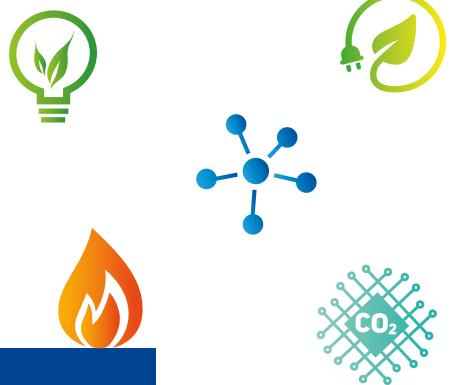




CONNECTING EUROPE FACILITY (CEF) **ENERGY**



**SPOTLIGHT ON SUPPORTED
ACTIONS 2022**

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European Climate, Infrastructure and Environment Executive Agency (CINEA)
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FOREWORD



Ditte Juul Jørgensen
Director-General,
DG Energy



Dirk Beckers
Director,
CINEA

Russian fossil fuels while keeping the focus on tackling the climate crisis.

One of the main elements of the Plan is the role of cross-border energy infrastructure to realise an integrated energy market that secures supply in a spirit of solidarity. The revised Trans-European Networks for Energy (TEN-E) Regulation, which entered into force in June 2022, aims to reduce energy dependence of the Union and increase interconnectedness via Projects of Common Interest (PCIs) which will modernise, decarbonise and connect Member States' cross-border energy infrastructures fully in line with the European Green Deal. It continues to ensure market integration, competitiveness and security of supply.

Electricity and gas PCIs already made a significant impact on the energy market and integration between the Member States. Electricity PCIs (of which there are 67 on the 5th

PCI list) contribute to market integration, enable the uptake of increasing shares of renewable energy sources in the electricity market, and reduce renewable energy curtailment in line with the REPowerEU objectives. As highlighted in the REPowerEU Communication, in 2022 alone, gas PCIs with a total additional gas transmission capacity of 20 bcm/year have been or will be commissioned, helping Europe to become less reliant on Russian supplies.

In order to become the first climate-neutral continent by 2050 with secure energy supply, the EU deploys a number of instruments, policies and funding programmes. Among such instruments is the Connecting Europe Facility (CEF) Energy programme, which has been supporting key energy infrastructure projects since 2014 aiming to increase gas and electricity interconnections in the EU. With its €4.8 billion budget allocated for energy PCIs, CEF Energy 2014-2020 contributed to the development of more than 150 strategic cross-border infrastructures for natural gas and electricity. With a budget of €5.8 billion, CEF Energy 2021-2027 continues to fund more energy projects.

CEF Energy ensures that the infrastructure and the funded cross-border renewable energy projects significantly contribute to the energy transition. Through CEF Energy, the Commission will continue to finance eligible cross-border projects in the fields of electricity, smart grids, gas (only during a transitional period), and renewables. Moreover, from 2024, when the revised TEN-E comes into play from a CEF perspective, this will include new categories such as offshore grids and hydrogen. Through Projects of Mutual Interest (PMIs), as of 2024, CEF can also support eligible projects between Members States and third countries, in order to guarantee a larger and higher quality of energy mix and of supply possibilities for all Members States.

This brochure presents a selection of CEF Energy funded Actions and highlights their important role in the Union's energy security of supply and green transition.

The European Union's future is green. The European Climate, Infrastructure and Environment Executive Agency (CINEA), since its creation in 2021 as the successor to the Innovation and Networks Executive Agency (INEA), has continued to play a key role in guaranteeing transparent and clear support to the stakeholders involved in delivering the European Green Deal.

INTRODUCTION

Since its launch in January 2014, the Connecting Europe Facility (CEF) has been the flagship EU funding programme to support 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 **Projects of Common Interest (PCIs)** in 8 priority corridors and 2 priority thematic areas. It provides funding for new energy infrastructure in electricity, smart grids, CO₂ and natural gas under the Trans-European Networks for Energy (TEN-E) Regulation, by taking up the challenge of financing the infrastructure investment gap and minimising the costs for consumers.

The CEF Energy programme pursues the following main objectives:

- » enhancing the Union's security of energy supply
- » increasing EU competitiveness by promoting further integration of the Internal energy market and interoperability of electricity and gas networks across borders
- » integrating energy from renewable sources into the transmission network
- » developing smart energy networks and CO₂ transportation networks
- » contributing to the goals of the EU Green Deal, as well as the Paris Agreement, the 2030 climate and energy targets and long-term decarbonisation objectives.

To date, 110 Projects of Common Interest received funding from the Connecting Europe Facility through 154 individual cross-border energy infrastructure Actions for a total awarded amount of €5.69 billion. Twenty-six of these PCIs have been already completed and are operational.

For the period 2021-2027, the CEF programme allocated a total budget of €5.8 billion to key energy infrastructure. In addition to the PCIs, since its revision in 2021, CEF Energy supports the implementation

Actions:

Within the framework of the CEF Energy programme, an Action is an activity or set of activities, usually lasting for one or several years, which contribute to the implementation of one or several PCIs. An Action can consist of studies or works. Completion of an Action does not necessarily coincide with the completion of a PCI.

and deployment of the cross-border renewable energy sources (CB RES) and focuses on regional and cross-border cooperation to develop renewables in Europe. Roughly, €875 million is reserved under CEF Energy for projects in the CB RES sector, depending on the market uptake. The kick-start CB RES call of 2022 resulted in two preparatory studies Actions focusing on offshore wind and RES district heating. The first status call was launched on 4 March 2022 and closed on 10 May 2022. Ten project submitted their proposals. The selected projects will be part of the CB RES list expected to be published in autumn 2022.

With the review of TEN-E Regulation entering into force in June 2022, deeply rooted in security of supply, CEF Energy's contribution is now enlarged to support the accelerated EU decarbonisation by promoting integration of renewables, low carbon gases and new clean energy technologies into the energy system. This raises the number of priority corridors to 11, with new categories such as offshore electricity grids, hydrogen infrastructure and the thematic areas to 3, including gas smart grids. These new corridors and thematic areas will contribute to further develop and interconnect energy networks in Europe for an effective energy transition whilst achieving the EU climate goals. From the last ones, offshore electricity grids and hydrogen infrastructure are of particular focus. The first call for proposal under the revised TEN-E is expected by 2024.

CINEA manages the CEF Energy calls for proposals and follows up on the technical and financial implementation of the Actions with the beneficiaries, providing technical expertise and high quality programme management.

This brochure highlights some of the key Actions supported by CEF Energy, showing how the programme delivers on its objectives and demonstrating tangible benefits to the development of secure, future-prone, decarbonised and sustainable European energy system.

[Watch video on PCIs](#)

[Watch video on EU energy grid](#)

[What is CINEA doing?](#)

