

# Public consultation: Industrial Carbon Management

Fields marked with \* are mandatory.

## Introduction

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This public consultation gives you the opportunity to share your views on the technological options available for the transport, use, and storage of carbon dioxide (CO<sub>2</sub>) captured from fossil fuel, biogenic or atmospheric sources, e.g. directly from the air.

These processes are known as:

- Carbon Capture and Storage (CCS): when the CO<sub>2</sub> is captured from industrial emissions or directly from the air and subsequently permanently stored
- Carbon Capture and Utilisation (CCU): when the CO<sub>2</sub> is captured and reused (e.g. through mineralisation or to make fuels and other products)
- Industrial Carbon Removals: when the process leads to net negative CO<sub>2</sub> emissions e.g. when the CO<sub>2</sub> is captured from non-fossil industrial sources and permanently stored. This consultation is concerned only with technological carbon removal solutions, not nature-based solutions.

In October 2022, the Commission announced its intention to develop a Communication on its strategic vision for the deployment of Carbon Capture, Utilisation and Storage (CCUS) in the EU, to be published by the end of 2023. The main purpose of the public consultation is to gather views and opinions on various CCS, CCU and Industrial Carbon Removals related issues, including specific policy recommendations. The feedback will inform the development of an EU strategy on industrial carbon management.

### Guidance on the questionnaire

This public consultation consists of a set of introductory questions related to your profile, followed by a questionnaire split into two sections: a general section and a section for experts. Please note that you are not obliged to respond to both parts, and you can choose to fill in only the general part.

The results of the questionnaire will be published online, along with uploaded position papers and policy briefs.

## About you

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### \* Language of my contribution

Bulgarian

Croatian

- Czech
- Danish
- Dutch
- English
- Estonian
- Finnish
- French
- German
- Greek
- Hungarian
- Irish
- Italian
- Latvian
- Lithuanian
- Maltese
- Polish
- Portuguese
- Romanian
- Slovak
- Slovenian
- Spanish
- Swedish

\* I am giving my contribution as

- Academic/research institution
- Business association
- Company/business
- Consumer organisation
- EU citizen
- Environmental organisation
- Non-EU citizen
- Non-governmental organisation (NGO)
- Public authority
- Trade union
- Other

\* First name

Luis

\* Surname

Ruspoli

\* Email (this won't be published)

[luis.ruspoli@euturbines.eu](mailto:luis.ruspoli@euturbines.eu)

\* Organisation name

*255 character(s) maximum*

EUTurbines

\* Organisation size

- Micro (1 to 9 employees)
- Small (10 to 49 employees)
- Medium (50 to 249 employees)
- Large (250 or more)

Transparency register number

*255 character(s) maximum*

Check if your organisation is on the [transparency register](#). It's a voluntary database for organisations seeking to influence EU decision-making.

\* Country of origin

Please add your country of origin, or that of your organisation.

*This list does not represent the official position of the European institutions with regard to the legal status or policy of the entities mentioned. It is a harmonisation of often divergent lists and practices.*

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| <input type="radio"/> Åland Islands | <input type="radio"/> Dominica           | <input type="radio"/> Liechtenstein | <input type="radio"/> Saint Pierre and Miquelon        |
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<input type="radio"/> American Samoa	<input type="radio"/> Egypt	<input type="radio"/> Macau	<input type="radio"/> San Marino
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<input type="radio"/> Bangladesh	<input type="radio"/> French Southern and Antarctic Lands	<input type="radio"/> Moldova	<input type="radio"/> South Georgia and the South Sandwich Islands
<input type="radio"/> Barbados	<input type="radio"/> Gabon	<input type="radio"/> Monaco	<input type="radio"/> South Korea
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<input type="radio"/> <b>Belgium</b>	<input type="radio"/> Germany	<input type="radio"/> Montenegro	<input type="radio"/> Spain
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<input type="radio"/> Bhutan	<input type="radio"/> Greenland	<input type="radio"/> Myanmar/Burma	<input type="radio"/> Svalbard and Jan Mayen
<input type="radio"/> Bolivia	<input type="radio"/> Grenada	<input type="radio"/> Namibia	<input type="radio"/> Sweden
<input type="radio"/> Bonaire Saint Eustatius and Saba	<input type="radio"/> Guadeloupe	<input type="radio"/> Nauru	<input type="radio"/> Switzerland
<input type="radio"/> Bosnia and Herzegovina	<input type="radio"/> Guam	<input type="radio"/> Nepal	<input type="radio"/> Syria

