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IMPACT RIS3T

Fondo Europeo de Desarrollo Regional
Fundo Europeu de Desenvolvimento Regional



UNIÓN EUROPEA
UNIÃO EUROPEIA



RIS3T Galicia-Região Norte

INDUSTRY 4.0

Opportunities in Horizon Europe

Cluster 4 - Digital, Industry, Space



Business Support on Your Doorstep



Estratégia de Especialização Inteligente Transfronteiriça Galiza-Norte de Portugal (RIS3T)



TOPICS

- 1 Vision - Horizon Europe (2021-2027)
- 2 Partnerships, Initiatives, Strategies with interest for Industry 4.0
- 3 Industry 4.0 in Cluster 4 - Digital, Industry, Space

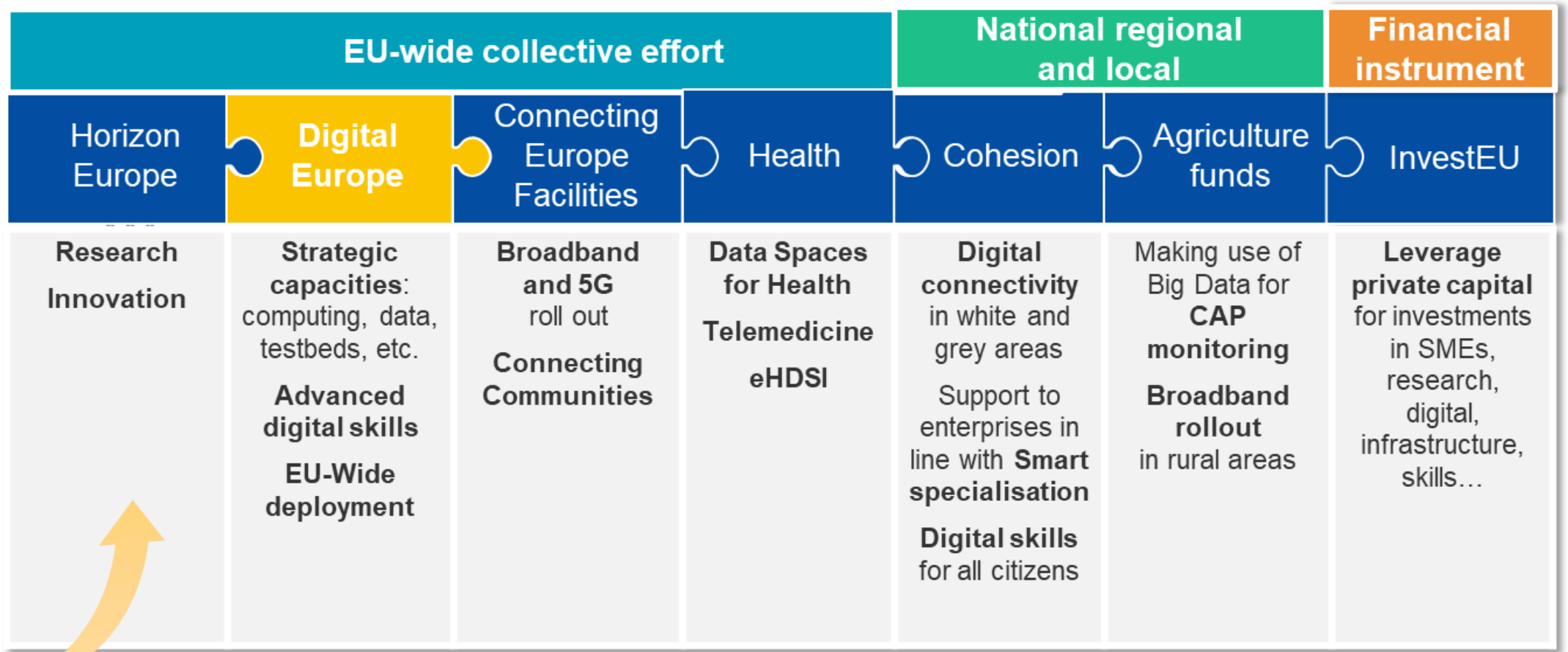
PERIN

Portugal in Europe
Research and Innovation Network



Horizon Europe (2021-2027)

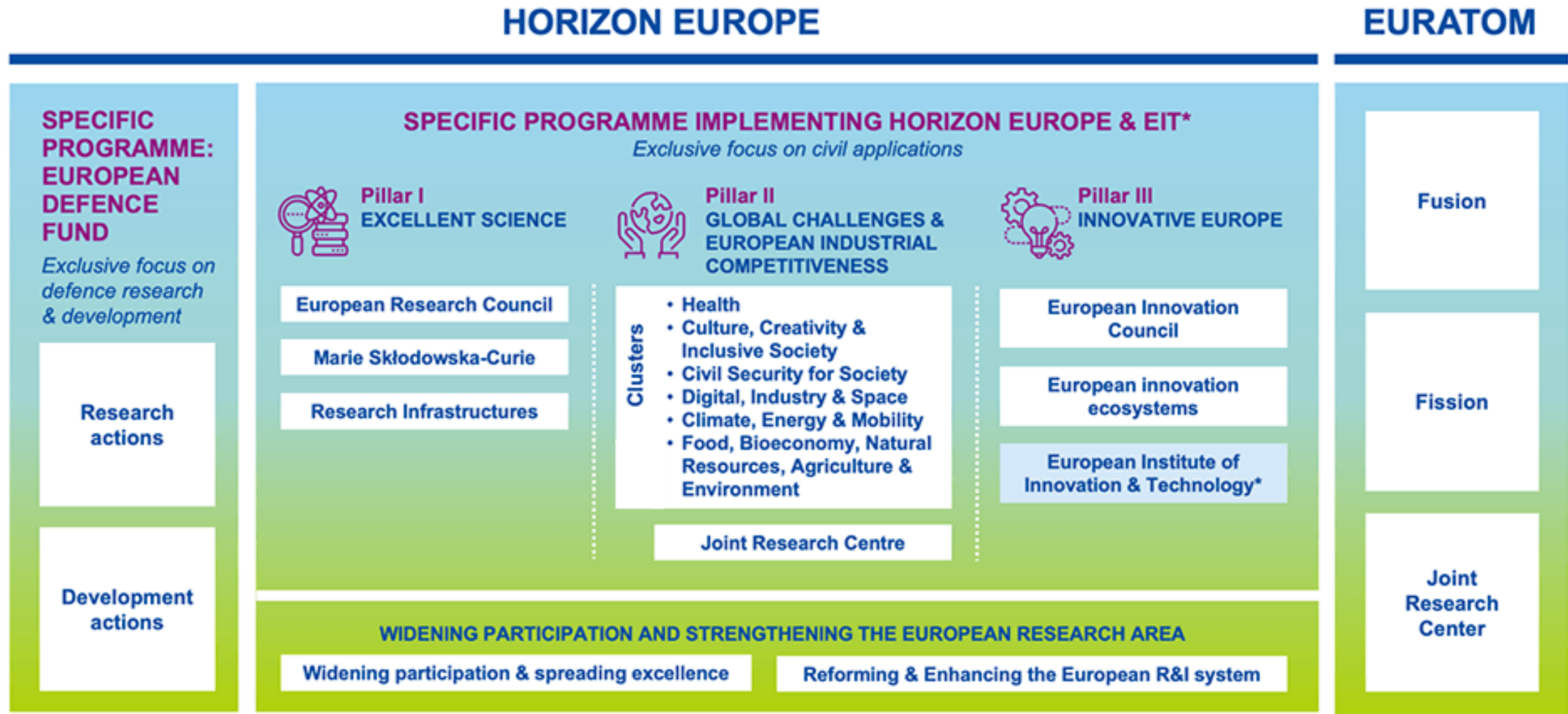
EU Programmes are complementary !



