Energía en Horizonte Europa
Clúster 5 - Calls 2022

HORIZONTE EUROPA
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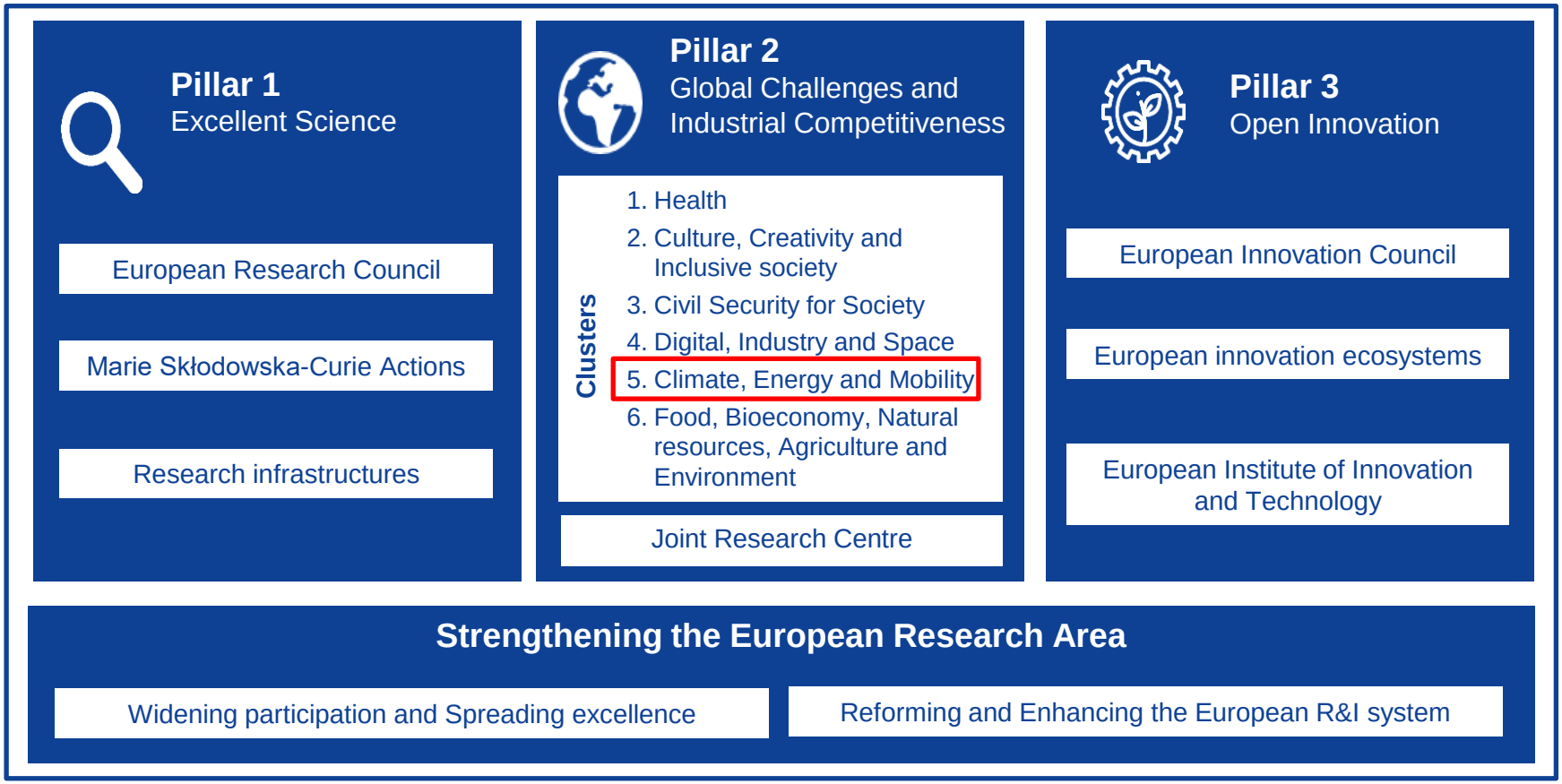
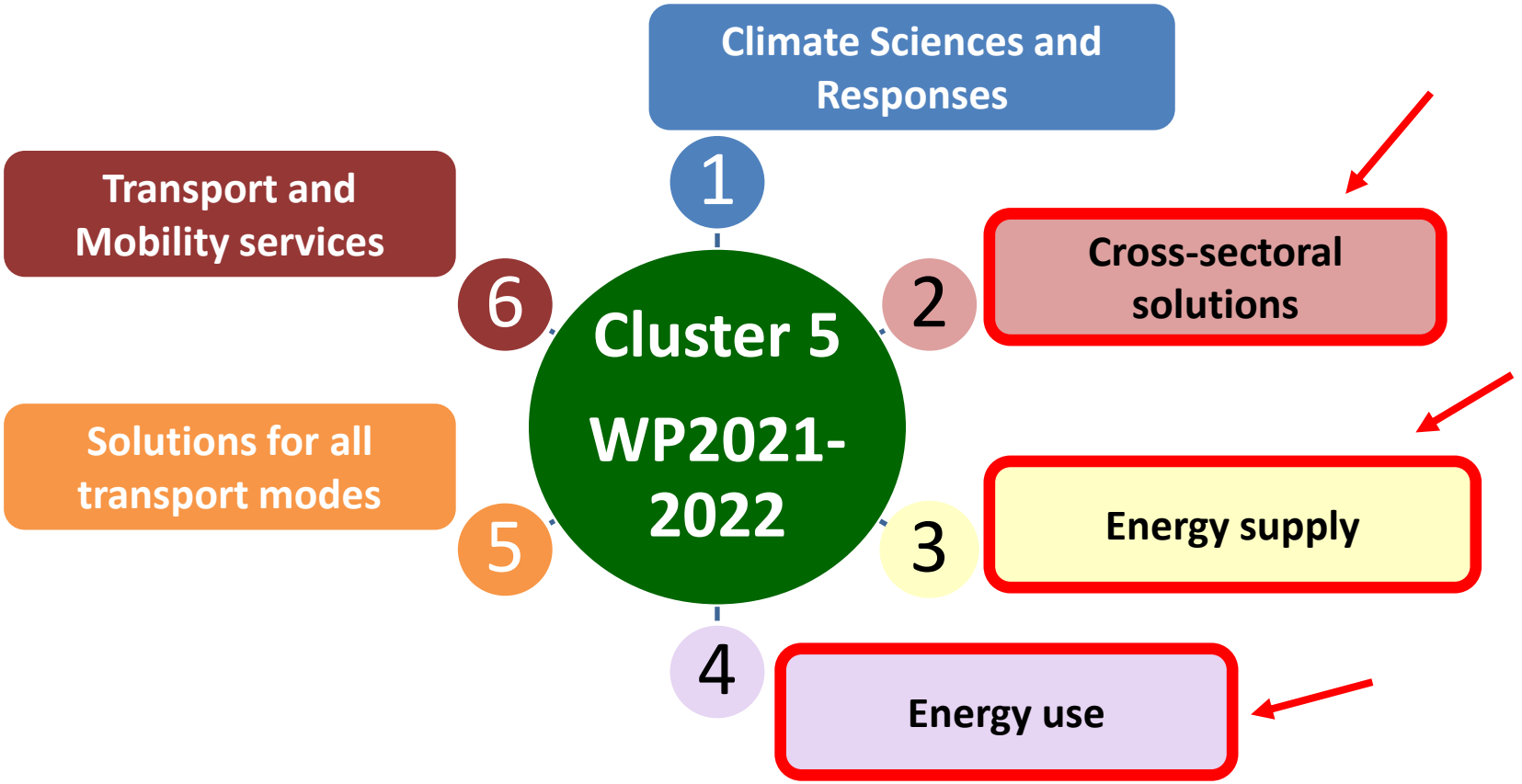
Infoday Cluster 5 Energía, 11 mayo 2022
Luisa Revilla, Dirección de Programas Europeos y Cooperación Territorial, CDTI

