

Power Sector Views on Industrial Carbon Management

A Eurelectric response paper

August 2023

Eurelectric represents the interests of the electricity industry in Europe. Our work covers all major issues affecting our sector. Our members represent the electricity industry in over 30 European countries.

We cover the entire industry from electricity generation and markets to distribution networks and customer issues. We also have affiliates active on several other continents and business associates from a wide variety of sectors with a direct interest in the electricity industry.

We stand for

The vision of the European power sector is to enable and sustain:

- A vibrant competitive European economy, reliably powered by clean, carbon-neutral energy
- A smart, energy efficient and truly sustainable society for all citizens of Europe

We are committed to lead a cost-effective energy transition by:

investing in clean power generation and transition-enabling solutions, to reduce emissions and actively pursue efforts to become carbon-neutral well before mid-century, taking into account different starting points and commercial availability of key transition technologies;

transforming the energy system to make it more responsive, resilient and efficient. This includes increased use of renewable energy, digitalisation, demand side response and reinforcement of grids so they can function as platforms and enablers for customers, cities and communities;

accelerating the energy transition in other economic sectors by offering competitive electricity as a transformation tool for transport, heating and industry;

embedding sustainability in all parts of our value chain and take measures to support the transformation of existing assets towards a zero carbon society;

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August 2023

KEY MESSAGES

- Eurelectric welcomes the opportunity to provide feedback and inform the ongoing works on the development of the EU's strategy for industrial carbon management.
- In particular, Eurelectric considers that carbon removals will play a key role in delivering negative emissions necessary for achieving net-zero and counterbalancing the residual CO₂ in hard-to-abate sectors where no other technological decarbonisation solution is currently available. Industrial carbon removals can significantly contribute to this regard. It is therefore crucial to rapidly ramp up these technologies, many of which are being enabled by CCS. CCS for abatement, on the other hand, would at best be a bridge technology before 2050. Currently not abatable industrial processes that are unlikely to decarbonise on their own by mid century may apply this technology.
- CCS and carbon removals must not in any way replace or reduce mitigation efforts. As the EU opens up to removals through the establishment of a certification framework and explores options for CO₂ transport and storage, it is paramount that climate policy framework continues to incentivise the pursuit of greenhouse gas emissions abatement through cost-effective solutions, including electrification, phasing out of fossil fuels and accelerating the deployment of clean and renewable generation capacities.
- The electricity industry is engaged in a deep decarbonisation process and considers that the EU's electricity supply can be fully climate-neutral well before 2050 if the right enablers are activated, including investment in generation capacities and distribution networks; streamlined permitting processes; access to raw materials and components for net-zero technologies; and a stable, predictable regulatory framework.
- Electrification is the most direct, efficient, and effective way to achieve the society's decarbonisation goal, as it reduces emissions in three ways: switching to carbon-neutral power generation, reducing total energy demand, and replacing fossil-based inputs to industrial processes.
- To reach a net zero power sector, [Eurelectric's Decarbonisation Speedways](#) FF55-inspired scenario, estimates that 133 Mton CO₂ would need to be captured. By 2050, the power sector is assumed not to emit any GHGs, hence the role of such technologies in the electricity industry will be limited. However, at least 106 Mt CO₂ emissions from end use needs to be covered in the FF55-inspired speedway to reach a net zero economy.
- The costs of carbon capture are currently too high to be economically feasible. With the help of government and company's support installations can be build. Investments in such infrastructure should follow thorough cost-benefit analysis and the polluter pays principle. EU Industrial Carbon Management policy should maintain a technology neutral approach and recognise the benefits and limitations of each carbon capture and removal technologies.

Public consultation: Industrial Carbon Management

Fields marked with * are mandatory.

