

Member State report on Implementation of Directive 2009/31/EC on the geological storage of carbon dioxide ("CCS Directive")

GREECE

Changes, reviews and updates of national implementation legislation

1. *Are there any changes to national legislation, permitting system or competent authorities that have taken place since the last report on implementation of the CCS Directive in your country?*

In Greece, the Ministerial Decision 48416/2037/E.103/2011 (Government Gazette B' 2516/2011), as amended, transposed the CCS Directive 2009/31/EC into Greek law. The decision largely follows the philosophy of the EU CCS Directive. The recent law L.4920/2022 (art.228 par.1), as amended by the L.4964/2022 (article 175), designates the Hellenic Hydrocarbons and Energy Resources Management Company (HEREMA) as the competent authority for the licensing, monitoring and supervision of carbon storage projects. Moreover, article 173 of L.4964/2022 introduces a new licensing process for CO₂ exploration and storage permits for economical operators who already hold hydrocarbon exploration and production rights in areas which could potentially be used for carbon storage.

2. *Are there processes in place for storage permit applicants to engage pro-actively with the competent permitting authorities regarding relevant applications? If yes, please provide details.*

There aren't yet any specific processes in place for storage permit applicants to engage proactively with the competent permitting authorities regarding relevant applications in Greece, as the country is still in the early stages of defining potential storage sites. However, in the case of the Prinos field where a CO₂ exploration license has been granted, a working group has been established between the competent authority (HEREMA) and the exploration license holder to monitor progress and share concerns related to the exploration work. This working group meets on a regular basis every two months, with additional ad-hoc meetings scheduled as needed. This process allows for proactive engagement between the potential CO₂ storage operator and/or the exploration holder with the competent authority, to ensure smooth operations and that any potential obstacles are addressed and effectively mitigated.

3. *Please provide the name, email address and telephone of the contact point at the competent authority responsible for fulfilling the duties established under the Directive.*

Theodoros Sketopoulos: t.sketopoulos@herema.gr – Phone Number: +30 2106797836

Efthimios Tartaras: e.tartaras@herema.gr - Phone Number: +30 2106797852

4. *Are there any issues that the competent authority would like to discuss with other competent authorities in relation to the practical implementation of the Directive and in particular the national permitting procedures in the Information Exchange Group under the auspices of Article 27(2)?*

HEREMA, the competent authority for CO₂ storage in Greece, is actively participating in the Information Exchange Group to cooperate with other competent authorities and the EU Commission in order to ensure the implementation of the Directive. During a previous in-person meeting in Brussels, HEREMA raised several issues related to the practical implementation, including the need for a smooth transition from Oil & Gas to carbon storage operations by the same operator to expedite CO₂ storage applications in the country. Additionally, concerns were raised regarding the practical implementation of financial security and long-term liability.

Selection of areas for storage sites (Article 4)

5. *Which areas are determined from which storage sites may be selected pursuant to Article 4(1) until April 2023?*

We are still in the process of identifying the areas from which storage sites may be selected in accordance with Article 4(1) of the relevant directive. Although a preliminary assessment of potential storage areas has been conducted, this has only been done on a qualitative basis and no specific areas have been officially designated as of yet. However, the Prinos Basin, which includes the almost depleted offshore Prinos oil field, is currently a mature candidate site for carbon storage in Greece, for which an exploration permit was issued by HEREMA to Energean in September 2022, following the permitting process of L. 4964/2022.

6. *Will additional areas be determined from which storage sites may be selected in the period until the next report at the end of 2027, if so, which geological type of areas are considered (e.g, saline aquifers, depleted or not depleted gas & oil fields, mafic rocks) from a geological point of view and what are the next steps?*

Preliminary studies to determine potential areas for CO₂ storage in Greece have been mainly based on the type of geological formations, the “reservoir” quality of the rocks present, and the proximity to industrial clusters with considerable CO₂ emissions. Three types of areas are considered: saline aquifers, O&G fields and mafic rocks. Social acceptance and concurrent land/marine uses have not yet been addressed. More detailed studies are currently planned in order to designate in the coming years general areas from which potential storage sites may be selected for exploration.

