



DESTINATION 1
CLIMATE NEUTRAL, CIRCULAR AND
DIGITISED PRODUCTION

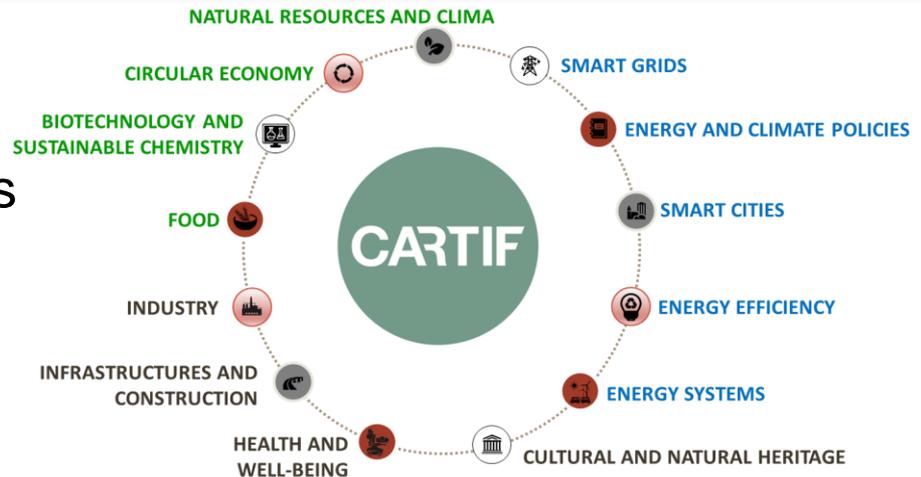
Marta HERRERO
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FUNDACION CARTIF (ES)

- **RTO non-profit** specialized in offering global solutions to companies
- Over 25 years of experience in developments, processes, systems and products.

- **69 on-going international projects**

(and 1 more H2020 in negotiation stage), including 56 H2020 on goings projects (13 as coordinator), 6 LIFE projects (2 as coordinator), 5 Interreg projects and 2 CYTED.



HE – CLUSTER 4

HORIZON EUROPE

EURATOM



* The European Institute of Innovation & Technology (EIT) is not part of the Specific Programme

Source: [EC](#)



HE – CLUSTER 4: Digital, Industry and Space

DESTINATION 1 – CLIMATE
NEUTRAL, CIRCULAR AND
DIGITISED PRODUCTION

DESTINATION 2 – INCREASED
AUTONOMY IN KEY STRATEGIC
VALUE CHAINS FOR RESILIENT
INDUSTRY

DESTINATION 3 – WORLD
LEADING DATA AND
COMPUTING TECHNOLOGIES

DESTINATION 4 – DIGITAL AND
EMERGING TECHNOLOGIES FOR
COMPETITIVENESS AND FIT FOR
THE GREEN DEAL

DESTINATION 5 – OPEN
STRATEGIC AUTONOMY IN
DEVELOPING, DEPLOYING AND
USING GLOBAL SPACE-BASED
INFRASTRUCTURES, SERVICES,
APPLICATIONS AND DATA

DESTINATION 6 – A HUMAN-
CENTRED AND ETHICAL
DEVELOPMENT OF DIGITAL AND
INDUSTRIAL TECHNOLOGIES

DESTINATION 1 – CLIMATE NEUTRAL, CIRCULAR AND DIGITISED PRODUCTION

HE – CLUSTER 4- DESTINATION 1

Strategic Plan

KSO C, 'Making Europe the first digitally led circular, climate-neutral and sustainable economy through the transformation of its mobility, energy, construction and production systems.'

KSO A, 'Promoting an open strategic autonomy by leading the development of key digital, enabling and emerging technologies, sectors and value chains to accelerate and steer the digital and green transitions through human-centred technologies and innovations.'

KSO D, 'Creating a more resilient, inclusive and democratic European society, prepared and responsive to threats and disasters, addressing inequalities and providing high-quality health care, and empowering all citizens to act in the green and digital transitions.'

