Contribution ID: 5de490d0-38ba-4358-852d-9460db4bf6e1
Date: 09/01/2026 21:16:24

Public consultation on a legislative initiative for CO2 markets and infrastructure

Fields marked with * are mandatory.

Introduction

The Communication on a 2040 climate target[1] and its impact assessment[2] demonstrate that, alongside the roll-out of renewable energy and achieving energy and material efficiency, industrial carbon management (ICM) is necessary to meet the European Union's climate objectives. With that in mind, the industrial carbon management strategy[3] (ICM strategy), adopted by the Commission in February 2024, sets out a comprehensive approach for the EU to scale up carbon management. The strategy identifies a set of actions to be taken, at EU and national level, to establish a single market for CO_2 and to create a more attractive environment for investments in industrial carbon management technologies.

Encompassing carbon capture, utilisation and storage (CCUS) and carbon removals, industrial carbon management can address remaining hard-to-abate CO_2 emissions, including process emissions from industry. Moreover, carbon capture and carbon removals are a prerequisite to retaining a decarbonised and competitive industrial base in the EU while achieving climate neutrality by 2050.

Industrial carbon management can be divided into three main components:

1. Capture of CO_2 for storage (CCS), where CO_2 emissions of fossil origin are captured for permanent and safe geological storage;
2. Capture of CO_2 for utilisation (CCU), where captured CO_2 is used in synthetic products, chemicals or fuels (e.g. synthetic fuels can be produced using hydrogen combined with CO_2, to be used in drop-in fuels and processes);
3. Removal of CO_2 from the atmosphere, where biogenic or atmospheric CO_2 is captured by technological means and permanently stored either geologically or in products.

Where CO_2 is not directly stored or used at the place of capture, it will need to be transported to a different location via pipeline, ship, truck, or rail for its permanent storage or utilisation. Transportation is therefore key for these three technologies, and is necessary to enable a fully-fledged EU CO_2 market.

Today, a limited number of ICM projects are being built and final investment decisions have only been taken for a few storage sites in the EU, including Greensand (CO_2 storage project in Denmark, 0.4 million tonnes of

CO_2 per year (Mtpa) in the initial phase) and Porthos (CO_2 storage project in the Netherlands, 2.5 Mtpa). From the first Union list of Projects of Common Interest and Projects of Mutual Interest, two CO_2 infrastructure projects are under construction[4]. However, the modelling of the 2040 climate target impact assessment indicates that the EU would need to capture 50 million Mtpa already by 2030, 280 Mtpa by 2040, and up to 450 Mtpa by 2050 to stay on track with its climate targets.

The EU already has legislation in place to support the deployment of industrial carbon management solutions.

The Directive on the geological storage of carbon dioxide[5] (CCS Directive) establishes a legal framework for the safe geological storage of CO_2, covering all geological formations across the EU and the European Economic Area in the lifetime of storage sites.

The Regulation on trans-European networks for Energy[6] (TEN-E) facilitates the building of cross-border CO_2 infrastructure recognised as Projects of Common Interest (PCIs) and Projects of Mutual Interest (PMIs). This is made possible through accelerated permitting procedures and financing under the Connecting Europe Facility. Given the critical role of grids for integrating affordable renewable energy and supporting electrification, the Commission has announced a European Grids Package whose key objective will be to help upgrade and expand energy networks and speed up permitting. To gather input, the Commission launched a public consultation in May 2025 on a call for evidence[7] and on a questionnaire[8], which also includes questions on CO_2 transport.

The Net Zero Industry Act (NZIA)[9] aims to establish an EU market for CO_2 storage services and sets a legally binding target of 50 million tonnes of annual CO_2 injection capacity in the EU by 2030. To create this part of the necessary CO_2 infrastructure, 44 EU oil and gas producers must contribute to developing these CO_2 storage sites. The NZIA also streamlines the permitting process for the projects that will need to be carried out to meet this objective. In addition, under the CCS Directive, Member States must take the necessary measures to ensure that potential users are able to obtain access to transport networks and to storage sites for the geological storage of the produced and captured CO_2[10].

The EU ETS Directive[11] incentivises the capture of CO_2 from fossil fuels and industrial processes by exempting permanently stored emissions from the requirement to surrender allowances. Under its review clause, the Commission must submit a report by July 2026 - and possibly propose legislation - on the integration of atmospheric CO_2 removals into the EU ETS, as well as on how to account for captured and utilised CO_2 in products. This initiative on EU ETS is subject to a separate public consultation[12].

Investments in the CO_2 value chain and funding (for research, innovation and deployment) are crucial to unlock the full potential of industrial carbon management. The EU ETS price is key to make CCS projects commercially viable, because EU ETS allowances are not required for CO_2 that is permanently stored. Several funding mechanisms are available for large-scale CCS projects (such as the EU ETS Innovation Fund, InvestEU and the Connecting Europe Facility)[13]. In addition, as stated in the ICM strategy, tariffs, new financing instruments, guarantees and risk instruments would need to be introduced to facilitate investments. The Clean Industrial Deal has highlighted the importance of lead markets for decarbonised end products, to

underpin the long-term business case for decarbonisation through the capturing of CO_2 emissions.

While the current legislative framework covers important parts of the CO_2 value chain and infrastructure, its primary aim is not to foster the development of an internal market for CO_2 and related infrastructure. However, substantial CO_2 transport infrastructure needs to be developed to move captured CO_2 to storage or utilisation sites[14].

Still today however, barriers to cross-border CO_2 transportation and market access continue to exist, both within the EU and with third countries. Also, CO_2 pipeline infrastructure is likely to have the characteristics of a natural monopoly whilst the market for CO_2 storage capacity and injection is one with significant entry barriers, which affect the emergence of a competitive value chain and trust in equitable market outcomes. Other barriers are connected to permitting CO_2 assets, the reuse or repurposing of existing assets for CO_2 and the means to effectively address investment risks, in particular at early stages of market development.

Moreover, investment risks are perceived as high due to a lack of confidence and regulatory certainty and predictability and coordination problems along the CO_2 value chain (i.e. lack of coordination between capture, transport infrastructure and storage projects)[15]. At the same time, there is a need to develop significant CO_2 transport infrastructure to move CO_2 from capture to storage or utilisation sites.

The ICM strategy has therefore identified the need to develop a regulatory framework supporting the emergence of an integrated and competitive market for CO_2 and CO_2 infrastructure. The political guidelines for the 2024-2029 Commission[16] reiterated the need to put forward a proposal for a regulatory package on CO_2 infrastructure and markets, while the Clean Industrial Deal communication[17] highlighted the need to implement the ICM strategy and reiterated the EU's long-standing objective to create a market for captured carbon.

This public consultation is part of a wider stakeholder consultation strategy aimed at informing the development of the impact assessment and the legislative proposal on CO_2 infrastructure and markets. The answers to this questionnaire will provide valuable evidence for the impact assessment, which will in turn feed into the preparation of the legislative initiative.

When developing the impact assessment and legislative proposal, the Commission will also take into account the outcome of previous consultations, including the consultation[18] carried out for the preparation of the ICM strategy, the grid package and the work developed under the ICM Forum[19].

In this questionnaire, the more general questions are set out in Chapter 1, while specific questions on technical and regulatory issues are set out in Chapters 2 to 5.

1. Commission communication: Securing our future Europe's 2040 climate target and path to climate neutrality by 2050 building a sustainable, just and prosperous society, 6 February 2024, EUR-Lex - 52024DC0063 - EN - EUR-Lex.

2. Commission staff working document: Impact Assessment accompanying the document communication on 'Securing our future Europe's 2040 climate target and path to climate neutrality by 2050 building a sustainable, just and prosperous society', 6 February 2024, EUR-Lex - 52024SC0063 - EN - EUR-Lex.

3. Commission communication: Towards an ambitious Industrial Carbon Management for the EU, 6 February 2024, (COM/2024/62), EUR-Lex - 52024DC0062 - EN - EUR-Lex.

4. This includes the projects CO_2 TransPorts (CCS project between Rotterdam, Antwerp and North Sea Port areas) and Northern Lights (CO_2 storage on the Norwegian continental shelf with cross-border infrastructure connecting several European capture initiatives, among others in Belgium, Germany, Ireland, France and Sweden. These two projects are expected to begin operations in 2026 with a storage volume of up to 5 Mt /y CO_2.

5. Directive 2009/31/EC on the geological storage of carbon dioxide of 23 April 2009; Directive - 2009/31 - EN - EUR-Lex.

6. Regulation (EU) 2022/869 on guidelines for trans-European energy infrastructure of 30 May 2022; Regulation - 2022/869 - EN - EUR-Lex.

7. Call for Evidence: European grid package.

8. Public consultation questionnaire: European grid package.

9. Regulation (EU) 2024/1735 on establishing a framework of measures for strengthening Europe's net-zero technology products manufacturing ecosystem of 16 March 2023; Regulation - 2024/1735 - EN - EUR-Lex.

10. Member States must ensure that users have access to CO_2 transport networks and storage sites for geological storage in accordance with Article 21 of Directive 2009/31/EC. To that end Member States must 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 economical to do so or when a potential customer is willing to pay for them.

11. Directive 2003/87/EC.

12. EU emissions trading system for maritime, aviation and stationary installations, and market stability reserve – review.

13. Commission Communication: Towards an ambitious Industrial Carbon Management for the EU, EUR-Lex - 52024DC0062 - EN - EUR-Lex.

14. JRC study: Shaping the future CO_2 transport network for Europe, 6 February 2024; an update of this study is expected in Q2 2025.

15. See also the Commissions' Call for Evidence [insert link when available]

16. Political Guidelines 2024-2029 | European Commission.

17. The Clean Industrial Deal: A joint roadmap for competitiveness and decarbonisation, COM(2025) 85 final.

18. The public consultation ran between 8 June and 31 August 2023, Industrial carbon management – carbon capture, utilisation and storage deployment; The results are available in the Summary report of the results to the open public consultation - Publications Office of the EU.

19. The Industrial Carbon Management Forum (ICM Forum), named the CCUS Forum until 2023, was established in 2021 and meets annually since. It brings together representatives from the EU institutions, EU and non-EU countries, NGOs, business leaders and academia to facilitate the deployment of carbon capture and storage (CCS) and carbon capture and utilisation (CCU) technologies. The Forum also established different working groups focusing on particular issues of the ICM value chain. ICM Forum and Working Groups

About you

* Language of my contribution

- ○ Bulgarian
- ○ Croatian
- ○ Czech
- ○ Danish
- ○ Dutch
- ◉ English
- ○ Estonian

- **Anonymous**
  Only organisation details are published: The type of respondent that you responded to this consultation as, the name of the organisation on whose behalf you reply as well as its transparency number, its size, its country of origin and your contribution will be published as received. Your name will not be published. Please do not include any personal data in the contribution itself if you want to remain anonymous.
- **Public**
  Organisation details and respondent details are published: The type of respondent that you responded to this consultation as, the name of the organisation on whose behalf you reply as well as its transparency number, its size, its country of origin and your contribution will be published. Your name will also be published.

☑ I agree with the personal data protection provisions

1/ General questions

Q1. The industrial carbon management value chain still has room to mature. A regulatory framework that is fit for purpose must take this into account. With that in mind, what regulatory model at EU level do you consider suitable to support the emergence of an integrated and competitive EU market for CO_2?

- No regulatory intervention is needed. Progress so far has been made without such market rules at EU level and competitive market outcomes are likely to emerge without intervention.
- A common approach is needed with an EU legislative framework setting out key regulatory principles (addressing barriers to cross-border trade, ensuring competitive market outcome and a level playing field, fostering infrastructure development, etc.).
- The rules should be developed in phases. Key regulatory principles can be set now at EU level, while more detailed EU-wide technical rules should be left until later, with individual Member States having the option to introduce such rules earlier if they consider it necessary.

