



# Clúster 5 – Horizonte Europa Energía

## Work Programme 2023-2024



Infoday Cataluña- Horizonte Europa Energía

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CDTI

16 Enero 2023

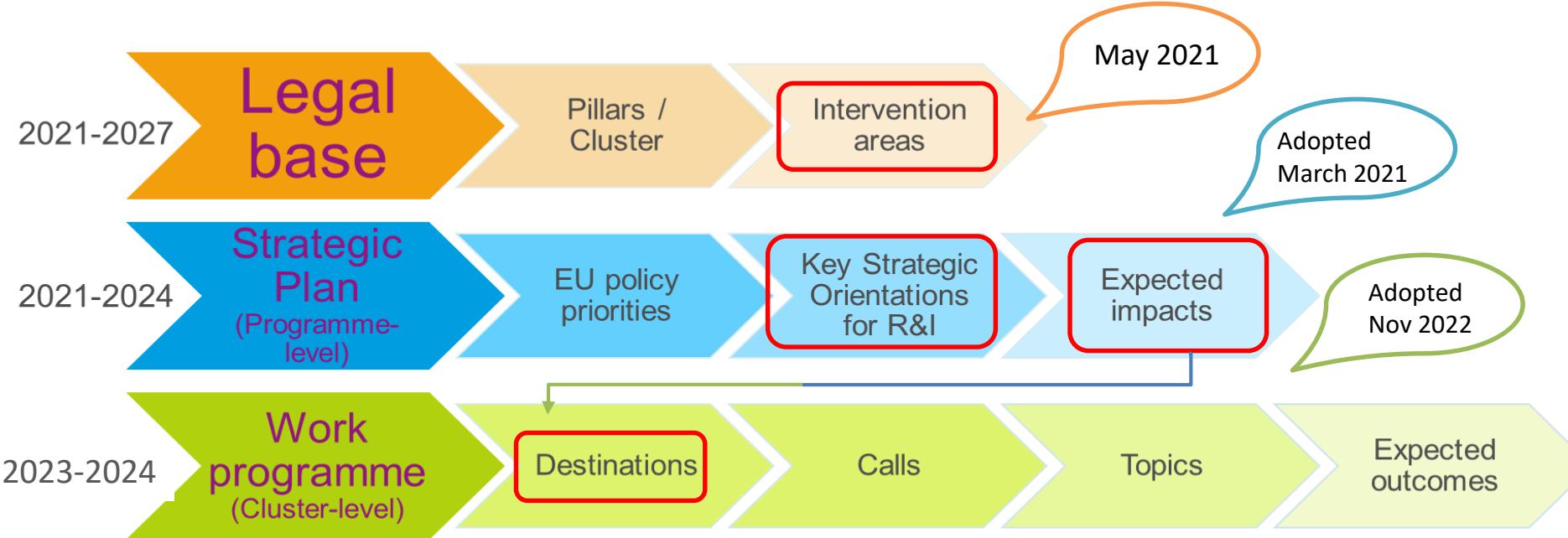
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- 3. Resultados globales- Programa de trabajo 2021-2022. Participación entidades de Cataluña**

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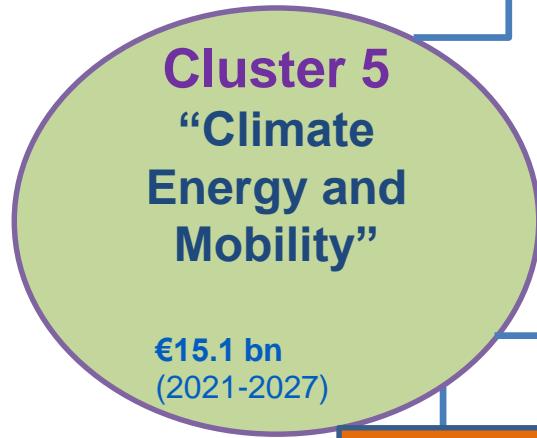
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# Programme intervention logic



Source: European Commission

# HE Legal Base - Cluster 5 → 9 Intervention Areas



**Cluster 5 work programme**  
(including co-funded and co-programmed European Partnerships (CET, DUT, B4P,...))

**Institutional Partnerships**  
(Clean Hydrogen; Rail; Clean Aviation; Air Traffic Management)

**EU Missions**  
(e.g. on Cities; Climate Adaptation; Oceans)

# WP 2023-2024 Policy Priorities



Contribute to **EU policy objectives**

Maximise the **impact and uptake** of activities

Foster **synergies**

# “EU Policy Strategies” que hay que conocer:

2020

8 Jul

14 Oct

19 Nov



A more **efficient** and  
“circular” system

A cleaner power system

A cleaner fuel system



## Prioridades de la Estrategia de Renovación



Tackling **energy poverty**  
and **worst-performing  
buildings**



Renovation of **public  
buildings** such as schools,  
hospitals and public  
administrations



Decarbonisation of  
**heating** and **cooling**

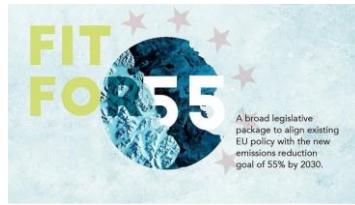


TARGETs	2020	2030	2050
WIND energy capacity	12 GW	60 GW	300 GW
OCEAN ENERGY capacity (e.g. wave, tidal)	13 MW	1 GW	40 GW

# “EU Policy Strategies” que hay que conocer:

2021

14 Jul



2022

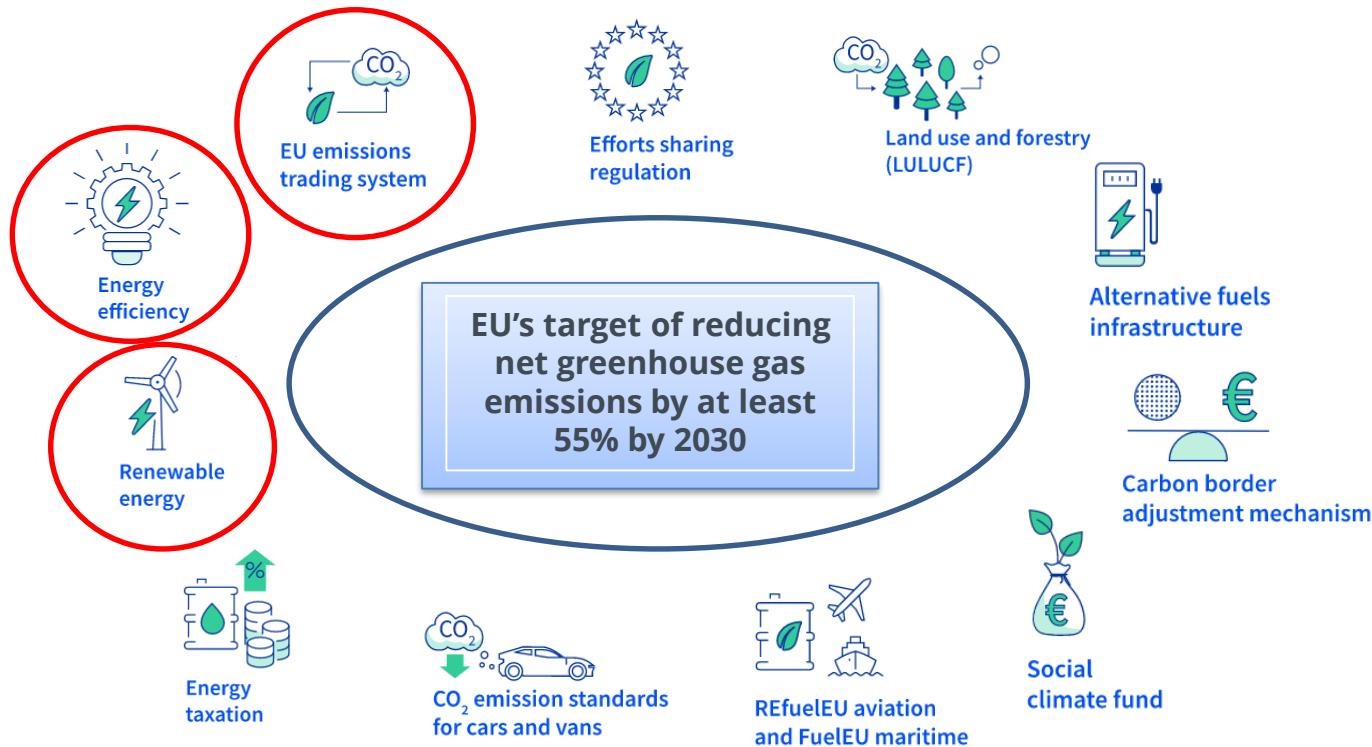
8 Mar  
18 Mayo



18 Oct



# “Fit for 55 package”



# “Fit for 55 package”



EU emissions  
trading system

## Which sectors are currently covered



electricity and heat  
generation



energy-intensive industry  
sectors (e.g. oil refineries,  
steel industry, cement, glass  
and paper production)



commercial aviation  
(flights within the European  
Economic Area)

## What will change with the reform?



gradual phasing out of free allowances for certain  
sectors (in parallel with the introduction of the carbon  
border adjustment mechanism – a carbon pricing system  
applicable to energy-intensive products imported into the  
EU in order to avoid carbon leakage)



the ETS to cover new sectors:

→ extension to **maritime  
transport**



→ a separate new ETS for  
**buildings and road transport**

Source: European Commission



GOBIERNO  
DE ESPAÑA

MINISTERIO  
DE CIENCIA  
E INNOVACIÓN



# “Fit for 55 package”



## Increased efficiency target

The revised legislation will make it compulsory for the EU as a whole to reduce energy consumption, compared with consumption projections for 2030.