CL4 expected impact

Global leadership in clean and climate-neutral industrial value chains, circular economy and climate-neutral digital systems and infrastructures (networks, data centres), through innovative production and manufacturing processes and their digitisation, new business models, sustainable-by-design advanced materials and technologies enabling the switch to decarbonisation in all major emitting industrial sectors, including green digital technologies.

HE – CLUSTER 4 - DESTINATION 1 - IMPACTS

- Accelerate the **twin green and digital transition** of the manufacturing and construction sectors
- Create a **new green, flexible and digital way** to build and produce goods.
 - sustainable, flexible, responsive and resilient factories and value chains, enabled by digitisation, AI, data sharing, advanced robotics and modularity
 - reduce CO₂ emissions and waste in these sectors, and enhance the durability, reparability and re-cycling of products/components
 - better and more efficient use of construction-generated data to sustain competitiveness and greening of the sector
- Make the **jobs** of the humans working in the manufacturing and construction sectors more **attractive and safer**, and point the way to opportunities for upskilling

HE – CLUSTER 4 - DESTINATION 1 - IMPACTS

- Set out a credible pathway to contributing to **climate neutral, circular and digitalised energy intensive industries**
- **Increase productivity**, innovation capacity, resilience, sustainability and global competitiveness of European energy intensive industries:
 - As many as possible new large hubs for circularity by 2025 (TRL 7 or above);
 - developing sustainable ways for circular utilisation of waste streams and CO₂/CO streams
 - and electrifying industry to enable and foster a switch to a renewable energy system
- Contribute to a substantial **reduction of waste and CO₂ emissions**, turning them into alternative feedstocks to replace fossil-based raw materials and decrease reliance on imports

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- **International Cooperation** is encourage
- **Do Not Significant Harm**
- **Three co-programmed partnerships :**
 - Made in Europe (by EFFRA)
 - Clean Steel (by ESTEP)
 - Processes4Planet (former SPIRE)

CO-PROGRAMMED

Based on Memoranda of Understanding/contractual arrangements; implemented independently by the partners and by Horizon Europe

funding rate of 60% on actions

>TRL4 → TRL7-8

(100% for non-profit legal entities)

