



CCS Programme Office

# ORLEN S.A. – implementing CCS through ECO2CEE Project

---

Vilnius, 2024



Co-funded by  
the European Union

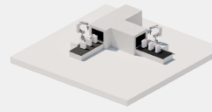
# ORLEN Group: the biggest multi-energy company in CEE

## REFINING



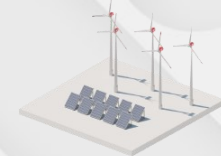
- 7 refineries in Poland, Lithuania and Czechia with max. crude oil throughput of 42.6 mt/y.
- Strategic location of refineries with an access to crude oil pipelines, product pipelines and sea terminals.
- Diversification of crude oil supplies.

## PETROCHEMICALS



- Petrochemical assets fully integrated with refining.
- Wide portfolio of petchem products sold to more than 60 countries.

## ENERGY



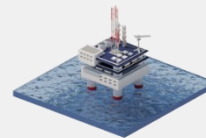
- Installed capacity: 5.6 GWe (electricity) / 13.8 GWt (heat).
- > 70% of electricity production comes from zero and low-emission sources (renewables and modern CCGT's).
- > 200 th. km of electricity network.
- Construction of the first wind farm in the Baltic Sea with a capacity of up to 1.2 GWe.

## RETAIL



- ORLEN – the most recognizable and valuable Polish brand worth ~ PLN 10 bn.
- ~ 3 500 fuel stations in 7 countries – the largest retail network in CEE.
- ~ 2 700 fuel stations equipped in non-fuel concept.
- ~ 800 alternative fuel stations (EV charges, CNG, H2).

## UPSTREAM



- Onshore and offshore activities in Poland, Norway, Canada, Pakistan and Lithuania.
- ~ 1.3 bn. boe 2P crude oil and gas reserves.
- ~ 215 k boe/d average hydrocarbon production.

## GAS



- The biggest supplier and importer of gas for business and households in Poland.
- Long term contracts for LNG supplies.
- Norwegian gas portfolio – own production and supply contracts.
- > 3.3 bcm gas storage capacity.
- > 210 th. Km of gas distribution network with service lines / 7.6 m customers / ~ 70% coverage of Poland.

# CCS implementation – challenges

## CHALLENGES



### REGULATORY

Necessary further changes to the law before CCS is possible in Poland.



### SOCIAL

Lack of common knowledge about CCS technology and potential fear of it - public resistance.



### FINANCIAL

Necessary high CAPEX for each CCS value chain element.



### TECHNICAL

Investigation of potential geological structures may reveal that they are not suitable for CCS purposes.

# 1st PCI/PMI list

## PCI

**CO2 TransPorts** - will establish infrastructure to facilitate large-scale capture, transport and storage of CO<sub>2</sub> from the Rotterdam, Antwerp and North Sea Port areas (No. 12.3 on the fifth PCI list)

**ECO2CEE<sup>1</sup>** - open-access cross-border CO<sub>2</sub> transport and storage project with projected storages sites in Denmark, Norway, Netherlands and UK (extension of no. 12.9 on the fifth PCI list)

**Callisto** - development of multi-modal CO<sub>2</sub> hubs in the Mediterranean storing CO<sub>2</sub> emissions from France and Italy

**Delta Rhine Corridor** - project to transport CO<sub>2</sub> via pipelines from emitters in the Ruhr area in Germany and the Rotterdam area in the Netherlands to offshore storage off the Dutch coast

**GT CCS Croatia** - construction of pipeline transport infrastructure in Croatia and Hungary, with underground storage in HR

**Prinos** - offshore storage at Prinos field for emissions from EL, by pipeline, and from BG, HR, CY, EL, IT and SI by ship

**Aramis** - cross-border CO<sub>2</sub> transport and storage project, intake from emitters in the hinterland of the Rotterdam harbour area, pipe transport to storage on the Dutch continental shelf (No. 12.7 on the fifth PCI list)

**Bifrost** - transport and storage project with offshore storage in DK from emitters from Denmark, Germany and Poland

**CCS Baltic Consortium** - cross-border CO<sub>2</sub> transport via rail between Latvia and Lithuania with a multi-modal LCO<sub>2</sub> terminal based in Klaipeda

**EU2NSEA** - cross-border CO<sub>2</sub> network developed between Belgium, Germany and Norway to also collect CO<sub>2</sub> from DK, FR, LV, NL, PL and SE, with storage on the Norwegian continental shelf

**Norne** - transport infrastructure in Denmark with onshore and possibly offshore storage, emitters primarily from DK, SE, BE and UK will transport to DK via ship

**Pycasso** - transport and storage of CO<sub>2</sub> in onshore storage site in southwestern FR, industrial emitters from FR and ES