-36%

for final  
consumption

## A more energy-efficient public sector

The public sector will contribute to energy efficiency by:

- **reducing its final consumption by 1.7% annually**, or alternatively, by at least 1.9% each year, if public transport and the armed forces are excluded (compulsory measure)
- **renovating buildings** (equal to 3% of public building floor space per year) to improve their energy performance
- **revising public procurement procedures** to better integrate efficiency requirements

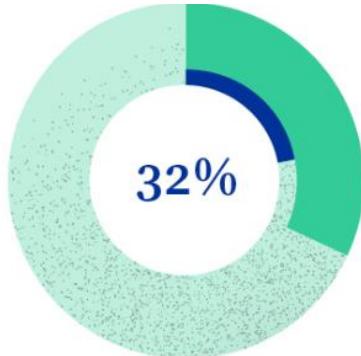
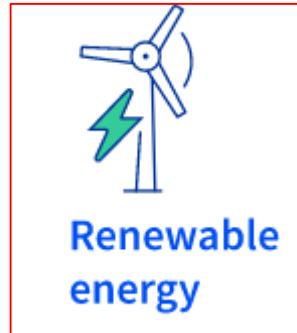
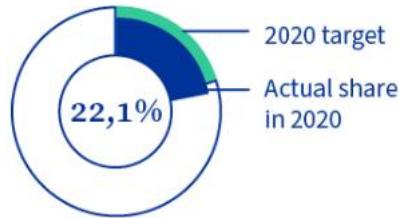


Source: European Commission

# “Fit for 55 package”

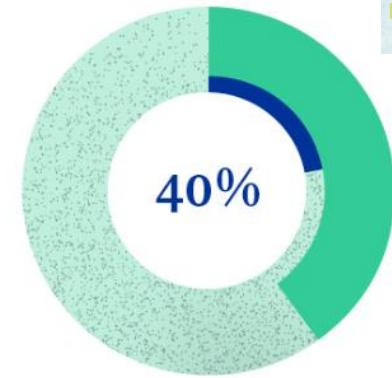


Share of renewable energy  
at EU level in 2020



Current 2030 target  
at least 32% share

.....



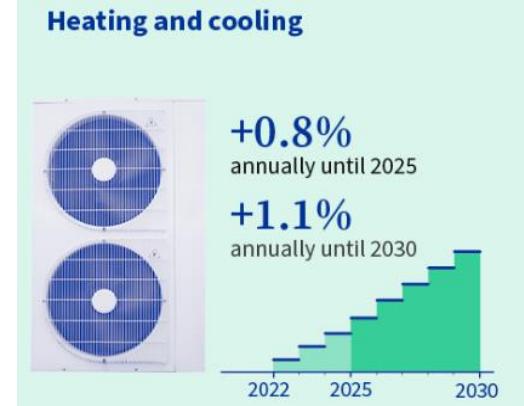
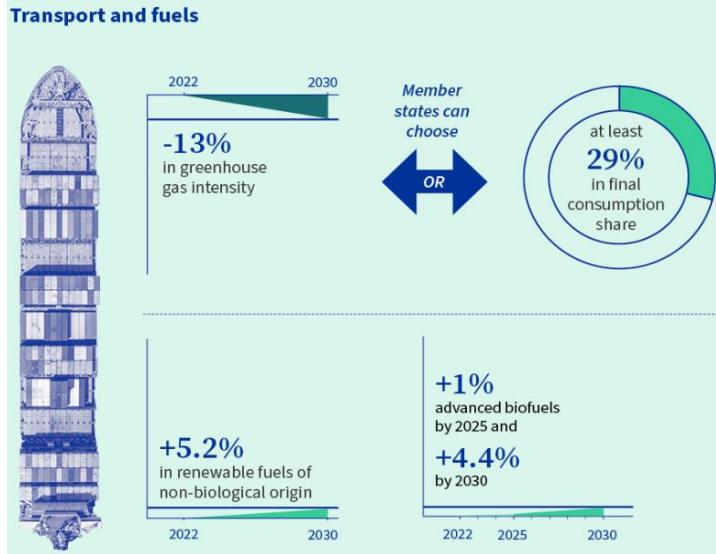
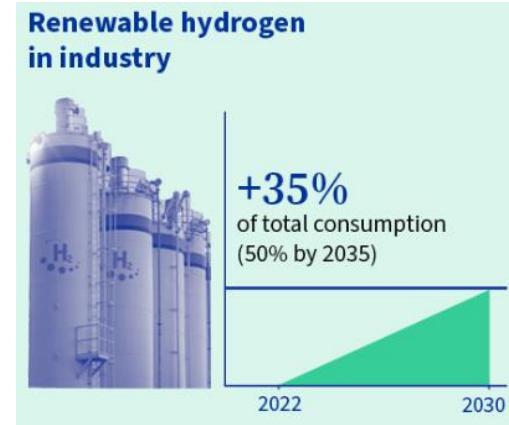
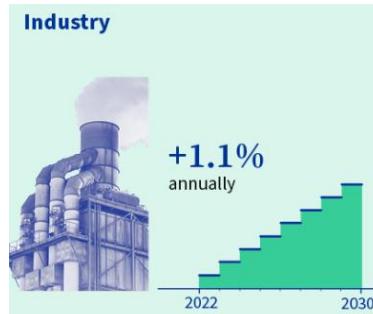
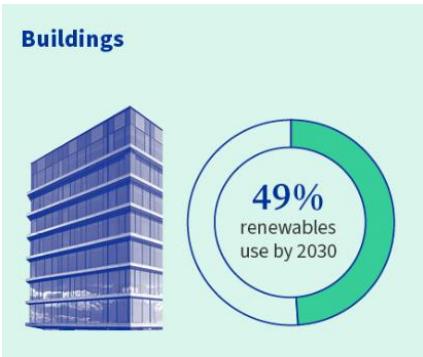
New 2030 target  
at least 40% share

## Achieving progress across sectors

Progress in the uptake of renewables across economic sectors has so far been mixed. The new directive aims to set out new EU-wide **sector-specific sub-targets** and measures for 2030.

Source: European Commission

# “Fit for 55 package”



Source: European Commission

# Contribution to the RePOWER-EU

- Broad portfolio of **renewable energy technologies**. Almost **600 M€** for more performant and cheaper renewable energy sources:
  - 216 M€ for solar and wind energy
  - 103 M.€ for renewable fuels
  - 181 M.€ for other renewable solutions
  - 40 M.€ for renewable energy valleys
  - 65 M.€ for cross-cutting actions

## Energy supply

- Replace natural gas with renewable gases
- Boost renewable energy sources

## Energy demand

- Reduce reliance on fossil fuels across multiple sectors (Building, Transport, Industry...)

## Energy system

- Increase electrification
- Integrate higher shares of renewables

### Buildings

- **172 M.€** on energy efficient and clean energy buildings

### Industry

- **36 M.€** on energy savings in industry

**280,6 M.€** for making the **energy system more flexible and resilient** (including storage solutions and digitization of energy system)

# RePOWER-EU Flagships



40M.€

- **Renewable Energy Valleys** to increase energy security while accelerating the green transition in Europe (HORIZON-CL5-2023-D3-01-01 )

25M.€

- Innovative solutions for **cost-effective decarbonisation of buildings** through energy efficiency and electrification (HORIZON-CL5-2023-D4-01-05)

20M.€

- Supporting the development of a **digital twin** to improve management, operations and resilience **of the EU Electricity System** in support to REPowerEU (HORIZON-CL5-2023-D3-01-10)

30M.€

- Demonstration of innovative, **large-scale, seasonal heat and/or cooling storage technologies** for decarbonization and security of supply (HORIZON-CL5-2023-D3-01-14 )

# EU Solar Strategy

**Horizon Europe  
*Flagship Initiative* for  
the Solar Strategy  
covers:**

- Concentrated Solar Power (CSP)
- Photovoltaics (PV)
- Solar Heat & Power

**In total 14 topics for a total budget of 151 M€**

A dedicated **EU Solar Strategy** to at least **double solar photovoltaic capacity by 2025** and install **600 GW by 2030**.

- **European Solar Rooftops Initiative**, with a phased-in legal obligation to install **solar panels on new public and commercial buildings and new residential buildings**.
- EU large-scale skills partnership
- EU Solar PV Industry Alliance



# Digitalization – Five covered areas:

An EU-wide coordinated approach



Cybersecurity & Data Protection

Empowerment of Consumers

Carbon Footprint of ICT Solutions

EU data-sharing Infrastructure

# Digitalization

*This thematic area is cutting across the Horizon Europe destinations and clusters.*

## Proposed R&I needs – grids and storage

- ✓ Supporting the development of a **digital twin** to improve management, operations and resilience of the **EU Electricity System** in support to REPowerEU
- ✓ **Digital tools** for enhancing the uptake of **digital services** in the energy market
- ✓ Accelerating the development and piloting of **Artificial Intelligence & Internet of Things edge-cloud solutions** for the energy ecosystem to support the green and digital transformation of the energy system.
- ✓ Tools, technologies and systemic solutions to ensure **cybersecurity and energy system resilience**.

## Proposed R&I needs – buildings

- ✓ **BIM-based processes and digital twins** for facilitating and optimising circular energy renovation (Built4People)
- ✓ Innovative **uses of lifecycle data** monitoring for the management of building and building portfolios (Built4People)
- ✓ **Smart-grid ready buildings**
- ✓ Thermal management and energy optimisation of **high energy demand IT systems equipment** in tertiary buildings

## Proposed R&I needs – RES

- ✓ **Retrofitting CSP plants by means of digital tools**

# Maximise the impact and uptake of activities

## European Partnerships

**10 topics – 94 M.€** support industry priorities in industry-led Partnerships

## Innovation Actions

Almost **60%** of topics are Innovation Actions targeting TRL 6 or higher

## Standardisation

**25** topics contribute to standardisation

## Societal dimension

**14 topics (16% of all topics)** require active societal engagement and integration of SSH in Project preparation and implementation.

## International Cooperation

**11 topics (12 % of all topics)** foster international cooperation in multilateral initiatives (e.g. Mission Innovation), or target specific regions (Africa) or countries.