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| <input type="radio"/> Brazil                         | <input type="radio"/> Guinea                            | <input type="radio"/> New Zealand              | <input type="radio"/> Tanzania                             |
| <input type="radio"/> British Indian Ocean Territory | <input type="radio"/> Guinea-Bissau                     | <input type="radio"/> Nicaragua                | <input type="radio"/> Thailand                             |
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| <input type="radio"/> Burkina Faso                   | <input type="radio"/> Honduras                          | <input type="radio"/> Norfolk Island           | <input type="radio"/> Tokelau                              |
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| <input type="radio"/> Cambodia                       | <input type="radio"/> Hungary                           | <input type="radio"/> North Korea              | <input type="radio"/> Trinidad and Tobago                  |
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| <input type="radio"/> Cocos (Keeling) Islands        | <input type="radio"/> Japan                             | <input type="radio"/> Philippines              | <input type="radio"/> United States Minor Outlying Islands |
| <input type="radio"/> Colombia                       | <input type="radio"/> Jersey                            | <input type="radio"/> Pitcairn Islands         | <input type="radio"/> Uruguay                              |
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Comoros

Jordan

Poland

US Virgin Islands

Congo

Kazakhstan

Portugal

Uzbekistan

Cook Islands

Kenya

Puerto Rico

Vanuatu

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| <input type="radio"/> Côte d'Ivoire                    | <input type="radio"/> Kosovo     | <input type="radio"/> Réunion                                      | <input type="radio"/> Venezuela         |
| <input type="radio"/> Croatia                          | <input type="radio"/> Kuwait     | <input type="radio"/> Romania                                      | <input type="radio"/> Vietnam           |
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| <input type="radio"/> Cyprus                           | <input type="radio"/> Latvia     | <input type="radio"/> Saint Barthélemy                             | <input type="radio"/> Yemen             |
| <input type="radio"/> Czechia                          | <input type="radio"/> Lebanon    | <input type="radio"/> Saint Helena, Ascension and Tristan da Cunha | <input type="radio"/> Zambia            |
| <input type="radio"/> Democratic Republic of the Congo | <input type="radio"/> Lesotho    | <input type="radio"/> Saint Kitts and Nevis                        | <input type="radio"/> Zimbabwe          |
| <input type="radio"/> Denmark                          | <input type="radio"/> Liberia    | <input type="radio"/> Saint Lucia                                  |   |

The Commission will publish all contributions to this public consultation. You can choose whether you would prefer to have your details published or to remain anonymous when your contribution is published. **For the purpose of transparency, the type of respondent (for example, 'business association', 'consumer association', 'EU citizen') country of origin, organisation name and size, and its transparency register number, are always published. Your e-mail address will never be published.** Opt in to select the privacy option that best suits you. Privacy options default based on the type of respondent selected

### \* Contribution publication privacy settings

The Commission will publish the responses to this public consultation. You can choose whether you would like your details to be made public or to remain anonymous.

#### **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](#)

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## Part 1 - General public questions

CCS is a technology whereby CO<sub>2</sub> is captured at industrial installations or directly from the air. The CO<sub>2</sub> is then transported to a permanent storage site where it is injected deep underground. This process could lead to negative emissions when the captured CO<sub>2</sub> is of atmospheric or biogenic origin. It is then called Industrial Carbon Removals. In both cases, the environmental integrity of the storage sites used is ensured through permits that are awarded in compliance with Directive 2009/31/EC (e.g. permanence, monitoring, liability, etc.)