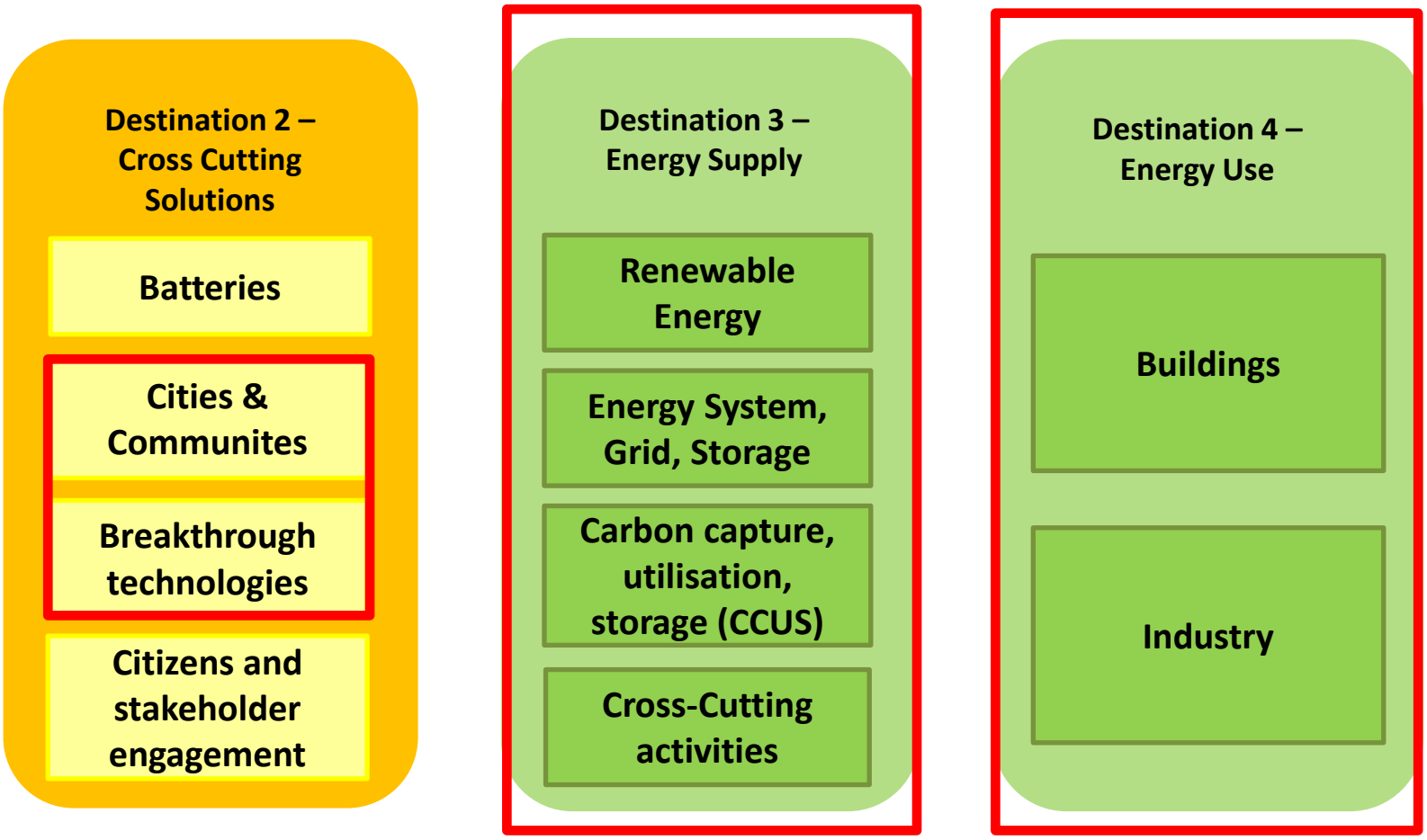
Horizon Europe (2021-2027) Estructura



Cluster 5 – Destinations

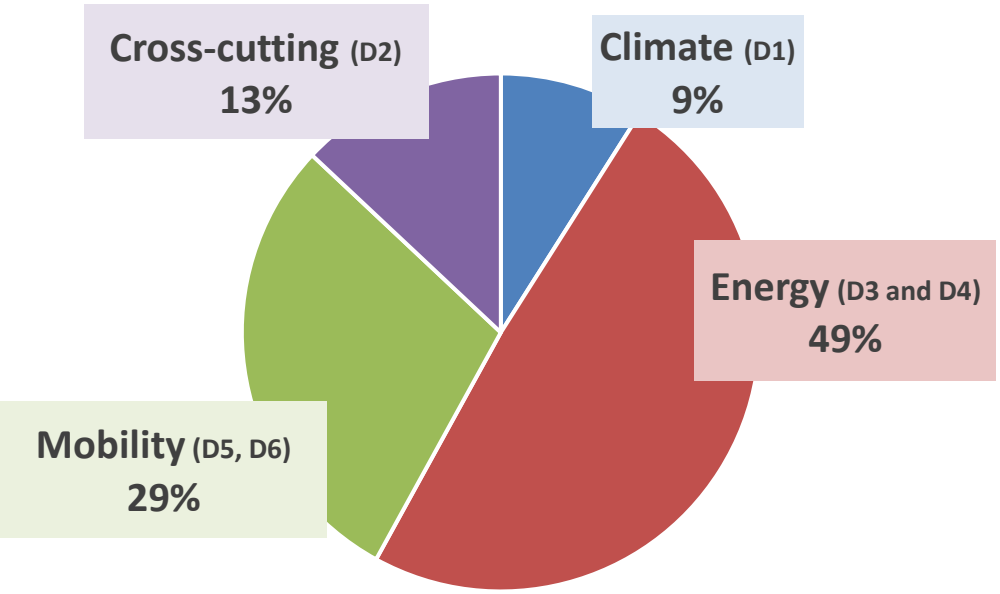


Cluster 5: Climate, Energy, Mobility

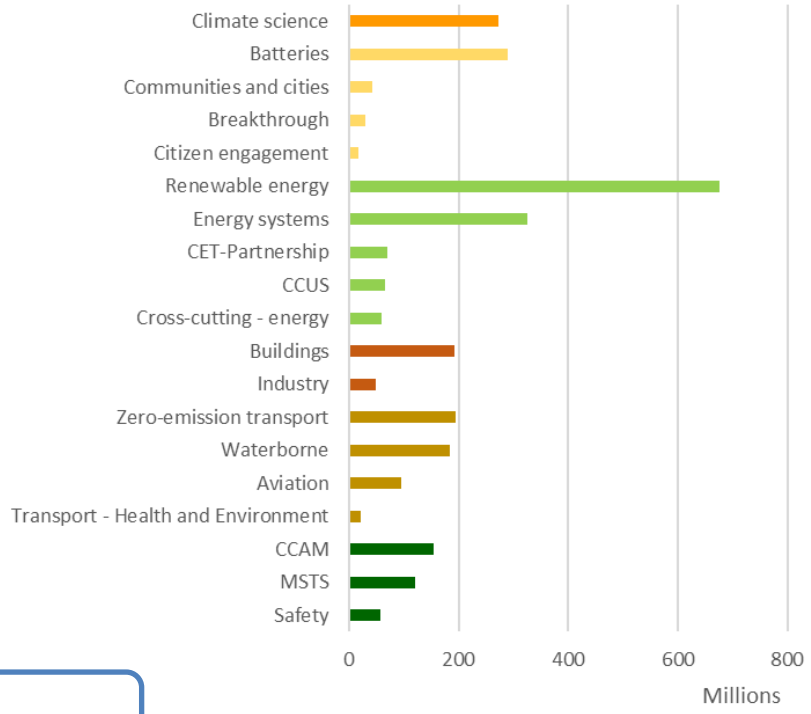


Cluster 5 - Budget allocation

Budget allocation per Destination (2021 and 2022)



Budget allocation per thematic heading (2021 and 2022)



Budget 2021-2022: **3000 M€**

Horizon Europe – Partnerships D2, D3 y D4

Institutional Partnerships	Co-programmed Partnerships	Co-funded Partnerships
• **Clean Hydrogen Europe (CHE)**	• **Built4People** | People-centric sustainable built environment • **Batteries** | For stationary applications and e-mobility	• **Driving urban transitions** to a sustainable future **(DUT)** • **Clean Energy Transition (CET)**
Separate calls **Multi Annual Work Programme (MAWP)** **Annual Work Programme (AWP)**	**Calls in WorkProgramme of Cluster 5** *** Built4People: Destination 4** *** Batteries: Destination 2**	**Separate Calls**

Partenariado “Clean Hydrogen Europe”

Antecedentes y Presupuestos:

FP7 (2008-2013) **=> 470 M€ from EC**

Horizon 2020 (2014-2020) **=> 665 M€ from EC**

Horizon Europe (2021-2027) => 1.000 M€ from EC

Documentos de trabajo:

SRIA – Strategic Research and Innovation Agenda & **MAWP** – Programa de Trabajo Multianual

AWP – Programa de Trabajo Anual

Call for proposals 2022: Total Budget **300.5 M€ (41 topics)**

Convocatoria abierta

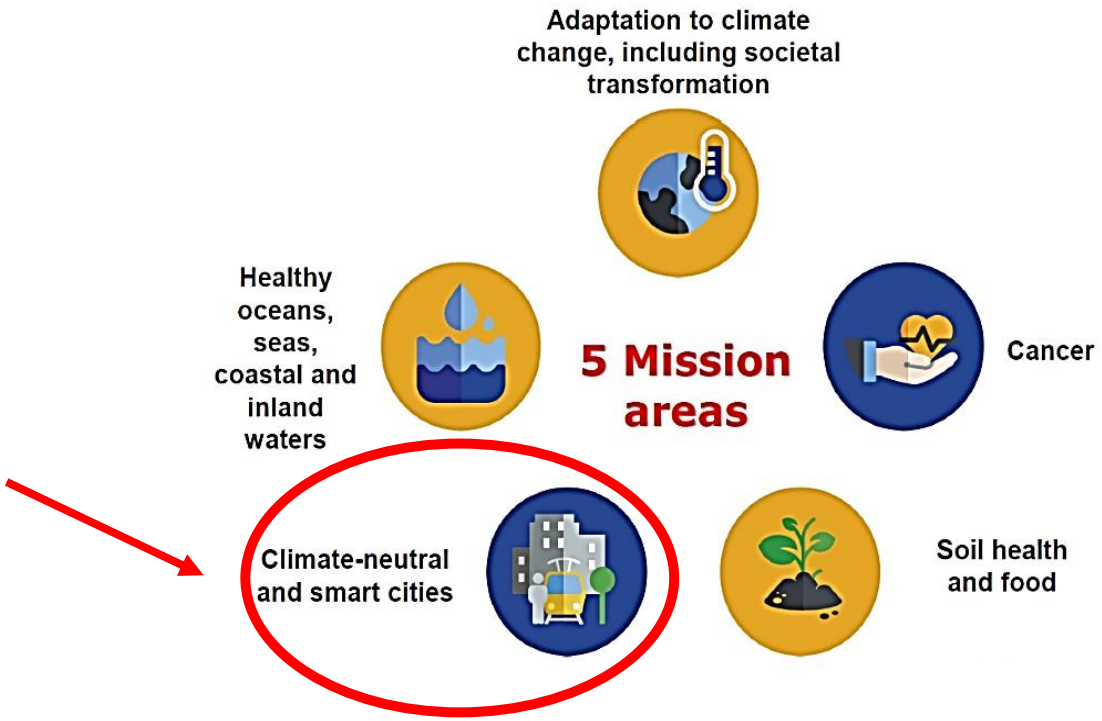
Two deadlines: 31st May 2022 / 20th September 2022

Infodays Call 2022: Clean Hydroen – JU; Infoday CDTI

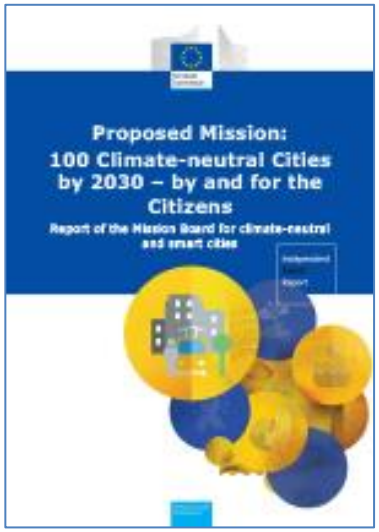
Misiones en Horizonte Europa

Cartera de acciones multidisciplinares, de plazo determinado, con meta audaz e inspiradora y de éxito cuantificable, que tiene un impacto en la sociedad y la ciudadanía.