# Fostering synergies

Around 35% of all topics refer explicitly to “synergies”

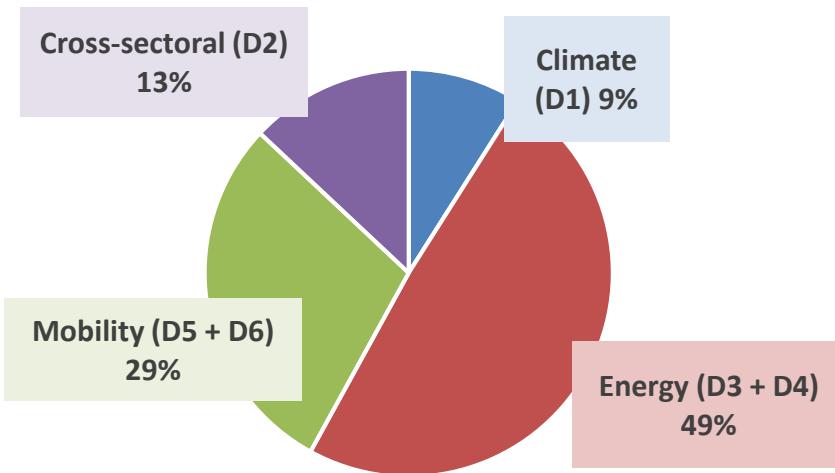


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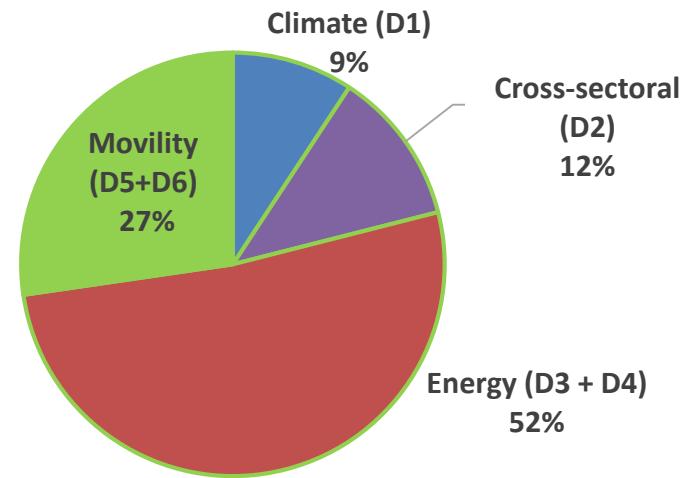
# Cluster 5 - Budget allocation

Budget allocation per Destination  
**(2021 and 2022)**



Budget 2021-2022: **3.000 M€**

Budget allocation per Destination  
**(2023 and 2024)**

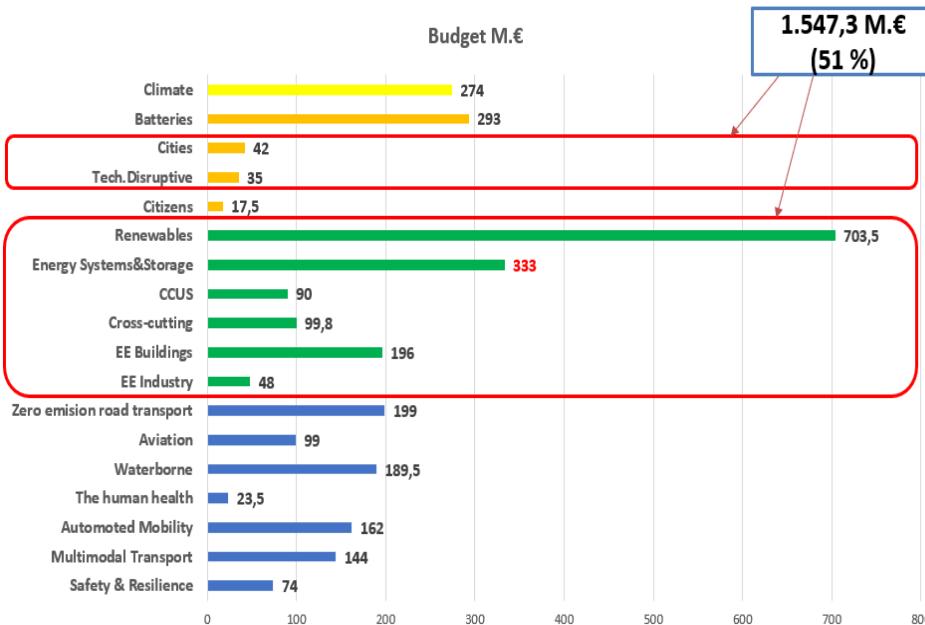


Budget 2023-2024: **2.384 M€**

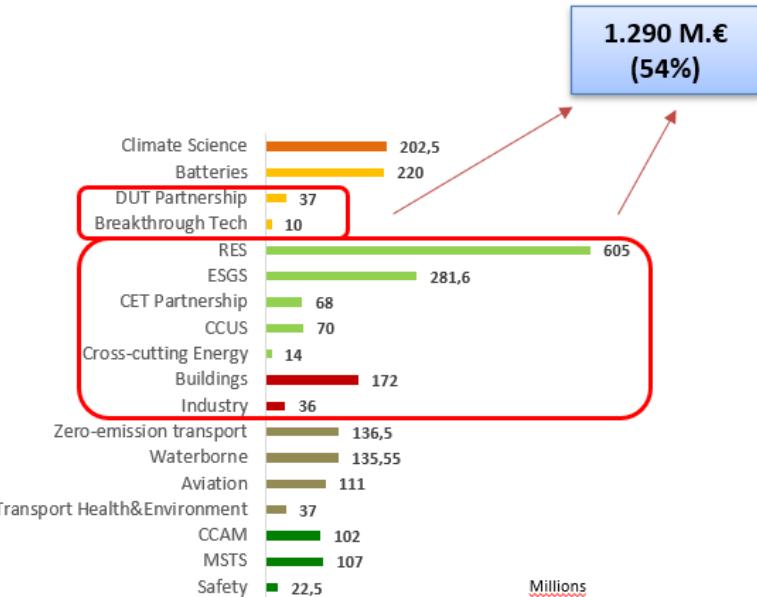
20%

# Cluster 5 - Budget allocation

Budget allocation per Area  
(2021 and 2022)



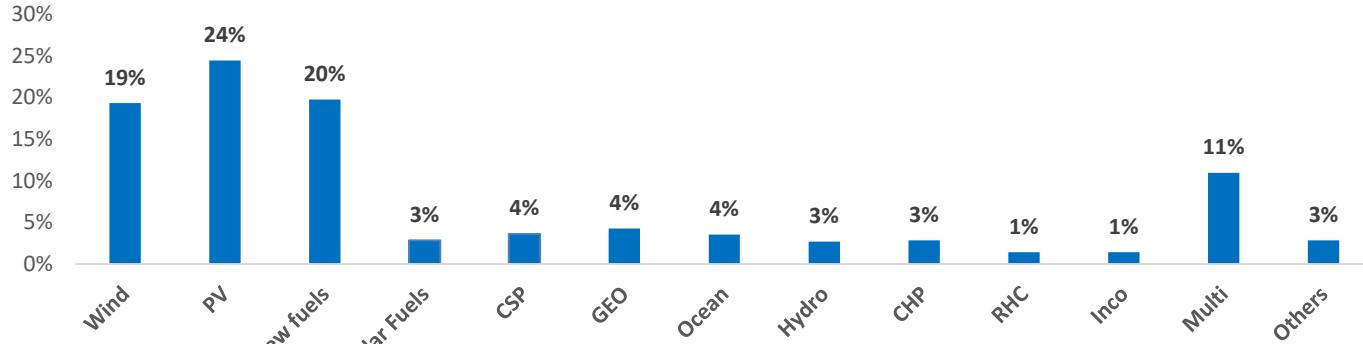
Budget allocation per Area  
(2023 and 2024)



# Budget allocation– Renewables

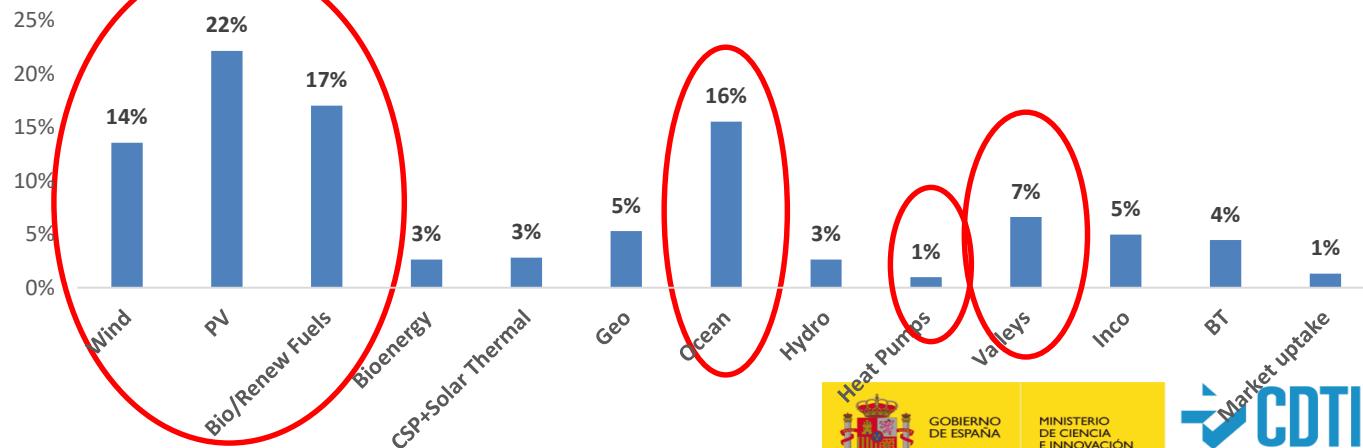
Budget allocation within  
renewable energy area, per  
technology (WP 2021-2022)

Total budget:  
703,5 M€



Budget allocation within  
renewable energy, per  
technology (WP 2023-2024)

Total budget: 605  
M€ - 44 topics  
(20 RIA, 21 IA)



# Convocatorias “Energía” (2023-2024)

90 topics  
1.200 M€

Destination  
2

Cross-cutting

- 2 topics – 14 M€

Breakthrough technologies

- 1 topic – 10 M€

Destination  
3

Renewable energy

- 44 topics – 605 M€

Energy systems, grids and storage

- 21 topics – 281 M€

Carbon capture, utilisation and storage (CCUS)

- 3 topics – 70 M€

Destination  
4

Buildings

- 17 topics – 172 M€

Industry

- 2 topics – 36 M€

# Calendario de convocatorias (2023-2024)

Destination	Call	Opening	Deadline
Destination 3	HORIZON-CL5-2023-D3-01	13 Diciembre 2022	30 Marzo 2023
Destination 2	HORIZON-CL5-2023-D2-01	13 Diciembre 2022	18 Abril 2023
Destination 4	HORIZON-CL5-2023-D4-01	13 Diciembre 2022	20 Abril 2023
Destination 3	HORIZON-CL5-2023-D3-02	4 Mayo 2023	5 Septiembre 2023
Destination 4	HORIZON-CL5-2023-D4-02	4 Mayo 2023	5 Septiembre 2023
Destination 3	HORIZON-CL5-2023-D3-03	4 Mayo 2023	10 Octubre 2023
Destination 3	HORIZON-CL5-2024-D3-01	12 Septiembre 2023	16 Enero 2024
Destination 2	HORIZON-CL5-2024-D2-01	7 Diciembre 2023	18 Abril 2024
Destination 4	HORIZON-CL5-2024-D4-01	7 Diciembre 2023	18 Abril 2024
Destination 3	HORIZON-CL5-2024-D3-02	7 Mayo 2024	5 Septiembre 2024
Destination 4	HORIZON-CL5-2024-D4-02	7 Mayo 2024	5 Septiembre 2024

# Destination 2

## Áreas

## Destination 2 – Cross-cutting

- **Open pilot line/testbed for hydrogen** for testing hydrogen production technology
- **Support the deployment of R&I results for climate mitigation.**  
Synergies with the Innovation Fund



Subarea	Topic code	Topic title	Opening	Deadline	Type of Action	Budget	Budget per project	Number of projects expected	Lump Sum Topics
Cross-cutting	HORIZON-CL5-2023-D2-01-06	Open Pilot Line/Test Bed for hydrogen	13/12/2022	18/04/2023	IA	10	10	1	
	HORIZON-CL5-2023-D2-01-07	Support for the deployment of R&I results for climate mitigation. Synergies with the ETS Innovation Fund	13/12/2022	18/04/2023	CSA	4	1	4	Lump Sum

# Destination 2 – Breakthrough technologies

- Emerging energy technologies for a climate neutral Europe:** novel bottom-up technological solutions with breakthrough potential across all parts of the energy sector value chain.