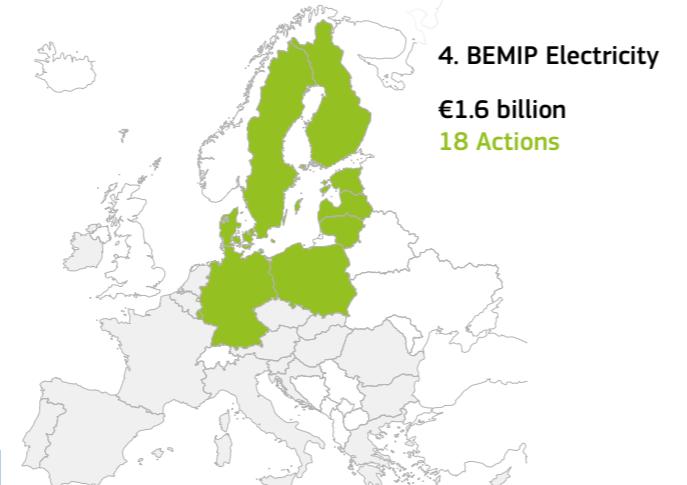
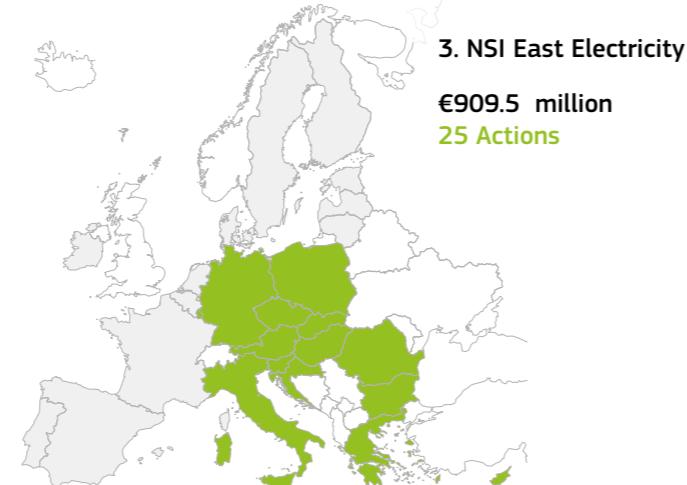
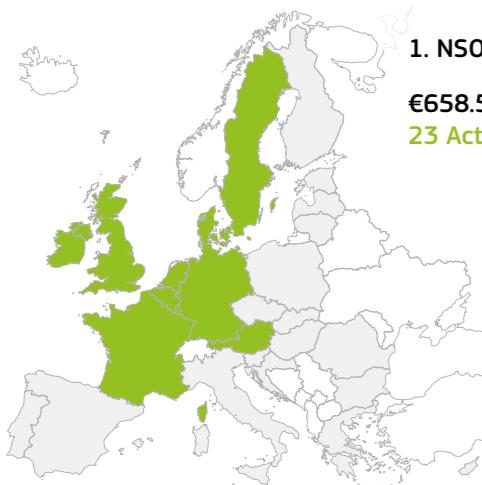
FOCUS ON PRIORITY CORRIDORS AND THEMATIC AREAS

As highlighted in the introduction, the CEF Energy programme provides funding to electricity, smart grids, CO₂ networks and natural gas infrastructure projects, with the aim to better interconnect energy networks in Europe. CEF Energy currently supports the implementation of PCIs in 8 priority corridors (four in each of the electricity and gas

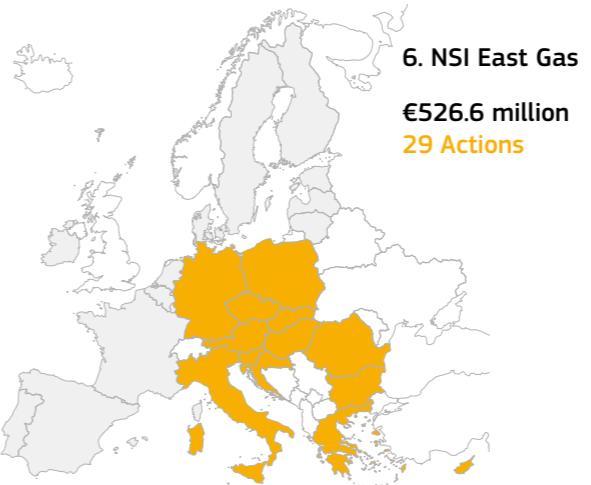
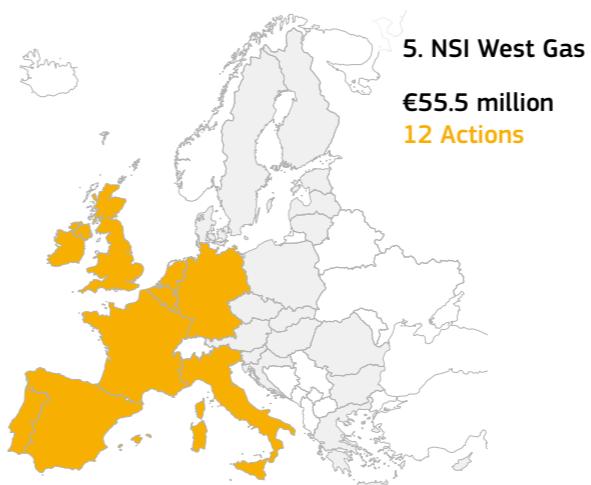
sectors) and in 2 thematic areas (smart grids and cross-border CO₂ networks) under the 2013 Trans-European Networks for Energy (TEN-E) Regulation (347/2013). These priority corridors and thematic areas described below were defined to address the energy infrastructure needs at regional and European level.

Electricity

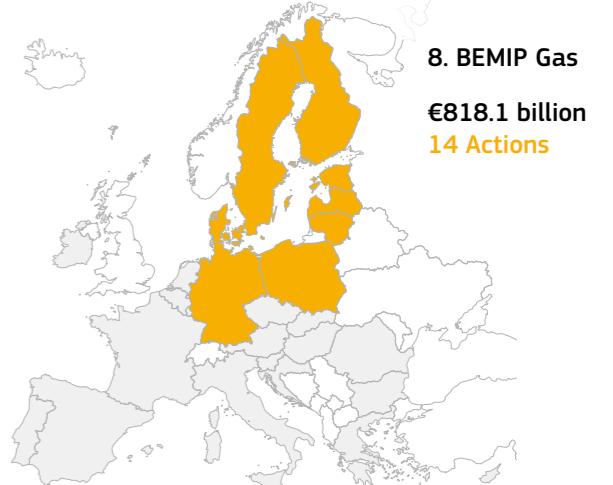
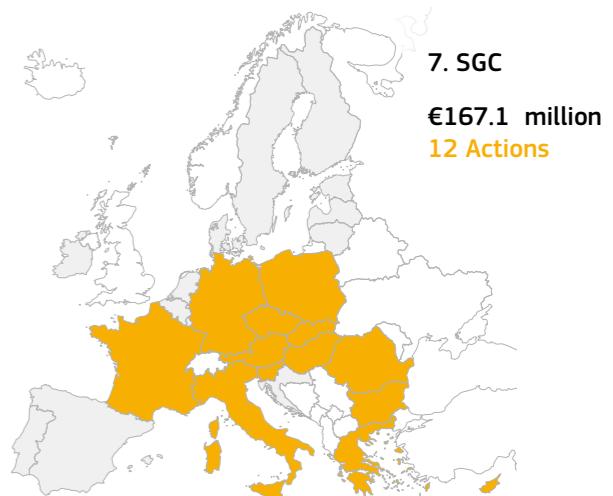
- Northern Seas Offshore Grid (NSOG)**: its main goal is to develop an integrated offshore electricity grid and related interconnectors in the North Sea, Irish Sea, English Channel, Baltic Sea and neighbouring waters to transport electricity from renewable offshore energy sources to centres of consumption and storage and to increase cross-border electricity exchange.
- North-South electricity interconnections in Western Europe (NSI West Electricity)**: its main goal is to integrate electricity from renewable energy sources and reinforce internal grid infrastructure to promote market integration in the region.
- North-South electricity interconnections in Central Eastern and South Eastern Europe (NSI East Electricity)**: its main goal is to complete the internal EU electricity market and to integrate generation from renewable energy sources through construction of interconnectors and internal lines.
- Baltic Energy Market Interconnection Plan in electricity (BEMIP Electricity)**: its main goal is to achieve an open and integrated regional electricity market between EU countries in the Baltic Sea region, ending energy isolation.



- North-South gas interconnections in Western Europe (NSI West Gas)**: its main goal is to further diversify routes of gas supply and increase short-term gas availability in Western Europe.
- North-South gas interconnections in Central Eastern and South Eastern Europe (NSI East Gas)**: its main goal is to enhance security of supply, diversify gas transit routes and provide for alternative gas supply sources in the region.



