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Stakeholder Perspectives on Carbon Capture and Storage in the EU

POLICY BRIEF
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Introduction

Carbon capture and storage is a topic intersecting technology, policy, climate and economics. This is reflected in the diversity of stakeholders involved in its development at all levels, from individual projects to regulations. Despite having been a subject of discussion for decades, CCS is still a contentious issue and far from being universally accepted, let alone supported, by policymakers, governments, civil society or even industrial players themselves.

As such, perspectives on the appropriate deployment of these technologies and their contribution to decarbonisation differ significantly among stakeholders. It can therefore be useful to have an overview of the actors involved and their perspectives on the various aspects of CCS in the EU.

This brief aims to map stakeholders based on their positions on the following topics:

- General position on CCS: To what extent do stakeholders support the deployment of CCS as part of climate mitigation efforts, and what conditions or safeguards do they consider necessary?
- Sectors to prioritise: Which sectors, industries, or applications do stakeholders consider priorities for CCS deployment and which do they view as lower priority or not preferable for support?
- Regulation: what regulatory framework should be put in place?
- Injection capacity obligations: What are stakeholders' views on obligations to develop CO_2 storage and injection capacity, including the allocation of responsibilities among public and private actors?
- Public support for CCS development: Should CCS projects receive public support, and if so, what forms of support are considered appropriate?

General position on CCS

CCS is not universally considered a viable pathway for decarbonising industrial production. Even after decades of technological development, it remains a complex operation that requires coordination between many moving parts, from CO_2 capture to transport and storage. Furthermore, CCS often involves the development and operation of cross-border infrastructure, which creates additional layers of legal, administrative and technical complexity.[1]

Another barrier is the business case for CCS, which remains a challenge in many industrial sectors. While the EU ETS provides an important incentive, current carbon price signals and revenue expectations are often insufficient to offset the relatively high upfront costs and

1 Bellona Europa - Building blocks for a well-functioning market for CO_2

risks associated with CCS investments. This can make it difficult for companies to commit to projects, particularly at a time when major investment decisions are needed to keep industrial sectors on track towards net-zero by 2050.

Despite these challenges, hard-to-abate industrial emitters are generally supportive of CCS, although views differ regarding its role and the extent to which it will be needed in different sectors. Most industrial stakeholders see CCS as an important decarbonisation tool, particularly for addressing process emissions that are difficult to tackle through other measures. At the same time, many emphasise that CCS should be considered as part of a broader portfolio of decarbonisation solutions alongside electrification, energy efficiency, circularity, fuel switching, and other technological pathways.

The perceived importance of CCS varies across sectors depending on their emissions profile, available alternatives, and expected decarbonisation pathways. Sectors such as cement[2], lime[3], chemicals[4] and parts of the hydrogen value chain[5] generally see a significant role for CCS in achieving full decarbonisation of their sectors. Other sectors may expect CCS to play a more limited or targeted role, while still supporting the development of CO_2 transport and storage infrastructure as a strategic option for industrial decarbonisation. The least favourable views come from sectors that have access to more effective or less costly decarbonisation alternatives, such as waste[6], fertilisers[7] and steel[8]. Others, notably lime, cement, hydrogen and chemicals, see a higher abatement potential and show more support for CCS while still acknowledging that it is only one part of their decarbonisation toolbox.

Transport and storage operators, for their part, also tend to support the deployment of CCS while emphasising their need for more flexible regulatory frameworks, access to public funding and lower risk-level investment conditions that can support the development of large-scale infrastructure projects.[9]

From the perspective of national governments, support for CCS varies considerably across the EU. The revised National Energy and Climate Plans (NECPs)[10] submitted in 2024 provided the first opportunity to see how Member States envision the role of CCS within their national decarbonisation strategies. While the level of detail and ambition varies, the plans offer valuable insight into national approaches to CCS deployment and reveal significant differences in political commitment, policy readiness, and expected reliance on the technology across the EU.[11]

A small group of Member States, including Denmark, France and the Netherlands, have integrated CCS into their long-term decarbonisation strategies and are taking concrete steps to develop the necessary transport and storage infrastructure, regulatory frameworks and investment de-risking mechanisms.