Introduction

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 (CO₂) 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 CO₂ is captured from industrial emissions or directly from the air and subsequently permanently stored
- Carbon Capture and Utilisation (CCU): when the CO₂ 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 CO₂ emissions e.g. when the CO₂ 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

* 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

Ioana

* Surname

Petcu

* Email (this won't be published)

ipetcu@eurelectric.org

* Organisation name

255 character(s) maximum

Eurelectric

* 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.

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* 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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| ☐ Afghanistan | ☐ Djibouti | ☐ Libya | ☐ Saint Martin |
| ☐ Åland Islands | ☐ Dominica | ☐ Liechtenstein | ☐ Saint Pierre and Miquelon |
| ☐ Albania | ☐ Dominican Republic | ☐ Lithuania | ☐ Saint Vincent and the Grenadines |

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| ☐ Andorra | ☐ El Salvador | ☐ Madagascar | ☐ São Tomé and Príncipe |
| ☐ Angola | ☐ Equatorial Guinea | ☐ Malawi | ☐ Saudi Arabia |
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| ☐ Argentina | ☐ Ethiopia | ☐ Malta | ☐ Sierra Leone |
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| ☐ Bahrain | ☐ French Polynesia | ☐ Micronesia | ☐ South Africa |
| ☐ Bangladesh | ☐ French Southern and Antarctic Lands | ☐ Moldova | ☐ South Georgia and the South Sandwich Islands |
| ☐ Barbados | ☐ Gabon | ☐ Monaco | ☐ South Korea |
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| ☐ Bhutan | ☐ Greenland | ☐ Myanmar/Burma | ☐ Svalbard and Jan Mayen |
| ☐ Bolivia | ☐ Grenada | ☐ Namibia | ☐ Sweden |
| ☐ Bonaire Saint Eustatius and Saba | ☐ Guadeloupe | ☐ Nauru | ☐ Switzerland |
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| ☐ Brazil | ☐ Guinea | ☐ New Zealand | ☐ Tanzania |
| ☐ British Indian Ocean Territory | ☐ Guinea-Bissau | ☐ Nicaragua | ☐ Thailand |
| ☐ British Virgin Islands | ☐ Guyana | ☐ Niger | ☐ The Gambia |
| ☐ Brunei | ☐ Haiti | ☐ Nigeria | ☐ Timor-Leste |
| ☐ Bulgaria | ☐ Heard Island and McDonald Islands | ☐ Niue | ☐ Togo |
| ☐ Burkina Faso | ☐ Honduras | ☐ Norfolk Island | ☐ Tokelau |
| ☐ Burundi | ☐ Hong Kong | ☐ Northern Mariana Islands | ☐ Tonga |
| ☐ Cambodia | ☐ Hungary | ☐ North Korea | ☐ Trinidad and Tobago |
| ☐ Cameroon | ☐ Iceland | ☐ North Macedonia | ☐ Tunisia |
| ☐ Canada | ☐ India | ☐ Norway | ☐ Türkiye |
| ☐ Cape Verde | ☐ Indonesia | ☐ Oman | ☐ Turkmenistan |
| ☐ Cayman Islands | ☐ Iran | ☐ Pakistan | ☐ Turks and Caicos Islands |
| ☐ Central African Republic | ☐ Iraq | ☐ Palau | ☐ Tuvalu |
| ☐ Chad | ☐ Ireland | ☐ Palestine | ☐ Uganda |
| ☐ Chile | ☐ Isle of Man | ☐ Panama | ☐ Ukraine |
| ☐ China | ☐ Israel | ☐ Papua New Guinea | ☐ United Arab Emirates |
| ☐ Christmas Island | ☐ Italy | ☐ Paraguay | ☐ United Kingdom |
| ☐ Clipperton | ☐ Jamaica | ☐ Peru | ☐ United States |
| ☐ Cocos (Keeling) Islands | ☐ Japan | ☐ Philippines | ☐ United States Minor Outlying Islands |
| ☐ Colombia | ☐ Jersey | ☐ Pitcairn Islands | ☐ Uruguay |
| ☐ Comoros | ☐ Jordan | ☐ Poland | ☐ US Virgin Islands |
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| ☐ Côte d'Ivoire | ☐ Kosovo | ☐ Réunion | ☐ Venezuela |
| ☐ Croatia | ☐ Kuwait | ☐ Romania | ☐ Vietnam |
| ☐ Cuba | ☐ Kyrgyzstan | ☐ Russia | ☐ Wallis and Futuna |
| ☐ Curaçao | ☐ Laos | ☐ Rwanda | ☐ Western Sahara |
| ☐ Cyprus | ☐ Latvia | ☐ Saint Barthélemy | ☐ Yemen |
| ☐ Czechia | ☐ Lebanon | ☐ Saint Helena
Ascension and
Tristan da Cunha | ☐ Zambia |
| ☐ Democratic
Republic of the
Congo | ☐ Lesotho | ☐ Saint Kitts and
Nevis | ☐ Zimbabwe |
| ☐ Denmark | ☐ Liberia | ☐ 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](#)