7. *Are there information about environmental and/or health risks relating to the geological storage of CO₂ in accordance with the applicable Community legislation available to the public?*

To the best of our knowledge there is no information about environmental and/or health risks related to the geological storage of CO₂ in Greece. It is possible that there may be limited information regarding the environmental and health risks due to the fact that the deployment of CCS technology is still in development in the country with no injection expected before early 2026. HEREMA is participating, along with other Greek research institutes, in a Horizon funded program (PilotSTRATEGY) which, among other things, also addresses public information dissemination and public acceptance related to CCS.

Exploration permits (Article 5)

8. *Are there areas or specific sites where no exploration permits are required to generate the information necessary for the selection of storage sites, pursuant to Article 5?*

Regarding the need for exploration permits in Greece, there are no areas or specific sites where such permits are not required to gather the necessary information for selecting carbon storage sites, as per Article 5. Greece is still in the process of defining potential storage areas, however within all these areas an exploration permit will be necessary for characterizing a specific site.

9. *How many exploration permits have been given pursuant to Article 5 since your last reporting?*

As of September 2022, only one exploration permit has been issued in Greece for CO₂ storage. The permit was granted to Energean, according to National Law 4964/2022, to explore the potential for CO₂ storage at the Prinos complex, where it currently holds the oil & gas exploration and production rights.

Storage permits applications (Article 10)

10. *Member States shall make the permit applications available to the Commission within one month after receipt. Are there any plans of potential operators to apply for storage permits pursuant to Article 7? If yes, please provide an approximate timing.*

The exploration permit that was granted to Energean in September 2022 to assess the suitability of the Prinos Complex for CO₂ storage has a 22-month duration. It is anticipated that the potential operator will submit a storage permit application before the end of Q2 2024.

Third-party fair and open access (Article 21)

11. *What measures – if any – have been taken to ensure that potential users are able to obtain fair and open access to transport networks and to storage sites for the purposes of geological storage of the produced and captured CO₂ (Article 21)*

As the Prinos carbon storage project matures, the future operator has initiated discussions with major CO₂ emitting industries in Greece to evaluate their interest in storing their carbon emissions at the (future) site. These discussions will help determine a potential model for capacity distribution among emitters with Industrial Carbon Capture (ICC). The potential operator is also in engagement with transportation entities such as gas pipeline owners in the country and shipping companies on the same aspect.

Meanwhile, as the Prinos carbon storage project progresses further and more information is obtained on the storage capacity and injectivity, the competent authority will take measures to ensure third-party access to the storage site and transport network in line with available storage capacity, thereby promoting fair and open access to the market. These measures could include establishing regulatory frameworks and guidelines for access to storage sites and transport networks, including pricing and allocation mechanisms that are transparent and non-discriminatory.

12. *Are you aware that prospective transport operators and/or storage operators have refused access to their facilities on the grounds of lack of capacity?*

As CCS deployment in the country is still in early stage (exploration stage), such situation has not arisen yet in Greece. It is expected that as the Prinos CCS project matures and the effective storage capacity is determined together with the annual injectivity, potential transport and storage operators will take necessary measures to ensure fair and open access to their facilities in accordance with regulatory frameworks and guidelines that will be set by the competent authority.

13. *What measures – if any – have been taken to ensure that the operator refusing access on the grounds of lack of capacity or a lack of connection makes any necessary enhancements as far as it is economic to do so or when a potential customer is willing to pay for them? (Article 21)*

As CCS deployment in the country is still in early stage (exploration stage), such situation has not arisen yet in Greece.

Transboundary cooperation (Article 24)

14. *Is there any experience or plans for transboundary CO₂ transport or CO₂ storage sites or storage complexes? Please provide details on the status of preparations, if any.*

There is no experience with transboundary CO₂ transport and there are currently no plans for transboundary CO₂ storage sites or complexes. However, the planned Prinos CO₂ storage project is expected to be the only available storage solution for regional emitters in hard to abate sectors. Provided that its suitability for carbon storage is confirmed, it is expected that it could receive CO₂ from other EU emitters outside Greece via ships (e.g., from Italy).