Consider at least one of the following areas:

- Energy distribution and transmission
- Long-term energy storage
- Novel energy generation/conversion methods



Subarea	Topic code	Topic title	Opening	Deadline	Type of Action	Budget	Budget per project	Number of projects expected	Lump Sum Topics
Emerging Breakthrough Technologies and climate solutions	HORIZON-CL5-2024-D2-01-04	Emerging energy technologies for a climate neutral Europe	07/12/2023	18/04/2024	RIA	10,00	1,5-2,5	4	

# Destination 3

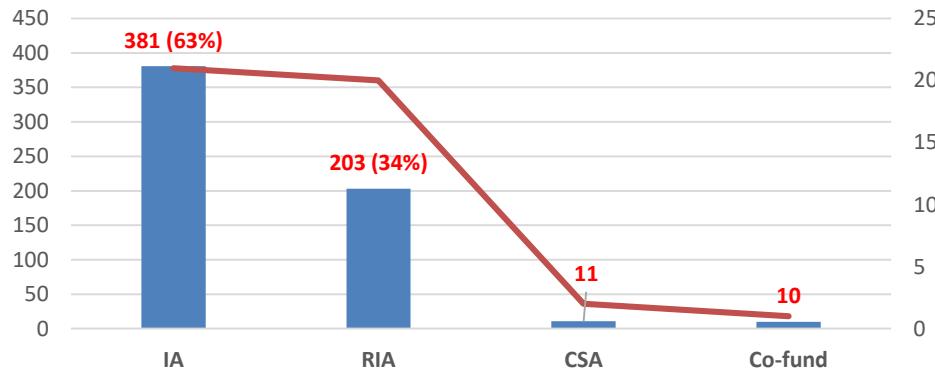
## Áreas

# Destination 3

## Renewable Energy

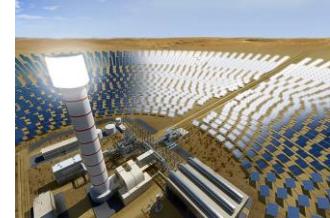
44 topics  
605,5 M€

Área de Renovables (M.€/Nº Topic) por tipo de Acción



# Destination 3 - Renewable Energy (1/3)

- **Concentrated Solar Power (CSP):** ; next generation thermal energy storage for CSP ; digital tools for CSP and solar thermal plants
- **Solar Thermal:** ; solar for industrial process power and/or heat ; ; industrial manufacturing for lower-cost components and systems
- **Photovoltaics:** ; PV integrated in buildings and in infrastructure ; ; PV-integrated electric mobility ; Community-integrated PV ; ; floating PV ; solar for industrial process power and/or heat ; ; crystalline silicon technology ; perovoskite solar cells and modules ; ; advanced manufacturing of PV ; low-power PV ; resource-efficiency of PV in production, use and disposal
- **Heat pumps:** innovative components and configurations



## Destination 3 - Renewable Energy (2/3)

- **Bioenergy**: ; biomass heat and/or CHP including carbon capture ; ; carbon fixation technologies for biogenic flue gases
- **Renewable fuels**: ; next generation biofuel/synthetic renewable fuel technologies ; renewable fuels for aviation/shipping ; smart concepts of integrated biorefineries ; improvement of light harvesting and carbon fixation with synthetic biology ; intermediate renewable energy carrier technologies for transport fuels
- **Hydropower**: hydropower equipment for improving techno-economic efficiency and equipment resilience in refurbishment
- **Geothermal**: ; exploration technologies for geothermal resources in a wide range of geological settings ; smart use of geothermal electricity and heating and cooling in the energy system ; integration of geothermal heating and cooling in industry



# Destination 3 - Renewable Energy (3/3)

- **Ocean Energy:** demonstration of tidal/wave energy farms ; power take-off and control systems for wave energy devices ; critical technologies for the future ocean energy farms
- **Wind energy:** critical technologies to improve lifetime, decommissioning and circularity of offshore and onshore wind energy ; digital twin for forecasting power production ; environmental/socio-economic impacts in the deployment, operation and decommissioning of offshore wind farms ; demonstrations of floating wind systems
- **Renewable energy valleys:** to increase energy independence
- **Cross-technologies:** next generation RES ; green transition and energy access in Africa ; market-uptake



# Destination 3 – Renewables (1/6)

Subarea	Topic code	Topic title	Opening	Deadline	Type of Action	Budget	Budget per project	Number of projects expected	Lump Sum Topics
Energy Valleys	HORIZON-CL5-2023-D3-01-01	Renewable Energy Valleys to increase energy independence while accelerating the green transition in Europe	13/12/2022	30/03/2023	IA	40,00	20	2	
Wind	HORIZON-CL5-2023-D3-01-05	Critical technologies for the offshore wind farm of the Future	13/12/2022	30/03/2023	RIA	18,00	6	3	
	HORIZON-CL5-2023-D3-02-14	Digital twin for forecasting of power production to wind energy demand	04/05/2023	05/09/2023	RIA	12,00	6	2	Lump Sum
	HORIZON-CL5-2023-D3-02-15	Critical technologies to improve the lifetime, efficient decommissioning and increase the circularity of offshore and onshore wind energy systems	04/05/2023	05/09/2023	RIA	12,00	4	3	
	HORIZON-CL5-2024-D3-02-08	Minimisation of environmental, and optimisation of socio-economic impacts in the deployment, operation and decommissioning of offshore wind farms	07/05/2024	05/09/2024	RIA	10,00	5	2	Lump Sum
	HORIZON-CL5-2024-D3-02-09	Demonstrations of innovative floating wind concepts	07/05/2024	05/09/2024	IA	30,00	15	2	

# Destination 3 – Renewables (2/6)

Subarea	Topic code	Topic title	Opening	Deadline	Type of Action	Budget	Budget per project	Number of projects expected	Lump Sum Topics
Photovoltaics	HORIZON-CL5-2023-D3-01-02	PV integration in buildings and in infrastructure	13/12/2022	30/03/2023	IA	16,00	8	2	
	HORIZON-CL5-2023-D3-01-03	Floating PV Systems	13/12/2022	30/03/2023	IA	14,00	7	2	
	HORIZON-CL5-2023-D3-01-04	Solar Systems for Industrial Process Power and/or Heat	13/12/2022	30/03/2023	IA	14,00	7	2	
	HORIZON-CL5-2023-D3-02-11	Advanced concepts for crystalline Silicon technology	04/05/2023	05/09/2023	RIA	9,00	3	3	
	HORIZON-CL5-2023-D3-02-12	Large Area Perovskite solar cells and modules	04/05/2023	05/09/2023	IA	14,00	7	2	
	HORIZON-CL5-2023-D3-02-13	Operation, Performance and Maintenance of PV Systems	04/05/2023	05/09/2023	IA	10,00	5	2	
	HORIZON-CL5-2024-D3-01-01	Alternative equipment and processes for advanced manufacturing of PV technologies	12/09/2023	16/01/2024	IA	24,00	12	2	
	HORIZON-CL5-2024-D3-01-02	Low-power PV	12/09/2023	16/01/2024	IA	6,00	3	2	Lump Sum
	HORIZON-CL5-2024-D3-02-05	PV-integrated electric mobility applications	07/05/2024	05/09/2024	IA	14,00	7	2	
	HORIZON-CL5-2024-D3-02-06	Innovative, Community-Integrated PV systems	07/05/2024	05/09/2024	IA	10,00	5	2	
	HORIZON-CL5-2024-D3-02-07	Resource Efficiency of PV in Production, Use and Disposal	07/05/2024	05/09/2024	CSA	3,00	3	1	Lump Sum

# Destination 3 – Renewables (3/6)

Subarea	Topic code	Topic title	Opening	Deadline	Type of Action	Budget	Budget per project	Number of projects expected	Lump Sum Topics
Renewable Fuels	HORIZON-CL5-2023-D3-01-06	Demonstration of advanced biofuel technologies for aviation and/or shipping	13/12/2022	30/03/2023	IA	18,00	9	2	Lump Sum
	HORIZON-CL5-2023-D3-01-07	Demonstration of synthetic renewable fuel technologies for aviation and/or shipping	13/12/2022	30/03/2023	IA	18,00	9	2	
	HORIZON-CL5-2023-D3-02-07	Development of next generation advanced biofuel technologies	04/05/2023	05/09/2023	RIA	12,00	4	3	
	HORIZON-CL5-2023-D3-02-08	Development of microalgae and/or direct solar fuel production and purification technologies for advanced aviation and /or shipping fuels	04/05/2023	05/09/2023	RIA	8,00	4	2	
	HORIZON-CL5-2024-D3-01-03	Demonstration of improved intermediate renewable energy carrier technologies for transport fuels	12/09/2023	16/01/2024	IA	20,00	10	2	Lump Sum
	HORIZON-CL5-2024-D3-01-04	Improvement of light harvesting and carbon fixation with synthetic biology and/or bio-inspired//biomimetic pathways for renewable direct solar fuels production	12/09/2023	16/01/2024	RIA	8,00	4	2	
	HORIZON-CL5-2024-D3-02-02	Development of next generation synthetic renewable fuel technologies	07/05/2024	05/09/2024	RIA	12,00	4	3	
	HORIZON-CL5-2024-D3-02-03	Development of smart concepts of integrated energy driven bio-refineries for co-production of advanced biofuels, bio-chemicals and biomaterials	07/05/2024	05/09/2024	RIA	7,00	3.5	2	

