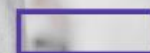


European Innovation Council

Backing visionary entrepreneurs

Antonio Marco Pantaleo
Program manager, European Innovation Council

European
Innovation
Council

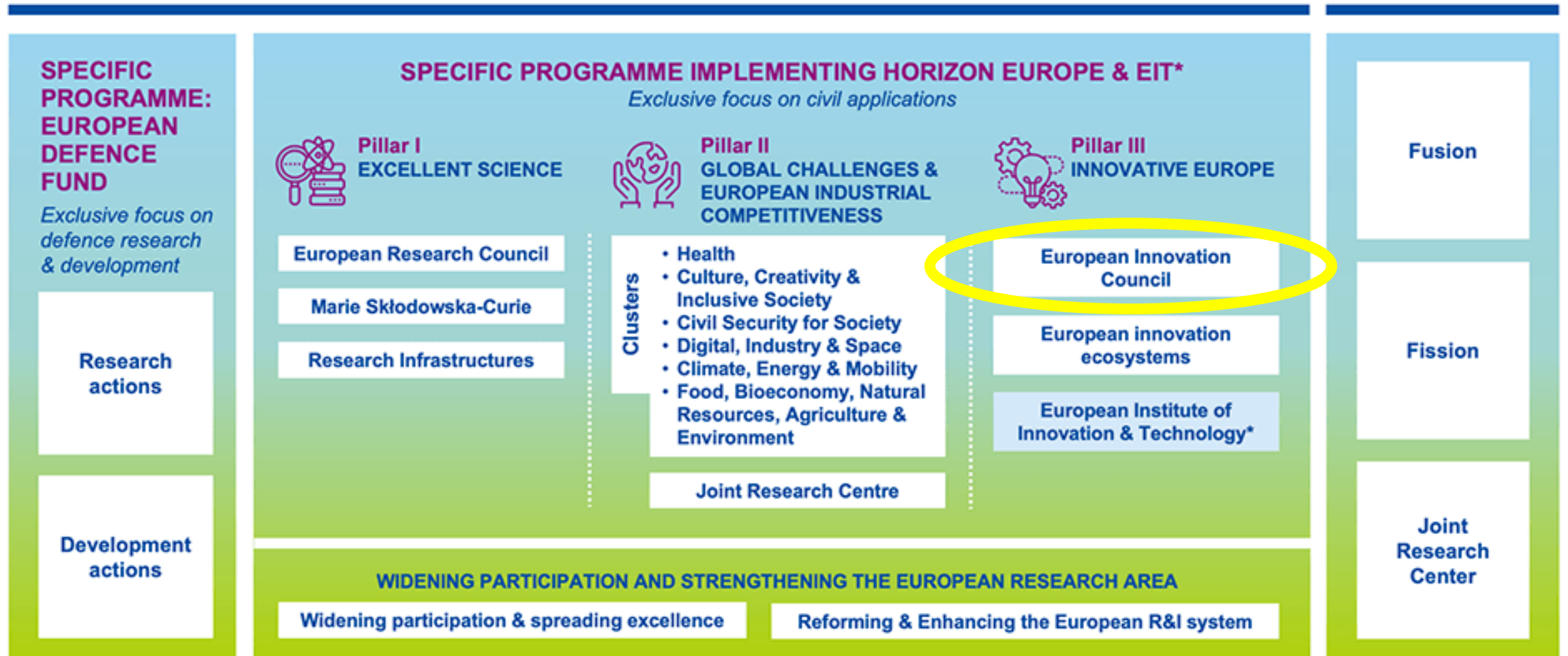


The Horizon Europe framework programme



HORIZON EUROPE

EURATOM



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



EIC Programs

Pathfinder (TRL1-4)

- **For consortia (open and challenge calls) and single entities (challenge call)**
- Early stage research on breakthrough technologies
- **Grants up to €3/4 million**

Transition (TRL 4-6)

- **For consortia and single entities**
- Technology maturation from proof of concept to validation
- Business & market readiness
- **Grants up to €2.5 million**

Accelerator (TRL 6-9)

- **For individual SMEs**
- Development & scale up of deep-tech/ disruptive innovations by startups/ SMEs
- Blended finance (**grants up to €2.5 million; equity investment up to €15 million or above**)



Iordanis Arzimanoglou

Biotechnology & Health

Eric Claverol-Tinturé

MedTech & Medical Devices

Francesco Matteucci

Materials for Energy & Environment

Antonio Marco Pantaleo

Energy Systems

Stella Tkatchova

Space systems & technologies

Federica Zanca *Incoming PM
for AI in Medical technologies*

Samira Nik

Quantum tech & electronics

Franc Mouwen

*Architecture engineering construction
technologies*

Ivan Stefanic

Food chain technologies, novel & sustainable food

Isabel Obieta

Sustainable electronics

Carina Faber

Renewable energy conversion & alternative resource exploitation

**EIC
PROGRAMM
E
MANAGERS**



EIC Programme Manager Priorities

Identify candidate challenges and select portfolios of projects

Science and innovation intelligence activity

Outreach and community building

Steering panel members to select portfolio of projects for Pathfinder, and active observers for Transition and Accelerator