95.5 billion euros to support R&D&i

Horizon Europe (2021-2027)

Structure



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

Horizon Europe (2021-2027)

Opportunities – where?



CLUSTER

e.g. **Cluster 4** – Digital, Industry, Space

DESTINATIONS & CALLS

(areas of impact)

e.g.

Destination 1

Call: Green, flexible and advanced manufacturing

TOPICS (specific calls !)

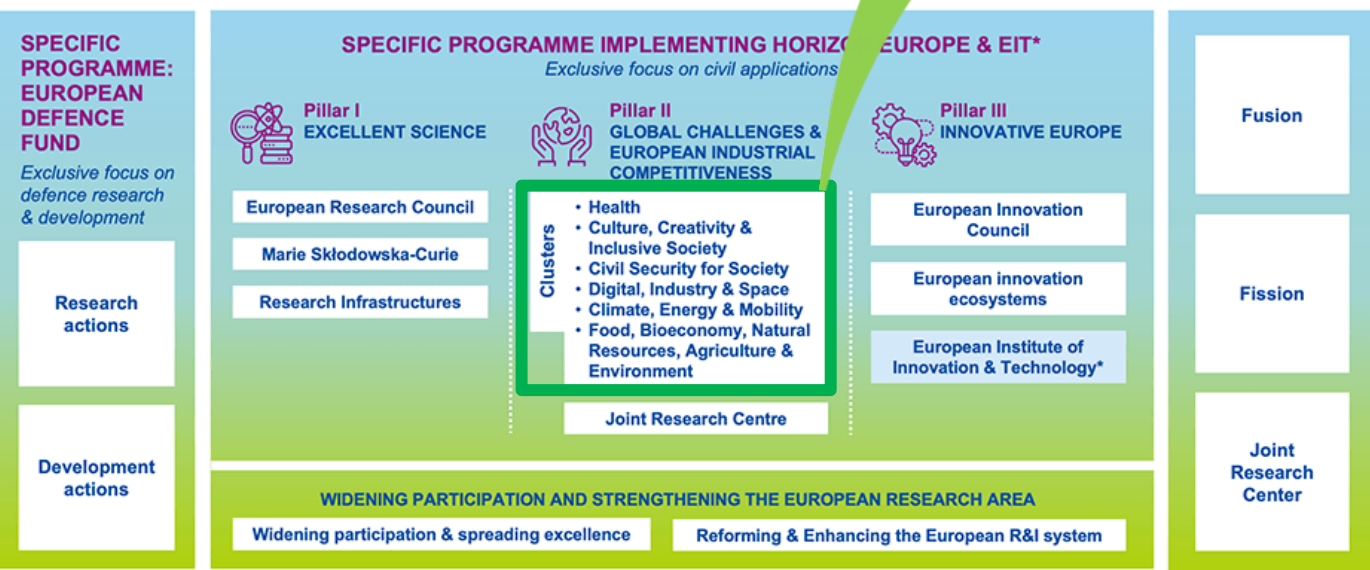


e.g. **HORIZON-CL4-2021-TWIN-TRANSITION-01-01:**
AI enhanced robotics systems for smart manufacturing
(*topic objectives, budget, TRL, etc*)

- **Expected outcome**
- **Expected contribution**
- **Scope**

HORIZON EUROPE

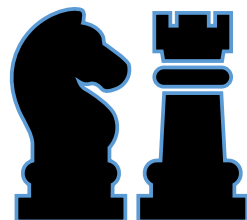
EURATOM



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

Horizon Europe

European strategy
&
Initiatives



Industry


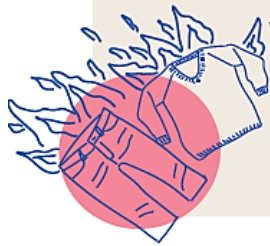



 European Commission

1 NO POVERTY	2 ZERO HUNGER	3 GOOD HEALTH AND WELL BEING	4 QUALITY EDUCATION	5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION	7 AFFORDABLE AND CLEAN ENERGY	8 DECENT WORK AND ECONOMIC GROWTH	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE	10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES	SUSTAINABLE DEVELOPMENT GOALS			12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION	14 LIFE BELOW WATER	15 LIFE ON LAND	16 PEACE, JUSTICE AND STRONG INSTITUTIONS	17 PARTNERSHIPS FOR THE GOALS



Implementing the Sustainable Development Goals through the next Multi-Annual Financial Framework of the European Union
 Advisory report to the European Commission by the Multi-Stakeholder Platform on the Implementation of the Sustainable Development Goals in the EU, March 2018

TEXTILES


Worldwide, a full truck of **textiles** is sent to incineration or landfilled every second.

