

A.SPIRE Hubs4Circularity (H4Cs) Workshop

EXPLORING THE SECTORAL H4CS POTENTIAL IN EU REGIONS

The 3rd International Sustainable Energy Conference ISEC 2024

Wednesday 10 April 2024 at 15h30–17h00

Graz, Austria



Key notes: framing Hubs4Circularity

Why H4Cs? The Pathways to Industrial-Urban Symbiosis and Circular Economy

by **Antonio Ferrandez Garcia**, Industrial Transformation Unit, DG RTD, European
Commission



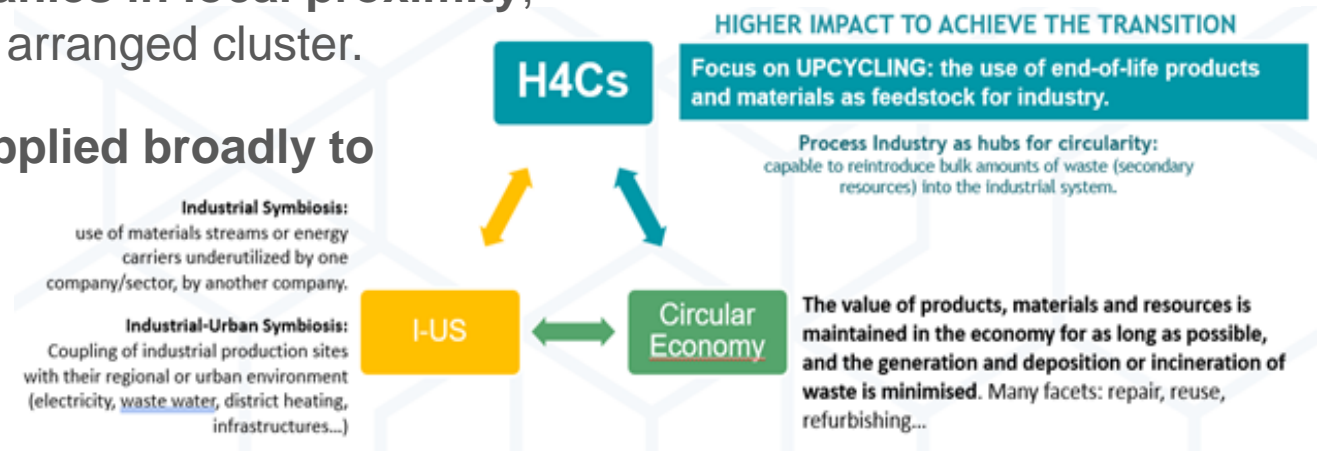
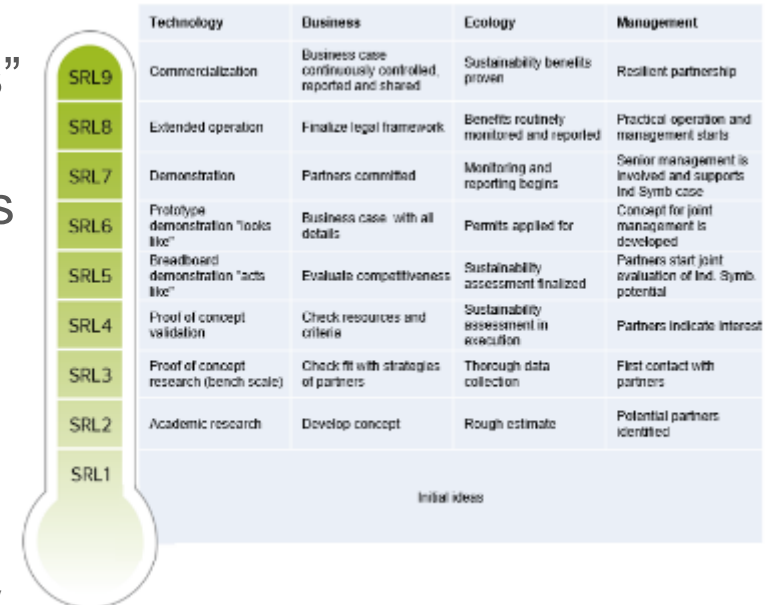
Hubs for Circularity

Why H4C? The Pathways to Industrial-Urban Symbiosis and Circular Economy

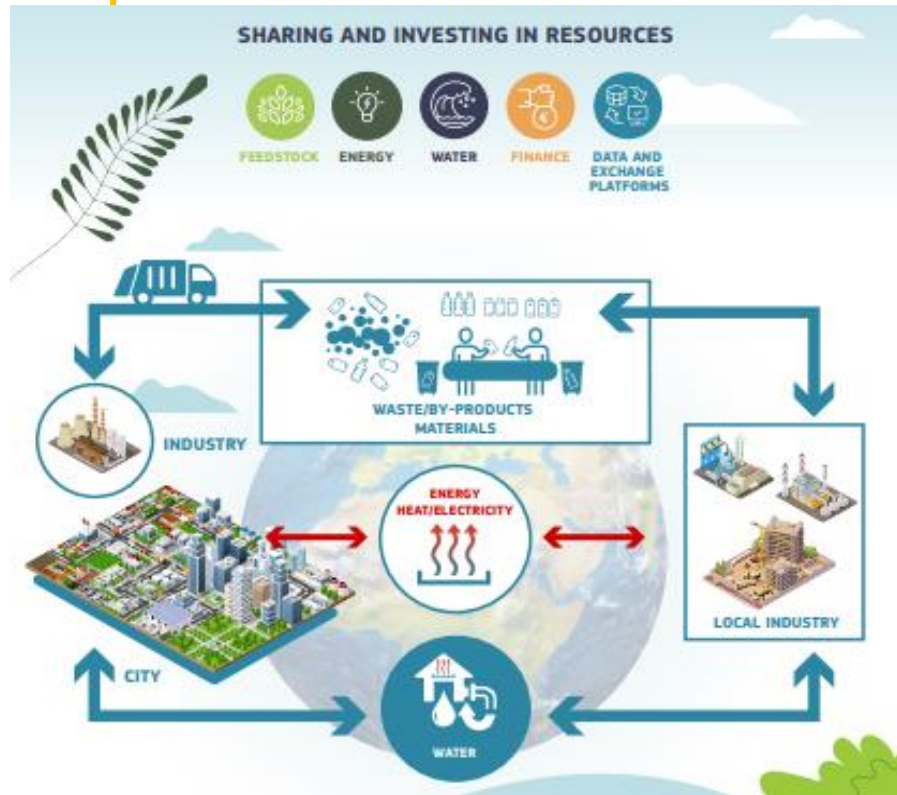
10/04/2024

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**.



