

Roadmap for advancing carbon capture and storage in Romania

Executive summary

CCS - a vector of decarbonization in Romania. As an EU member state, Romania is committed to achieve climate neutrality by 2050. Although electrification and energy efficiency are the most effective solutions for reducing carbon dioxide (CO₂) emissions, some sectors will need carbon capture and storage (CCS) to prevent their CO₂ emissions from reaching the atmosphere. In Romania, these sectors (such as cement and steel production) are economically significant, so the development of CCS projects and related value chains is a strategic priority.

Romania has a number of large industrial issuers, experience in relevant industries (such as oil and gas production) and also a potentially significant CO₂ storage capacity. However, there is a lack of an adequate regulatory framework, scarcity of institutional capacity needed to advance projects, insufficient stakeholder coordination and financial incentives. Successful initiatives in Scandinavia and Western Europe demonstrate that CCS projects are feasible - but to achieve them in Romania requires more effort.

Key actions required. This roadmap signals a serie of concrete actions, belonging to distinct areas, which are necessary to advance CCS in Romania.

Among the most important are:

- **A detailed assessment** of the potential of CCS in Romania
- **A national CCS strategy**, linked to relevant decarbonisation strategies
- An appropriate **regulatory framework**
- **A platform** for knowledge transfer and project implementation
- **A program to involve the public** and strengthen institutional capacity.

These actions are mainly the responsibility of the Romanian Government and the National Agency for Mineral Resources (NAMR), and would benefit from the establishment of an inter-ministerial committee to oversee the CCS activities. The Ministries of Environment, Economy and Energy, as well as the competent authorities, economic operators, research institutions and NGOs should be involved.

In order to activate the CCS projects in Romania, these key actions, as well as others indicated in this roadmap, must be implemented as soon as possible. **The long execution deadlines** for changes in public policies, as well as for CCS projects themselves, highlight the need for prompt action to allow these technologies to contribute to Romania's 2050 targets. More broadly, the decarbonisation of Romanian industry is essential for ensuring a sustainable and competitive future for some of the most important sectors of the Romanian economy.

Opportunities and challenges for CCS in Romania

In 2019, Romania's CO₂ emissions were up to 77.4 megatons, with the majority coming from the energy sector (85.5%), followed by industry (13.8%). The main major emitters are located in the regions of Gorj, Galați, Ploiești, Constanța, Târgu Mureș and Bucharest. The adoption of CCS technologies is an important decarbonization solution for many of Romania's industrial producers, such as cement and steel producers, refineries, and others.

Romania has a potentially significant geological storage capacity for CO₂. Estimates of theoretical storage potential reach 22.6 gigatons - but more studies are needed to refine these estimates and to assess the technical and economic potential of storage. Mainly, the most detailed estimates are for depleted hydrocarbon deposits, but most of Romania's storage potential is located in saline aquifers, which are less well known.

Romania also has experience and know-how in the field of CCS projects and technologies. The Getica demonstrative project was a good example a decade ago, but was largely abandoned due to a lack of constant government support. Since then, research in the field of CCS has continued in Romanian universities and research institutions.

From the point of view of the regulatory framework, Romania has transposed the EU CCS Directive, and designated the National Agency for Mineral Resources (ANRM) as the competent authority for CO₂ storage. However, more effort is needed to reach an appropriate regulatory framework, including appropriate procedures and the institutional capacity to identify and operate CO₂ storage tanks. The lack of a coherent national strategy for CCS also leads to uncertainty regarding state support for these technologies

Roadmap for CCS in Romania

The key actions for advancing CCS in Romania are the following.

Public policies, regulatory framework and the state

- ➔ The transposition of the CCS Directive (GEO 64/2011) needs to be revised and primary and secondary legislation needs to be improved.
- ➔ An inter-ministerial committee should lead the public policy and regulatory activity for CCS.
- ➔ There is a need for a clear, trilateral strategy for CCS, involving the Ministries of Environment, Economy and Energy and based on an updated assessment of the national potential for CCS.
- ➔ Specific legislation (e.g. Petroleum law) needs to be amended and certain procedures amended or established.
- ➔ Standards for the transport and storage of CO₂ must be incorporated into national legislation.
- ➔ Romania should ratify the London Protocol.
- ➔ Decarbonization strategies need to be updated to include CCS.
- ➔ The Romanian Government should disseminate existing CCS strategies and communications, and experts from all political parties should be encouraged to address CCS.
- ➔ The government needs to establish and coordinate a funding framework that is accessible to CCS projects, including informing and supporting applications for EU funds.
- ➔ Relevant authorities need to be aligned.
- ➔ One or more specific operators for the transport and storage of CO₂ must be designated. Emerging CCS hubs should encourage business development with government support.

Research, development and marketing

1) Cooperation, knowledge and capacity

- CO₂ storage division of ANRM should be equipped with adequate resources.
- A national CCS knowledge transfer platform should be created by the inter-ministerial committee. Its activities would include institutional capacity building and regional cooperation efforts.
- An association of economic operators for CCS should be formed.
- The Romanian authorities need to get more involved in international CCS platforms, such as Zero Emissions Platform.

2) Evaluation of storage capacity

- An up-to-date and detailed assessment of the potential of CCS in Romania must be carried out, including the assessment of emitters, storage sites, transport routes and costs and benefits. This assessment must underpin the national CCS strategy and identify potential hubs.
- Following the evaluation, the NAMR must invite applications for exploration and storage permits.
- Detailed assessments of depleted hydrocarbon deposits must also be performed.
- During this assessment of hydrocarbon deposits, the NRAM should direct funds towards the assessment of CO₂ storage potential in saline aquifers.