2 CEMBUREAU (2023) – Industrial Carbon Mangement Strategy recommendations
3 EULA (2023) - A PATHWAY TO NEGATIVE CO2 EMISSIONS BY 2050, The contribution of the lime industry to a carbon-neutral Europe
4 CEFIC (2024) – Chemical Industry access to Carbon Capture and Storage (CCS)
5 Hydrogen Europe (2024) - Low carbon hydrogen: key principles for a coherent methodology in the upcoming Delegated Act
6 FEAD (2024) - Permanent emissions storage through carbon capture and utilisation in the EU ETS
7 Fertilizers Europe (2023) - Roadmap for the European Fertilizer Industry
8 EUROFER (2026) - Euroean Steel in Action
9 Gas Infrastructure Europe (2025) – A Regulatory Framework for CO2 Infrastructure
10 European Commission – Energy – National Energy and Climate Plans
11 Bellona Europa (2025) - Carbon Capture and Storage in the National Energy and Climate Plans

Beyond these frontrunners, many Member States acknowledge a potential role for CCS in achieving climate neutrality, particularly for hard-to-abate sectors. However, in most cases, this recognition has not yet translated into comprehensive deployment strategies, clear targets, or detailed implementation plans. Support often remains focused on feasibility studies, pilot projects or early-stage planning activities.

A smaller number of Member States continue to give limited attention to CCS in their climate and energy planning, either because they prioritise alternative decarbonisation pathways, face geographic or economic constraints, or have not yet identified a clear role for CCS within their national context. As a result, the level of political commitment and policy readiness for CCS deployment remains uneven across the Union.

CCS policy frontrunners	Partially developed CCS policy	Lack of political commitment to deploying CCS
Belgium (Flanders)	Austria	Cyprus
Denmark	Bulgaria	Estonia
France	Croatia	Finland
Italy	Czechia	Hungary
The Netherlands	Germany	Latvia
	Greece	Malta
	Ireland	Slovakia
	Lithuania	Slovenia
	Luxembourg	Spain
	Poland	
	Portugal	
	Romania	
	Sweden	

Figure 1: State-of-play in CCS policy development by EU Member States. Sources: Final NECPs, national CCS strategies, policies and legislative frameworks (2023-2026)

Moderate to high support for CCS	Conditional to moderate support for CCS
CCS technology developers Transport and storage operators Certain industrial emitters (cement, lime, chemicals, hydrogen)	Certain industrial emitters (aluminium, steel and other metals, fertilisers, waste, ceramics)

Figure 2: Support for CCS deployment by industrial players. Sources: position papers, roadmaps, joint statements and other public communications (2023-2026)

The final NECPs submitted in 2024 provide a valuable snapshot of how Member States view the role of CCS within their national decarbonisation strategies. However, they largely reflect national priorities before the full implementation of the EU's industrial carbon management framework began.

A significant development in this regard was the adoption of the Net-Zero Industry Act (NZIA) in 2024. Through its binding objective of reaching 50 Mt of annual CO_2 injection capacity by 2030 and the associated obligation on oil and gas producers to contribute to this target, the NZIA elevated CO_2 storage from a largely voluntary policy choice to a strategic priority for the European Union. The Regulation also introduced a range of obligations for Member States related to permitting, transparency, reporting, and the enabling conditions required for CO_2 storage deployment.

As a result, Member States are becoming increasingly engaged on the topic. Since December 2024, all Member States have been required to submit annual reports to the European Commission under Article 21 of the NZIA.[12] These reports provide information on CO_2 capture, transport and storage projects under development, expected infrastructure needs, national support measures, strategies, targets, and cross-border cooperation arrangements. Together, they offer the first EU-wide overview of how Member States are planning for industrial carbon management and reveal a highly diverse landscape in terms of project maturity, policy preparedness, and political commitment.

The first round of Article 21 reports suggests that while a number of Member States are actively developing CO_2 capture, transport and storage projects and supporting frameworks, progress remains uneven across the Union. The reports highlight significant differences in national strategies, levels of policy support, and readiness to facilitate large-scale CCS deployment, reinforcing the picture already visible in the NECPs.

12 The EU's 2030 carbon storage target - Climate Action

Sectors to prioritise

The question of where to apply CCS compared to other decarbonisation options sees more fragmentation. This is partly due to the breadth of possible applications: many industrial production routes in multiple sectors could technically use CCS to reduce their emissions. However, each sector faces its own challenges and considerations like cost, abatement potential and geography.

