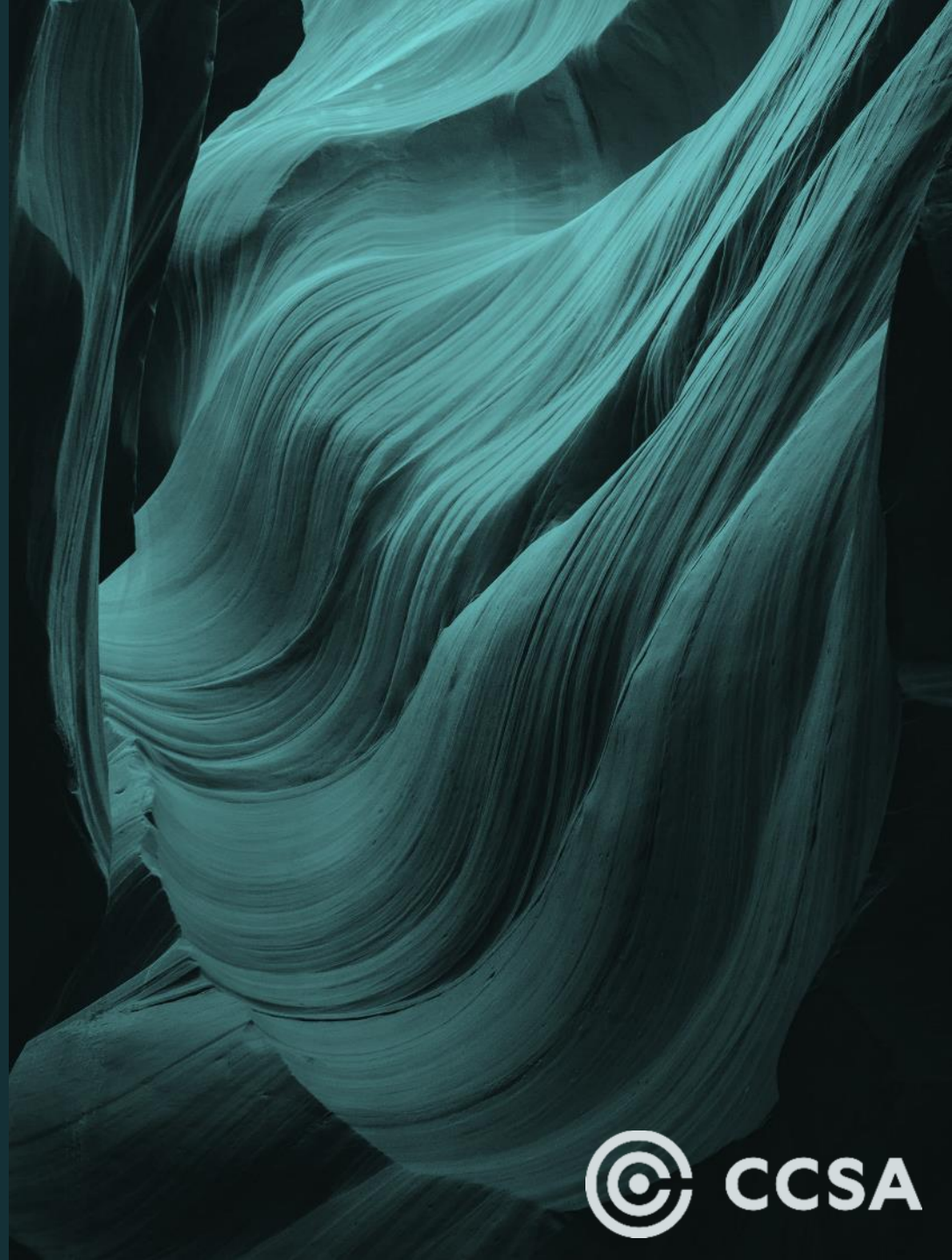
CCSA Carbon Capture and Utilisation (CCU) Task Subgroup

Virtual Meeting

27th February 2024



Agenda

No.	Approx. Time	Item	Speaker
1	11:00 [10 min]	**Introductions and CCSA competition law policy notice**	CCSA Secretariat
2	11:10 [15 min]	**Recap: last meeting's take homes and agreed outputs**	CCSA Secretariat Discussion: All
3	11.25 [up to 1 hour]	**CCSA's CCU Position paper review**	All
4	12:25 [20 min]	**Conclusions**	CCSA Secretariat

House Keeping

- Meeting is being recorded
- If you are not speaking please mute your microphone
- Active participation encouraged: you are welcome to **share your views by raising your hand** (you will be invited to come off of mute) and also to pose any **comments in the chat** (these will be picked up by the secretariat)

CCSA Competition Law Policy

YOU MAY:

