Advancing circular economy in process industries through innovation and funding programmes

AQUASPICE Final Conference

12 December 2024, Brussels
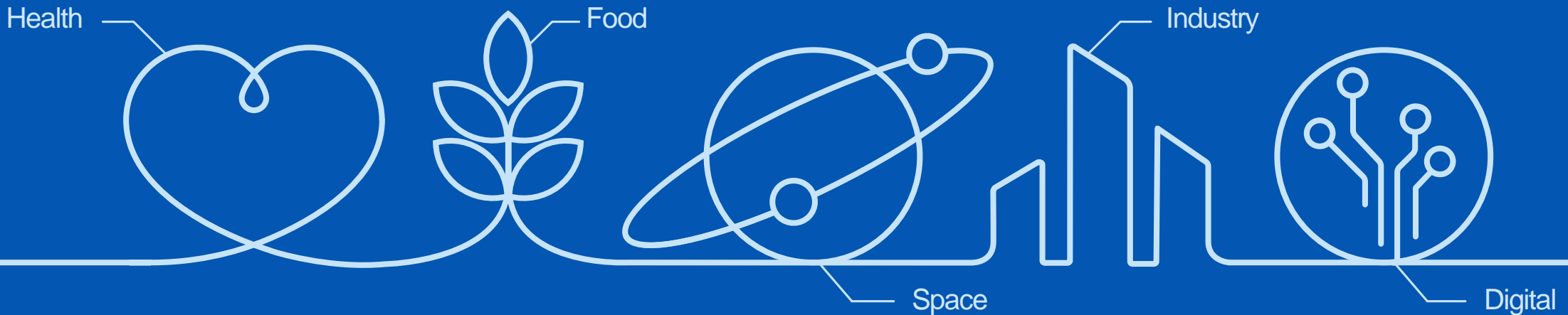
Health and Digital Executive Agency

Dimos Paraskevas

Project Adviser HADEA B3 - Industry
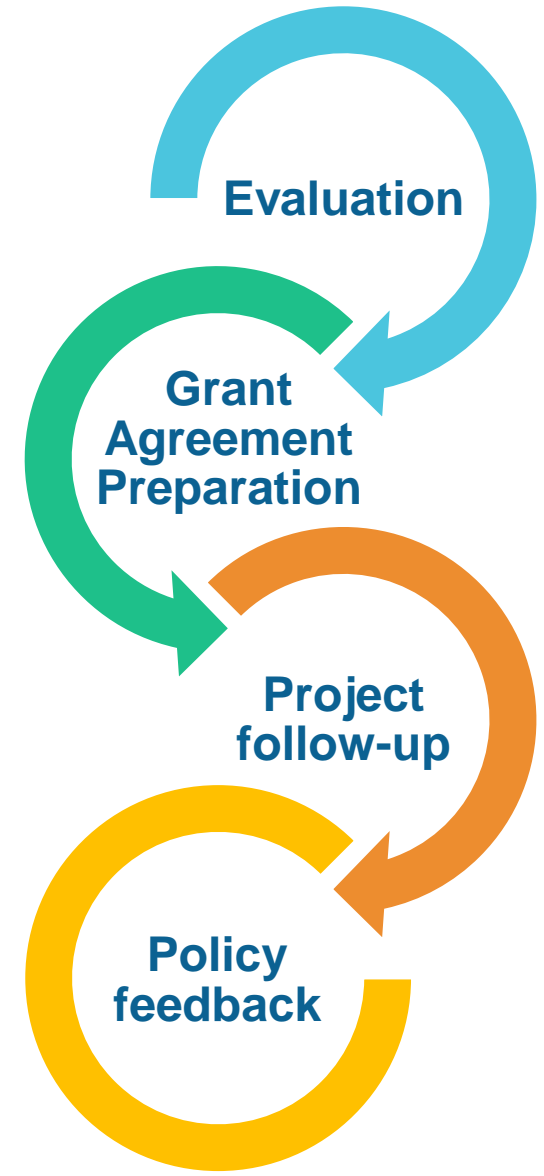
Who we are

