



# Connecting Europe Facility (CEF) **ENERGY** 2023

**Latest achievements and way forward**

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European Climate, Infrastructure and Environment Executive Agency (CINEA)  
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# Introduction

Since its launch in January 2014, the Connecting Europe Facility (CEF) has been the flagship EU funding programme supporting the development of high performing, sustainable and efficiently interconnected trans-European networks in the sectors of transport, energy and telecommunications.

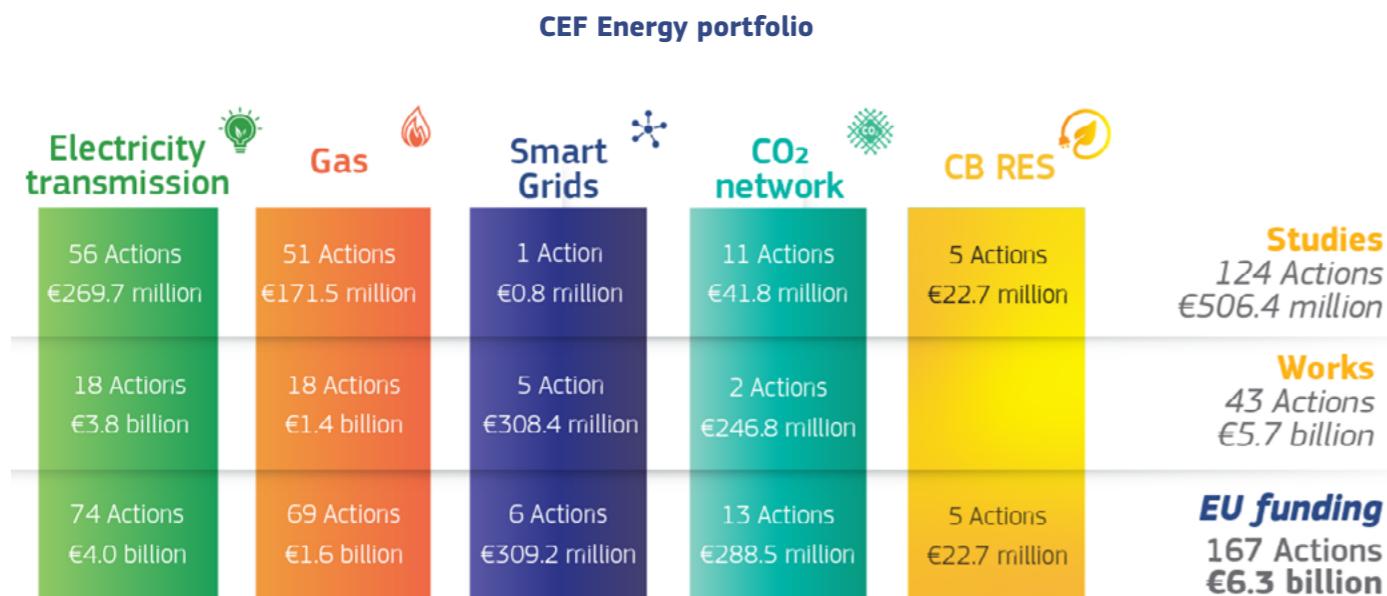
In the energy sector, the CEF programme provides funding to energy infrastructure, namely to Projects of Common Interest (PCIs). It provides funding for energy infrastructure for electricity, smart grids, CO<sub>2</sub> networks and natural gas under the Trans-European Networks for Energy (TEN-E) Regulation<sup>1</sup>, by taking up the challenge of financing the investment gap and minimising the costs for consumers. Energy infrastructure projects with the PCI status, located on priority corridors and in thematic areas, can apply for CEF funding and benefit from an accelerated permit granting process and improved regulatory treatment.

More recently, since its revision in 2021, CEF Energy also provides funding to cross-border renewable energy (CB RES) projects to foster cross-border cooperation contributing to cost-effective deployment of renewable energy (RES) in Europe.

Overall, the CEF Energy programme has the following main specific objectives:

- To contribute to the development of PCIs relating to further integration of an efficient and competitive internal energy market, interoperability of networks across borders and sectors, facilitating decarbonisation of the economy, promoting energy efficiency and ensuring security of supply
- To facilitate cross-border cooperation in the area of energy, including renewable energy

Since 2014, the Connecting Europe Facility for Energy has invested EUR 6.3 billion in more than 167 projects (also known as Actions). These Actions triggered a total investment of EUR 13.5 billion and contributed to the implementation of 117 PCIs.



<sup>1</sup> REGULATION (EU) 2022/869 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 30 May 2022 on guidelines for trans-European energy infrastructure, amending Regulations (EC) No 715/2009, (EU) 2019/942 and (EU) 2019/943 and Directives 2009/73/EC and (EU) 2019/945, and repealing Regulation (EU) No 347/2013

For the period 2021-2027, CEF Energy has a total budget of EUR 5.8 billion for key energy infrastructure, of which EUR 1.66 billion has been already allocated after two calls for proposals for PCIs studies and works. EUR 23.1 million was allocated to cross-border renewable energy projects after two calls for preparatory studies and one call for studies and works. The plan is to invest an additional budget of more than EUR 4 billion by 2027. Up to EUR 0.85 billion is reserved under CEF Energy for projects in the CB RES sector, depending on market uptake.

CEF Energy co-finances both studies and works. Studies include activities needed to prepare project implementation, such as preparatory, mapping, feasibility, evaluation, testing and validation studies, including in the form of software, and any other technical support measures, including prior action to define and develop a project and decide on its financing, such as reconnaissance of the sites concerned and preparation of the financial package. Works include the purchase, supply and deployment of components, systems and services including software, the development, construction and installation activities relating to a project, the acceptance of installations and the launching of a project.

The largest share of CEF Energy funding goes to works (EUR 5.75 billion, representing 92%), with projects in the electricity sector receiving the most, followed by natural gas.

The Climate, Infrastructure and Environment Executive Agency (CINEA) manages the CEF Energy calls for proposals and follows up on the technical and financial implementation of the supported Actions with the beneficiaries, providing technical expertise and high-quality programme management.

**CEF Energy projects per sector**



# The way forward as of 2024

As of 2024, fundamental changes will take place in the programme with the entry into force of the revised TEN-E Regulation<sup>1</sup>.

Eligibility under CEF Energy funding will cover new categories of PCIs, namely offshore electricity grids, hydrogen infrastructure and gas smart grids. These new corridors<sup>2</sup> and thematic areas aim to further develop and interconnect energy networks in Europe for an effective energy transition whilst contributing to the achievement of EU climate goals. The funding for conventional natural gas infrastructure is discontinued<sup>3</sup>.

Under the revised Regulation, CEF Energy will support the implementation of PCIs in **11 priority corridors** and in **3 thematic areas**<sup>4</sup> in order to help bridge the funding gap of the new TEN-E infrastructure categories with urgent needs. In addition, CEF Energy funding will enable and accelerate PCI implementation, complementing the regulatory framework and incentives laid down.