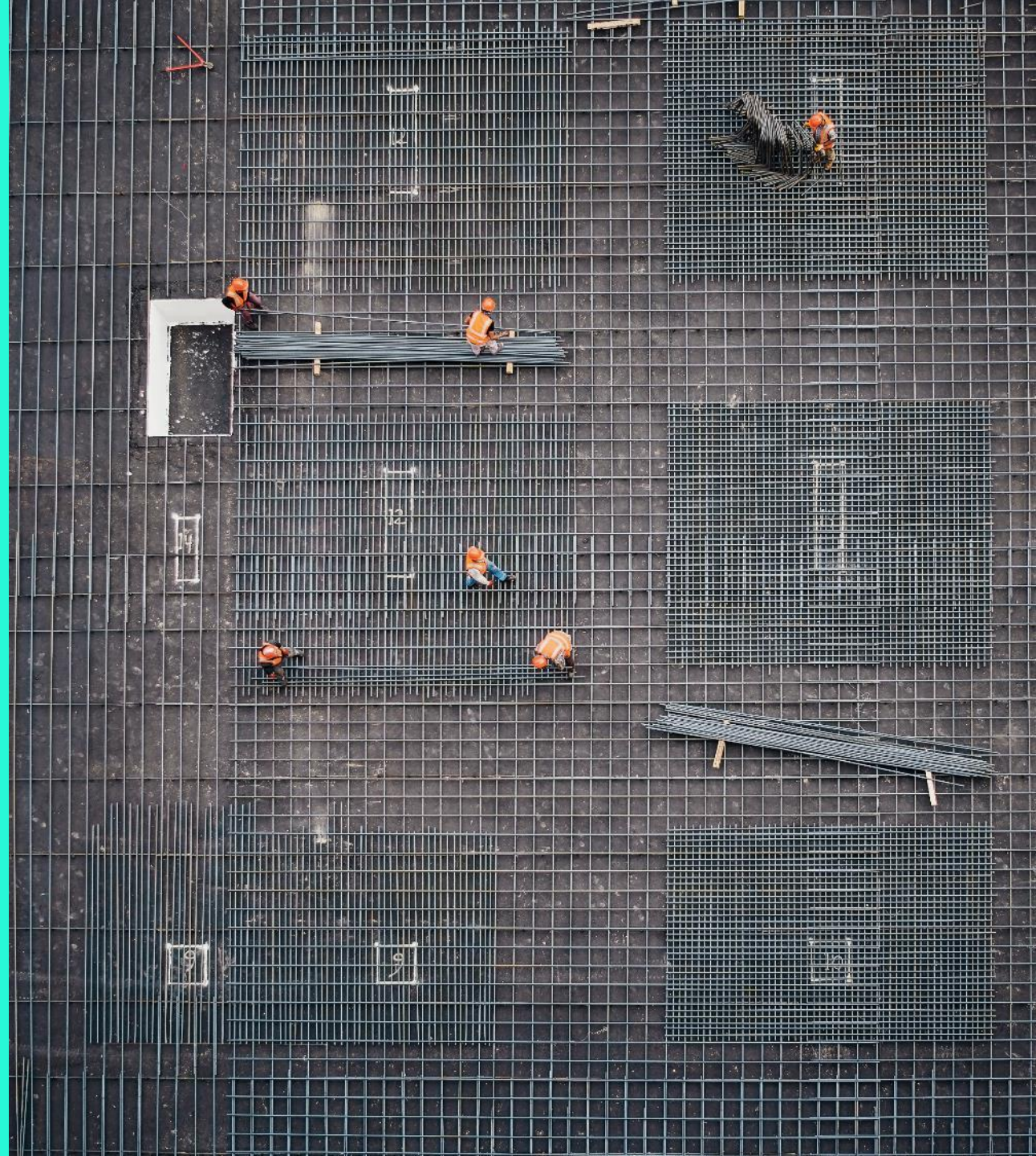
- Discuss matters of general interest and concern, e.g. market trends, the regulatory framework, proposed changes in the law, best practice, health and safety issues and public policy.
- Share non-sensitive information, e.g. information which is historic, anonymous, aggregated or publicly available.
- Report on pricing trends within the industry over a period of time in general terms in so far as it does not identify individual competitors' data and is non-sensitive.
- Discuss the lobbying of the Government, Ofgem, DECC (and other such organisations) on legal reform or on other issues of concern to members.

DO NOT:

- Discuss prices (including: actual prices, discounts, increases, reductions, rebates), customer lists, production costs, quantities, turnovers, sales, capacities, qualities, marketing plans, risks, plans, investments, technologies, R&D programmes, results and other commercially sensitive issues (as a test, consider whether you would be prepared to publish the information in a newspaper).
- Reach any agreement whatsoever relating to price-fixing (or the exchange of pricing information), market sharing, bid rigging, territorial divisions of the market or customer sharing with another member of the CCSA (or any other competitors) at any time before, during or after any CCSA Meeting, or as a result of any recommendation or decision made by CCSA to its members.
- Seek information from members of the CCSA on any assumptions/findings relating to market conduct. Adopt any rules or recommendations which could prevent or distort competition or which could be seen to prevent or distort competition.
- Adopt industry standards which create a barrier to entering the market, unless such standards can be objectively justified and legal advice has been sought.
- Fetter your own commercial freedom of action through discussions with your competitors.
- Use ambiguous or unhelpful language during CCSA Meetings or other communications which might be subsequently misinterpreted if read by competition authorities.
- Encourage, permit, hold or attend any ad-hoc, unofficial or 'shadow' meeting before or after any CCSA Meetings or any other time