CO₂ capture readiness (Article 33)

15. *How many combustion plants with a rated electrical output of 300 MW or more have received a permit since the last implementation report? What was the outcome of the assessment under Article 36 of Directive 2010/75/EU? In case of negative assessment, have the combustion plants set aside suitable space irrespectively? Please provide detail for each permit according to Annex 2.*

Up to date, no combustion plants with a rated electrical output of 300 MW or more, which have or provide for the possibility of carbon capture and storage facilities, have been licensed.

Further questions

16. What other national programmes are in place or planned to support research, demonstration and deployment of CCS?

In Greece, efforts are underway to promote the deployment of carbon capture and storage (CCS) technology through various initiatives, partnerships, and collaborations with international organizations, as well as the establishment of a competent authority for CO₂ storage. The CO₂ storage project of Prinos has been included in Greece's projects eligible for funding from the Recovery and Resilient Fund. The Prinos project aims to develop the first CO₂ geological storage site in the country in the offshore Prinos oil field, which will allow storage of CO₂ emissions from the hard-to-abate Greek industries.

HEREMA has also published a White Paper that addresses the current status and latest developments of CCS worldwide, with particular focus on Europe. The White Paper also addresses the regulatory frameworks in other countries with more advanced CCS regulations, such as Italy, Spain, Norway, Netherlands, and the UK, to identify legislative gaps and best practices. This work has also mapped the next steps required on the regulation aspect and evaluating all potential CCS business models that can be applied in Greece. The White Paper was officially presented to all key stakeholders, including the Government, emitters, transport and storage operators, in April 2023, and it kick-started the discussions towards a practical implementation of CCS solutions in the country.

HEREMA has also appointed representatives to the STAC (Scientific and Technological Advisory Committee) Task Force of the Eastern Mediterranean Gas Forum (EMGF) on decarbonization of the energy sector and climate change mitigation. This appointment further demonstrates Greece's commitment to advancing the deployment of CCS technology.

In October 2022, HEREMA signed a Memorandum of Understanding (MoU) with the Cyprus Hydrocarbon Company (CHC) to explore issues related to the transport, use, and storage of CO₂. Additionally, in October 2022, a partnership was signed with the Norwegian SINTEF Foundation to explore ways in which the experience of the hydrocarbon and offshore industries in Norway was adapted for the development of CCS and offshore wind projects, and how Greece can benefit from this experience.

Furthermore, in April 2022, HEREMA signed a Memorandum of Understanding with the Hellenic Centre for Marine Research (HCMR) to provide technical support and data exchange for the study and implementation of actions related to CO₂ storage, examination of issues and proposals concerning technical, environmental, and spatial issues, as well as the investigation of monitoring, measurement, and verification (MMV) methods and corrective measures for CO₂ storage sites, in particular Prinos. These partnerships and collaborations demonstrate Greece's commitment to exploring various avenues for the deployment of CCS technology and its potential to mitigate climate change.

17. Are there any ongoing national or European research projects that may have relevance to the Directive?

HEREMA is currently participating in the PilotSTRATEGY project, which is 100% funded by the Horizon 2020 Call and has an expected duration of five years. The project involves sixteen partners from seven European countries, including France, Spain, Portugal, Greece, Poland, Germany, and the UK. With a total budget of 10,022,547€, HEREMA's budget for the project is 365,000€. The objective of the project for the basins of Greece and Poland is to increase the maturity and confidence level of the storage resources, involving regional stakeholders and the public to study the social acceptance of CCUS technology in the transitional context of their energy system.

18. Are there other plans to support further appraisal of CO₂ storage sites, to prepare for CO₂ transport infrastructure or for CO₂ hubs and clusters?

HEREMA, as the competent authority for CO₂ storage, plans to study and determine areas in which additional storage sites could be explored. In terms of transport infrastructure, discussions are ongoing between relevant stakeholders (industry and government) for the development of (hybrid) transport solutions, comprising a mix of pipelines and shipping (e.g., a regional pipeline gathering all CO₂ emissions from local industry, and transporting it to a unique liquifying station from where it could then be transported to the storage site(s) by ships).