It is estimated that less than 1% of all textiles worldwide are recycled into new textiles.

Driving new business models will boost sorting, reuse and recycling of textiles, and allow consumers to choose sustainable textiles. Ecodesign will apply to a broader range of products: clothes will be made to last longer.

PLASTICS



Consumption of plastics is expected to double in the coming 20 years.

By 2050, plastics could account for 20% of oil consumption, 15% of greenhouse gas emissions, and there could be more plastics than fish in the ocean.







Single-use products will be **phased out** wherever possible and replaced by durable products for multiple use.

Acting on microplastics - restricting intentionally added microplastics, increasing the capture of microplastics at all relevant stages of the product lifecycle.

FOOD and PACKAGING



In 2017 packaging waste reached in Europe a record of **173 kg per inhabitant**.




New legislative initiatives on reuse to **substitute single-use packaging**, tableware and cutlery by reusable products in food services, as well as targets for reducing packaging waste will be proposed.

WASTE




Each citizen produces nearly **half a tonne of municipal waste per year**.




Measures will be introduced for **waste prevention and reduction**, increasing recycled content, minimising waste exports outside EU. An EU model for separate collection and labelling of products will be launched.




Circular Economy Action Plan

The European Green Deal


March 2020
#EUGreenDeal

ELECTRONICS and ICT



Electrical and electronic equipment is one of the fastest growing waste streams in the EU.

Two in three Europeans would use their digital devices for longer provided performance is not significantly affected.




Products placed on EU market will be designed to **last longer, to be easier to repair and upgrade, recycle and reuse**.

Providing incentives for **product-as-a-service**: companies will keep the ownership and responsibility for the product throughout its lifecycle.

INDUSTRY 5.0



WHAT

Industry 4.0 evolution complemented by R&I drive towards the transition to a **sustainable, human-centric** and **resilient** European industry.

GOAL

A better fit and "win-win" interaction between industry and society, leveraging R&I support to industry long-term service to humanity within planetary boundaries.



Human-centric industry

- Serving the human needs and interests
- Human-machine-interaction
- Human dignity & health
- Safe and inclusive work environment
- Promote up-skilling and re-skilling of workers



Sustainable industry

- Circular processes
- Re-use, re-purpose, recycle
- Reduce waste and environmental impact.
- Reducing energy consumption & emissions
- Avoid degradation of natural resources



Resilient industry

- Flexibility and agility of processes
- Resist disruptions
- Higher degree of robustness in production
- Support critical infrastructure in crisis (geopolitical shifts and natural crises)



EU Chemicals Strategy for Sustainability

Objectives

- better protect citizens and the environment
- boost innovation for safe and sustainable chemicals

Actions

- risk and hazard assessment of chemicals
- boost investment and innovation
- safe and sustainable by design
- promoting resilience of supply and sustainability of critical chemicals
- high standards and not exporting chemicals banned in the EU



European
Commission

European Partnerships – Why ?

1

THEY BRING TOGETHER KEY ACTORS FROM ACROSS SECTORS TO JOINTLY IMPLEMENT R&I ROADMAPS.

EXAMPLE

Photonics21 has developed a roadmap for European photonics for 2021-2027 with more than 1700 companies and research organisations across Europe.

2

THEY CREATE CRITICAL SCALES OF INVESTMENT TO DEMONSTRATE RADICALLY NEW INNOVATIONS ACROSS EUROPE.

EXAMPLE

The proposed partnership on clean hydrogen aims to roll-out hydrogen technologies at scale... building on the Fuel Cells and Hydrogen Joint Undertaking's successful demonstration of zero-emission fuel cell buses and refuelling infrastructure.



Horizon Europe's Next-Generation European Partnerships and their contribution to a greener and more digital Europe

European Partnerships – A New Approach in HE (~50% of Pillar II budget)

CLUSTER 1: Health	CLUSTER 4: Digital, Industry & Space	CLUSTER 5: Climate, Energy & Mobility	CLUSTER 6: Food, Bioeconomy, Agriculture, ...	EIT	SUPPORT TO INNOVATION ECOSYSTEMS
Innovative Health Initiative	Key Digital Technologies	Clean Hydrogen	Circular Bio-based Europe	InnoEnergy	Innovative SMEs
Global Health Partnership	Smart Networks & Services	Clean Aviation	Rescuing Biodiversity to Safeguard Life on Earth	Climate	
Transformation of health systems	High Performance Computing	Single European Sky ATM Research 3	Climate Neutral, Sustainable & Productive Blue Economy	Digital	
Chemicals risk assessment	European Metrology (Art. 185)	Europe's Rail	Water4All	Food	
ERA for Health	AI-Data-Robotics	Connected and Automated Mobility (CCAM)	Animal Health & Welfare*	Health	
Rare diseases*	Photonics	Batteries	Accelerating Farming Systems Transitions*	Raw Materials	
One-Health Anti Microbial Resistance*	Made in Europe	Zero-emission waterborne transport	Agriculture of Data*	Manufacturing	
Personalised Medicine*	Clean steel – low-carbon steelmaking	Zero-emission road transport	Safe & Sustainable Food System*	Urban Mobility	
Pandemic Preparedness* <i>Co-funded or co-programmed</i>	Processes4Planet	Built4People		Cultural and Creative Industries	
	Global competitive space systems**	Clean Energy Transition			
		Driving Urban Transitions			