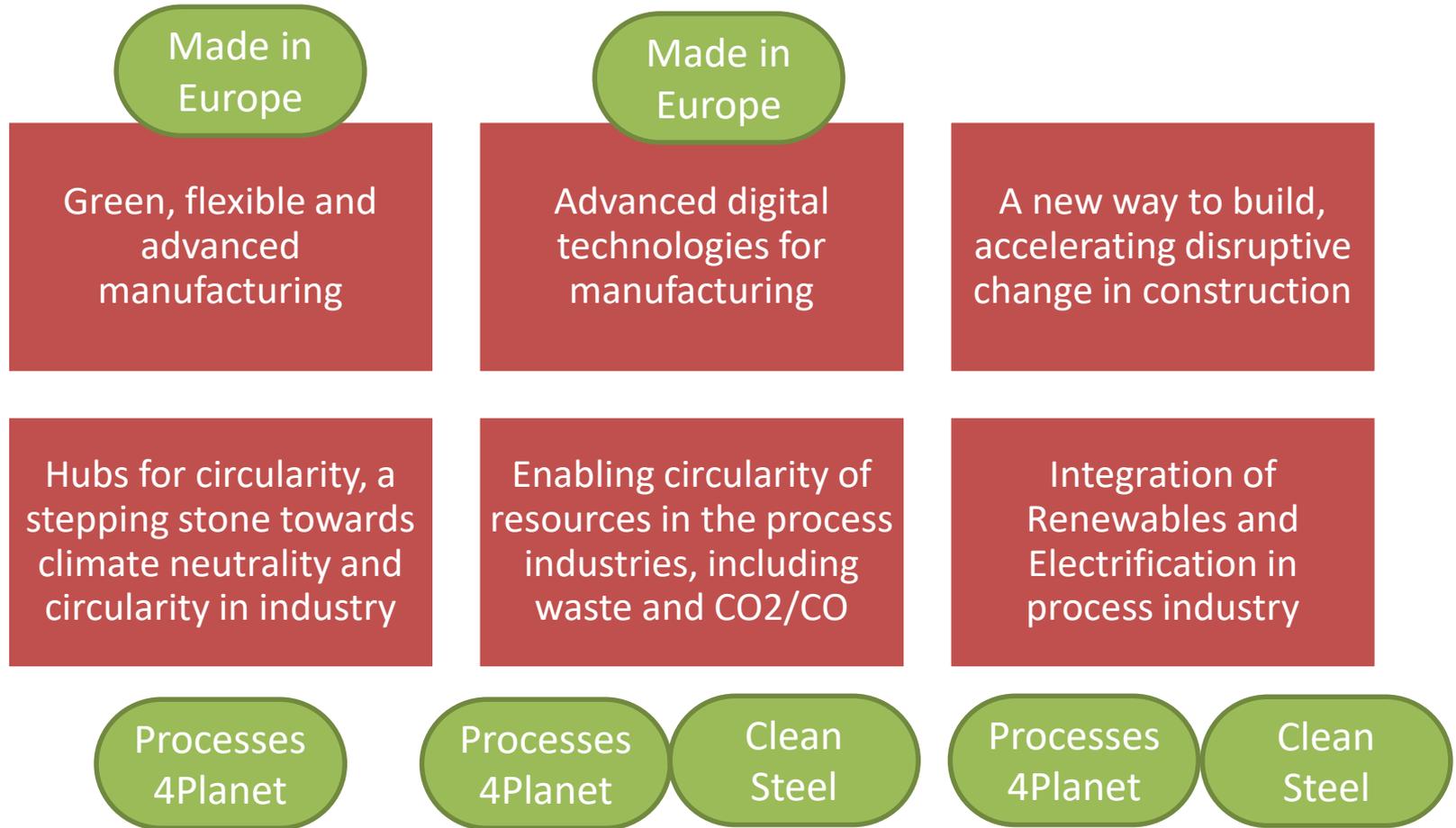
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- Link to other
 - Cluster 5: integration of renewables and thermal energy management in industry
 - EIC and Pillar III: SMEs
 - Other synergies: other EU programmes; the Digital Europe Programme (DEP); links to the EIT (Manufacturing and Digital KICs); and links to the thematic smart specialisation platform on industrial modernisation.
- topics in this Destination, for which proposals should demonstrate the expected impact by including a ***business case and exploitation strategy for industrialisation***

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Call	Budgets (EUR million)		Deadline(s)
	2021	2022	
HORIZON-CL4-2021-TWIN-TRANSITION-01	403.00		23 Sep 2021
HORIZON-CL4-2022-TWIN-TRANSITION-01		334.50	30 Mar 2022
Overall indicative budget	403.00	334.50	

DESTINATION 1 – Focus Areas/Headings



Green, flexible and advanced manufacturing Made in Europe Partnership

HORIZON-CL4-2022-TWIN-TRANSITION-01-01: Rapid reconfigurable production process chains (Made in Europe Partnership) (IA)

HORIZON-CL4-2022-TWIN-TRANSITION-01-02: Products with complex functional surfaces (Made in Europe Partnership) (RIA)

HORIZON-CL4-2022-TWIN-TRANSITION-01-03: Excellence in distributed control and modular manufacturing (Made in Europe Partnership) (RIA)

HORIZON-CL4-2022-TWIN-TRANSITION-01-04: Intelligent work piece handling in a full production line (Made in Europe Partnership) (RIA)

Green, flexible and advanced manufacturing Made in Europe Partnership

HORIZON-CL4-2022-TWIN-TRANSITION-01-01: Rapid reconfigurable production process chain