Furthermore, a new category of projects (Projects of Mutual Interest - PMIs), with a third country involved, has been put in place. PMIs should be able to demonstrate significant net socioeconomic benefits at EU level and in at least one third country. PMIs are eligible for inclusion in the Union list provided that the policy framework has a high level of convergence, is supported by enforcement mechanisms and demonstrates a contribution to the EU's and third country' overall energy and climate policy objectives.

The first list of PCIs/PMIs under the revised TEN-E Regulation was published in November 2023 and the first call for proposals under the new list is expected to be launched in 2024. In addition, for the CB RES sector, CINEA will also launch a call for status as well as a call for grants for works and studies.

<sup>1</sup> Trans-European Networks for Energy Regulation

<sup>2</sup> The in-depth description of the corridors can be found under DG ENER's website [here](#)

<sup>3</sup> Natural gas infrastructure will no longer be eligible for PCI status (hence for CEF funding) as of 31 December 2027. In the case of Cyprus and Malta, which are not interconnected to the trans-European gas network, a derogation is in place. The derogation shall apply until Cyprus or Malta, respectively, is directly interconnected to the trans-European gas network or until 31 December 2029, whichever is the earlier.

<sup>4</sup> The in-depth description of the corridors can be found under DG ENER's website [here](#)

# Delivering CEF Energy

In light of the current energy situation in Europe, the revised TEN-E Regulation and CEF Energy funding are part of a wider policy context framed by REPowerEU<sup>1</sup> (which outlines a plan to make Europe independent from Russian fossil fuels by 2030) and the Fit for 55 legislation package<sup>2</sup> (with the overall aim to reduce net greenhouse gas emissions in the EU by at least 55% by 2030). Hence, they play a significant role as they continue promoting investments aiming at eliminating dependence on Russian gas imports, facilitating cross-border uptake of renewables and developing high performing, sustainable and efficiently interconnected trans-European energy networks. It is worth highlighting that several key PCIs supported by CEF were completed in 2022 contributing to reducing dependency on European gas imports from a single supplier (Russia).

In this respect, one of the key objectives of CEF Energy supported Actions is precisely to enhance the EU security of energy supply through diversification of supply sources, counterparts and routes, and by increasing storage capacity, system resilience and the connection of isolated markets to more diversified supply sources.

The examples below showcase the projects that were completed between January 2022 and June 2023.

For the full list of projects, please visit [CINEA's public Dashboard](#).

## Key achievements in energy infrastructure: Projects of Common Interest (PCIs)

CEF Energy is making a difference by accelerating PCIs which are of key importance in the EU energy system, to allow meeting the European Green Deal targets as well as contributing to the REPowerEU objectives.

Between January 2022 and June 2023, 12 PCIs were commissioned with CEF Energy support. By the end of 2023, 7 additional PCIs will be commissioned with CEF funding, and another 69 PCIs supported by CEF Energy 2014-2020 are under implementation. Overall, 87 PCIs have been completed, 35 of which with CEF support.



<sup>1</sup> COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE EUROPEAN COUNCIL, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS REPowerEU Plan, COM/2022/230 final, More information on the REPowerEU Strategy can be found under the [website](#)

<sup>2</sup> COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS 'Fit for 55': delivering the EU's 2030 Climate Target on the way to climate neutrality, COM/2021/550 final

# Electricity



# CELESTRI CITY

The following projects have been completed and contribute to meeting the CEF Energy funding objectives.

## Interconnection line between Maritsa East (BG) and Nea Santa (EL)

**CEF Energy funding:  
EUR 28.64 million**

Under the scope of the Action "3.7.1 Construction of a new 400 kV interconnection line between Maritsa East (BG) and Nea Santa (EL)," the Bulgarian section of the PCI 3.7.1. "Interconnection line between Maritsa East (BG) and Nea Santa (EL)" was commissioned in July 2023.

The objective of the Action was to build and commission an approximately 123 km long overhead transmission line on the territory of Bulgaria between the substation Maritsa East and the Bulgarian-Greece



border connection point. With the Action's scope being fully covered and the Action completed, the PCI is now finalised.

The PCI has a significant impact on the security of supply in the region and contributes to the flexibility of the system, to the transmission of electricity from renewable energy, to the interoperability and to the secure operation of the electricity system.



## Interconnection between Žerjavinec (HR)/Hévíz (HU) and Cirkovce (SI)

**CEF Energy funding:  
EUR 48.22 million**

Under the scope of the Action 3.9.1-0024-SI-W-M-18, the PCI 3.9.1 was implemented on Slovenian territory. The objective of the Action was to build and commission the PCI consisting in: a) new 400 kV and 110 kV switchyards in substation Cirkovce, b) removing the existing and obsolete 220 kV and 110 kV switchyards in substation Cirkovce and c) building and commissioning an approximately 80 km long new double system circuit 400 kV overhead transmission line (OHTL) transmitting 1330 MVA per circuit at a voltage of 400 kV between the substation Cirkovce and the Slovenia-Hungary border (in the Pince (SI)



and Tomyiszentmiklós (HU) area). With the Action's scope being fully covered, the line was commissioned in June 2022 and the commercial operation of the interconnection between Cirkovce (SI), Hévíz (HU) and Žerjavinec (HR) has started. The PCI strengthens the Slovenian power network, allowing electricity to flow between the three countries and thus contributing to regional security of supply, integration of renewable power generation and EU internal market integration leading to wholesale electricity price convergence.



## Baltic Synchronisation project

**CEF Energy funding for the entire synchronisation project: EUR 1.233 billion**

There have been several developments in the synchronisation project, which aims to synchronise the Baltic States (Lithuania, Latvia and Estonia) with European Continent Networks (PCI cluster 4.8), as listed below<sup>1</sup>.

Under the scope of the Action 4.8.1-0021-LTLV-W-M-18, the interconnection between Tartu (EE) and Valmiera (LV) and the internal line between Balti and Tartu (EE) were commissioned between February and May 2023. Together, these lines form one Estonian-Latvian link. Furthermore, the first of the three synchronous condensers in Estonia was officially commissioned in Püssi 330 kV substation in May 2023.



Electricity pylon called Bog Crane (Sookurg in Estonian), an example of infrastructure design enhancing the living space, the local identity and creativity.

## New projects kicked-off

In addition to those completed projects in the electricity sector, there are some new ones that kicked off in 2022 and mid 2023.