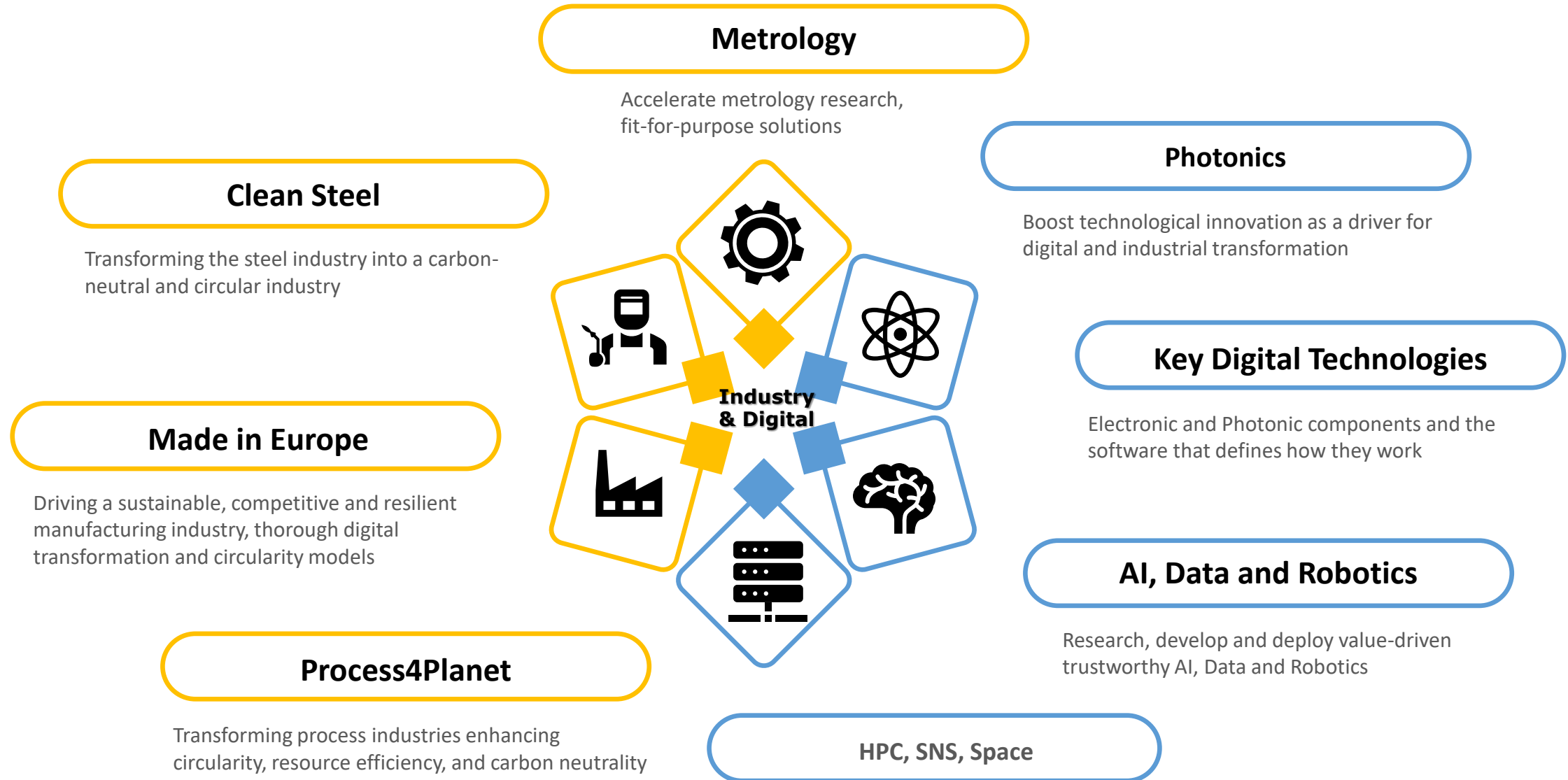
CROSS-PILLARS II AND III

European Open Science Cloud

- Institutionalised Partnerships (Art 185/7)
- Institutionalised partnerships / EIT KICs
- Co-Programmed
- Co-Funded

* Calls with opening dates in 2023-24
** Calls with opening dates not before 2022

European Partnerships – industry 4.0



Cluster 4

Digital, Industry, Space



6 “destination” 6 expected impacts

15,349 b€

• 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

Global leadership



Industrial leadership and increased autonomy in key strategic value chains with security of supply in raw materials



Globally attractive, secure and dynamic data-agile economy



Sovereignty in digital technologies and in future emerging enabling technologies



Strategic autonomy in developing, deploying and using global space-based infrastructures, services, applications and data



A human-centred and ethical development of digital and industrial technologies



- Green, flexible and advanced manufacturing
- Enabling circularity of resources in the process industries, including waste, water and CO₂/CO
- Advanced digital technologies for manufacturing
- Integration of Renewables and Electrification in process industry
- Increase productivity, efficiency

- Resilient, sustainable and secure (critical) raw materials value chains
- Materials with enhanced functionalities and sustainable-by-design
- Materials solutions for clean, toxic/pollutant free environment
- Raw materials for transition to a climate-neutral and circular economy
- Advanced materials