Cinco áreas de misiones



Climate Neutral and Smart Cities by 2030



Report of the Mission Board

22 September 2020 – Interim Report from Mission Board

- Process formalised in a **Climate City Contract**
- **Co-design and co-implementation with citizens**, as users, producers, consumers and owners
- **Removal of barriers** to **participatory governance**
- Help for cities to design an **investment strategy** and access to funding
- Cross-sectoral and **systemic transformation**, encompassing transport, energy, built environment, digitalisation, etc

29.09.2021: Official launch of the EU Mission on Climate Neutral and Smart Cities and publication of the mission implementation plan
Implementation Plan - master copy 19 05 (europa.eu)

28.04.2022: Commission announces 100 cities participating in EU Mission for climate-neutral and smart cities by 2030

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100 Climate-neutral cities by 2030 by and for the citizens – Work Programme 2021-22

Topics focused on:

- Fostering inclusive, safe and sustainable **urban mobility**
- Enhancing the potential of **public transport**
- Promoting smart, integrated, inclusive and human-centred **urban planning and design**
- **Positive Energy Districts**

Convocatoria abierta, sólo topic Urban Mobility. Dealine: 6 Septiembre 2022

Cross-cutting issues to be addressed as relevant: digital/smart elements, zero pollution, inclusion, interoperability and standards

2021-22 WorkProgramme of R&D activities – published on **15 December 2021**

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Muchas oportunidades aún en Clúster 5 Energía

“Green Deal: EU Energy Policy Strategies” que hay que conocer:

2020

8 Jul

14 Oct

19 Nov

An EU strategy for Energy System Integration

Contexto político europeo:

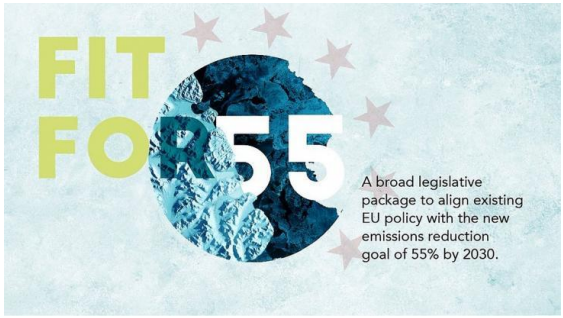
- EU Strategy on Energy System Integration (08.07.2020) https://ec.europa.eu/energy/topics/energy-system-integration/eu-strategy-energy-system-integration_en

A more **efficient** and "**circular**" **system**	Where **waste energy** is captured and re-used
A **cleaner power system**	With more direct **electrification of end-use sectors** such as industry, heating of buildings and transport
A **cleaner fuel system**	**For hard-to-electrify sectors** like heavy industry or transport

“EU Energy Policy” que hay que conocer

2021

14 Jul



2022

8 Mar

“FIT for 55” Package – Aspectos claves:

Reducir emisiones netas de GEI en un 55% como mínimo de aquí a 2030, en comparación a los niveles de 1990.

Mayor uso de Energías Renovables, y mayor ahorro energético:

- Revisión RED – 40% de energías renovables en el mix energético para 2030. Sectores del transporte, construcción e industria. Criterios de sostenibilidad para bioenergía
- Revisión EED – Renovación anual del 3% de edificios públicos

Movilidad ecológica

- Normas más estrictas en materia de emisiones de CO2 para turismos y furgonetas
- A partir de 2035, los vehículos nuevos matriculados serán zero emisiones
- Revisión del Reglamentode infrastructuras de combustibles alternativos
- Fomento de combustibles sostenibles para aviación (ReFuel-EU) y para transporte marítimo (Fuel-EU)

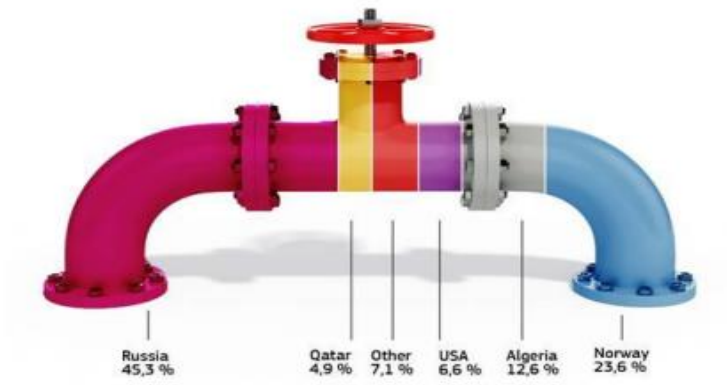
Revisión Régimen de Derechos de Emision de CO2 (ETS-Emission Trading Sytem)

- Eliminación gradual de los derechos de emisión gratuitos para la aviación
- Se incluye las emisiones del transporte marítimo por primera vez
- Nuevo régimen de comercio de derechos para la distribución de combustible para el transporte por carretera y para edificios

Mecanismo ajuste en la frontera / Revision Directiva fiscalidad energía / Nuevo Fondo Social para el clima / Ampliación Fondo de Innovación y Modernización/ ….

REPowerEU: Joint European Action for more affordable, secure and sustainable energy

Share in EU natural gas imports, 2021



Source: European Commission

EU imports **90%** of its gas consumption, with Russia providing more than **40%** of the EU's total gas consumption

I. Hacer frente a la emergencia:

1.1.Reducir los precios minoristas y apoyar a las empresas especialmente expuestas

1.2. Preparación para el próximo invierno con la garantía de un almacenamiento suficiente de gas

II. REPower-EU: Eliminar nuestra dependencia de los combustibles fósiles rusos:

2.1. Diversificar los suministros de gas**:**

2.1.1. Importaciones de GNL y por gasoducto

2.1.2. Aumentar la producción de biometano en la UE

2.1.3. Acelerador de hidrógeno

2.2. Reducir dependencia de los combustibles fósiles

2.2.1. **Despliegue renovables eólica y solar,** y bombas de calor

2.2.2. Descarbonización de la industria

2.2.3. Permitir una concesión de permisos más rápida

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Oportunidades “Energía” 2022

27 topics
≈ 366.5M€

Destination 3	Renewable energy (2 convocatorias)	• 17 topics – budget: 226.5 M€
Destination 4	Buildings	• 3 topics – total budget: 36 M€
	Buildings – B4P partnership	• 5 topics – total budget: 86 M€
	Industry	• 2 topics – total budget: 18 M€

Calendario de convocatorias (2021-2022)

Destination	Call	Opening	Deadline
Destination 2	HORIZON-CL5-2021-D2-01	24 June 2021	19 October 2021
	HORIZON-CL5-2022-D2-01	28 April 2022	6 September 2022
Destination 3	HORIZON-CL5-2021-D3-01	24 June 2021	19 October 2021
	HORIZON-CL5-2021-D3-02	24 June 2021	5 January 2022
	HORIZON-CL5-2021-D3-03	2 September 2021	23 February 2022
	HORIZON-CL5-2022-D3-01	14 October 2021	26 April 2022
	HORIZON-CL5-2022-D3-02	26 May 2022	27 October 2022
	HORIZON-CL5-2022-D3-03	6 September 2022	10 January 2023
Destination 4	HORIZON-CL5-2021-D4-01	24 June 2021	19 October 2021
	HORIZON-CL5-2021-D4-02	2 September 2021	25 January 2022
	HORIZON-CL5-2022-D4-01	28 April 2022	6 September 2022
	HORIZON-CL5-2022-D4-02	6 September 2022	24 January 2023

Calendario convocatorias todavía abiertas – Ordenadas por deadline

27 topics
≈ 366 M€

Call	Destination/Nº Topics/Areas	Opening date	Deadline to apply
HORIZON-CL5-2022-D4-01	• **Destination 4** **3** Buildings, **2** Industry	28 April 2022	6 Sept. 2022
HORIZON-CL5-2022-D3-02	• **Destination 3** **8** Renewable	26 May 2022	27 Oct. 2022
HORIZON-CL5-2022-D3-03	• **Destination 3** **9** Renewable	6 Sept. 2022	10 Jan. 2023
HORIZON-CL5-2022-D4-02	• **Destination 4** **5** Buildings – B4P	6 Sept. 2022	24 Jan. 2023

Infoday de la Comisión – 3 febrero
https://ec.europa.eu/info/research-and-innovation/events/upcoming-events/horizon-europe-info-days/cluster-5_en

Destination 3

Destination 3
Renewables

Destination 3 – Renewables (1/3)