Part 1 - General public questions

CCS is a technology whereby CO₂ is captured at industrial installations or directly from the air. The CO₂ is then transported to a permanent storage site where it is injected deep underground. This process could lead to negative emissions when the captured CO₂ 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 CO₂ 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 CO₂ 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 CCS 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	☐	☒	☐	☐
* Do more to communicate the advantages and risks of CCU	☐	☒	☐	☐
* Do more to communicate the advantages and risks of Industrial Carbon Removals	☐	☒	☐	☐

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	☐	☒	☐	☐
* Support the deployment of CCU	☐	☒	☐	☐
* Support the deployment of Industrial Carbon Removals	☐	☒	☐	☐

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

2. Why should CO2 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 CO2 use as carbon feedstock for production (to substitute the use of fossil carbon).
- ☐ No CO2 capture is needed.
- ☐ I have no opinion.

Please explain your choice

500 character(s) maximum

Mitigation hierarchy, based on the most efficient solution, must be followed. This entails prioritising direct electrification, followed by indirect electrification, CCS & CCU. Removals should be used to deliver negative emissions. Capturing is needed for residual CO2 in hard-to-abate sectors & production processes where no other technological decarbonisation solution is available. Minimal role for power generation capacities, kept online for baseload & energy security.

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 CO₂ 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 CO₂ 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 CO₂ 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.

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

	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)	☐	☐	☐	☐	☒	☐
* 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	☐	☐	☐	☐	☒	☐
* The establishment of a dedicated EU level regulatory authority responsible for CO2 transport and storage infrastructure	☐	☒	☐	☐	☐	☐
* An integrated network planning at the EU level (including e.g. cross-border backbone pipelines and 10-year network development plans)	☐	☐	☐	☐	☒	☐
* Guidelines to streamline infrastructure planning and/or permitting with respect to CO2 transport and storage	☐	☐	☐	☐	☐	☒

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	☐	☒	☐	☐	☐	☐
* State controlled energy infrastructure companies	☐	☒	☐	☐	☐	☐
* Member States	☐	☒	☐	☐	☐	☐
* Installations capturing CO2	☐	☐	☐	☒	☐	☐
* CO2 storage operators	☐	☐	☐	☒	☐	☐
Other	☐	☒	☐	☐	☐	☐

If you have suggestions for other options please explain

500 character(s) maximum

The applications of CCS, CCU in the power sector will be limited, considering the ongoing decarbonisation processes. If public funding supports such infrastructure it should follow a through cost-benefits analysis. Another option could be to apply the polluter pays principle.

