

BUILDING MOMENTUM  
FOR THE LONG-TERM CCS DEPLOYMENT  
IN THE CEE REGION

# Summary of CCS4CEE project

Romania

Implemented by:



Co-financed by:



Sfinansowano przez Narodowy Instytut  
Wolności - Centrum Rozwoju  
Społeczeństwa Obywatelskiego  
ze środków Programu Rozwoju  
Organizacji Obywatelskich  
na lata 2018 – 2030

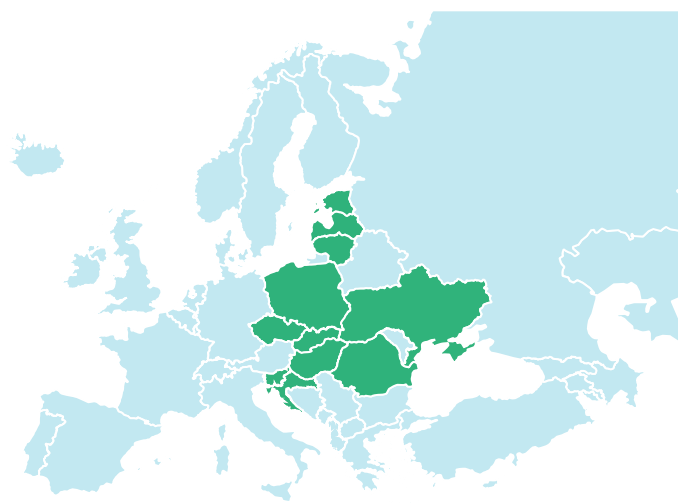


# CCS4CEE project

**PROJECT CONTEXT** | Recent advances in several key areas (e.g., renewable energy sources, energy storage, electric vehicles) enable significant greenhouse gas (GHG) emission cuts but are not sufficient to reach deep decarbonisation consistent with Paris Agreement. This is recognised by International Energy Agency in its technology assessments and various modelling studies by both European Union institutions and independent researchers. Carbon capture and storage (CCS)<sup>1</sup> deployment may reduce industrial emissions, provide low-carbon industrial heat and improve the energy security by allowing dispatchable power sources to continue operating with low emissions. However, its large-scale implementation requires a long-term policy framework. At the moment, the topic of CCS is not present in the mainstream debate on climate policy in the Central and Eastern European (CEE) countries. This may lead to uneven progress in CCS deployment across Europe, resulting in increased catching-up costs as well as missed opportunities for national development and regional cooperation. This project is designed to counteract this scenario.

**PROJECT GOAL** | The project aims to renew the discussion on the long-term deployment of CCS in the CEE region, leading to new policies and joint projects. It is expected that building evidence-based consensus among key stakeholders will pave the way to implement concrete policies and ventures. This will be achieved through combining analytical work, in the form of national and regional publications, with outreach, communication and capacity-building activities focused on the importance of timely CCS deployment and associated international cooperation.

**SCOPE AND PHASES** | The project covers Poland, Czech Republic, Slovakia, Hungary, Slovenia, Croatia, Romania, Lithuania, Latvia, Estonia and Ukraine.



---

<sup>1</sup> CCS refers to “the capture of CO<sub>2</sub> from industrial installations, its transport to a storage site and its injection into a suitable underground geological formation for the purposes of permanent storage”, as defined by the European Commission. On the other hand, in carbon capture and utilization (hereinafter – CCU), the captured CO<sub>2</sub> is transported to a facility in which it is utilized. CCU exhibits fundamental differences stemming from the fate of the captured and transported CO<sub>2</sub> – in CCU, it is embodied into products, whereas in CCS it is permanently stored in underground geological formations. The main focus of the CCS4CEE project is CCS.

The project is implemented by four stakeholders from the CEE region in cooperation with the expert partner from Norway:



WiseEuropa

WiseEuropa is an independent think-tank institute located in Warsaw. It is the lead partner of the project and coordinator of the work in Poland, Croatia and Slovenia.



Institute for  
European  
Integration

Institute for European Integration is a non-profit, non-partisan, and independent think tank focusing on European integration and cohesion. It coordinates the work in the Czech Republic and Slovakia.

CIVITTA

CIVITTA is a leading management consultancy from CEE. It coordinates the work in Lithuania, Latvia, Estonia and Ukraine.

EPG  
ENERGY POLICY GROUP

Energy Policy Groups is a non-profit, non-partisan independent think-tank located in Bucharest. It coordinates the work in Romania and Hungary.

BELLONA  
E U R O P A

The Bellona Foundation (expertise partner) is an independent non-profit organization that aims to provide expertise regarding the climate change issue by identifying and implementing sustainable environmental solutions.