# Destination 3 – Renewables (4/6)

Subarea	Topic code	Topic title	Opening	Deadline	Type of Action	Budget	Budget per project	Number of projects expected	Lump Sum Topics
Bioenergy	HORIZON-CL5-2023-D3-02-01	Development of near zero-emission biomass heat and/or CHP including carbon capture	04/05/2023	05/09/2023	RIA	8,00	4	2	
	HORIZON-CL5-2024-D3-01-05	Development of carbon fixation technologies for biogenic flue gases	12/09/2023	16/01/2024	RIA	8,00	4	2	
Ocean	HORIZON-CL5-2023-D3-01-08	Demonstration of sustainable tidal energy farms	13/12/2022	30/03/2023	IA	40,00	20	2	
	HORIZON-CL5-2023-D3-02-10	Development of innovative power take-off and control systems for wave energy devices	04/05/2023	05/09/2023	RIA	8,00	4	2	Lump Sum
	HORIZON-CL5-2024-D3-01-08	Demonstration of sustainable wave energy farms	12/09/2023	16/01/2024	IA	38,00	12-13	3	
	HORIZON-CL5-2024-D3-02-04	Critical technologies for the future ocean energy farms	07/05/2024	05/09/2024	RIA	8,00	4	2	

# Destination 3 – Renewables (5/6)

Subarea	Topic code	Topic title	Opening	Deadline	Type of Action	Budget	Budget per project	Number of projects expected	Lump Sum Topics
Solar Thermal CSP	HORIZON-CL5-2023-D3-01-04	Solar Systems for Industrial Process Power and/or Heat	13/12/2022	30/03/2023	IA	14,00	7	2	
	HORIZON-CL5-2023-D3-02-03	Industrial manufacturing for lower-cost solar thermal components and systems	04/05/2023	05/09/2023	IA	6,00	3	2	
	HORIZON-CL5-2023-D3-02-02	Novel thermal energy storage for CSP	04/05/2023	05/09/2023	RIA	5,00	2,5	2	
	HORIZON-CL5-2024-D3-02-01	Digital tools for CSP and solar thermal plants	07/05/2024	05/09/2024	IA	6,00	3	2	Lump Sum
Heat Pumps	HORIZON-CL5-2023-D3-02-04	Innovative components and configurations for heat pump systems	04/05/2023	05/09/2023	RIA	6,00	2	3	
Hydropower	HORIZON-CL5-2023-D3-02-09	Demonstration of sustainable hydropower refurbishment	04/05/2023	05/09/2023	IA	8,00	8	1	Lump Sum
	HORIZON-CL5-2024-D3-01-07	Development of hydropower equipment for improving techno-economic efficiency and equipment resilience in refurbishment situations	12/09/2023	16/01/2024	RIA	8,00	4	2	

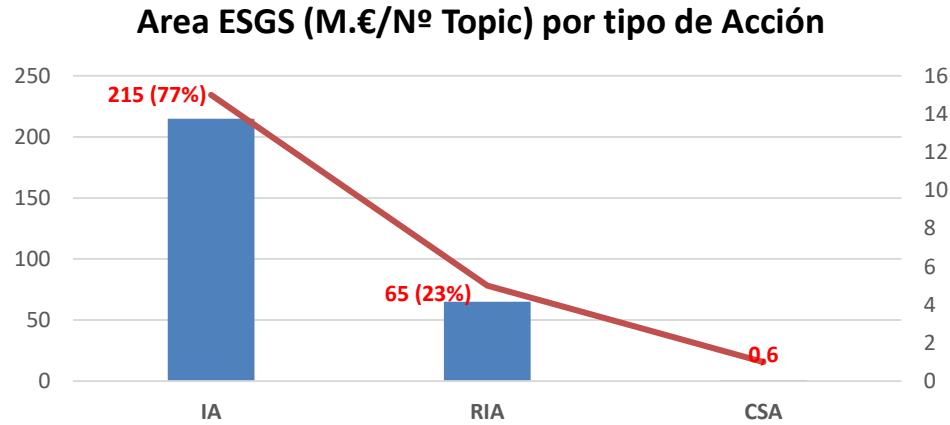
# Destination 3 – Renewables (6/6)

Subarea	Topic code	Topic title	Opening	Deadline	Type of Action	Budget	Budget per project	Number of projects expected	Lump Sum Topics
Geothermal	HORIZON-CL5-2023-D3-02-05	Advanced exploration technologies for geothermal resources in a wide range of geological settings	04/05/2023	05/09/2023	RIA	8,00	4	2	
	HORIZON-CL5-2023-D3-02-06	Smart use of geothermal electricity and heating and cooling in the energy system	04/05/2023	05/09/2023	IA	15,00	5	3	
	HORIZON-CL5-2024-D3-01-06	Innovative applications/integration of geothermal heating and cooling in industry	12/09/2023	16/01/2024	RIA	9,00	3	3	
Cross-Technology International Cooperation	HORIZON-CL5-2023-D3-02-16	Accelerating the green transition and energy access in Africa	04/05/2023	05/09/2023	IA	20,00	5	4	
	HORIZON-CL5-2024-D3-01-09	Africa-EU CO-FUND action	12/09/2023	16/01/2024	Co-fund with 50% EC share	10,00	10	1	
Breakthrough	HORIZON-CL5-2024-D3-01-10	Next generation of renewable energy technologies	12/09/2023	16/01/2024	RIA	27,00	3	9	
Market Uptake	HORIZON-CL5-2024-D3-02-10	Market Uptake Measures of renewable energy systems	07/05/2024	05/09/2024	CSA	8,00	2	4	Lump Sum

# Destination 3

## Energy Systems, Grids and Storage

21 topics  
281 M€



# Destination 3 - Energy Systems, Grids and Storage (1/3)

- **Energy sector integration:** integrating and combining power, heat, gas and other sectors (industry and mobility) to a cost-optimized, flexible energy system of systems with massively integrated RES

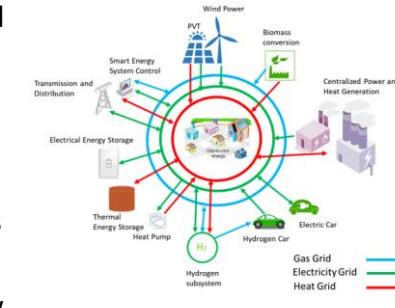
- Integration of renewable gases other than hydrogen or methane and which have not access to gas grids
- Increasing the efficiency of innovative static energy conversion devices for electricity and heat/cold generation.

- **Energy system planning and operation:** innovative grid planning tools and operation, including digital tools based on Artificial Intelligence-based forecasting systems

- System approach for grid planning and upgrade in support of a dominant electric mobility (vehicles and vessels) using AI tools.
- Development and integration of advanced software tools in SCADA systems for High, Medium, Low voltage AC/DC hybrid systems

- **Active consumers, Markets and Energy Communities:** optimal engagement of distributed active consumers and energy communities

- Digital tools for enhancing the uptake of digital services in the energy market
- Create an open-source peer-to-peer energy sharing platform architecture for the energy sector

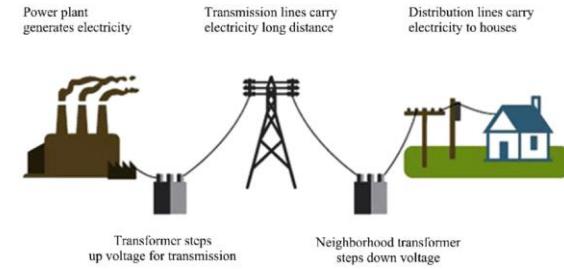


# Destination 3 - Energy Systems, Grids and Storage (2/3)

- **Electricity system reliability and resilience-grid architecture:**

Development of new methods and simulation tools that integrates the impact of additional RES, investigating new grid architectures.

- DC and AC/DC hybrid transmission and distribution architecture and systems
- Demonstration of DC powered data centre, buildings, industry and ports
- Support action to the SET-PLAN WG on HVDC



- **Electricity system reliability and resilience - risk preparedness**

- Components and interfacing for AC & DC side protection system – AC & DC grid: components and systems for grid optimisation
- Condition & Health Monitoring in Power Electronics (PE) - Wide Band Gap PE for the energy sector

# Destination 3 - Energy Systems, Grids and Storage (3/3)

- **TSO/DSO flexibility management:** Distributed Energy Resources (DER) flexibilities for transmission and distribution systems
  - Supporting the development of a digital twin of the EU Electricity System or the EU energy system.
  - Energy Management Systems for flexibility services
- **Digitalisation of the energy system, interoperability and data:** development and piloting of Artificial Intelligence-Internet of Things Edge-cloud and platform solutions
- **Transmission of energy:** Demonstration of extensive hybrid Pan-European AC-DC grid control as well as of offshore grids for transporting off-shore RES energy.
  - Development of MVDC, HVDC and High-Power Transmission systems and components for a resilient grid
  - HVAC, HVDC and High-Power cable systems
- **Storage development and integration:**
  - Development of novel long-term electricity storage technologies;
  - Waste heat reutilisation from data centres;
  - Demonstration of innovative, large-scale, seasonal heat and/or cooling storage technologies
  - Demo of innovative pumped storage equipment and tools in combination with innovative Storage Management Systems