Representatives from different industries therefore advocate for different CCS hierarchies. This applies to both single parts of the value chain (which emitting sector should receive support) and to the CCS value chain itself (which part should be developed first).

CCS technology developers and providers generally support the deployment of CCS applications and often advocate for technology-neutral policy frameworks.[13] Many emphasise the importance of creating market conditions that allow different capture, transport, storage and carbon removal solutions to develop according to their technical maturity, cost profile, and potential contribution to climate objectives. As a result, CCS technology providers tend to favour policy approaches that do not narrowly prioritise specific sectors or applications.

On the other hand, emitters often place greater emphasis on the role that CCS can play within their own decarbonisation pathways. However, the arguments advanced vary by sector. Some highlight the importance of CCS for addressing process emissions that are difficult or impossible to eliminate through other means, particularly in sectors such as cement and lime. Others stress the relatively high cost of CO_2 capture in their sector and the need for targeted public support to enable deployment, like in the aluminium sector.[14] Across sectors, stakeholders view CCS as one component of a broader decarbonisation strategy rather than a standalone solution.

Many industrial stakeholders also see a long-term role for carbon removals enabled by CCS including Bioenergy with Carbon Capture and Storage (BECCS) and Direct Air Carbon Capture and Storage (DACCS). These technologies are generally presented as a means of addressing residual emissions and contributing to net-negative emissions where further emissions reductions may not be technically or economically feasible.

For national governments, there is a wide range of approaches to CCS, reflecting differences in each country's specific situation in terms of industrial structure, geological conditions, geography and access to potential storage sites, economic priorities, and broader decarbonisation strategies. In their National Energy and Climate Plans (NECPs), the majority of Member States acknowledge a role for CCS in achieving climate-neutrality, particularly for addressing process emissions from hard-to-abate industries such as lime or cement, chemicals and parts of heavy industry.

However, many countries do not explicitly prioritise CCS applications based on the availability of alternative decarbonisation options or the share of unavoidable process emissions.

13 CCS Europe (2024) - Industrial Carbon Management position paper

14 European Aluminium (2023) - NET-ZERO BY 2050: SCIENCE-BASED DECARBONISATION PATHWAYS FOR THE EUROPEAN ALUMINIUM INDUSTRY

Instead, in several cases, Member States place particular emphasis on sectors that are strategically important to their national economies or where domestic project development is already underway, such as refining, chemicals, waste-to-energy, or hydrogen production. As a result, views on the role of CCS often reflect national industrial priorities as much as assessments of where the technology could deliver the greatest climate mitigation benefits.

Regulation

The regulatory framework around CCS value chains defines rules for access to infrastructure, whether and how to plan its deployment, cross-border rules, tariffs and more. Given that the EU is currently developing its own CO_2 Infrastructure and Markets Regulation, the chosen model will have a considerable influence on the future of CCS.

Positions on this issue diverge in industry. On one hand, CCS technology providers show a clear preference for a more open, flexible and less constrained market.[15] They oppose EU-wide tariffs, restrictive rules for third-party access to their infrastructure (e.g. CO_2 pipelines) and harmonised standards for transport and storage, which they view as a barrier to the development of a market for CO_2 products. They are also against unbundling requirements, seeing vertically integrated or full-chain projects as necessary before the market has matured. Finally, they advocate for coordination between the EU and third countries to remove legal barriers and align administrative rules, as well as faster permitting for their projects.

On the other hand, many CO_2 emitters take the opposing view. They generally favour regulated third-party access to transport and storage infrastructure, arguing that it is necessary to prevent the negative effects of monopoly or dominant market positions and to ensure fair, transparent, and non-discriminatory access.[16] Harmonised standards and EU-level coordination for infrastructure development are also regularly mentioned as necessary for market development. Nevertheless, emitters tend to also demand accelerated permitting procedures and a focus on supporting transport infrastructure deployment.

Regarding Member States, very few of them have created their own national regulatory frameworks for CCS: Denmark, the Netherlands and the Flemish region of Belgium are among the few jurisdictions that have introduced more detailed rules addressing issues such as network development, infrastructure access, ownership structures, and the operation of CO_2 transport systems. These frameworks take different approaches to questions such as third-party access, unbundling requirements and tariff structures.