Carbon removals, or the removal of CO<sub>2</sub> from the atmosphere, are integral to achieving climate neutrality by 2050. Important international organisations and institutions, such as the Intergovernmental Panel on Climate Change (IPCC), International Energy Agency (IEA) and the USA National Energy Technology Laboratory (NETL) argue, in line with the European Commission, that without carbon removals it will be difficult to achieve the Paris Agreement goal of limiting temperature rise to well below 2°C.

Instead of storing CO<sub>2</sub> permanently, it can be used in some industrial processes as input. It can also be used to make synthetic fuels or more permanent products like cement or plastics. These applications are referred to as CCU.

Taken together with all other decarbonisation and energy technologies CCS, CCU and Industrial Carbon Removals are part of the toolbox of solutions that will be needed to reach the EU's legally binding target of climate neutrality by 2050. The target is enshrined in the European Climate Law (Regulation (EU) 2021 /1119), which requires that GHG emissions and carbon removals are balanced within the Union by 2050 at the latest, and that the EU shall aim to achieve net negative emissions thereafter.

### \* 1. Have you heard about CSS technology?

No, I have never heard of it.

- Yes, but I don't really know what it is.
- Yes, I have heard of it and know what it is.

### \* 2. Have you heard about CCU technology?

No, I have never heard of it.

- Yes, but I don't really know what it is.
- Yes, I have heard of it and know what it is.

### \* 3. Have you heard about Industrial Carbon Removals?

No, I have never heard of it.

- Yes, but I don't really know what it is.
- Yes, I have heard of it and know what it is.

4. Do you think that the European Commission should:

	Yes	Yes, but only to a limited extent	No	No opinion
* Do more to communicate the advantages and risks of CCS	<input checked="" type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
* Do more to communicate the advantages and risks of CCU	<input checked="" type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
* Do more to communicate the advantages and risks of Industrial Carbon Removals	<input checked="" type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. Do you think that the European Commission should:

	Yes	Yes, but only to a limited extent	No	No opinion
* Support the deployment of CCS	<input checked="" type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
* Support the deployment of CCU	<input checked="" type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
* Support the deployment of Industrial Carbon Removals	<input checked="" type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Part 2 - Expert questions (in English only)**

*Overarching questions*

1. Considering the [sixth assessment report of the Intergovernmental Panel on Climate Change \(IPCC\)](#) and the European energy and climate objectives do you think that the EU should do more to facilitate deployment of: (multiple answers possible)

- Carbon capture and storage.
- Carbon capture and utilisation.
- Industrial carbon removals (negative carbon emissions via technological solutions).
- Natural carbon removals (negative carbon emissions via nature-based solutions).
- It shouldn't facilitate deployment of either of any of these options other GHG emissions reduction measures should be prioritised.
- I have no opinion.

Please explain your choice

*500 character(s) maximum*

In EU Turbines we advocate for the quick decarbonisation of the EU without a technological bias. CCS solutions are already existing and deployable at scale, but require considerable investments to be put in place. The EU could play a decisive role by developing a comprehensive, clear regulatory framework which will allow for business cases based on CCUS to be formed and a CCUS market to flourish.

## 2. Why should CO<sub>2</sub> capture in Europe be applied? (multiple answers possible)

- To reduce carbon emissions from hard-to abate industrial sectors like steel or cement.
- To reduce carbon emissions from gas based hydrogen production.
- To reduce carbon emissions from power generation.
- To reduce carbon emissions from heat and power plants.
- To generate negative emissions (e.g. DACCS).
- To use CO<sub>2</sub> use as carbon feedstock for production (to substitute the use of fossil carbon).
- No CO<sub>2</sub> capture is needed.
- I have no opinion.

### Please explain your choice

500 character(s) maximum

It should be the preferred decarbonisation solution for sectors with no alternative path and as interim for sectors like power generation and co-generation where the switch to a completely renewable system still requires some years to be deployed.

Renewable energy sources are expected to decarbonise the EU energy system by 2050, with flexible generation supporting intermittent renewable generation. Countries still relying on coal could quickly reduce CO<sub>2</sub> emissions by using gas and applying CCS. Bioenergy processes with CCS can also ensure negative emissions of CO<sub>2</sub>.