Our Agency

The European Health and Digital Executive Agency (HaDEA) implements European programmes and initiatives on behalf of the European Commission, by managing projects that are related to health, digital, food, industry and space.
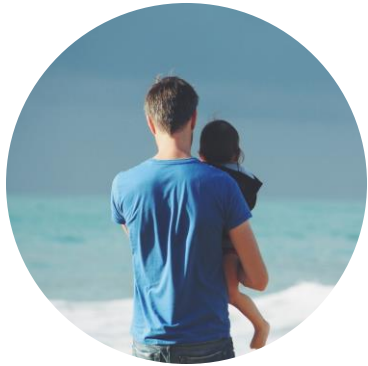

Health

Food

Industry

Space

Digital

What we do

The role of HaDEA

- **Managing EU programmes**

- **Feeding into the policy-making process the project's outcome & success stories**

➢ In charge of the whole project life:

  - **Evaluation** of Proposals

  - **Grant Agreement** Preparation

  - Scientific/Technical and Financial **monitoring** of projects

  - Supporting **exploitation and dissemination** of project results (policy feedback)

Evaluation

Grant Agreement Preparation

Project follow-up

Policy feedback

European Commission

The programmes we manage

Health

EU4Health

Horizon Europe – Health

Food

Single Market Programme (SMP): Food Safety

Digital

Horizon Europe – Digital

Connecting Europe Facility – Digital

Digital Europe Programme
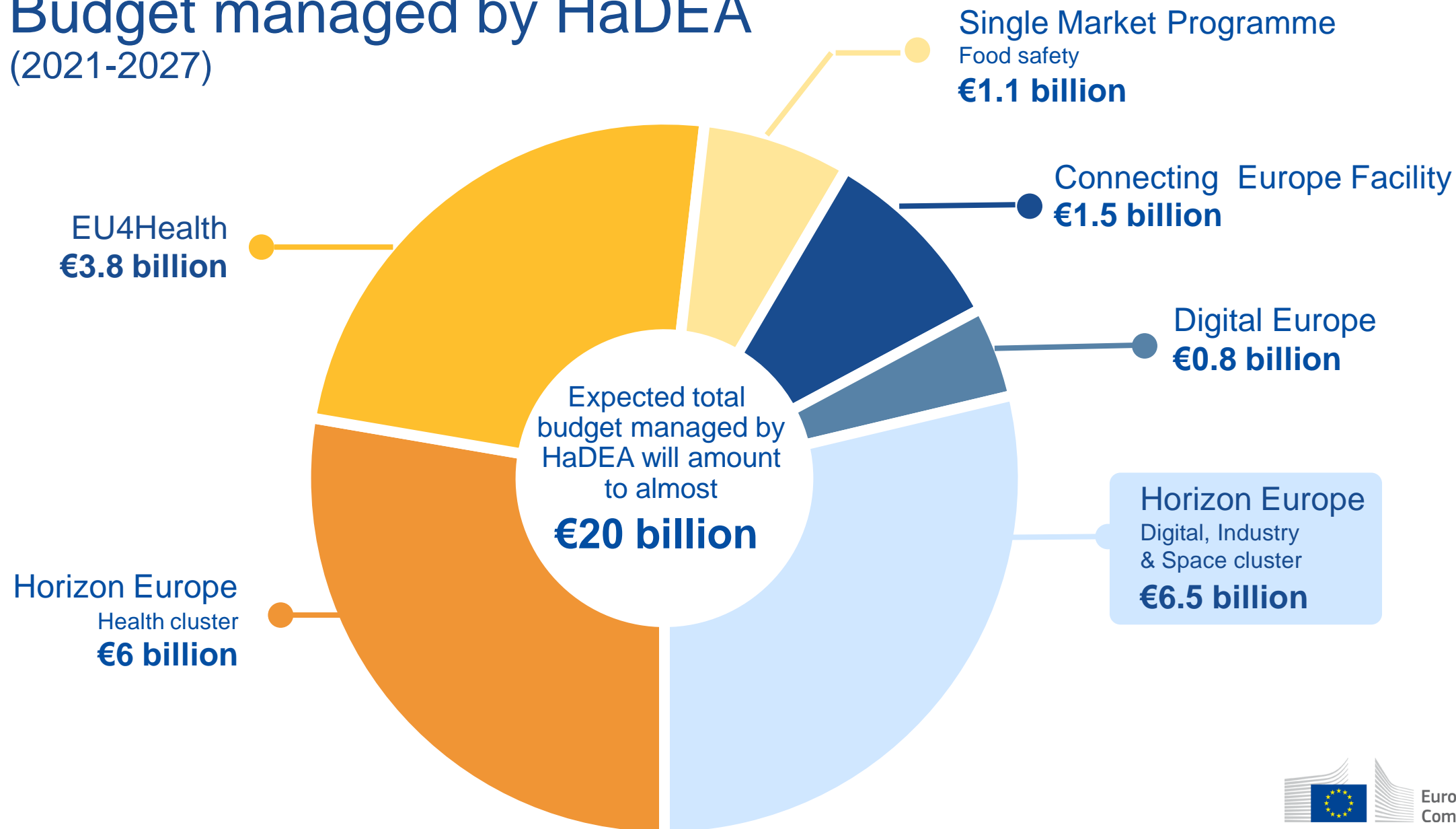
Industry

Horizon Europe – Industry