Subarea	Topic	Topic title	Type of action	Indicative project budget	Total Budget	Expected number of grants
África - UE	HORIZON-CL5-2022-D3-02-02	AU-EU Energy System Modelling	RIA	Around 2.50	5.000.000,00	2
Renewable fuels/Bioenergy/	HORIZON-CL5-2022-D3-02-05	Renewable energy carriers from variable renewable electricity surplus and carbon emissions from energy consuming sectors	IA	Around 10.00	20.000.000,00	2
	HORIZON-CL5-2022-D3-02-08	Demonstration of complete value chains for advanced biofuel and non-biological renewable fuel production	IA	Around 10.00	20.000.000,00	2
	HORIZON-CL5-2022-D3-03-02	Best international practice for scaling up sustainable biofuels	RIA	Around 3.00	9.000.000,00	3
	HORIZON-CL5-2022-D3-03-06	Efficient and low-emission technologies for industrial use of combustion and gasification systems from low-value biogenic residues and wastes	RIA	3.00 to 5.00	10.000.000,00	2
	HORIZON-CL5-2022-D3-03-07	Development of algal and renewable fuels of non-biological origin	RIA	Around 5.00	15.000.000,00	3

Destination 3 – Renewables (2/3)

Subarea	Topic	Topic title	Type of action	Indicative project budget	Total Budget	Expected number of grants
Wind	HORIZON-CL5-2022-D3-03-04	Integrated wind farm control	RIA	Around 6.00	18.000.000,00	3
Photovoltaics	HORIZON-CL5-2022-D3-03-05	Novel Thin Film (TF) technologies targeting high efficiencies	RIA	Around 5.00	20.000.000,00	4
	HORIZON-CL5-2022-D3-03-09	Recycling end of life PV module	IA	6.00 to 7.00	20.000.000,00	3
Hydropower	HORIZON-CL5-2022-D3-03-08	Development of digital solutions for existing hydropower operation and maintenance	RIA	3.00 to 4.50	9.000.000,00	3
Concentrated Solar Power	HORIZON-CL5-2022-D3-03-01	Innovative components and/or sub-systems for CSP plants and/or concentrating solar thermal installations	IA	Around 5.50	16.500.000,00	3

Destination 3 – Renewables (3/3)

Subarea	Topic	Topic title	Type of action	Indicative project budget	Total Budget	Expected number of grants
Digital	HORIZON-CL5-2022-D3-02-01	Digital solutions for defining synergies in international renewable energy value chains	RIA	Around 3	9.000.000,00	3
Renewable Heating and Cooling	HORIZON-CL5-2022-D3-02-03	Innovative renewable energy carrier production for heating from renewable energies	IA	Around 10.00	10.000.000,00	1
Solar Fuel Technologies	HORIZON-CL5-2022-D3-02-04	Technological interfaces between solar fuel technologies and other renewables	RIA	3.00 to 5.00	10.000.000,00	2
	HORIZON-CL5-2022-D3-03-03	Efficient and circular artificial photosynthesis	RIA	3.00 to 5.00	10.000.000,00	2
RES for industry	HORIZON-CL5-2022-D3-02-06	Direct renewable energy integration into process energy demands of the chemical industry	RIA	3.00 to 5.00	10.000.000,00	2
RES in agro sector	HORIZON-CL5-2022-D3-02-07	Renewable energy incorporation in agriculture and forestry	IA	Around 7.5	15.000.000,00	2

Destination 4

Destination 4
Buildings

Destination 4 – Buildings BEE (1/2)

Subarea	Topic	Topic title	Type of action	Indicative project budget	Total Budget	Expected number of grants
Building Energy Efficiency	HORIZON-CL5-2022-D4-01-01	Demand response in energy-efficient residential buildings	IA	4.00 to 6.00	12.000.000,00	2
	HORIZON-CL5-2022-D4-01-02	Renewable-intensive, energy positive homes	IA	4.00 to 6.00	12.000.000,00	2
	HORIZON-CL5-2022-D4-01-03	Smarter buildings for better energy performance	IA	4.00 to 6.00	12.000.000,00	2

Destination 4 – Buildings B4P (2/2)

Subarea	Topic	Topic title	Type of action	Indicative project budget	Total Budget	Expected number of grants
Built4People (B4P)	HORIZON-CL5-2022-D4-02-01	Designs, materials and solutions to improve resilience, preparedness & responsiveness of the built environment for climate adaptation (Built4People)	IA	5.00 to 7.50	15.000.000,00	2
	HORIZON-CL5-2022-D4-02-02	Solutions for the sustainable, resilient, inclusive and accessible regeneration of neighbourhoods enabling low carbon footprint lifestyles and businesses (Built4People)	IA	5.00 to 7.50	15.000.000,00	2
	HORIZON-CL5-2022-D4-02-03	Sustainable and resource-efficient solutions for an open, accessible, inclusive, resilient and low-emission cultural heritage: prevention, monitoring, management, maintenance, and renovation (Built4People)	RIA	4.00 to 5.00	20.000.000,00	4
	HORIZON-CL5-2022-D4-02-04	Smart-grid ready and smart-network ready buildings, acting as active utility nodes (Built4People)	IA	6.00 to 9.00	18.000.000,00	2
	HORIZON-CL5-2022-D4-02-05	More sustainable buildings with reduced embodied energy / carbon, high life-cycle performance and reduced life-cycle costs (Built4People)	IA	6.00 to 9.50	18.000.000,00	2

Destination 4
Industry

Destination 4 – Industry

Subarea	Topic	Topic title	Type of action	Indicative project budget	Total Budget	Expected number of grants
Industry	HORIZON-CL5-2022-D4-01-04	Development and pilot demonstration of heat upgrade technologies with supply temperature in the range 150-250°C	RIA	3.00 to 5.00	10.000.000,00	2
	HORIZON-CL5-2022-D4-01-05	Development of high temperature thermal storage for industrial applications	RIA	3.00 to 4.00	8.000.000,00	2

Destination 3
Convocatorias 2022

Destination 3 – Expected Impact

To contribute to

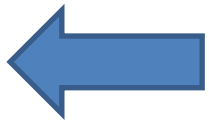
More efficient, clean, sustainable, secure and competitive energy supply

through:

i. Fostering global leadership in affordable, secure and sustainable **renewable energy technologies and services** by improving their competitiveness in global value chains and their position in growth markets, notably through the diversification of the renewable services and technology portfolio

ii. Ensuring cost-effective uninterrupted and affordable supply of energy to households and industries in a scenario of high penetration of variable renewables and other low carbon energy supply. This includes more efficient approaches to managing **smart and cyber-secure energy grids** and optimization the interaction between producers, consumers, networks, infrastructures and vectors

iii. Accelerating the development of **Carbon Capture, Use and Storage (CCUS)** as a CO2 emission mitigation option in electricity generation and industry applications (including also conversion of CO2 to products)



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D3 - Renewables

D3 – Renewable technologies Expected Impacts

The main expected impacts to be generated by topics are:

a. **Disruptive renewable energy and renewable fuel technologies** and systems will be available in 2050 in order to accelerate the replacement of fossil-based energy technologies

b. **Reduced cost and improved efficiency of renewable energy and renewable fuel** technologies and their value chains

c. **De-risking of renewable energy and fuel technologies** with a view to their commercial exploitation and net zero greenhouse gas emissions by 2050

d. **Better integration in energy consuming sectors**

e. Reinforced scientific basis and export potential for renewable energy technologies through **international collaboration** (notably with Africa and enhanced collaboration with Mission Innovation countries)

f. Enhanced **sustainability of value chains**, taking fully into account social, economic and environmental aspects

g. More effective **market uptake**

Digital solutions

1 topic

Topic	Topic title	Type of action	Indicative project budget	Total Budget	Expected number of grants
HORIZON-CL5-2022-D3-02-01	Digital solutions for defining synergies in international renewable energy value chains	RIA	Around 3	9.000.000,00	3

Deadline: 27 Oct. 2022

RIA
3 M€/project
Total budget 9 M€
TRL 5 end of the project

Provide digital solutions for promoting the increase of the global renewable energy share

*Improve **reliability of system components**, advanced and automated functions for **data analysis, diagnosis and fault detection**, forecasting and model-predictive **control frameworks**, ancillary services for the **stability of the network**; maintenance planning and/or reporting*

HORIZON-CL5-2021-D3-02-01

Digital solutions for defining synergies in international renewable energy value chains

Development of:

- **Novel** real time and open data **monitoring and/or simulation solutions** (e.g. including digital twins) for **sustainable energy production and consumption**
- **Predictive modelling and artificial intelligence** for the analysis of international renewable energy value chains and for internationally aligned decision-making in cooperation with international partners from Mission Innovation Countries

To ensure trustworthiness, wide adoption by user communities and support EU policy-makers, actions should:

- Promote the highest standards of transparency and openness
- Going well beyond documentation and extending to aspects such as assumptions, models and data related to renewable energy and fuels

At least one legal entity established in a Mission Innovation Country, not being Member State or Associated Country

http://mission-innovation.net/

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Africa-EU

1 topic

Topic	Topic title	Type of action	Indicative project budget	Total Budget	Expected number of grants
HORIZON-CL5-2022-D3-02-02	AU-EU Energy System Modelling	RIA	Around 2.50	5.000.000,00	2

Deadline: 27 Oct. 2022

HORIZON-CL5-2021-D3-02-02

AU-EU Energy System Modelling

RIA

2,5 M€/project

Total budget 5 M€

Reinforce the AU-EU High Level Policy Dialog Climate Change and Sustainable Energy Partnership

Increase clean energy generation in the African energy systems

The development of **energy system models tailored to the specific African social, economic and regulatory environment** is crucial for energy generation system planning and for energy policy development. Today African countries are relying heavily on developed country models.