- Detailed rules (with key regulatory principles and technical provisions) are needed at EU level from the start to prevent regulatory divergence between Member States and to create investment certainty.
- Next to market rules we need rules that support market development. Notably, the NZIA annual CO_2 injection capacity of at least 50 million tonnes of CO_2 by 2030 supports the emergence of an integrated and competitive EU market for CO_2 storage services. Such a target is an example to follow. A renewal of this Union-level objective should be considered in the context of the Commission assessment of the need for a new Union-wide injection capacity objective in June 2027 (Article 20 (3) NZIA).

Other(s) - Please specify what approach is needed and why.

500 character(s) maximum

A suitable EU legislative framework would be iterative and evidence-based, rather than phased according to predefined timelines, reflecting the CO2 market's nascent and heterogeneous nature. Regulatory competences should be clearly allocated at national level (NRAs or equivalent), within an EU framework that enables periodic adjustments in response to observed market developments. This does not preclude additional rules to support market development or to renew NZIA targets.

Q2. The development of CO_2 markets seems highly likely. However, a significant amount of uncertainty remains. How should this uncertainty be taken into account when designing a regulatory framework that is fit for purpose?

- Clearly setting out key regulatory principles for infrastructures and market design will remove a significant amount of uncertainty, while flexible rules will not. Setting out clear rules at the outset is therefore better than allowing flexibility.
- (●) Setting out key regulatory principles leaves enough flexibility for details to be fine-tuned later or at Member State level. No additional specific provisions need to be set out to enable the main regulatory principles to be applied in a flexible way during the ramp-up phase. The CO_2-related provisions in the NZIA Regulation are sufficient as a ramp-up phase regulatory regime.
- Only the main regulatory principles are needed. However, sufficient flexibility needs to be built into these main principles, e.g. by allowing temporary exemptions/derogations befitting the value chain's ramp-up phase.

Other(s) - Please specify.

500 character(s) maximum

Uncertainty should be addressed through a framework that is robust but adaptable. This include requiring Member States to designate NRAs and clearly defining their powers to adopt regulatory obligations where necessary. It also necessitates strengthening market transparency to reduce information asymmetries and price speculation along the value chain by requiring the publication of tariffs ranges; Where stricter rules are introduced, targeted exemptions or transitional arrangements may be needed

Carbon capture and storage (CCS) is often seen as a solution for industries where emissions are economically or technically hard-to-abate. However, technological change may affect what decarbonisation option is most effective in a given industrial application. Also, Member States have different starting positions and decarbonisation pathways. Some flexibility, such as on the applications where CCS is applied, may therefore have benefits. At the same time, the risk of continued fossil fuel use must be avoided.

Q3. With this in mind, what should be the focus of an EU market regulatory framework?

- EU market rules should clearly state that CCS is only to be used in hard-to-abate sectors. The risk of distortion due to technological bias is less serious than the risk that CCS is used in applications that result in the continued use of fossil fuels.
- Legislation should support decarbonisation but be technologically neutral. This would avoid market distortions and additional costs due to technological bias in the regulatory framework. Decisions on the decarbonisation option to be used in a given application or industry should be left to the market.
- Market legislation at EU level should be technologically neutral. Other EU or national instruments (like subsidy schemes) are more suitable to steer the industries and applications in which CCS is deployed.

Other(s) - Please specify what approach is needed and why.

500 character(s) maximum

Options 2 and 3 can be combined. EU market legislation should remain technologically neutral, with deployment decisions largely left to the market, while other EU and national instruments can steer CCS towards targeted applications. Market rules must avoid incentives to delay direct emissions reductions but should support early movers and enable the emergence of an integrated CO_2 value chain. Dedicated support – including via the IDB – may be necessary to unlock early investment.

Q4. The industrial carbon management strategy and the 2024 impact assessment picture a future where CO_2 is not only permanently stored but also one where CO_2 is

captured (such as through bioenergy with carbon capture and storage (BECCS) and direct air capture (DAC)) and used in synthetic products, chemicals or fuels, especially after 2040. What impact should this have on market design?

- (●) Market design should already take full account of storage and reuse of CO_2 as well as the streams by BECCS and DAC, which have different requirements.
- ( ) Minimal impact. The main market design principles are not fundamentally different for permanent storage and reuse of CO_2 anyway.
- ( ) CO_2 capture for permanent storage will be the main driver of the value chain for a significant period of time. Therefore, we should focus on this and pay particular attention to storage-related issues, such as access conditions.
- ( ) I don't have an opinion.

Other(s) - Please specify.

500 character(s) maximum

The EU CO_2 market framework should stay technology-neutral, but since permanent storage will drive the value chain for coming decades, it should prioritise scaling transport and storage with clear access and capacity rules. CO_2 utilisation may grow after 2040, yet most CCU pathways are at early TRL with different logistics and quality needs. EU ETS rules should remain the default for MRV, accounting and liability.

Q5. Laying down rules can create legal certainty and regulatory predictability. However, laying down rules too early can be risky for a still-developing value chain. How important would it be to set out the following regulatory principles early on in order to support the development of a dedicated CO_2 network and market framework? Please indicate your position for each regulatory principle.

Regulatory principles	Very important	Important	Neutral	Not very important	Not important	No opinion
Coordinated planning of the CO_2 transport infrastructure.	○	◉	○	○	○	○
Providing regulatory certainty for existing CO_2 projects.	◉	○	○	○	○	○
Enabling the use of existing energy infrastructure for the transport of CO_2.	○	○	◉	○	○	○
Streamlining the permitting framework.	◉	○	○	○	○	○
Removing legal barriers to cross-border CO_2 transport and trade.	◉	○	○	○	○	○
Clear rules for CO_2 interconnections with non-EU (EEA) countries.	◉	○	○	○	○	○
Ensuring clear responsibility for CO_2 leakage in parts of the CO_2 value chain.	◉	○	○	○	○	○
Creating cross-border interoperability to enable the unhindered flow of CO_2 across borders and between modes of transport.	○	○	◉	○	○	○
Ensuring non-discriminatory and transparent access to CO_2 networks.	◉	○	○	○	○	○
Ensuring non-discriminatory and transparent access to CO_2 storage.	◉	○	○	○	○	○
Avoiding conflicts of interest in the CO_2 market.	○	○	◉	○	○	○
De-risking investments in the CO_2 transport infrastructure.	◉	○	○	○	○	○
Increasing market transparency and visibility in the CO_2 value chain.	◉	○	○	○	○	○

Other(s) - Please specify.

500 character(s) maximum

All principles are relevant, but their importance depends on market maturity. In the early ramp-up phase of the CO2 market, priority should be given to regulatory certainty for first movers, streamlined permitting procedures, investment de-risking for CO_2 transport infrastructure, and greater transparency across the value chain. These measures are critical to unlock investment and enable timely deployment.

2/ Providing regulatory certainty and investor confidence to develop the necessary CO_2 infrastructure

Coordinated CO_2 infrastructure planning

Almost all Member States include the capturing of CO_2 in their decarbonisation policies. However, not all have the possibility to store CO_2 on their territory due to regulations that prohibit CO_2 storage or due to insufficient CO_2 storage capacity. The transportation of CO_2 over longer distances, including the cross-border transportation of CO_2, is therefore expected to play an important role in the decarbonisation of the EU's hard-to-abate sectors. Currently, CO_2 can be transported via pipelines as well as via modes of transport not involving pipelines, including shipping, rail and road transport.

In this section of the questionnaire, CO_2 'transport infrastructure' means the network of CO_2 pipelines as defined in the NZIA, i.e. including associated booster stations, for the transport of CO_2 to the storage site, as well as any ships, road or rail modes of transport, including liquefaction devices and temporary storage facilities, if needed, for the transport of CO_2 to the harbour facilities and storage site, while CO_2 'pipeline network' is limited to the transport of CO_2 via pipelines.

Q6. How do you see the current and future role of CO_2 transportation modes? Please indicate whether and to what extent you agree with the following statements. Please indicate your position for each statement.

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	No opinion
CO_2 transportation by truck, train, ship or pipeline will continue to exist side-by-side in the foreseeable future.	◉	○	○	○	○	○
The higher the volume of CO_2 to be transported and the longer the distance, the more cost effective will be CO_2 transportation by pipeline.	○	◉	○	○	○	○

Non-pipeline-based transportation modes are only important in the ramp-up phase as they provide flexibility and timely availability.	○	○	○	○	◉	○
The closest substitute for CO_2 transportation by pipelines is maritime shipping of CO_2 (where waterways are available).	◉	○	○	○	○	○
As they can more readily be used in other applications and locations, investments in non-pipeline-based CO_2 transportation modes are inherently less risky as an investment and will be rolled out more easily.	○	○	◉	○	○	○

Other – Please explain.

500 character(s) maximum

CO_2 transport will require a mix of modes, with choices driven by volumes, distance, geography and market maturity. Pipelines are the most cost-effective for sustained high volumes, but involve higher upfront commitment and sizing risk.Beyond ca. 700km, shipping is cheaper, has low location redeployment risk, is well suited to early and cross-border volumes but often requires dedicated terminals. Trucks and rail provide flexibility for small volumes and early projects, but are hard to redeploy.

CO_2 transport infrastructure will be needed, both within the EU and with third countries. However, there may be barriers that slow down or prevent such CO_2 transport infrastructure from being developed. Furthermore, some of the facilitating measures in NZIA, such as Article 22 on CO_2 infrastructure, will cease to exist once the objective of 50 Mt objective by 2030 is met.

Q7. What do you consider to be the main barriers to the development of a CO_2 transport infrastructure, both within the EU and with third countries? Please indicate your position for each potential barrier.

Potential barriers	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	No opinion
Lack of investor confidence along the CO_2 value chain.	◉	○	○	○	○	○
Lack of regulatory certainty for infrastructure developers.	○	◉	○	○	○	○

Lack of coordination along the CO_2 value chain and across Member States.	◉	○	○	○	○	○
Lack of visibility of CO_2 capture volumes and of storage capacity availability.	○	◉	○	○	○	○
Lack of coordinated CO_2 infrastructure planning at national level, i.e. within a Member State.	○	◉	○	○	○	○
Lack of coordination of infrastructure plans between neighbouring Member States.	○	◉	○	○	○	○
Lack of coordination of CO_2 infrastructure planning along infrastructure corridors (i.e. CO_2 infrastructure over longer distances, crossing several Member States, with destinations including offshore locations).	○	◉	○	○	○	○
Lack of coordinated and transparent EU-level infrastructure planning.	○	○	○	◉	○	○

Other(s) – Please specify.

500 character(s) maximum

A key obstacle is the asymmetric pace of cross-border project development, often relying on one side to take initiative. This is compounded by underdeveloped cross-border cost allocation and risk-sharing mechanisms, including uncertainty on tariff treatment. A framework that preserves national network planning as the primary approach but complements it with stronger EU-level coordination and transparency would help reduce these barriers and unlock cross-border infrastructure.

Under the TEN-E Regulation, CO_2 infrastructure can be assigned the status of Project of Common Interest or Project of Mutual Interest under certain conditions, and can benefit from accelerated permitting procedures and co-funding under the Connecting Europe Facility (for studies and works). However, the TEN-E Regulation does not provide a regulatory tool for the planning of cross-border and/or national CO_2 infrastructure. Currently, there are no CO_2 infrastructure planning measures in EU legislation.

Q8. Current network planning tools for electricity, gas and hydrogen (national network plans, EU-level 10-year network development plans) focus on the planning of pipeline networks. In your view, how should the planning of CO_2 transport infrastructure take into account non-pipeline modes of transport?

- (●) The planning tool for CO_2 transport infrastructure should cover both pipeline and non-pipeline infrastructure.
- ( ) The availability of alternative modes of transport should be taken into account when considering the need for pipeline infrastructure. However, there is no need to actually plan non-pipeline CO_2 modes of transport, as the market will take care of that.
- ( ) Not at all.

Other – Please explain.

500 character(s) maximum

CO_2 infrastructure planning should be multimodal, covering not only pipelines but also liquefaction facilities, terminals, and intermediate buffer storage. Detailed planning of shipping routes is not necessary, however associated liquefaction plants and terminals are integral components of the broader CO_2 transport network, and terminals can be essential nodes for pipeline-linked systems.