The three phases of the project are as follows:

1. Determination of the starting point: assessment of the current state and potential of technological options, as well as European policy landscape and national contexts (Work Package 3, 2021);
2. Development of national roadmaps as well as regional cooperation roadmap for CCS deployment in the CEE region (Work Package 4, 2022);
3. Supporting implementation of the roadmaps through networking and capacity-building events (Work Package 5, 2023).

The project targets national and local policymakers, the business sector, research institutions and civil society. This will support the emergence of a socially accepted mix of appropriate policies, R&D and deployment activities. The project will ultimately benefit the CEE societies by supporting the timely implementation of CCS technologies which will ensure a smooth low-carbon transition.

**PROJECT FUNDING** | The project is funded by EEA and Norway Grants Fund for Regional Cooperation (project contract number 2018-1-1141).

**ADDITIONAL INFORMATION ON THE PROJECT** | Additional information about the project, including national and regional reports and deliverables, can be accessed on the project website: [ccs4cee.eu](https://ccs4cee.eu)

# Opportunities and barriers for CCS deployment

## CCS4CEE PROJECT COUNTRIES

Across project countries, several commonalities relevant to CCS have been identified:

- Many project countries **rely on manufacturing sectors**, while their energy production depends heavily on fossil fuels. This condition, coupled with sometimes distant or uncertain deadlines for emissions reduction targets, means that **CCS for the energy sector cannot be ruled out in the CEE region**.
- Various transportation methods may be available to move CO<sub>2</sub> from emitters to storage sites in project countries or within the region. However, **CO<sub>2</sub> transportation infrastructure is mostly absent**.
- Amongst project countries, Ukraine has the highest estimated potential for geological storage of CO<sub>2</sub>, followed by Romania and Poland. However, **more research is needed** to refine knowledge on storage potential, which often relies on theoretical estimates.
- Most project countries have a history of research (and occasionally testing) of CCS. Future projects would be supported by **existing know-how and experience**, including international cooperation.
- The regulatory environments of project countries are **relatively underdeveloped**, and many fail to provide certainty for CCS, particularly regarding storage and transportation.
- **Funding support** is available at the EU level, and frameworks such as Projects of Common Interest may lend themselves to large-scale regional CCS projects.
- Many stakeholders in project countries **are cautious about deploying CCS** due to its high costs, lack of clear government support and financing, and challenging administrative procedures. Many also tend to favour CCU over CCS due to perceived lower complexity and risks.
- An overall **lack of public and institutional knowledge** of CCS is an important feature evident in project countries.

## ROMANIA

While Romania's emissions have declined significantly since 1989, the country's economy still **relies on high-emitting industries**, with industry emissions making up a third of total national CO<sub>2</sub> emissions (including 14% from process emissions, higher than the EU average). Important contributing industries to these emissions include **cement production, metallurgy and chemicals production**, which could benefit from carbon capture as a decarbonization pathway. Significant emitters include Liberty Steel Galați (primary steel producer), Holcim and HeidelbergMaterials (cement producers), Azomureș (fertilizer producer) and the Petrobrazi and Năvodari refineries, but also large energy producers using coal or natural gas (see Figure 1).