- Southern Gas Corridor (SGC)**: the Southern gas corridor is the natural gas supply route from the Caspian and Middle Eastern regions to Europe. Its main goal is to reduce Europe's dependence on Russian gas and diversify sources and routes of gas supply.
- Baltic Energy Market Interconnection Plan in gas (BEMIP Gas)**: its main goal is to end dependence on a single gas supplier (Russia), reinforce internal gas networks and increase diversification and security of gas supply in the Baltic region.

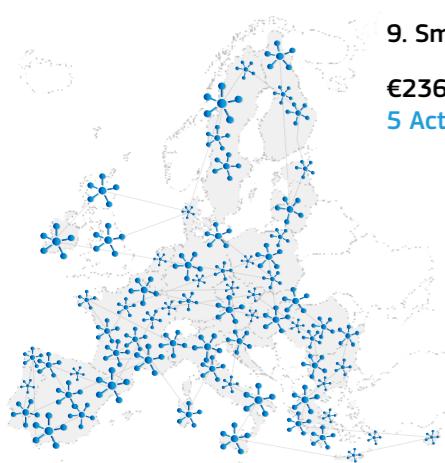


FOCUS ON PRIORITY CORRIDORS AND THEMATIC AREAS



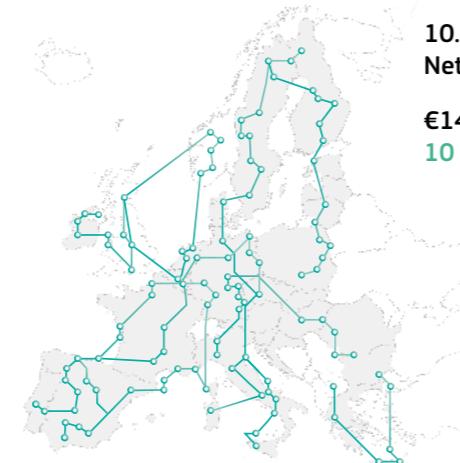
Smart grids

9. **Smart grids deployment:** its main goal is to develop a cross-border and smart electricity grid that can optimise grid operations and integrate in a cost efficient manner the behaviour of all users connected to it. Ultimately, it aims to ensure an economically efficient and sustainable power system with low losses and high levels of quality, security of supply and safety.



CO₂ networks

10. **Cross-border CO₂ Networks:** its main goal is to support deployment of CO₂ transport infrastructure between Member States and with neighboring third countries with a view to the transport of carbon dioxide from carbon capture facilities to underground geological storage (CCS).



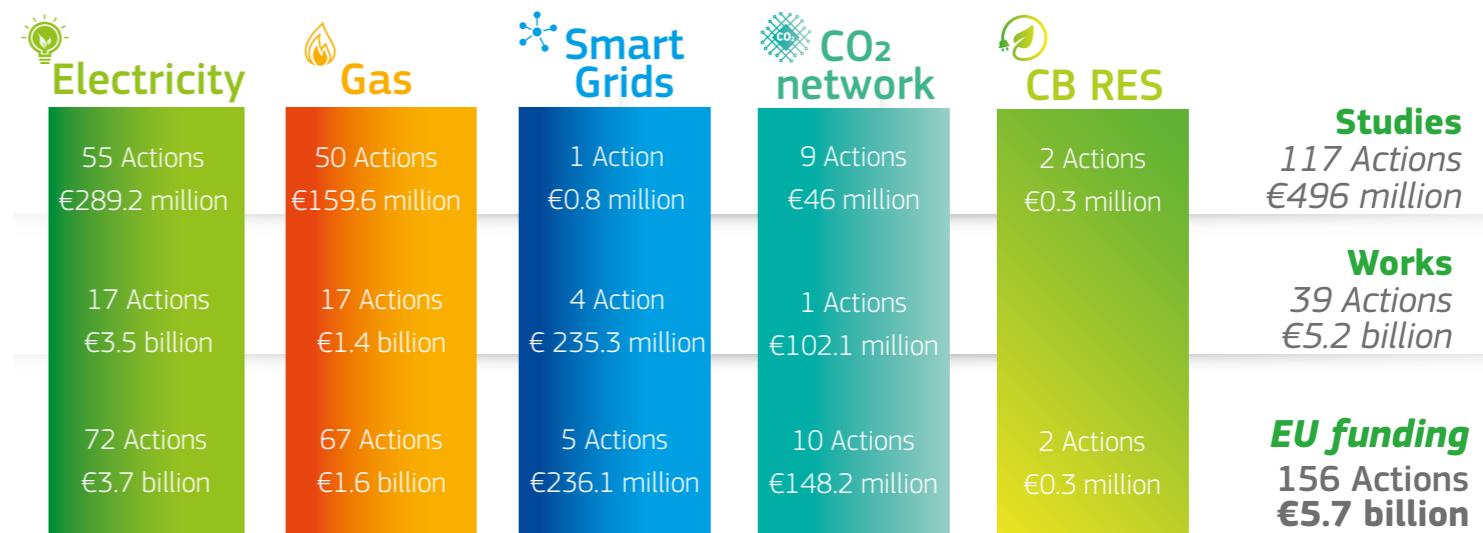
In light of the current energy situation in Europe and the recently launched REPowerEU Plan (which outlines a plan to make Europe independent from Russian fossil fuels by 2030), the new TEN-E Regulation and CEF Energy funding play a significant role as they promote projects aiming at eliminating dependence on Russian gas imports. Importantly,

one of 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.

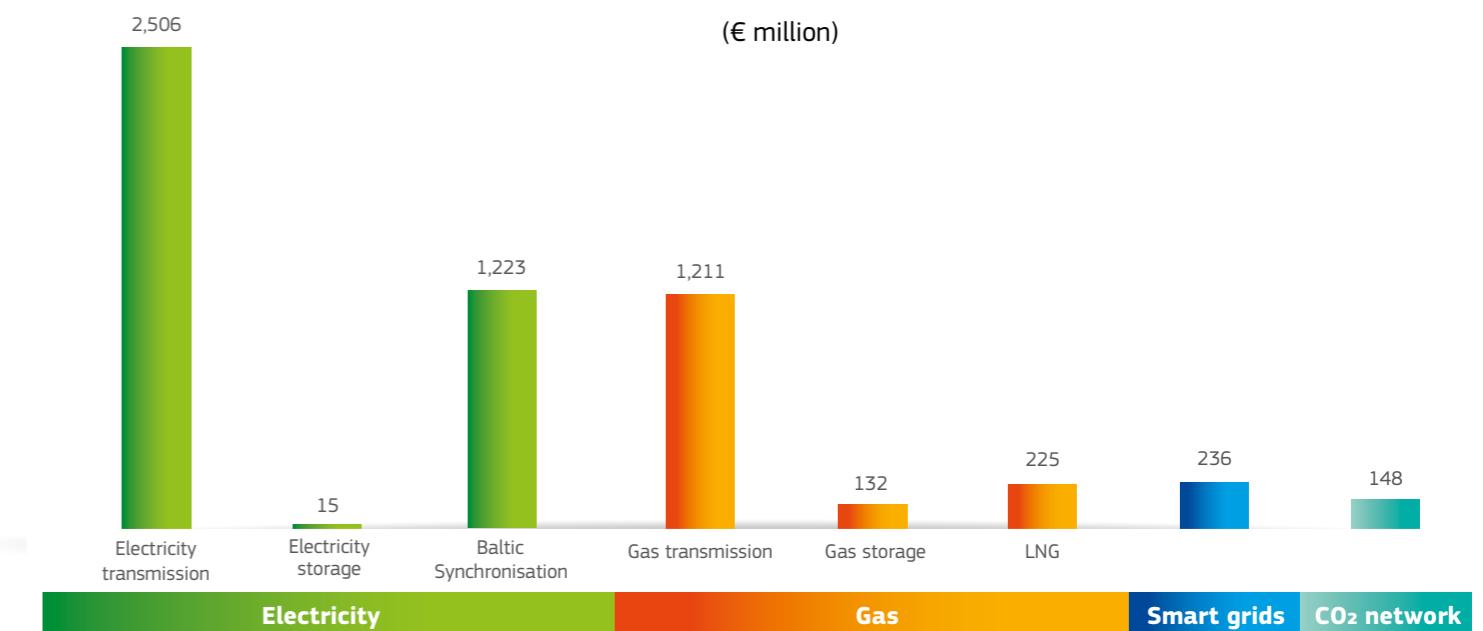
CEF ENERGY PORTFOLIO FOR PCIS

The CEF Energy portfolio for PCIs currently consists of 154 Actions accounting for €5.69 billion of CEF Energy funding, covering the time frame 2014-2022. They all contribute to the implementation of 110 PCIs. The largest share

of funding goes to works (91%), and the PCIs that receive the largest share of CEF Energy funding are in the electricity sector, followed by natural gas.