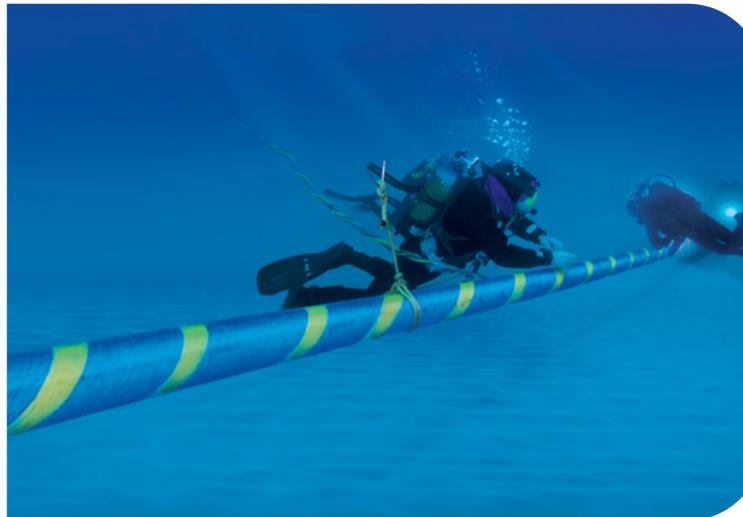
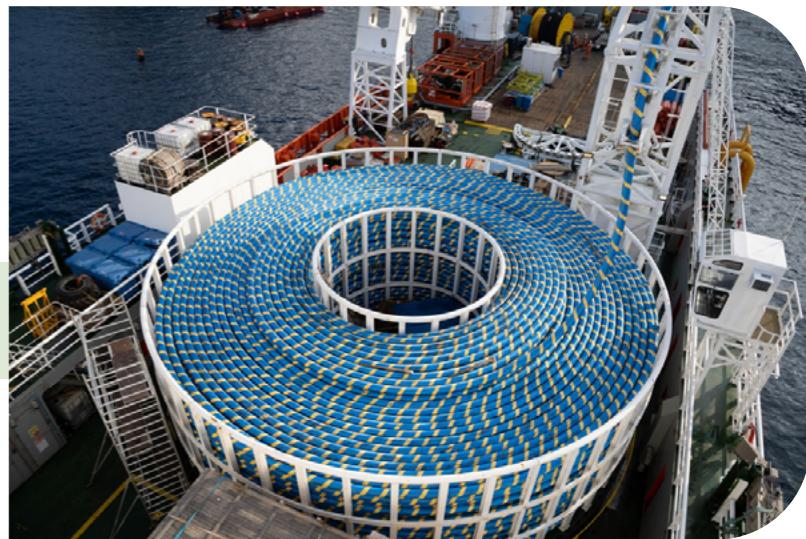
## Interconnector between Italy and Tunisia (aka ELMED)

**CEF Energy funding: EUR 307.65 million**

Under the scope of the Action 2.33-ITTN-W-M-22-ELMED, the PCI 2.33, which is an interconnection between Italy and Tunisia (aka ELMED), will be implemented. The PCI consists of a new bidirectional HVDC (High Voltage Direct Current) electricity interconnection, partly submarine and partly terrestrial, between Partanna (Trapani) in Sicily on the Italian side and Mlaaba on the Cap Bon peninsula in Tunisia.

CEF Energy co-finances through this Action the construction of two new converter stations, one in Partanna (IT) and one in Mlaaba (TU), and of an approximately 240 km submarine and terrestrial cable link with a nominal power of 600 MW and nominal DC voltage at +/- 500 kV.

Once the project is completed, the ELMED interconnector will be ready to operate. ELMED is expected to improve energy security, promote the integration of the European and African electricity markets and allow for greater renewable electricity generation across Europe.



<sup>1</sup> Several preparatory studies as well as works under Phase I and Phase II of the Baltic Synchronisation project received funding. Once Phases I and II are completed, Lithuania, Latvia and Estonia will be ready to operate in synchronous mode with the European Continent Networks (CEN). The synchronisation of the Baltic States' electricity grid with the CEN will ensure greater security of supply for consumers in the Baltics, while also enabling other Member States to benefit from renewables produced in Estonia, Latvia and Lithuania.

# Electricity



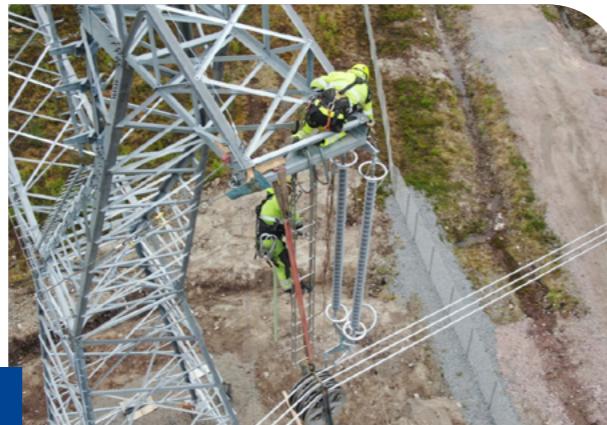
## Third interconnection Finland - Sweden (Aurora Line)

**CEF Energy funding:  
EUR 127 million**

The Action 4.10.1-W-M-21-Aurora Line implements the PCIs 4.10.1 (Interconnection between northern Finland and northern Sweden) and 4.10.2 (Internal line between Keminmaa and Pyhänselkä (FI)), which belong to cluster 4.10 Finland-Sweden (currently known as ,Third interconnection Finland - Sweden' or Aurora Line).

The PCIs cluster aims to build a new 400 kV overhead transmission line to increase the cross-border transmission capacity by 800 MW from Sweden to Finland and 900 MW from Finland to Sweden.

The Action's aim is the construction of Aurora Line between the "Messaure" substation in Sweden and the "Pyhänselkä" substation in Finland. It is located in the regions of "Övre Norrland" in Sweden and "Pohjois- ja Itä-Suomi" in Finland. The 380 km interconnector (approx. 180 km in Sweden and



approx. 200 km in Finland) crosses the Tornio River from Risudden in Sweden to Vuennonkoski in Finland.

The Action's scope covers the tendering, detailed design, civil works, construction, testing and commissioning of the following infrastructure items: substations in Messaure (SE) and Viitajarvi (FI), series compensation stations in Isovaara (SE) and Isomaa (FI) and overhead transmission lines from Messaure to Risudden on the Swedish side and from Risudden to Pyhänselkä on the Finnish side.

Once the Action is completed, the commissioned PCIs will increase the transmission capacity between Sweden and Finland, thus strengthening the internal electricity market, increasing security of supply in the region and improving integration of RES in the region.

# Smart Electricity Grids



In the smart electricity grids area, the following projects and infrastructure have been completed between January 2022 and June 2023.

## SINCRO.GRID

**CEF Energy funding:  
EUR 41.82 million**

PCI 10.3 SINCRO.GRID (phase I and phase II) has put in place innovative solutions to increase reliability of the grid, such as the integration of voltage compensation devices and a battery storage system, as well as the development of a dynamic thermal rating system and a virtual cross-border control centre. All these elements helped to increase the capacity and flexibility of the cross-border network and allow a better integration of renewable energy sources in Slovenia and Croatia. The scope of the Actions 10.3-0022-SIHR-W-M-16 and 10.3-0018-SI-W-M-18 co-financed by CEF Energy was successfully completed in June 2022 and implemented fully the PCI 10.3 SINCRO.GRID.