Space

Horizon Europe – Space

European Commission

Budget managed by HaDEA
(2021-2027)

Single Market Programme
Food safety
€1.1 billion

Connecting Europe Facility
€1.5 billion

Digital Europe
€0.8 billion

Horizon Europe
Digital, Industry
& Space cluster
€6.5 billion

EU4Health
€3.8 billion

Horizon Europe
Health cluster
€6 billion

Expected total
budget managed by
HaDEA will amount
to almost
€20 billion

European Commission

SPECIFIC PROGRAMME IMPLEMENTING HORIZON EUROPE & EIT*

Exclusive focus on civil applications

Pillar I
EXCELLENT SCIENCE

- European Research Council
- Marie Skłodowska-Curie
- Research Infrastructures

Pillar II
GLOBAL CHALLENGES & EUROPEAN INDUSTRIAL COMPETITIVENESS

Clusters
- Health
- Culture, Creativity & Inclusive Society
- Civil Security for Society
- Digital, Industry & Space
- Climate, Energy & Mobility
- Food, Bioeconomy, Natural Resources, Agriculture & Environment

Joint Research Centre

Pillar III
INNOVATIVE EUROPE

- European Innovation Council
- European innovation ecosystems
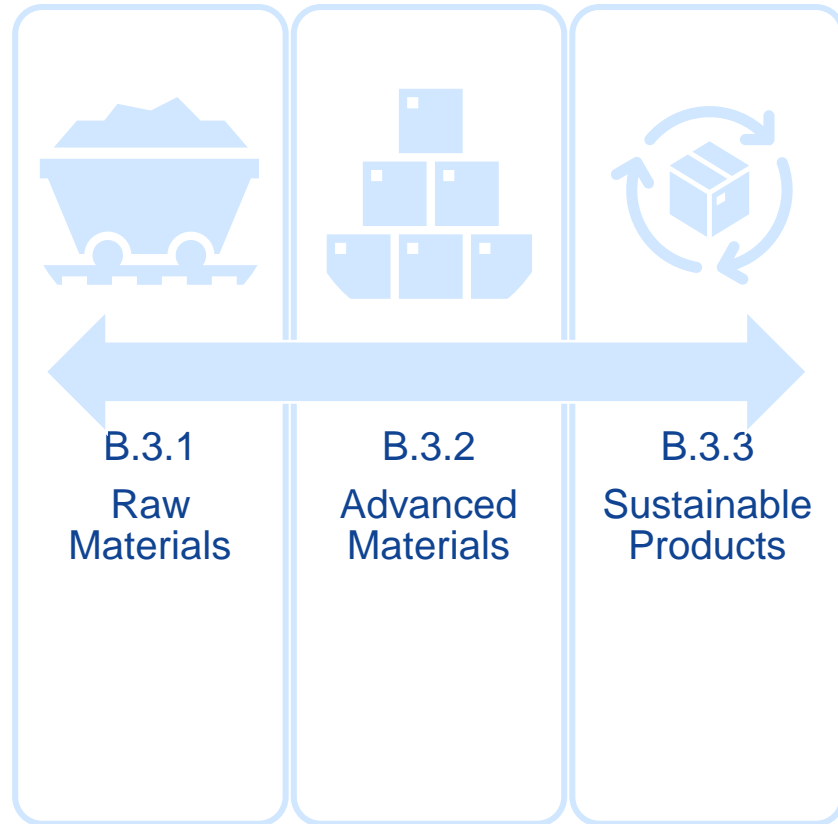- European Institute of Innovation & Technology*