3) Research projects

- A governance framework is needed for partnerships between economic operators and research institutes, for CCS pilot projects.
- Economic operators should approach research institutes and planning companies to form consortia and apply for EU funds.

Stakeholder involvement, cooperation and dissemination of know-how

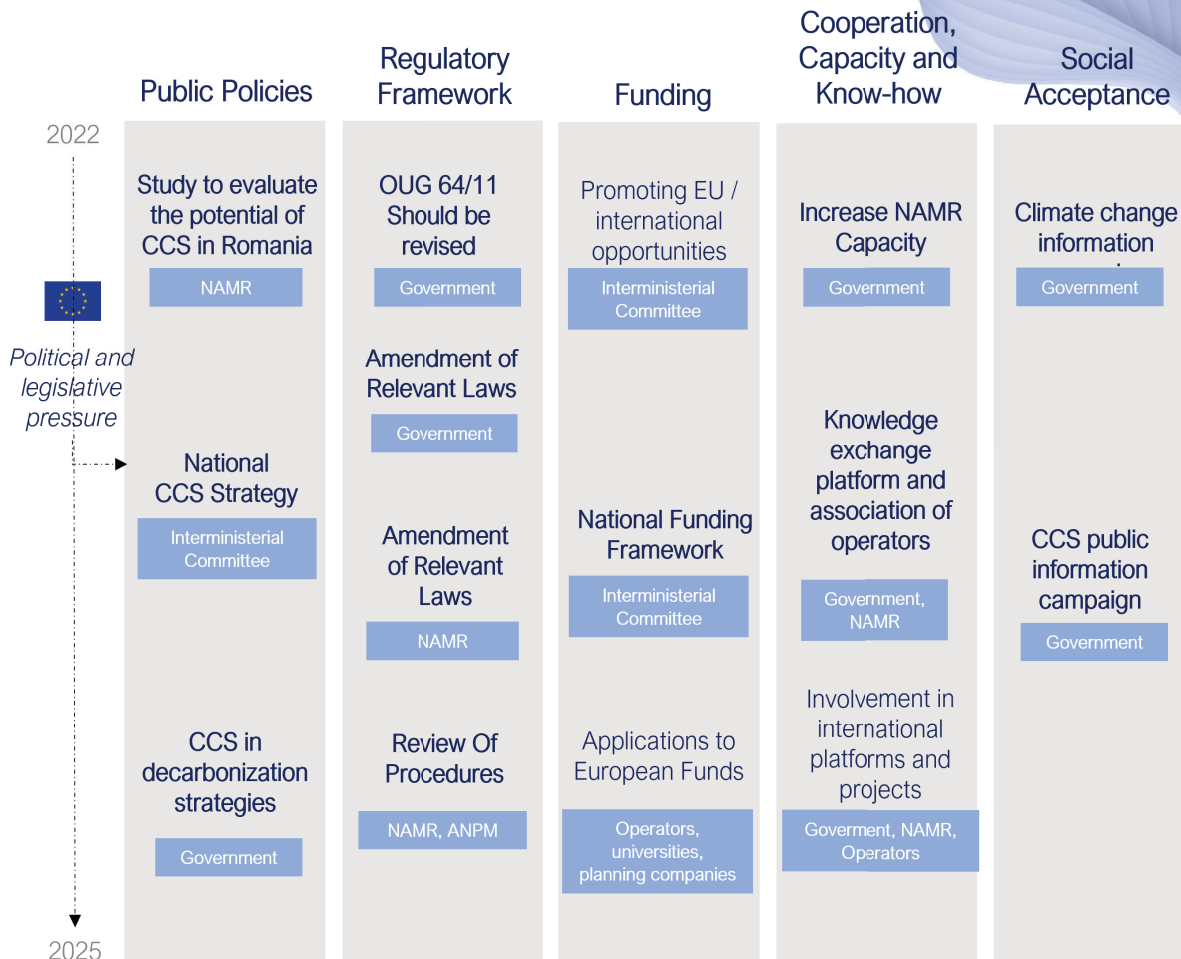
- The Romanian Government must communicate with interested parts from the beginning (even before the applications for exploration permits).
- Authorities should get involved and conduct knowledge transfer workshops.
- Opportunities for cross-border projects should be explored.
- The Government should consider classifying CCS projects as Projects of Common / Mutual Interest.
- Oil companies should cooperate with the cement, steel, and chemical industries to catalyze a CO₂ market and form hubs.

Social issues and public support

- The government must implement a national plan to raise awareness of climate change.
- The government, together with an independent NGO, should implement a national program for educating the public on CCS, as well as for institutions, within the broader decarbonization programs.
- Changes in public policy and regulatory framework must be transparent and encourage public involvement.
- Communities around potential CCS sites need to be involved from the beginning.

Priority actions for 2025

During the analysis for this roadmap, the following key actions have been identified that has to be implemented in the short term time (2025) to advance CCS in Romania.



The action led by the responsible stakeholder

NAMR: National Agency for Mineral Resources, ANRE: National Authority for Regulation in the Field of Energy, ANPM: National Agency for Environmental Protection, GEO: Government Emergency Ordinance

This roadmap was developed as part of the „Building Momentum for the Long-Term CCS Deployment in the CEE Region" (CCS4CEE) project, funded by Iceland, Liechtenstein and Norway through the EEA and Norway Grants Fund for Regional Cooperation. A more detailed version of this roadmap, as well as an analysis of the context and opportunities of CCS in Romania, are available on the CCS4CEE project website, at ccs4cee.eu.

EPG

The Energy Policy Group (EPG) is an independent think-tank, specialized in energy and climate policy. Grounded in 2014, EPG brings together experts that work together on research international projects. EPG pays close attention to a broader context of European politics and global trends, to promote a constructive dialogue among decision-makers and the general public.

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