# Smart Electricity Grids



## SMART ELECTRICITY GRIDS

### ACON

**CEF Energy funding:  
EUR 91.23 million**

Regarding ACON (PCI 10.4), a number of MV border lines and one cross-border line between Slovakia and Czechia were constructed, a primary 110/22 kV substation in Borský Svätý Jur (SK) was commissioned, around 1000 secondary smart substations were completed in both countries, numerous smart devices were integrated in the Czech grid (i.e.: 3 glazed frost detectors, 26 fault detectors, more than 200 remote control/automatic switchers and section breakers) and approx. 300 km of optical fibre was also installed in both countries. These infrastructure elements, together with the rest of the planned investments under this project, contribute to the market integration between the two countries, increasing the grid resilience and enabling active regulation of energy demand to facilitate the integration of new energy consumers and decentralise renewable energy sources. The full PCI is expected to be completed in 2024.



### Danube InGrid

**CEF Energy funding:  
EUR 101.93 million**

Under the scope of the Action 10.7-0008-SKHU-W-M-20 (PCI 10.7 - Danube InGrid), so far four 132/22 kV substations in Hungary (Öttevény, Székesfehérvár Dél, Gyermely and Kisbér) were commissioned, 13 secondary smart substations were completed, more than 500 remote controlled switching elements were installed in the grid, and around 13 km of distribution lines and more than 40 km of optical fibre were also installed. This infrastructure, together with the rest of the planned investments under this project, contributes



to efficiently supporting the increased energy demand from consumers, prosumers and distributed renewable energy sources. The full PCI is expected to be completed in 2025.



# Smart Electricity Grids



In addition to those completed projects in the smart electricity grid sector, there is a new one that kicked off in 2023.

## GreenSwitch

**CEF Energy funding:**  
**EUR 73.1 million**

Under the scope of the Action 10.12-ATHR-W-M-22-GreenSwitch, the PCI 10.12 GreenSwitch will be fully implemented. The PCI aims to increase security of supply, quality of service and flexibility, allowing the integration of largescale renewable energy sources, electric vehicles and heat pumps in the transmission and distribution networks of Slovenia, Croatia and Austria.

The project will reinforce and digitalise the transmission and distribution grids in Austria, Croatia and Slovenia by modernising the electrical

infrastructure (HV/MV substations and lines), installing new ICT (Information and Communications Technology) components, and developing control system applications.

Once the project is completed, the cross-border cooperation of the electricity markets of the three countries involved will be improved, increasing the quality, safety and reliability of electricity supply, and enhancing the integration of renewable energy sources and e-mobility in the grid.



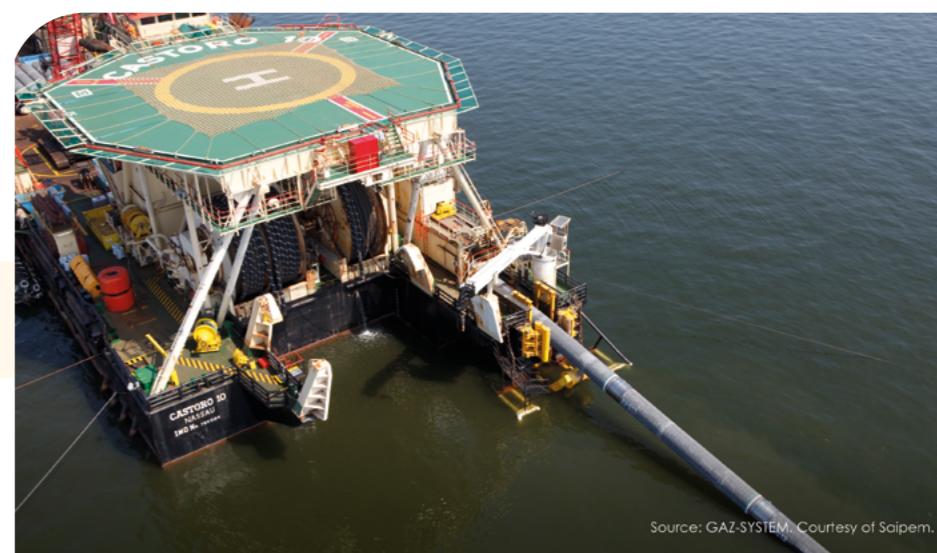
# Gas

In the gas sector, the following projects have been completed during the period going from January 2022 to June 2023. The timely completion of these projects marked an important step in reducing dependency of European gas imports from a single supplier (Russia).

## Poland–Denmark interconnection (Baltic Pipe)

**CEF Energy funding:**  
**EUR 263.1 million**

Action 8.3.1-0035-PLDK-W-M-18 contributed to the implementation of PCI 8.3.1 “Reinforcement of Nybro – Poland/Denmark Interconnection,” and PCI 8.3.2 “Poland-Denmark interconnection”, aka “Baltic Pipe”. The Baltic Pipe consists of a new, bi-directional offshore gas pipeline connecting Poland and Denmark through the Baltic Sea, with an estimated capacity of approx. 10 bcm/y and a length of approximately 274 km. It also includes onshore pipelines connecting the offshore pipeline with the national grids in both countries, and a receiving terminal in Poland, the Goleniow–Lwowe pipeline of approximately 191 km (DN 1000) as well as two compressor stations in Goleniow and Odolanow. The PCI, commissioned on 1 October 2022, makes it possible to import annually up to 10 billion cubic metres (bcm) of gas from Norway to Poland through Denmark, and the transmission of 3 bcm of gas from Poland to Denmark.



Source: GAZ-SYSTEM. Courtesy of Soipem.

The PCI enhanced the diversification of the gas supply in Central-Eastern Europe and the Baltic States by opening a new import route from the North Sea to the EU.

The Baltic Pipe has received CEF Energy funding to complete both preparatory studies and construction works necessary for this project.



Source: GAZ-SYSTEM.

## Gas Interconnection Poland-Lithuania (GIPL)

**CEF Energy funding:**  
**EUR 272.1 million**

The Action 8.5-0046-PLLT-P-M-14 contributed to the implementation of the PCI 8.5 “Poland-Lithuania interconnection”, aka GIPL, which consists of establishing a physical interconnection between the Polish and Lithuanian gas transmission systems.

GIPL includes infrastructure in both countries. On the Polish side, it includes a gas pipeline between Holowczyce and the PL-LT border (length of approximately 343 km); a new compressor station in Gustorzyn (approximately 16 MW of installed power without spare); the extension, modernisation and connection of the pipeline to the Hoowczyce node and related necessary improvements to the compressor station. In Lithuania, it includes a gas pipeline between Jauniunai and the PL-LT border (approximately 165 km) and the construction of the gas pressure reduction and metering station(s) located near the PL-LT border in Lithuania.