WIDENING PARTICIPATION AND STRENGTHENING THE EUROPEAN RESEARCH AREA

- Widening participation & spreading excellence
- Reforming & Enhancing the European R&I system

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

European Commission

HaDEA implements the Horizon Europe Cluster 4

B.3.1 Raw Materials

B.3.2 Advanced Materials

B.3.3 Sustainable Products

1. Funds projects

2. Provides Feedback to Policy

HaDEA also manages the Horizon 2020 legacy program

European Commission

CE-SPIRE-07-2020

Preserving fresh water: recycling industrial waters industry

SCOPE:
Aim at <u>near-zero discharge using closed-loop systems</u> in combination <u>with recovery of energy and/or substances</u> through the development of integrated water-smart strategies for industrial processes.

- Better <u>characterising</u> the water usage and production in the industrial processes;

- Defining <u>recycling options</u> with a combined water, waste and energy approach

- <u>Future production demand</u> through design, control options, and technologies integration that reduce water consumption, recycle water, and reduce the use of fresh water resources.

Preserving fresh water: recycling industrial waters industry

Reprograming of water resources and optimisation of water management in industrial processes applying the principles of waste - water - energy design in a circular context.

Development new technologies and approaches at a large scale, combining:

•Real time smart monitoring and management systems with innovative digital solutions for sensors and actuators (e.g. modelling and artificial intelligence) and;

•Recycling technologies such as highly selective separation or extraction processes and new solutions for water treatment to prevent fouling and corrosion.

Preserving fresh water: recycling industrial waters industry

Advancing Sustainability of Process Industries through Digital and Circular Water Use Innovations	AquaSPICE
Smart innovative system for recycling wastewater and creating closed loops in textile manufacturing industrial processes	Waste2Fresh
Accelerating Water Circularity in Food and Beverage Industrial Areas around Europe	AccelWater
intelligent Water Treatment Technologies for water preservation combined with simultaneous energy production and material recovery in energy intensive industries	intelWATT
Innovative WAter recoverY Solutions through recycling of heat, materials and water across multiple sectors	iWAYS

European Commission

Preserving fresh water: recycling industrial waters industry

Expected impacts:

• Significant reduction of the current use of fresh water resources;
• Significant steps towards near-zero discharge using closed-loop systems in industrial processes;
• Significant increase of the recovery of water, energy and/or substances and materials;
• Increase of resource and water efficiency by 30%
• Effective dissemination of major innovation outcomes to the current and next generation of employees
• Evironmental gains in absolute figures
• Replication potential

PORTOFOLIO OVERVIEW

Research & innovation will play a crucial role

- The present challenges and opportunities demand fundamental change in which **research and innovation** (R&I), enabled and reinforced by policymaking, plays **a crucial role.**

- R&I will contribute to **accelerate the necessary transitions**, deploying and demonstrating solutions, and engaging citizens in social innovation.

- R&I will help drive and navigate the **long-term systemic changes** required to create a cleaner, greener, fairer society.

**FP7
(2007-2013)
53.2 billion EUR** → **Horizon 2020
(2014-2020)
77 billion EUR** → **Horizon Europe
(2021-2027)
95.5 billion EUR**

HORIZON EUROPE
plays a pivotal role in shaping, supporting and delivering on European policy priorities, including the European Green Deal.

> 35%
of the expenditure from actions under the Horizon Europe Programme will contribute to climate objectives

European Commission

Portfolio overview: H2020 and Horizon Europe

➢ SPIRE (H2020) and Processes4Planet (Horizon Europe) partnerships

Process industries refers to industries concerned with the processing of bulk resources into other products. It includes **resource & energy-intensive industries**.

Industrial sectors:

Cement   Ceramics   Chemicals   Engineering   Non-ferrous metals

Minerals   Pulp & paper   Refining   Steel   Water

Objectives

I. Circularity

II. Climate neutrality

III. Enhanced competitiveness

European Commission

Horizon 2020: SPIRE partnership

- The H2020 public-private partnership **SPIRE "Sustainable Process Industry through Resource and Energy Efficiency"** had the aim of integrating, demonstrating and validating systems and technologies capable of achieving

  - ➢ a reduction in fossil energy intensity of up to 30%
  - ➢ a reduction of up to 20% in non-renewable, primary raw material intensity
  - ➢ a significant contribution to efficiency improvement in CO_2-equivalent of up to 40%

- Co-programmed partnership with **>90 H2020 projects** and **>620 million EUR funding**.