# Destination 3 – Energy Systems, Grids and Storage (1/3)

Subarea	Topic code	Topic title	Opening	Deadline	Type of Action	Budget	Budget per project	Number of projects expected	Lump Sum Topics
Energy Sector Integration	HORIZON-CL5-2023-D3-03-01	Increasing the efficiency of innovative static energy conversion devices for electricity and heat/cold generation	04/05/2023	10/10/2023	RIA	9,00	5	2	
	HORIZON-CL5-2023-D3-03-02	Integration of renewable gases other than hydrogen or methane and which have not access to gas grids and interfacing with electricity and heat sectors	04/05/2023	10/10/2023	IA	12,00	6	2	
Energy System Planning and Operation	HORIZON-CL5-2023-D3-03-03	System approach for grid planning and upgrade in support of a dominant electric mobility (vehicles and vessels) using AI tools	04/05/2023	10/10/2023	IA	11,00	11	1	
	HORIZON-CL5-2024-D3-01-11	AI Testing and Experimentation Facility (TEF) for the energy sector – bringing technology to the market	12/09/2023	16/01/2024	IA	16,00	5	3	
	HORIZON-CL5-2024-D3-01-17	Development and integration of advanced software tools in SCADA systems for High, Medium and Low voltage AC/DC hybrid systems	12/09/2023	16/01/2024	IA	12,00	6	2	
Active consumers, Markets and Energy Communities	HORIZON-CL5-2023-D3-03-04	Digital tools for enhancing the uptake of digital services in the energy market	04/05/2023	10/10/2023	IA	11,00	3-4	3	
	HORIZON-CL5-2023-D3-03-05	Creation of a standardised and open-source peer-to-peer energy sharing platform architecture for the energy sector	04/05/2023	10/10/2023	IA	5,00	5	1	

# Destination 3 – Energy Systems, Grids and Storage (2/3)

Subarea	Topic code	Topic title	Opening	Deadline	Type of Action	Budget	Budget per project	Number of projects expected	Lump Sum Topics
TSO/DSO Flexibility Management	HORIZON-CL5-2023-D3-01-10	Supporting the development of a digital twin to improve management, operations and resilience of the EU Electricity System in support to RePowerEU	13/12/2022	30/03/2023	IA	20,00	6-7	1	
	HORIZON-CL5-2024-D3-01-12	Energy Management Systems for flexibility services	12/09/2023	16/01/2024	IA	10,00	5	2	
Electricity System reliability and resilience - grid architecture	HORIZON-CL5-2023-D3-01-11	Demonstration of DC powered data centres, buildings, industries and ports	13/12/2022	30/03/2023	IA	18,00	9	2	
	HORIZON-CL5-2023-D3-01-16	Support action to the SET-Plan IWG on HVDC & DC Technologies	13/12/2022	30/03/2023	CSA	0,60	0,6	1	
	HORIZON-CL5-2024-D3-01-13	DC and AC/DC hybrid transmission and distribution systems	12/09/2023	16/01/2024	RIA	13,00	6	2	
Electricity System reliability and resilience - risk preparedness	HORIZON-CL5-2023-D3-03-06	Components and interfacing for AC & DC side protection system – AC grid: components and systems for grid optimisation	04/05/2023	10/10/2023	IA	10,00	5	2	
	HORIZON-CL5-2024-D3-01-14	Condition & Health Monitoring in Power Electronics (PE) - Wide Band Gap PE for the energy sector	12/09/2023	16/01/2024	RIA	13,00	4	3	

# Destination 3 – Energy Systems, Grids and Storage (3/3)

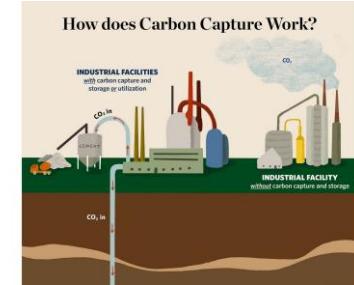
Subarea	Topic code	Topic title	Opening	Deadline	Type of Action	Budget	Budget per project	Number of projects expected	Lump Sum Topics
Transmission of Energy	HORIZON-CL5-2023-D3-01-12	Development of converter and MVDC, HVDC and High-Power Transmission systems and components for a resilient grid	13/12/2022	30/03/2023	IA	22,00	11	2	Lump Sum
	HORIZON-CL5-2024-D3-01-15	HVAC, HVDC and High-Power cable systems	12/09/2023	16/01/2024	RIA	16,00	5-6	3	Lump Sum
Green digitalisation of the energy system - interoperability and data	HORIZON-CL5-2023-D3-01-15	Supporting the green and digital transformation of the energy ecosystem and enhancing its resilience through the development and piloting of AI-IoT Edge-cloud and platform solutions	13/12/2022	30/03/2023	IA	18,00	18	1	
Storage development and integration	HORIZON-CL5-2023-D3-01-09	Waste heat reutilisation from data centres	13/12/2022	30/03/2023	IA	12,00	6	2	
	HORIZON-CL5-2023-D3-01-13	Development of novel long-term electricity storage technologies	13/12/2022	30/03/2023	RIA	14,00	4	3	
	HORIZON-CL5-2023-D3-01-14	Demonstration of innovative, large-scale, seasonal heat and/or cooling storage technologies for decarbonisation and security of supply	13/12/2022	30/03/2023	IA	30,00	10	3	
	HORIZON-CL5-2024-D3-01-16	Demonstration of innovative pumped storage equipment and tools in combination with innovative storage management systems	12/09/2023	16/01/2024	IA	8,00	8	1	

# Destination 3

## Carbon Capture, Use and Storage

# Destination 3 - Carbon Capture, Use and Storage (CCUS)

- **CO2 transport and storage demo projects:** new demonstration projects connecting CO2 sources with potential storage sites, connecting CCUS clusters to CO2 transport and storage infrastructures
- **Carbon Capture and Use for the production of fuels:** development of energy-efficient, economically and environmentally viable CO2 conversion technologies
- **Direct Air Capture Conversion and Storage (DACCs) and Bioenergy with Carbon Capture and Storage (BECCS) for CO2 removal/negative emissions:** advance the technological development of DACCs and BECCs, addressing the environmental, social and economic challenges and benefits



# Destination 3 – Carbon Capture, Use and Storage

Subarea	Topic code	Topic title	Opening	Deadline	Type of Action	Budget	Budget per project	Number of projects expected	Lump Sum Topics
Carbon capture, Utilization and Storage	HORIZON-CL5-2023-D3-01-17	Development of CO2 transport and storage demo projects	13/12/2022	30/03/2023	IA	40,00	20	2	
	HORIZON-CL5-2024-D3-02-11	CCU for the production of fuels	07/05/2024	05/09/2024	IA	15,00	7	2	Lump Sum
	HORIZON-CL5-2024-D3-02-12	DACCS and BECCS for CO2 removal/negative emissions	07/05/2024	05/09/2024	IA	15,00	5-7	2-3	Lump Sum

# Otras oportunidades

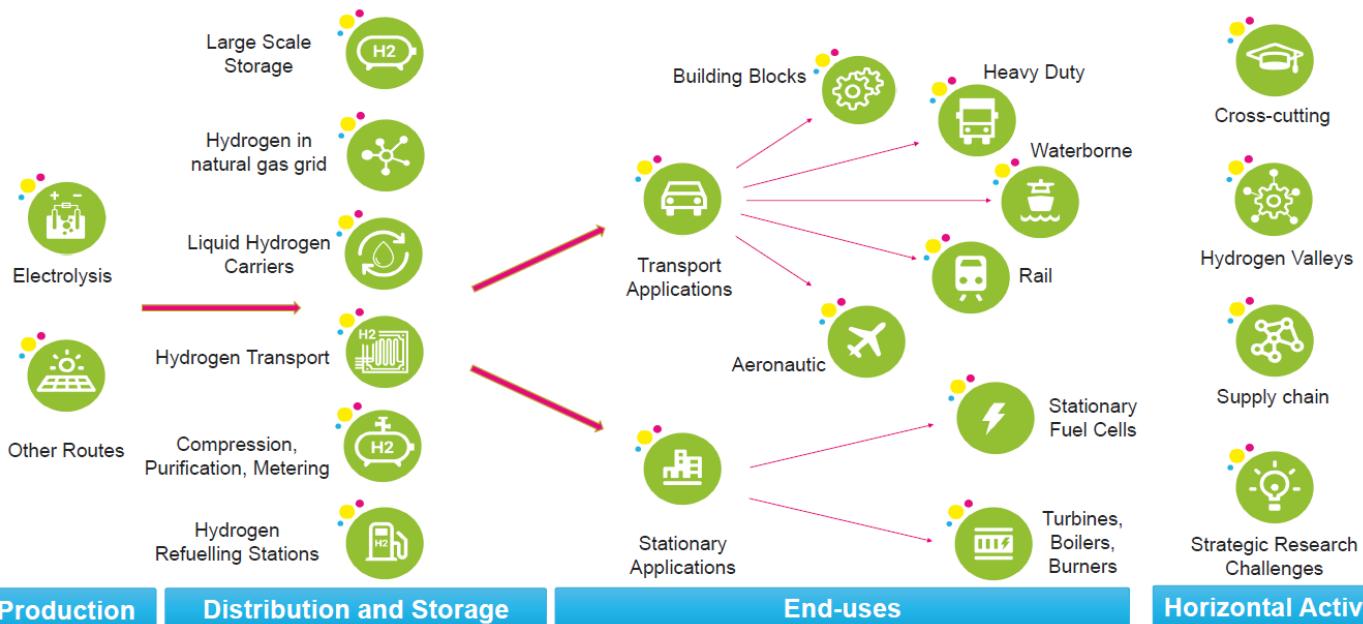
- Partenariado institucional “Clean Hydrogen Partnership”
- Partenariado co-fund “Driving Urban Transitions” (DUT)
- Partnerariado co-fund “Clean Energy Transition” (CET)
- Misión de Ciudades

# Partenariado “Clean Hydrogen Partnership”



- **1.000 M€** en el período 2021-2027
- Miembros del partenariado => Comisión Europea y 2 Asociaciones:  
“**Hydrogen Europe**” – Industria [hydrogeneurope.eu](http://hydrogeneurope.eu)  
“**Hydrogen Europe Research**” – Grupos de Investigación [hydrogneuropereasearch.eu](http://hydrogneuropereasearch.eu)
- Principal ventaja:
  - Participar en la elaboración de los Programas de Trabajo anuales (AWP)
- En principio **mismas condiciones de participación que en Horizon Europe**, pero las convocatorias pueden incluir criterios de elegibilidad adicionales

# Partenariado “Clean Hydrogen Partnership”



# Clean Hydrogen Partnership – convocatoria 2023

Call HORIZON-JTI-CLEANH2-2023

- Renewable hydrogen production
- Hydrogen storage and distribution
- Transport applications
- Heat and Power
- Cross-cutting
- Hydrogen valleys
- Strategic Research Challenges



Total budget:  
195 M€  
26 topics

Call Identifier	Budget (EUR mill)	Publication	Deadline
HORIZON-JTI-CLEANH2-2023			
HORIZON-JTI-CLEANH2-2023-1	195.00	January 2023	April 2023