10. How should investment in the CO2 transport infrastructure be recovered?
(please rank your answers)

	No	Maybe	Neutral	Yes	Very much	No opinion
* Tariffs set at EU level	☐	☐	☐	☐	☐	☒
* Tariffs set at national level	☐	☐	☐	☐	☐	☒
* Negotiated fees for infrastructure use	☐	☐	☐	☐	☐	☒
* Long-term ship-or-pay contracts	☐	☐	☐	☐	☐	☒
Other	☐	☐	☐	☐	☐	☒

If you have suggestions for other options please explain

500 character(s) 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 character(s) maximum

The 3 first physical parameters are critical to ensure the proper functioning of such a network. CO2 standards will be needed to ensure the best interoperability in CO2 transport infrastructure among Member States. The focus should be set on purity as it is essential for the viable performance of the infrastructure. Temperature and pressure will of course also be important to guarantee efficient grid connection. Last but not least, interoperability of networks should be key.

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	☐	☐	☐	☒	☐	☐

* Lack of geological storage capacity available before 2030	☐	☐	☐	☐	☒	☐
* Lack of CO2 transport infrastructure	☐	☐	☐	☐	☒	☐
* Lack of viable business models	☐	☐	☐	☒	☐	☐
* Lack of public awareness	☐	☐	☒	☐	☐	☐
Other	☐	☐	☐	☒	☐	☐

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

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Other barriers include: public acceptance; economic signals; cost and maturity of technology; Some Member States will still face difficulties post-2030, considering their access to and potential to develop storage capacities. The EU could incentivise and coordinate the creation of hubs by building clear economic signals according to the evolution of the technology maturity.

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

	No	Maybe	Neutral	Yes	Very much	No opinion
* Promoting voluntary markets	☐	☐	☐	☒	☐	☐
* EU-level funding for research and innovation	☐	☐	☐	☒	☐	☐
* EU-level funding for full CCS value chain	☒	☐	☐	☐	☐	☐
* EU-level funding for capture	☒	☐	☐	☐	☐	☐
* EU-level funding for transport & storage	☒	☐	☐	☐	☐	☐
* National-level support measures	☐	☐	☒	☐	☐	☐
* Carbon Contract for Difference	☐	☐	☒	☐	☐	☐
* Regulating the price of CO2 for transport and storage	☐	☐	☐	☐	☒	☐
* Tax measures	☐	☐	☐	☒	☐	☐
* Addressing societal and political acceptance	☐	☐	☐	☐	☒	☐
Other	☐	☐	☐	☐	☐	☒

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

500 character(s) maximum

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	☒	☐	☐	☐	☐	☐
* Biogenic CO2 captured from bioenergy combustion	☐	☐	☐	☐	☒	☐
* CO2 capture from process emissions	☐	☐	☒	☐	☐	☐
* CO2 capture directly from the atmosphere	☐	☐	☐	☒	☐	☐
I disagree with the reuse of captured CO2 for new products	☒	☐	☐	☐	☐	☐

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)	☐	☐	☐	☐	☒	☐
* Production of plastics	☐	☐	☒	☐	☐	☐
* Production of chemicals (solvent, detergent, additives, etc.)	☐	☐	☒	☐	☐	☐
* Production of synthetic fuels	☐	☐	☐	☒	☐	☐
* Agriculture and food industry (e.g. to stimulate growth of plants in Greenhouses or in carbonated drinks)	☐	☐	☒	☐	☐	☐
Other	☐	☐	☐	☐	☐	☐

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

500 character(s) maximum

Low carbon bio-sourced or synthetic molecules will have to replace carbon-based input in applications that cannot be decarbonised via electrification. Synthetic fuels should be used only if they are atmospheric/ biogenic CO2-based. CCU could create a link between incompressible residual CO2 emitters & activities dependent on carbon products or services. CCU should focus on emissions from process and bioenergy - a label could differentiate the source.