<u>The proposal should:</u>

- Develop and test models for decision makers and planners to design and evaluate energy system(s) with a high penetration of renewable energy generation through a regional approach
- Considerations to climate neutrality of cities and industries, using no fossil fuels
- Focus on the introduction of clean energy technologies
- Tests should be done for at least two base cases

The consortium must include ***at least three legal entities from three different African countries***

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Photovoltaics

2 topics

Topic	Topic title	Type of action	Indicative project budget	Total Budget	Expected number of grants
HORIZON-CL5-2021-D3-02-04	Novel tandem, high efficiency Photovoltaic technologies targeting low cost production with earth abundant materials	RIA	Around 5.00	20.000.000,00	4
HORIZON-CL5-2021-D3-03-07	Stable high performance Perovskite Photovoltaics	RIA	Around 5.00	15.000.000,00	3
HORIZON-CL5-2021-D3-03-10	Innovative foundations, floating substructures and connection systems for floating PV and ocean energy devices	RIA	Around 3.50	10.000.000,00	3
HORIZON-CL5-2021-D3-03-13	Demonstration pilot lines for alternative and innovative PV technologies (Novel c-Si tandem, thin film tandem, bifacial, CPV, etc.)	IA	Around 15.00	45.000.000,00	3
HORIZON-CL5-2022-D3-01-03	Advanced manufacturing of Integrated PV	IA	Around 16.00	32.000.000,00	2
HORIZON-CL5-2022-D3-01-06	Novel Agro-Photovoltaic systems	IA	Around 5.00	10.000.000,00	2
HORIZON-CL5-2022-D3-03-05	Novel Thin Film (TF) technologies targeting high efficiencies	RIA	Around 5.00	20.000.000,00	4
HORIZON-CL5-2022-D3-03-09	Recycling end of life PV module	IA	6.00 to 7.00	20.000.000,00	3

Deadline: 10 January 2023

HORIZON-CL5-2022-D3-03-05

Novel Thin Film technologies targeting high efficiencies

RIA

5 M€/project

Total budget 20 M€

TRL 5 end of the project

Increase the potential of thin-film technologies for mass production, low cost and/or specialized applications

Allow for an efficient use of available areas for renewable energy generation reducing competition between different kinds of land use by further increasing PV energy yield/m2

Proposals should address **all of** the following:

- Develop **novel** environmentally benign **thin-film technology concepts** that optimize PV cell and module architecture, increase **durability, decrease losses** and target **very high efficiencies (>25%)**
- Employ simple, scalable and low cost/low energy consumption and **higher rate deposition processes**
- Ensure **compliance with all relevant standards** (specific applications)
- Perform device/module real-life (under actual outdoor operating conditions) characterization for reliability and energy yield assessment
- **Perform a life cycle analysis to bring evidence of the lower environmental impact, better resource efficiency than current commercial PV technologies**

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Lump Sum

Deadline: 10 January 2023

HORIZON-CL5-2022-D3-03-09

Recycling end of life PV modules

IA

6-7 M€/project

Total budget 20 M€

TRL 7 end of the project

Increase recyclability and minimize the environmental impact of PV

Introduce new business models, open new marketS in PV recycling

Reduce dependency ***on primary raw materials through the circular use of resources***

Strengthen domestic sourcing of raw materials in the EU

The proposal should address **all of** the following:

- **Forecast the PV waste streams** and estimate the market potentials
- Develop and demonstrate **flexible, high efficiency and throughput recycling technologies** adapted to large volumes of PV modules/products that will be disposed in the future
- Demonstrate **re-use potential of high-value recycled material** (maintaining its purity and/or integrity) in the PV sector
- Demonstrate a **business case and a market introduction strategy**
- Address aspects **of low environmental impact, resource efficiency and circularity potential**
- Involve **multidisciplinary consortia** including **industrial partners**

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Wind

1 topic

Topic	Topic title	Type of action	Indicative project budget	Total Budget	Expected number of grants
HORIZON-CL5-2021-D3-03-04	Physics and aerodynamics of atmospheric flow of wind for power production	RIA	Around 6.00	18.000.000,00	3
HORIZON-CL5-2021-D3-03-05	Wind energy in the natural and social environment	RIA	Around 3.00	10.000.000,00	3
HORIZON-CL5-2021-D3-03-12	Innovation on floating wind energy deployment optimized for deep waters and different sea basins (Mediterranean Sea, Black Sea, Baltic Sea, North-east Atlantic Ocean)	IA	Around 16.00	50.000.000,00	3
HORIZON-CL5-2022-D3-01-02	Demonstration of innovative materials, supply cycles, recycling technologies to increase the overall circularity of wind energy technology and to reduce the primary use of critical raw materials	IA	Around 13.00	40.000.000,00	3
HORIZON-CL5-2022-D3-03-04	Integrated wind farm control	RIA	Around 6.00	18.000.000,00	3

Deadline: 10 January 2023

HORIZON-CL5-2022-D3-03-04

Integrated wind farm control

RIA

6 M€/project

Total budget 18 M€

TRL 5 end of the project

Open source data-driven tools to decrease energy costs on operation, increasing total wind farm output

Development of physical and digital tools, interoperable frameworks and controls, for enhanced data collection, analysis, and operation

Allow operators to make better informed decisions

Address **all** the following aspects:

- Address and validate how **digital innovation** is able to provide **more stable, resilient, secure, reliable and affordable energy**, while retaining high levels of **cybersecurity**
- How these **data-driven innovations** reduce operational and maintenance costs, increase energy output, and their impact on (component, turbine, farm) lifetime
- Address the role of such innovations as a **prognostic tool**, regarding failures and damages
- Develop and release an **open source digital/AI solution** for sector uptake. It should account for the advent of large wind turbines (up to 20 MW) and include those in the development of the tool

Renewable fuels/Bioenergy/ Synthetic fuels/Biofuels

5 topics

Topic	Topic title	Type of action	Indicative project budget	Total Budget	Expected number of grants
HORIZON-CL5-2021-D3-03-03	Hybrid catalytic conversion of renewable energy to carbon-neutral fuels	RIA	Around 3.3	10.000.000,00	3
HORIZON-CL5-2021-D3-03-09	Carbon-negative sustainable biofuel production	RIA	Around 5.00	15.000.000,00	3
HORIZON-CL5-2021-D3-03-14	Demonstration of large-scale CHP technologies for a shift to the use of biogenic residues and wastes	IA	Around 10.00	10.000.000,00	1
HORIZON-CL5-2021-D3-03-16	Innovative biomethane production as an energy carrier and a fuel	IA	Around 10.00	20.000.000,00	2
HORIZON-CL5-2022-D3-01-01	Demonstration of cost-effective advanced biofuel technologies utilizing existing industrial plants	IA	Around 10.00	20.000.000,00	2
HORIZON-CL5-2022-D3-02-05	Renewable energy carriers from variable renewable electricity surplus and carbon emissions from energy consuming sectors	IA	Around 10.00	20.000.000,00	2
HORIZON-CL5-2022-D3-02-08	Demonstration of complete value chains for advanced biofuel and non-biological renewable fuel production	IA	Around 10.00	20.000.000,00	2
HORIZON-CL5-2022-D3-03-02	Best international practice for scaling up sustainable biofuels	RIA	Around 3.00	9.000.000,00	3
HORIZON-CL5-2022-D3-03-06	Efficient and low-emission technologies for industrial use of combustion and gasification systems from low-value biogenic residues and wastes	RIA	3.00 to 5.00	10.000.000,00	2
HORIZON-CL5-2022-D3-03-07	Development of algal and renewable fuels of non-biological origin	RIA	Around 5.00	15.000.000,00	3

Deadline: 27 Oct. 2022

HORIZON-CL5-2021-D3-02-05

Renewable energy carriers from variable renewable electricity surplus and carbon emissions from energy consuming sectors

IA

10 M€/project

Total budget 20 M€

TRL 7 end of the project

Improving techno-economic efficiency

Avoidance of CO2/GHG emissions and renewable electricity economic or curtailment losses

Supported by a life cycle assessment

- **Demonstration of renewable energy carrier synthesis** from variable renewable electricity surplus and carbon emissions from energy consuming sectors which is targeting improvement of the overall synthesis value chain **efficiency and viability** while **making best use of the CO2 emissions** in synergy with **renewable electricity generation.**
- **The incorporation of** hybrids of renewable electricity with algal or synthetic renewable fuels in energy intensive sectors by integrating the conversion of surplus renewable electricity and carbon emissions from these sectors to liquid renewable energy carriers by algal, artificial photosynthesis or homologous non-solar pathways **will be demonstrated**.
- **Conversion technologies should be based upon** biological, biochemical, thermochemical and or electrochemical processes.

Deadline: 27 Oct. 2022

HORIZON-CL5-2021-D3-02-08

Demonstration of complete value chains for advanced biofuel and non-biological renewable fuel production

IA

10 M€/project

Total budget 20 M€

TRL 6-7 end of the project

De-risk technology, boost the scale-up

Respond to short and medium term needs for renewable fuels in energy and transport

- **Demonstrate** innovative and cost-effective sustainable **value chains for advanced biofuels or synthetic renewable fuels of non-biological origin** over the entire cycle from feedstock to end use.
- **Any sustainable biomass feedstock**, including residues and wastes, or biogenic CO2 or industrial CO2 and renewable hydrogen, as well as input energy to the conversion **should be addressed.**
- **Pathways** which are biochemical, thermochemical, biological, chemical, electrochemical or combinations of them should be considered.
- **Improve performance** in terms of increasing the efficiency and sustainability and reducing costs, while **evidencing the value creation along the value chain steps**.