Q9. What is your position on CO_2 pipeline network planning? Please indicate whether and to what extent you agree with the following statements.

Statements	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	No opinion
CO_2 pipeline network planning coordinated at EU level provides visibility on CO_2 pipeline needs.	( )	(●)	( )	( )	( )	( )
CO_2 pipeline network planning coordinated at EU level provides visibility on CO_2 pipeline availability for CO_2 emitters and storage operators.	( )	(●)	( )	( )	( )	( )
CO_2 pipeline network planning coordinated at EU level can help mitigate the coordination risk in the CO_2 value chain.	( )	( )	(●)	( )	( )	( )

CO_2 pipeline network planning coordinated at EU level can help speed up the development of CO_2 pipelines.	○	○	○	◉	○	○
CO_2 pipeline network planning coordinated at EU level is absolutely necessary for developing the CO_2 infrastructure needed CO_2.	○	○	○	◉	○	○
CO_2 pipeline network planning coordinated at EU level should be based on national CO_2 pipeline planning.	◉	○	○	○	○	○
CO_2 pipeline network planning coordinated at EU level should make use of information already available under existing EU legislation (e.g. EU ETS Directive, CCS Directive, NZIA)[20].	◉	○	○	○	○	○
CO_2 pipeline network planning coordinated at EU level should guarantee that infrastructure included in the plans is built.	○	○	◉	○	○	○

Other(s) – Please explain.

500 character(s) maximum

Q10. Which of the below CO_2 pipeline network planning measures do you think would be needed to enable the necessary CO_2 transport infrastructure to be planned and developed in a timely and cost-efficient way? Please indicate your view for each planning tool.

Planning tools	Needed	May be needed	Not needed	No opinion
Planning by each infrastructure operator	◉	○	○	○
National network plans	◉	○	○	○
Coordinated national and EU-level network plans	◉	○	○	○
Coordinated EU-level network plan	○	○	◉	○

Other(s) – Please specify.

500 character(s) maximum

CO_2 network planning should remain primarily at MS level, with the EU playing a limited coordination role focused on cross-border needs and interoperability. At this stage of the market, a fully centralised and detailed EU-level plan risks being rigid, slow, and poorly aligned with the characteristics of each local industrial cluster and CCS value chain. A bottom-up approach preserves flexibility, avoids premature over-planning, while EU coordination can help enable cross-border development.

Recent legislation (i.e. the Hydrogen and Gas Market Decarbonisation Package) reinforced the system integration approach by strengthening integrated network planning provisions for the electricity, hydrogen and gas sectors. At EU level, the 10-year network development plans for electricity, hydrogen and gas have to be developed by ENTSO-E, ENTSOG and ENNOH (i.e. the associations representing electricity and gas transmission system operators and hydrogen transmission network operators) working in close cooperation. National network development plans will also be based on joint scenarios across the three sectors. These joint scenarios aim to limit the costs of infrastructure development and increase the overall efficiency of the energy system by identifying the most suitable solutions across the sectors.

The use of CCUS technologies is closely linked to the energy sector, for example in terms of (i) the high electricity demand of CO_2 capture and purification technologies, (ii) the release of cold energy in liquefied natural gas (LNG) terminals during the regasification process which can be used for CO_2 liquefaction, (iii) low-carbon hydrogen production as a demand factor for CO_2 capture, transport and storage, and (iv) the potential for reusing energy infrastructure that is no longer needed for the transport of CO_2.

Q11. In your view, what are the trade-offs between CO_2 and other networks, and what are the possible benefits of integrated network planning? Please indicate your view for each statement.

Statements	There are positive trade-offs and benefits	There are no positive trade-offs and benefits	I don't have an opinion
Linking the planning of the electricity network with the planning of CO_2 assets (i.e. electricity consumption of capture and liquefaction technologies).	◉	○	○
Linking the planning of the gas network with the planning of CO_2 assets (i.e. potential for reusing gas infrastructure that is no longer needed for the transport of CO_2).	◉	○	○
Linking the planning of the hydrogen network with the planning of CO_2 assets (i.e. for the capture of CO_2 emitted in the process of producing low-carbon hydrogen).	◉	○	○

Linking the planning of the electricity, gas and hydrogen network with the planning of CO_2 assets, i.e. applying a full system integration approach.	◉	○	○

Other(s) – Please specify.

500 character(s) maximum

Repurposing existing oil and gas pipelines could reduce upfront costs and accelerate early deployment of CO_2 transport, enabling faster emissions reductions.However, most of these pipelines are owned by market incumbents, which can create high entry barriers and distort competition in an emerging market. Retrofitting feasibility and cost vary depending on the condition and design of each asset.Integrated network planning can identify realistic repurposing opportunities and stranded asset risks.

Regulatory predictability for existing projects

Q12. While still in its infancy, the CCUS value chain is beginning to develop, and investment decisions have been and are likely to continue to be taken before any new rules have been adopted on CO_2 pipeline and storage projects. How do you think such cases should be treated?

- ○ To protect investments, all pre-existing CO_2 pipelines and storage sites should be exempted from any new EU rules.
- ○ Operators of pre-existing CO_2 pipelines and storage sites that have been exempted from new EU rules can choose to 'opt-in' to an existing regulated system (i.e. apply the new rules).
- ◉ Pre-existing CO_2 pipelines and storage sites can be exempted from certain regulatory requirements. However, this exemption will expire by a certain date or the occurrence of a pre-defined event (e.g. once initial contracts expire, once assets become (part of) a larger, interconnected system, an assessment by regulatory authorities on pre-defined criteria, ,…).
- ○ Pre-existing infrastructure should not be given any special treatment. The main regulatory principles should apply to all CO_2 pipelines and storage sites as soon as they are introduced. Having uniform market rules and avoiding regulatory barriers is the most important thing.
- ○ I don't have an opinion.

Other(s) – Please specify.

500 character(s) maximum

In case of stringent ex-ante rules, those should not apply to projects that have already taken FID. These should benefit from time-limited exemptions corresponding to the duration of their initial long-term contracts (15-25 years).This preserves regulatory predictability and protects irreversible investment decisions. Exemptions should also be tailored where necessary for technical constraints (e.g. CO_2 quality specifications), if compliance would require major redesign or compromise safety.

Removing barriers to infrastructure development

Enabling the reuse of existing energy pipeline infrastructure for the transport of CO_2

Q13. Reusing existing energy infrastructure that is no longer needed (e.g. oil and natural gas pipelines and oil and gas rigs) is considered by some as a solution for developing the necessary CO_2 infrastructure. Would you agree?

- Yes, reusing existing energy pipelines and other energy infrastructure (like oil and gas rigs) can play a crucial role in the transportation of CO_2.
- (●) Yes, reusing existing energy pipelines can play a role, albeit a limited one.
- No, reusing existing energy pipelines cannot play a role in developing the necessary CO_2 pipeline network.
- I don't have an opinion.

What specific benefits would you expect reusing existing energy pipeline infrastructure (i.e. repurposing) to bring to the transportation of CO_2? Please indicate your view for each potential benefit.

Potential benefit	Yes, I expect this as a benefit of repurposing	No, this is not a benefit of repurposing	I don't have an opinion
Cost saving, due to the lower cost of reusing existing infrastructure, as compared to newly built infrastructure.	(●)	( )	( )
Time saving, i.e. shorter time needed to make existing infrastructure technically ready for the transport of CO_2 compared to the time needed to build new infrastructure.	(●)	( )	( )
Accelerated administrative processes.	(●)	( )	( )

Other(s) – Please specify.

500 character(s) maximum

Repurposing existing infrastructure can play a limited but useful role, as it may reduce costs, shorten timelines and some administrative procedures.However, feasibility depends on asset condition and technical requirements, and repurposing could confer undue advantages to incumbents. In addition, repurposing is

unlikely to deliver the scale needed in the near term, as many potentially suitable pipelines are not expected to be decommissioned or available for conversion until around 2035-2040.

If you expect cost savings, can you provide an estimate of those savings?

500 character(s) maximum

In order to repurpose the existing natural gas pipeline infrastructure for CO_2 transport, it is necessary to clarify whether rights of land use, private easements as well as (other) public permits that have been granted for the construction and operation of natural gas pipelines will remain valid once the pipeline ceases to transport natural gas and starts transporting CO_2.

Q14. In your view, are there any barriers to the repurposing of existing energy pipeline infrastructure for the transport of CO_2 today? Please indicate whether or not you agree that the following factors constitute a potential barrier.

Types of potential barrier	Yes, this constitutes a barrier	No, this does not constitute a barrier	I don't have an opinion
Legal factors (e.g. existing national or EU legislation).	○	◉	○
Regulatory barriers to reusing existing permits and rights.	◉	○	○
The technical characteristics of existing pipelines make them unsuitable for being repurposed to transport CO_2.	◉	○	○
It is financially more attractive to continue using existing pipelines for natural gas (or other energy carriers).	○	◉	○
No potential for scalability, i.e. it would be difficult to adapt the technical characteristics of the pipelines to make them suitable for transporting a higher volume of CO_2 (e.g. in dense phase vs gaseous phase).	◉	○	○

Other(s) – Please specify.

500 character(s) maximum

Technical constraints are the main barrier to repurposing pipelines. Repurposing should therefore be conditional on a public, independent feasibility study assessment (covering e.g. metallurgy, fracture risk, diameter, pressure rating, dehydration requirements) demonstrating safe and cost-effective operation. Repurposing can also face regulatory barriers to reusing permits and rights-of-way, as CO_2 transport may require different authorisations/safety conditions than natural gas corridors.

Q15. In your view, can energy infrastructure assets other than pipelines (e.g. terminals) be reused for the transport of CO_2?

- (●) Yes
- ( ) No
- ( ) I don't have an opinion

Please specify which energy infrastructure assets (other than pipelines) could be reused for transporting CO_2.

500 character(s) maximum

This would be complex given the different CO2 handling requirements (e.g. compression, dehydration, liquefaction and safety standards), so feasibility would be highly site-specific. For LNG terminals or offshore assets expected to be decommissioned after 2030, operators should be required to carry out a mandatory reuse assessment and publish an independent CO_2 reuse feasibility study within 18 months of the legislative act's entry into force.

Permitting for CO_2 transport infrastructure

Q16. The TEN-E Regulation ((EU) 2022/869), the NZIA ((EU) 2024/1735) and the Environmental Impact Assessment Directive (2011/92/EU and 2014/52/EU) include provisions for the permitting of CO_2 transport infrastructure. Moreover, the EU ETS Directive includes provisions for the permitting of the activity of CO_2 transport for storage. To what extent do you agree that these pieces of legislation set out an effective, coherent and durable framework to enable permitting and land use access for CO_2 transport infrastructure?

- ( ) Strongly agree
- ( ) Agree
- ( ) Neutral
- (●) Disagree
- ( ) Strongly disagree
- ( ) I don't have an opinion

Q17. Do you think that the effectiveness, coherence and durability of the permitting procedures for CO_2 transport infrastructure can be improved? Please indicate whether and to what extent you agree with the following statements. Please indicate your position for each statement.

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	No opinion
Permitting procedures should be fully digitalised.	◉	○	○	○	○	○
There should be a basic permitting framework that applies under all circumstances e.g. for projects that do not want to apply for or isn't able to qualify for status as net-zero strategic project or PCI/PMI.	◉	○	○	○	○	○
The basic permitting framework should be permanent and without an expiry date, i.e. not linked to a specific time limited target like the NZIA 2030 storage injection capacity.	○	○	○	◉	○	○
There should be a single point of contact to assist and guide applicants through the permitting procedure for CO_2 transport infrastructure projects.	◉	○	○	○	○	○
The entire permitting procedure should have a maximum duration specified in EU legislation.	◉	○	○	○	○	○
Member State authorities should be required to ensure adequate resources to deal with the permitting of installations and transport capacities that have been specified in the national energy and climate plans or in their reports under Art. 21 of NZIA.	◉	○	○	○	○	○
The repurposing of energy infrastructure to CO_2 transport through the associated technical adaptations should have a simpler and shorter permitting process than for newly built infrastructure.	○	○	○	◉	○	○
The availability and sharing of environmental and geological data,	○	◉	○	○	○	○

and any other technical data necessary for the permitting process, should be ensured.						