Pro-active management of selected portfolios and projects

Technology

Regulation

Transition to innovation

Communication and dissemination

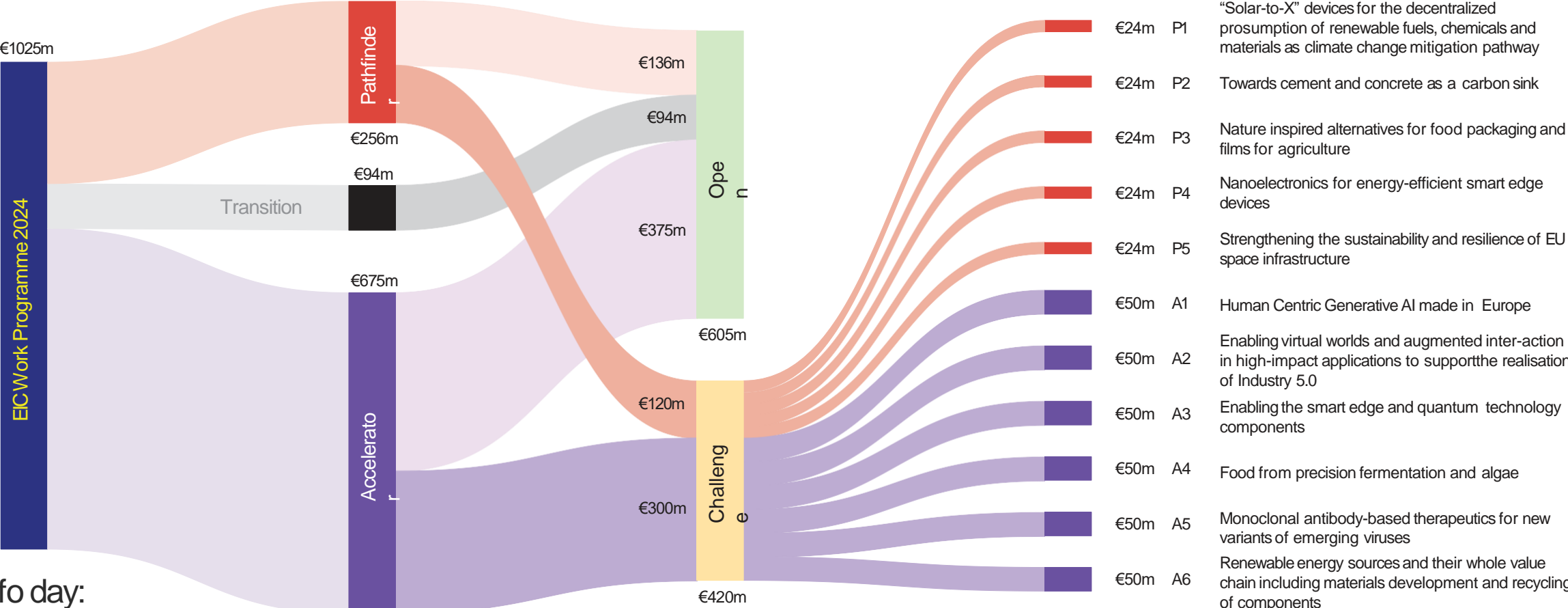
EIC
Programme
Management
(per sector)

Temporary role: scientific and innovation expert to bring vision, technical knowledge, networking to EC policy and implementation

3 PM positions open until 26-01-24

Bridging policy and implementation

2024 EIC WP ~€1 bn



Info day:
[15 January \(General\)](#)
[16 January \(Accelerator Challenges\)](#)
 20 March (tbc) Pathfinder Challenges

WORK PROGRAMME 2024

What are the main elements?

€

BUDGET

€1.2 billion

3

MAIN FUNDING SCHEMES



EIC PATHFINDER

Early-stage technology research **€256 million**

Grants **<€4 million**



EIC Pathfinder Open 2024 [€136 million]
APPLY BY 7 MARCH 2024



EIC Pathfinder Challenges 2024 [€120 million]
APPLY BY 16 OCTOBER 2024



EIC TRANSITION

Technology validation and spin-out **€94 million**

Grants **<€2.5 million**



EIC Transition Open [€94 million]
APPLY BY 18 SEPTEMBER 2024



EIC ACCELERATOR

Commercialisation and scale-up **€675 million**

Grants **<€2.5 million**

Equity investments **<€15 million**



EIC Accelerator Open [€375 million] and Challenges [€300 million]
APPLY ANYTIME



Cut-offs:
13 MARCH 2024
3 OCTOBER 2024

EIC PATHFINDER CHALLENGES IN THE EIC WORK PROGRAMME 2024



- EIC Pathfinder Open: €136 million [**deadline: 7 March**]
- EIC Pathfinder Challenges: €120 million [**deadline: 16 October**]

1

"SOLAR-TO-X" DEVICES

- To make progress towards synthetic fuels and chemical technologies integrating all necessary conversion steps into a single device, solely and directly driven by solar energy.