The PCI, commissioned on 5 May 2022, makes it possible to transport 2.4 bcm/year from Poland to Lithuania and up to 1.9 bcm/year from Lithuania to Poland. This PCI enables a better-integrated and interconnected gas supply market to reduce the EU Member States' energy dependence from unreliable suppliers.

GIPL has received CEF Energy funding to complete both the preparatory studies and construction works necessary for this project.

## Poland-Slovakia Gas Interconnector

**CEF Energy funding:**  
**EUR 100.1 million**

The Action 6.2.1-0019-SKPL-W-M-16 implemented the PCI 6.2.1 “Poland – Slovakia Interconnector”, commissioned in August 2022. It established the first connection between the two natural gas transmission systems. The Action covered 165 km of new pipelines, metering stations, adjustments to the existing compressor stations and development of complex gas nodes, overall allowing to transport up to 15.6 mcm/d of gas from Slovakia to Poland and 12.9 mcm/d from Poland to Slovakia.



This PCI represents an important milestone towards building a well-functioning and fully integrated internal market. Its completion represents a significant step in reinforcing European security and reducing the EU's energy dependence on an unreliable supplier.

## Rehabilitation, modernisation and expansion of the Bulgarian transmission system

**CEF Energy funding:  
EUR 27.7 million**

The Action has contributed to the development of PCI 6.8.2 „Rehabilitation, modernisation and expansion of the Bulgarian transmission system,” by completing its phase II, via the rehabilitation of the two sections of the Northern semi-ring of the Bulgarian gas transmission network, thus providing secure and reliable gas transmission, increased transmission capacity and improved conditions for injection and withdrawal of the Bulgarian underground gas storage facility Chiren.

The rehabilitation, modernisation and expansion of the Bulgarian transmission system was completed in June 2022. The new infrastructure allows



transporting additional natural gas quantities across the country, facilitating several interconnectors with neighbouring countries (namely Romania, Greece and Serbia) leading to improved security, reliability and flexibility of the natural gas network. Upon completion of the project, the volume of stored active gas will be up to 1 bcm, while the average daily injection and withdrawal rates will reach up to 8-10 mcm/day.

The project received CEF Energy funding to complete both the preparatory studies and construction works.

In addition to those completed projects in the gas sector, there is a new one that kicked off in 2022.

## Bilciureşti underground gas storage - Daily withdrawal capacity increase

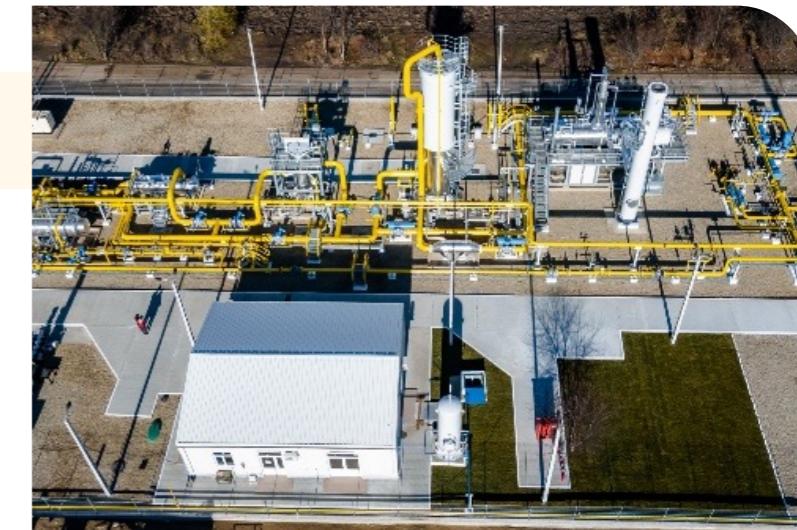
**CEF Energy funding:  
EUR 38 million**

The Action 6.20.7-RO-W-M-22 “Bilciureşti UGS - Daily withdrawal capacity increase” will contribute to the implementation of the PCI 6.20.7 “Bilciureşti UGS” and aims at increasing the daily delivery capacity of gas, from 14 million scm/day up to 20 million scm/day (43% increase), associated with an increase in storage capacity of 108 million scm/cycle (9% increase).

The project will develop new surface facilities, enabling the take over of the additional flow, but it will also upgrade and complete the existing ones, ensuring a high degree of operational safety and an enlarged natural gas infrastructure.

The implementation of the project will contribute to improving the security of gas supply and market integration by increasing gas transmission flows and diversifying natural gas resources, both in Romania and in South-East Europe, and by ensuring flexibility in operations and network balancing services, backing-up the renewable energy production.

New projects kicked-off



# CO<sub>2</sub> networks



# CO<sub>2</sub> networks

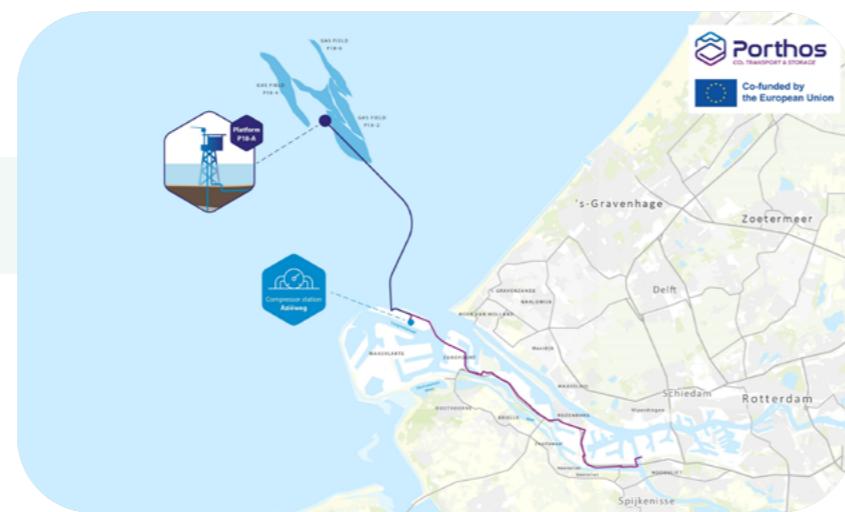
In the CO<sub>2</sub> networks sector, the following studies have been completed during the period from January 2022 to June 2023.

## Rotterdam CCUS project – PORTHOS

**CEF Energy funding:**  
**EUR 6.5 million**

The Actions 12.3-0022-NL-S-M-18 "Rotterdam CCUS project – PORTHOS" aims to implement the PCI 12.3, which will establish infrastructure to facilitate large-scale capture, transport and storage of CO<sub>2</sub> from Rotterdam, Antwerp and the North Sea Port. The PCI is comprised of several pipelines proposed for development in three distinct project phases:

- **Part 1 – Rotterdam:** CEF Energy is funding the construction of an onshore transport pipeline (approximately 33 km) that will have a transport capacity between 4-10 Mt CO<sub>2</sub> to collect and transport CO<sub>2</sub> from industries in the Port of Rotterdam area. A 20 MW compressor station will also be built to supply CO<sub>2</sub> in gas phase and compress it towards an offshore transport pipeline (approximately 25 km), which will transport it to a permanent geological storage offshore in the Netherlands.