Hubs for Circularity – The concept



- First-of-a-kind, lighthouse demonstrator plants of commercial size
 - industrial symbiosis and/or urban industrial symbiosis
 - achieving a step change in circular utilization of resources and GHG emission reductions within a given representative geographical area
 - strong technological focus and industrial 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 in process and energy 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 \(europea.eu\)](https://europea.eu)

Thank you

Antonio.FERRANDEZ-GARCIA@ec.europa.eu



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Key notes: framing Hubs4Circularity

What is at stake for the process industry? The industrial perspective

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



Hubs4Circularity

– What is at stake for the process industry? An industrial perspective

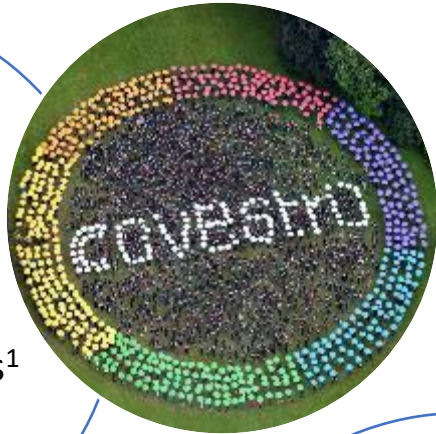
Dorota Pawlucka
Global Alliance Manager at Covestro
Board Member at A.SPIRE