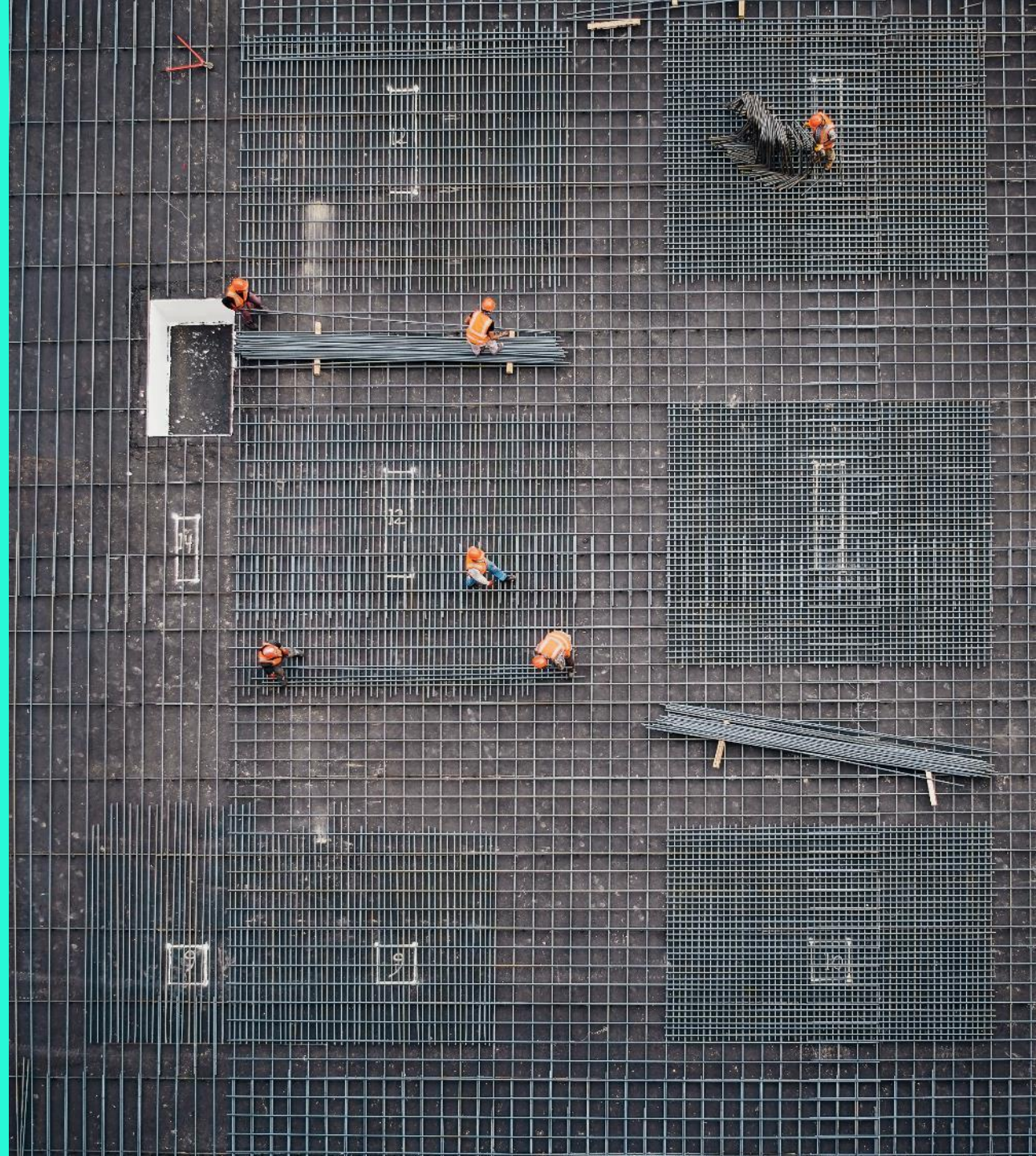
Introductions

All



Recap

CCSA Secretariat



Last meeting's discussion

Key take homes and agreed outputs from January's kick-off meeting

Identified the following focus areas:

- Permanence: what is the longest technical definition?
- CCU value proposition, where "value" extends beyond cost-effectiveness, and with a particular consideration of:
  - Life Cycle Analysis (LCA)
  - Complementary role to CCS (circularity and momentum)

Outputs

- Agreement that the Subgroup's **initial output will be to update the CCSA's CCU Position Paper**
  - Once updated, **this position paper will provide a solid basis for engaging with the UK Government and European Commission, providing a targeted route for the CCSA to shape future CCU policy developments**

