CO2 Storage beyond the EU

Regulatory challenges and business opportunities

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Roundtable on
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Sustainable Transition

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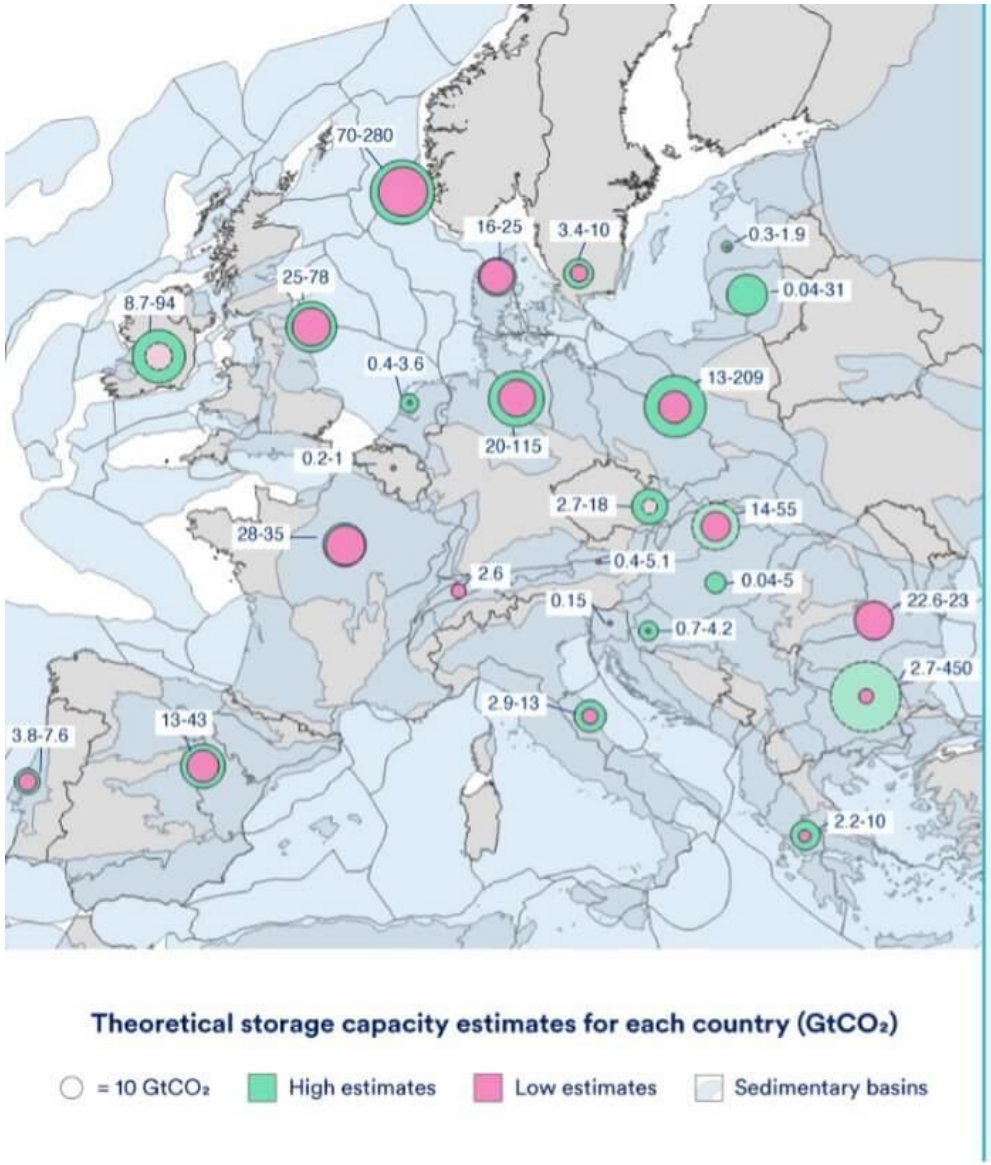
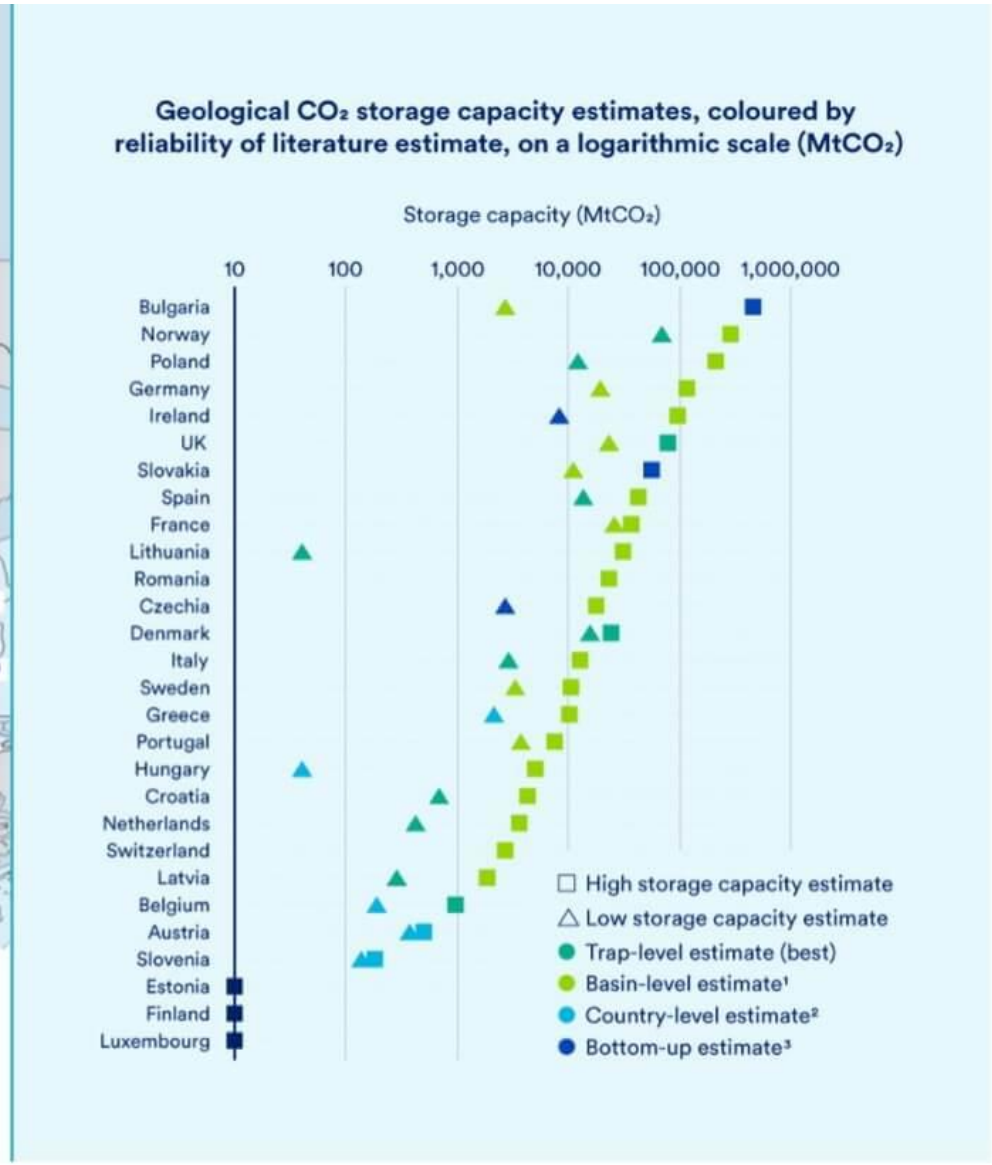
EU Storage Capacity Limitations