Processes4Planet Partnership (P4P)

*"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."*

➢ Developing and deploying climate-neutral solutions

➢ Closing the energy and feedstock loops

➢ Achieving a global leadership in climate-neutral and circular solutions, accelerating innovation and unlocking public and private investment (competitiveness)

Partners: more than 150 members, represented by A.SPIRE. Including large industries, SME, RTOs, associations etc

Process industries in Horizon Europe

Pillar II
GLOBAL CHALLENGES &
EUROPEAN INDUSTRIAL
COMPETITIVENESS

Clusters

1. Health
2. Culture, Creativity & Inclusive Society
3. Civil Security for Society
4. Digital, Industry & Space
5. Climate, Energy & Mobility
6. Food, Bioeconomy, Natural Resources, Agriculture & Environment

Cluster 4 – Digital, industry and space

Destination 1 - Climate neutral, Circular and Digitised production

Global leadership in clean, climate-neutral and resilient industrial value chains, circular economy and climate-neutral and human-centric digital systems and infrastructures
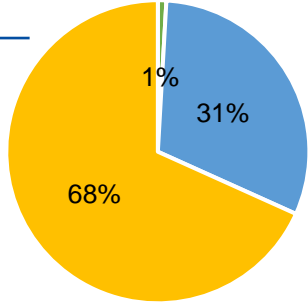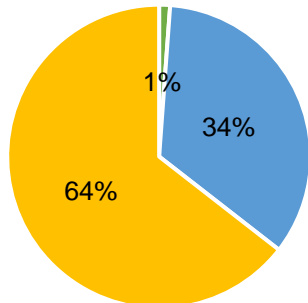
Three co-programmed partnerships: Made in Europe, Clean Steel and **Processes4Planet**

European Partnerships in Cluster "Digital Industry, Space"

Name	Type	Scope/Aim
Made in Europe	**Co-programmed**	**Green, digital and flexible manufacturing**
Processes4Planet	**Co-programmed**	**Climate-neutral, circular and competitive process industry**
Clean Steel	**Co-programmed**	**Carbon-neutral steel production**
Photonics	Co-programmed	Maintain leadership in photonic technologies
AI, data and robotics	Co-programmed	Innovation and uptake of AI, data and robotics
Global Competitive Space Systems	Co-programmed	Reinforce EU capacity to access and use space
Metrology	Art.185	A world-class metrology system for EU
Key Digital Technologies	Art.187	Digital hardware and software development
Smart networks and Services	Art.187	Support European 5G and develop 6G
High Performance Computing	Art.187	Quantum/super-computing technologies

Portfolio overview: H2020 and Horizon Europe

➤ SPIRE (H2020) and Processes4Planet (Horizon Europe) partnerships

	H2020 (2014-2020)	Horizon Europe (2021-2022)
Total EU funding [EUR]	624.0 M	314.6 M (out of 1,300 M)
Number of topics	32	10
Number of projects	94	27
Running projects	22	27 (+17 GAPs 2023)
Average project duration [months]	45	48
Average no. participants per project	15	21
Average EU funding per project [EUR]	6.6 M	11.6 M

EU funding – H2020

- CSA
- RIA
- IA

1%
31%
68%

EU funding – Horizon Europe

- CSA
- RIA
- IA

1%
34%
64%

23 Work programme 2023-2024 (estimated): 330.67 million EUR (11 topics, 27 projects)

P4P projects portfolio in HaDEA (2021-2024)

EU funding: EUR 680.4 Million

Call topics: 21

Projects: 57 (31 RIAs, 24 IAs, 2 CSAs)