ISEC 2024, Graz, 10.04.2024

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



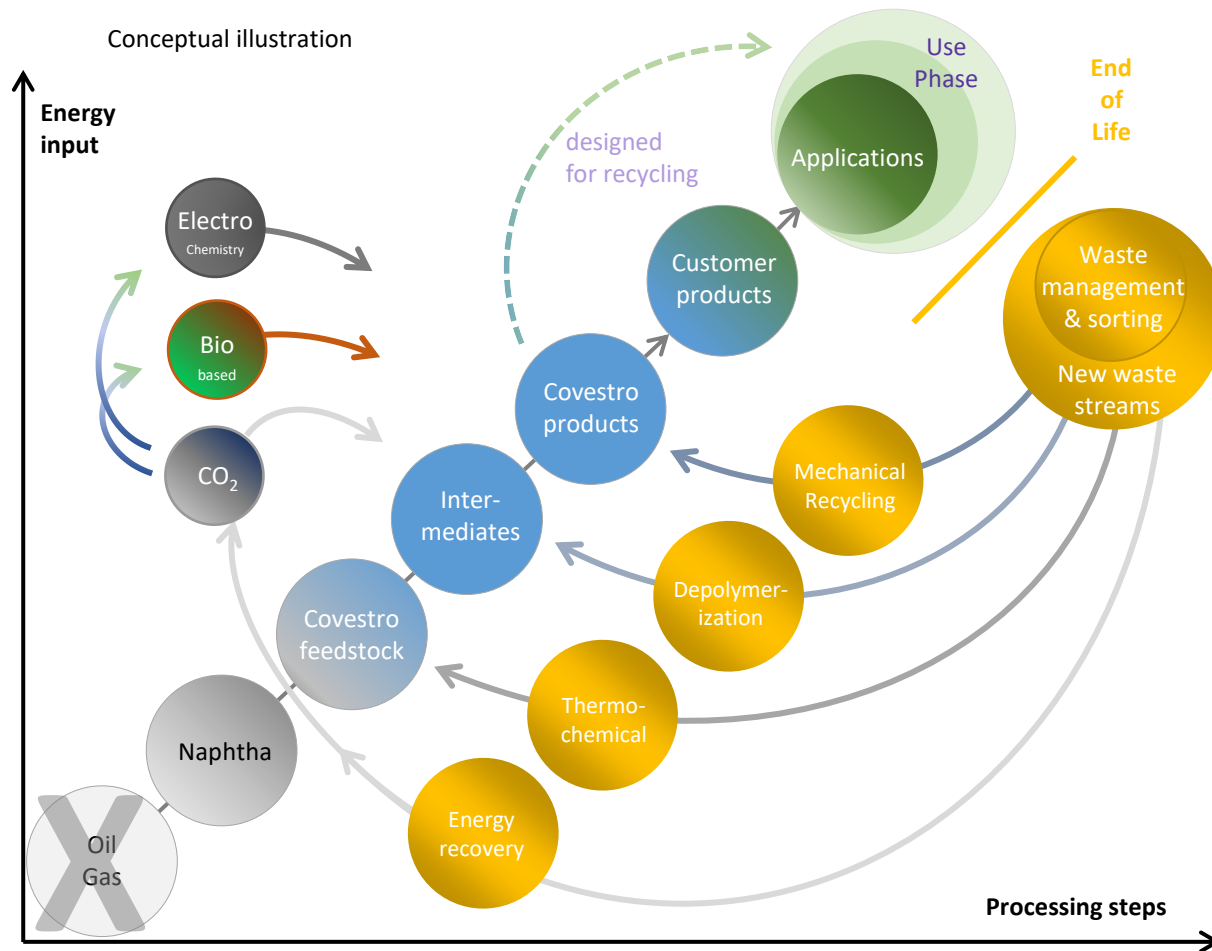
Plastics

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



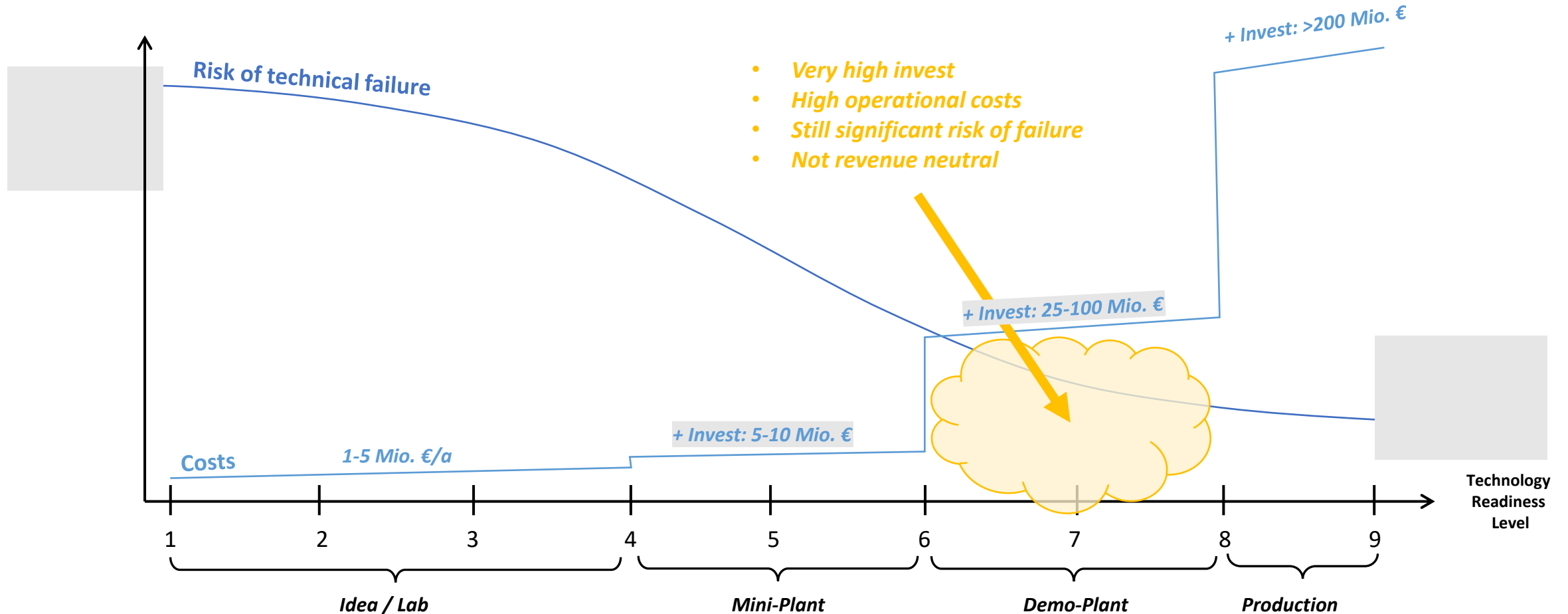
Industry: systemic transition from a problem to a solution

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








Technology development

- Realization is the real challenge

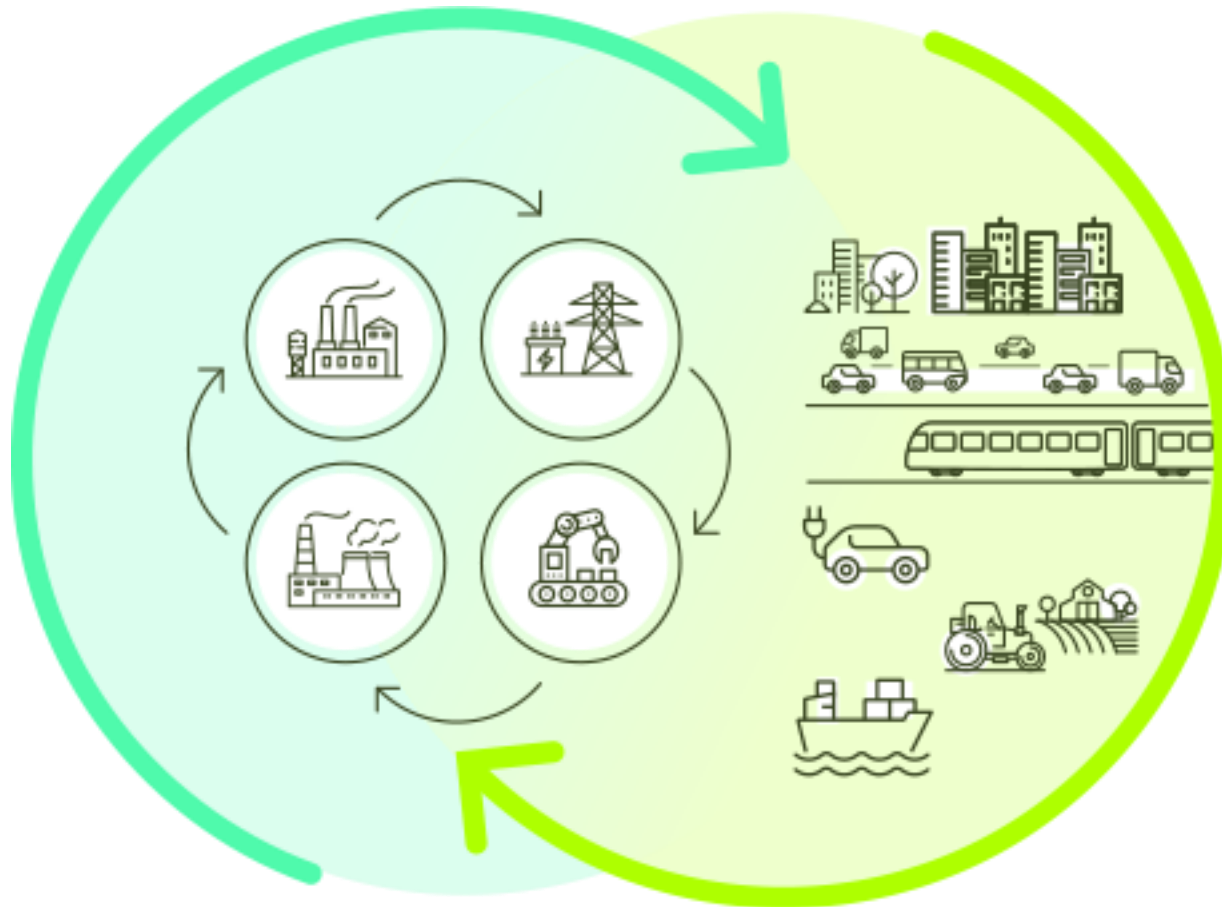


➤ Tech development requires significant resources. (Blended) funding also at later TRLs needed.