DEVELOPING INFRASTRUCTURE





ENERGY INFRASTRUCTURE: PROJECTS OF COMMON INTEREST (PCIs)

The CEF Energy funded Actions below contribute to meeting the criteria defined in the TEN-E Regulation for the PCIs selection:

- I. **Security of supply:** through interoperability, appropriate connections and secure and reliable system operation;
- II. **Market integration:** through lifting the isolation of at least one Member State and reducing energy infrastructure bottlenecks, competition and system flexibility;
- III. **Sustainability:** through the integration of renewable energy into the grid and the transmission of renewable generation to major consumption centres and storage sites.

ELECTRICITY

The Actions below contribute to CEF Energy objectives by enhancing the security of supply through studies and construction works.

Delivering the Celtic Interconnector: studies and works

Following the CEF contribution to two completed studies, CEF Energy is currently funding a works Action. This Action implements the PCI 1.6 - France - Ireland subsea 700 MW HVDC interconnection of 575 km between La Martre (FR) and Knockraha (IE).

Once completed, the Celtic Interconnector will enhance the security of supply and facilitate transition to a low carbon energy future.

CEF Energy funding: €537.6 million

Countries involved: France and Ireland

Beneficiaries: EirGrid (IE), RTE (FR)



Implementing the Aurora Line: studies and works

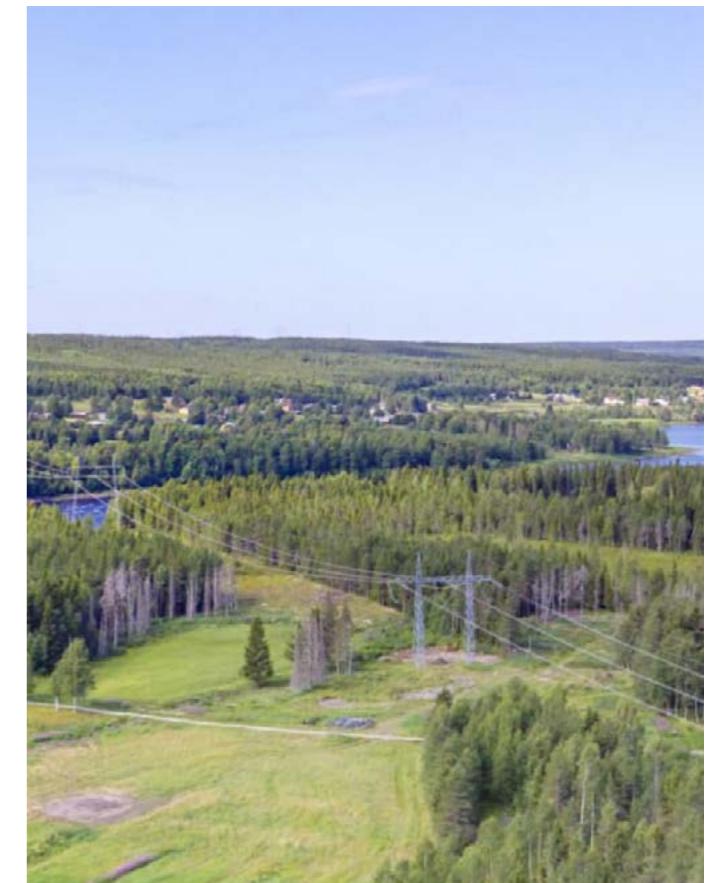
Following the CEF Energy contribution to the ongoing study, CEF is also funding the works Action that implements the PCI cluster 4.10 Finland-Sweden, currently known as 'Third interconnection Finland - Sweden' or Aurora Line. The cluster consists of PCI 4.10.1 Interconnection between northern Finland and northern Sweden (400 kV overhead transmission line of 180 km) and PCI 4.10.2 Internal line between Keminmaa and Pyhänselkä (FI) (400 kV overhead transmission line of 200 km). The Aurora Line aims to increase the cross-border transmission capacity by 800 MW from Sweden to Finland and 900 MW from Finland to Sweden.

Once completed, the Aurora line will strengthen the internal electricity market, increase security of supply in the region and improve RES integration in the region.

CEF Energy funding: €131.3 million

Countries involved: Finland and Sweden

Beneficiaries: Fingrid (FI), Svenska Kraftnät (SE)



Biscay Gulf electricity France-Spain interconnection: studies and works

CEF Energy has contributed to the implementation of the Biscay Gulf electricity interconnection between France and Spain, a new 400 kV HVDC subsea cable interconnection of approximately 370 km with a capacity of 2x1000 MW, with two finalised studies. Construction works' Action is ongoing.

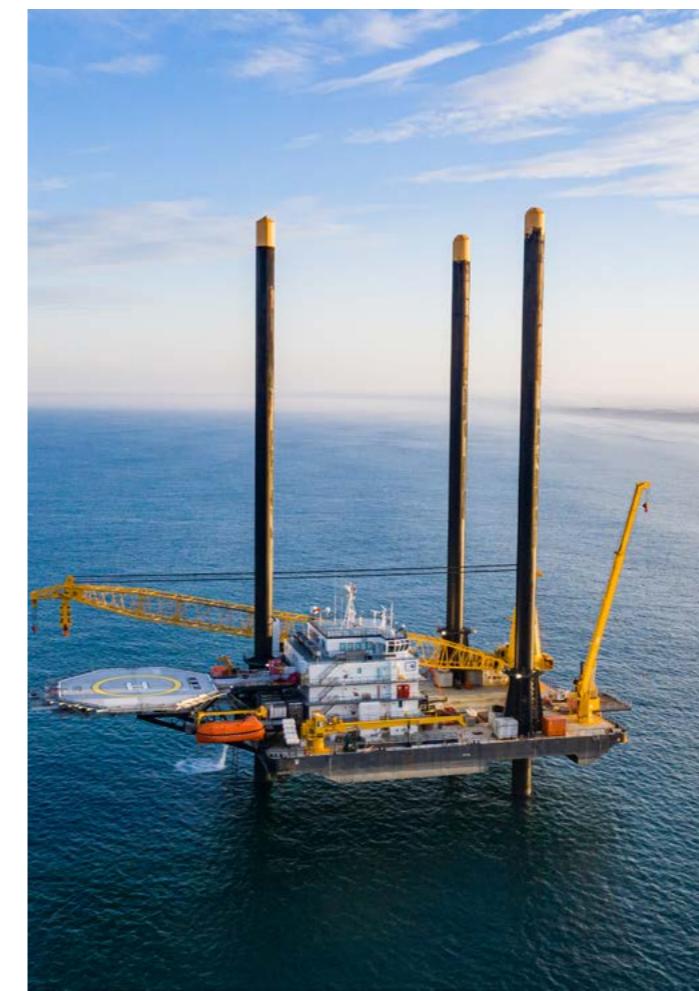
The two finalised permitting studies focused on feasibility, the impact of the new interconnector and identified the final feasibility of the selected route and detailed the technical means to secure it. The ongoing Action implements the construction works of the interconnector.

Once completed, the Biscay Gulf interconnector will increase interconnection capacity between the Iberian Peninsula and France and thus it will enhance regional security of supply, contribute to the completion of the EU internal electricity market and improve RES integration in the region.