## THE BIGGEST EMITTERS IN ROMANIA

EU ETS covered emissions of greenhouse gases in 2021

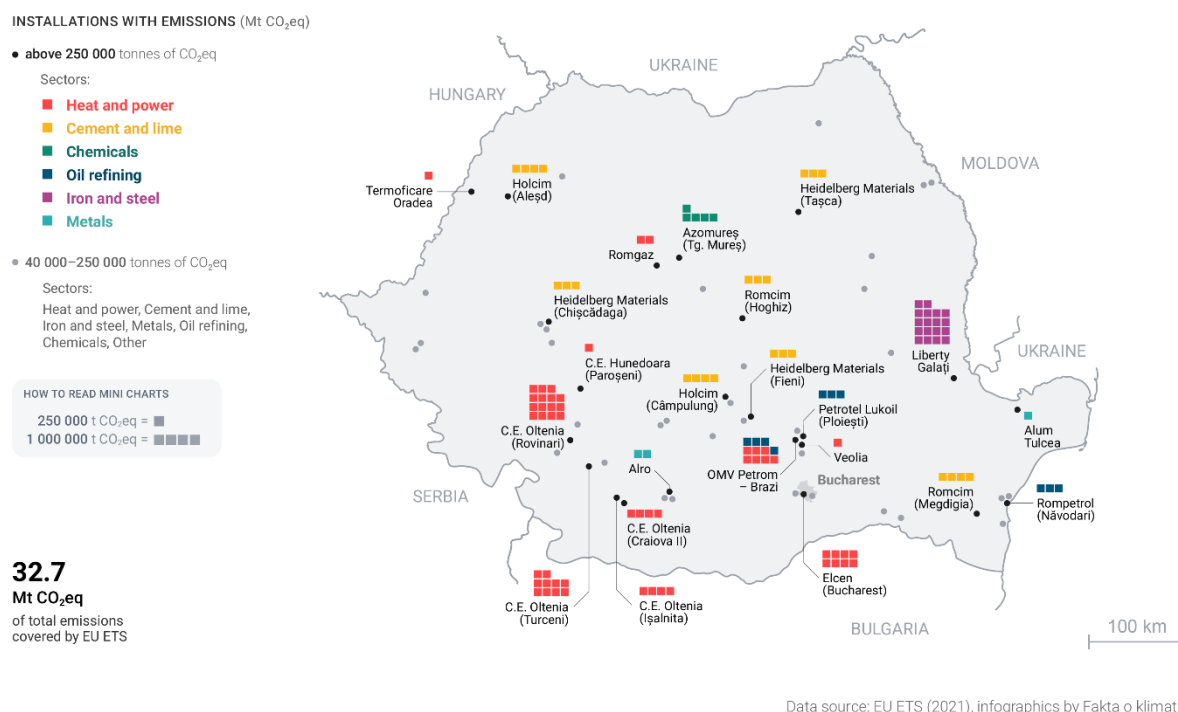


FIGURE 1. ROMANIA'S LARGEST EMITTERS IN THE EU ETS IN 2021.

In addition to having numerous point-source emitters which may benefit from carbon capture, Romania **may have ample potential for geological storage** of its domestic CO<sub>2</sub> emissions, both in onshore depleted hydrocarbon fields and saline aquifers. Estimates of onshore geological storage potential range from 9 Gt to 22.6 Gt<sup>2</sup>, most of which is found in deep saline aquifers. Potential storage capacity in depleted hydrocarbon fields is estimated at between 1.5 Gt and 4 Gt<sup>3</sup>, and short-term CO<sub>2</sub> injection for enhanced hydrocarbon recovery purposes has been successfully trialled at a number of Romanian oil wells. Offshore saline aquifers in the Black Sea have low capacities and are sparsely researched, while offshore depleted oilfields in the western Black Sea Basin may offer good possibilities for CO<sub>2</sub> storage.

Experience with CCS research is ripe in Romania, and the mature oil and gas industry brings technical know-how on CO<sub>2</sub> injection and storage. However, **no demonstration or commercial CCS projects have been successfully implemented in Romania** to date. Romania's only proposal for a CCS demonstrator was the Getica project (2011), a full-chain CCS project proposing to capture up to 1.5 Mt CO<sub>2</sub>/year from a unit of the coal-fired Turceni power plant (see Figure 1) and store it in nearby onshore saline aquifers, at an estimated cost of €1 billion. The project never materialized due in part to the collapse of EU carbon prices dictating the

<sup>2</sup> Estimates from the CO<sub>2</sub>STOP project and EU GeoCapacity project, respectively.

<sup>3</sup> Ibid.

availability of project funding, and to the lack of reconfirmation of support from the Romanian government, as part of the process of applying for EU funding. Nevertheless, Romanian research and academic institutions have continued contributing to national, European and international research projects on CCS, and in recent years, **interest in CCS has been rekindled** among Romanian stakeholders.

Given their high capital costs and infrastructure requirements, CCS technologies require concerted government support, including policy incentives and regulatory frameworks fit for purpose. Romania transposed the EU CCS Directive in 2011 to enable the Getica demonstrator project, with the National Agency of Mineral Resources (NAMR) being assigned as the competent authority on CO<sub>2</sub> storage. However, **secondary legislation to enable CO<sub>2</sub> transport and storage is unclear or missing**, and the transposition of the Directive **lacks the administrative and procedural aspects** to enable commercial CO<sub>2</sub> storage projects. Moreover, CCS is rarely mentioned in Romania's national policies or strategies on energy or climate. Therefore, improvements in the regulatory framework and the establishment of policy commitments to CCS are likely one of the foremost necessary steps to be taken in deploying CCS in Romania.

A variety of stakeholders should be leveraged to enable CCS projects in Romania, particularly cement and chemicals producers. Stakeholders engaged in the CCS4CEE project primarily identified **the lack of institutional involvement and high costs of CCS** as barriers to deployment and pointed to national and European authorities for more clarity on incentives and timescales for commercial CCS projects. Their main recommendations were:

- 1) The development of a national CCS strategy.
- 2) The development of transportation infrastructure and industrial clusters.
- 3) The establishment of a national financing framework and suitable financial instruments.
- 4) Public/institutional education, dialogue and capacity-building. Importantly, public discourse around CCS is negligible in Romania, and the risk of social opposition to potential projects should not be discounted.