2

TOWARDS CEMENT AND CONCRETE AS A CARBON SINK

- To support breakthrough innovations and (alternative) pathways for decarbonised and carbon-negative cement and concrete.

3

NATURE INSPIRED ALTERNATIVES FOR FOOD PACKAGING AND FILMS

- To support interdisciplinary research leading to the development and production of sustainable nature inspired alternatives for food packaging and agricultural production such as, but not limited to, greenhouse and mulch films.
- To replace the use of fossil-carbon-based plastics from farm to fork and thereby support EU policy ambitions to move towards a more circular, resource efficient economy.

4

NANOELECTRONICS FOR ENERGY-EFFICIENT SMART EDGE DEVICES

- To explore solutions that will have a drastic impact on decreasing the power consumption of any smart edge device, especially for Edge Processing and memories, Edge Sensing and Imaging, Edge Communication and Edge Power Management.

5

STRENGTHENING THE SUSTAINABILITY AND RESILIENCE OF EU SPACE INFRASTRUCTURE

- To support the development of innovations strengthening the protection of EU space infrastructure.
- To develop technologies for space debris mitigation and active debris removal and concepts for in-space recycling of dysfunctional orbital assets.

EIC Cleantech challenges



EIC Challenges 2021

	Pathfinder	Transition	Accelerator
Cleantech	<ul style="list-style-type: none"> Novel routes to green hydrogen production (Portfolio kick off meeting October 2022) 	<ul style="list-style-type: none"> Energy harvesting and storage technologies 	<ul style="list-style-type: none"> Green Deal innovations for the economic recovery

EIC Challenges 2022

	Pathfinder	Transition	Accelerator
Cleantech	<ul style="list-style-type: none"> Carbon dioxide & Nitrogen management and valorisation (final retained list end March 2023) Mid-long term, systems-integrated energy storage (final retained list end March 2023) 	<ul style="list-style-type: none"> Process and system integration of clean energy technologies Green digital devices for the future 	<ul style="list-style-type: none"> Technologies for 'Fit for 55'

EIC Challenges 2023

	Pathfinder (32.7mIn Euro)	Transition (20mIn Euro)	Accelerator (100mIn Euro)
Cleantech	<ul style="list-style-type: none"> Clean and efficient cooling (submission deadline 18th October 2023) 	<ul style="list-style-type: none"> Environmental Intelligence (submission deadline 12th April and 27th September 2023) 	<ul style="list-style-type: none"> Energy Storage (submission deadline 22nd March, 7th June, 4th October 2023)

EIC Accelerator – The evaluation process

We will help **you** to prepare your **business plan** and draft a **proposal** with AI tool and coaching



You submit your full **proposal** which will be **assessed** by Remote evaluators



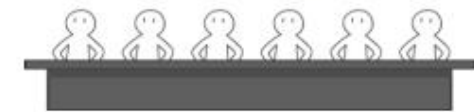
You have a disruptive / deep tech **idea** with a potential to **scale up** and you need **financial support**



Tell us your story in 5 pages



You will **pitch** your innovation in front of EIC Jury Members



If selected, you will sign the **contract**



A four-steps process





Investment component

- minimum EUR 0.5 million and maximum EUR 15 million,
- usually in the form of direct equity or quasi-equity,
- maximum 25% of the voting shares of the company,
- “patient capital” principle (7-10 years perspective on average).

Grant component

- maximum EUR 2.5 million,
- eligible costs are reimbursed up to a maximum of 70%,
- innovation activities supported should be completed within 24 months,
- small mid-caps are not eligible for grant (but can apply for investment only).



Overview of the EIC Fund

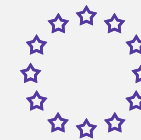
EIC Fund invests in and supports early-stage companies to scale-up!



A **€4 billion Agnostic VC fund**, established in June 2020, with a "sweet spot" for Deep Tech



Nearly **€1 billion** of investments in deep tech companies have been approved by the EIC Fund since the Fund started its operations in **September 2022**.



