



HORIZON EUROPE

THE EU RESEARCH & INNOVATION PROGRAMME

2021 – 2027

Horizon Europe – Cluster 4

NCP Training

4 October 2023

Destinations

TWIN-TRANSITION Climate neutral,
circular and digitised production

RESILIENCE Increased autonomy in key
strategic value chains for resilient
industry

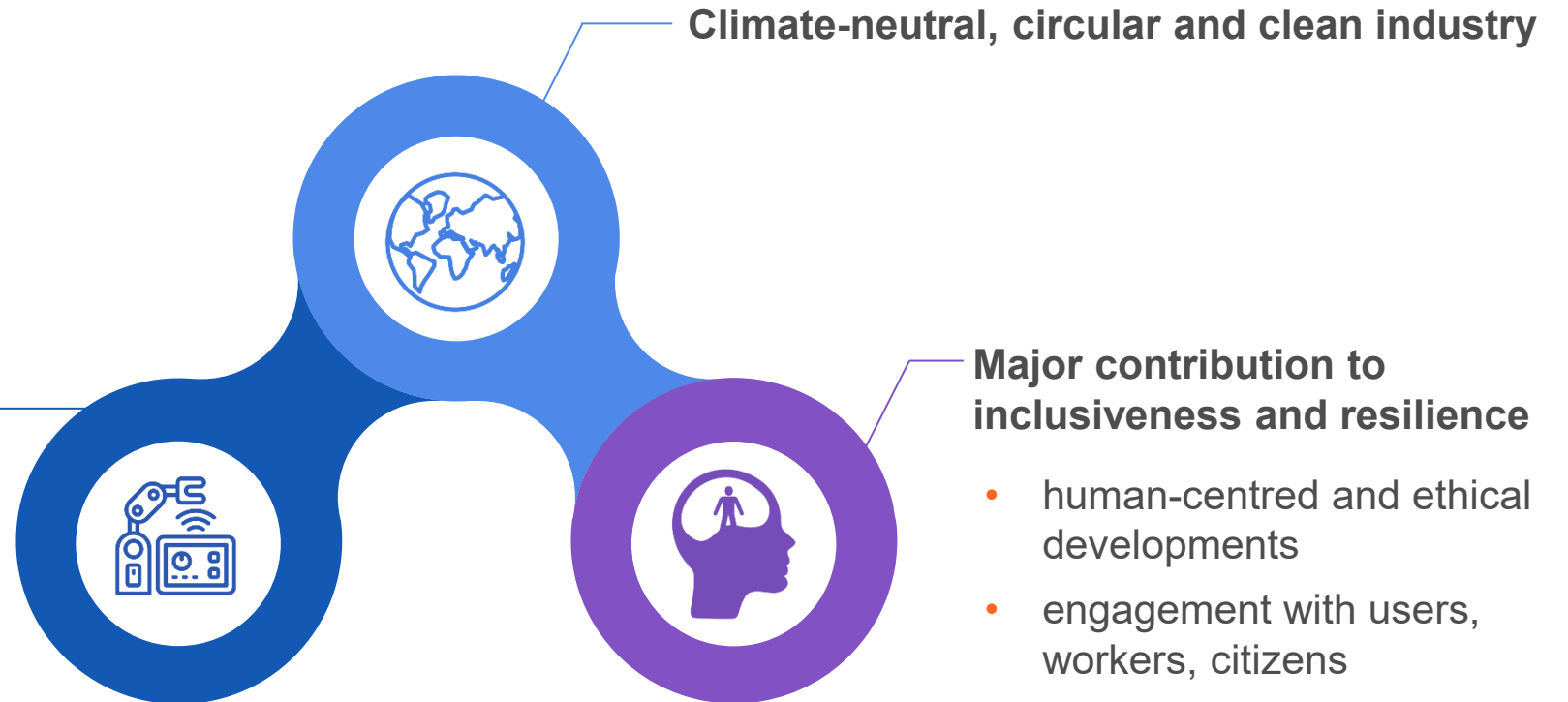
Cluster 4 - Vision

*Competitive technologies respecting the boundaries of our planet,
and reflecting human needs*

Twin Green and Digital Transitions

Industrial and digital transformation

- mastering technologies
- deploying technologies and technology infrastructures
- securing autonomy in strategic value chains