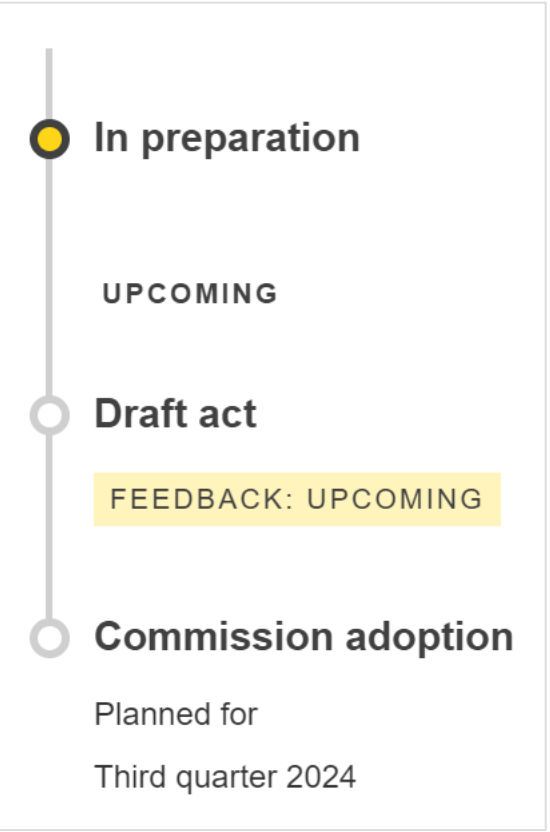
- Agreement that this Subgroup would be a suitable conduit for feeding into work set out in the **CCUS Vision**
  - Government outlined their intent to work with industry to consider the role of CCU in its 2023 CCUS Vision publication, ***"committing to engage with industry, to consider the potential role of CCU within the CCUS framework"*** *(see appendix for recap)*

Update: CCU consultation (EU)

Titled ***"Emissions trading system (ETS) – permanent emissions storage through CCU"***

What do we know? This initiative, based on the revised ETS Directive*, will **set the conditions under which these GHG emissions can be considered as permanently chemically bound in a product so that they do not enter the atmosphere** under normal use and under any normal end-of-life activity.

The CCSA response to the consultation will be liaised via the EU Policy Subgroup (RegPol) in coordination with this CCU Task Subgroup (Technical)