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Deadline: 10 January 2023

HORIZON-CL5-2022-D3-03-02

Best international practice for scaling up sustainable biofuels

RIA

3 M€/project

Total budget 9 M€

TRL 4-5 end of the project

*Contribute to **cost-effective and more sustainable large-scale production of sustainable biofuels***

Develop networks for skill development and knowledge sharing in sustainable biofuels value chains worldwide

Fostering **international cooperation** to develop best practices and concepts along the entire value chain for accelerating the scale-up of sustainable biofuels

- **Any sustainable non-food/feed biomass feedstock** and any **innovative technology** or combinations of them should be considered
- Proposals should address systemic **constraints and opportunities for scaling up** complete value chains of sustainable biofuels and propose solutions
- Proposals should enhance overall cost-effectiveness and sustainability of large scale production of sustainable biofuels based on **Life Cycle Analysis**
- International cooperation with **Mission Innovation** countries is expected

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Deadline: 10 January 2023

HORIZON-CL5-2022-D3-03-06

Efficient and low-emission technologies for industrial use of combustion and gasification systems from low-value biogenic residues and wastes

RIA

3-5 M€/project

Total budget 10 M€

TRL 5 end of the project

Bioenergy integration into industrial settings

Increased feedstock diversification, cost reduction of bioenergy

Reduced emissions of biomass combustion and gasification *and bioenergy value chains*

Development of technologies for optimization of advanced **biofuel flexible systems** regarding upstream multi-feedstock, logistics, feeding, ash management, combustion or gasification processes and effluent emissions and their effective integration into industrial process energy environment through **efficient and low-emission technologies for industrial use of combustion and gasification systems** from **low-economic value, but fully sustainable biogenic residues and wastes.**

Lump Sum

Deadline: 10 January 2023

HORIZON-CL5-2022-D3-03-07

Development of algal and renewable fuels of non-biological origin

RIA

5 M€/project

Total budget 15 M€

TRL 4-5 end of the project

Facilitate development of biofuels from algae vegetable lipids

Increase robustness of conversion and process sustainability

*Deliver technology **for longer-term needs for renewable fuels in energy and transport***

Develop and improve **algal <u>and/or</u> non-biological renewable fuel** technologies (other than hydrogen as a final product) through developing **synthetic pathways including biological, biochemical, thermochemical, electrochemical processes or combinations of them**.

- Improving the **performance of the conversion process** by increasing the efficiency, reducing the cost and decreasing the GHG emissions
- Implementing and improving **circularity for energy and material use**
- Address systemic **constraints and opportunities** for scaling-up algal and non-biological renewable fuel technologies

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Hydropower

1 topic

Topic	Topic title	Type of action	Indicative project budget	Total Budget	Expected number of grants
HORIZON-CL5-2021-D3-03-11	Development of hydropower equipment for hidden hydropower	RIA	3.00 to 5.00	10.000.000,00	2
HORIZON-CL5-2022-D3-03-08	Development of digital solutions for existing hydropower operation and maintenance	RIA	3.00 to 4.50	9.000.000,00	3

Lump Sum

Deadline: 10 January 2023

HORIZON-CL5-2022-D3-03-08

Development of digital solutions for existing hydropower operation and maintenance

RIA

3-4,5 M€/project

Total budget 9 M€

TRL 5 end of the project

*Increasing the **flexibility, sustainability and predictability of existing hydropower***

Improve environmental and socio-economic sustainability of the existing hydropower fleet

Development of **novel sensor technologies and digital solutions for digitalization** of **existing hydropower plants** and **improving their sustainable operation** by addressing one or more of the following:

- Weather and flow forecast
- Biodiversity monitoring
- Predictive modelling and artificial intelligence for the analysis of sensor data for decision-making in operation and maintenance

Acknowledging eventual confidentiality of operational data to ensure wide uptake and reliability, actions should promote the highest standards of **transparency and openness** of the digital solutions, extending to aspects such as assumptions, architecture, code and data.

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Concentrated Solar Power

1 topic

Topic	Topic title	Type of action	Indicative project budget	Total Budget	Expected number of grants
HORIZON-CL5-2021-D3-03-06	Novel approaches to concentrated solar power (CSP)	RIA	Around 3.00	9.000.000,00	3
HORIZON-CL5-2022-D3-03-01	Innovative components and/or sub-systems for CSP plants and/or concentrating solar thermal installations	IA	Around 5.50	16.500.000,00	3

Deadline: 10 January 2023

HORIZON-CL5-2022-D3-03-01

Innovative components and/or sub-systems for CSP plants and/or concentrating solar thermal installations

IA
5.5 M€/project
Total budget 16.5 M€
TRL 6-7 end of the project

Higher shares of variable output renewables in the energy system

Higher efficiency *of CSP plants and/or concentrating solar thermal installations*

Reduced operation and maintenance costs *of CSP plants and/or concentrating solar thermal installations*

Demonstration of innovative, cost-effective and more reliable components and/or sub-systems for CSP plants and/or concentrating solar thermal installations

- The components and/or sub-systems will allow **better efficiency in terms of solar energy conversion**
- The demonstration should span a **continuous interval of at least six months** covering all possible incidence angles of the direct solar radiation
- Assess the **sustainability of the proposed components and/or sub-systems** in environmental, social and economic terms
- All **demonstrators fully and transparently documented**, to ensure replicability, up-scaling and to assist future planning decisions

Renewable heating and cooling

1 topic

Topic	Topic title	Type of action	Indicative project budget	Total Budget	Expected number of grants
HORIZON-CL5-2022-D3-02-03	Innovative renewable energy carrier production for heating from renewable energies	IA	Around 10.00	10.000.000,00	1

Deadline: 27 Oct. 2022

HORIZON-CL5-2021-D3-02-03

Innovative renewable energy carrier production for heating from renewable energies

IA
10 M€/project
Total budget 10 M€
TRL 7 end of the project

Increase of feedstock availability for renewable heating

Technology de-risk of renewable energy carrier value chains *as a necessary step before scaling up at commercial level*

Demonstrate cost-effective and energy- efficient, catalyst-efficient and equipment material-efficient **transformation of renewable energy into renewable energy carriers for heating**……..

……while ensuring very good combustion properties in respect of

- efficiency and avoidance of pollutants and
- environmental and socioeconomic sustainability of the respective heating supply and value chains

Solar Fuel technologies

2 topics

Topic	Topic title	Type of action	Indicative project budget	Total Budget	Expected number of grants
HORIZON-CL5-2022-D3-02-04	Technological interfaces between solar fuel technologies and other renewables	RIA	3.00 to 5.00	10.000.000,00	2
HORIZON-CL5-2022-D3-03-03	Efficient and circular artificial photosynthesis	RIA	3.00 to 5.00	10.000.000,00	2

Deadline: 27 Oct. 2022

HORIZON-CL5-2021-D3-02-04

Technological interfaces between solar fuel technologies and other renewables

RIA
3-5 M€/project
Total budget 10 M€
TRL 4 end of the project

Provide breakthrough solutions *towards a fossil-free economy*

Bridging solar energy and other renewables in boosting renewable fuel production and storage

Development of energy transmitting technological interfaces to couple solar fuel technologies to other renewables such as from e.g. biosources or directly connected renewable power generation……

……which allow **for efficient feed in of other forms of renewable energy into solar fuel conversion technologies** and allow for **efficient and continuous renewable fuel production.**

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Lump Sum

Deadline: 10 January 2023

HORIZON-CL5-2022-D3-03-03

Efficient and circular artificial photosynthesis

RIA

3-5 M€/project

Total budget 10 M€

TRL 5 end of the project

Provide solar fuel breakthrough solutions by bridging solar energy and fuel needs with the potential of high penetration in the energy system, ensuring stability and security of energy supply

Increase their scalability and integration within the industrial value chain in respect of circularity

Development of **novel artificial photosynthesis technologies**, which allow for:

- Improved efficiency of light harvesting
- Conversion to electrochemical potential and energy fixation to carriers

With strictly implementing circularity by design and efficient use of carrier and (photo)catalys materials

Through novel photoelectrochemical or bio-based (bio-hybrid) or biological pathways for solar fuel production with increased efficiency in comparison to light and dark reactions of natural photosynthesis

Production of hydrogen as a final product is not envisaged

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Renewables for industry

1 topic

Topic	Topic title	Type of action	Indicative project budget	Total Budget	Expected number of grants
HORIZON-CL5-2022-D3-02-06	Direct renewable energy integration into process energy demands of the chemical industry	RIA	3.00 to 5.00	10.000.000,00	2

Deadline: 27 Oct. 2022

HORIZON-CL5-2021-D3-02-06

Direct renewable energy integration into process energy demands of the chemical industry

RIA

3-5 M€/project

Total budget 10 M€

TRL 4-5 end of the project

Provide breakthrough solutions towards a fossil-free economy

Sustainable solutions across ***energy intensive chemical industry,*** *targeting in particular* ***process energy and its GHG emissions***

Development of the technology and the methodology of **integrating renewable energy in chemical processing by substituting fossil process energy in chemical industry** (which has a high carbon footprint due to processing relative to the mass of the final product).

Renewable energy integration into process energy demands of the chemical industry beyond electricity (targeting e.g. electrochemical potential of artificial photosynthesis to chemical reduction processes and/or e.g. direct solar thermochemical conversion) and should improve GHG balance and sustainability of the targeted process.

Renewables for agriculture and forestry

1 topic

Topic	Topic title	Type of action	Indicative project budget	Total Budget	Expected number of grants
HORIZON-CL5-2022-D3-02-07	Renewable energy incorporation in agriculture and forestry	IA	Around 7.5	15.000.000,00	2

Deadline: 27 Oct. 2022

HORIZON-CL5-2021-D3-02-07

Renewable energy incorporation in agriculture and forestry

IA

7,5 M€/project

Total budget 15 M€

TRL 6-7 end of the project

Promote decentralized renewable energy use and decentralized production of renewable energy carriers

Reduce agriculture and forestry carbon footprint** from **own energy consumption and agricultural/forest waste management

Demonstrate **incorporation of renewable energy technologies in agriculture or forestry to meet its electricity, heat, cold, waste and land management needs.**

Combine value chains from different renewables and adapted storage options to de-fossilize agricultural or forest processes trans-seasonally.