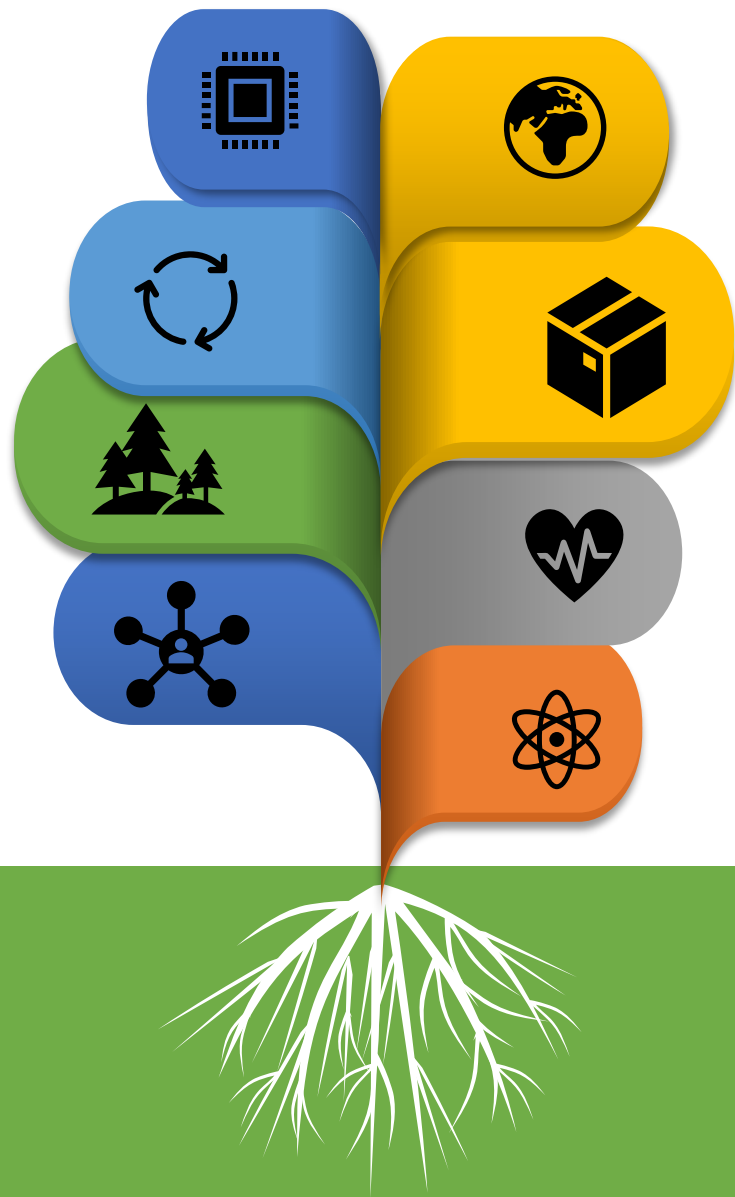
- Data sharing in the common European data spaces
- Strengthening Europe’s data analytics capacity
- From Cloud to Edge to IoT for European Data

- Ultra-low power processors
- Electronics
- Photonics
- 6G and foundational connectivity
- AI, data and robotics
- Quantum Technologies
- Graphene

- Foster competitiveness of space systems
- Evolution of space and ground infrastructure for Galileo/EGNOS
- Evolution of services of the EU space programme components Galileo, EGNOS and Copernicus
- Development of applications from the EU space programme components

- Leadership in AI based on trust
- An Internet of Trust
- eXtended Reality (XR)
- Make the most of the technologies within society and industry

Examples of topics – industry 4.0



HORIZON-CL4-2021-TWIN-TRANSITION-01-01: **AI enhanced robotics systems for smart manufacturing**

HORIZON-CL4-2021-TWIN-TRANSITION-01-02: **Zero-defect manufacturing towards zero-waste**

HORIZON-CL4-2021-TWIN-TRANSITION-01-07: **Artificial Intelligence for sustainable, agile manufacturing**

HORIZON-CL4-2021-TWIN-TRANSITION-01-05: **Manufacturing technologies for bio-based materials**

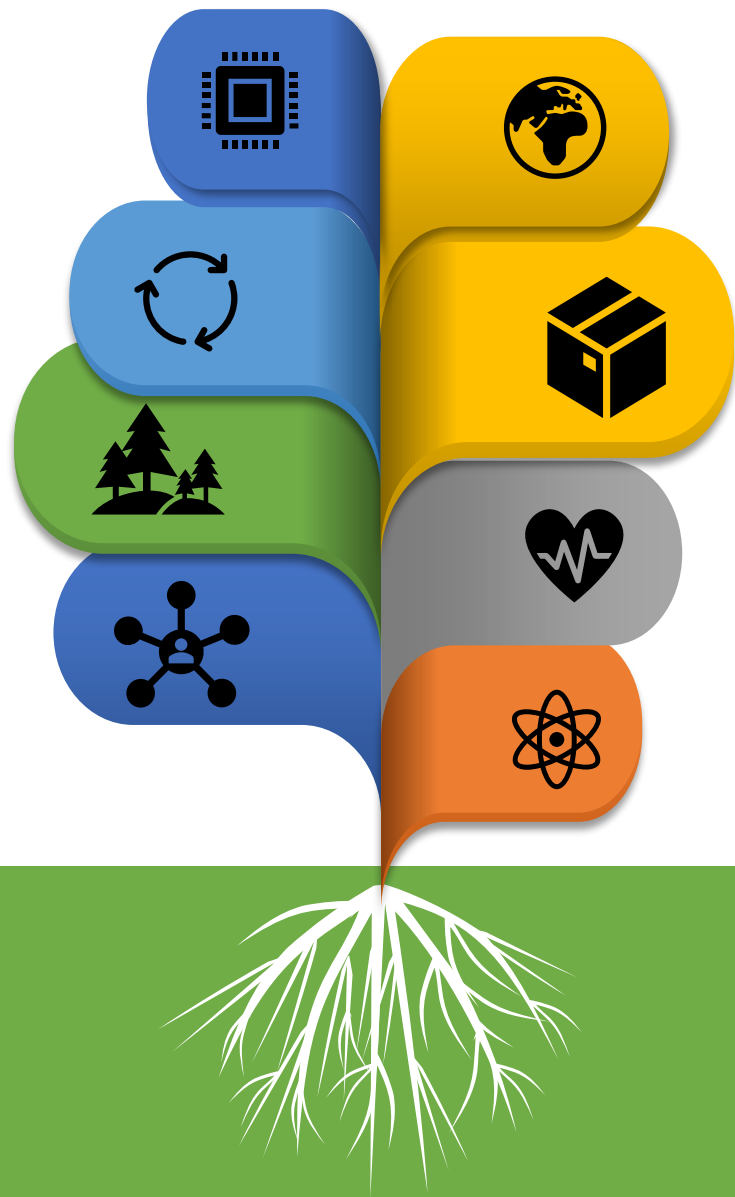
HORIZON-CL4-2021-TWIN-TRANSITION-01-17: **Plastic waste as a circular carbon feedstock for industry**

HORIZON-CL4-2021-TWIN-TRANSITION-01-21: **Design and optimisation of energy flexible industrial processes**

HORIZON-CL4-2021-TWIN-TRANSITION-01-18: **Carbon Direct Avoidance in steel: Electricity and hydrogen-based metallurgy**