What we need and H4Cs can help with...

-  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)
-  Provide shared / managed / supported demonstration facilities for circular technologies and solutions and trustful collaboration spaces.
-  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 with nodes in neighbouring regions to collect higher-value materials, exploiting synergies in solutions, capacities, infrastructures, networks
-  Promote framework conditions for stable long-term business models: regulation, faster permits and availability of finance (aligned EU and regional), regional support/co-investments
-  Consumer and customer transformation towards circular economy to support sustainable solutions

Hubs4Circularity



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

Thank you!

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Where are we now? H4Cs Cases in practice

The experience of an established H4C: Brightlands Circular Space

by **Maurice Olivers**, H4C Brightlands Circular Space

H4C Brightlands Circular Space

**ISEC 3rd International Sustainable Energy Conference
April 10, 2024, GRAZ**

Maurice Olivers
Public Relations BCS
Sittard –Geleen, The Netherlands



**Brightlands
Circular
Space**



Closing loops. Opening worlds.

Powered by:

Brightlands
Chemelot Campus



Maastricht University

TNO innovation
for life



Brightlands
Circular
Space



System Integral Cooperation



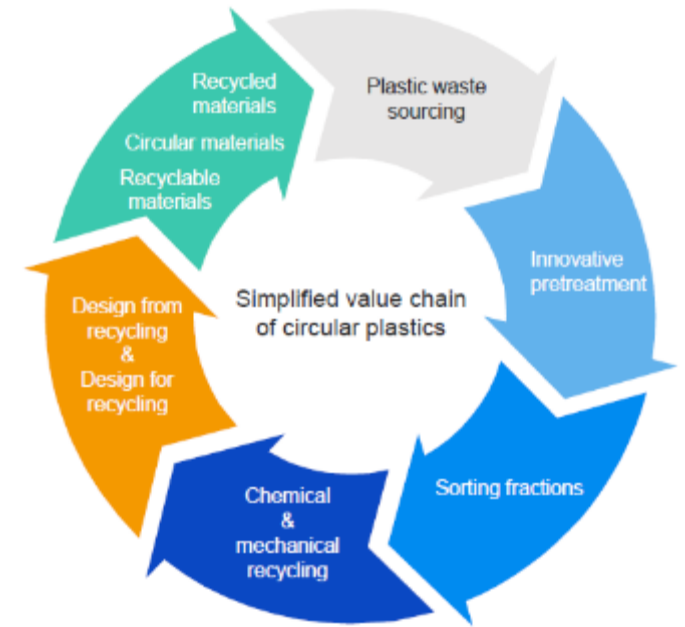
Circular Co-creation



System Integral Cooperation



Closing loops. Opening worlds.



Investments & partnerships

Multi-billion investment
Public private partnerships
Networks
Project & programs



Collaboration

Dream

Vision

Actions

Joint venture

Investments



Brightlands
Circular
Space

Thank you!

maurice.olivers@brightlands.com

Brightlands
Chemelot Campus



Maastricht University

TNO innovation
for life

Where are we now? H4Cs Cases in practice

Emerging H4C from P4Planet projects: Case 1 – REDOL

by **Diego Redondo Taberner**, Project Manager CIRCE

REDOL

Aragon's REgional hub for circularity



Redol
ARAGON'S REGIONAL HUB
FOR CIRCULARITY

Demonstration Of Local industrial urban symbiosis initiatives

Diego Redondo – CIRCE Technology Centre



A.SPIRE Hubs4Circularity (H4Cs) Workshop

EXPLORING THE SECTORAL H4CS POTENTIAL IN EU REGIONS



500 kg per capita
of SUW in the EU

2020



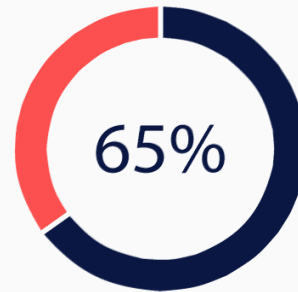
CE Action Plan
(COM/2020/98)



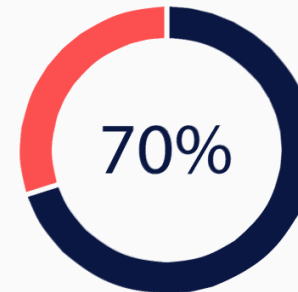
2030



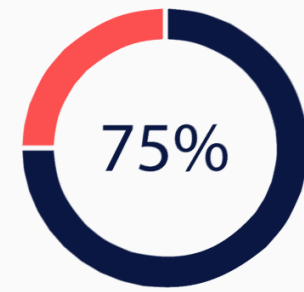
2030 targets for recycling



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.