## 3. Which power generation technology with added CCS should play a role in a decarbonised EU power market? (multiple answers possible)

- Power production based on sustainable biomass.
- Coal fired power plants.
- Gas fired power plants.
- Waste incineration.
- None.
- I have no opinion.

4. In line with the objectives of the EU circular economy and the [cascading principle](#), should it be mandatory to equip large-scale installations where municipal household waste is incinerated to provide heating and electricity (or both) with CO2 capture?

- Yes.
- No.
- I have no opinion.

5. In order to transport captured CO<sub>2</sub> emissions to areas where they can be safely and permanently stored underground or used in products, new infrastructure is needed. Are public funds necessary to stimulate the deployment of such infrastructure to facilitate emitting industries to transport their CO<sub>2</sub> for permanent storage or sustainable use?

- Yes.
- Yes, but only for a limited period of time, to kick-start the market.
- No, the market alone is able to deliver on those investments.
- No, other measures such as regulatory or market-based instruments are sufficient and more appropriate to create the necessary incentives.
- I have no opinion.

6. The Commission has encouraged Member States to include in their updated National Energy and Climate Plans (NECP) actions enabling capture and permanent storage of CO<sub>2</sub> in accordance with Directive 2009/31/EC. Are you satisfied with the way stakeholders are involved in the NECPs in identifying hard-to-abate emissions and developing decarbonisation roadmaps with assigned roles to CCS, CCU and carbon removals?

- Yes.
- No.
- I have no opinion.

7. Do you expect the deployment of CCS, CCU or Industrial Carbon Removals to have any of the following negative effects? (multiple answers possible)

- Discourage investments in research and development of renewable energy technologies and/or energy efficient production processes.
- Discourage investments in the deployment of renewables.
- Discourage investments in decarbonised industrial processes not based on CCS or CCU.
- Stimulate new investments in fossil energy generation or industrial production based on fossil fuels.
- None of the above.
- I have no opinion.

*Policy framework and regulation*

8. At the EU level, do you think we need the following: (please rank your answers)

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	No	Maybe	Neutral	Yes	Very much	No opinion
* A comprehensive Action Plan on CCS, CCU and industrial carbon removals with quantifiable and verifiable milestones looking towards 2050 (with 2030-2040 intermediate goals)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
* New regulations in addition to third-party access to CO2 transport networks and storage sites, as guaranteed by Articles 21 and 22 of Directive 2009/31/EC	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
* The establishment of a dedicated EU level regulatory authority responsible for CO2 transport and storage infrastructure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
* An integrated network planning at the EU level (including e.g. cross-border backbone pipelines and 10-year network development plans)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
* Guidelines to streamline infrastructure planning and/or permitting with respect to CO2 transport and storage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

## 9. Who do you think should finance investment in the CO2 transport infrastructure?

	No	Maybe	Neutral	Yes	Very much	No opinion
* Private energy infrastructure companies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
* State controlled energy infrastructure companies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
* Member States	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
* Installations capturing CO2	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
* CO2 storage operators	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

If you have suggestions for other options please explain

Financing of CO2 transport infrastructure requires coordinated public-private involvement to secure funds and scale up CCUS. Member States should provide funds, subsidies, and de-risking mechanisms. Private companies finance and develop the infrastructure, but risk-balancing mechanisms are necessary. The UK business model for Transport and Storage, where Grants and loan guarantees support initial project phases for transport companies can serve as a suitable model to launch and accelerate the construction of a new infrastructure until the market stabilizes.

## 10. How should investment in the CO2 transport infrastructure be recovered?

(please rank your answers)

	No	Maybe	Neutral	Yes	Very much	No opinion
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* Tariffs set at EU level	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
* Tariffs set at national level	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
* Negotiated fees for infrastructure use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
* Long-term ship-or-pay contracts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

If you have suggestions for other options please explain

(500 characters maximum)

11. If you think common CO2 standards are needed in the EU to ensure compatibility of EU-wide CO2 transport infrastructure, which elements should be considered? (multiple answers possible)

- Pressure.
- Purity.
- Temperature.
- Other.
- No common EU standards are necessary.
- I have no opinion.