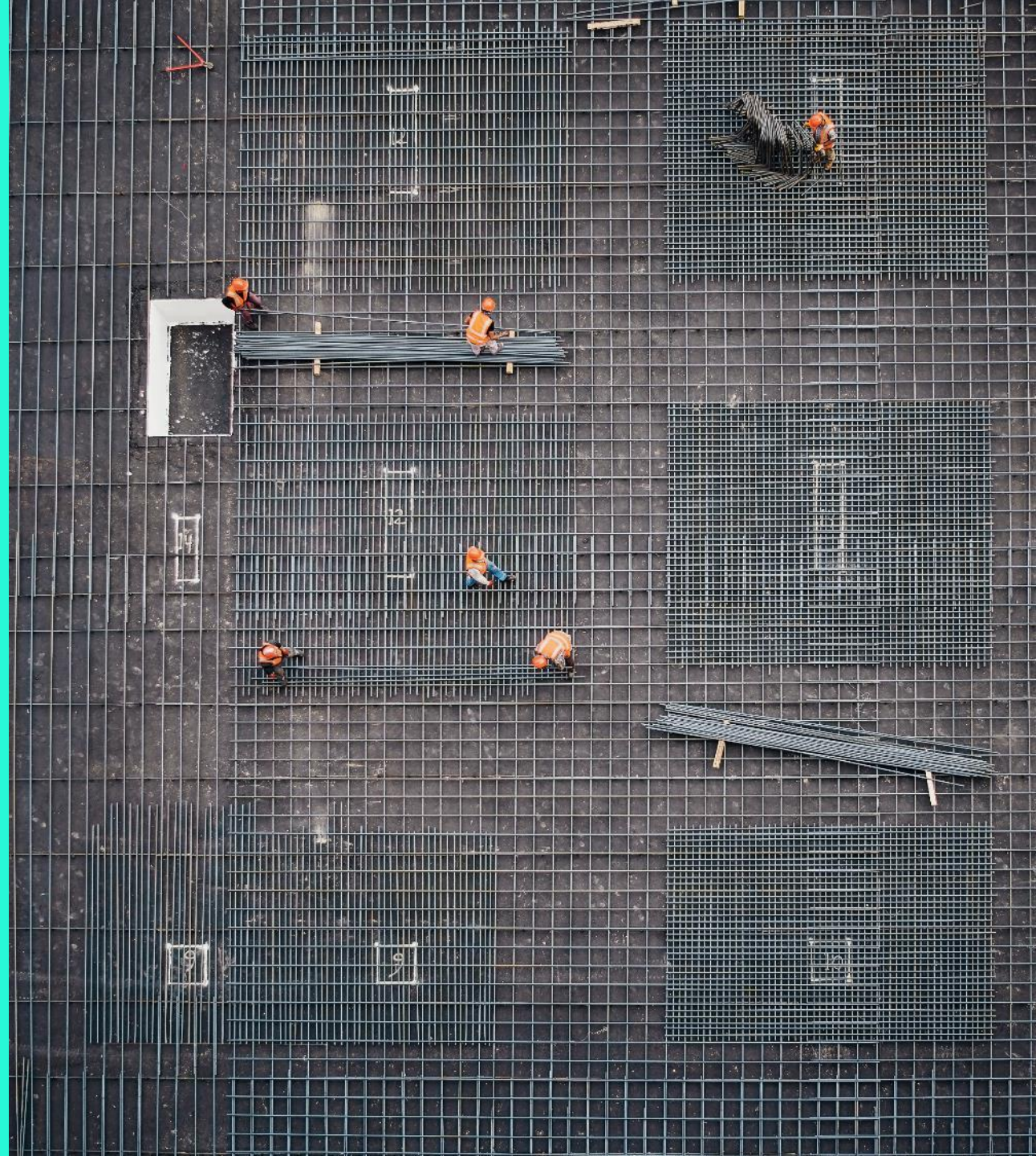


** The EU Emissions Trading System (ETS) Directive has been revised with the EU target set out in the European Climate Law. The target is to reduce net greenhouse gas (GHG) emissions by 55% by 2030, compared to 1990 levels*

Position Paper Review

CCSA Secretariat

All



CCU position paper (2022)

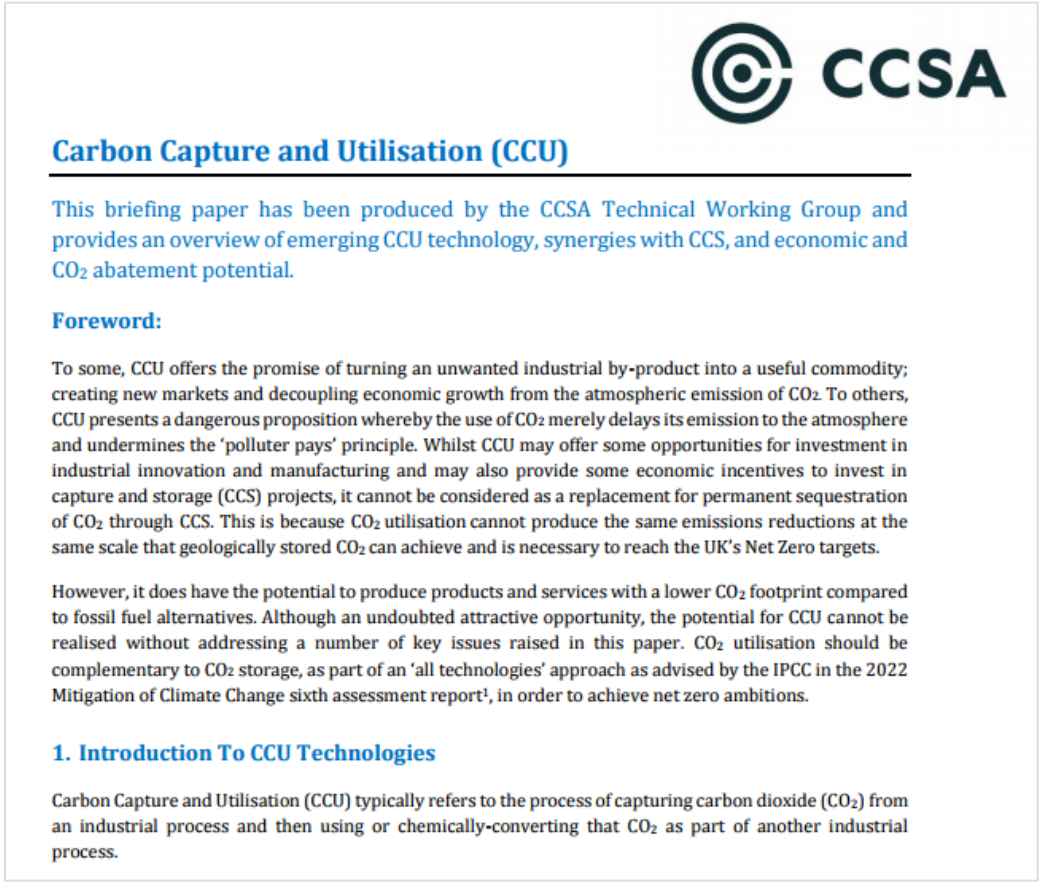
A briefing paper produced by the CCSA Technical Working Group providing an overview of emerging CCU technology, synergies with CCS, and economic and CO2 abatement potential.

The paper highlights a number of **key challenges:**

- **CCU without CCS is insufficient to address the CO2 abatement required** in the Governments Net Zero Strategy for a 'well-below' 2 °C scenario.
- There is a **need for greater lifecycle analysis** for CCU products.
- Further assessment is required to **determine whether CCU represents a cost-effective pathway** to abate CO2 emissions
- Many CCU technologies are **not currently ready for commercial deployment**

And an **opportunity:**

- **There are potential synergies between CCU and CCS.** Whilst the points above need to be considered, within industrial regions, CCU may offer a number of economic opportunities for private sector investment in CCS clusters.



CCSA

Carbon Capture and Utilisation (CCU)

This briefing paper has been produced by the CCSA Technical Working Group and provides an overview of emerging CCU technology, synergies with CCS, and economic and CO_2 abatement potential.