Other(s) – Please specify.

500 character(s) maximum

Permitting procedures should be fully digitalised to improve efficiency and transparency, while still ensuring opportunities for direct interaction between project developers and competent authorities.

Regarding the maximum duration of the entire permitting procedure, to which extent do you agree with the following statements? Please indicate your position for each statement.

The entire permitting procedure should have a maximum duration specified in EU legislation:	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	No opinion
In addition, this maximum duration should be shorter than current practice.	○	○	○	○	○	◉
In addition, maximum duration should be established for intermediate steps of the permitting procedure (e.g. max duration for acknowledging complete application, max duration for requesting additional information).	○	○	○	○	○	◉

Q18. Regarding the single point of contact mentioned in Q17 that assist and guide the applicants for the permitting of CO_2 transport infrastructure projects, to which extent do you agree with the following statements? Please indicate your position for each statement.

Statements	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	No opinion
The single point of contact for CO_2 transport infrastructure should as well be responsible for CO_2 capture infrastructure.	○	◉	○	○	○	○

The single point of contact for CO_2 transport infrastructure should as well be responsible for conditioning facilities.	○	◉	○	○	○	○
The single point of contact for CO_2 transport infrastructure should as well be responsible for temporary or intermediate storage.	○	◉	○	○	○	○
The single point of contact for CO_2 transport infrastructure should as well be responsible for permanent storage.	○	◉	○	○	○	○

The permitting process typically involves multiple competent authorities (in charge of e.g. species protection, safety, transport, emissions, buildings).

Q19. Which model of cooperation and coordination would you prefer for CO_2 transport infrastructure permitting, considering that the 'single point of contact' mode can deal with more complex integrated projects than a 'one-stop shop' model.

- ○ 'Single point of contact': one entity is in charge of guiding the applicant through the process. The permitting process may entail several independent decisions, each of which are subject to different time constraints.
- ◉ 'Coordinated single point of contact': one entity is in charge of guiding the applicant through the process and helping them comply with the different time constraints. The permitting process may entail several independent decisions from different authorities.
- ○ 'One-stop shop': one entity is in charge of the entire scope of the application and takes a consolidated decision based on input from the relevant authorities.
- ○ I don't have an opinion

Other(s) – Please specify.

500 character(s) maximum

Establishing a single point of contact will not automatically improve administrative efficiency unless the permitting system is properly organised and coordinated. Consolidating decisions within the one-stop shot model may reduce transparency relative to a coordinated single-point-of-contact model, where responsibilities and inputs from competent authorities are visible. MS should be required to designate a coordinated single point of contact for CO2 transport infrastructure by 2028.

3/ Removing barriers to the cross-border transportation of CO_2

Barriers and legal uncertainty originating from international treaties

EU Member States, along with neighbouring countries, have entered into several international treaties aimed at protecting the marine environment, which may affect the cross-border transport of CO_2 for offshore geological storage. For the Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter ('London Protocol'), EEA countries rely on the EU legal framework as a relevant 'arrangement' which already allows any operator of CO_2 transport networks and/or CO_2 storage sites to fully benefit from EU rules when importing or exporting captured CO_2 within the EEA. For other conventions including the Convention on the Protection of the Marine Environment of the Baltic Sea Area (Helsinki Convention, 'HELCOM'), the Convention for the Protection of the Marine Environment of the North-East Atlantic ('OSPAR Convention'), the Convention for the Protection for the Protection of the Marine Environment and the Coastal Region of the Mediterranean ('Barcelona Convention') and the Convention on the Protection of the Black Sea Against Pollution ('Bucharest Convention'), the concern about providing legal certainty for the cross-border export and import of CO_2 is currently under discussion.

In addition, cross-border industrial carbon management activities also need to be reported in greenhouse gas (GHG) inventories under the United Nations Framework Convention on Climate Change (UNFCCC). Particular attention should be given to international value chains where the CO_2 is captured, transported, stored or used in different countries. The Intergovernmental Panel on Climate Change (IPCC) will play an essential role in providing clear guidelines and methodologies to properly report all type of CCS, CCU and industrial carbon removal operations in the UNFCCC GHG inventories.

Q20. Do you think that certain international treaties represent a restriction to the cross-border transport of CO_2 within the EU (and EEA)? Please indicate whether and to what extent the below treaties represent a restriction.

	Represents a significant restriction	Represents a moderate restriction	Does not represent a restriction	I don't have an opinion
London Protocol	○	◉	○	○
HELCOM	○	○	◉	○
OSPAR Convention	○	○	◉	○
Barcelona Convention	○	○	◉	○
Bucharest Convention	○	○	◉	○
GHG reporting under the United Nations Framework Convention on Climate Change (UNFCCC)	○	○	◉	○

Other(s) - Please specify.

500 character(s) maximum

The London Protocol poses only a moderate constraint, as the 2009 amendment enabling cross-border CO_2 transport for sub-seabed storage has not yet entered into force. It requires ratification from two-thirds of Contracting Parties (to date, 15 States out of the 56). The 2019 Resolution (LP.5(14)) provides a workaround but it involves additional administrative steps (e.g. declarations and bilateral arrangements) that would be unnecessary if the amendment were fully in force.

Q21. If you indicated in the previous question that at least one international treaty represents a restriction for cross-border CO_2 transport within the EU, please specify the nature of the restriction for each treaty.

	Clear legal barriers arising from explicit restrictions on the cross-border transport of CO_2 for offshore geological storage	Clear legal barriers arising from the inaction of individual parties to the treaties (The inaction of the individual parties to the treaties may include the non-ratification of an amendment or the non-compliance with a Resolution.)	Legal uncertainty due to divergent interpretation of the treaties (including interpreting the geological storage of CO_2 under the seabed as dumping of waste into the sea)	Legal uncertainties due to the inaction of parties to the treaties	I don't have an opinion
London Protocol	○	◉	○	○	○
HELCOM	○	○	○	○	○
OSPAR Convention	○	○	○	○	○
Barcelona Convention	○	○	○	○	○
Bucharest Convention	○	○	○	○	○
GHG reporting under the United Nations Framework Convention on Climate	○	○	○	○	○

Change (UNFCCC)					

Other(s) - Please specify.

500 character(s) maximum

Q22. In your opinion, what appropriate measures could be taken at EU level to address potential legal uncertainties and restrictions arising from international treaties, in order to facilitate cross-border CO_2 transport for permanent geological storage purposes? Please indicate your view, if any, for each treaty.

	EU regulatory intervention, in particular the adoption of a legal framework for CO_2 transport	Publication of European guidelines for Member States	Establishment of EU-led agreements with third countries	Encourage Member States to take action, including drawing up bilateral agreements between parties to the relevant international treaties	No EU intervention necessary	I don't have an opinion
London Protocol	○	○	○	◉	○	○
HELCOM	◉	○	○	○	○	○
OSPAR Convention	○	○	○	○	◉	○
Barcelona Convention	○	○	○	○	◉	○
Bucharest Convention	○	○	○	○	◉	○
GHG reporting under the United Nations Framework Convention on Climate Change (UNFCCC)	○	○	○	○	◉	○

Other(s) - Please specify.

500 character(s) maximum

HELCOM is currently assessing the compatibility of offshore CO2 storage with the text of the Convention. The forthcoming EU framework on the CO_2 market and infrastructure may create pressure for the Contracting Parties to amend the Convention accordingly.
For the Barcelona Convention, no immediate EU action is required at this stage, but the 1995 Offshore Protocol would need to be amended before it can be ratified to ensure that it does not create barriers to CO2 storage activities.

CO_2 interconnections with countries outside the EU and EEA

The EU ETS Directive and the CCS Directive ensure high safety standards to avoid accidents that could negatively affect public health or the environment. These directives also support the achievement of the EU climate targets. However, the lack of alignment between the EU legislative framework and that of countries outside the EU/EEA (third countries) may lead to restrictions on the cross-border flow of CO_2, and on access to storage sites and utilisation sites in third countries. At the same time, the first Union list of PCI and PMI projects[21] includes a number of CO_2 infrastructure projects with third countries under certain conditions.

Q23. Which third countries/regions have CO_2 transport and storage infrastructure that could be relevant for your industrial carbon management project? Multiple answers are possible.

- [x] United Kingdom
- [x] North Africa
- [x] Ukraine
- [x] Türkiye
- [x] Arabian Peninsula
- [ ] United States
- [ ] Asia
- [ ] None
- [ ] I don’t have an opinion

Other(s) - Please specify.

500 character(s) maximum

These countries’ continental shelves offer storage potential for industrial carbon management. The UK should be the priority due to large North Sea capacity and proximity to EU clusters, but UK storage is not currently eligible for EU ETS compliance without regulatory alignment. Extending eligibility beyond the EU/EEA could accelerate the market, but requires safeguards: MRV/accounting equivalence and agreements ensuring consistent liability, standards and enforcement.

Q24. For what reason(s) might access to potential CO_2 transport and storage infrastructure in third countries be relevant for your industrial carbon management project. Multiple answers are possible.

- [x] To reduce overall project costs.
- [x] To gain access to additional storage or utilisation capacity.
- [x] To address storage availability bottlenecks.
- [x] To improve our negotiating position with infrastructure providers.
- [x] To increase project flexibility and resilience.
- [x] To access geographically closer or more suitable infrastructure.
- [x] All of the above.
- [ ] Not relevant for our project.
- [ ] I don't have an opinion.

Other(s) - Please specify.

500 character(s) maximum

Q25. Do you think that any of the following factors could pose a restriction on the cross-border movement of CO_2 to or from third countries? Please indicate whether and to what extent each factor represent a restriction.

	Represents significant restriction	Represents a moderate restriction	Does not represent a restriction	I don't have an opinion
London Protocol	○	◉	○	○
HELCOM	○	○	◉	○
OSPAR Convention	○	○	◉	○
Barcelona Convention	○	○	◉	○
Bucharest Convention	○	○	◉	○
Alignment with the EU ETS Directive (i.e. the need to establish a comparable monitoring, reporting and verification system as well as a mechanism for surrendering CO_2 allowances in third countries)	◉	○	○	○

Alignment with the CCS Directive (i.e. the need to establish similar safety, permitting and governance measures in third countries)	◉	○	○	○
Permitting for cross-border CO_2 transport infrastructure with third countries	◉	○	○	○
Liability and international reporting rules under international agreements, including the UNFCCC, for CO_2 emissions	○	◉	○	○
Coordination between national competent authorities for CO_2 transport infrastructures beyond the EU	○	◉	○	○
Assurances that the market rules in third countries are aligned with the corresponding rules in the EU	○	◉	○	○
Assurances that rules for access to storage in third countries are aligned with the corresponding rules in the EU	◉	○	○	○
Assurances that CO_2 pipeline infrastructure connecting the EU with third countries is operated in a way that is coherent with EU rules	○	◉	○	○

Other(s) - Please specify.

500 character(s) maximum

he extent to which different elements pose a restriction depends on which third country would be included. Alignment with the CCS Directive could pose a restriction for North Africa, for instance.

Ensuring clear responsibility for CO_2 leakage in parts of the value chain

Under the EU ETS Directive, the permitting process and the allocation of responsibility for CO_2 leakage from the CO_2 transport infrastructure (regardless of the mode of transport) is determined by each Member State when it transposes the Directive into national legislation.