- IA: TRL5→TRL7
- Budget: 8-10M€ - up to 3 projects (27M€)
- Rapid reconfiguration for flexible systems
- Ambitious demos covering different steps running at medium or high volume manufacturing rates (including logistics)



HORIZON-CL4-2022-TWIN-TRANSITION-01-02: Products with complex functional surfaces

- RIA: TRL4 → TRL6
- Budget: 4-6M€ - up to 4 projects (21,5M€)
- Technologies for surface treatment
 - Decrease the environmental footprint and energy consumption
 - Integration in manufacturing processes

Green, flexible and advanced manufacturing Made in Europe Partnership

[HORIZON-CL4-2022-TWIN-TRANSITION-01-03: Excellence in distributed control and modular manufacturing](#)

- RIA: TRL4 → TRL6
- Budget:4-6€ - up to 4 projects (21,5M€)
- Modular processing
- Organising and control reconfigurable manufacturing systems
- New production modules for those processes not already developed

[HORIZON-CL4-2022-TWIN-TRANSITION-01-04: Intelligent work piece handling in a full production line](#)

- RIA: TRL4 → TRL6
- Budget:4-6€ - up to 4 projects (21,5M€)
- Highly flexible, resilient, reconfigurable and agile production lines

Advanced digital technologies for manufacturing Made in Europe Partnership

HORIZON-CL4-2022-TWIN-TRANSITION-01-06: ICT Innovation for Manufacturing Sustainability in SMEs (I4MS2) (Made in Europe Partnership) (IA)

HORIZON-CL4-2022-TWIN-TRANSITION-01-07: Digital tools to support the engineering of a Circular Economy (Made in Europe Partnership) (RIA)

Advanced digital technologies for manufacturing

Made in Europe Partnership

HORIZON-CL4-2022-TWIN-TRANSITION-01-06: ICT Innovation for Manufacturing Sustainability in SMEs (I4MS2)

- IA: TRL5 → TRL7
- Budget: 4-8M€ - up to 4 projects (30M€)
- Financial support to third parties (u to 60,000€)
- Support European SMEs and mid-caps to innovate and make more sustainable their products → 50% of the budget allocated
- Complementary to DIHs
- Technologies: AI, IIoT, advances interfaces, smart working environments



HORIZON-CL4-2022-TWIN-TRANSITION-01-07: Digital tools to support the engineering of a Circular Economy

- RIA: TRL3-4 → TRL6
- Budget: 3-6M€ - up to 3 projects (22M€)
- Innovative concepts, methods, and tools that track and trace the status of relevant manufactured products and components,
- Inclusion and handling of real-time production data in analysis
- Support tools in at least two different realistic production environments

A new way to build, accelerating disruptive change in construction

HORIZON-CL4-2022-TWIN-TRANSITION-01-09: Demonstrate the use of Digital Logbook for buildings (IA)

- IA: TRL5 → TRL7
- Budget: around 4,5M€ - up to 2 projects (9M€)
- Demonstrate the potential of Digital Building Logbooks
 - Increase efficiency circularity and transparency
 - improve decision making for all actors
- Horizon Europe 'Built4People' co-programmed Partnership

Hubs for circularity, a stepping stone towards climate neutrality and circularity in industry

HORIZON-CL4-2022-TWIN-TRANSITION-01-10: Circular flows for solid waste in urban environment

- IA: TRL5 → TRL7
- Budget: 12-18M€ - up to 3 projects (42,5M€)
- Processes4Planet Partnership
- Concept of Industrial-Urban Symbiosis (I-US) on a real scale demonstrator
- Reduce 80 % (in weight or volume) solid waste
- Innovative solution engaging waste management actors in novel value chains :upcycling back to secondary materials instead of down cycling of low re-use



Enabling circularity of resources in the process industries, including waste and CO₂/CO