## PMI

**Northern Lights** - a CO<sub>2</sub> cross-border connection project between several European capture initiatives (among others Belgium, Germany, Ireland, France, Sweden) transport by ship to storage on the Norwegian continental shelf (No. 12.4 on the fifth PCI list)

**Nautilus CCS** - Emissions from Le Havre, Dunkirk, Duisburg and Rogaland areas to be captured and transported by ship to various sinks in the North Sea (extension of no. 12.8 on the fifth PCI list)

**Abovementioned project can apply for grants form CEF Energy „Studies” and „Works” phase in 2024-2025**

### UWAGA:

1. The change of the project's name from EU CCS Interconnector to ECO2CEE resulted from the addition of another entity to the cooperation with ORLEN S.A., Holcim Polska S.A. i Air Liquide Polska Sp. z o.o. – ORLEN Lietuva

# Projects with CEF Energy funding

PROJECTS	FUNDING	DESCRIPTION	PHASE
D'Artagnan	189 mEUR	Construction of a pipeline and CO <sub>2</sub> terminal	WORKS
CO <sub>2</sub> NEXT	33 mEUR	Construction of CO <sub>2</sub> terminal	
Aramis	124 mEUR	Construction of 200 km pipeline connecting the CO <sub>2</sub> Terminal with the sequestration site	
Northern Lights	131 mEUR	Expansion of the CO <sub>2</sub> Terminal and the construction of 100 km pipeline connecting the Terminal with the sequestration site	
<b>EU CCS Interconnector</b>	2,54 mEUR	Documentation preparation stage for the CO <sub>2</sub> Terminal and transport infrastructure	STUDIES

ORLEN S.A. project implemented in cooperation with Holcim Polska S.A. and Air Liquide Polska Sp. z o.o.

All projects were previously included in the 5th PCI List of Projects of Common Interest

# ECO2CEE Project – general information

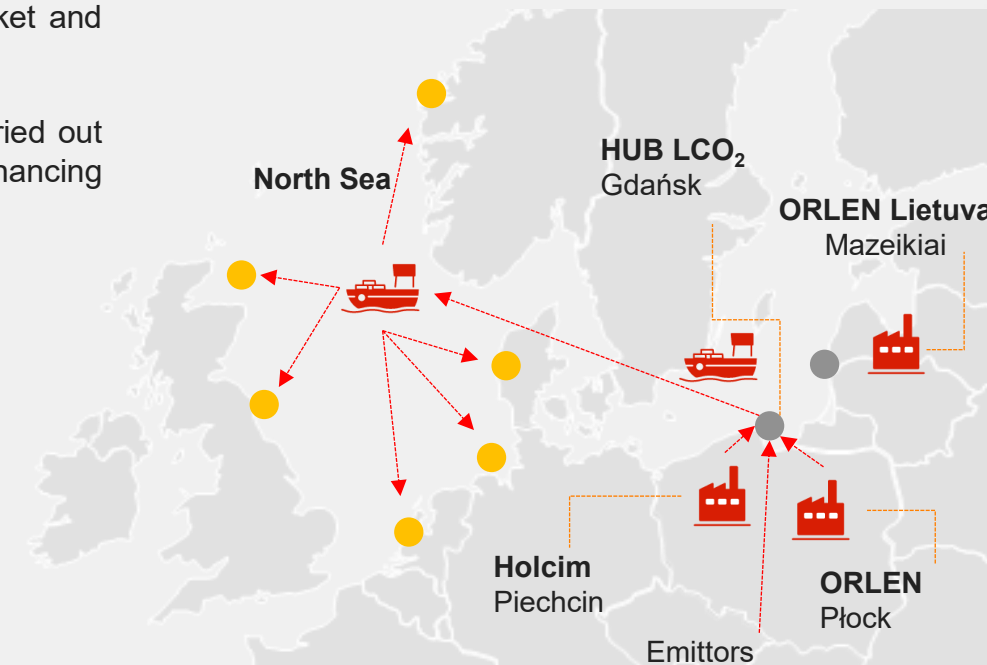
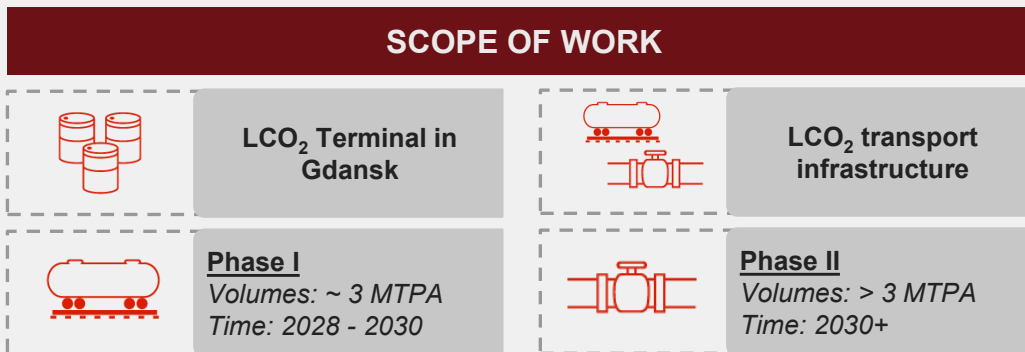
**ECO2CEE** is a project led by the consortium made of **ORLEN** (Coordinator), **Air Liquide** and **Holcim**. The main aim is to **develop CCS infrastructure allowing to decarbonise entities in hard-to abate sectors in Poland**. It will contain an open access multi-modal liquid CO<sub>2</sub> (LCO<sub>2</sub>) import-export terminal in Gdańsk and related CO<sub>2</sub> transport infrastructure (railways or pipelines) from the facilities of industrial emitters to the pan-European CCS network (especially sequestration sinks on the North Sea).