EIB - Investment Advisor performs due diligence
EISMEA hires high quality independent experts for Tech DD



Ticket size between €0.5 to €15 million (current average €5.3 million)



726 companies selected for support (164 investment agreements signed - direct equity investment or convertible loans)



Current multiplier effect for equity investments is **3.14x average of the EIC money**

Key Strategic Goals

Our strategic goals reflect our ambition to create a strong European VC ecosystem

Strategic goals as defined in EIC's Work Program for 2023



Be the investor of
choice for those with
visionary ideas



Crowd in €30-50 billion
investment into European
deep tech



Support the most promising
innovations
for society



Increase number of European
unicorns
and scale ups



Catalyze innovation impacts
from European public sector



Achieve operational
excellence

Financial & Non-financial support

All the EIC Awardees receive both financial & non-financial support



Financial Support

- Financial support includes investing up to €2.5m in grants and €15m in equity



Coaching and mentoring

- Business experts with entrepreneurial and fund-raising background to provide companies with crucial insights and guidance



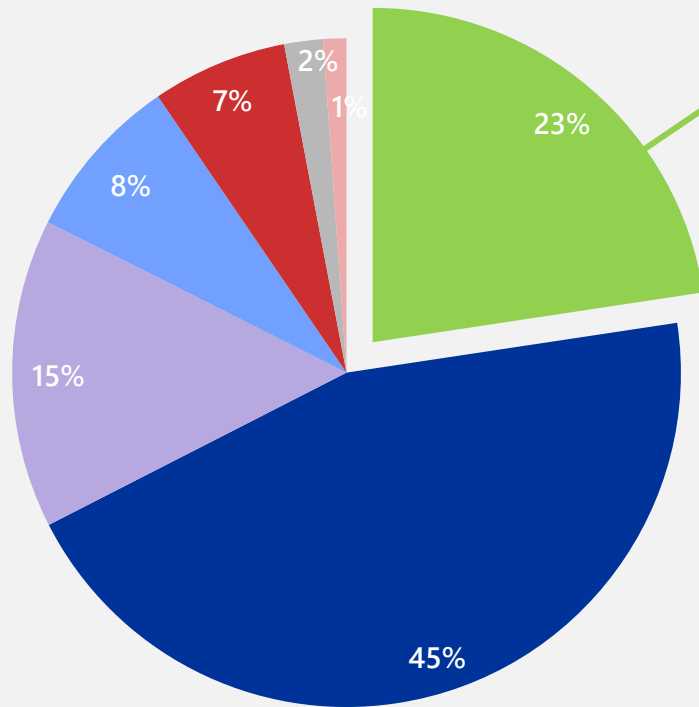
Business Acceleration Services

Direct introduction to investors, partners (corporates, procurers etc), participation in overseas trade-fairs

EIC Fund companies split across sectors

Total of 726 companies selected, 535 selected for equity investment and 164 with signed investment agreements

Portfolio Split between sectors
(total # of companies*)






- Cleantech
- Health - Biotech and Medtech
- Hardware
- Enterprise Software
- Food and Agritech
- Space
- Consumer Products

Cleantech

- **121 companies (23% of the total)**




Environment & Energy

- 61 companies (11% of the total)




New Materials & Construction

- 34 companies (6% of the total)




Transport & Mobility

- 26 companies (5% of the total)




Food and Agri Tech

- 35 companies (7% of the total)




Health - Biotech & Medtech

- 240 companies (45% of the total)




Hardware

- 80 companies (15% of the total)




Enterprise Software

- 43 companies (8% of the total)

Space

- 10 companies (2% of the total)

Customer Products and Services

- 6 companies (1% of the total)




*Excluding Grant-Only Portfolio companies



Thank you!