The transport of CO_2 for geological storage, which is permitted under the CCS Directive, and for permanent storage in products, falls within the scope of the EU ETS Directive. The CO_2 transport infrastructure for these types of storage is considered as an ETS installation under EU rules (regardless of the transport mode), meaning that it requires a GHG emission permit and a monitoring plan. Any CO_2 that leaks from the transportation system, as well as other emissions resulting from the operation of the CO_2 transport infrastructure (e.g. fuel combustion, etc.) needs to be monitored and reported, and EU ETS emission allowances need to be surrendered accordingly. The financial exposure by transport operators resulting from a leakage can however also be contracted away, for instance, to network users.

Q26. For cross-border CO_2 transport, what do you think the applicable rules should be determined by?

- ○ Bilateral or multilateral agreements between the Member States involved.
- ○ Case-by-case arrangements negotiated by the concerned operators.
- ◉ A harmonised EU-level framework.
- ○ I don't have an opinion.

Other(s) - Please specify.

500 character(s) maximum

Cross-border CO_2 transport needs a harmonised EU framework for legal certainty and clear responsibilities. It should include a mandatory contractual cascade for leakage risk, based on a standard EU model contract defining obligations for CCS operators. Parties may negotiate costs but not shift primary regulatory responsibility. For pipelines spanning two Member States reporting and compliance should be managed by one authority, ideally where CO_2 departs, to avoid duplication.

Q27. Do you think that further measures should be taken to prevent CO_2 leakage in the CO_2 transport infrastructure?

- ○ The ETS already provides a significant incentive to avoid CO_2 leakage. No further measures are required. Under EU rules, each participant carries the ETS liability until hand-over to the next participant. In case of a leak, the directly affected participant would have to surrender emission allowances and have to pay for the leaked CO_2.
- ◉ Further measures are required.

Please specify.

500 character(s) maximum

EU-level guidance on EU ETS liability for leakage in cross-border transport, to ensure consistent allocation of responsibilities.Stronger incentives are needed to ensure best operational performance by transport operators, as emitters remain the primary EU ETS compliance point and can face disruption and leakage exposure beyond their control. Cross-border transport tariffs and contractual arrangements should cover price leakage and performance risk transparently and appropriately.

Q28. In the event of a cross-border CO_2 leakage, particularly in relation to international obligations under the UNFCCC, how should liability and reporting responsibilities be determined between countries?

- ○ EU legislation should clearly specify that the Member State where the leakage physically occurs is responsible for reporting the associated emissions.

- EU legislation should clearly specify that the Member State where the CO_2 was originally captured is responsible for reporting.
- EU legislation should clearly allocate responsibilities indicating which Member State has jurisdiction and responsibility in case of leakage over the specific parts of the infrastructure, reflecting the division of roles across the CO_2 transport and storage value chain.
- Responsibility should be shared between the Member States involved, based on a predefined EU rule, with the approach supported by EU-level guidance or coordination.
- Bilateral or multilateral agreements should be concluded between the Member States involved.
- I don’t have an opinion.

Q29. Would you agree that rules should be introduced on emergency response in the event of accidental release of CO_2 from the pipeline network?

- Yes, they are necessary.
- Yes, they are necessary, also for other means of transportation (i.e. not limited to pipelines).
- No, they are not necessary.
- I don’t have an opinion.

In your view, what would be the most appropriate level at which emergency response rules for the accidental release of CO_2 should be set?

- Such rules should be set at EU level.
- Such rules should be set at national level based on EU-level principles.
- Such rules should be set at national level.
- Such rules should be set by the infrastructure operators.
- No, there is no need for such rules.
- I don't have an opinion.

Other(s) - Please specify.

500 character(s) maximum

CO_2 stream quality standardisation and quality management

A CO_2 stream is a flow of substances that results from the CO_2 capture processes. Large-scale cross-border transport of CO_2 will require handling CO_2 streams from different sources and capture technologies, and through different modes of transport. Existing EU legislation lays down CO_2 stream acceptance criteria and procedures for permitted geological storage sites. The CCS Directive stipulates that, on a case-by-case basis, acceptable CO_2 streams for storage sites must consist 'overwhelmingly of carbon dioxide', and that the concentrations of all other substances must be below levels that would (i) adversely affect the integrity of the storage site or the relevant transport infrastructure, (ii) pose a significant risk to the environment or human health, or (iii) breach EU rules[22]. The NZIA tasks the Commission with publishing guidelines indicating the appropriate levels of CO_2 purity and of trace elements within the CO_2 stream, for CO_2 storage projects contributing to the EU's injection capacity objective.

However, EU legislation does not yet lay down detailed requirements on CO_2 quality (e.g. concerning corrosive components and other impurities) either for transport or for storage infrastructures. So far, specifications have been determined on a case-by-case basis by the main transport and storage operators, or by shippers.

According to the ICM strategy, it will be necessary to set minimum CO_2 quality standards to ensure the unhindered flow of CO_2 and to avoid market fragmentation. The Commission has requested that research be undertaken by European Standardisation Bodies to help determine appropriate standards.

Q30. At EU level, the European Committee for Standardisation (CEN) is working towards a standard for CO_2 transportation by pipeline, with work expected to conclude in Q2 2026. Do you agree that minimum CO_2 quality standards and specifications will contribute to the following? Please indicate whether and to what extent you agree with each of the following statements.

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	No opinion
Avoiding market fragmentation.	◉	○	○	○	○	○
Creating market liquidity and free flow of CO_2.	○	◉	○	○	○	○
Interoperability in the CO_2 pipeline network, including cross-border transport and compatibility between different CO_2 transportation modes.	◉	○	○	○	○	○
Clarity for emitters as to the type of capture installations.	○	◉	○	○	○	○
Attribution of liability in case of injection of CO_2 outside of the						

predefined quality specification (off-spec).	○	○	◉	○	○	○
Avoiding significant risk to the environment or human health.	◉	○	○	○	○	○
Avoiding adverse effect for the integrity of the relevant transport infrastructure.	◉	○	○	○	○	○
Avoiding adverse effect of the integrity of the relevant storage site.	○	◉	○	○	○	○

Other(s) – Please specify.

500 character(s) maximum

An EU-wide minimum CO_2 stream quality standard, limited to well-understood impurities, should safeguard infrastructure integrity, protect health and the environment, and reduce avoidable costs from outages or damage. To ensure interoperability across transport modes, storage types and future networks, it should reflect the highest common denominator across CCS chains. The standard should be reviewed periodically as data grows and capture technologies mature.

Q31. In your view, what should be the most relevant drivers for setting clear CO_2 quality specifications and standards in CO_2 networks (storage, pipeline, terminals)? Multiple answers are possible.

- ☐ Ensure containment of CO_2 and avoid CO_2 leakages.
- ☑ Avoid corrosion and ensure system integrity.
- ☑ Ensure interoperability for cross-border CO_2 transport and between modes of transport.
- ☑ Limit the cost of technology development and deployment, as well as the operational costs for infrastructure users.
- ☐ Support the scaling-up of equipment manufacturing.
- ☐ I don’t have an opinion.

Other(s) – Please specify.

500 character(s) maximum

Long-term system integrity is the baseline. It requires common limits on corrosive/reactive impurities to prevent degradation, outages and safety risks over 30-50 years. Interoperability is also critical as CO_2 moves across plants, transport modes, borders and shared hubs: harmonised minimum specs are key to avoid fragmentation and enable a competitive European market. Limits must be balanced: if too strict, it raises capture costs; if too lax, it shifts costs to transport/storage (e.g.material)

The transportation of CO_2 will link capture sites with storage or utilisation facilities. This could involve several different infrastructure assets, i.e. both pipeline and non-pipeline modes of transport (ships, rail, road transport, collection terminals, i.e. common infrastructure that gathers CO_2 streams from multiple emitting sources, port facilities, etc.).

Q32. When different CO_2 streams from industrial processes and - in the future from, direct air capture (DAC) are mixed together in the transport infrastructure, the quality of the CO_2 can change. To ensure that CO_2 quality remains acceptable throughout its transportation (i.e. without damaging equipment), as well as affordable, how should the CO_2 quality requirements be?

- ○ Should be the same throughout the CO_2 value chain (from capture via non-pipeline and/or pipeline transport, including terminals, to storage and/or utilisation).
- ○ Should be the same in the interconnected CO_2 pipeline network.
- ◉ Should be the same in the interconnected CO_2 pipeline network and in the infrastructure directly connected to pipelines (e.g. terminals).
- ○ Can vary at different points within the interconnected CO_2 pipeline network.
- ○ Can vary at different points within the CO_2 transport infrastructure (for instance, depending on the mode of transport).
- ○ I don’t have an opinion.

Other(s) – Please specify.

500 character(s) maximum

Set default CO_2 composition requirements to protect the most sensitive CCS element unless downstream conditioning occurs. Shared networks need a common CO_2 quality envelope for safe, compatible operations, while capture sites (incl. DAC/BioCCS) retain flexibility in how they meet it to manage costs. EU rules should clarify responsibility, verification and liability at interfaces, ensuring compliance is proven at entry/hand-over points and accountability is clear along the chain.

Q33. In your view, how should it be ensured, that the quality of the CO_2 is within the applicable quality specifications in the CO_2 pipeline network?

- ◉ CO_2 specifications should be set by the most sensitive component in the system (mode of transport, storage site, CO_2 user, etc.), regardless of the volumes or the specification concerned.
- ○

Managing CO_2 stream specifications that threaten system integrity and safety (e. g. avoiding corrosion) should be the responsibility of emitters that inject CO_2 into the transport infrastructure.

- Characteristics of CO_2 streams that do not threaten system integrity and safety should be allowed in principle. System users or modes of transport that cannot handle such a specific CO_2 stream specification are responsible for its management.
- The network operators should be responsible and socialise the costs over all users.
- I don't have an opinion.

Other(s) – Please specify.

500 character(s) maximum

CO_2 quality standardisation needs structured collaboration and data sharing across industry, academia and policymakers, drawing on experience from regions with network codes (e.g. the UK). To support CEN, open-access digital tools and EU registries linked to EU ETS/CRCF MRV can enable transparent, verifiable CO_2 quality data exchange. Funding for joint R&D and pilots on mixed streams can provide the evidence base for robust standards and best practices

Q34. To what extent, if any, should information on the quality requirements for CO_2 transport and storage infrastructure be made available to the public?

- (●) Fully. The public needs to be confident that the specifications are justified. Information on the underlying research should therefore be made available to them. If we want to make progress towards stable, trusted specifications, research cannot be propriety.
- Partially. Information on the underlying research is only relevant for standardisation bodies, who already have access to that information. Once determined, information on the CO_2 stream specifications is sufficient for the public.
- I don't have an opinion.

Other(s) – Please specify.

500 character(s) maximum

Public disclosure of CO_2 quality requirements on a central EU platform is needed to build trust, enable verification, and support cross-border interoperability. Core standards should be fully public, while sensitive project-specific details can be shared in aggregated or anonymised form, and trade secrets (e.g. purification

methods) should remain protected. Transparent end-requirements and monitoring protocols also strengthen safety and environmental oversight and support public acceptance.

Q35. In your view, how can we foster cooperation and exchange of data regarding operational and research knowledge on CO_2 quality? Please explain.

500 character(s) maximum

Build cooperation and evidence for future CO_2 quality standards by using EU-supported forums and platforms to share operational lessons and align terminology, complemented by open-access digital tools (e.g. databases) for anonymised CO_2 quality data and mixing scenarios. Reinforce this through publicly funded research and pilots (e.g. Horizon Europe/JIPs) with dissemination requirements, EU-level guidelines for a harmonised CO_2 quality specs and a value-chain-wide CO_2 quality data platform.

Q36. What do you consider to be the most cost-effective purification requirements across the CO_2 value chain? Please explain.

500 character(s) maximum

Cost-effective CO_2 quality rules should be risk-based: set baseline impurity limits, with stricter thresholds only if necessary. Allow controlled variances where equivalent safety barriers exist (e.g. enhanced monitoring, real-time sensors, corrosion-resistant materials) to avoid unnecessary over-purification. This links purification to downstream needs, cutting system costs and supporting low-cost capture innovation.