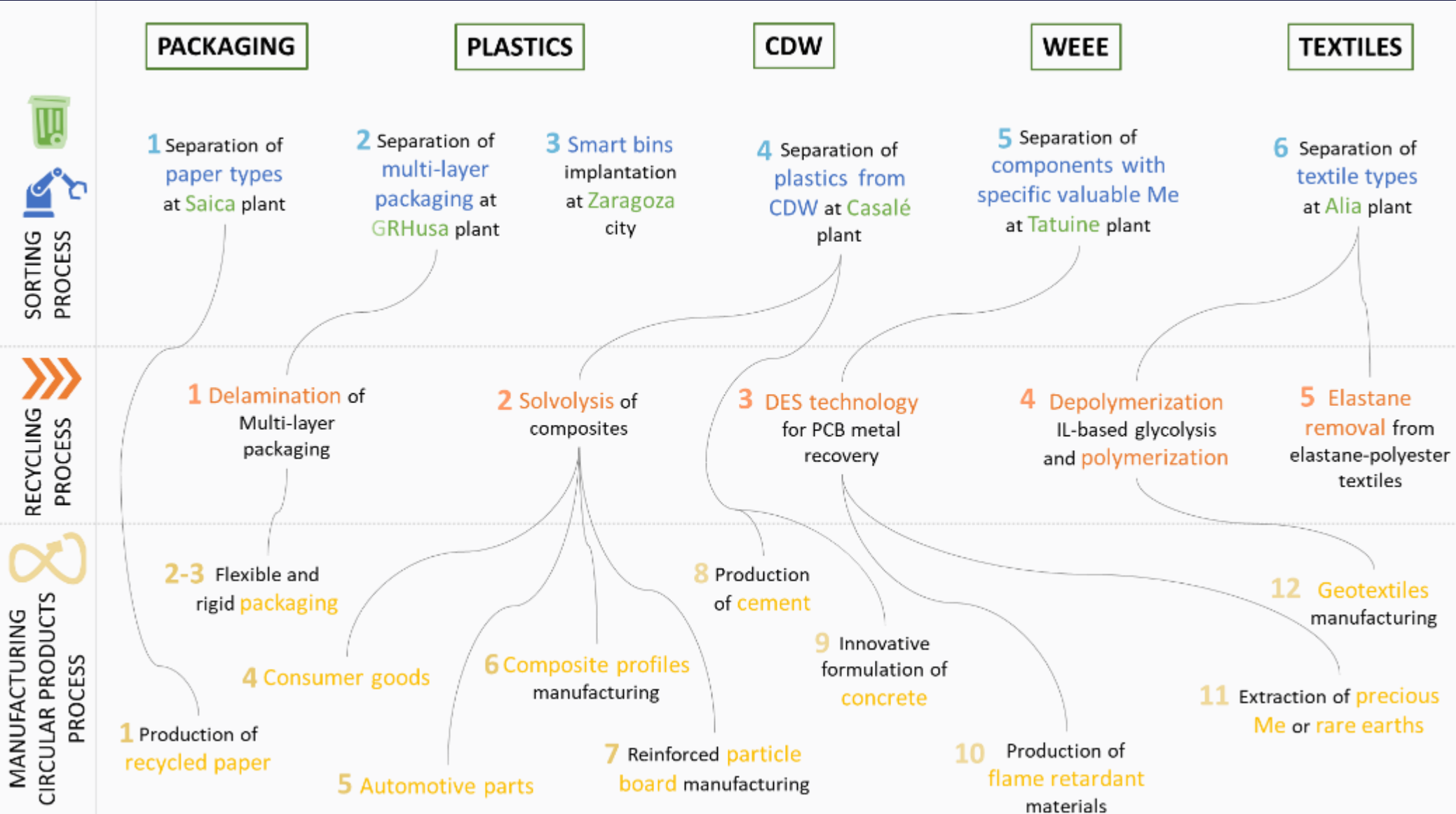
REDOL: First steps for creating a new HUB



- 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



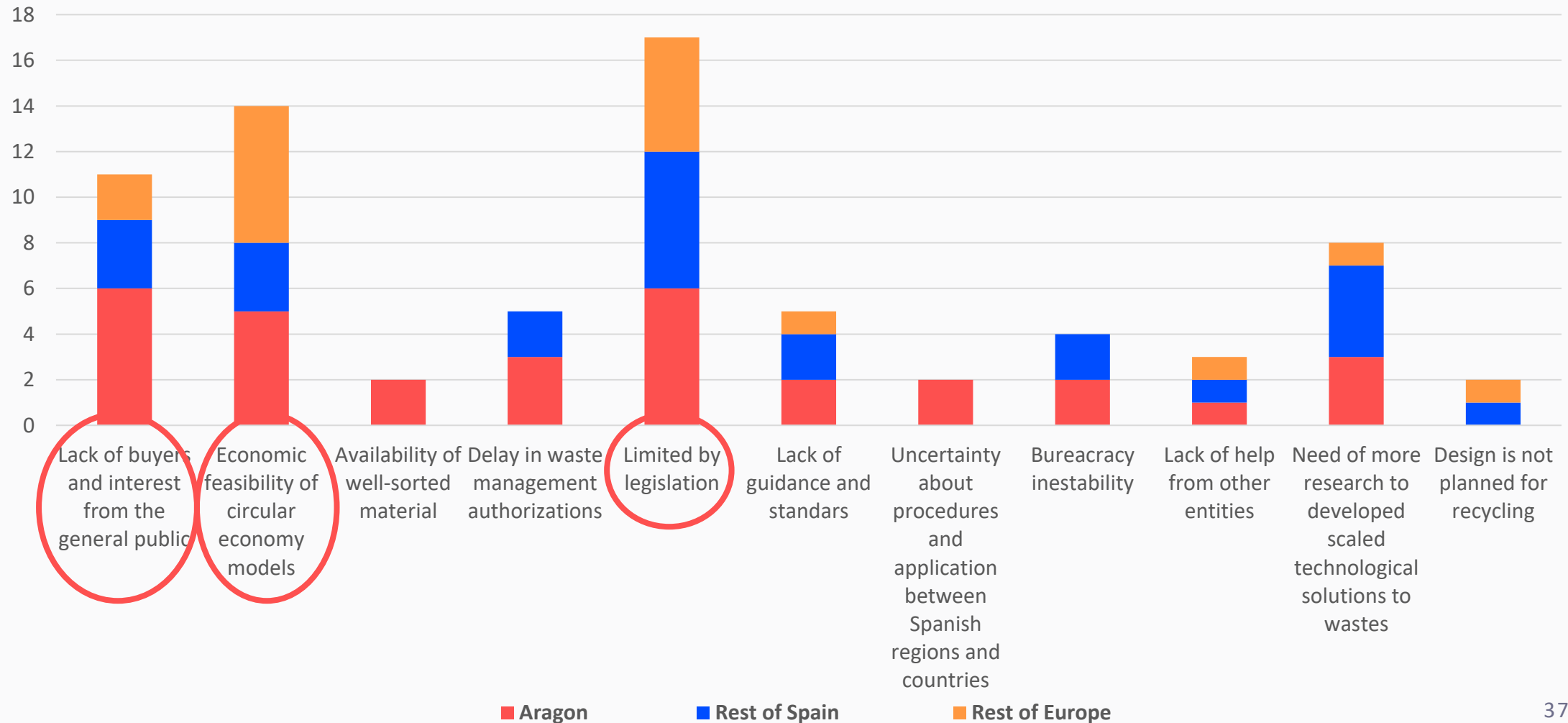
1.- Characterization of value chains and key players interaction