- The European Union faces a significant challenge in meeting its CO_2 storage needs within its borders. While the North Sea offers substantial storage potential, capable of accommodating centuries of European emissions, the EU's ambitious climate goals necessitate exploring storage options beyond its boundaries.
- Current projections indicate that the EU will require a CO_2 storage capacity of approximately 450 million tonnes per year by 2050 to achieve carbon neutrality. This represents a nearly tenfold increase from the 2030 target of 50 million tonnes per year, as outlined in the Net Zero Industry Act (NZIA). The rapid escalation in required capacity underscores the urgency of developing robust storage solutions.
- The European Commission's Industrial Carbon Management Strategy sets ambitious storage targets, which highlight the exponential growth required in the EU's carbon capture and storage (CCS) capabilities over the next three decades:
  - 2030: 50 million tonnes of CO_2 storage capacity per year
  - 2040: 280 million tonnes of CO_2 capture capacity per year (to achieve 90% emissions reduction)
  - 2050: 450 million tonnes of CO_2 storage capacity per year





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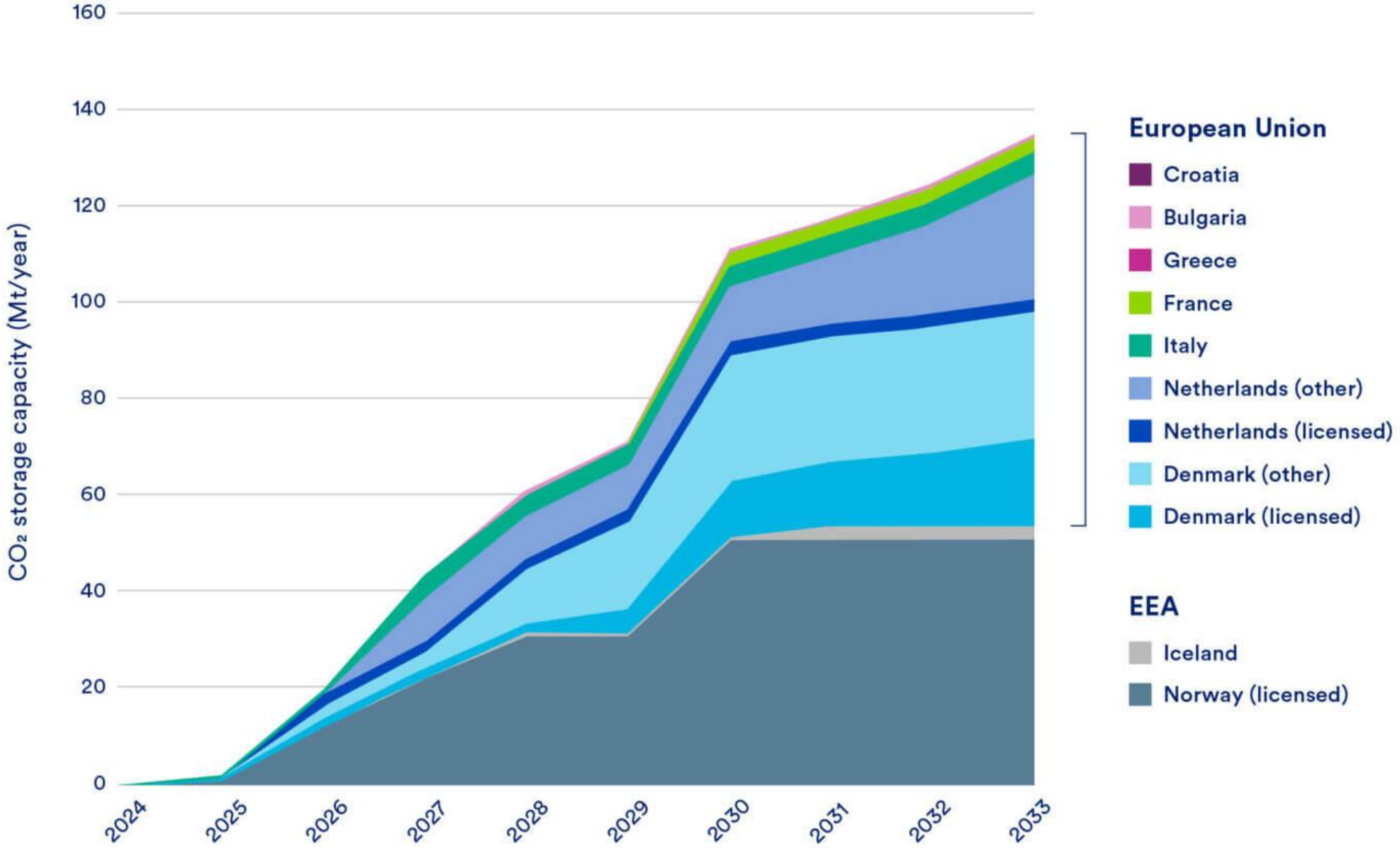