## Convocatoria

<https://www.clean-hydrogen.europa.eu/>

- [Infoday de la JTI – 26 enero - online](#)
- [Infoday de CDTI – 14 febrero](#)

# Co-fund “Driving Urban Transitions” (DUT)

## Partnership Concept



Positive Energy Districts  
and Neighbourhoods  
transforming the urban energy  
system



Downsizing District  
Doughnuts  
an integrated approach for urban  
greening and circularity transitions



The 15 Minutes Cities  
rethinking the urban mobility  
system and space

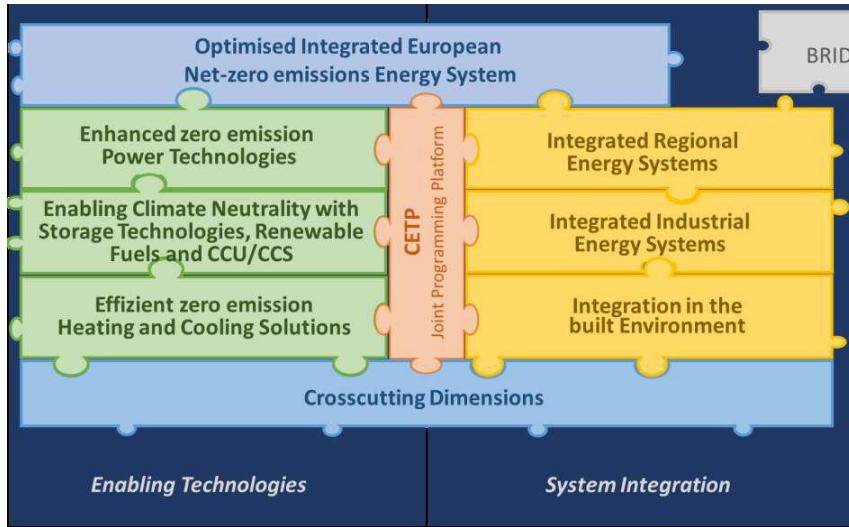
1<sup>a</sup> convocatoria  
Plazo 1<sup>a</sup> fase:  
21/11/2022

1<sup>a</sup> convocatoria  
Plazo 2<sup>a</sup> fase:  
03/05/2023

- Web de DUT <https://dutpartnership.eu/>
- Jornada AEI-CDTI partenariados co-fund – 7 septiembre 2022 (consultar presentaciones)
- Infoday 1 – 20 septiembre 2022 Infoday 2 – 18 octubre 2022
- Plataforma para búsqueda de socios <https://dut-calls.b2match.io/home>
- Contactos: Milvia Soumbounou [partenariadoshe@cdti.es](mailto:partenariadoshe@cdti.es); AEI [urban@aei.gob.es](mailto:urban@aei.gob.es)

# Co-fund “Clean Energy Transition” (CET)

## Challenges



1<sup>a</sup> convocatoria  
Plazo 1<sup>a</sup> fase:  
23/11/2022

1<sup>a</sup> convocatoria  
Plazo 2<sup>a</sup> fase:  
20/03/2023

- Web de CET <https://cetpartnership.eu/>
- [Jornada AEI-CDTI](#) – 7 septiembre 2022
- Infoday de CET – 13 septiembre 2022  
<https://cetpartnership.eu/cetpartnership-joint-call-2022-infoday-online>
- Plataforma para búsqueda de socios:  
<https://cetp-call-launch-2022.b2match.io/home>
- Contactos:  
Marina Sopeña [partenariadoshe@cdti.es](mailto:partenariadoshe@cdti.es)  
AEI [era-energia@aei.gob.es](mailto:era-energia@aei.gob.es)

# Index

1. Programa de trabajo 2023-2024. Introducción, visión general y contexto político
2. Oportunidades de financiación- WP 2023
3. Resultados globales- Programa de trabajo 2021-2022. Participación entidades de Cataluña

# Resultados Calls Energía 2021

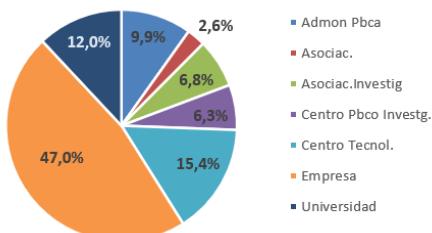
Subvención obtenida por España: 120,9 M.€ (814 M.€ Total)

241 participaciones I+D+I (14%)

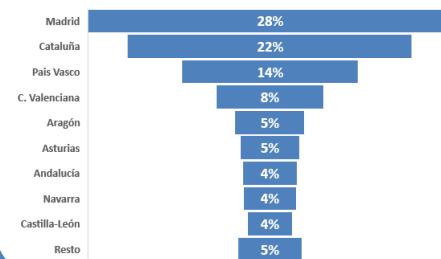


33 proyectos coordinados (26%)

Retorno ES por tipo de entidad (%)



Retorno por CCAA (%)



## Entidades más destacadas:

**Acciona Construcción, SA; F. Tecnalia; CSIC; CIRCE; F. Cartif; ETRA, I+D, SL; Univ Sevilla; ATOS IT; IREC; Schwartz-Hautmont Const. Metálicas, SA; Acciona Generación Ren SA; ACSM Shipping CO,SL**

España se sitúa como el 1º país en retornos: 16,9% UE-27

# Participación Española en Horizonte Europa Energía

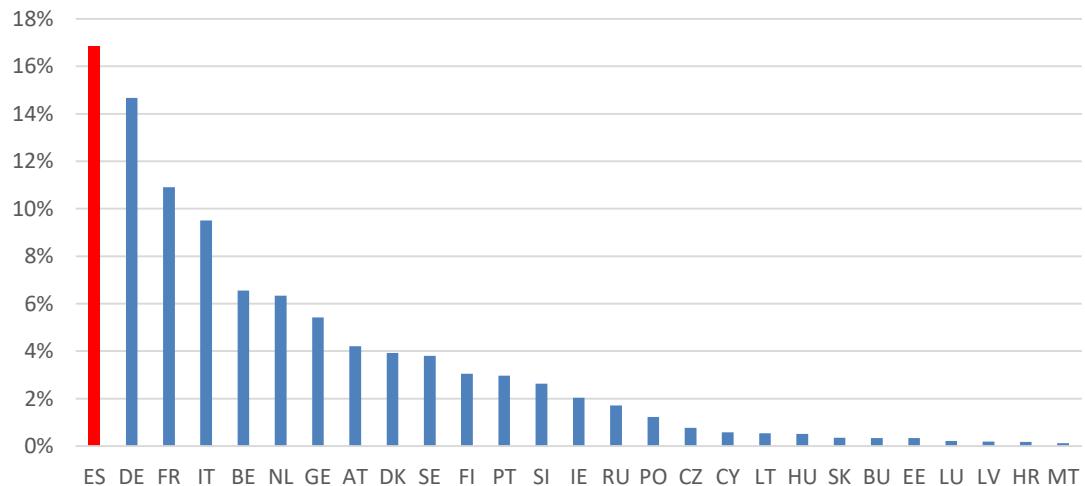
Tasa de éxito media UE → 20% => se financia 1 de cada 5 propuestas

Tasa de éxito España → 21 % => algo por encima de la media UE

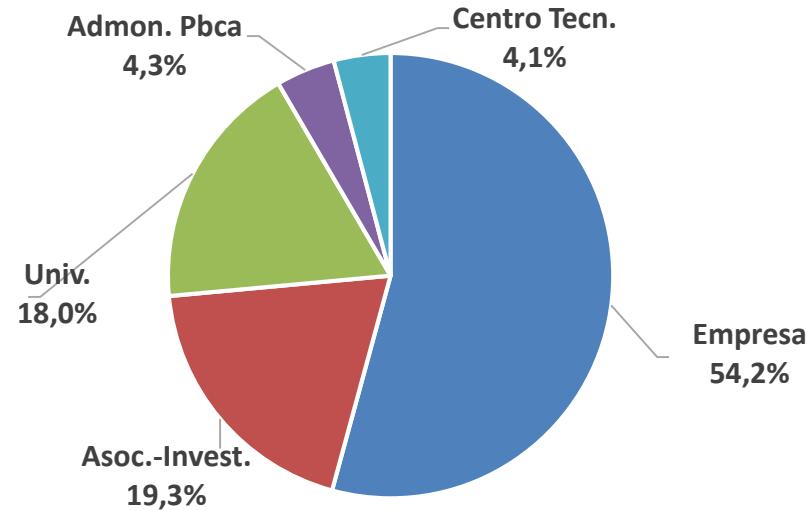
Distribución Retorno por países (%)

✓ **España es el 1er país**  
con mayor retorno en  
Horizonte Europa Energía

✓ **España es el 1er país**  
con mayor número de  
proyectos coordinados  
(el doble que el 2º país,  
Italia)



# Participación de entidades CATALANAS - CL5 – HE -Energía- Calls 2021



- ✓ Las entidades catalanas obtienen 26,9 M€ (22%)
- ✓ Han coordinado 6 proyectos (18%)

## Entidades más destacadas:

- ✓ Schwartz-Hautmont Construcciones Metálicas, SA
- ✓ Centro Tecnológico del Agua
- ✓ Exponential Renewables SL
- ✓ Universidad Politécnica de Cataluña – UPC
- ✓ Fundació privada Institut de Recerca de l'Energia de Catalunya – IREC
- ✓ Universidad de Lérida
- ✓ Instituto de Ciencias Fotónicas – ISCFO
- ✓ COMET Global Innovation, S.L.

# Revisar el topic en el Funding Portal

The screenshot shows the European Commission's Single Electronic Data Interchange Area (SEDIA) portal. A red arrow points to the search bar where "HORIZON-CL5-2022-D3-03-09" has been typed. Another red arrow points to the "SEARCH FUNDING & TENDERS" dropdown menu, which is open to show options like "Search funding & tenders", "Funding updates", and "Archived funding (FP7-CIP)". The main search results page displays three projects under the "Alternative Fuel Infrastructure Facility - Unit Contributions" category:

Programme	Type of action	Status	Deadline model
Connecting Europe Facility (CEF)	CEF AFIF-EVRI Unit Grants	Open for submission	multiple cut-off
16 September 2021		Next deadline	07 June 2022 17:00 Brussels time

Below this, two more projects are listed under different categories:

Programme	Type of action	Status	Deadline model
Connecting Europe Facility (CEF)	CEF Infrastructure Projects	Open for submission	multiple cut-off
16 September 2021		Next deadline	07 June 2022 17:00 Brussels time

Programme	Type of action	Status	Deadline model
Connecting Europe Facility (CEF)	CEF Infrastructure Projects	Open for submission	multiple cut-off
16 September 2021		Next deadline	07 June 2022 17:00 Brussels time

# Revisar el topic en el Funding Portal

The screenshot shows the European Commission's Single Electronic Data Interchange Area (SEDIA) portal. The top navigation bar includes links for English, Register, and Login. Below the header, there are two warning messages: one about maintenance activity from May 5, 2022, and another about legal entity and bank account validations on May 4, 2022.