If you chose 'other'; please list the other options.

(500 characters maximum)

CCS specific

12. What are the main barriers for CCS development? (please rank your answers)

	No	Maybe	Neutral	Yes	Very much	No opinion
* Lack of geological storage capacity	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
* Lack of geological storage capacity available before 2030	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
* Lack of CO2 transport infrastructure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
* Lack of viable business models	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
* Lack of public awareness	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>



If you chose 'other'; please list the other options.

500 character(s) maximum

Lack of clarity towards the CO<sub>2</sub> transport grid infrastructure. Some industries have a hard time deciding whether to install or not CCS solutions in the coming years because of the lack of ambitious transport infrastructure planning, which raises the risk when it comes to attracting investments, impeding viable business models. This lack of viable business models is the key barrier for CCS deployment in Europe. Despite recent increases, EUA credits are not sufficient to financially underpin the establishment of the complex CCS value chains across Europe.

### 13. Which type of policies should support the development and deployment of CCS?

	No	Maybe	Neutral	Yes	Very much	No opinion
* Promoting voluntary markets	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
* EU-level funding for research and innovation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
* EU-level funding for full CCS value chain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
* EU-level funding for capture	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
* EU-level funding for transport & storage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
* National-level support measures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
* Carbon Contract for Difference	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
* Regulating the price of CO <sub>2</sub> for transport and storage	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
* Tax measures	<input type="radio"/>		<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
* Addressing societal and political acceptance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

If you chose 'other'; please list the other options.

500 character(s) maximum

The main problem CCS faces nowadays is the lack of a business model resulting from the uncertainty with regards to transport infrastructure planning as well as the lack of a common, clear regulatory framework for the EU.

Additional financial support in the market build-up phase should come from CCfDs for emitters, state-guarantees for infrastructure operators, and smart, targeted CAPEX support to infrastructure and storage project developers.

### 14. Do you consider that the Commission should define storage availability targets as part of the climate targets for 2040 and 2050?

- Yes.
- No.
-

I have no opinion.

15. In order to speed up storage site permitting, should governments be obliged to provide pre-competitive exploration and assessment of CO2 storage facilities? (as described in the IEA report: [Exploring Clean Energy pathways - The role of CO2 storage](#))?

- Yes.
- No.
- I have no opinion.

*CCU specific*

16. Carbon as feedstock:

Captured CO2 could play a role as a new feedstock for industry replacing the fossil carbon inputs from current production (e.g. for chemicals/plastics). If this is overall good for the climate depends on the source of the carbon, how long the carbon is contained in the products and the overall energy penalty. From which sources do you think this CO2 could best be captured? (please rank your answers)

	No	Maybe	Neutral	Yes	Very much	No opinion
* Fossil CO2 captured from oil and gas combustion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
* Biogenic CO2 captured from bioenergy combustion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
* CO2 capture from process emissions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
* CO2 capture directly from the atmosphere	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I disagree with the reuse of captured CO2 for new products	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

17. Which applications of CO2 utilisation should the Communication support as priority and why? (please rank your answers)

	No	Maybe	Neutral	Yes	Very much	No opinion
* Long-term binding of CO2 in products (e.g. cement)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
* Production of plastics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

* Production of chemicals (solvent, detergent, additives, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
* Production of synthetic fuels	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
* Agriculture and food industry (e.g. to stimulate growth of plants in Greenhouses or in carbonated drinks)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

If you chose 'other'; please list the other options.

The role of CCU in reaching net zero will also be important. These technologies can also contribute to the EU energy and climate objectives.

*Industrial carbon removals specific*

18. A consensus has emerged in the scientific community on the importance of removing carbon from the atmosphere to meet the objectives of the Paris Agreement: Carbon removals are required first to neutralize hard-to-abate emissions that with current technologies cannot be captured or avoided to reach net-zero GHG emissions and then to clean up the atmosphere and bring the CO<sub>2</sub> to concentrations compatible with 1.5°C or even 2°C objectives.

