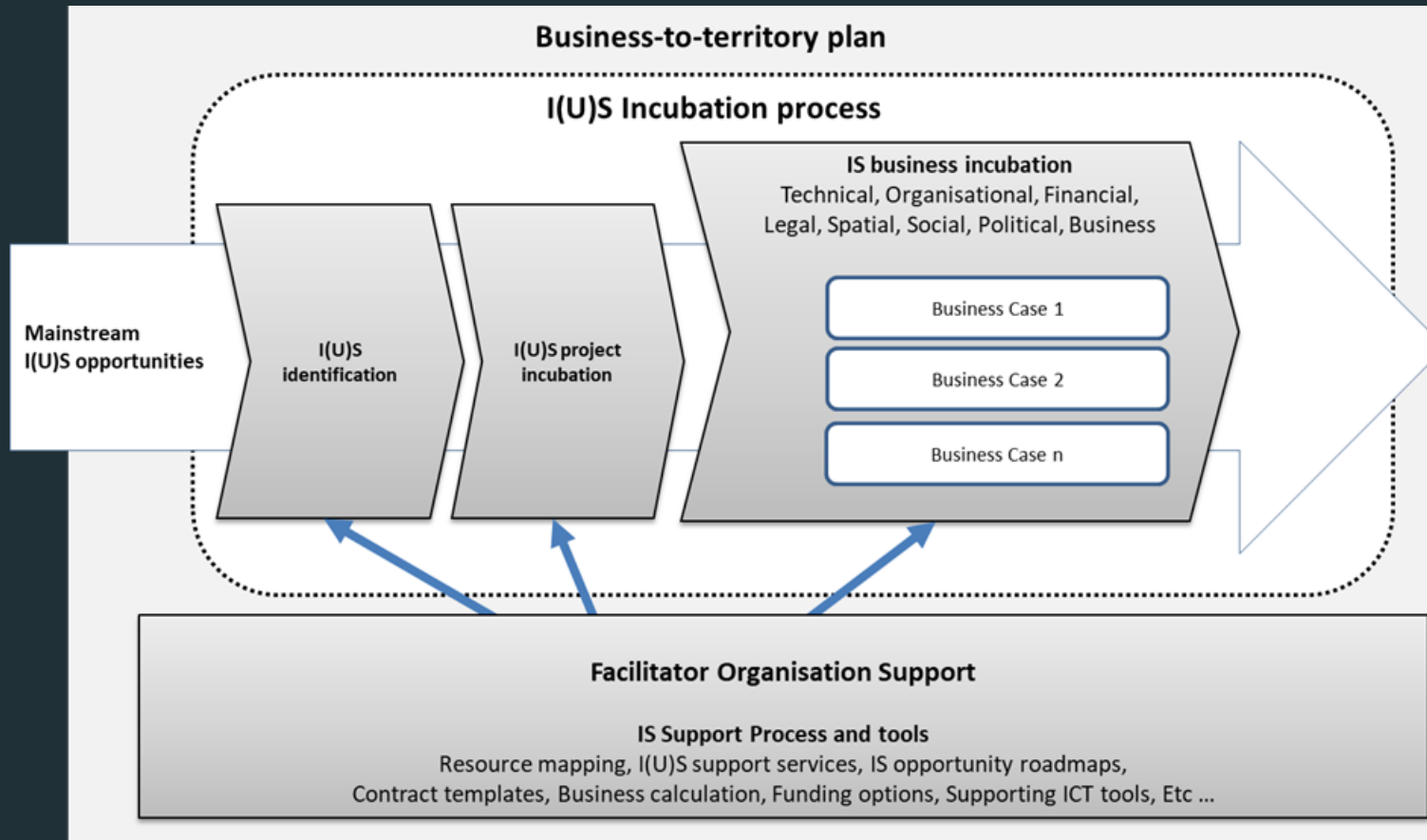
REQUIREMENTS TO ACCELERATE H4Cs

Governance and Facilitation



- Strategic planning advocacy
- Facilitated incubation of initiatives
- Joint governance of industrial clusters
- Importance of Facilitation Organizations (FOs)
- Addressing barriers to investment and collaboration (e.g., risk management, trust)