D1 - CLIMATE NEUTRAL, CIRCULAR AND DIGITISED PRODUCTION

Examples of topics – industry 4.0



HORIZON-CL4-2022-RESILIENCE-01-01: **Circular and low emission value chains through digitalisation**

HORIZON-CL4-2022-RESILIENCE-01-05: **Technological solutions for tracking raw material flows in complex supply chains**

HORIZON-CL4-2022-RESILIENCE-01-10: **Innovative materials for advanced (nano)electronic components and systems**

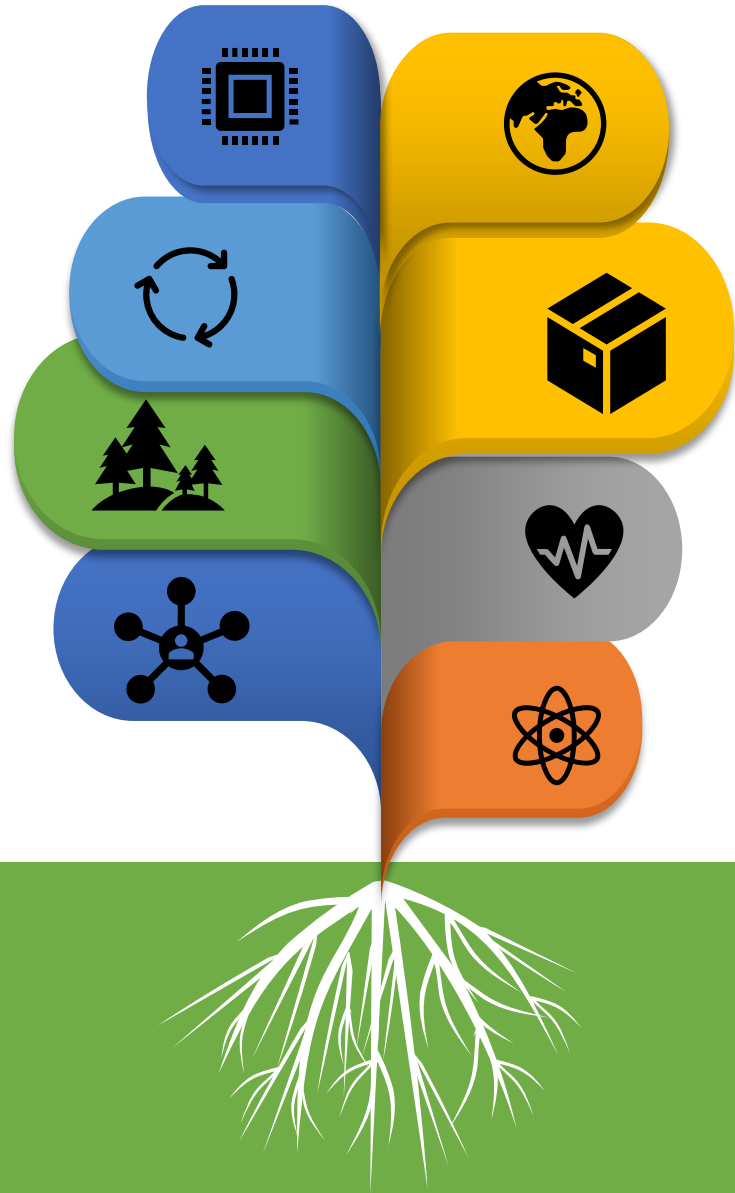
HORIZON-CL4-2022-RESILIENCE-01-23: **Safe- and sustainable-by-design organic and hybrid coatings**

HORIZON-CL4-2022-RESILIENCE-01-13: **Smart and multifunctional biomaterials for health innovations**

HORIZON-CL4-2022-RESILIENCE-01-24: **Novel materials for supercapacitor energy storage**

**D2 - INCREASED AUTONOMY IN KEY STRATEGIC VALUE CHAINS
FOR RESILIENT INDUSTRY**

Examples of topics – industry 4.0



HORIZON-CL4-2021-DATA-01-01: Technologies and solutions for compliance, privacy preservation, green and responsible data operations

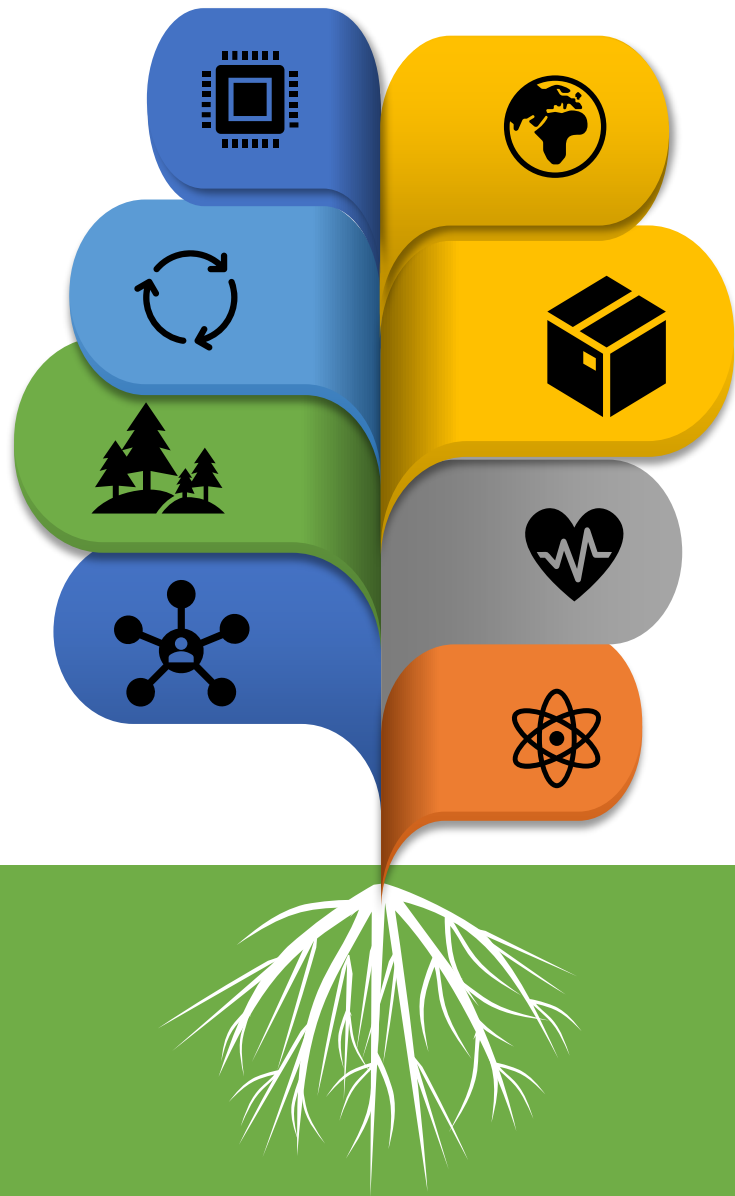
HORIZON-CL4-2022-DATA-01-04: Technologies and solutions for data trading, monetizing, exchange and interoperability