How would you describe the role that industrial solutions have to play to capture CO<sub>2</sub> from the atmosphere, or biogenic sources, transport and store it, in order to achieve the goals of the Paris Agreement and the objectives of the EU Climate Law?

- They are essential to remove carbon at the scale needed.
- They have an important role to play but are not essential.
- They might have a certain role to play although not important compared to other technologies.
- They have a role to play but nature-based solutions should be prioritised to remove sufficient amounts of carbon from atmosphere.
- They have no role to play.
- I have no opinion.

19. Which type of industrial carbon removal should be prioritized: (please rank your answers)

	No	Maybe	Neutral	Yes	Very much	No opinion
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* Bioenergy with CCS (BECCS)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
* Direct air carbon capture and storage (DACCS)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
* Enhancement of mineralisation processes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
* Biochar	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Other types of carbon removals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
None	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

20. Some stakeholders have voiced their concerns on the potential environmental risks of the use of BECCS and its high costs. Do you think that these risks outweigh the climate benefits?

- No, addressing those risks is important but they do not impede supporting BECCS.
- Yes, those risks might have an important role to play on whether to promote BECCS and they might be a significant barrier for its implementation.
- Yes, those risks might have a certain role to play on whether to promote BECCS and could to some extent limit BECCS implementation.
- Yes, these risks cannot be neglected and nature-based solutions should be prioritized to remove sufficient amounts of carbon from the atmosphere.
- I have no opinion.

21. What are the main barriers to the development of industrial carbon removals? (please rank your answers)

	No	Maybe	Neutral	Yes	Very much	No opinion
* Lack of long-term policies on carbon removals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
* Lack of market for carbon removals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
* Lack of CO2 transport infrastructure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
* Lack of available CO2 storage sites	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
* Lack of public awareness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
* High capital expenditure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
* High operating costs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
* Lack of common standards	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

If you chose 'other'; please list the other barriers.

*500 characters maximum*

22. Which type of policies should support the development and deployment of industrial carbon removals? (please rank your answers)

	No	Maybe	Neutral	Yes	Very much	No opinion

* Stimulating demand for carbon removals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
* Promoting voluntary markets for carbon removals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
* Establishing a compliance market for regulated Carbon Removal Certificates	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
* Linking industrial carbon removals to the EU ETS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
* EU-level funding (grants or financial instruments)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
* National-level support measures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
* De-risking measures such as Contracts for Difference	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
* Tax measures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
* Addressing societal and political acceptance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

If you chose 'other'; please list the other policies.

*500 characters maximum*

*Business involvement*

23. Where could private investors and governments work closer together to better stimulate deployment of technologies covered above: (please rank your answers)

	No	Maybe	Neutral	Yes	Very much	No opinion
* Share long-term CO2 storage risks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
* Co-invest in developing storage sites	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
* Co-invest in the CO2 transport network	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
They should not work closer	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

If you chose 'other'; please list the other areas.

Governments must work closely with all industries benefitted from CCUS solutions when planning the transport infrastructure to make investments safe. State-backed guarantees to transportation infrastructure operators can enable early tariff levels which don't penalize early movers; smart, targeted funding is needed for infrastructure investors in the market build up phase, emitters need CCfDs to invest into capture installations, book transportation services, and contract storage services, and clear terms are needed when storage operators transfer storages at life-end.

24. In some sectors like hydrogen or biomethane, industrial initiatives (like European Clean Hydrogen Alliance) have been created to advance the technology development and speed up project deployment. Such initiatives foresee a close co-operation of business and the European Commission. Do you think that such an initiative is needed for industrial CCS, CCU and Carbon Removals?

- Yes.
- No.
- I have no opinion.

If you chose 'Yes', please indicate the objective that such an initiative should pursue in your opinion.

*500 character(s) maximum*

The European Clean Hydrogen Alliance works identifying barriers and research needs for clean hydrogen in the EU. Currently, CCUS doesn't need as much research: the solutions are already working to a good degree, and can of course be perfected. However, an industrial Partnership would be useful to provide visibility to the technology and a more hands-on approach for the Commission with regard to the infrastructure development by adding the private sectors' experience.