The main content area displays a topic titled "Recycling end of life PV modules" with TOPIC ID: HORIZON-CL5-2022-D3-03-09. A red box highlights the "General information" section on the left, which contains links for Topic description, Destination, Conditions and documents, Partner search announcements, Submission service, Topic related FAQ, and Get support. A red arrow points from the text "Partner Search" to this box. Another red arrow points from the text "Topic FAQs" to the "Topic description" link within the box.

The "General information" section on the right provides details about the programme (Horizon Europe Framework Programme), call (Sustainable, secure and competitive energy supply (HORIZON-CL5-2022-D3-03)), type of action (HORIZON-IA HORIZON Innovation Actions), and deadline model (single-stage). It also lists the planned opening date (06 September 2022), deadline date (10 January 2023 17:00:00 Brussels time), and type of MGA (HORIZON Action Grant Budget-Based [HORIZON-AG]). A "See budget overview" button is available.

# Otra forma de acceder a las FAQs

The screenshot shows the European Commission's Single Electronic Data Interchange Area (SEDA) interface. At the top, there is a navigation bar with links for SEARCH FUNDING & TENDERS, HOW TO PARTICIPATE, PROJECTS & RESULTS, WORK AS AN EXPERT, SUPPORT (which is currently selected), and FAQ. A red circle highlights the 'FAQ' link in the SUPPORT dropdown menu. Below the navigation bar, there is a banner for Horizon Europe (HORIZON). A red arrow points to the search bar labeled 'Search by keyword, question...'.

**FAQ - Frequently Asked Questions (323)**

These pages are updated with the answers to the most frequent questions that have been submitted to the Research Enquiry Service and Participant Validation, IT Helpdesk, eProcurement Helpdesk, Call Coordinators and H2020 NCP correspondents.

In case of questions related to a call for tenders, there is always a specific timeslot to ask questions and requesting information, clarification must be done exclusively within the call for tenders on eTendering. Read about calls for tenders.

Grant category: Select a grant category...  
Programming period: Select a programme period...  
Programme: Horizon Europe (HORIZON) (323)

Sort by: [dropdown]

List of frequently asked questions:

- Under HORIZON-HLTH-2021-CORONA-01-01, with respect to mild and moderate COVID-19, is there a concrete definition for the distinct COVID-19 disease phases? Applicants are welcome to consult the WHO website for the clinical progression scale proposed by the WHO Working Group on the Clinical Characterisation and Management of COVID-19 inf...
- HORIZON-EIC-2021-iCapitalPrize: Are previous participants allowed to participate in the contest? Yes, with some exceptions. Among the cities that participated in previous contests, only the previous winners as well as the runners-up of the 2020 edition are not eligible to apply....
- HORIZON-EIC-2021-iCapitalPrize: What is the focus of the award, and what will be evaluated in particular?

# Programme Guide, Online Manual y “IT How to”

The screenshot shows the EU Funding & Tenders portal for the Horizon Europe program. A red arrow labeled '1' points to the 'HOW TO PARTICIPATE' dropdown menu, which is expanded to show 'Reference documents'. Another red arrow labeled '2' points to the 'Programming period' dropdown, which is also expanded to show 'Horizon Europe (HORIZON)'. A third red arrow labeled '3' points to the 'Clear filter' button. A red arrow labeled '4' points to the 'Filter' input field at the top of the 'Reference Documents' list. A red arrow labeled '5' points to the 'HE Programme Guide' link in the list.

1

2

3

4

5

Reference Documents

Grants

This page includes reference documents of the programmes managed on the EU Funding & Tenders portal starting with legal documents and the Commission work programmes up to model grant agreements and guides for specific actions.

Please select the programme to see the reference documents.

Procurement

Reference Documents related to tendering opportunities are published on TED eTendering in the calls for tenders.

Filter

Legislation

Work programme & call documents

Grant agreements and contracts

Guidance

HE Programme Guide

List of eligible countries (HE)

Online Manual

Rules for Legal Entity Validation, LEAR Appointment and Financial Capacity Assessment

## Reference Documents

# Apúntate como Evaluador

The screenshot shows the European Commission's SEDE website. At the top, there is a logo for the European Commission and the text "Funding & tender opportunities". Below the logo, a navigation bar includes links for "SEARCH FUNDING & TENDERS", "HOW TO PARTICIPATE", "PROJECTS & RESULTS", "WORK AS AN EXPERT" (which is highlighted with a red circle), and "SUPPORT". On the right side of the header, there are "English" and "Español" language options, along with "Register" and "Login" buttons.

The main content area is titled "Work as an expert". It contains a video thumbnail with the caption "Being an expert for the European Commission ...". The video thumbnail shows a person speaking into a microphone. Below the video, there is a list of tasks experts assist in:

- Evaluation of proposals, prize applications and tenders
- Monitoring of actions, grant agreements, public procurement contracts
- Preparation, implementation and evaluation of EU programmes and design of policies.

In addition, experts provide opinion and advise on:

- In particular: experts assist in:
- Evaluation of proposals, prize applications and tenders
- Monitoring of actions, grant agreements, public procurement contracts
- Preparation, implementation and evaluation of EU programmes and design of policies.

Below this, there is a section for "Interested? Please join the database of external experts!" with a "Register as expert" button. A note states: "As new expert, you will be first requested to create your EU login account and register your profile." Another note says: "Registered experts can update the profile via the My Expert Area after login."

On the right side of the page, there is a "News" section with two items:

- 15 Feb. 2021: INEA looking for experts to assess CEF Energy calls
- 24 Mar. 2021: Call for expression of interest 2021-2027 – New

At the bottom right, there is a "Quick Links" section with several links:

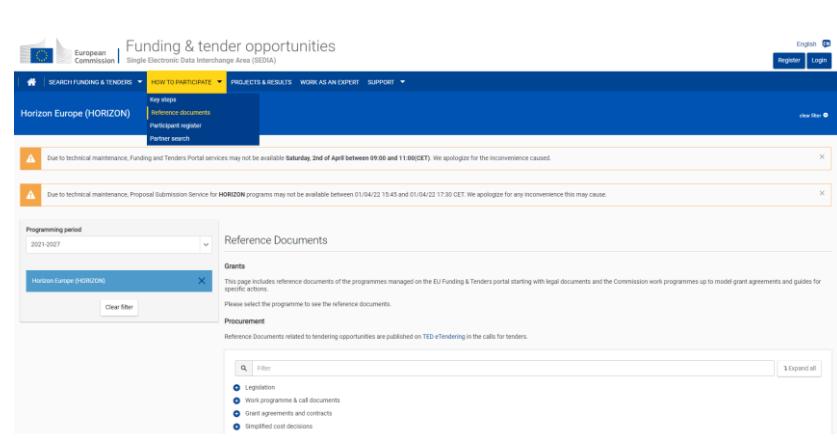
- Experts standard briefing slides
- FAQ for Experts
- Expert recommendations
- Lists of contracted experts
- EU Grants - Model Contract for Experts
- Methodology for expert fees for remote evaluation and ethics review
- FAQ on the evaluation of innovation, social sciences and humanities and other aspects of H2020 proposals

Se buscan diferentes perfiles: Científico-técnicos, business, emprendedores, entidades públicas, asociaciones, NGOs...

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/work-as-an-expert>

# Información de interés

- Funding and Tenders Portal
- Work Programme Clúster 5
- Proposal Template
- Programme Guide
- Online Manual
- IT How to



# Información de interés

## Webinars European Commission

- [How to prepare a successful proposal in Horizon Europe](#) (24 March 2021)
- [A successful proposal for Horizon Europe](#) (21 April 2021)
- [Tips and Tricks while writing your Horizon Europe proposal](#) (23 June 2021)
- [Recipe for success: Tips and tricks to writing your Horizon Europe proposal](#) (29 September 2022)
- [Dissemination, Communication and Exploitation](#) (9 June 2021)
- [The Funding & tenders Portal for beginners](#) (27 May 2021)
- [New features Funding & Tenders Portal](#) (28 September 2021)
- [The Gender Equality Plan](#) (23 June 2022)
- [Horizon Results Booster](#) (17 November 2022)
- [Submission and evaluation, Grant Agreement Preparation, Legal and Financial Aspects](#) (10 December 2021)
- [Grant Agreement Preparation, Legal and Financial Aspects](#) (26 January 2022)
- [Cost reporting of other costs \(with focus on internal invoicing\)](#) (23 March 2022)
- [Lump Sum funding: How does it work and what are the next steps?](#) (7 April 2022)
- [Lump Sum funding: How to write a proposal?](#) (19 May 2022)
- [Lump Sum funding: How does it work? How to write a proposal?](#) (20 October 2022)
- [Avoiding errors in declaring personnel costs in Horizon 2020 grants](#) (30 November 2022)



# Enlaces de interés

- [Work Programme clúster 5 "Climate, Energy and Movility"](#)
- [EU strategy on energy system integration \(europa.eu\)](#)
- [Key actions of the EU Hydrogen Strategy \(europa.eu\)](#)
- [Renovation wave \(europa.eu\)](#)
- [Offshore wind and ocean energy \(europa.eu\)](#)
- [The Digital Services Act package | Shaping Europe's digital future \(europa.eu\)](#)
- [« FIT 4 55 PACKAGE » EUR-Lex - 52021DC0550 - EN - EUR-Lex \(europa.eu\)](#)
- [REPowerEU: affordable, secure and sustainable energy for Europe | European Commission \(europa.eu\)](#)
- [Solar energy \(europa.eu\)](#)

# Más información

**Portal español Horizonte Europa**

<https://www.horizonteeuropa.es/>

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- Canal de Telegram
- 1 RSS
- ESHorizonte2020

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[https://twitter.com/HE\\_Energia\\_CDTI](https://twitter.com/HE_Energia_CDTI)

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Mantente informado a través del Portal español de Horizonte Europa

[www.horizonteeuropa.es](http://www.horizonteeuropa.es)