HORIZON-CL4-2022-DATA-01-02: Cognitive Cloud: AI-enabled computing continuum from Cloud to Edge

HORIZON-CL4-2022-DATA-01-03: Programming tools for decentralised intelligence and swarms

D3 - WORLD LEADING DATA AND COMPUTING TECHNOLOGIES

Examples of topics – industry 4.0



HORIZON-CL4-2021-DIGITAL-EMERGING-01-01: **Ultra-low-power, secure processors for edge computing**

HORIZON-CL4-2021-DIGITAL-EMERGING-01-05: **Open Source Hardware for ultra-low-power, secure processors**

HORIZON-CL4-2022-DIGITAL-EMERGING-01-03: **Advanced multi-sensing systems**

HORIZON-CL4-2021-DIGITAL-EMERGING-01-07: **Advanced Photonic Integrated Circuits**

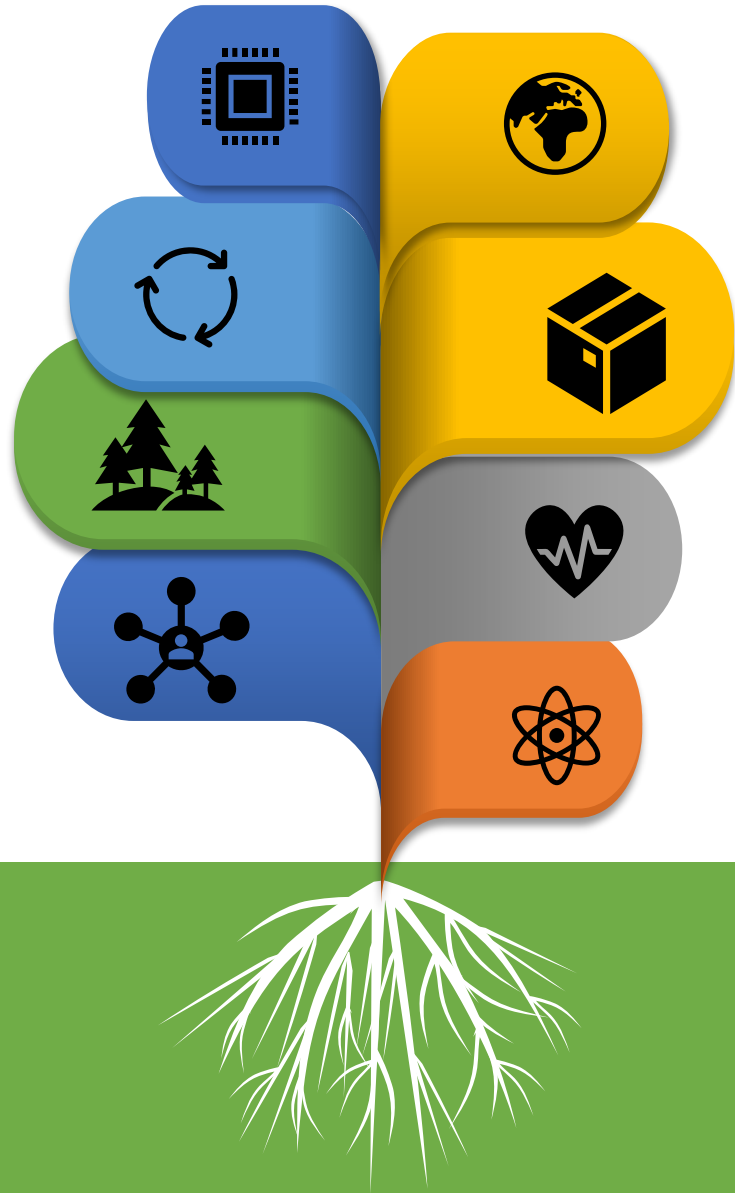
HORIZON-CL4-2022-DIGITAL-EMERGING-01-06: **Pushing the limit of physical intelligence and performance**

HORIZON-CL4-2021-DIGITAL-EMERGING-01-09: **AI, Data and Robotics for the Green Deal**

HORIZON-CL4-2021-DIGITAL-EMERGING-01-30: **Investing in new emerging quantum computing technologies**