Address one of the two options:

- Transformation of **agricultural or forest wastes to renewable energy carriers** in situ
- Development of **renewable-based agricultural protocols for cropping** which **increase carbon sequestration and soil organic matter and reduce pesticides**, combined with transformation to renewable energy carriers in situ

Destination 4
Convocatorias 2022

Destination 4 – Expected Impact

To contribute to

Efficient and sustainable use of energy, accessible for all

through:

a. Technological and socio-economic breakthroughs for achieving climate neutrality and the transition to zero pollution of the **building stock** by 2050, based on inclusive and people-centric R&I

b. Increased energy efficiency in **industry** and reducing industry's Greenhouse Gas and air pollutant emissions through recovery, upgrade and/or conversion of industrial excess (waste) heat and through electrification of heat generation

D3 – Buildings Expected Impacts

Topics targeting **energy efficiency in buildings** to achieve the impacts:

- More energy efficient building stocks supported by an accurate understanding of buildings performance and of related evolutions
- Building stocks that effectively combine energy efficiency, renewable energy sources and digital and smart technologies

Topics contributing to the **Built4People Partnership** to achieve the impacts:

- Higher buildings' performance with lower environmental impacts through increased rates of holistic renovations
- Higher quality, more affordable built environment preserving climate, environment and cultural heritage and ensuring better living conditions

D4 – Buildings (BEE)

Building Energy Efficiency

3 topics

Subarea	Topic	Topic title	Type of action	Indicative project budget	Total Budget	Expected number of grants
Building Energy Efficiency **(BEE)**	HORIZON-CL5-2021-D4-01-01	Advanced energy performance assessment and certification	IA	3.00 to 5.00	10.000.000,00	2
	HORIZON-CL5-2021-D4-01-02	Industrialisation of deep renovation workflows for energy-efficient buildings	IA	5.00 to 8.00	16.000.000,00	2
	HORIZON-CL5-2021-D4-01-03	Advanced data-driven monitoring of building stock energy performance	IA	3.00 to 5.00	10.000.000,00	2
	HORIZON-CL5-2022-D4-01-01	Demand response in energy-efficient residential buildings	IA	4.00 to 6.00	12.000.000,00	2
	HORIZON-CL5-2022-D4-01-02	Renewable-intensive, energy positive homes	IA	4.00 to 6.00	12.000.000,00	2
	HORIZON-CL5-2022-D4-01-03	Smarter buildings for better energy performance	IA	4.00 to 6.00	12.000.000,00	2

Deadline: 6 Sept. 2022

HORIZON-CL5-2022-D4-01-01

Demand response in energy-efficient residential buildings

IA
4-6 M€/project
Total budget 12 M€
TRL 6-7 end of the project

Increased benefits, trust and acceptability of demand-response solutions for residential consumers

Advanced asset control** and **aggregation approaches** that enable the **participation of residential buildings in commercial demand response

Address the large but untapped potential of the **residential sector** for **Demand Response** with a view to support the energy transition at system level while respecting **user privacy, comfort and ownership**.

Proposals should:

Investigate solutions including **new control modes and asset optimization techniques**, **involving as many devices as possible,**

- **Minimise** the effort required to **elicit user preferences**
- Consider **social innovations**, tools, ideas and methods **leading to active citizen engagement**
- Solutions that lead to **reducing costs of small demand response assets**
- Solutions suitable for explicit demand response or a combination of both **explicit and implicit residential demand response**

Deadline: 6 Sept. 2022

HORIZON-CL5-2022-D4-01-02

Renewable-intensive, energy positive homes

IA
4-6 M€/project
Total budget 12 M€
TRL 6-7 end of the project

*Integration of **advanced smart technologies, renewable energy and storage solutions** in **residential construction and renovation** projects*

Improved skills and competences among the workforce

Proposals should:

- Investigate and demonstrate approaches for **the construction of new energy positive residential buildings** (and/or the renovation of existing ones), with a focus on **multi-family, multi-store buildings**, encompassing all relevant areas:
  - Selection and installation of affordable and **high performance construction products and materials**
  - **Integration of renewable energy production for** heating and cooling, electricity production and where relevant thermal and electrical storage
  - **Advanced use of smart management technologies** to improve air quality, human health and well-being parameters
  - **Reuse and recycling** of elements, components and materials
- Ensure the cost of such buildings/apartments does not increase substantially compared to current local/regional practices

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Deadline: 6 Sept. 2022

HORIZON-CL5-2022-D4-01-03

Smarter buildings for better energy performance

IA

4-6 M€/project

Total budget 12 M€

TRL 8 end of the project

More innovative, affordable, user-friendly and accessible ***products and systems to continuously monitor and improve the energy performance of buildings***

Higher replicability to increase number of buildings with ***smart building devices*** *and digital infrastructure*

Improvement and cost-reduction of technologies to predict, assess, monitor and control in real time the energy performance of buildings, including energy efficiency, renewables, storage and their optimisation

Proposals should:

- Develop new or enhance existing **solutions for interoperability of systems**, e.g. between automation and control systems and other technical systems
- Ensure high level of **security and privacy by design** in buildings
- Demonstrate the **potential for energy savings based on smart technical systems** (predictive controllers, smart thermostats, active sensors, smart lighting, etc)
- Assess the contribution of the solution to the enhancement of **smart readiness of buildings** as rated by the smart readiness indicator under Directive 2010/31/EU
- Project developed with a view to integrate its results/deliverables under a digital **building logbook**

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D4 – Buildings (B4P)

D3 – Buildings Expected Impacts

Topics targeting **energy efficiency in buildings** to achieve the impacts:

- More energy efficient building stocks supported by an accurate understanding of buildings performance and of related evolutions
- Building stocks that effectively combine energy efficiency, renewable energy sources and digital and smart technologies

Topics contributing to the **Built4People Partnership** to achieve the impacts:

- Higher buildings' performance with lower environmental impacts through increased rates of holistic renovations
- Higher quality, more affordable built environment preserving climate, environment and cultural heritage and ensuring better living conditions

Built4People

5 topics

Subarea	Topic	Topic title	Type of action	Indicative project budget	Total Budget	Expected number of grants
Built4People **(B4P)**	HORIZON-CL5-2021-D4-02-01	Demonstrating integrated technology solutions for buildings with performance guarantees (Built4People)	IA	5.00 to 7.50	15.000.000,00	2
	HORIZON-CL5-2021-D4-02-02	Cost-effective, sustainable multi-functional and/or prefabricated holistic renovation packages, integrating RES and including re-used and recycled materials (Built4People)	IA	9.00 to 11.00	22.000.000,00	2
	HORIZON-CL5-2021-D4-02-03	Strengthening European coordination and exchange for innovation uptake towards sustainability, quality, circularity and social inclusion in the built environment as a contribution to the new European Bauhaus (Built4People)	CSA	Around 1.00	1.000.000,00	1
	HORIZON-CL5-2022-D4-02-01	Designs, materials and solutions to improve resilience, preparedness & responsiveness of the built environment for climate adaptation (Built4People)	IA	5.00 to 7.50	15.000.000,00	2
	HORIZON-CL5-2022-D4-02-02	Solutions for the sustainable, resilient, inclusive and accessible regeneration of neighbourhoods enabling low carbon footprint lifestyles and businesses (Built4People)	IA	5.00 to 7.50	15.000.000,00	2
	HORIZON-CL5-2022-D4-02-03	Sustainable and resource-efficient solutions for an open, accessible, inclusive, resilient and low-emission cultural heritage: prevention, monitoring, management, maintenance, and renovation (Built4People)	RIA	4.00 to 5.00	20.000.000,00	4
	HORIZON-CL5-2022-D4-02-04	Smart-grid ready and smart-network ready buildings, acting as active utility nodes (Built4People)	IA	6.00 to 9.00	18.000.000,00	2
	HORIZON-CL5-2022-D4-02-05	More sustainable buildings with reduced embodied energy / carbon, high life-cycle performance and reduced life-cycle costs (Built4People)	IA	6.00 to 9.50	18.000.000,00	2

Lump Sum

Deadline: 24 Jan. 2023

HORIZON-CL5-2022-D4-02-01

Designs, materials and solutions to improve resilience, preparedness & responsiveness of the built environment for climate adaptation (Built4People)

IA

5-7,5 M€/project

Total budget 15 M€

TRL 6-7 end of the project

Improved ability of the built environment to support the ***preparedness and responsiveness to disruptive events at larger scales***

Strengthened ***supply chains for materials and solutions*** *for a resilient and climate proof built environment, adapted to local risks*

- Deliver **innovative designs, materials and solutions** to improve resilience and climate proofing of the built environment (in particular new and existing buildings) in a **cost-effective and reliable manner**
- Ensure the proposed solutions **cover a broad spectrum of natural risks and disasters**, such as earthquakes, floods, heat waves
- Make use of **materials and technologies** that help combat the effects of global warming
- Consider **social innovation** where relevant, social change, social ownership
- Develop and deploy **digital and interoperable tools** for monitoring, detection of and response to critical situations
- Lead at least **3 large-scale demonstrations** in diverse geographical areas
- Clustering and cooperation with other relevant projects is strongly encouraged

Funding rate is:

- *up to 60% (both for members and non-members of the partnership)*
- *up to 100% for non-profit legal entities*

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Deadline: 24 Jan. 2023

HORIZON-CL5-2022-D4-02-02

Solutions for the sustainable, resilient, inclusive and accessible regeneration of neighbourhoods enabling low carbon footprint lifestyles and businesses (Built4People)