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



Main barriers



Next steps



- 1 | Definition of governance structure
- 2 | Guidelines of recommendations, regulations and barriers
- 3 | Social, industrial and political awareness
- 4 | Digitalisation and GDPR: REDOL platform
- 5 | Understanding the potential of I-US: REDOL impact quantification
- 6 | 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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Co-funded by
the European Union

Where are we now? H4Cs Cases in practice

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

by **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:

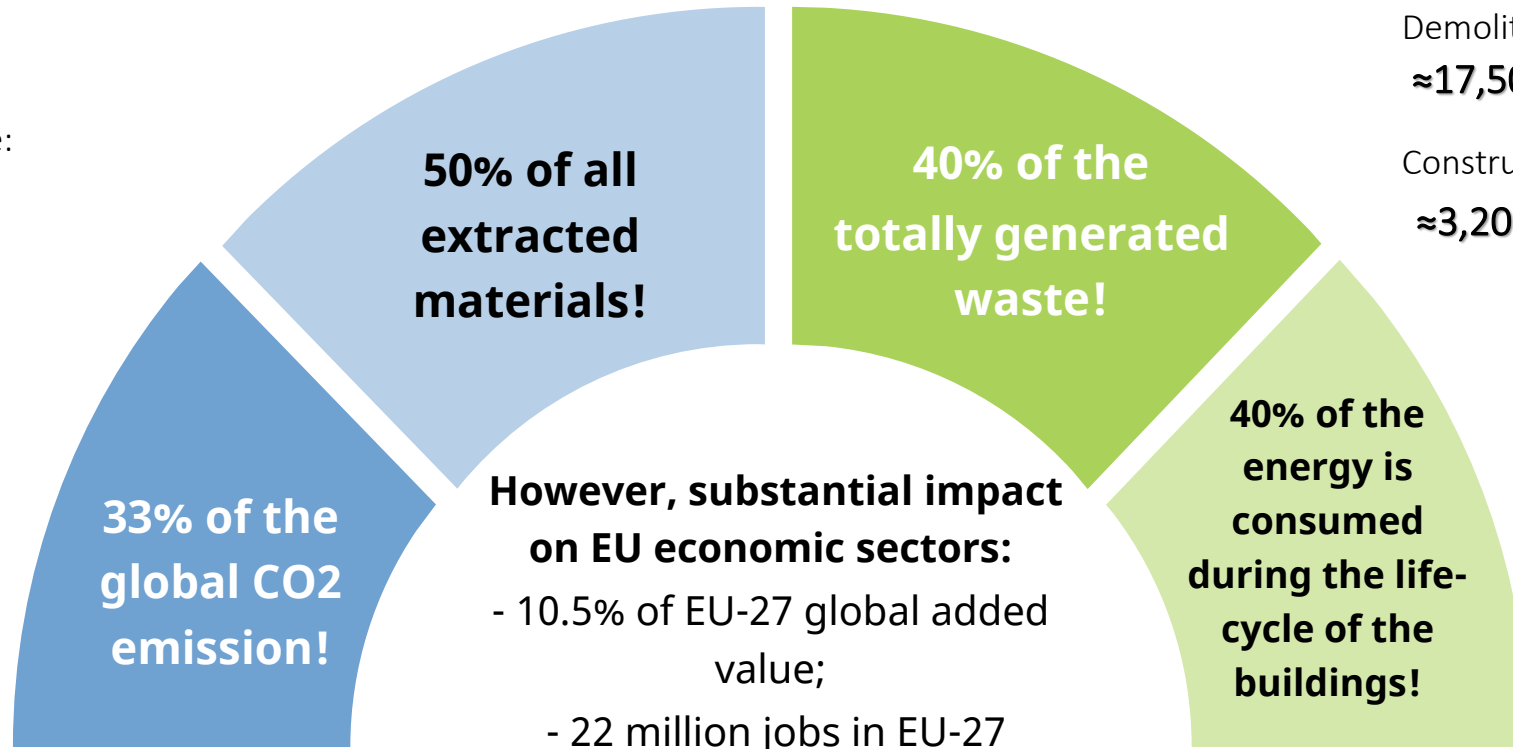
Demolition Stage / Waste:

≈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!

Among the many economic sectors that are expected to contribute to the circular journey - the construction sector is one of the most promising.