CEF Energy funding: €587.9 million

Countries involved: France and Spain

Beneficiaries: REE (ES), RTE (FR)



GAS

The Actions below contribute to this objective by enabling the interoperability, appropriate connections and secure and reliable system operation and diversification of gas supply sources and routes through studies and construction works.

Poland-Denmark interconnection: Baltic Pipe: studies and works

Four CEF co-funded Actions (3 studies and 1 works) have contributed to the implementation of Baltic Pipe, part of the PCI cluster 8.3 which aims to import gas from Norway into the European market via Denmark and Poland. The studies comprise a feasibility study, preparatory studies and engineering works, pre-construction activities, and preparation of the necessary project documentation up to the obtainment of the building permits in Poland and Denmark. The works Action entails the construction of a bidirectional offshore gas pipeline connecting PL and DK (approx. 275 km), two onshore pipeline sections in Poland (approx. 5,5 km and 40-85 km, respectively), a receiving terminal, an onshore pipeline from Goleniów to Lwówek (approx. 192 km), and the expansion of the compressor stations in Goleniów (approx. additional 12 MW) and in Odolanów (approx. additional 12 MW).

After completion (expected in October 2022), this project will enhance security of gas supply and diversification of sources and routes for the gas market in Poland and other countries, following interruption of gas imports from Russia.



CEF Energy funding: €266,7 million

Countries involved: Poland and Denmark

Beneficiaries: GAZ-SYSTEM (PL), Energinet (only studies)
(DK)



Krk LNG Terminal : studies and works

This project entailed the construction of the Liquefied Natural Gas terminal in Croatia, consisting of a Floating Storage and Regasification Unit (FSRU), with send-out capacity of up to 2.6 bcm/y, minimum storage capacity of 135,000 m³ and of adjacent infrastructure, namely a jetty and the Omišalj-Zlobin transmission pipeline connecting the LNG terminal to the Croatian gas transmission system. The pipeline allows the flow of 2.6 bcm/y from the LNG terminal and 1.7 bcm/y towards Hungary. Up to 5 Actions co-funded by CEF Energy contributed to the implementation of PCI 6.5.1 “Development of a LNG terminal in Krk (HR) up to 2.6 bcm/a- Phase I and connecting pipeline Omišalj – Zlobin (HR)”. The 5 awarded Actions included preparatory technical and legal studies and construction works up to the full commissioning of the infrastructure in January 2021. The project enhanced the security and diversification of gas supply to Croatia and the SEE region.

CEF Energy funding: €124.03 million

Countries involved: Croatia

Beneficiaries: LNG Hrvatska d.o.o. (HR)



GAS



Development on Romanian territory of the National Gas Transmission System on the Bulgaria-Romania-Hungary direction, execution works Stage 1 (BRUA): studies and works

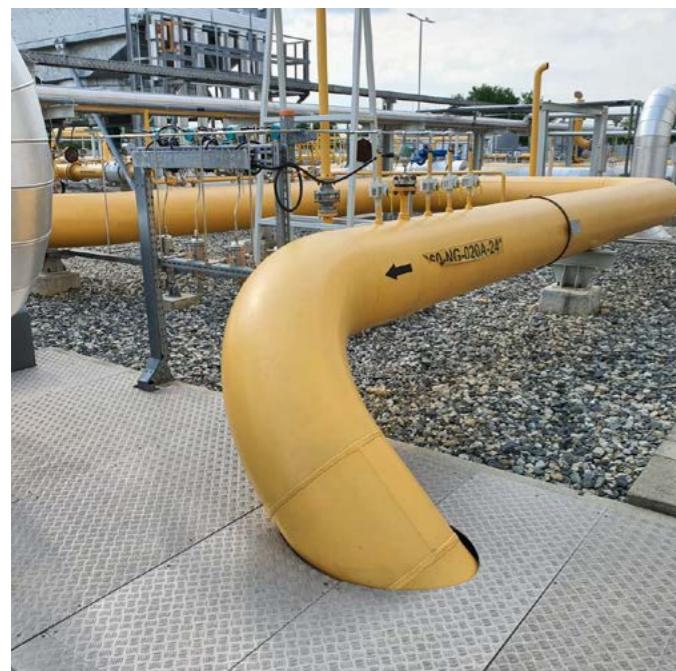
Two CEF Energy funded Actions (1 study and 1 works) implemented Stage 1 of the PCI 6.24.1 "Gas pipeline from Bulgaria to Austria via Romania and Hungary", known as "BRUA", which aims at a gas delivery capacity of 6.1 mcm/day in Bulgaria, Romania and Hungary. The study Action consisted in the FEED studies for three compressor stations in Podisor, Bibesti and Jupa, while the works Action enabled the construction of those three compressor stations and a gas transmission pipeline from the Technological Node (TN) Podisor up to the TN Recas. The installed capacity of each compressor station is 9.2 MW. The stations were built to provide bidirectional gas flow at suction pressures of 20-40 bar and discharge pressures of 30-63 bar. Its finalisation has enabled the interconnection of the gas transmission systems in Bulgaria and Hungary with Romania. The pipeline and compressor stations are operational and commissioned since 2020.

The completion of these Actions has paved the way for Stage 2 of PCI 6.24.1 "Gas pipeline from Bulgaria to Austria via Romania and Hungary", by upgrading the transmission capacity and increasing the related pressures.

CEF Energy funding: €160.2 million

Countries involved: Romania

Beneficiaries: TRANSGAZ S.A. (RO)



Chiren Underground Gas Storage Expansion (BG): studies and works

Two CEF Energy Actions contribute to the expansion of the existing underground gas storage facility (UGS) in Chiren, Bulgaria. A study consisting on 3D seismic surveys and an Action for construction works will allow to reach a projected working gas volume up to 1 bcm, a projected daily injection and withdrawal capacity up to 8-10 mcm/d and a cycling rate of 1 time/year. The works Action covers the construction of the above-ground facilities, including a compressor station, a gas metering station, as well as new underground facilities, namely 10 exploitation and 3 observation wells.

These Actions contribute to the implementation of the PCI cluster "6.20 Cluster increase storage capacity in South-East Europe". Once completed, it will enhance security of gas supply and flexibility for the Bulgarian gas system, especially following the interruption of gas imports from Russia to this country.

CEF Energy funding: €81.8 million

Countries involved: Bulgaria

Beneficiaries: Bulgartransgaz EAD (BG)



ELECTRICITY

The Actions below contribute to CEF Energy objectives by ensuring market integration through fully connecting the Baltic States to the Central European Network (CEN).

Synchronisation of the Baltic States to the Central European Network: studies and works

Currently CEF funds four Actions that contribute towards this goal. These include three works Actions for missing infrastructure in Latvia, Lithuania, Estonia and Poland and one study related to Harmony link, a 330 km long HDVC link of 700 MW between Poland and Lithuania.

The scope of the Baltic Synchronisation works Actions cover a variety of items such as: internal transmission network reconstruction and reinforcements, the installation and commissioning of synchronous condensers, the construction and modernisation Over Head Lines, the modernisation of a substation, Battery Energy Storage System (BESS) and the installation of needed IT equipment. The Harmony link construction is the new submarine High Voltage Direct

Current interconnector between Lithuania and Poland. The studies for the latter cover the selection of a route for the submarine cable.

Once the Baltic Synchronisation Project is complete, the Baltic States will be ready to operate in synchronous mode with the Central European Network (CEN).

CEF Energy funding: €1,22 billion

Countries involved: Poland, Lithuania, Latvia and Estonia

Beneficiaries: Polskie Sieci Elektroenergetyczne S.A.(PL), Litgrid (LT), Augstsprieguma tīkls AS (LV) and Elering (EE)



GAS

The following Actions contribute to this objective by interconnecting Member States, lifting isolation and reducing energy infrastructure bottlenecks, enabling competition and system flexibility.