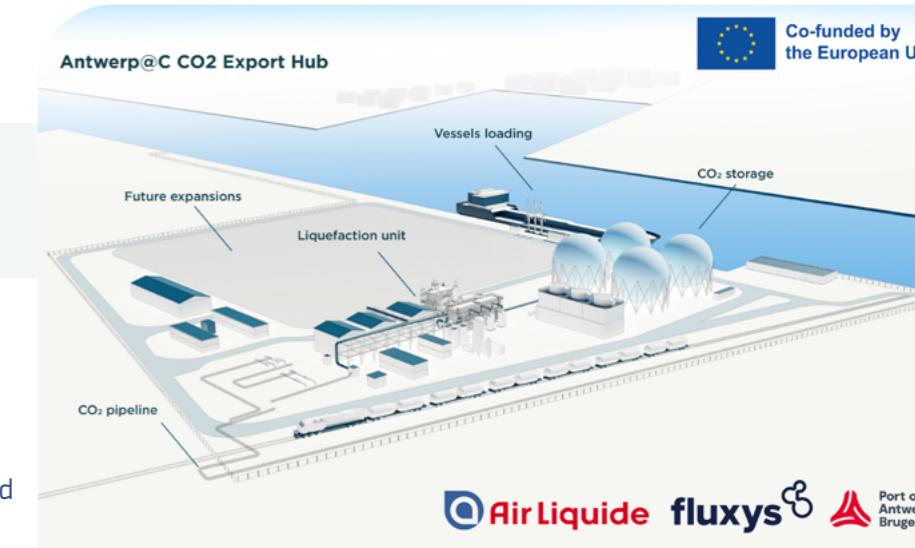
- **Parts 2-3: Antwerp/Ghent:** The construction of local backbones in the Antwerp and Ghent Clusters to transport CO<sub>2</sub> to the storage sites is being investigated.

## "Antwerp@C" studies

**CEF Energy funding for the two studies:**  
**EUR 5.44 million**

The Antwerp Port Authority (PoA) has initiated a collaborative large-scale Carbon Capture, Utilization, and Storage (CCUS) initiative called the "Antwerp@C" project. It aims at reducing the port's carbon footprint. For this purpose, a modular and scalable infrastructure will be developed, designed to collect and further transmit CO<sub>2</sub> streams from multiple emitters. It will include a common CO<sub>2</sub> backbone for the port area, an export pipeline towards the port of Rotterdam (part of PCI 12.3) and a liquefaction terminal, including a marine offloading facility (part of PCI 12.4). Two Actions contribute to the Antwerp@C initiative, namely:

- **Actions 12.3-0027-BENL-S-M-20 "Antwerp CO<sub>2</sub> Collection Network and Cross-border Pipeline" and**
- **Action 12.4-0010-BE-S-M-20 "Antwerp Liquid CO<sub>2</sub> Export Terminal" (studies)**



These Actions have delivered detailed engineering, design studies and a Cost-Benefit Analysis (CBA) for the Antwerp CO<sub>2</sub> Collection Network, as well as Front-End Engineering Design (FEED) studies for the construction of a CO<sub>2</sub> Liquid Export Terminal, which includes a liquefaction unit, buffer storage and the marine offloading facilities. The Actions address commercial barriers and include a CBA establishing an economically viable business case.

Both studies define technical requirements and identify design parameters for the PCIs, thereby providing greater certainty on overall costs and key risks and allowing to proceed towards a Final Investment Decision (FID) and the next steps of the PCI implementation (construction works – see below Action 12.4-BE-W-M-22).

# CO<sub>2</sub> networks



In addition to those completed studies in the CO<sub>2</sub> networks sector, there are some new projects that kicked off in 2022 and mid 2023.

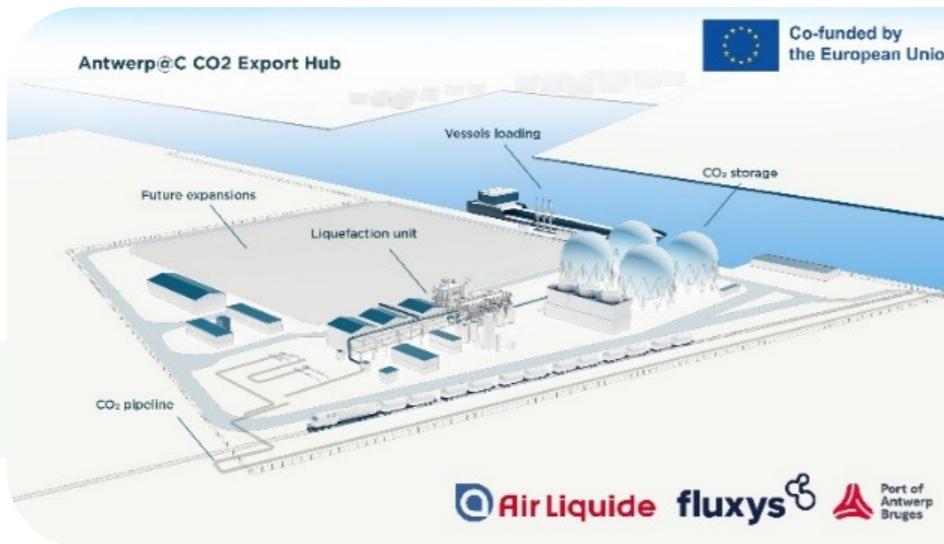
## Northern Lights - Antwerp@C CO<sub>2</sub> Export Hub

**CEF Energy funding:**  
**EUR 144.6 million**

The PCI 12.4 Northern Lights is a commercial CO<sub>2</sub> cross-border transport connection project between several European capture initiatives (from the UK, Ireland, Belgium, the Netherlands, France and Sweden) and transports the captured CO<sub>2</sub> by ship to a storage site on the Norwegian continental shelf.

The Action 12.4-BE-W-M-22- "Antwerp@C CO<sub>2</sub> Export Hub", as part of PCI 12.4, aims at developing a world-scale open-access modular infrastructure for the transport, liquefaction and export of CO<sub>2</sub> captured by industries in the Antwerp port area. The project is one of the capture initiatives of the Northern Lights PCI, which focuses on developing the infrastructure to transport and permanently store CO<sub>2</sub> in the Norwegian continental shelf. The project will be finalised in June 2027 and consists of an export terminal (2.5 Mtpa CO<sub>2</sub>) with an innovative liquefaction process (first-of-its-kind), buffer storage facilities, marine loading facilities to export CO<sub>2</sub> via vessels (ships and barges) and a CO<sub>2</sub> pipeline backbone (approximately 22 km) connecting CO<sub>2</sub> emitters, users and export facilities, with a 10 Mtpa total capacity, as well as port infrastructure (quay walls) dedicated to berthing liquid CO<sub>2</sub> vessels.