**ECO2CEE Project** was submitted on **the 5th PCI list and 1st PCI/PMI list**.






„Projects of common interest (PCI) / Projects of mutual interest (PMI)” - are key infrastructure projects aimed at completing the European internal energy market and help the EU to achieve its energy and climate objectives.

Preparation of technical documentation for the ECO2CEE project is being carried out as part of the **Sudies4CCS Interconnector** action, implemented with the co-financing from the CEF Energy program.

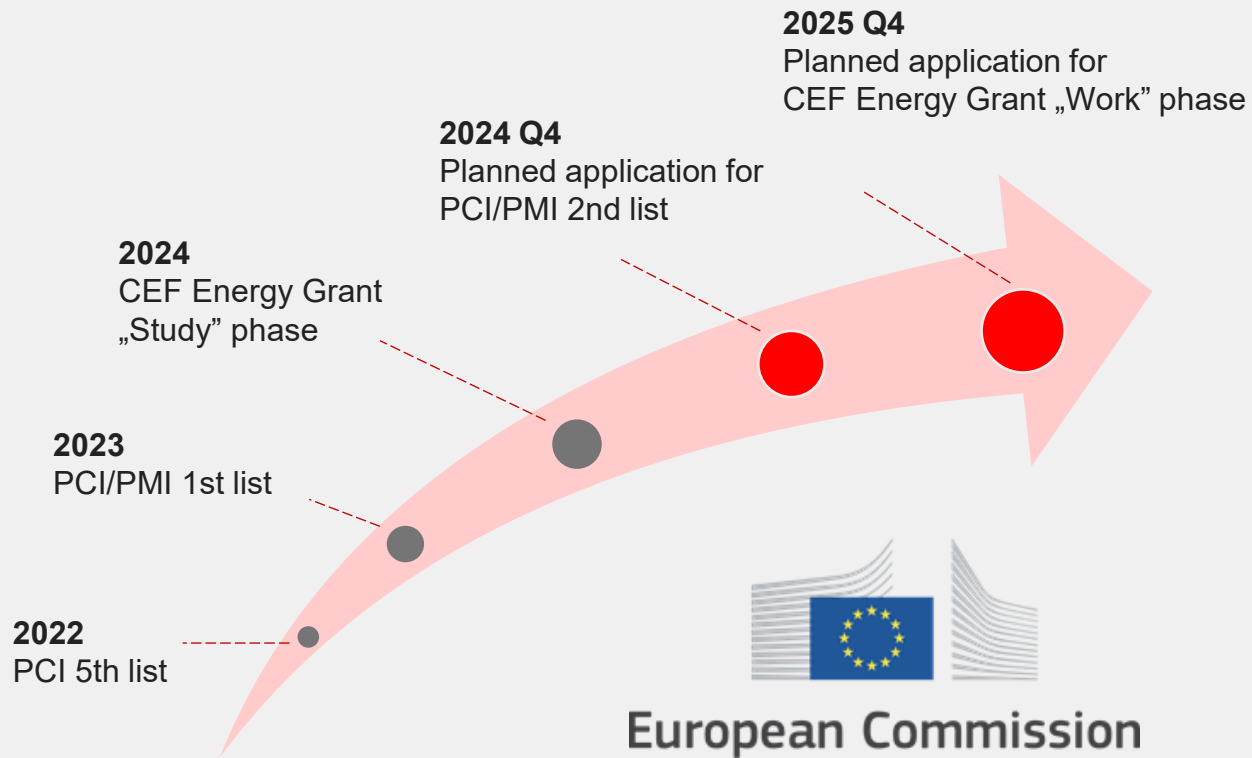


Co-funded by  
the European Union

# ECO2CEE Project – Study Phase granted with CEF Energy

Work package	Scope of work	Comments
 <b>WP1</b>	<b>Project Management</b>	<i>It aims to ensure successful project implementation within the set deadlines, budget and in accordance with the terms and conditions of the Grant Agreement.</i>
 <b>WP2</b>	<b>Civil engineering design study for the Gdańsk LCO<sub>2</sub> HUB</b>	<i>It will prepare the design with a 3D spatial model of main components of CO<sub>2</sub> terminal and produce detailed engineering drawings and packages the scope work into commitment package ready to do out for bid during the next phase. It will initiate and follow all necessary authorisation and files for permitting for the LCO<sub>2</sub> hub construction.</i>
 <b>WP3</b>	<b>Feasibility Study for maritime transportation from Gdańsk to the potential storage sites</b>	<i>The aim is to analyse the current state of play of ships transporting LCO<sub>2</sub> via the Baltic-sea from Gdańsk to the CO<sub>2</sub> storage location, both port-to-port and port-to-storage operations, including global costing estimate though a benchmark of maritime transportation fee from LCO<sub>2</sub> shipping operators.</i>
 <b>WP4</b>	<b>Feasibility Study for short distance pipeline from the nearest emitters to CO<sub>2</sub> Gdańsk hub</b>	<i>The study on a feasibility of pipeline connection with the nearest emitters of the Gdańsk hub.</i>
<b>WP5</b>	<b>Feasibility study for long distance pipeline from emitters to CO<sub>2</sub> Gdańsk hub</b>	<i>The study on a feasibility of pipeline connection between the Gdańsk hub and main emitters, located up to 300 km from it.</i>
 <b>WP6</b>	<b>CBA for global socio-economic assessment</b>	<i>Complete analysis and calculation of all positive and negative externalities.</i>

# ECO2CEE Project – PCI/PMI 2nd list and CEF Energy Works



In autumn 2024, a new call for **2nd PCI/PMI list** will be opened for the next 2 years. The Commission intends to draw up a new EU list of projects of common/mutual interest. ORLEN, together with its partners Holcim and Air Liquide, plans to apply to this call.



After conducting all necessary studies we also plan to apply for **CEF Energy Works** grant. It will help us to continue the ECO2CEE Project and develop CCS infrastructure in Poland. Given that the most advanced projects are located in North-Western Europe, the contribution of ECO2CEE is crucial to decarbonise hard-to-abate sectors in the short-term.