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EU Emissions Trading System (ETS) Limitations

- The EU ETS currently only recognizes storage sites permitted under the 2009 CCS Directive. This creates a significant barrier for storing EU-generated CO_2 outside the EU, as:
  - Storage facilities outside the European Economic Area (EEA) cannot obtain permits under the CCS Directive.
  - Emissions stored outside the EEA do not qualify for exemptions from surrendering allowances under the ETS.
- This limitation effectively discourages the use of non-EU storage sites, even if they are technically suitable and economically viable.

London Protocol

- The London Protocol, an international maritime treaty, presents another regulatory hurdle: it prohibits the export of waste, including CO_2, for offshore disposal. A 2009 amendment allows for cross-border transport and storage of CO_2 but requires bilateral agreements between involved countries. For Contracting Parties, there's an imperative to provisionally apply the 2009 Amendment to Article 6 if they seek to export CO_2 for offshore storage. The implementation of this amendment is crucial for enabling international CO_2 storage projects.

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Helsinki Convention

- The Helsinki Convention, which governs the Baltic Sea region, presents a unique challenge: It currently imposes a clear ban on CO_2 storage in the Baltic Sea. Enabling CO_2 storage in the Baltic Sea would require amending the Helsinki Convention or adopting a resolution allowing an interpretation that permits sub-seabed CO_2 storage. This restriction significantly limits storage options for countries in the Baltic region.

Cross-border agreements

- Countries like Denmark, Belgium, the Netherlands, and Sweden have established arrangements with Norway for cross-border CO_2 transport and storage. Similar agreements are being pursued between other EU countries.

How to overcome the regulatory barriers associated with storing EU-generated CO_2 outside the EU?

Economic Model Implications

- The economic viability of storing EU-generated CO_2 beyond its borders is intrinsically linked to the regulatory framework and carbon pricing mechanisms. The current structure of the EU ETS, which doesn't recognize storage outside the EU, significantly impacts the business case for international storage.
- Recent economic modeling conducted by Xodus on behalf of the Carbon Capture and Storage Association (CCSA) demonstrates significant potential benefits of enabling EU/EEA-UK cross-border CO_2 transport and storage:
  - Emitters in Europe using offshore CO_2 storage could benefit from a 20% cost saving (€11/t) by 2040.
  - With the market expected to grow to 243 $MtCO_2pa$ by 2040, this would represent €2.7 billion in annual savings for emitters using storage in the North Sea.
  - EU-27 emitters could see an average €16/t reduction in offshore transportation and storage costs, a 28% decrease

Business Model Implications

- The business model for storing EU CO2 outside the EU would likely involve a multi-stakeholder approach across the entire carbon capture and storage value chain. EU-based emitters would capture CO2 from their operations and pay for its transport and storage. Transport operators would move the CO2 internationally, potentially using a combination of pipelines and ships. Non-EU storage operators would then permanently store the CO2 in suitable geological formations.
- Credit attribution could follow two possible approaches:
  1. credits could be assigned to the emitter who captures and pays for storage
  2. credits could be assigned to the storage operator who sequesters the CO2.
- The attribution, affected by cost distribution and potential cost reduction, would affect how the economic benefits of carbon removal are distributed along the value chain.
- Success factors for the business model would include developing a robust payment structure, ensuring clear credit attribution, and fostering strong international cooperation.

What is the business model for storing EU-generated CO_2 outside the EU?