**D4 - DIGITAL AND EMERGING TECHNOLOGIES FOR
COMPETITIVENESS AND FIT FOR THE GREEN DEAL**

Examples of topics – industry 4.0



HORIZON-CL4-2021-HUMAN-01-24: **Tackling gender, race and other biases in AI**

HORIZON-CL4-2021-HUMAN-01-04: **Trust & data sovereignty on the Internet**

HORIZON-CL4-2021-HUMAN-01-13: **eXtended Reality Modelling**

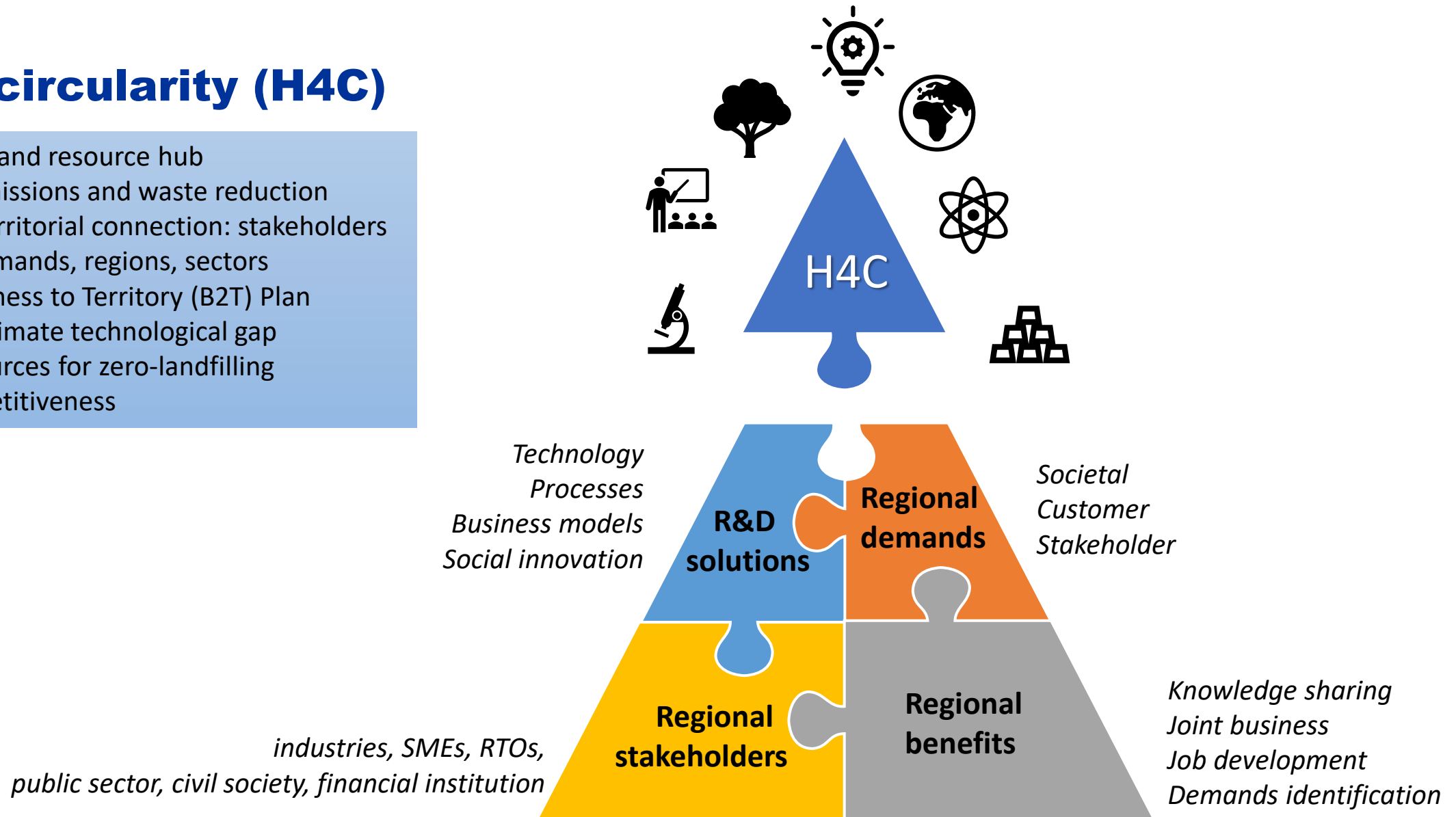
HORIZON-CL4-2021-HUMAN-01-19: **Testing innovative solutions on local communities'demand**

HORIZON-CL4-2021-HUMAN-01-26: **Workforce skills for industry 5.0**

**D6 - A HUMAN-CENTRED AND ETHICAL DEVELOPMENT OF
DIGITAL AND INDUSTRIAL TECHNOLOGIES**

Building hubs for circularity (H4C)

- Competence and resource hub
- Culture of emissions and waste reduction
- Accelerate territorial connection: stakeholders solutions, demands, regions, sectors
- Set up a Business to Territory (B2T) Plan
- Closing the climate technological gap
- Circular resources for zero-landfilling
- Global competitiveness



Examples of topics – industry 4.0

Destination 1 (2021)	Climate neutral, circular and digitised production HORIZON-CL4-2021-TWIN-TRANSITION-01-02 Zero-defect manufacturing towards zero-waste
Stakeholders Manufacturing	Expected Outcome: <ul style="list-style-type: none"> • Demonstrate a significant increase of <u>sustainable production</u> through improved <u>control systems</u> and <u>non-destructive inspection</u> methods • Develop methodologies and tools to prevent the generation of defects at component level and its propagation to the system level
IA Total budget ≈ /project ≈ projects	<ul style="list-style-type: none"> • Create new <u>diagnostic methods</u> for in-situ <u>monitoring</u> of industrial production • Ensure <u>efficient use of materials</u>, <u>repair</u> strategies, and reduced <u>production cost and time</u> <p>This topic implements the co-programmed European Partnership on <u>Made in Europe</u>.</p>

Examples of topics – industry 4.0

<p>Destination 2 (2022)</p>	<p>Increased autonomy in key strategic value chains for resilient industry</p> <p>HORIZON-CL4-2022-RESILIENCE-01-11</p> <p>Advanced lightweight materials for energy efficient structures</p>
<p>Stakeholders Manufacturing</p>	<p>Expected Outcome:</p> <ul style="list-style-type: none"> • <u>Renewable lightweight materials, 25 % lower cost</u> than currently used materials; • Light-weight products containing <u>>50% sustainable, bio-based materials</u>; • <u>Up to 30% lightweight potential</u> through tailored functionality for a range of extreme environment (<u>infrastructures, aeronautics, space</u>) applications ;
<p>RIA Total budget ≈ /project ≈ projects</p>	<ul style="list-style-type: none"> • <u>Reduction in CO₂ emissions (LCA)</u> of at least 20 %; • <u>Business models and circular value chains</u> for lightweight bio based components; • <u>Improved time-to-market</u> for European providers of lightweight solutions.



RIS3T Galicia-Região Norte



Thank You !
Cluster 4 - Digital, Industry, Space

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