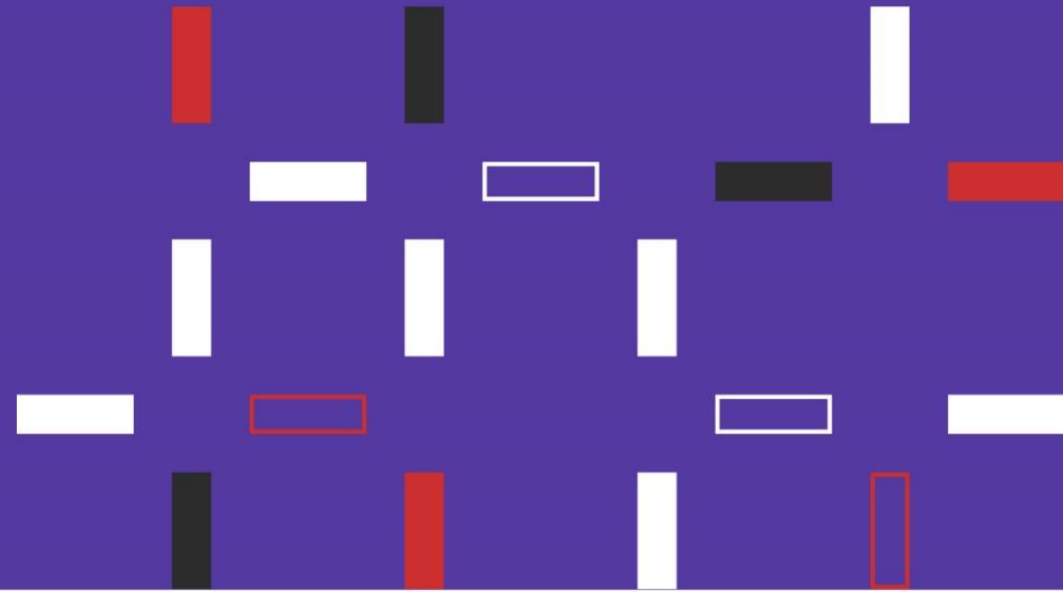


Antonio.pantaleo@ec.europa.eu

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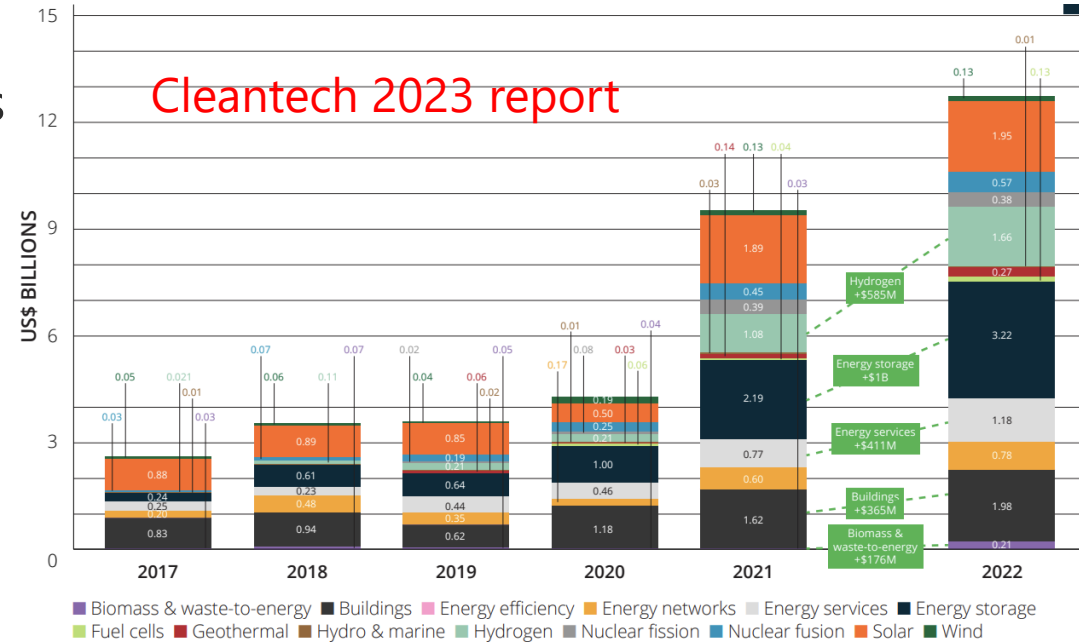
All images © European Union, unless otherwise stated. Image sources: ©Tom Merton/Caia Image, #315243588; ©REDPIXEL, #220695664; ©Halfpoint, #180578699; ©bnenin #213968072; ©MyMicrostock/Stocksy, #3094437622021. Source: Stock.Adobe.com. Icons © Flaticon – all rights reserved.



Portfolios of projects managed at EIC in cleantech



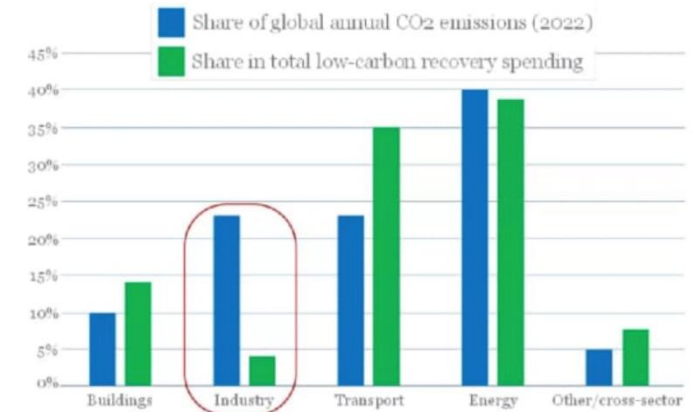
- Green hydrogen generation and uses
- Energy storage and systems integration
- CO2 and N management valorization
- Energy harvesting and conversion
- Clean cooling and cold chains
- Energy services and digital solutions



Future research and innovation trends

Modular Nuclear Reactors, georeactors and deep geothermal, sustainable mining/sea mining, materials substitution, solar chemistry, click chemistry, synthetic biology

GHG energy-related emissions *versus* low-carbon technology spending in different sectors



