

# EU carbon capture and storage policy

The EU's CCS gamble relies on a theoretical and expensive solution with a high delivery risk.

## Fact Sheet

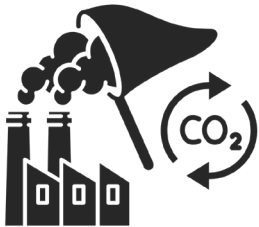
The European Union (EU) is betting on carbon capture and storage (CCS) as a core pillar of its efforts to reach **net zero by 2050**. The bloc's [Industrial Carbon Management Strategy](#), introduced in February 2024, seeks to develop CCS technologies and the regulatory and investment framework to support them.



These plans are reliant on an **unproven technology** that will require billions of euros in subsidies and **take longer to implement** than expected.

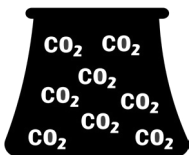
Proposed CCS uses are **too expensive to work on a commercial basis**, typically have **few or no current projects or test cases** and **lack supporting legislation or standards**.

## What is CCS?



**Carbon capture, utilisation and storage (CCUS)** refers to a suite of technologies that **capture carbon from large sources**, such as power stations or industrial plants that use fossil fuels or biomass as fuel. The carbon is then used on-site or at another location.

Historically, the economic justification for CCUS has centred around supporting oil and gas operations. The technology aids fossil gas processing by removing carbon dioxide (CO<sub>2</sub>) from the gas. The other application is to inject CO<sub>2</sub> back into oil reservoirs to support increased oil production.



If the carbon is not utilised, this is referred to as CCS. In this scenario, the carbon is compressed and transported by pipeline, ship or rail to be injected into deep geological formations underground to avoid emissions into the atmosphere. The injected carbon then needs to be monitored regularly to ensure it stays securely stored.

## Current European projects

CCS as an emissions reduction solution is very much in its infancy. There are only five operational projects in Europe that **capture a total of 2.7 million tonnes of CO<sub>2</sub> (MtCO<sub>2</sub>) per annum**. Of this, 1.7 MtCO<sub>2</sub> is for natural gas processing in Norway.

CCS operations in the EU total 1 MtCO<sub>2</sub> across three projects: a refinery in the Netherlands and two small projects totalling 0.3 MtCO<sub>2</sub> in Belgium and Hungary.

## What are the EU's targets?

The EU's Industrial Carbon Management Strategy sets an annual carbon capture target of **450 MtCO<sub>2</sub> by 2050, or 13% of the bloc's 2022 emissions**.

# What are the risks of relying on CCS?



## High costs

For projects planned in the European Economic Area and the UK, the cost of capture, transportation and storage averages US\$198 per tonne of CO<sub>2</sub> captured. This is twice that of forecast carbon prices of US\$105 per tonne over the balance of the decade. **With such high costs, there is insufficient economic incentive for firms to decarbonise without government funding.**

IEEFA estimates the total cost of Europe's planned CCS projects will be **€520 billion**. Assuming financial incentives in the form of reduced emissions trading system payments support investment in projects, this would cover 73% of the expenditure. This means up to **€140 billion of taxpayer subsidies** may be required for the construction and operation of Europe's planned CCS projects.

The relative infancy of many CCS applications and the challenges that plague current projects point to increased costs in the short term.



## History of failure

Operational projects globally have failed to deliver on their expected emissions capture. While the industry targets a 95% capture rate, IEEFA research shows **no existing project has consistently captured more than 80% of carbon.**

Storage performance is also worrisome. Offshore carbon storage facilities in Norway, often championed as success cases, **have been plagued with technical issues** that have prevented or delayed storage capacity.



## Leaving it too late for alternatives

For Europe's proposed projects, more than 90% of the emissions capture is from sectors where technology and applications are **at the prototype or demonstration phase.**

The timelines of these projects are overoptimistic despite the problems faced at smaller, less complex projects in operation and under construction.

Championing CCS risks leaving it too late to reduce emissions through alternative measures when it's realised that the technology's contribution to net zero will likely fail. **Policymakers should begin working urgently to put alternatives in place.**



## About IEEFA

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