Cluster 4 – Six Destinations

Destination 1: Climate neutral, circular, and digitised production

Destination 2: A digitised, resource-efficient and 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: Strategic autonomy in developing, deploying and using global space-based infrastructures, services, applications and data

Destination 6: A human-centred and ethical development and industrial technologies

Call - TWIN GREEN AND DIGITAL TRANSITION 2023

FUNDING RATES FOR PARTNERSHIP TOPICS

- Innovation Actions in co-funded partnerships Made in Europe, Processes for Planet and Clean Steel:
- 60% funding for with-profit entities, used in some topics
- Pilot started in 2021-22, continued in 2023-24

BUSINESS CASE

- Expected impact in terms of market opportunities
- ... and deployment capacities in EU in short to medium term

EXPLOITATION STRATEGY

- Identify needs, obstacles and necessary actions – e.g. matching value chains
- For TRL 7, credible strategy for full-scale deployment in EU
- Where relevant, skills addressed through training material that can be up-scaled, e.g. through ESF+

WORK PROGRAMME 2023-2024 – DESTINATION 1 “CLIMATE NEUTRAL, CIRCULAR AND DIGITISED PRODUCTION”

HORIZON-CL4-2024-TWIN-TRANSITION-01

**Open: 19 Sep 2023
Deadline: 7 Feb 2024**

HORIZON-CL4-2024-TWIN-TRANSITION-01-TWO-STAGE

**Open: 19 Sep 2023
Deadline: 7 Feb 2024 (1st stage), 24 Sep 2024 (2nd stage)**

Processes4Planet Partnership

“Transforming the European energy intensive process industries to make them circular and achieve overall climate neutrality at EU level by 2050, while enhancing their competitiveness.”

➔ Roadmap



10 industry sectors: cement, steel, ceramics, chemicals, engineering, minerals and ores, non-ferrous metals, water, refineries, pulp/paper.

Budget of 2.6 BEUR (1.3 BEUR from Horizon Europe)

WP 2023 24 – Energy Intensive Process Industries Section

Call - TWIN GREEN AND DIGITAL TRANSITION 2024

Energy-efficient and climate neutral process industries

- HORIZON-CL4-2024-TWIN-TRANSITION-01-32: Optimisation of thermal energy flows in the process industry (Processes4Planet partnership) (IA)
- HORIZON-CL4-2024-TWIN-TRANSITION-01-34: Renewable hydrogen used as feedstock in innovative production routes (Processes4Planet Partnership) (RIA)
- HORIZON-CL4-2024-TWIN-TRANSITION-01-35: Turning CO2 emissions from the process industry to feedstock (Processes4Planet partnership) (IA)

HORIZON-CL4-2024-TWIN-TRANSITION-01-32: Optimisation of thermal energy flows in the process industry (Processes4Planet partnership) (IA)

Expected Outcomes :

- Energy intensive industries will be enabled to increase their energy efficiency through optimisation of thermal energy flows between processes, minimizing losses and using all levels of energy;
- Demonstrate highly process-integrated solutions that offer better opportunities to increase energy efficiency and reduce investment cost of high temperature installations;
- Demonstrate a substantial increase in flexibility of the processes;
- Contribute to achieving EU Climate neutrality goal and becoming independent from fossil fuel and fossil fuel imports as put forward in the REPowerEU Plan ;
- Enable the increase of the competitiveness and resilience of the European process industry.

Indicative budget: EUR 30 million

EU contribution per project: EUR 10-15 million

Type of Action: Innovation Actions

TRL: starting at 5 achieving 7

HORIZON-CL4-2024-TWIN-TRANSITION-01-34: Renewable hydrogen used as feedstock in innovative production routes (Processes4Planet Partnership) (RIA)

Expected Outcomes :

- Enable the technical and economic feasibility of innovative production routes using hydrogen as feedstock demonstrated and validated at suitable scale against current state of art of industrial processes;
- Enable the efficient use and integration of hydrogen as a feedstock in innovative industry processes, considering also fluctuation of availability;
- Support the increased utilisation of renewable energy sources combined with digital technologies in the process industries, thereby contributing to the independency on fossil fuel and fossil fuel imports as put forward in the REPowerEU Plan;
- Contribute to EU Climate neutrality goal by proving the effectiveness of the GHG emission avoidance in the targeted process;
- Support Mission Innovation 2.0 NZEID on 'Net-zero Industries' and its ambition via networking and dissemination activities.