Most Member States have not yet developed dedicated regulatory frameworks for CO_2 transport, in part because large-scale CO_2 transport networks are only beginning to emerge and many countries are still assessing their future role within the European CO_2 value chain. Consequently, few governments have publicly articulated detailed positions on issues such as network governance, tariff methodologies, regulated versus negotiated access, or un-

15 (2026) Joint Industry Statement: CO Transport infrastructure, Enabling a Pragmatic Framework for early Market Development

16 EULA (2026) - Feedback on the Commission's Legislative initiative on CO2 Transportation Infrastructure and Markets

bundling requirements.

This situation is likely to evolve rapidly in the coming years. Once the European Commission puts forward its proposal on the CO_2 Infrastructure and Markets Regulation, Member States will increasingly be required to take positions on how CO_2 networks should be planned, financed, regulated, and integrated across borders. Given the varying approaches already emerging at national level, these discussions are likely to reveal differing preferences regarding the future design of a European CO_2 transport and market.

More regulated and harmonised approach	Phased and flexible regulatory framework
Certain industrial emitters (cement, lime, hydrogen)	CCS technology providers Transport and storage operators Certain industrial emitters (chemicals, aluminium)

Figure 3: Favoured regulatory approach by industrial players. Sources: position papers, roadmaps, joint statements and other public communications (2023-2026)

Injection capacity obligations

The Net Zero Industry Act, in its Article 23, creates an obligation for major oil and gas companies to deploy 50 Mt of annual CO_2 injection capacity by 2030. This obligation was put in place to accelerate the deployment of CO_2 injection capacity in the EU, which is a major bottleneck hindering the rapid emergence of a market for the technological abatement of CO_2.

Views among oil and gas producers on the Article 23 obligation are mixed. While a number of companies have challenged the measure before the EU courts, arguing that the obligation is disproportionate, not well founded legally, or difficult to deliver within the required timeframe, others have not pursued legal action and are instead focusing on compliance and project development.[17] Even among companies that have not challenged the measure, concerns have been raised regarding the practical challenges of delivering large-scale storage projects within the required timeframe, the pace of permitting processes, and the ab-

17 AMICUS CURIAE Obligated entities under Article 23 NZIA v. Commission

sence of a dedicated EU framework for regulating CO_2 transport infrastructure.[18] At the same time, many oil and gas companies and their trade associations have long supported the expansion of CCS and recognise a significant role for geological CO_2 storage in European decarbonisation strategies. As a result, industry positions often reflect support for the development of a CO_2 storage market in principle, while differing on the design, timing, and implementation of the Article 23 obligation itself.

Industrial emitters have generally expressed stronger views on the need for timely and affordable access to CO_2 storage than on the Article 23 obligation itself.[19] Many of them view the availability of storage capacity as a prerequisite for investing in capture projects, particularly in hard-to-abate sectors where CCS is expected to play a significant role in decarbonisation.

However, relatively few emitters have taken explicit public positions on the injection capacity obligation as a policy instrument. This may reflect the fact that the obligation is directed at oil and gas producers rather than industrial emitters. As a result, industrial stakeholders have tended to focus their advocacy on ensuring that sufficient storage capacity is developed and made available to the market, rather than on the specific design of the obligation itself. Where positions have been expressed, they generally support measures that can accelerate storage deployment and reduce the risk that a lack of storage capacity becomes a bottleneck for deep industrial decarbonisation.

Few EU Member States have expressed a position on the Article 23 annual injection capacity obligations during or after negotiations. Austria voiced reservations regarding the geographic distribution of CO_2 storage in the EU, recalling that a national ban was still in force on its territory, and advocated for expanding the eligible storage area from the EU to the European Economic Area (EEA).[20] Italy, for its part, supported the obligation but asked for a more lenient assessment of obligated entities' contributions.[21] The text initially proposed by the Commission received only minor adjustments during the legislative procedure, both the volume of injection capacity and the 2030 deadline having been left unchanged. The Net-Zero Industry Act itself was adopted by near-absolute majority, signalling broad agreement with its purpose and mechanisms.[22]