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 CO2 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 CO2 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
* Bioenergy with CCS (BECCS)	☐	☐	☐	☐	☒	☐
* Direct air carbon capture and storage (DACCS)	☐	☐	☐	☐	☒	☐
* Enhancement of mineralisation processes	☐	☐	☐	☒	☐	☐
* Biochar	☐	☐	☒	☐	☐	☐
Other types of carbon removals	☐	☐	☒	☐	☐	☐
None	☐	☐	☐	☐	☐	☐

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	☐	☐	☐	☒	☐	☐
* Lack of market for carbon removals	☐	☐	☒	☐	☐	☐
* Lack of CO2 transport infrastructure	☐	☐	☐	☒	☐	☐
* Lack of available CO2 storage sites	☐	☐	☐	☒	☐	☐
* Lack of public awareness	☐	☐	☐	☐	☒	☐

* High capital expenditure	☐	☐	☐	☐	☒	☐
* High operating costs	☐	☐	☐	☐	☒	☐
* Lack of common standards	☐	☐	☐	☐	☒	☐
Other	☐	☐	☐	☒	☐	☐

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

500 character(s) maximum

Technological maturity is currently a major barrier to the development of projects. Carbon management technologies have unique advantages and limitations, hence life-cycle analyses of these technologies should be conducted.

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	☐	☐	☐	☒	☐	☐
* Promoting voluntary markets for carbon removals	☐	☐	☐	☒	☐	☐
* Establishing a compliance market for regulated Carbon Removal Certificates	☐	☐	☐	☒	☐	☐
* Linking industrial carbon removals to the EU ETS	☐	☒	☐	☐	☐	☐
* EU-level funding (grants or financial instruments)	☐	☒	☐	☐	☐	☐
* National-level support measures	☐	☐	☐	☐	☒	☐
* De-risking measures such as Contracts for Difference	☐	☐	☐	☐	☒	☐
* Tax measures	☐	☒	☐	☐	☐	☐
* Addressing societal and political acceptance	☐	☐	☐	☐	☒	☐
Other	☐	☐	☐	☐	☐	☐

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

500 character(s) maximum

While linkage of an eventual market for removals with the EUETS is premature, we believe it should be investigated considering that the issue will be addressed in the post-2030 discussions. Nevertheless, it should be carefully assessed and linked to a clear and precise registry of carbon certificates in order to avoid double counting of emission reduction. Otherwise, it would create a real risk of distortion for the mechanism.

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	☐	☐	☐	☒	☐	☐
* Co-invest in developing storage sites	☐	☐	☐	☒	☐	☐
* Co-invest in the CO2 transport network	☐	☐	☐	☒	☐	☐
They should not work closer	☒	☐	☐	☐	☐	☐
Other	☐	☐	☐	☐	☐	☐

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

500 character(s) maximum

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

Such an authority could coordinate transport infrastructure projects and certify that all standards are respected in all Member States. It could be a place of exchanges between all actors which is crucial to efficiently develop projects. Finally, it could enhance access and organise the management of storage sites among Member States.

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.

500 character(s) maximum

Such developments and cooperation with countries outside the EU should follow highest environmental standards, and compliance with EU-based rules and processes. A step-wise approach is recommended, extending the cooperation possibilities to EEA countries and other neighbouring countries.

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

To decarbonise, direct levers such as electrification and energy efficiency have to be prioritised and upscaled. Carbon capture will be needed in the short, medium and long term and that more research on the different technologies should be carried out, as well as more funds need to be dedicated to the launch of new projects. As a second step, indirect electrification through the use of low-carbon electrolytic hydrogen should be used to decarbonise hard to abate sectors. Carbon capture comes in as a last step for abatement, while removals can be used to tackle residual emissions at the pace needed (climate neutrality by 2050) and deliver negative emissions

Useful links

Carbon capture, use and storage (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)

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)

Background Documents

Study (May 2023) EU regulation for the development of the market for CO₂ transport and storage

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Eurelectric pursues in all its activities the application of the following sustainable development values:

Economic Development

- Growth, added-value, efficiency

Environmental Leadership

- Commitment, innovation, pro-activeness

Social Responsibility

- Transparency, ethics, accountability



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