A detailed assessment of the current state, past experiences and potential for CCS/CCU deployment in Romania and other project countries is available on the project website: [ccs4cee.eu](https://ccs4cee.eu)

# Policy roadmap for the scaled-up deployment of CCS in Romania

Based on the assessment of past experiences and CCS potential, a national policy roadmap was prepared to outline how the future development of CCS technologies could proceed in Romania, and under which enabling conditions. The roadmap provides an overview of various policy actions along the innovation cycle, from research and development to enabling policy and financial frameworks for commercialization. While the roadmap aims to describe an enabling environment to deploy CCS projects, it also focuses on ways to develop transferable knowledge and skills by national stakeholders (governments, research organizations, academia, private sector) in one or more stages along the carbon capture, transport, storage and utilization chain, and create linkages to gain knowledge and experience from more experienced stakeholders across the globe.

Based on the developed roadmap, immediate actions for the further advancement of CCS in Romania (i.e., to be delivered in the next 1-2 years) are as follows.

- 1) Establishing government commitment by appointing **CCS “champions”** in the Ministries of Energy, Environment and Economy.
- 2) Enable a **detailed assessment of CCS potential** in Romania.
- 3) Formulate and propose a **national CCS strategy**.
- 4) Build **institutional knowledge and capacity** on CCS within public authorities.
- 5) Establish an **association of interested actors** for knowledge transfer and advocacy.
- 6) Prepare a **public education and participation plan**.

Longer-term actions to enable CCS (i.e., to be delivered beyond the immediate actions) are as follows:

## Policy, regulatory framework and the role of the state

- Romania’s transposition of the EU CCS Directive (**GEO 64/2011**) must be reviewed and improved in primary and secondary legislation.
- An **inter-ministerial committee** should drive policy and regulatory change for CCS.
- A **clear trilateral CCS strategy** between the Ministries of Economy, Energy, and Environment must be established based on an updated assessment of national CCS potential.
- **Specific regulations** (e.g., national petroleum law) and procedures should be amended or developed.
- **Standards** for CO<sub>2</sub> transport and storage must be incorporated into national legislation.
- Romania should ratify the **London Protocol**.
- Relevant **decarbonization strategies** should be updated to reflect CCS.
- The Romanian government should disseminate **existing strategies and communications** on CCS, and experts from across political parties should be encouraged to **discuss CCS**.
- The Romanian government should establish and coordinate **financing frameworks** that CCS projects can access, including disseminating information and supporting applications for EU funding.
- **Relevant authorities** must be aligned in their approach to CCS.
- Transport and storage should be assigned to a **specific operator**.
- Emerging CCS hubs should encourage horizontal **business opportunities** supported by the government.

## Research, development and scaling

- 1) Cooperation, knowledge, and capacity:
  - The **CO<sub>2</sub> storage division** of the NAMR should be provided with the appropriate resources.
  - A **national knowledge platform** for CCS should be established by the inter-ministerial committee. Activities should include an institutional **capacity-building** programme and **regional cooperation** efforts.
  - An association of **economic operators** for CCS should be established.
  - Romanian authorities should be more involved in international CCS platforms, e.g., the Zero Emissions Platform.
  
- 2) Evaluation of CO<sub>2</sub> storage potential:
  - An **updated and in-depth assessment** of Romania's CCS potential should be conducted, including emitters, storage potential, transport and cost-benefit analyses. It should inform the CCS strategy and identify potential hubs.
  - Following evaluation, NAMR should **invite applications** for exploration and storage permits.
  - Following evaluation, in-depth studies of **depleted oil and gas reservoirs** should be conducted.
  - While the evaluation of hydrocarbon reservoirs is ongoing, the NAMR should direct financing to the evaluation of the storage potential **of saline aquifers**.
  
- 3) Research projects:
  - A framework to govern **corporate-research partnerships** for pilot CCS projects is needed.
  - Economic operators should approach research institutions and co-opt engineering design firms to project consortia for **EU funding applications**.

## Stakeholder engagement, cooperation and know-how dissemination

- The Romanian government must **communicate with stakeholders** on CCS from the start (before exploration permit applications).
- Authorities should engage in and lead **knowledge transfer workshops**.
- **Cross-border project opportunities** should be explored.
- The government should consider classifying CCS projects as **Projects of Common or Mutual Interest**.
- Petroleum companies should cooperate with the cement, metallurgy, and chemical industries to catalyse the **CO<sub>2</sub> market** and form hubs.

## Social aspects and public support

- The government must implement a **national education and awareness plan** for climate change.
- Subsequently, the government, with an independent NGO, should deliver a **national CCS education programme** for the public and institutions as part of broader decarbonisation programmes.
- Policy and regulatory changes for CCS should be **transparent** and encourage **public participation**.



- **Communities** local to potential CCS sites should be engaged early on.

The detailed CCS national roadmap for Romania and other project countries is available on the project website: [ccs4cee.eu](https://ccs4cee.eu)

