



Industry Brief: International and European Regulatory Framework for Carbon Capture and Storage (CCS)

The International and European regulatory framework is paving the way for the effective implementation and deployment of CO₂ capture and storage (CCS) technologies through global agreements and national legislations. Key international agreements like UNCLOS, OSPAR, and the London Protocol define the international rules for CCS, while the European regulatory framework is legislated by the EU ETS Directive and the CO₂ Storage Directive.

Introduction Carbon Capture and Storage (CCS) stands as a key solution to mitigate climate change, involving the capture, transport, and permanent storage of carbon dioxide (CO₂) emissions from point sources (e.g., cement, waste-to-energy, pulp-and-paper industries). Navigating the complex regulatory landscapes at both the international and European Union (EU) levels is essential to ensure effective CCS implementation, environmental safeguards, and cross-border collaboration.

International Regulatory Framework International law provides the foundation for CCS activities, emphasizing the need for responsible practices and cooperation across borders. Key international agreements shaping the CCS regulatory landscape include:

- **United Nations Convention on the Law of the Sea (UNCLOS)** UNCLOS, established in 1982, governs global ocean use and resource management. It mandates states to prevent the transfer of damage or hazards from one area to another, safeguarding marine environments from pollution. Although CO₂ is not classified as a pollutant under UNCLOS, the convention has relevance for regulating maritime activities related to CO₂ capture, transport, and storage.
- **OSPAR Convention** The OSPAR Convention, ratified in 1992, focuses on protecting the marine environment of the North-East Atlantic. This convention is particularly significant for EU and other emitters considering CO₂ storage in this region. Amendments to OSPAR were necessary to align its regulations with international agreements, such as the London Protocol, enabling the implementation of CCS without obstructing its progress.
- **London Protocol** The London Protocol, a critical agreement dating back to 1996, is central to the CCS landscape. With a primary objective of safeguarding the marine environment, it prohibits waste dumping at sea, including storage in seabed and subsurface areas. Notably, the London Protocol allows exceptions for "carbon dioxide streams from carbon dioxide capture processes for sequestration." However, the London Protocol's effectiveness hinges on ratification by parties, with an amendment allowing transboundary CO₂ transport for storage awaiting approval from a two-thirds majority of the signatories. Meanwhile, in October 2019, a resolution was adopted allowing sub-seabed geological formations used for CO₂ sequestration to be shared across national boundaries, provided countries involved make a unilateral declaration and sign a bilateral agreement for cross-border CO₂ transportation.



European Regulatory Framework The European Union's regulatory framework for CCS encompasses several key components, with the EU Emissions Trading System (EU ETS) and the CO₂ Storage Directive at its core.

- **EU Emissions Trading System (EU ETS) and CCS** The EU ETS is a foundational mechanism for reducing greenhouse gas (GHG) emissions across the EU. Integrating CCS into the EU ETS involves crucial aspects:
 - **Deduction of Emission Allowances** Until recently, operators within the EU ETS who capture, transport, and geologically store CO₂ were only permitted to subtract emissions from their account if the CO₂ was being transported via a pipeline or upon its arrival at the storage site. However, with the recent expansion of Annex I of the EU ETS Directive, encompassing all modes of CO₂ transport, industries engaged in CO₂ capture are now exempt from liability for any potential leaks during transportation, regardless of the transport method employed. Consequently, each EU ETS operator can now deduct emission allowances from their account as soon as the CO₂ is transferred to the next operator. However, to unlock these advantages to their fullest potential, Article 49 of the Monitoring and Reporting Regulation must be updated.
 - **Extension of the EU ETS to maritime transport** Given that permanent CO₂ storage will rely on geological reservoirs located mostly offshore, shipping of CO₂ will play a significant role in this context. Notably, by 2024, shipping operators will be obligated to account for their emissions by surrendering allowances.

Limitations in Incentivising Technological Removals The EU ETS does not recognise or account for industries employing removal technologies such as Bioenergy with Carbon Capture and Storage (BECCS), Direct Air Carbon Capture and Storage (DACCS), or for the biogenic component of Waste-to-Energy (WtE) with Carbon Capture and Storage (CCS). Industries utilizing removal technologies will not be exempted from surrendering allowances. Nonetheless, it is worth mentioning that the European Union is promoting a proposal for a voluntary Carbon Removal Certification Framework (CRCF), seeking to provide a credible and transparent framework for certifying high-quality carbon removals. By 2026, the Commission will have to assess the potential inclusion of carbon removals with permanent storage in the EU ETS. This inclusion is strongly opposed by certain organizations like Bellona and WWF as it is claimed it would undermine reduction efforts.

- **CO₂ Storage Directive: Comprehensive Framework for CCS Implementation** The CO₂ Storage Directive, established in 2009, provides a comprehensive regulatory framework for CCS activities within the EU. Key elements of the directive include:





- **Cross-Border Transport and Storage** The CO₂ Storage Directive accommodates cross-border transport of CO₂ for storage purposes within European Economic Area (EEA) countries (EU Member States and Iceland, Liechtenstein, and Norway). CO₂ captured in the EEA can also be transported and stored in EFTA countries (incl. Switzerland). This flexibility fosters cooperation within EEA and EFTA countries, enabling safe and efficient cross-border operations.
- **Third-Party Access (TPA)** Ensuring fair and non-discriminatory access to CO₂ transport networks and storage sites is integral to CCS deployment. TPA obligations aim to prevent monopolies and promote competition. However, challenges emerge from technical compatibility issues, and capacity limitations of the transport and storage systems, necessitating transparent and equitable guidelines.
- **Quantitative Standards for CO₂ Purity** The Directive mandates that CO₂ streams must be "overwhelmingly" composed of CO₂ before injection. However, specific quantitative thresholds for CO₂ purity are lacking. This flexibility may allow national authorities to establish purity criteria, but harmonization and clarity challenges arise for cross-border activities.
- **Long-Term Liability and Transfer** The CO₂ Storage Directive addresses the duration of liability of the storage operator and outlines conditions for transferring long-term liability to competent authorities. Upon this transfer, all legal obligations are transferred for both climate and environmental damage resulting from CO₂ storage. Challenges include defining leakage, establishing financial contribution requirements, and ensuring comprehensive coverage of financial risks over extended periods.
- **Long-Term Liability and Financial Contribution** The Directive mandates that Member States secure a financial contribution from storage operators, sufficient to cover 30 years of monitoring costs and any expenses related to permanent CO₂ sequestration. Financial contribution requirements are essential to address financial risks associated with long-term liabilities and potential leakage scenarios.

Conclusion Carbon Capture and Storage (CCS) holds great promise as a climate change mitigation tool, necessitating robust and adaptable regulatory frameworks. The integration of CCS into the EU Emissions Trading System (EU ETS) and the comprehensive provisions of the CO₂ Storage Directive demonstrate the European Union's commitment to fostering sustainable CCS deployment. Challenges surrounding third-party access, technical compatibility, long-term liability, and quantitative standards for CO₂ purity underscore the need for continuous regulatory evolution to ensure the effectiveness, safety, and success of CCS initiatives within the EU.