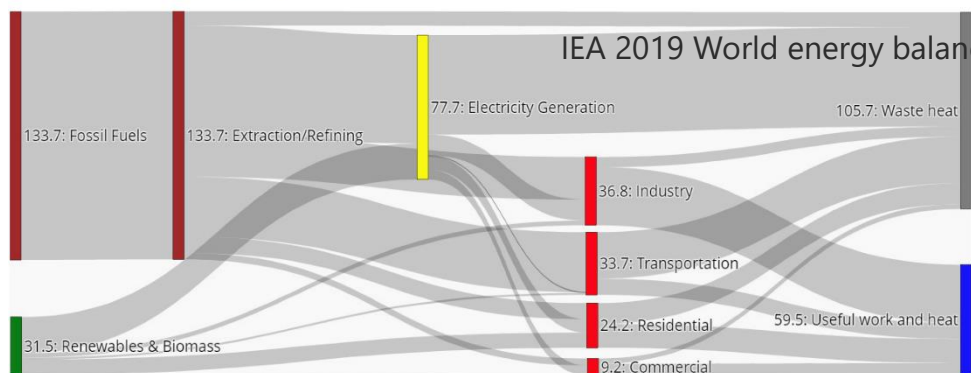
Strategic EU research and innovation priorities 2024

Chips and AI – Cleantech – Biotech and biomanufacturing – advanced materials

Priorities for the energy transition



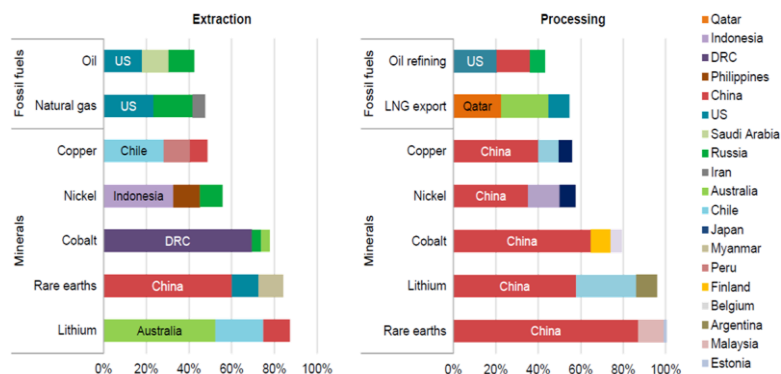
Today's Energy Economy (PWh/year)



64% of primary energy is lost

Final uses (energy efficiency, digital transition..)

Share of top three producing countries in production of selected minerals and fossil fuels, 2019

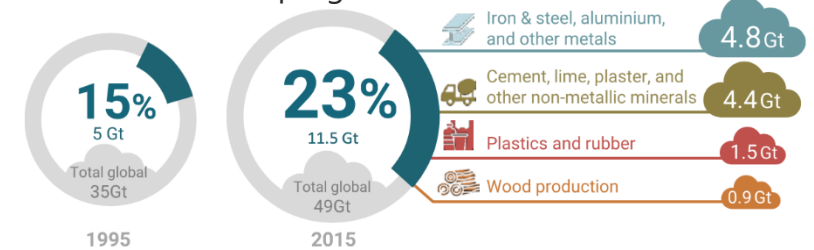


IEA. All rights reserved.

EU is 75-100% reliant on import for metals

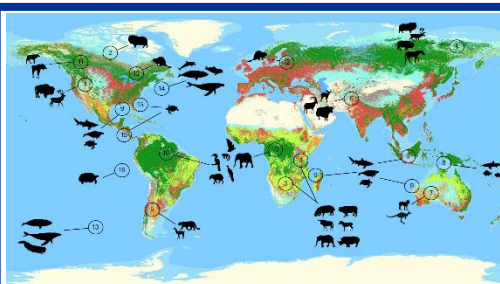
Circularity and security (reuse, recycle, critical materials, domestic resources)

UN environment program, 2020



Emissions from materials production

Systems integration (sectors coupling, industrial symbiosis, H2 in steel etc)



Nature Climate Change Vol 13, April 2023

CO2 is only part of the problem

Nature based solutions – biodiversity
Combine engineering and bio: synthetic biology
Broader views (food-water-energy)