Foreword:

To some, CCU offers the promise of turning an unwanted industrial by-product into a useful commodity; creating new markets and decoupling economic growth from the atmospheric emission of CO_2. To others, CCU presents a dangerous proposition whereby the use of CO_2 merely delays its emission to the atmosphere and undermines the 'polluter pays' principle. Whilst CCU may offer some opportunities for investment in industrial innovation and manufacturing and may also provide some economic incentives to invest in capture and storage (CCS) projects, it cannot be considered as a replacement for permanent sequestration of CO_2 through CCS. This is because CO_2 utilisation cannot produce the same emissions reductions at the same scale that geologically stored CO_2 can achieve and is necessary to reach the UK's Net Zero targets.

However, it does have the potential to produce products and services with a lower CO_2 footprint compared to fossil fuel alternatives. Although an undoubted attractive opportunity, the potential for CCU cannot be realised without addressing a number of key issues raised in this paper. CO_2 utilisation should be complementary to CO_2 storage, as part of an 'all technologies' approach as advised by the IPCC in the 2022 Mitigation of Climate Change sixth assessment report[1], in order to achieve net zero ambitions.

1. Introduction To CCU Technologies

Carbon Capture and Utilisation (CCU) typically refers to the process of capturing carbon dioxide (CO_2) from an industrial process and then using or chemically-converting that CO_2 as part of another industrial process.

Section 1: Introduction to CCU technologies

Reminder: areas of focus identified during last meeting

- Permanence: what is the longest technical definition?
- Value proposition: "value" beyond cost-effectiveness, considering:
- Life Cycle Analysis (LCA)
- Complementary role to CCS (circularity and momentum)

CCSA

1. **Overview of emerging CCU technology**
2. Synergies with CCS
3. Status of CCU
4. Economic and CO2 abatement
5. Value for dispersed sites

Section recap:

Provides a breakdown of CCU types:

- Carbon mineralisation / carbonation
- Conversion of CO2 to fuels
- The use of CO2 as a feedstock for chemicals
- Non-conversion use of CO2
- CO2 utilisation in food and drink

Position:

- Regarding the conversion of CO2 to fuels *"energy intensive, and where possible, would benefit from full LCA as well as using renewable energy to ensure they align with UK environmental goals"*
- Regarding non-conversion uses *"it should be recognised that whilst the use of CO2 for EOR is considered to be utilisation, this practise is not in line with the UKs Net Zero strategy and does not further the goal to limit global warming"*
- Regarding CCU in food and drink *"commercial potential for CCU for this sector is limited and the CO2 used is ultimately still emitted to the atmosphere therefore permanent storage of CO2 will still be a necessity in order to reach net zero*

Questions for the group:

Is the content of this section still relevant?

Does it require reframing?

Does it require any additions?

Has our position changed?

Section 2: Drivers for CCU in the UK and synergies with CCS

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CCSA

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Section recap:

High level and diagrammatic:

- UK ETS
- Low-c products market
- Circular economy
- CCS cost concerns
- Net zero
- Security of supply

- Lack of incentives / regulatory framework
- Permanency questions
- Competition form existing market products
- Low TRL

Position:

- *"Many of the challenges associated with commercial-scale CCS deployment, such as perceptions of high costs and* ***the need for a strong and consistent policy framework*** *also exist for CCU"*
- *"The introduction of Voluntary Carbon Markets in the EU and UK can also play an important role in driving the CCU sector and the production of low carbon products."*
- *"What will be critical going forward is to define a regulatory framework for the inclusion of CCU in the UK offset market, as well as* ***forming definitions in the UK and EU emissions trading schemes around the permanency*** *of CO2 removal through utilisation."*

Questions for the group:

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Section 3: The current status of CCU in the UK

Reminder: areas of focus identified during last meeting

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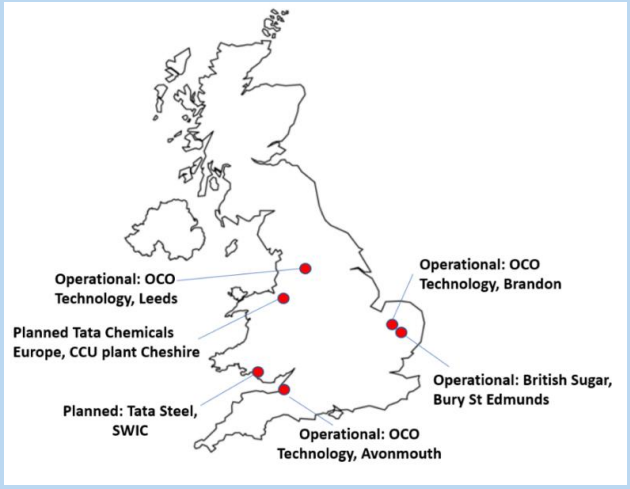
CCSA

1. Overview of emerging CCU technology
2. Synergies with CCS
3. **Status of CCU**
4. Economic and CO2 abatement
5. Value for dispersed sites

Section recap:

- CCU applications:
  - Biggest use in UK is food and drink
  - UK moving away from CO2 use for EOR
- CCS announcements in NZ Strategy
- Overview of CCU projects
- What remains unclear in Government policy



Position:

- *"What is unclear from BEIS's current policy, is to what extent CCU will play a role in the early phases of CCUS cluster deployment, how* ***the issue of permanency of utilisation applications should be assessed and how CCU will integrate and be compatible within the CCS business models****."*
- *"This will be essential for the success of the CCUS sector and therefore needs to be urgently addressed by Government via the business models and* ***a Government acknowledged life cycle analysis method*** *which can be used as a standard across CCU industries."*

Questions for the group:

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Does it require any additions?