*International co-operation*

25. Is it desirable to create international coalitions for developing cross-border CO2 transport infrastructure and storage infrastructure?

- Yes.
- No.
- I have no opinion.

If you chose 'Yes', please indicate the most relevant regions to be involved in your opinion.

These international coalitions should help to connect industrial clusters with storage sites and cover different areas in the EU such as the North Sea cluster which is under development - Belgium + Netherlands + Denmark + Germany + Norway + UK. This would accelerate the establishment of CCS value chains across Europe, and this model should also be applied to South of Europe (Italy / Greece, Spain / Portugal / Southwest of France) as well as Central/East Europe with no access to the sea but heavily industrialized regions (Poland, Czech Republic)

26. Is it desirable that the European Commission contributes to the deployment of CCS, CCU and industrial carbon removals globally?

- Yes.
- 
-



No.

I have no opinion.

*Public awareness*

27. Do you think the European Commission should take a role in improving the quantity and quality of public information available on the three topics: industrial CCS, CCU and Carbon Removals?

- Yes, active support for centralized information is required.
- Yes, but via Member States and other existing fora.
- No, regional and local authorities should do this.
- No, there is already enough information available.
- No, there is no role for EC in this.
- I have no opinion.

28. Do you think the European Commission should take a role in the support of societal engagement and participation for the three topics: industrial CCS, CCU and Carbon Removals?

- Yes, societal engagement and participation are critical, and EC should support this.
- No, societal engagement and participation are very important but it is not the role of the European Commission to support this.
- I have no opinion.

29. Is there anything else you want to share with us that we have not (sufficiently) addressed in previous questions?

*1000 character(s) maximum*

We would like to emphasise yet again the importance of establishing a clear communication towards a comprehensive CCUS infrastructure plan. This, added to a unified European regulatory framework, is the key to developing the necessary business models that will be the basis for a carbon market in the EU, and which are not viable now.

The EU should also support the development of CCU. We will need various solutions to reach the net-zero goal by 2050.

In the energy sector, gas-based power generation will remain important in the transition to a climate-neutral energy system and for providing the necessary reliable backup to renewables. The use of hydrogen and other renewable fuels but also the use of pre- and post-combustion carbon capture are important solutions to decarbonise their operations. CCUS is not only technologically available but is also a proven technology. It can be applied to new but also existing plants still using natural gas.

## Useful links

[Carbon capture, use and storage \(https://climate.ec.europa.eu/eu-action/carbon-capture-use-and-storage\\_en\)](https://climate.ec.europa.eu/eu-action/carbon-capture-use-and-storage_en)

[CCUS Forum \(https://energy.ec.europa.eu/topics/oil-gas-and-coal/carbon-capture-storage-and-utilisation/ccus-forum\\_en\)](https://energy.ec.europa.eu/topics/oil-gas-and-coal/carbon-capture-storage-and-utilisation/ccus-forum_en)

[Study \(May 2023\) EU regulation for the development of the market for CO2 transport and storage \(https://op.europa.eu/en/publication-detail/-/publication/bb3264da-f2ce-11ed-a05c-01aa75ed71a1/language-en?WT.mc\\_id=Searchresult&WT.ria\\_c=37085&WT.ria\\_f=3608&WT.ria\\_ev=search&WT.URL=https%3A%2F%2Fenergy.europa.eu%2F\)](https://op.europa.eu/en/publication-detail/-/publication/bb3264da-f2ce-11ed-a05c-01aa75ed71a1/language-en?WT.mc_id=Searchresult&WT.ria_c=37085&WT.ria_f=3608&WT.ria_ev=search&WT.URL=https%3A%2F%2Fenergy.europa.eu%2F)

## Background Documents

[Study \(May 2023\) EU regulation for the development of the market for CO2 transport and storage](https://op.europa.eu/en/publication-detail/-/publication/bb3264da-f2ce-11ed-a05c-01aa75ed71a1/language-en?WT.mc_id=Searchresult&WT.ria_c=37085&WT.ria_f=3608&WT.ria_ev=search&WT.URL=https%3A%2F%2Fenergy.europa.eu%2F)

## Contact

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