# Helsinki Convention – sequestration on Baltic Sea



## Helsinki Convention

**The Helsinki Convention is a treaty, an international agreement**, i.e. an agreement between states and international organizations, which is a normative act, concluded in writing and regulated by international law. It's interpretation must deal with the Vienna Convention requirements.

The Convention establishes rules on the **protection of the marine environment of the Baltic Sea area**.

**The Baltic Marine Environment Protection Commission** – also known as the **Helsinki Commission (HELCOM)** – is an intergovernmental organisation (IGO) and a regional sea convention in the Baltic Sea area.

HELCOM members and signatories to the Convention are the countries bordering the Baltic Sea, i.e. Denmark, Estonia, Finland, Lithuania, Latvia, Germany, Poland, Russia, Sweden and the European Union.

It refers to the offshore oil and gas activities in the annex 6. – however it does not prohibit it but set strict rules.



**There are some misunderstandings in the interpretation of the principles and definitions of the Helsinki Convention regarding CCS. Some may try to use the Helsinki Convention to stop CCS activities in the Baltic Sea.**

In fact the meaning and purpose of CCS should be understood as beneath:

- **Geosequestration does not involve the introduction of substances into the sea.**
- **Hermetic underground storage of CO<sub>2</sub> does not generate the risks** mentioned in the Convention's definition of „pollution”.
- **The purpose of CCS is to permanently and hermetically trap CO<sub>2</sub>** in an underground complex and does not constitute "placing material for disposal only". The behavior of the gas after injection is covered by monitoring covering a period of decades and by modeling assuming hundreds of years of CO<sub>2</sub> cloud propagation in the complex.
- **Underground storage of CO<sub>2</sub> does not mean dumping** within the meaning of the Convention: the gas is not introduced into the sea or onto the seabed, but into underground structures bounded by an overburden of not less than 800 meters in thickness. Such structure may be deemed as „seabed subsoil”, but not as „seabed”.
- The "seabed" is only a narrow geological layer lying under the water column, several to a dozen or so meters thick. The Helsinki Convention does not limit the right to use the deep layers of the shelf.

***Action to clarify the application of the Helsinki Convention and enable the implementation of CCS in the Baltic Sea as a variable and safe technology enabling decarbonisation of hard-to-abate sectors.***



CCS Programme Office

# Thank you for your attention.

---

Vilnius, 2024



Co-funded by  
the European Union