Project: MOBICCON-PRO

Consortium:

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



<https://mobiccon-pro.eu/>

Financing Programme

HORIZON EUROPE

Project Timeline

2022

2027

Budget



13,000,000 EUR





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:

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



Co-funded by the
European Union

Transport Emissions Savings (Mobile plant concept):



Emissions savings from transport (-35 km)
**Mobile plant - reduces transport
of both waste & recycled materials.**



Sectoral potential of H4Cs in different EU regions

by **Ron Weerdmeester**, H4C Community of Practice & PNO Consultants

Funded by the
European Union



PROCESSES+PLANET

Hubs4Circularity Community of Practice

*Supporting Hubs4Circularity to accelerate
industrial symbiosis and industrial-urban symbiosis*

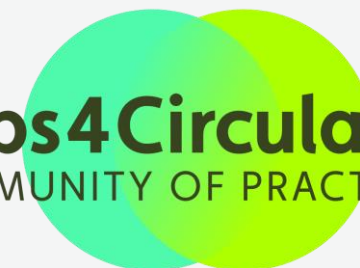


www.h4c-community.eu



info@h4c-community.eu

Hubs4Circularity
COMMUNITY OF PRACTICE



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

900+ registered users

Discussion Forum

Challenges (*upcoming*)

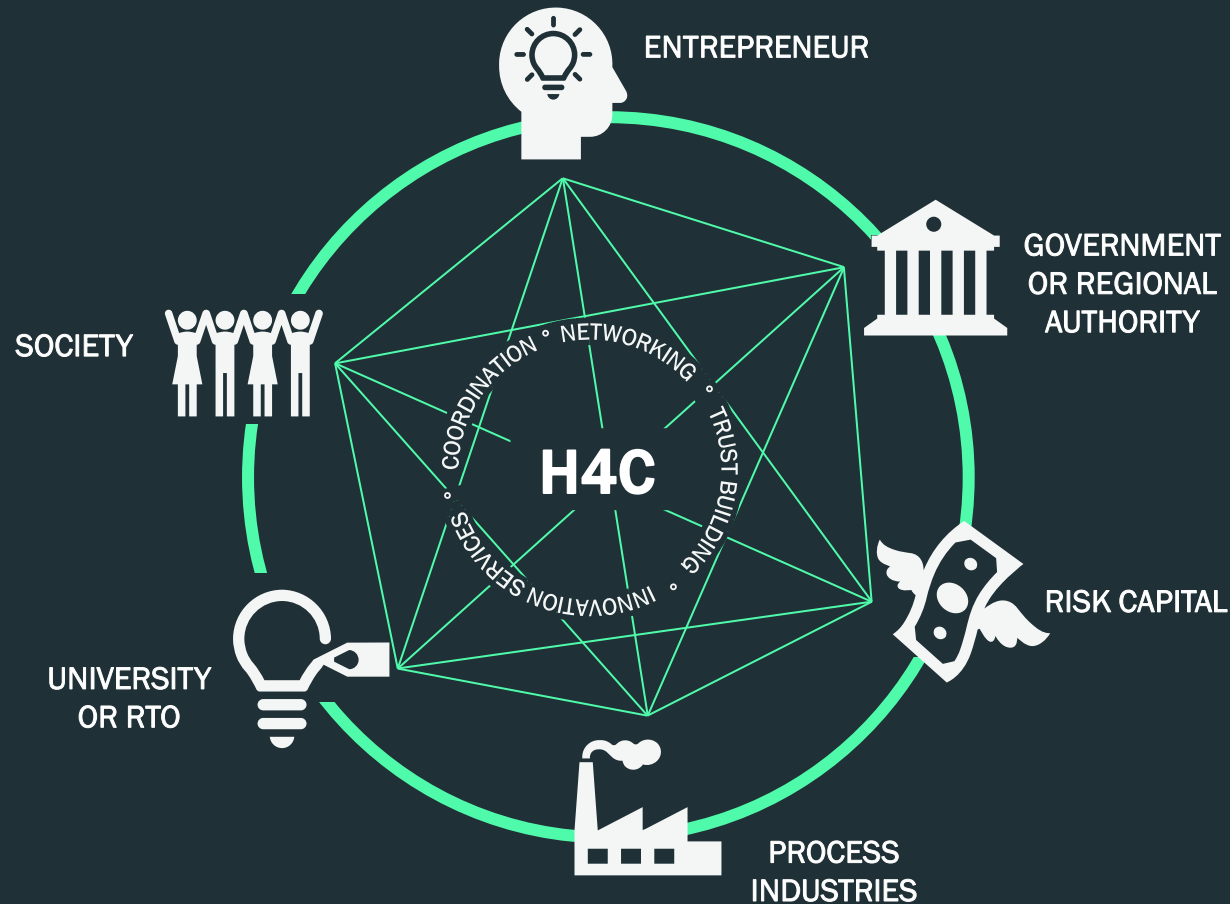
Community access

Hubs4Circularity
COMMUNITY OF PRACTICE



REQUIREMENTS TO ACCELERATE H4Cs

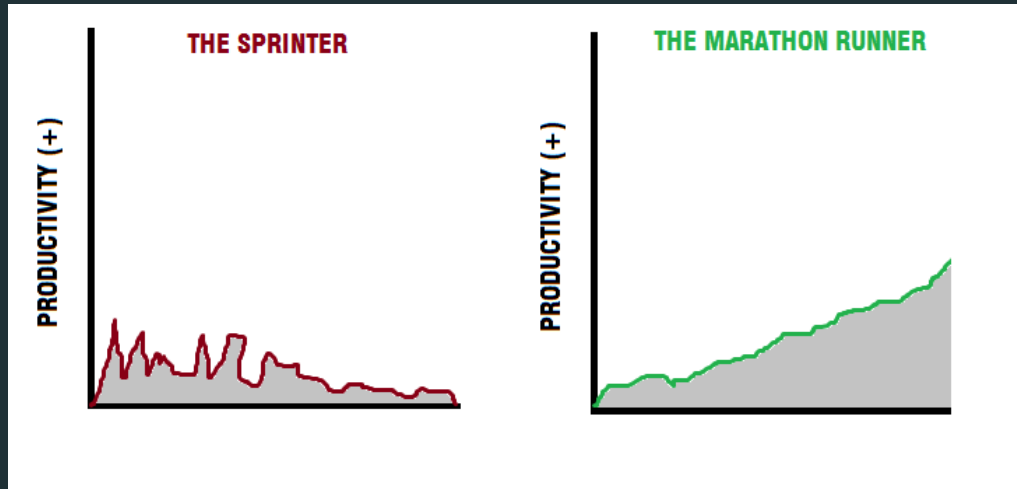
Governance and Facilitation



- 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)