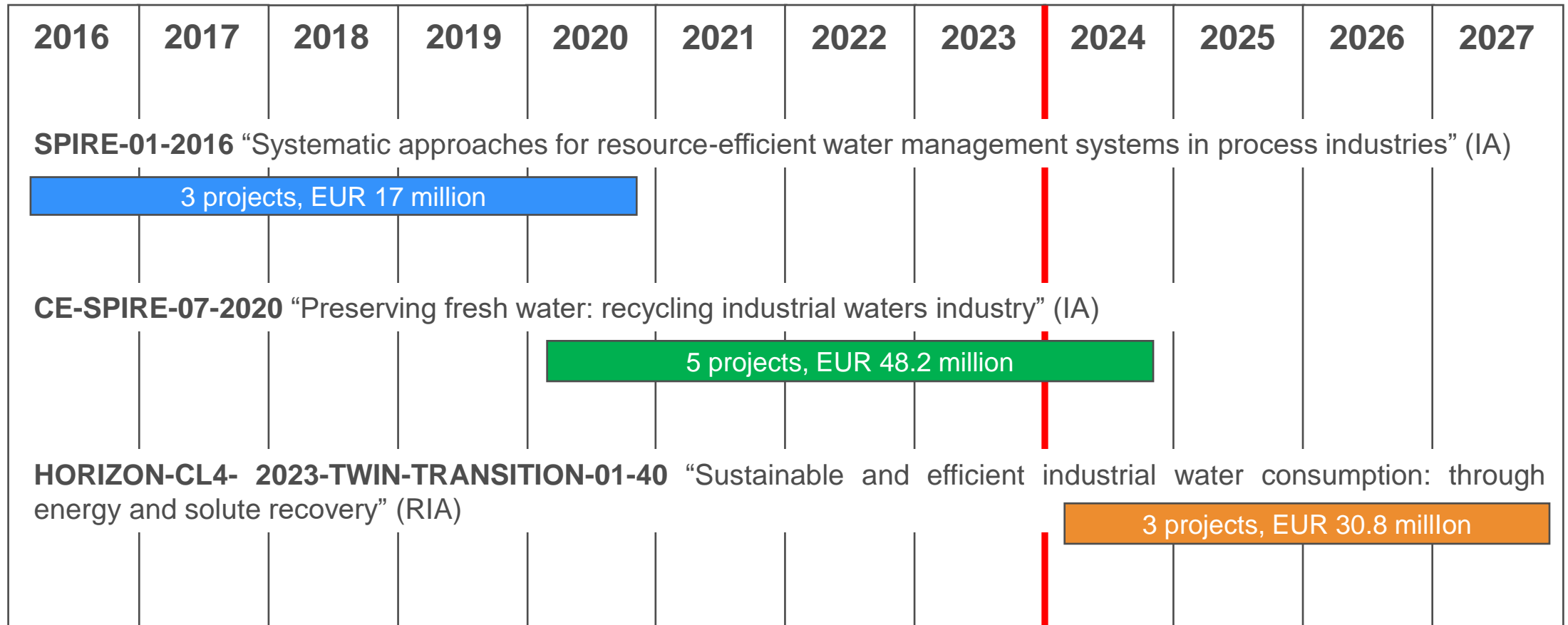EU funding per project: EUR 11.9 Million

Key areas:

o Industrial decarbonisation
o Circularity and resource efficiency
o Industrial symbiosis
o Enhanced competitiveness

European Commission

Networking & Synergies

Efficient water use in Process industries

2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027

SPIRE-01-2016 "Systematic approaches for resource-efficient water management systems in process industries" (IA)

3 projects, EUR 17 million

CE-SPIRE-07-2020 "Preserving fresh water: recycling industrial waters industry" (IA)

5 projects, EUR 48.2 million

HORIZON-CL4- 2023-TWIN-TRANSITION-01-40 "Sustainable and efficient industrial water consumption: through energy and solute recovery" (RIA)

3 projects, EUR 30.8 million

What our subscribers do

CORDIS
Results Pack on
energy-intensive industries

Decarbonisation,
energy efficiency
and circularity
for a climate neutral
and sustainable EU

Research and Innovation

europa.eu/!HRbmCD

𝕏 @EU_Hadea

in @hadea

#processindustries
#decarbonisation
#circularity
#energyefficiency
#Processes4Planet
#HorizonEU
#EUfunded

Become an independent expert

25% new experts

Read excellent proposals

Network with fellows

✓ Academia
✓ Private sector / innovation agencies
✓ Local / national authorities / agencies

Work as an expert (europa.eu)

European Commission

Thank you