The Antwerp@C CO<sub>2</sub> export Hub project has the potential to reduce the CO<sub>2</sub> emissions in the port of Antwerp by more than 50% by 2030 while ensuring the long-term competitiveness of one of Europe's main economic centres.

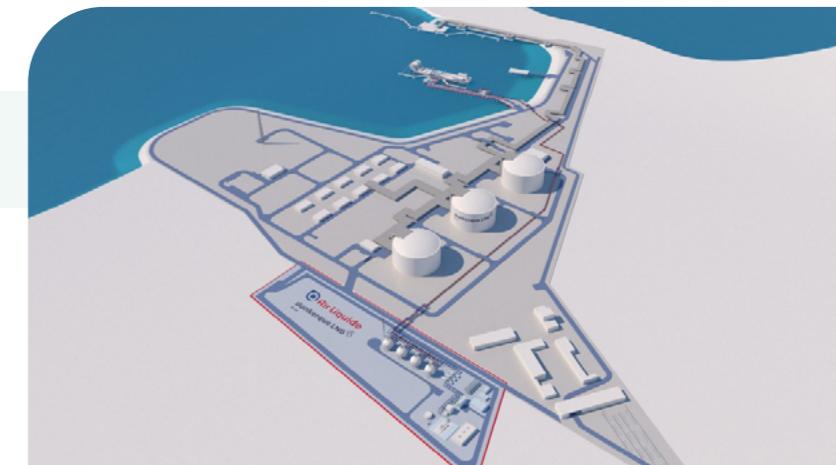


## D'Artagnan - CO<sub>2</sub> export Multimodal HUB from Dunkirk and its hinterland

**CEF Energy:**  
**EUR 5.2 million**

D'Artagnan studies are part of the PCI 12.8, which aims to establish an open-access primary CO<sub>2</sub> infrastructure in Dunkirk and its surroundings. The PCI's objective is to gather CO<sub>2</sub> from various sources, liquefy it and store it before transporting it to North Sea storage sites. D'Artagnan's primary focus is to create a CO<sub>2</sub> hub initially capable of handling approximately 2 million tonnes per year, capturing emissions from three major sources: EQIOM Lumbres cement plant, Lhoist Réty lime plant and ArcelorMittal Dunkirk steelmaking facilities.

The EU is funding key activities including preparatory studies, such as pre-FEED and FEED for the CO<sub>2</sub> Export Terminal and pipelines, as well as the necessary documentation for permits and an economic viability assessment. Successful completion of the FEED phase will contribute to achieving the hub expected by the end of 2027. Overall, this PCI aims to connect northern France to North Sea CO<sub>2</sub> storage sites, thus aligning EU and French CO<sub>2</sub> reduction objectives and promoting a robust European Carbon Capture and Storage (CCS) market in Europe.



## Key achievements for Cross-border Renewable Energy Projects (CB RES)

Since the revision of the CEF Regulation in 2021, CEF Energy also supports the implementation of the cross-border renewable energy (CB RES) deployment. This additional CEF Energy window complements other EU renewable energy funding opportunities, focusing specifically on cross-border cooperation to complement national efforts for RES deployment in Europe.

Around EUR 0.85 billion is reserved under CEF Energy for projects in the CB RES sector, depending on the market uptake. So far, EUR 22.7 million has been allocated for cross-border projects in the field of renewable energy.

Since the launch of the CB RES window, two calls were carried out for preparatory studies and three studies have been selected so far.

To be eligible for CEF Energy funding under technical studies and works, CB RES projects should first receive a CB RES status via a dedicated status call. Until now, the programme has carried out two status calls. Three projects were selected in the first CB RES call and two in the second call. Thus, the latest CB RES list, adopted in September 2023, includes five projects.

The first CEF Energy call for grants for technical studies and works for CB RES 'status' projects was launched in 2022 and, as a result, two studies projects were selected for funding.

The following is an example of a project completed in 2023, as well as some of the new projects approved in 2023.

### Gulf of Riga Hybrid Offshore Wind Farm: Conceptual Engineering Study (GORIO)

**CEF Energy funding:**  
**EUR 99.000**

The objective of the preparatory studies for the project GORIO was to support the development of a cross-border offshore wind project in the Gulf of Riga. The commercial operation of the wind farm is expected to start by 2030.

The EU funding allowed the beneficiary to conduct a study to support the conceptual engineering study (Pre-FEED), the ongoing environmental impact assessment with technical data regarding turbines, foundations, connection cable lines, construction methodologies and other necessary data. Moreover, the study contributed to the cost estimate as well as operational expenditure estimate of the wind farm.



In parallel, EU funding also supported Eesti Energia AS in its stakeholder engagement strategy, with the objective of initiating cooperation mechanisms with other EU Member States to prepare the project application for CB RES status.

The Action was completed in March 2023.



## Estonian Latvian joint hybrid offshore wind project (ELWIND)

**CEF Energy funding:  
EUR 18,8 million**



This Action stems from the CB RES status project “2022-05 - ELWIND”, which entered in the list of cross-border renewable energy projects in 2022. The ELWIND status project is a joint Estonian-Latvian state-run cross-border offshore wind project. The size of the project is between 700-1000 MW (approximately 100-180 wind turbines), aiming for an annual renewable electricity output of about 3 to 3,5 TWh per year. The plan is to build two offshore wind parks, one in Estonian and one in Latvian waters with a capacity split of 400MW (Estonia) to 600MW (Latvia).

The beneficiaries envisage to carry out the pre-development activities of the joint offshore wind project, making sure that all necessary studies are done to receive permits for producing offshore wind energy.

The studies are expected to be finalised by December 2027.

## Ceo alliance Cross-border European green hydROGeN valuE chain - Green Ammonia infrastructure study (CICERONEGreenNH3stud)

**CEF Energy funding:  
EUR 3,4 million**

This Action stems from the CB RES status project “2022-07-CICERONE”, which entered in the list of cross-border renewable energy projects in 2022. The CICERONE status project aims to build an integrated industrial scale cross-border European green hydrogen and ammonia value chain.

The core of the project is to build new, additional renewable power plants in Italy, Spain and Germany and then convert the green power produced to green hydrogen and/or ammonia. Part of the ammonia will be used for off-takers directly in the Netherlands, but the bulk part will be converted to hydrogen and transported to Germany.

The beneficiaries will launch an articulated study covering environmental assessment, market study and engineering design for the realisation of infrastructure for renewable energy sources, electrolyser and green ammonia to be installed and managed in Spain.

Ultimately, Iberdrola’s scope within the CICERONE initiative is the installation of 400 MW of additional renewable photovoltaic (PV) plant that will feed together with a renewable power purchase agreement (PPA) a 120 MW greenfield green ammonia facility ready by 2028.