Supporting the IS incubation process

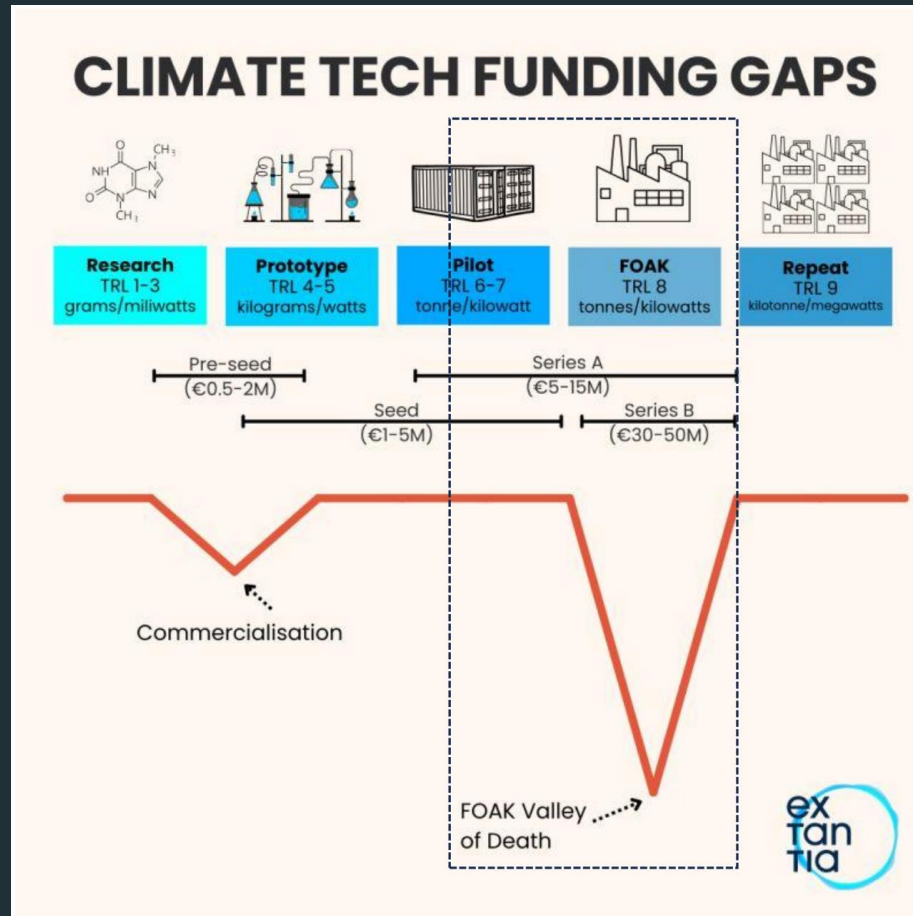


Support for:

- Resources Mapping
- Ideation of new value chains
- Technology scouting
- Stakeholder engagement
- Incubation of new I(U)S and CE business cases
- Blended financing strategy

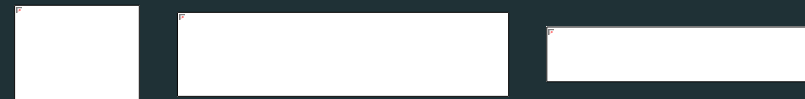
REQUIREMENTS TO ACCELERATE H4Cs

Blended Funding and Financing Strategies



- (hybrid) investments to overcome funding gaps and drive innovation
- Public funding for Facilitation Organizations (FOs)
- Cascade funds to ignite new value chain collaborations
- Joint (R&D or I(U)S infrastructures
- Overcoming residual non-technological risks (e.g. economic viability)

Source and credits: <https://extantia.com/>
* TRL = Technology Readiness Level



REQUIREMENTS TO ACCELERATE H4Cs

Enabling Policies and Legislation



The screenshot shows the top portion of a web page. At the top left is the 'EASTMAN' logo. To its right is a blue circular menu icon with three horizontal lines. Below the logo is the text 'Media center' with a downward arrow. A breadcrumb trail reads 'Home / ... / News and stories / Eastman to invest up to \$1 billion to accelerate circular economy through building world's largest molecular plastics recycling facility in France'. The main content area has a light blue background. It features the heading 'PRESS RELEASES' in blue. The main headline is 'Eastman to invest up to \$1 billion to accelerate circular economy through building world's largest molecular plastics recycling facility in France', with 'world's largest molecular plastics recycling facility in France' in a larger, bold blue font. A small blue circle with a white 'x' is overlaid on the left side of the headline. Below the headline is the text 'January 16, 2022 · 6 min read'.

- Predictable (impact driven) legislative landscape on resource efficiency
- Green targets beyond CO2 emission reduction
materials footprint, 0-pollution, biodiversity, water scarcity
- Combined with financial support (e.g. ETS and IF type)
- End-Of-Waste criteria for H4Cs



Thanks!

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www.h4c-community.eu

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Session 3 - Sectoral potential of H4Cs in different EU regions

Roundtable discussion

Moderator: Àngels Orduña

Panellists:

- Antonio Ferrandez Garcia
- Kalin Marinov
- Dorota Pawlucka
- Diego Redondo Taberner
- Ron Weerdmeester.

Session 4 – Conclusions

Àngels Orduña

Executive Director A.SPIRE

Hubs4Circularity Community of Practice and A.SPIRE Webinar

EXPLORING THE SECTORAL H4CS POTENTIAL IN EU REGIONS

26 September 2024
10h30 - 12h00 CET

End of the webinar.
THANK YOU!

info@aspire2050.eu