Mixing CO_2 streams from different industrial processes (and in the future from DAC) will be relevant for the optimal design of a cost-efficient transport of CO_2, as different CO_2 streams have different concentrations of impurities that would need to be managed. Special consideration should be given to CO_2 hubs and other common infrastructure that collects CO_2 from different industrial emitters.

Q37. Which measures can, in your view, address potential technical barriers when CO_2 streams are mixed, while allowing the unhindered transportation of CO_2 in different infrastructure assets and modes of transport? Please explain.

500 character(s) maximum

Mixed CO_2 stream barriers should be addressed through an EU-wide framework with harmonised entry specifications and aligned MRV to ensure compatibility. Variability can be managed via hub-based modular purification, real-time monitoring and standard off-spec procedures to avoid operability risks. This should be supported by mandatory liability and cost-sharing clauses, coordination platforms, and EU funding for pilots and infrastructure upgrades to refine thresholds and scale cost-effectively.

The EU market legislation for gas and hydrogen (Gas Directive and Gas Regulation) provides for the cooperation between operators and national regulatory authorities to ensure the unhindered cross-border flow of gas and hydrogen in the face of (potential) differences in the quality of these gases or differences between their specifications. Solutions can include operational activities, technical measures and infrastructure adaptations. The legislation ensures that agreements on sharing the cost of implementing the necessary measures are reached.

Q38. Which measures, in your opinion, would be necessary to ensure that differences in CO_2 quality or quality specifications do not lead to interruption of the cross-border transport of CO_2? Please indicate whether and to what extent you agree with each measure.

Measure	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	No opinion
Pipeline operators should coordinate across borders to identify and implement solutions on a voluntary basis.	○	○	○	◉	○	○
Obligations on pipeline operators to cooperate across borders are necessary to identify and implement solutions.	○	◉	○	○	○	○
Mandatory cross-border coordination of the relevant competent regulatory authorities is necessary to solve problems.	○	◉	○	○	○	○
Rules on agreements on sharing the cost of implementing the jointly identified solutions across borders are necessary.	○	◉	○	○	○	○
CO_2 quality specifications applicable at cross-border interconnection points need to be agreed by the operators on both sides of the border.	○	○	◉	○	○	○
Obligatory CO_2 quality specifications applicable at cross-border interconnection points are necessary to ensure unhindered cross-border flow of CO_2.	○	◉	○	○	○	○

Other(s) – Please specify.

500 character(s) maximum

CO_2 quality will be measured and controlled at operational points, not “at the border”. The preferred approach is operator-led cross-border cooperation, backed by binding cooperation duties, clear cost-sharing rules, and light-touch regulatory authority coordination. EU-wide mandatory CO_2 quality specifications at interconnections may be premature: in the near term, route-specific specs agreed by both operators can provide flexibility while ensuring uninterrupted flows.

4/ Supporting the emergence of a competitive, cost-effective CO_2 value chain

Competitive conditions in the CO_2 value chain

Q39. What competitive conditions would you expect in various parts of the CO_2 value chain? Please indicate whether and to what extent you agree with each of the following statements.

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	No opinion
Pipeline transportation is characterised by high fixed costs and low variable or marginal costs.	◉	○	○	○	○	○
The capacity of CO_2 pipelines is highly scalable by e.g. increasing pressure levels.	○	○	◉	○	○	○
CO_2 pipelines have large economies of scale.	◉	○	○	○	○	○
Construction costs for pipelines imply that it is attractive to build capacity for future capacity demand (given that volume risks are managed).	◉	○	○	○	○	○
It is economically inefficient to build multiple competing pipelines.	◉	○	○	○	○	○
The market for CO_2 storage has high entry barriers.	○	◉	○	○	○	○
The number of companies that are well placed to develop storage sites is low.	○	◉	○	○	○	○
Opportunities for the geological storage of CO_2 are not readily available in large parts of the EU. Where storage opportunities are limited, storage operators have significant market power.	○	◉	○	○	○	○
CO_2 transportation by ship is likely to be an activity subject to effective competition.	◉	○	○	○	○	○

CO_2 transportation by truck is likely to be an activity subject to effective competition.	◉	○	○	○	○	○
CO_2 transportation by train is likely to be an activity subject to effective competition.	○	◉	○	○	○	○

Access conditions to CO_2 pipelines

CO_2 networks are considered by some to be natural monopolies[23]. This means that CO_2 network operators may have the market power to set tariffs for using their network at a rate significantly above competitive levels.

For CO_2 networks, Article 21 of the CCS Directive requires that Member States ensure that transparent and non-discriminatory third-party access exists on CO_2 pipelines, without specifying how this should be done in practice, and leaving Member States a wide margin of discretion in this matter.

In the EU electricity, hydrogen and gas markets, network tariffs can be regulated. These tariffs should reflect the costs of network operators and provide appropriate incentives to, among others, increase efficiencies, foster market integration and support efficient investments.

Q40. Which measures, if any, are required to better organise the tariff setting for CO_2 networks? Please indicate your position for each statement.

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	No opinion
As CO_2 networks do not confer market power, network prices or tariffs can be expected to be set at competitive levels. Therefore, no rules are needed. Competition law is a sufficient back-up option.	○	○	○	◉	○	○
Market rules that ensure that markets will deliver competitive market outcomes foster trust and investment.	○	◉	○	○	○	○
The third-party access provisions of Article 21 of the CCS Directive are sufficient to ensure reasonable tariffs for access to CO_2 storage and transportation infrastructure.	○	○	◉	○	○	○
To support the emergence of cost-effective, transparent and non-						

discriminatory tariffs, it is sufficient to harmonise access conditions. Tariff levels can, however, be decided during negotiations between CO_2 network operators and users.	○	○	◉	○	○	○
Alongside access conditions, the level of tariffs of CO_2 pipelines needs to be regulated at national level.	○	○	◉	○	○	○
Alongside access conditions, the level of tariffs of CO_2 pipelines needs to be regulated at EU level.	○	○	◉	○	○	○
Access conditions and tariffs for pipeline transportation should be tested and offered to the markets by means of market tests known as 'open seasons'[24].	○	○	◉	○	○	○
Tariff setting should not distort competition between pipelines and other means of CO_2 transportation.	○	◉	○	○	○	○
As pipelines are long-term investments, network operators should be shielded from any risk of network users disconnecting before the network connection is depreciated.	○	○	○	◉	○	○
The tariff each user pays should reflect the costs that the user incurs for the system (network development follows economic principles only).	○	○	◉	○	○	○
There should be scope to structure network tariffs to reflect criteria other than pure economic efficiency (e.g. equity rules when connecting certain industries, emissions avoided, etc.).	○	◉	○	○	○	○
To ensure equal access to CO_2 pipelines it is also necessary to set access rules for CO_2 terminals (i.e. common infrastructure assets						

gathering CO_2 streams from multiple emitting sources and treating it for further transport or storage).	○	◉	○	○	○	○

Avoiding conflicts of interest in the CO_2 market

CO_2 networks are considered by some to be natural monopolies. When network operators are vertically integrated entities, these vertically integrated entities may discriminate against competitors, which could hamper entry into the market and cause non-competitive market outcomes.

For CO_2 networks, Article 21 of the CCS Directive requires that Member States ensure transparent and non-discriminatory third-party access to CO_2 pipelines, without specifying how this should be done in practice, and giving Member States a wide margin of discretion in this matter.

In the EU market for electricity, hydrogen and gas, the current level of harmonisation means that there are rules in place to ensure non-discriminatory access, increase transparency, reduce the risk of discrimination and remove incentives to engage in discriminatory conduct.

Q41. Is it necessary to introduce measures to ensure real and non-discriminatory access to CO_2 networks? What should such measures involve? Please indicate your position for each statement.

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	No opinion
CO_2 networks do not confer market power to vertically integrated companies, so there is no reason to fear discriminatory anti-competitive conduct. Competition law provides for sufficient enforcement measures.	○	○	○	◉	○	○
There is no risk of vertical integration of CO_2 networks with downstream or upstream network users, so it is not necessary to set rules to avoid discriminatory conduct.	○	○	○	◉	○	○
Discriminatory conduct is a significant risk. However, the provisions of Article 21 of the CCS	○	○	○	◉	○	○

Directive on third-party access at national level are sufficient to control this risk.						
Discriminatory conduct is a significant risk, especially if CO_2 networks are vertically integrated with downstream users, such as storage operators.	○	○	◉	○	○	○
Discriminatory conduct is a significant risk, especially if CO_2 networks are vertically integrated with upstream users, such as emitters.	○	○	◉	○	○	○
Discriminatory conduct is a significant risk. We need more rules to ensure CO_2 markets will be competitive.	○	◉	○	○	○	○
In order to ensure effective third-party access to CO_2 pipelines, access rules also need to exist for installations that are ancillary to pipeline transportation or are needed to enter or exit the pipeline system (such as CO_2 liquification and purification installations and terminals).	○	◉	○	○	○	○

Q42. Which of the following rules concerning CO_2 pipelines do you consider necessary to ensure that CO_2 markets are competitive? Please indicate your position for each statement.

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	No opinion
No additional rules are needed.	○	○	○	◉	○	○
Access conditions and tariffs for CO_2 pipelines should be tested and offered on the market by means of open seasons.	○	○	◉	○	○	○
Rules to avoid discriminatory capacity allocation, capacity hoarding and capacity management (e.g. use-it-or-lose-it						

rules, return of non-used capacity to the market, capacity release obligation, secondary capacity market, capacity auctioning).	○	◉	○	○	○	○
Rules to avoid cross-subsidies to upstream or downstream activities.	○	○	◉	○	○	○
Regulated, cost-reflective tariffs for CO_2 networks.	○	○	◉	○	○	○
CO_2 network activities should be delegated to a separate legal entity to ensure transparency and facilitate enforcement (these activities should be separate from other activities in the CO_2 value chain).	○	○	○	◉	○	○
Appropriate unbundling rules for CO_2 networks similar to those already applied in electricity, gas and hydrogen networks.	○	○	○	◉	○	○
We should take the opportunity to organise the industry from the start to prevent discrimination. Structural links between CO_2 networks and upstream and downstream network users should be prohibited.	○	○	○	◉	○	○
If non-discriminatory access to pipelines is to be ensured, it is also necessary to set some rules for installations where CO_2 enters or leaves the CO_2 pipeline system to /from other modes of transport.	○	◉	○	○	○	○

Other(s) – Please specify.

500 character(s) maximum

At this stage, mandatory unbundling should not be imposed. Instead, NRAs should ensure robust oversight and use regulatory obligations such as mandating account/legal/ownership unbundling, only where entry barriers persist, competition law is insufficient, and durable market power is proven.

Access conditions to CO_2 storage

According to some, CO_2 storage capacity is scarce and entry barriers to the industry[25] are high. This is likely to result in prices for storage capacity and injection being set well above the competitive level.

Article 21 of the CCS Directive requires that Member States ensure transparent and non-discriminatory third-party access to CO_2 storage. However, it does not specify how this should be done in practice, and gives Member States a wide margin of discretion in this matter.

In the EU markets for electricity, hydrogen and gas, the current level of harmonisation means that there are rules in place ensuring non-discriminatory access to infrastructure that is important for the proper functioning of these markets. Elements of this infrastructure include LNG and hydrogen terminals and large-scale underground storage tanks for natural gas and hydrogen.

Q43. Is it necessary to introduce measures to ensure real and non-discriminatory access to CO_2 storage? What should such measures involve? Please indicate your position for each statement.

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	No opinion
The market for CO_2 storage capacity will be competitive. CO_2 storage capacity prices will reflect this. Competition law enforcement provides for sufficient enforcement measures.	○	○	○	◉	○	○
The market for storage capacity will not be inherently competitive, but the provisions of Article 21 of the CCS Directive on the national arrangements concerning third-party access to CO_2 storage are sufficient to control this risk.	○	○	○	◉	○	○
Market outcomes will ultimately be driven by the geological potential for CO_2 storage, which differs significantly across the EU. Any measure should reflect this reality in a pragmatic manner.	◉	○	○	○	○	○

Q44. Which of the following rules do you consider necessary to ensure that CO_2 storage markets are competitive? Please indicate your position for each statement.