REQUIREMENTS TO ACCELERATE H4Cs

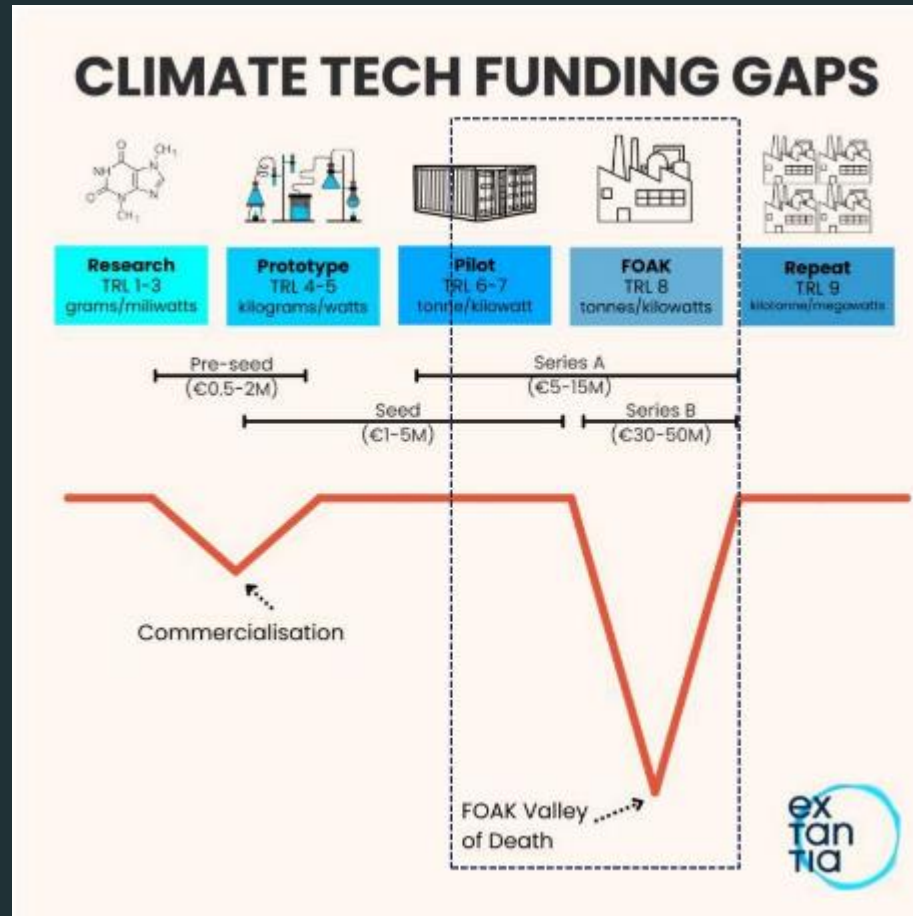
Facilitating Long-Term Programmes vs. Projects



- Build sustainable H4C programmes that incubate MANY IS and CE projects to generate impact
- Tech-scouting/matching initiatives
- Hub-to-Hub coordination for cross-regional collaboration and innovation in I(U)S and circular economy practices.

REQUIREMENTS TO ACCELERATE H4Cs

Blended Funding and Financing Strategies



- Public funding for Facilitation Organizations (FOs)
- Investments in high TRL technologies
- Joint infrastructures

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

REQUIREMENTS TO ACCELERATE H4Cs

Enabling Policies and Legislation



- Predictable legislative landscape on resource efficiency
- Impact-driven legislation
- Financial support for circular economy targets
- End-Of-Waste criteria for H4Cs

Thanks!

JOIN THE COMMUNITY

www.h4c-community.eu

✉ info@h4c-community.eu

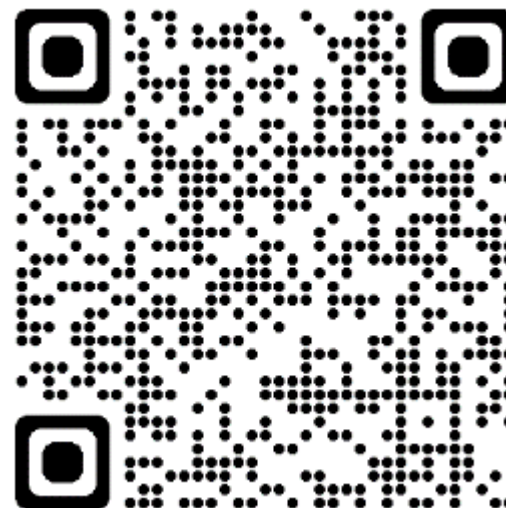
Sectoral potential of H4Cs in different EU regions

Roundtable discussion on the potential of different regions in Europe to move to systematically close the loops

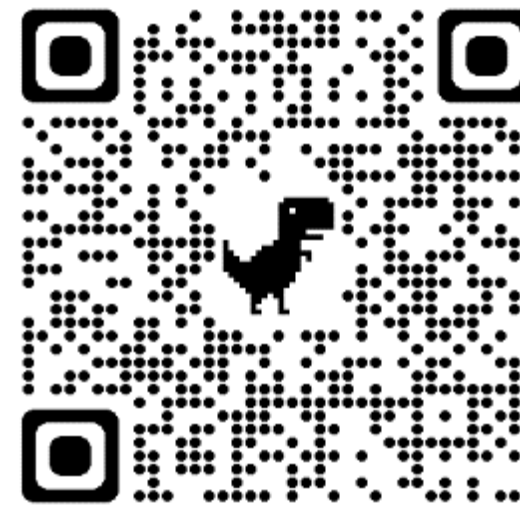
With the participation of: **Antonio Ferrandez Garcia, Dorota Pawlucka, Maurice Olivers, Diego Redondo Taberner, Kalin Marinov, Ron Weerdmeester**

Conclusions

By Àngels Orduña



[A.SPIRE Contacts](#)



[A.SPIRE Membership](#)

Thank you!