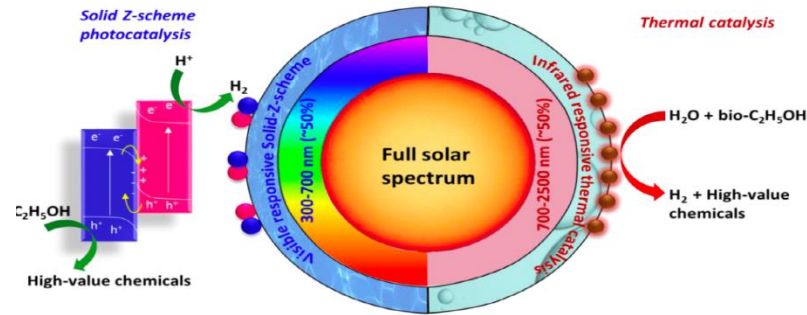
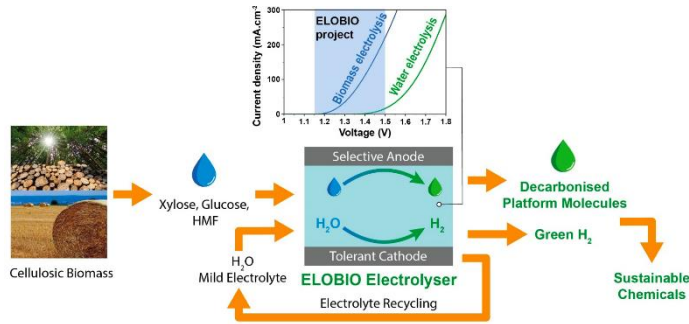
- Fit for 55%
- RepowerEU, RefuelEU
- Green deal industrial plan
- Net zero industry act
- Critical raw materials act
- Electricity market design
- Chips act
- Economic security

Green H2 generation portfolio: systems integration and biomass feedstock

Sustainable local biomass for co-electrolysis or reforming to H2 and chemicals or materials

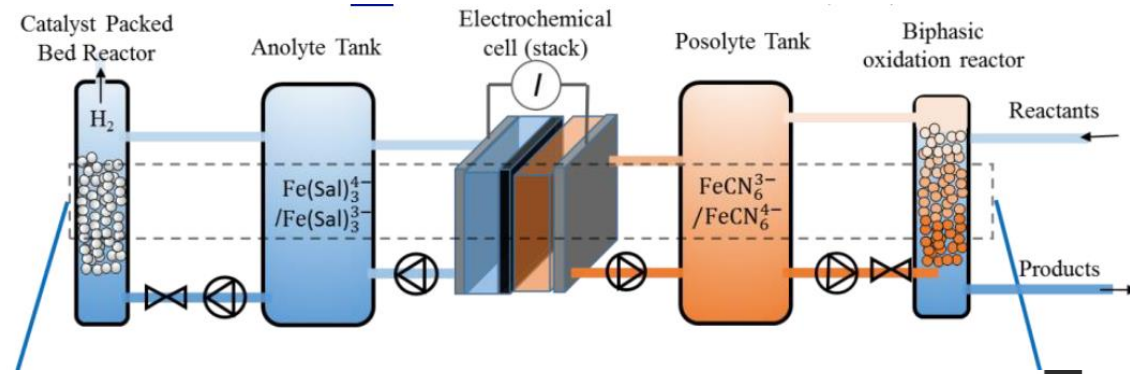
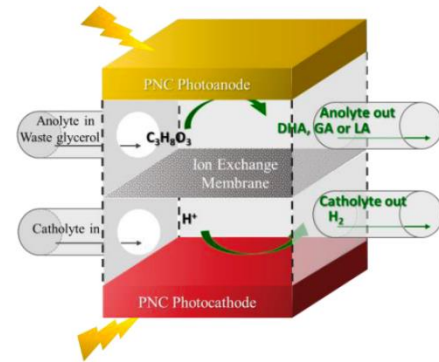
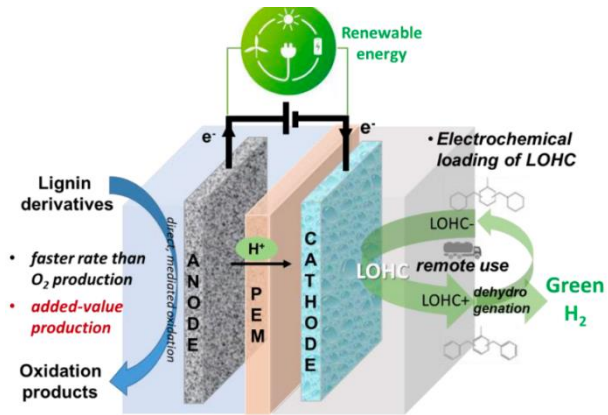
Portfolio activities on biomass supply, bio-chemicals markets, biorefineries integration, added values

Synergies with CBE JU for biobased materials production



GH2: bioethanol and photoelectrolysis

ELOBIO: Cellulose and hemicellulose



Dualflow: redox flow battery and H2 electrolysis with mediated oxidation of cellulose to chemicals