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	No opinion

No additional rules are needed.	○	○	○	◉	○	○
Access conditions and tariffs for CO_2 storage should be tested and offered on the market by means of 'open seasons'.	○	○	◉	○	○	○
Rules to avoid discriminatory capacity allocation, capacity hoarding and capacity management (e.g. use-it-or-lose-it rules, return of non-used capacity to the market, capacity release obligation, a secondary capacity market, capacity auctioning).	○	○	◉	○	○	○
Regulated, cost-reflective tariffs for CO_2 storage.	○	○	○	◉	○	○
Rules to avoid cross-subsidies from CO_2 storage to other activities.	○	○	◉	○	○	○
CO_2 storage activities should be delegated to a separate legal entity to ensure transparency and facilitate enforcement (these activities should be separate from other activities in the CO_2 value chain).	○	○	○	◉	○	○
We should take the opportunity to organise the industry from the start to prevent discrimination. Structural links between CO_2 storage and upstream activities should be prohibited.	○	○	○	◉	○	○
Bundled transport and storage services offers could lead to lock-in effects and un-competitive market outcomes.	○	○	◉	○	○	○

Other(s) – Please specify.

500 character(s) maximum

CO_2 storage has high entry barriers (CAPEX, expertise, permitting, long lead times), especially offshore, making capacity scarce and concentrated. In a low-liquidity early market, strict access regulation would add limited competitive benefits and could deter investment. Policy should prioritise capacity build-out. Onshore storage (where permitted) can scale faster and at lower cost, supporting greater competition. NTPA with NRA oversight is therefore the most appropriate regulatory approach.

Accounting of biogenic CO_2

The Renewable Energy Directive (RED III)[26] and the Carbon Removals Carbon Farming Regulation (CRCF Regulation)[27] have introduced certification mechanisms for the biogenic CO_2 captured and used, respectively, in the production of renewable fuels and for the accounting of CO_2 removals. To ensure the effectiveness of negative-emission technologies and circularity, certifying biogenic CO_2 is essential for verifying that biomass is sustainably sourced. The EU framework currently does not include a harmonised certification mechanism for biogenic CO_2 that would cover all CO_2 utilisation and storage pathways, including those involving non-permanent products.

Q45. How do you see the establishment of a harmonised EU-wide certification system for biogenic CO_2 across all utilisation pathways (e.g. fuels, materials, chemicals)? Please justify your answer.

- (●) A harmonised certification system is essential for ensuring consistency, transparency, and credibility across the EU.
- ( ) It would be useful only for specific sectors, as a one-size-fits-all approach may not be appropriate.
- ( ) Further analysis is needed.
- ( ) A harmonised system would offer limited benefits.

Other(s) - Please specify.

500 character(s) maximum

A harmonised EU-wide certification system for biogenic CO_2 would streamline processes across sectors and end uses, enabling cross-border trade, a larger, more efficient market and increase transparency. It would improve comparability, strengthen price signals, reduce fragmentation, and support investment. The system should also incorporate a book-and-claim (or equivalent) mechanism to address mixed CO_2 streams via shared infrastructure, as physical (e.g. isotopic tracing) is impractical at scale

In cases where CO_2 flows are mixed, originating from fossil, biogenic, or atmospheric sources, traceability might be required to accurately account for CO_2 removal.

Q46. Do you think that a harmonised traceability method at EU level is necessary to ensure accurate accounting of CO_2 originating from different sources (fossil, biogenic, atmospheric)? Please justify your answer.

- ( ) Yes, a harmonised mass balance approach, applied across the entire network and all pathways, would be the preferred method.
- ( )

Yes, a harmonised monitoring of individual emission sources, applied across the entire network and all pathways, would be the preferred method.

- (●) Yes, a harmonised traceability system that combines a mass balance approach with monitoring of individual emission sources across the entire network and all pathways would be the preferred method.
- ( ) No, the traceability methods established under the existing legislation (RED III and CRCF) are sufficient.

Other(s) - Please specify.

500 character(s) maximum

Future CO_2 networks will use shared, multi-user infrastructure where fossil, biogenic, and atmospheric CO_2 are commingled. A harmonised EU traceability framework would ensure accurate EU ETS accounting, CRCF certification, and consistent application of state-aid/subsidy rules, reducing contractual dispute and liability risks. A harmonised mass-balance methodology, underpinned by source-level monitoring data across the network, is a scalable solution in line with tiered MRV principles.

5/ De-risking the development of CCS

Financing and de-risking cross-chain risk under the EU Emissions Trading System

Under EU rules, each participant carries the ETS liability until hand-over to the next participant. In the event of a leak, the directly affected participant would have to surrender emission allowances and pay for the leaked CO_2.

At the same time there are indirect financial risks. Market participants will have to buy transport infrastructure capacity to transport the captured CO_2 and storage capacity to store it. When an outage (service interruption) occurs (regardless of whether a leak was detected or not) market participants will be exposed to financial risks: if they have to vent the CO_2, they are liable for costs under the ETS. Depending on their contractual situation they may also need to continue paying for the infrastructure capacity which became unavailable (e.g. under a 'take-or-pay' contract).

Q47. In your opinion, what is the best way to address such cross-chain risk? Please indicate your position for each statement.

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	No opinion
The distribution of financial risks in the event of accidents and service interruptions is part of the normal contractual arrangements and negotiations between parties within	( )	( )	( )	(●)	( )	( )

the value chain. Specific measures are not required.						
Each value-chain partner separately should take out commercial insurance against the cost of CO_2 leakage caused by accidents and service interruptions.	○	○	◉	○	○	○
All value-chain partners should take out joint commercial insurance against the cost of CO_2 leakage due to accidents and service interruptions.	○	○	◉	○	○	○
All value-chain partners should create a joint pool of ETS allowances to serve as a buffer against CO_2 leakage costs due to accidents and service interruptions.	○	○	◉	○	○	○

Other(s) – Please specify.

500 character(s) maximum

In a nascent CO_2 market, disruptions are more likely and insurance for contingent cross-chain risks is often unavailable, too costly or complex, making purely bilateral contracts insufficient. A shared ETS-allowance buffer funded by value-chain partners could manage leakage and interruption exposure but should be complemented by public support early on. As markets mature, an industry-funded buffer can manage residual risks.

Financing and de-risking CO_2 transport infrastructure

Q48. To transport captured CO_2 to permanent storage sites or to places of its subsequent utilisation, it will be necessary to set up a new CO_2 pipeline infrastructure. However, there are apparent risks which may slow down its development. Would you agree that the following risks exist for the financing of CO_2 pipeline infrastructure? Please indicate your position for each statement.

Risk	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	No opinion
Volumes of captured CO_2 are smaller than those estimated at the stage of designing the pipeline infrastructure.	○	◉	○	○	○	○

Other elements of the CO_2 value-chain assets are not in place by the deadline initially set.	◉	○	○	○	○	○
The CO_2 storage infrastructure to which the pipeline would link the emitters is not in place by the deadline initially set.	◉	○	○	○	○	○
The necessary technological solutions are not fully developed or available as expected.	○	○	○	○	◉	○
The cost of technological development and deployment renders the investment economically unviable.	○	◉	○	○	○	○

Other(s) - Please specify.

500 character(s) maximum

The first 3 risks are systemic and can stall projects, making them the biggest threat to CO_2 infrastructure investment. Volume risk is critical: early pipelines are sized for 5-20 Mt/y by 2035-2040, but firm commitments are far lower, creating underutilisation risk without binding offtake or regulatory backstops. Coordination failures mean delays cascade; long storage appraisal/permitting (up to 10 years) and early scarcity can strand pipelines.

Q49. Would you agree that financing the development of cross-border CO_2 pipeline infrastructure may pose more challenges as compared to financing national CO_2 pipeline infrastructure? Multiple answers are possible.

- ☑ Yes, due to the involvement of more than one Member State.
- ☑ Yes, due to the differences in applicable regulatory frameworks.
- ☑ Yes, due to differences in market organisation.
- ☑ Yes, due to the lack of coordinated implementation of the EU regulatory framework (e.g. differences in network access rules and tariffs regulations).
- ☐ No
- ☐ I don’t have an opinion.

Other(s) - Please specify.

500 character(s) maximum

Cross-border CO_2 pipeline projects face additional challenges compared to national ones. Permitting procedures, regulatory frameworks, and the roles of competent authorities differ across Member States, increasing complexity and timelines for coordination and approvals. These variations make financing more

difficult, as developers must manage higher regulatory uncertainty and alignment across jurisdictions. Coordination of permitting procedures can simplify the development.

Q50. Are financial and non-financial de-risking measures necessary to develop the necessary CO_2 transport infrastructure?

- (●) Yes.
- ( ) Yes, but only for kick-starting the market. In principle, the value chain should pay for itself.
- ( ) No, the markets will be able to deliver on the necessary investments.
- ( ) I don't have an opinion.

Other(s) - Please specify.

500 character(s) maximum

Both financial and non-financial de-risking measures are essential to deliver the scale of CO_2 transport infrastructure and meet EU injection targets. Non-financial measures, such as public-interest status, coordinated permitting, designated corridors, and transparency platforms are foundational. Targeted public support (e.g. CEF/Innovation Fund grants, EU guarantees, CCfDs) will be needed for first-mover pipelines and anchor emitters until markets mature, especially until 2035.

What do you think would be the necessary timeframe for it?

- (●) For the early ramp-up phase, until ca. 2035.
- ( ) For an extended ramp-up phase, until ca. 2040.
- ( ) Beyond 2040.
- ( ) Continuous support would be needed.
- ( ) I don't have an opinion.

Other(s) – Please specify.

500 character(s) maximum

Which CO_2 transport assets would require it in order to be developed in Europe? Please indicate your view for each asset type.

CO_2 asset	Yes, there is a need for public support	Neutral	No, there is no need for public support	No opinion
CO_2 pipelines	(●)	( )	( )	( )

CO_2 transport assets other than pipelines (e.g. ships, rails, trucks)	○	○	◉	○
CO_2 terminals (common infrastructure asset gathering CO_2 streams from multiple emission sources)	○	◉	○	○

Other(s) – Please specify.

500 character(s) maximum

Q51. What do you think would be the appropriate tools and measures to mitigate the potential risks to the development of CO_2 pipelines, including cross-border pipelines? Please indicate your view for each tool/measure.

Tools/Measures	Yes, needed for financing national infrastructure development	Yes, needed for financing cross-border infrastructure development	No, not needed	No opinion
The development of CO_2 pipelines should be financed with market revenues only.	○	○	◉	○
Non-financial measures such as tools increasing transparency and visibility of infrastructure plans and developments.	○	◉	○	○
Any financial support should be financed internally from the CO_2 or energy systems (e.g. network user tariffs).	○	○	◉	○
If direct financial support is granted, this should be provided to pipeline network users, not pipeline operators. Pipeline operators can of course indirectly benefit from this support if network users are ready to pay for network services.	◉	○	○	○
Aid should be granted directly to pipeline operators.	○	○	○	◉

Other(s) - Please specify.

500 character(s) maximum

Market revenues will be important to finance the development of CO2 pipelines but not be sufficient on their own, especially early on.Targeted support to network users (rather than operators) can be effective, as it

indirectly improves pipeline bankability through higher booking rates and utilisation.This can be justified as a transitional tool to accelerate ramp-up, provided it is time-limited and phased out once the regulated tariff framework is mature and market-based revenues become reliable

Q52. What do you think would be the appropriate measures to enable the development of the necessary CO_2 pipelines assuming that they are financed internally from the CO_2 or energy systems? Please indicate your view for each measure.