The study is expected to be finalised by August 2024.



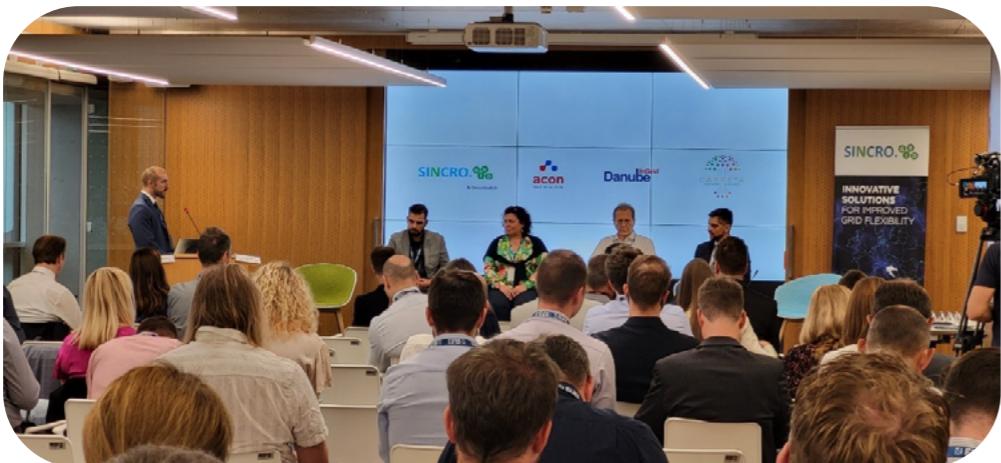
# Synergies with other programmes

CINEA puts efforts into finding and exploiting synergies and complementarities across different sectors and EU funding programmes.

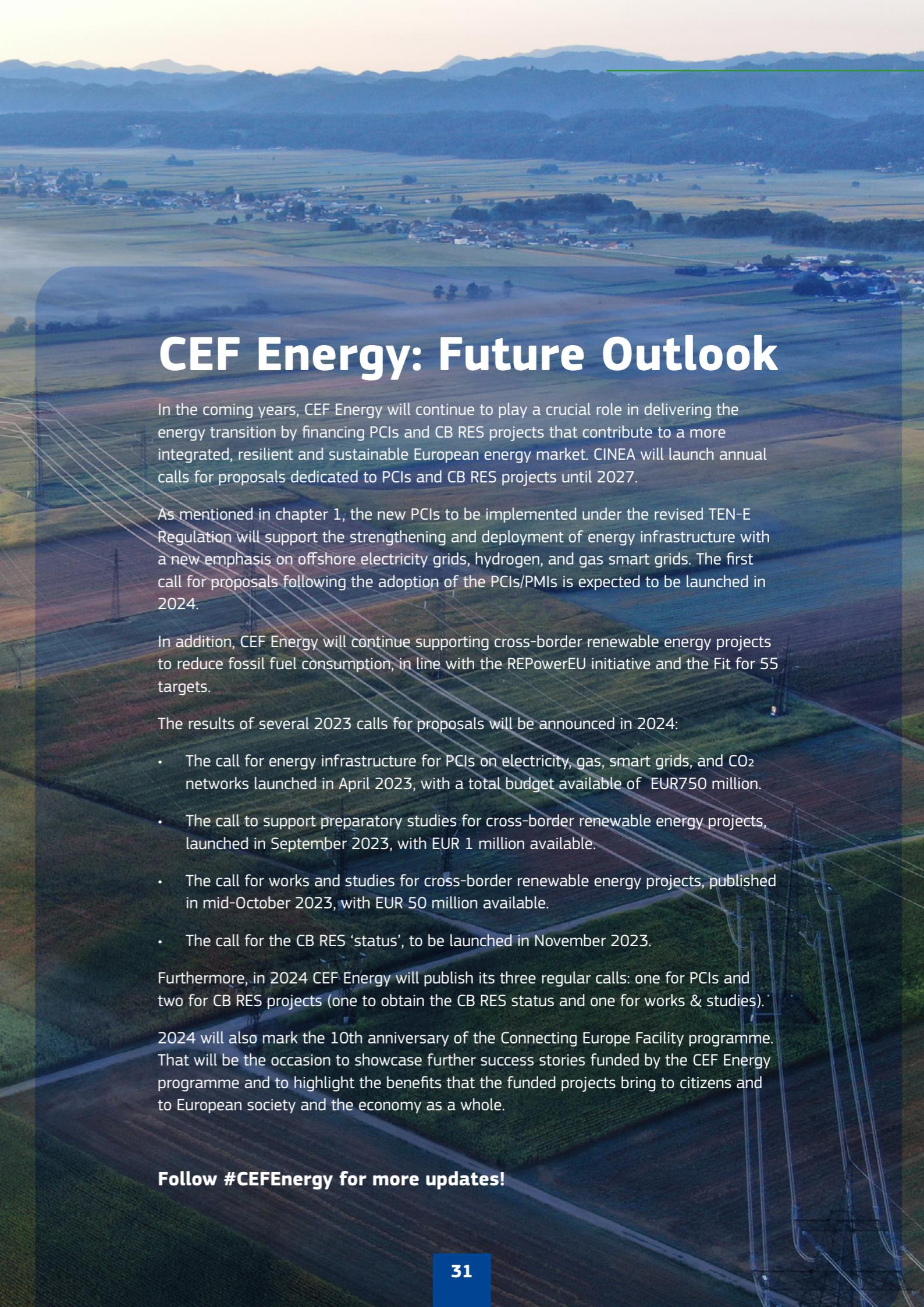
During the past year, CINEA hosted several successful cross-programme stakeholder and wider audience networking events, and also conducted some deep dive portfolio analyses.

## Below some highlights:

- **Smart Grid PCIs Summit (September 2022, Slovenia):** an event covering, among others, collaboration between Horizon Europe and CEF Energy funding programmes in investment in self-optimised, flexible grids with the final objective to support the EU to be on track with the Net Zero Emissions by 2050. More than 70 participants – from TSOs, DSOs, National Regulatory Authorities (NRAs), universities, research institutes and technology suppliers – attended the event. The sessions featured seven projects developing key smart grid technologies and allowed participants to discuss with transmission and distribution systems operators concrete perspectives on how to improve synergies between their activities.
- **Carbon Dioxide Capture, Utilisation and Storage (CCUS) activities:** CINEA prepared a portfolio analysis. The Innovation Fund, Horizon Europe and the Connecting Europe Facility are the three main EU funding programmes that are developing new CCUS technologies and financing cross-border CO<sub>2</sub> transportation and permanent storage infrastructure. The portfolio analysis encompasses over 80 individual projects supporting the CCUS sector and outlining the challenges faced in research, demonstration and CO<sub>2</sub> capture and evacuation infrastructure.



Stay tuned for our future CINEA synergy activities and events.



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