Interconnector between Estonia and Finland, known as "Balticconnector": studies and works

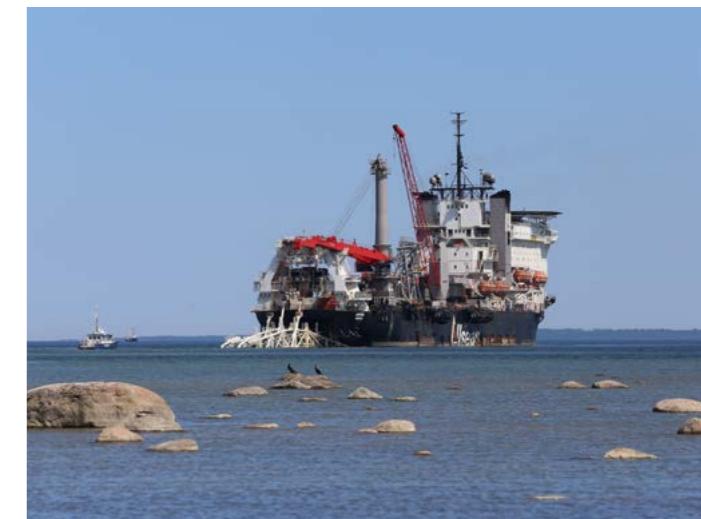
The PCI 8.1.1 Interconnector between Estonia and Finland, known as "Balticconnector" is a bidirectional offshore gas pipeline that physically connects the Finnish and Estonian gas networks. The Balticconnector pipeline consists of three sections: an onshore section in Finland (approx. 22 km, DN500, 80 bar), an onshore section in Estonia (approx. 54 km, DN700, 55 bar) and an offshore section between Estonia and Finland (approx. 78 km, DN500, 80 bar). In addition, it includes auxiliary equipment counting a pressure reduction station in Estonia and compressor and metering stations in both countries. The total length of Balticconnector is approx. 154 km and capacity is approx. 7.2 mcm/d.

Two CEF co-funded Actions have contributed to the project implementation: a study and a works Action. The first aimed to carry out the business model studies, environmental and technical studies, geotechnical and geophysical studies of the pipeline, and the necessary permits for the construction. The works Action entailed the construction of the three pipeline sections as well as the installation of the auxiliary equipment. The Balticconnector project was commissioned and entered into operation in December 2020.

CEF Energy funding: €189,30 million

Countries involved: Estonia and Finland

Beneficiaries: Elering AS (EE), Gasum Oy (FI), Baltic Connector Oy (FI)



GAS

Estonia-Latvia gas interconnection enhancement: works

The Project of Common Interest 8.2.2 "Enhancement of Estonia-Latvia interconnection" aims at improving the gas transmission infrastructure to allow bidirectional gas flow between the Estonian and Latvian gas transmission systems, as well as increasing the overall cross-border transmission capacity. After enhancement, the gas can flow in both directions with a capacity of 10 million m³ per day.

It was fully implemented by a CEF co-funded works Action, covering the construction of gas network infrastructures in three different locations: a gas metering station near the Estonia-Latvia border in Karksi; a border valve in Lilli (between Karksi and the Estonia-Latvia border) and a bidirectional compressor station in South Estonia in Puiatu.

The completed PCI enhances the interconnectivity and flexibility for gas markets in Baltic countries, enabling as well to make full use of the gas transmission capacity of the Balticconnector project.

CEF Energy funding: €18,6 million

Countries involved: Estonia

Beneficiaries: Elering AS (EE)



Gas Interconnection Poland-Lithuania (GIPL): studies and works

The Project of Common Interest 8.5 "Poland-Lithuania interconnection", known as GIPL, aims for a better-integrated and interconnected gas supply market and to reduce European energy dependence from unreliable suppliers. Overall, the new GIPL pipeline will have a capacity of 2.4 bcm/year in the direction Poland to Lithuania and up to 1.9 bcm/year in the direction Lithuania to Poland.

Two CEF co-funded Actions have contributed to the implementation of the GIPL project, namely: a study Action for preparatory works up to the obtainment of the building permission, and a works Action for the construction of the gas interconnection including supporting infrastructure. The study Action covered tendering documentation for localisation decision and territory planning, basic and detailed engineering studies, EIA and related activities for

compressor stations. The works Action entails construction works for the key infrastructures of the project, namely: on the Polish side, the gas pipeline (approx. 342 Km, DN 700) between Hołowczyce (PL) and the PL-LT Border, and the compressor station in Gustorzyn; on the Lithuanian side, the gas pipeline between the PL-LT Border and Jauniunai (LT), gas pressure reduction and metering station(s) located near the PL-LT Border.

The GIPL project has been commissioned and entered into operation in May 2022. All related infrastructures covered by the CEF works Action are to be finalised by October 2022.

CEF Energy funding: €276,5 million

Countries involved: Poland and Lithuania

Beneficiaries: GAZ-SYSTEM (PL) and Ambergid (LT)

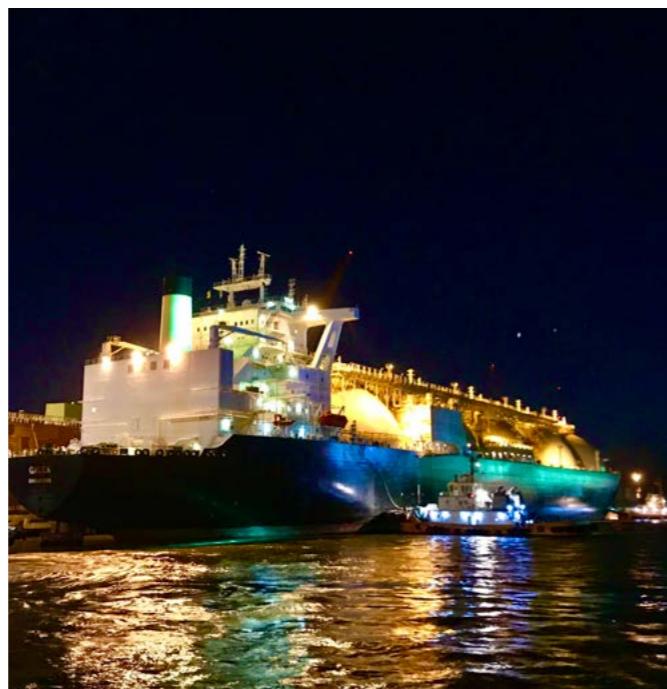
GAS



Cyprus LNG: Removing internal bottlenecks to end isolation and allow transmission of NG from Eastern Mediterranean: works

The CEF Energy Action implements the PCI 7.5 "Removing internal bottlenecks to end isolation & allow transmission of NG from Eastern Mediterranean (CyprusGas2EU)". This project entails the deployment of an offshore LNG facility (Floating Storage and Regasification Unit – FSRU) as well as the construction of several onshore natural gas facilities along the Port of Lemesos – Terminal 2 (Vassiliko), namely: a jetty for the unit's safe mooring, a jetty-borne natural gas pipeline, an onshore gas pipeline, a shoreside block valve facility, an onshore natural gas buffer solution and a pressure reduction and metering station.

The project is expected to be completed in 2023. Once completed, the island of Cyprus will acquire an entry point for natural gas and possible synergies between Cyprus and other Member States will be possible in the procurement of natural gas, optimising delivery schedules, creating economies of scale and enhancing solidarity.



CEF Energy funding: €101.2 million
Countries involved: Cyprus
Beneficiaries: Republic of Cyprus represented by the Ministry of Energy, Commerce and Industry (CY)

Reverse Flow Interconnection on TENP pipeline in Germany: studies and works

Two Actions (1 study and 1 works) contributed to the implementation of the PCI 5.10 "Reverse flow interconnection on TENP pipeline in Germany". They confirmed the feasibility of reverse gas flow towards Germany, taking into account the reversal of the compressor station in Huegelheim, and supported an industrial scale natural gas deodorisation facility at the Swiss-German border.