Measures	Strongly agree	Agree	Neutral	Disagree	Strongly agree	No opinion
Measures making it possible to finance infrastructure development with cross-subsidies from other network activities.	○	○	◉	○	○	○
Regulated tariffs permitting cross-subsidies within the network supporting the connections between specific (categories of) network users.	○	○	○	◉	○	○
Regulated tariffs which can be adjusted over time (e.g. inter-temporal cost allocation to lower the initial tariffs).	○	○	◉	○	○	○
State interventions limiting volume risks for network operators (e.g. capacity bookings by a State entity, State guarantees underwriting volume risks).	◉	○	○	○	○	○
Network operators carrying the risk of stranded network assets if and when users disconnect.	○	○	○	◉	○	○
Cross-border cost allocation mechanisms to enable the financing of cross-border infrastructure.	○	◉	○	○	○	○

Other(s) - Please specify.

500 character(s) maximum

Financing and de-risking investment in CO_2 storage sites

In line with Article 19 of the CCS Directive, Member States may decide that the financial security required from CO_2 storage operators is provided by means of a levy per tonne of CO_2 stored[28]. This arrangement can lower the up-front costs for investors in CO_2 storage sites. By working together across borders, Member States could further lower the amount of the up-front financial security and financial mechanism required under the Directive for investors, while reducing the risk for their own taxpayers.

Q53. What would be the most cost-efficient and appropriate tools to lower the amount of the up-front financial security and financial mechanism required for investors in CO_2 storage sites, while ensuring the lowest possible risk for the Member States issuing the CO_2 storage permits? Please indicate your view for each tool.

De-risking tool	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	No opinion
Individual financial guarantee provided by the storage site operator.	○	○	○	◉	○	○
Contributions from storage site operators to a national CCS financial security instrument.	○	○	◉	○	○	○
Contribution from storage site operators to a commercial insurance cover that is underwritten by a national financial security instrument (CCS-specific or general).	○	○	○	◉	○	○
Contributions from storage site operators to an EEA-wide CCS financial security instrument that is underwritten by EEA Member States that rely on CCS to reach their climate targets.	◉	○	○	○	○	○
Contributions from storage site operators to a commercial insurance cover which is underwritten by an EEA-wide CCS financial security instrument financed by Member States that rely on CCS to reach their climate targets.	◉	○	○	○	○	○

Other(s) - Please specify.

500 character(s) maximum

The EU ETS-related financial security component poses a significant challenge for CO_2 storage operators. Other elements, such as decommissioning, remediation, and long-term monitoring costs, are relatively predictable and can be effectively managed through conventional financial guarantees or commercial insurance. By contrast, ETS liability is inherently difficult to insure, because exposure depends on uncertain future leakage volumes combined with a volatile and unpredictable carbon price.

Increasing market transparency and visibility

Currently, in the CCUS value chain, investment risks are often perceived as high. There is an apparent lack of confidence and predictability as regards new and existing projects, infrastructure and capture installations.

Coordination problems across the value chain also seem to contribute to a slow-down in investment in CO_2 infrastructure. With this in mind, tools and measures which help improve market transparency and ensure coordination could boost investment predictability and security.

One of the goals of the ICM strategy is to develop a platform for demand assessment and demand aggregation for CO_2 transport or storage services by 2026. The aim is to match the emitters' CO_2 volumes of captured CO_2 with transport and storage service providers and to increase market transparency. Developing a CO_2 platform may draw on the positive experience of AgreggateEU[29]. At the same time, account should be taken of the specific characteristics of the nascent CO_2 infrastructure and market.

The following questions aim to assess whether it is necessary to introduce supportive measures for the nascent CO_2 market and whether those measures could take the form of an EU-wide-platform. The purpose of these questions is also to understand which specific functionalities could better support the market and the smaller market players in particular, so that they can leverage their commercial power.

Q54. Which of the existing platforms do you think could serve as a model for setting up a CO_2 platform?

- (●) A matching and aggregation platform (like AggregateEU and the Hydrogen mechanism[30]) connecting sellers and buyers in the market.
- ( ) A capacity booking platform (like PRISMA, GSA Platform or Regional Booking Platform[31]) which can offer storage and/or transport infrastructure capacity on the market (primary and secondary trading).
- ( ) A capacity transparency platform (like the ENTSOG transparency platform[32]) providing information on capacity and flows in a coordinated and transparent manner.
- ( ) None of the above.
- ( )

I don’t have an opinion.

Other(s) - Please specify.

500 character(s) maximum

A Demand Aggregation and Matching platform would allow emitters to register annual CO_2 demand (volumes, timelines,delivery points), while T&S providers submit firm offers, with anonymised matching results supporting price discovery and bankable letters of intent. A Capacity Booking module would enable regulated pipelines, terminals, liquefaction plants and storage sites to offer firm and interruptible capacity, including standardised products, auctions for scarce capacity and secondary trading.

Q55. What functionalities do you think such an CO_2 platform should have? Multiple answers are possible:

- [x] Increase market transparency and visibility of current and future supply (captured CO_2 volumes) and demand (CO_2 storage capacity and usage).
- [ ] Provide information on pipeline infrastructure access conditions.
- [x] Improve coordination along the CO_2 value chain to support final investment decisions (FIDs) and de-risk (infrastructural) investments by facilitating contacts between emitters, transport infrastructure operators and storage operators; matching storage demand of emitters with supply offers from storage operators (in terms of time and location), etc.
- [x] Provide information to facilitate CO_2 infrastructure planning by collecting information on CO_2 pipeline and storage capacity needs and availability.
- [x] Aggregate volumes of captured CO_2 by small(er) CO_2 emitters (e.g. SMEs) in order to help them access the transportation and storage.
- [ ] Support the emergence of tradable capacity products that are mutually compatible.
- [ ] Support the allocation of CO_2 storage and transportation capacity.
- [ ] Support the secondary trading in already contracted storage and transportation capacity.
- [ ] Support the synchronisation of the allocation of CO_2 storage and transportation capacity to help streamline FIDs throughout the value chain.
- [ ] I don’t have an opinion.

Other(s) - Please specify.

500 character(s) maximum

An EU CO_2 Aggregation Platform could support CCS deployment by improving transparency, coordination and market visibility across the value chain. It could increase tariff transparency by publishing indicative transport and storage tariff ranges, improving market visibility, and helping emitters assess project feasibility. The platform could also host a section where NZIA-obligated entities can disclose documents demonstrating compliance.

Q56. Please upload any supporting documents you believe may be relevant in the context of the issues covered by this public consultation questionnaire.

Only files of the type pdf,txt,doc,docx,odt,rtf are allowed

05336e70-c1ce-43bd-8d66-57fd204c70e5/ZEP_s_annex_on_CO2_markets_and_infrastructure.pdf

---

Contact: ENER-CO2-INITIATIVE@ec.europa.eu

---

20. Under existing EU legislation (ETS Directive, the CCS Directive and the Net-Zero Industry Act), Member States report information collected from market participants on CO_2 emitters' location and volumes of CO_2 emitted as well as on the potential CO_2 sinks (injection capacity of storage facilities, potentially their location).
21. Commission delegated regulation: Union list of projects of common interest and projects of mutual interest, C/2023/7930 final, 28 November 2023, EUR-Lex - C(2023)7930 - EN - EUR-Lex.
22. The CCS Directive requires operators to demonstrate that the CO_2 stream is suitable for safe and permanent storage. The Directive sets out a permitting regime, including requirements for selecting storage sites that ensure no significant risk of leakage or harm to the environment or human health.
23. E.g. Adrien Nicolle, Diego Cebreros, Olivier Massol, Emma Jagu Schippers: Modelling CO2 Pipeline Systems: An Analytical Lens for CCS Regulation; Banet, Catherine, *Market design options for CCS in Europe: CO_2 transport and storage regulation*, March 2025, CERRE, CERRE_Market-Design-Options-for-CCS-in-Europe_final-.pdf
24. An 'open season' is a process, usually run by an infrastructure operator, generally consisting of two steps: an open assessment of market demand for infrastructure capacity and a subsequent allocation and sale of capacity.
25. Banet, Catherine, *Market design options for CCS in Europe: CO_2 transport and storage regulation*, March 2025, CERRE, CERRE_Market-Design-Options-for-CCS-in-Europe_final-.pdf; ENTEC: *EU regulation for the development of the market for CO_2 transport and storage*, May 2023, eu regulation for the development of the market for-MJ0523015ENN (3).pdf; *CO_2 Storage Resources and their Development. An IEA CCUS Handbook*, December 2022, CO_2 storage resources and their development – Analysis - IEA
26. Directive (EU) 2023/2413 on the promotion of energy from renewable sources of 18 October 2023; Directive - EU - 2023/2413 - EN - Renewable Energy Directive - EUR-Lex
27. Regulation (EU) 2024/3012 establishing a Union certification framework for permanent carbon removals, carbon farming and carbon storage in products of 27 November 2024; Regulation - EU - 2024/3012 - EN - EUR-Lex
28. For details and more background please see: https://climate.ec.europa.eu/document/download/9a6b221d-642e-499e-a5a0-298ce1068b21_en?filename=ccs-implementation_gd4_en.pdf

29. AggregateEU pools gas demand from companies within the EU and the Energy Community contracting parties, matching this demand with competitive supply offers. After demand is matched with supply, companies have the option to voluntarily enter into purchase contracts with gas suppliers, either individually or jointly. Collaboration is especially advantageous for smaller firms and those in landlocked countries with more restricted access to international markets or less bargaining power. These purchase contracts between companies and gas suppliers are voluntary and are not governed by AggregateEU.
30. Mechanism to support the market development of hydrogen
31. PRISMA European Capacity Platform GmbH, Europe's leading gas capacity trading platform; GSA Platform, GSA; Regional Booking Platform, Regional Booking Platform.
32. ENTSOG - Transparency Platform

Useful links

Directive 2009/31/EC of the European Parliament and of the Council of 23 April 2009 on the geological storage of carbon dioxide (https://eur-lex.europa.eu/eli/dir/2009/31/oj/eng)

Regulation (EU) 2024/1735 of the European Parliament and of the Council of 13 June 2024 on establishing a framework of measures for strengthening Europes net-zero technology manufacturing ecosystem (https://eur-lex.europa.eu/eli/reg/2024/1735/oj/eng)

COMMUNICATION FROM THE COMMISSION Towards an ambitious Industrial Carbon Management for the EU (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52024DC0062)

COMMUNICATION FROM THE COMMISSION Securing our future Europe's 2040 climate target and path to clima neutrality by 2050 building a sustainable, just and prosperous society (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2024%3A63%3AFIN)

Commission Staff Working Document: Impact Assessment accompanying the document communication on Securin our future Europe's 2040 climate target and path to climate neutrality by 2050 building a sustainable, just and prosperous society (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52024SC0063)

Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment (https://eur-lex.europa.eu/eli/dir/2011/92/oj/eng)

Regulation (EU) 2022/869 of the European Parliament and of the Council of 30 May 2022 on guidelines for trans-European energy infrastructure (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02022R0869-20250205)

COMMISSION DELEGATED REGULATION (EU) /... amending Regulation (EU) No 2022/869 of the European Parliament and of the Council as regards the Union list of projects of common interest and projects of mutual interes (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=PI_COM%3AC%282023%297930&qid=1704358152782)

Directive (EU) 2023/2413 of the European Parliament and of the Council of 18 October 2023 as regards the promoti of energy from renewable sources (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32023L2413&qid=1699364355105)

Regulation (EU) 2024/3012 of the European Parliament and of the Council of 27 November 2024 establishing a Unic certification framework for permanent carbon removals, carbon farming and carbon storage in products (https://eur-l europa.eu/eli/reg/2024/3012/oj/eng)

Trans-European Networks for Energy (https://energy.ec.europa.eu/topics/infrastructure/trans-european-networks-energy_en)

AggregateEU (https://energy.ec.europa.eu/topics/energy-security/eu-energy-platform/aggregateeu_en)

EU Energy and Raw Materials Platform (https://energy-platform.ec.europa.eu/hydrogen)

Contact

ENER-CO2-INITIATIVE@ec.europa.eu