Indicative budget: EUR 20 million

EU contribution per project: EUR 8-10 million

Type of Action: Research and Innovation Actions

TRL: starting at 4 achieving 6

HORIZON-CL4-2024-TWIN-TRANSITION-01-35: Turning CO2 emissions from the process industry to feedstock (Processes4Planet partnership) (IA)

Expected Outcomes :

- Master the capture, purification and conversion of CO/CO2 from process industry point sources and utilization of renewable energy at reasonable costs to pave the road to the production of a large range of chemicals and materials;
- Showcase the system effectiveness for the GHG emission avoidance in the process industries as well as the scalability and the cost efficiency of the proposed concept;
- Enable the economic viability of the entire unit to compete with the existing state of the art production of the same or equivalent products (e.g., fossil-based production of chemicals and materials);
- Prove the efficient integration and use of renewable energy sources, and where relevant account for their intermittency and the possibility to offer demand-response flexibility;
- Enable the increase of the competitiveness and resilience of the European process industry.

Indicative budget: EUR 30 million

EU contribution per project: EUR 10-15 million

Type of Action: Innovation Actions (60% funding)

TRL: starting at 5-6 achieving 7

Call - TWIN GREEN AND DIGITAL TRANSITION 2024

Circularity and Zero Pollution in process industries

- HORIZON-CL4-2024-TWIN-TRANSITION-01-38: Hubs for circularity for industrialised urban peripheral areas (Processes4Planet partnership) (IA)
- HORIZON-CL4-2024-TWIN-TRANSITION-01-41: Breakthroughs to improve process industry resource efficiency (Processes4Planet partnership) (RIA)

HORIZON-CL4-2024-TWIN-TRANSITION-01-38: Hubs for circularity for industrialised urban peripheral areas (Processes4Planet partnership) (IA)

Expected Outcomes :

- Demonstrate zero urban waste in a near commercial scale environment through systemic resource recovery as alternative material feedstock; a decrease of GHG emissions is also expected by explicitly addressing the reduced flow of goods (due to geographical proximity);
- Reduce the freshwater consumption of the urban area by 50%, and re-use 90% of the solid waste generated by the water treatment;
- Citizens living in cities will benefit from a healthier environment through industrial/urban symbiosis by lowering emissions through circular and renewable energy sources and waste reduction;
- Use urban/industrial symbiosis and cross-sectorial cooperation to pave the way for achieving the EU Green Deal and “Fit for 55” package objectives: providing recommendations for optimized regional framework conditions by highlighting barriers and suitable innovation-oriented policies and looking for possible synergies with the cities selected by the Cities Mission.

Indicative budget: EUR 40 million

EU contribution per project: EUR 15-20 million

Type of Action: Innovation Actions

TRL: starting at 5 achieving 7

HORIZON-CL4-2024-TWIN-TRANSITION-01-41: Breakthroughs to improve process industry resource efficiency (Processes4Planet partnership) (RIA)

Expected Outcomes :

- Achieve a step change in the process industry's green transformation by improving by at least 30 % the industrial processes resource efficiency compared to the state of the art;
- Enable the techno-economic feasibility of novel technologies and processes, demonstrated and validated at suitable scale against current industrial processes to produce the same products;
- Overall positive environmental and if relevant health and safety impact demonstrated;
- Reduce the CO2 intensity of the process industry and contribute to the climate neutrality goal;
- Enable the increase of the competitiveness and resilience of the European process industry.

Indicative budget: EUR 30 million

EU contribution per project: EUR 10-12 million

Type of Action: Research and Innovation Actions

TRL: starting at 4 achieving 6

Thank you for your questions

HorizonEU

<http://ec.europa.eu/horizon-europe>



© European Union 2022

Unless otherwise noted the reuse of this presentation is authorised under the CC BY 4.0 license. For any use or reproduction of elements that are not owned by the EU, permission may need to be sought directly from the respective right holders.

Image credits: © ivector #235536634, #249868181, #251163013, #266009682, #273480523, #362422833, #241215668, #244690530, #245719946, #251163053, #252508849, 2020. Source: Stock.Adobe.com. Icons © Flaticon – all rights reserved.