The works Action consisted of the design and engineering of the reversal of the TENP pipeline to transport gas from Switzerland to Germany. It included as well the construction of an innovative industrial-scale deodorisation facility in the district of Freiburg (DE), with the aim of removing the gas odorant THT (Tetrahydrothiophene) in the northbound gas flows. The deodorisation plant has successfully started its commercial operations in December 2020.

The completed facilities enable the TENP system to provide firm northbound transport capacity to shippers, thus closely connecting the Italian, Swiss and German gas markets.

CEF Energy funding: €501,47 million
Countries involved: Germany
Beneficiaries: Fluxys TENP (DE) and TENP KG (DE)



ELECTRICITY

The Actions below contribute to this objective by integrating RES into the grid and allowing the transmission of renewable generation to major consumption centres and storage sites.

North Sea Wind Power Hub

The CEF funded Action implements the preparatory steps of the PCI 1.19 One or more hubs in the North Sea with interconnectors to bordering North Sea countries (Denmark, Germany, the Netherlands), which is a new hub-and-spoke concept connecting up to 12 GW future offshore wind parks to the systems of Denmark, the Netherlands and Germany.

Once completed, the North Sea Wind Power Hub will increase the integration of transnational offshore electricity grid systems of Denmark, the Netherlands and Germany, thus facilitating a transition to a low carbon energy future in the region.

CEF Energy funding: €13.7 million

Actions in Bulgaria: works and studies

CEF Energy has funded in Bulgaria six Actions for three PCIs, namely 3.7.4 3.8.1 and 3.7.1. PCI 3.7.4 is a new 150 km AC 400kV overhead transmission line between substation Maritsa East and substation Burgas with a capacity of 1500 MW. PCI 3.8.1 is a new 87 km 400 kV AC single-circuit onshore overhead transmission line between Dobrudja (Varna substation) and Burgas (Burgas substation) with a capacity of 1500 MW. PCI 3.7.1 is a new AC 400 kV single-circuit interconnector (overhead transmission line) of 153 km (123 km on Bulgarian territory and 30 km on Greek territory, funded exclusively by own resources) and a capacity of 1500MW between Maritsa East (BG) and Nea Santa (EL).

For each PCI a study's Action and a work's Action has been co-funded. Studies focusing on finalisation of the permit granting procedures and the preparation of procurement prepared the process to launch construction works, which were also co-funded by CEF Energy.

Once completed, all PCIs will further strengthen the Bulgarian power grid and allow electricity to flow North-South and East-West and thus contribute to integration of



Countries involved: Denmark, Germany, Netherlands

Beneficiaries: Energinet (DK), TenneT (NL), TenneT (DE), Gasunie (NL)



renewable power generation, regional security of supply and EU internal market integration leading to wholesale electricity price convergence. Moreover, they contribute to the grid system flexibility and stability and increase the network transfer capacity at the Bulgaria-Greece border and at the Bulgaria-Romania border.

CEF Energy funding: €88.1 million

Countries involved: Bulgaria

Beneficiaries: ESO EAD (BG)

Studies to increase transmission capacity in Germany: SuedLink and SuedOstLink

CEF Energy funded two studies in Germany for two different PCIs: 2.10 Internal line between Brunsbüttel-Großgartach and Wilster-Grafenrheinfeld (SuedLink) and 3.12 Internal line in Germany between Wolmirstedt and Bavaria to increase internal North-South transmission capacity (SuedOstLink).

The Actions aim to increase the German network's capacity at Northern and Southern borders and the internal North-South transmission capacity to allow further RES integration (RES) and connect the network to important industrial regions and consumption centres. The expected installed capacity for both lines is of 4GW and respectively 2GW and the length of approx. 700 km for SuedLink and approx. 600 km for SuedOstLink.

Both Actions aim to complete the Federal Sectoral Planning (Bundesfachplanung) - already finalised for SuedLink defining a 1,000 m wide corridor route, and for SuedOstLink to obtain the Planning Approval Procedure (Planfeststellungsverfahren) for starting the construction works.

Once completed, both lines will allow more integration of renewable energy sources to meet the climate goals in Germany.

CEF Energy funding: €110.25 million

Countries involved: Germany

Beneficiaries: TenneT TSO GmbH (DE), 50Hertz Transmission GmbH (DE) TransnetBW GmbH (DE)



CO₂ NETWORKS

The Carbon dioxide (CO₂) networks Actions co-funded by CEF Energy contribute to the EU's decarbonisation objectives and help the EU meet the Green Deal targets.

The objective of these Actions is to guarantee CO₂ avoidance by increasing the resilience and security of CO₂ transport and the efficient use of resources by enabling the connection of multiple carbon dioxide sources and storage sites via common infrastructure.



PORTHOS CO₂ transport network

Two CEF Energy Actions (1 study and 1 for works) contribute to the implementation of phase 1 of the Project of Common Interest (PCI) 12.3 "CO₂ TransPorts". While the study Action consisted on preparatory studies to reach the FID for the project, the objective of the works Action is the construction of a CO₂ transport backbone in the port of Rotterdam area able to transport CO₂ to the depleted gas fields in the North Sea. It comprises the construction of a 33 km long onshore pipeline connecting industrial emitters in the port area of Rotterdam, a compressor station of 20 MW and a 20 km offshore pipeline that will transport the compressed captured CO₂ to the depleted gas fields for CO₂ storage in the Dutch section of the North Sea. In the first operational phase, the pipelines will have a capacity of 5

MtCO₂/year, with provisions to upgrade the capacity to 10 MtCO₂/year.

Once completed, the PCI 12.3 will develop an open access cross-border CO₂ transport network for the transport of CO₂ from industrial sources in the ports of Rotterdam, Antwerp and the North Sea Port (Ghent) to offshore storage locations in depleted gas fields in the North Sea.

CEF Energy funding: €102,13 million

Countries involved: The Netherlands

Beneficiaries: Havenbedrijf Rotterdam N.V., N.V. Nederlandse Gasunie, EBN B.V. and Porthos Development CV (NL).

SMART GRIDS

The smart grids Actions co-funded by CEF Energy contribute to improving the network security, quality of supply and efficiency in the interoperability of transmission and distribution network as well as in the network investments.