HORIZON-CL4-2022-TWIN-TRANSITION-01-11: Valorisation of CO/CO₂ streams into added-value products of market interest (Processes4Planet Partnership) (IA)

HORIZON-CL4-2022-TWIN-TRANSITION-01-13: Raw material preparation for clean steel production (Clean Steel Partnership) (IA)

Enabling circularity of resources in the process industries, including waste and CO₂/CO

HORIZON-CL4-2022-TWIN-TRANSITION-01-11: Valorisation of CO/CO₂ streams into added-value products of market interest

- IA: TRL5 → TRL7
- Budget: 12-18M€ - up to 3 projects (42,5M€)
- Processes4Planet Partnership
- utilisation of CO/CO₂ streams converting them into added value products and/or intermediates and chemicals → Excluded fuels and energy carriers
 - Application in different sectors
 - CO₂ in energy intensive sectors
- Compatible with renewable energy systems



Enabling circularity of resources in the process industries, including waste and CO₂/CO

HORIZON-CL4-2022-TWIN-TRANSITION-01-13: Raw material preparation for clean steel production

- IA: TRL6 → TRL8
- Budget: 4-5M€ - up to 3 projects (14M€)
- Clean Steel Partnership) (IA)
- Focus on two main raw-materials in the iron and steelmaking route: the iron-ore and the scrap.
 - Technologies for upgrade an use of low quality
 - Reduce impurities before melting
 - Valorisation os low quality scrap streams (cold bonded agglomerate)



Integration of Renewables and Electrification in process industry

HORIZON-CL4-2022-TWIN-TRANSITION-01-15: New electrochemical conversion routes for the production of chemicals and materials in process industries (Processes4Planet Partnership) (RIA)

HORIZON-CL4-2022-TWIN-TRANSITION-01-16: Modular and hybrid heating technologies in steel production (Clean Steel Partnership) (IA)

HORIZON-CL4-2022-TWIN-TRANSITION-01-17: Integration of hydrogen for replacing fossil fuels in industrial applications (Processes4Planet Partnership) (IA)

Integration of Renewables and Electrification in process industry

[HORIZON-CL4-2022-TWIN-TRANSITION-01-15: New electrochemical conversion routes for the production of chemicals and materials in process industries](#)

- RIA: TRL3-4 → TRL5-6
- Budget: 8-12M€ - up to 3 projects (30M€)
- Processes4Planet Partnership)
- electrochemical conversion process: photo- and/or electro-catalytic processes
- Integration of renewable electricity
- International cooperation with Japan

[HORIZON-CL4-2022-TWIN-TRANSITION-01-16: Modular and hybrid heating technologies in steel production](#)

- IA: TRL5 → TRL7
- Budget: around 3M€ - up to 3 projects (10M€)
- Clean Steel Partnership
- Flexible, *modular technology* for the integration of heating technologies in Blast furnaces, Electric Arc Furnaces and Direct Reduction Processes;
- integration of new materials and gases workflows in existing steelworks



Integration of Renewables and Electrification in process industry

HORIZON-CL4-2022-TWIN-TRANSITION-01-17: Integration of hydrogen for replacing fossil fuels in industrial applications

- IA: TRL5 → TRL7
- Budget: 12-18M€ - up to 3 projects (42,5M€)
- Processes4Planet Partnership
- Reduction of CO₂ and NO_x levels no higher
- Hydrogen can replace fossil fuels to generate high temperature heat → Design of new furnaces to minimize NO_x and redesign heating process



SUMMARY

If you are going to prepare a proposal...

- Check the F&T's portal regularly for updates on the topic
 - Reference documents
 - FAQs
 - Partners
 - Ask your NCP in case you have any question
- Check other Infodays or events: [recording 2021](#), [documents 2021](#)
- Find the best consortium to apply: cover all roles
- Need to fit all the text in the topic and give solution
- Fill all the parts of the template (Part B) and take into account the page limitation
- Don't leave the Administrative Part for the last minute

Thank you!

Any question?

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