EPOCH: Lignin to chemicals and LOHC

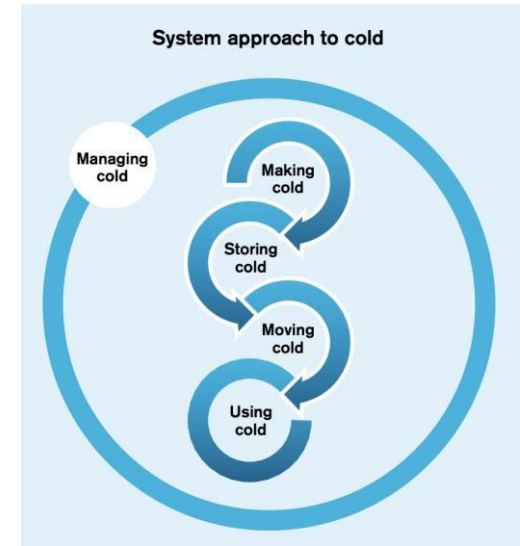
Ophera: glycerol

Integration H2 production and storage

Integration of energy storage technologies (mid and long duration)

The challenge on clean cooling

- **Dirty process:** 10% of CO2 emissions come from cooling (3 times more than aviation and shipping)
- **Fast increasing:** demand of air conditioning will cover 50% of global electricity demand by 2100
- **Data centres:** around **half of their energy consumption** goes on cooling (up to 100 GW by 2030)
- Current/future **energy carriers** (H₂, NH₃, CH₄) are small molecules : need cooling/ compression
- **Developing countries:** two million **vaccine** preventable deaths each year, and the **loss of 0.2 billion tonnes of food** (and 3.3 billion tonnes of CO2 emissions, third biggest emitter after US and China).
- Clean cold requires a **fully integrated 'cold economy'**, with novel clean cold technologies, the integration of waste and under-exploited energy resources (i.e. wasted cold from LNG)



Need for:

- **transformational research** - displace existing technologies
- **Integration of renewable energy** for cooling (i.e. passive cooling, radiative and solar cooling, absorption and hybrid heat pumps)
- **Components:** new compression-expander mechanisms (scroll, electrochemical compression), mixed refrigerants, novel cycles configurations
- **store and move cold** (decoupling demand/generation) and system level integration
- **End uses:** management of cold consumption, diagnostics and soft fault detection

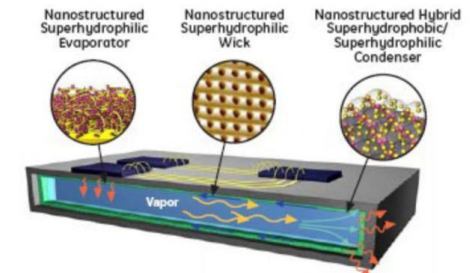
EIC pathfinder open: relevant research directions

- Dropwise condensation for heat exchange: Harmonic [Homepage HARMoNIC – HARMoNIC | ETH Zurich](#)
- Viscoelastic liquid cooling for batteries: i-Bat ([Immersion-cooling Concepts for Electric Vehicle Battery Packs using Viscoelastic Heat Transfer Liquids \(I-BAT\) | I-BAT | Project | Fact sheet | H2020 | CORDIS | European Commission \(europa.eu\)](#))
- Molecular storage and thermal fuels: Most and E-sim ([Most Project | For a Better Future | Solar Energy \(mostsolarproject.eu\)](#) ([About ESiM - ESiM Project \(esim-project.eu\)](#))
- Magnetocaloric cooling with non critical materials: CocoMag ([Optimized magnets for the energy transition | Max-Planck-Institut für Eisenforschung GmbH \(mpie.de\)](#))
- 3D printing heat exchangers: ThermoDust ([ThermoDust](#))
- Deep geothermal for heat discharge: Deep-U ([DeepU – A EU project on geothermal energy](#))

EIC accelerator: start ups

- Kiutra: solid state cryogenic cooling ([Cooling the second quantum revolution \(kiutra.com\)](#))
- Magnotherm: use of high magnetic fields for cryogenic cooling ([MAGNOTHERM](#))
- Magnetocaloric Heating Cooling ([Realizing New Sustainable Applications – Magneto](#))

Thermal material for electronics, courtesy of Peter De Boek, General Electrics



A diagram of GE's advanced thermal material system. Leveraging unique surface engineered coatings that both repel and attract water, GE's system achieves twice the heat conducting properties of copper and can function under extreme forces of gravity. The improved heat properties will enable a wide range of better electronics applications, ranging from faster laptops and more advanced radar systems to better aviation and naval electronic control systems.

EIC Fund's Co-investors

EIC Fund companies have also attracted many investors so far

Non-exclusive investors
examples



1038 Co-Investors¹
World-Wide



From Angel Investors
to Investment Funds
(ticket agnostic)



From Institutional
Investors to
Industry Leaders



Co-Investors from
40+ countries



1. This number reflects the number of investors that have invested in a company in the EU portfolio, but not necessarily in the same round

Institutionalised European Partnerships in the portfolio

PILLAR II - Global challenges & European industrial competitiveness

PILLAR III - Innovative Europe

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