SINCRO.GRID, ACON and Danube InGrid

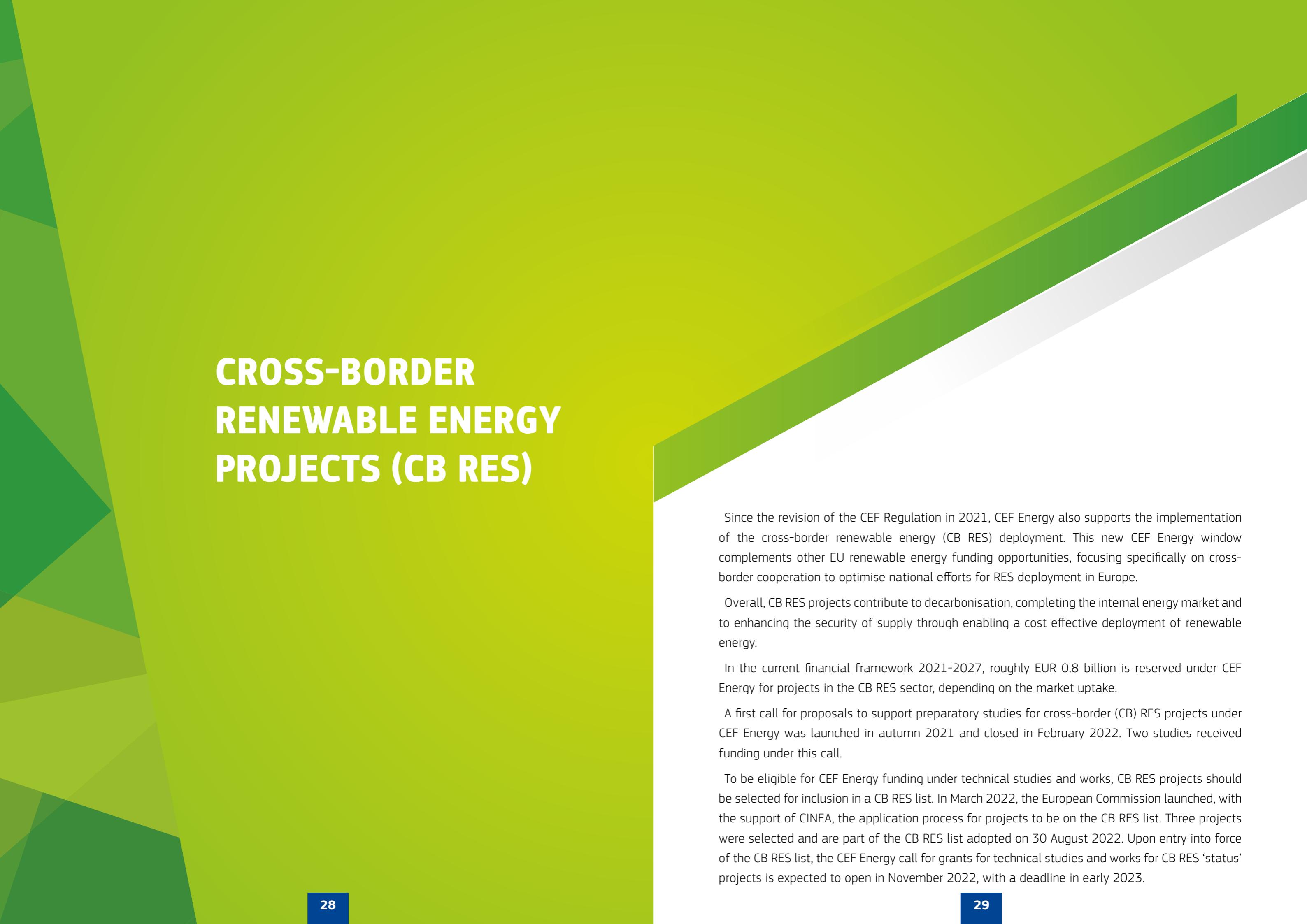
SINCRO.GRID (phase I and phase II) implemented innovative solutions to increase reliability of the grid, such as the integration of voltage compensation devices and a battery storage system, as well as the development of a dynamic thermal rating system and a virtual cross-border control centre. All these elements help to increase the capacity and flexibility of the cross-border network and allow a better integration of renewable energy sources in Slovenia and Croatia. These two Actions successfully ended in June 2022, completing the PCI 10.3 SINCRO.GRID.

ACON (Again COnnected Networks) and Danube InGrid aim to improve the efficiency, quality and reliability of the distribution grid at different locations of the Czech, Slovak and Hungarian territories, especially in the border areas and cross-border connections, which will allow the integration of more renewables and improve cooperation at the transmission and distribution network levels. In order to achieve these goals, both Actions will modernise the grid infrastructure and communication backbone by installing smart technologies and developing new ICT systems. Once completed, both Actions will fully implement the PCIs 10.4 ACON (CZ/SK) and 10.7 Danube InGrid phase I (SK/HU) by the end of 2024 and 2025 respectively.

CEF Energy funding: €235 million

Countries involved: Slovenia, Slovakia, Czechia, Hungary

Beneficiaries: ELES Ltd (SI), Západoslovenská Distribučná a.s. and), Slovenská elektrizačná prenosová sústava a.s.(SK), E.ON Distribuce a.s (CZ), E.ON Észak-dunántúli Áramhálózati Zrt. (HU)



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 new CEF Energy window complements other EU renewable energy funding opportunities, focusing specifically on cross-border cooperation to optimise national efforts for RES deployment in Europe.

Overall, CB RES projects contribute to decarbonisation, completing the internal energy market and to enhancing the security of supply through enabling a cost effective deployment of renewable energy.

In the current financial framework 2021-2027, roughly EUR 0.8 billion is reserved under CEF Energy for projects in the CB RES sector, depending on the market uptake.

A first call for proposals to support preparatory studies for cross-border (CB) RES projects under CEF Energy was launched in autumn 2021 and closed in February 2022. Two studies received funding under this call.

To be eligible for CEF Energy funding under technical studies and works, CB RES projects should be selected for inclusion in a CB RES list. In March 2022, the European Commission launched, with the support of CINEA, the application process for projects to be on the CB RES list. Three projects were selected and are part of the CB RES list adopted on 30 August 2022. Upon entry into force of the CB RES list, the CEF Energy call for grants for technical studies and works for CB RES 'status' projects is expected to open in November 2022, with a deadline in early 2023.

I. Enhancing cross-border cooperation in renewable energy

The Actions below contribute to CEF Energy objectives by facilitating cross-border cooperation in the area of renewable energy through preparatory studies for a) the Gulf of Riga Hybrid Offshore Wind Farm and b) the supra-regional district heating system in the Energieregion Südostbayern-Oberösterreich-Salzburg.

Gulf of Riga Hybrid Offshore Wind Farm: Conceptual Engineering Study

Eesti Energia AS has the ambition to develop and build, together with Latvian partners, a hybrid offshore wind farm. The wind farm will be situated in the Gulf of Riga and would have assets in both Estonian and Latvian territorial waters. The potential for a combined production capacity at the final phase of the project is up to 2 GW and the infrastructure (including generation and grid connection) would be shared between both countries. The commercial operation of the wind farm is expected to start before 2030.

CEF Energy is currently funding this Action to prepare a Conceptual Engineering Study with the aim of performing a technical study to define the conceptual technical scope of the planned offshore wind farm. The Conceptual Engineering Study will also support the ongoing environmental impact assessment (EIA) with technical data.

Once completed, the hybrid offshore wind farm will enhance the interconnection between Estonia and Latvia, increase the share of renewable energy and facilitate transition to a low carbon energy future in the region.



CEF Energy funding: € 99,000

Countries involved: Estonia and Latvia

Beneficiaries: Eesti Energia AS (EE)



CEF Energy funding: € 199,944

Countries involved: Germany and Austria

Beneficiaries: REGIONALWERK CHIEMGAU RUPERTIWINKEL GKU (DE)

Energieregion Südostbayern-Oberösterreich-Salzburg: Preparatory study

In this CEF funded Action, Regionalwerk Chiemgau-Rupertiwinkel will investigate the heat demand and supply as well as overall feasibility of a supra-regional district supplied by sustainable sources: geothermal energy, bioenergy as well as waste energy from local industry. The renewables-based district heating between southern Germany (Bavaria) and Austria (Upper Austria and Salzburg) would help the two participating countries to reduce their reliance on fossil fuels, increase security of supply, and decarbonise their energy systems. This Action will foster the regional cooperation on energy matters. Overall, if the suspected potential is confirmed, the supra-regional district heating could lead to over 2 TWh of annual heat consumption being supplied from sustainable sources, avoiding around 450 thousand tonnes of CO₂ emissions on a yearly basis.

CEF ENERGY 2021-2027 - MOVING FORWARD

In the upcoming years, and in the context of the multiannual financial framework covering from 2021 to 2027, CEF Energy will play a crucial role in delivering the energy transition by financing PCIs and CB RES projects that will contribute to a more integrated, resilient and sustainable European energy market.

The programme, implemented under the new TEN-E Regulation that entered into force this June 2022, will support the strengthening and deployment of energy infrastructure with a special emphasis on decarbonisation, offshore electricity grids, hydrogen and smart grids.

In addition, it will fund more renewable energy projects in order to reduce fossil fuels imports, in line with the REPowerEU strategy launched by the Commission in May 2022. Therefore, CEF Energy grants will be key to build the new energy infrastructure and system that Europe needs and hence to achieve those goals.

European Climate, Infrastructure and Environment Executive Agency

European Commission

W910

B-1049 Brussels, Belgium

+32 (0)2 299 5252



<https://cinea.ec.europa.eu>



cinea@ec.europa.eu



[@cinea_eu](https://twitter.com/cinea_eu)



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