IA

5-7,5 M€/project
Total budget 15 M€
TRL 6-7 end of the project

*Mainstreamed participatory **planning processes and interaction** with all relevant stakeholder groups in city planning*

Increased well-being and economic prosperity of citizens by ensuring high indoor and outdoor quality and affordability of renovation solutions

- Deliver **innovative methods and solutions** for the regeneration of neighbourhoods
- Due consideration of energy efficiency, sustainability, resilience, health, inclusiveness and accessibility, based on **participatory planning processes**
- Identify and integrate **local resources of raw materials for building renovation**
- Ensure the proposed solutions allow for **involving all stakeholder groups**
- Include concepts for **local renewable energy generation and consumption** integrated at building and district level in combination with **multi-modal mobility concepts** targeted to both urban and rural neighbourhoods
- **Optimising energy balancing at local level** (e.g. energy sharing platforms and services connected to local micro-grids)
- Lead at least **3 large-scale demonstrations** in diverse geographical areas

Funding rate is:

- *up to 60% (both for members and non-members of the partnership)*
- *up to 100% for non-profit legal entities*

GOBIERNO DE ESPAÑA MINISTERIO DE CIENCIA E INNOVACIÓN CDTI INNOVACIÓN

Deadline: 24 Jan. 2023

HORIZON-CL5-2022-D4-02-03

Sustainable and resource-efficient solutions for an open, accessible, inclusive, resilient and low-emission cultural heritage: prevention, monitoring, management, maintenance and renovation (Built4People)

RIA

4-5 M€/project

Total budget 20 M€

TRL 5 end of the project

Reliable and respectful historical renovation of heritage buildings, preserving their architectural and cultural identity

Enhanced prevention and monitoring of the heritage built environment

- **Energy and resource-efficient** preservation of cultural heritage built environment along all relevant aspects: inclusiveness, accessibility, resilience, environmental and energy performance
- **Cover all aspects of life cycle**: design, renovation works, operation, monitoring and management, and maintenance
- **Maintain the heritage value** while improving access and **comfort of users** and visitors, **reducing maintenance and operational costs**
- Facilitate integration of renewable energy sources while respecting the aesthetic and **cultural identity of the buildings**
- Ensure the proposed solutions contribute to **the cost-effective improvement of the energy performance,** also **reducing the cost of the interventions** compared to traditional methods
- **Involvement of relevant stakeholders** (e.g. civil society organisations, associations, cultural heritage stakeholders such as cultural heritage protection bodies)

GOBIERNO DE ESPAÑA MINISTERIO DE CIENCIA E INNOVACIÓN CDTI INNOVACIÓN

Deadline: 24 Jan. 2023

HORIZON-CL5-2022-D4-02-04

Smart-grid ready and smart-network ready buildings, acting as active utility nodes (Built4People)

IA

6-9 M€/project

Total budget 18 M€

TRL 7 end of the project

Improved interoperability and synergies between electricity and other energy carriers and with other non-energy sectors (e.g. mobility), supported by buildings

*Improved competitiveness of buildings as **flexibility assets for grid and network management***

- **Building-to-grid integration solutions** that are cost-effective, simple to use and easy to install and maintain, and applicable to new and existing buildings
- Enhance **interoperability and synergies between buildings and grids, electricity and other energy carriers** (e.g. district heating networks, hydrogen, etc) and **other sectors** (e.g. mobility) where relevant
- Implement and demonstrate **balancing, storage and generation services in buildings,** while maximizing building users' and occupants' health, comfort and satisfaction
- Demonstrate the **use of large-scale interoperable platforms that bring together different actors and sectors** (ESCOs, aggregators, DSOs, etc) to exchange data and develop services

Funding rate is:

- *up to 60% (both for members and non-members of the partnership)*
- *up to 100% for non-profit legal entities*

GOBIERNO DE ESPAÑA MINISTERIO DE CIENCIA E INNOVACIÓN CDTI INNOVACIÓN

Deadline: 24 Jan. 2023

HORIZON-CL5-2022-D4-02-05

More sustainable buildings with reduced embodied energy/carbon, high life-cycle performance and reduced life-cycle costs (Built4People)

IA

6-9,5 M€/project

Total budget 18 M€

TRL 6-7 end of the project

Increased and more traceable reduction of the GHG emissions of buildings in design, construction, renovation, operation and end of life

Faster market uptake of solutions, materials, products, techniques and business models to reduce life-cycle costs

- Design, construction and renovation methods and solutions that **minimize the overall life-cycle environmental impact**, **reducing energy consumption and carbon footprint from construction to end of life**
- Full building demonstrations **to optimize the use of energy and resources**, and **minimize the emissions of CO2 and other air pollutants**
- **Low embodied carbon products and solutions**, selected in terms of insulating, cooling, acoustic and hygrometric performance
- Integrate **local sources of reused or recycled construction products and secondary raw materials for building renovation** in urban and rural scenarios
- Demonstrate the solutions in diverse geographical areas

Funding rate is:

- *up to 60% (both for members and non-members of the partnership)*
- *up to 100% for non-profit legal entities*

GOBIERNO DE ESPAÑA MINISTERIO DE CIENCIA E INNOVACIÓN CDTI INNOVACIÓN

D4 - Industry

D4 – Industry Expected Impacts

Topics focus on thermal energy management in industry

The bulk of R&I activities related to industry is supported under Cluster 4 “Digital, Industry and Space”

Industry

2 topics

Topic	Topic title	Type of action	Indicative project budget	Total Budget	Expected number of grants
HORIZON-CL5-2021-D4-01-04	Full-scale demonstration of heat upgrade technologies with supply temperature in the range 90 - 160°C	IA	Around 8.00	16.000.000,00	2
HORIZON-CL5-2021-D4-01-05	Industrial excess (waste) Heat-to-Power conversion based on organic Rankine cycles	IA	10.00 to 14.00	14.000.000,00	1
HORIZON-CL5-2022-D4-01-04	Development and pilot demonstration of heat upgrade technologies with supply temperature in the range 150-250°C	RIA	3.00 to 5.00	10.000.000,00	2
HORIZON-CL5-2022-D4-01-05	Development of high temperature thermal storage for industrial applications	RIA	3.00 to 4.00	8.000.000,00	2

Deadline: 6 Sept. 2022

HORIZON-CL5-2022-D4-01-04

Development and pilot demonstration of heat upgrade technologies with supply temperature in the range 150-250ºC

RIA

3-5 M€/project

Total budget 10 M€

TRL 5 end of the project

Validate the technical feasibility of industrial heat upgrade systems capable of supplying various industrial processes with useful heat in the (sink) ***temperature range of 150-250ºC from renewable sources (e.g., solar thermal), ambient heat or industrial waste heat***

*Development and demonstration at pilot scale (**5-200 kWth**)*

To satisfy the need for **low-medium temperature heat in the relevant industrial sectors** by upgrading lower temperature heat flows.

All development areas need to be covered:

- Identify the target industrial processes which would benefit from this technology, as excess (waste) heat sources and as users (heat sinks)
- Develop one or more heat upgrade technologies to raise the sink output temperature to the range 150 to 250ºC
- Integration and demonstration of at least one system at pilot scale, in conditions, as far as practical, similar to real industrial environment
- Make a preliminary estimation of the future equipment cost for at least two industrial applications, to evaluate its economic potential; define an exploitation strategy

GOBIERNO DE ESPAÑA MINISTERIO DE CIENCIA E INNOVACIÓN CDTI INNOVACIÓN

Deadline: 6 Sept. 2022

HORIZON-CL5-2022-D4-01-05

Development of high temperature thermal storage for industrial applications

To satisfy the need for decoupling the heat generation from the heat use in continuous or non-continuous industrial processes, to allow for heat exchange between different industrial processes or to generate heat during off-peak times and so provide energy demand flexibility .

All development areas need to be covered:

- Cost effective and new designs for high temperature storage of industrial heat, with minimal footprint
- Development of thermal storage materials, container construction, insulation technology, heat exchangers with aid of computational fluid dynamics
- Integration and demonstration of the system at lab scale
- Make a preliminary estimation of the future equipment cost for at least two industrial applications, to evaluate its economic potential
- Make an analysis of the potential industrial applications and related benefits of the proposed storage system, define an exploitation strategy

RIA

3-4 M€/project

Total budget 8 M€

TRL 4-5 end of the project

Short term (intraday or a couple of days) thermal storage systems

Development of economically affordable new materials for heat storage

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)
- The Funding & tenders Portal for beginners (27 May 2021)
- Dissemination, Communication and Exploitation (9 June 2021)
- Tips and Tricks while writing your Horizon Europe proposal (23 June 2021)
- New features Funding & Tenders Portal (28 September 2021)
- Avoiding errors in declaring personnel costs in Horizon 2020 grants (30 September 2021)
- Horizon Results Booster (5 October 2021)
- Submission and evaluation, Grant Agreement Preparation, Legal and Financial Aspects (10 December 2021)
- Preparing and submitting a successful proposal (18 January 2022)
- Grant Agreement Preparation, Legal and Financial Aspects (26 January 2022)
- Infoday de la Comisión Clúster 5 – Calls 2022 (3 February 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)

✓ Para cualquier consulta

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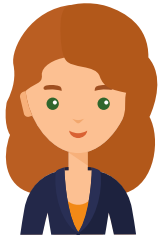

Mantente informado a través del Portal español de Horizonte Europa

www.horizonteeuropa.es

Conclusiones

- Cluster 5 Energía => Destination 3, Destination 4 y parte Destination 2
- WP Cluster 5 + WP JTI CHE + Co-funds + WP Cities Mission
- WP Cluster 5 publicado el 15 junio 2021 WP Cluster 5 Ver actualizaciones