Public support for CCS development

The high upfront capital costs and investment risks associated with of CCS are frequently identified by stakeholders across the CCS value chain as major barriers to its deployment

18 IOGP Europe recommendations to address the implementation challenges of the Net-Zero Industry Act's (NZIA) 2030 CO2 injection capacity objective - IOGP Europe
19 CEMBUREAU Welcomes Net Zero Industry Act - BACI
20 (2023) Net Zero Industry Act - Protocol declaration by Austria
21 (2023) Net Zero Industry Act – Statement by the Italian delegation
22 Net Zero Industry Act – Voting result

and scale-up. As a result, public support and de-risking schemes have become central elements of CCS policy for both Member States and the EU. These measures are intended to improve the business case for early projects, reduce investment uncertainty, and help bridge the gap towards a mature and well-functioning market for the technological abatement of CO_2.

At the same time, public resources available for industrial decarbonisation are limited, and governments must balance support for CCS against a range of other climate and industrial policy priorities. The question is often not whether CCS should receive support, but rather how much support it should receive, which applications should be prioritised, and how support should be allocated relative to alternative decarbonisation pathways.

There is broad consensus within industry that public support will be necessary to develop projects in all parts of the value chain. This mostly comes in two forms: direct financial support to reduce upfront capital costs and de-risking mechanisms designed to lower investment risk and improve revenue certainty. Capture project developers and industrial often emphasise the importance of grants and other capital support instruments to help address the significant CAPEX associated with capture facilities. Many also advocate for longer-term de-risking mechanisms, such as Carbon Contracts for Difference (CCfDs) which can provide greater certainty over future revenues and carbon price exposure.

Transport and storage operators similarly recognise the importance of public support, but often place particular emphasis on measures that can provide long-term visibility regarding infrastructure utilisation and future demand. Given the large capital investments and long asset lifetimes associated with CO_2 transport and storage infrastructure, these stakeholders frequently advocate for policy frameworks and support mechanisms that reduce demand risk, improve project bankability, and provide stable investment conditions over extended time horizons.

For Member States, dedicated funding for CCS remains limited to a handful of frontrunners. Countries such as Denmark, the Netherlands and, to a lesser extent, France and Belgium have begun deploying a mix of grants, revenue support mechanisms, and other investment de-risking instruments to facilitate CCS deployment. The design of these schemes often reflects national circumstances, including project maturity, sectoral priorities and expected climate benefits.

While a growing number of Member States acknowledge the potential role of CCS in their decarbonisation strategies and have indicated plans to support its development, relatively few have committed substantial national funding to date. As a result, many countries continue to rely on EU-level funding instruments, such as the Innovation Fund and Connecting Europe Facility, to support early-stage capture projects and transport infrastructure deployment, particularly cross-border projects. This reliance is particularly evident in Member States where CCS deployment remains at the planning or demonstration stage and where dedicated national support frameworks have yet to be established.

Conclusion

The stakeholder landscape surrounding CCS in Europe is diverse and, in many respects, still evolving. While significant differences remain regarding the role CCS should play in decarbonisation, the sectors that should be prioritised, the design of regulatory frameworks, the allocation of responsibilities for storage development, and the appropriate level of public support, a number of common themes emerge.

Across stakeholder groups, there is broad recognition that CCS will have a role to play in achieving climate neutrality, particularly in sectors with limited alternatives for addressing process emissions. At the same time, there is less consensus on the scale of that role, the pace of deployment, and the conditions under which public resources and regulatory support should be directed towards CCS.

Many of the debates identified in this brief reflect the fact that Europe is transitioning from a phase focused primarily on demonstrating CCS technologies to one centred on deploying them at commercial scale. Questions that were previously theoretical, such as how CO_2 infrastructure should be regulated, who should bear responsibility for developing storage capacity, and how risks and costs should be shared between public and private actors, are increasingly becoming practical policy challenges.

As the EU advances in implementing its Industrial Carbon Management Strategy [23] and develops new legislation on CO_2 transport and storage infrastructure, these differing stakeholder perspectives will continue to shape the future of CCS deployment in Europe. Understanding where interests align, where they diverge, and where opportunities for compromise exist will be essential for policymakers seeking to create the conditions necessary for effective and timely decarbonisation.

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