Has our position changed?

Section 4: The CO2 abatement potential of CCU

Reminder: areas of focus identified during last meeting

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CCSA

1. Overview of emerging CCU technology
2. Synergies with CCS
3. Status of CCU
4. **Economic and CO2 abatement**
5. Value for dispersed sites

Section recap:

Exploring the factors which determine CCU abatement potential:

- Permanency & the need for robust life cycle analysis
- Scale of production
- Market for CCU products
- Cost effectiveness and value for money abatement

Position:

- *"CO2 utilisation should be complementary to CO2 storage, as part of an 'all technologies' approach"*
- *"The variation in abatement potential underlines the need for targeted policy support … which must not distract from the need for permanent abatement through widespread implementation of CCS"*
- *"Assessment of the environmental value of CCU requires a 'whole systems' approach, accounting for the direct abatement opportunity and whether emissions are avoided elsewhere"*
- *"A number of initiatives exist to try and quantify climate benefits of CCU, including the Techno-Economic Analysis and Life Cycle Analysis Toolkit produced by Global CO2 Initiative, which looks to provide an industry standard framework for analysing technologies that may have the most impact."*
- ***"In order for this to become standardised we need Government acknowledged approach to LCA."***

Questions for the group:

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Does it require reframing?

Does it require any additions?

Has our position changed?

Section 5: Value of CCU for dispersed sites

Reminder: areas of focus identified during last meeting

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CCSA

1. Overview of emerging CCU technology
2. Synergies with CCS
3. Status of CCU
4. Economic and CO2 abatement
5. **Value for dispersed sites**

Section recap:

Presents the advantages of utilising CCU at dispersed sites:

- Progress towards net zero targets while generating income
- A route to emission reduction with limited CCUS infrastructure
- Opportunity to utilise biogenic CO2, usually produced at dispersed sites
- DAC for sustainable aviation fuel

Position:

- *"many uses of CO2 at dispersed sites do not offer permanent abatement of emissions but rather delay their release to the atmosphere, which may offer time for dispersed sites to connect to transport and storage infrastructure for geological sequestration"*

Questions for the group:

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AOB & Next meeting date

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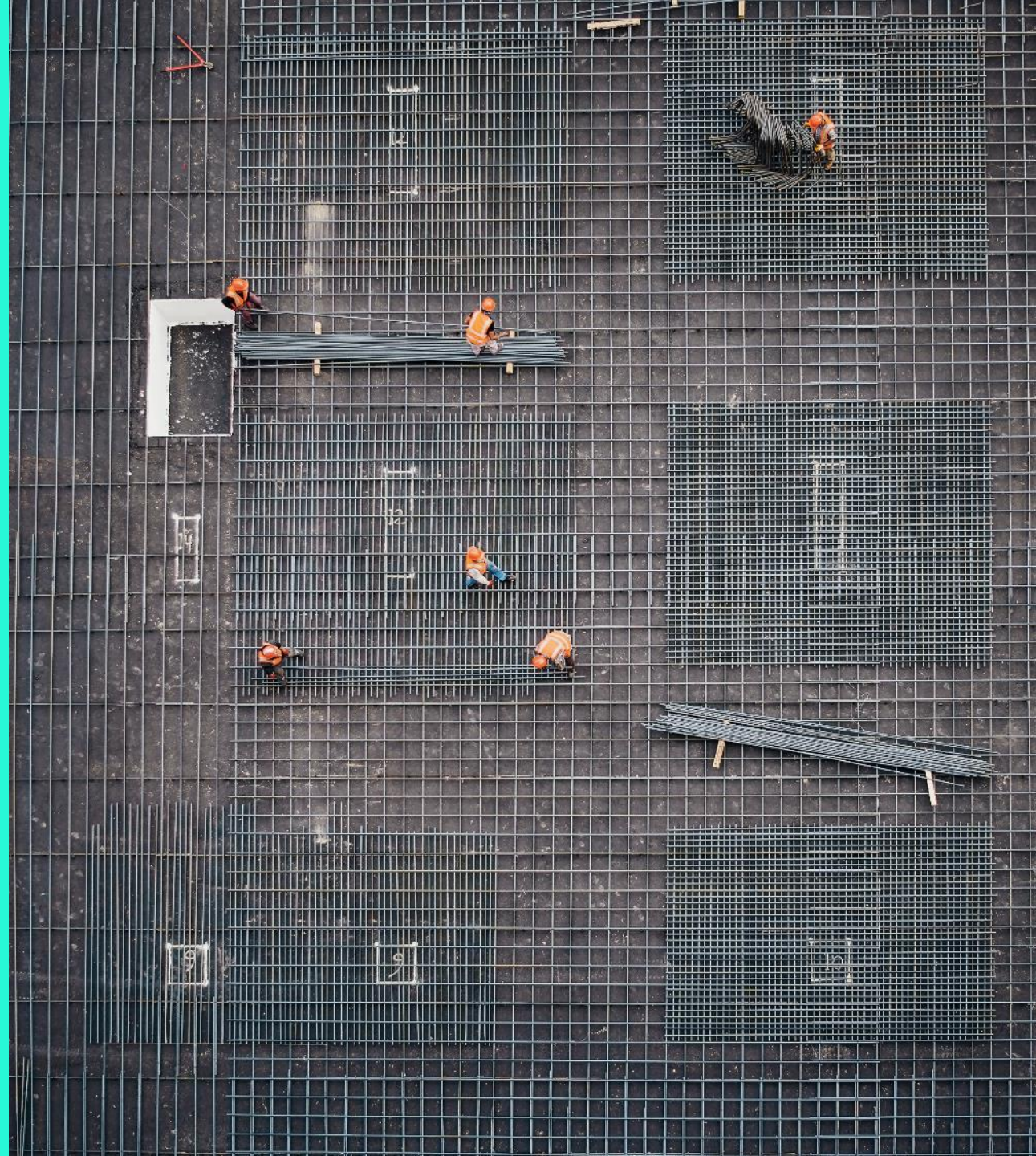
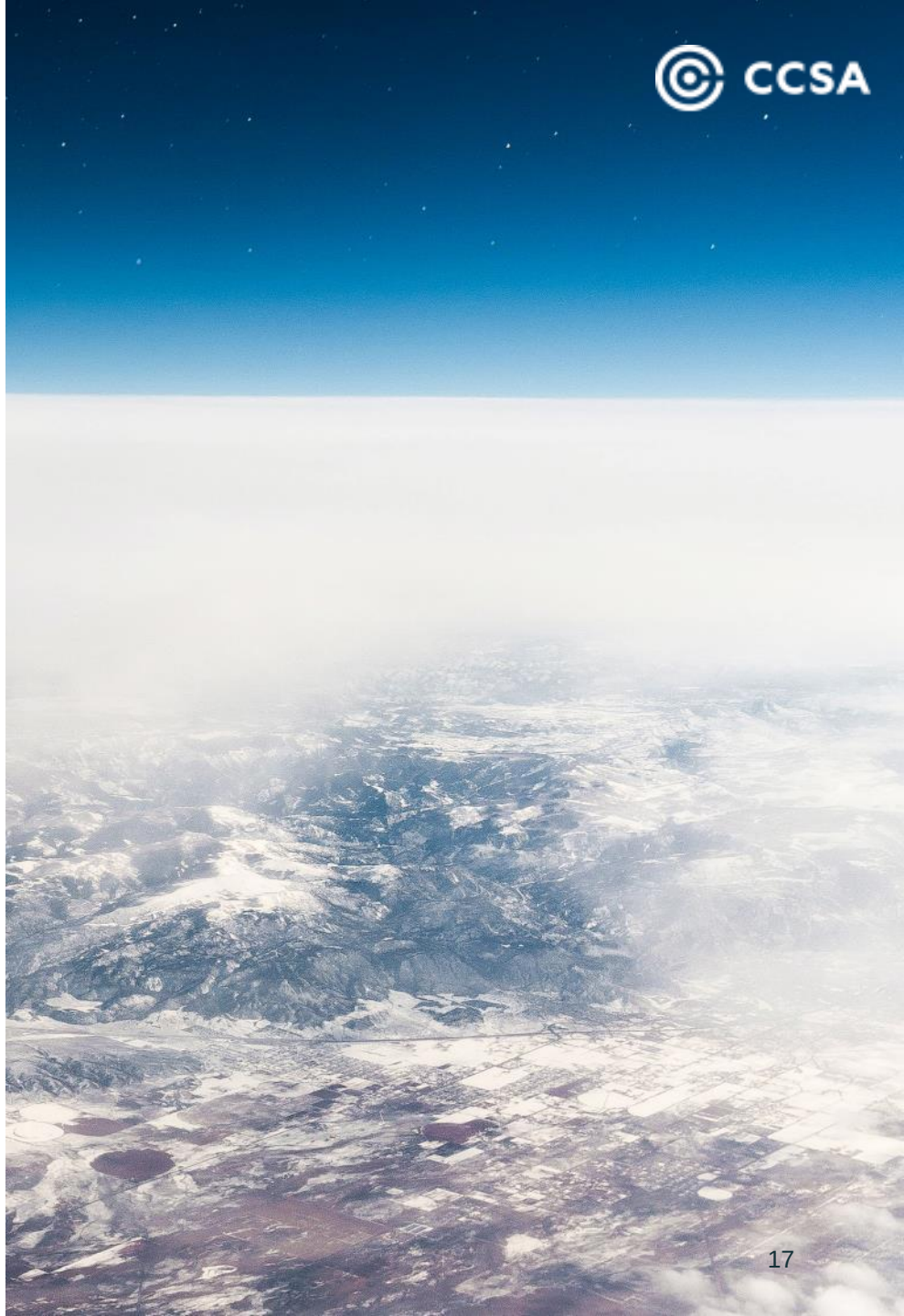


AOB & Conclusions

- **AOB**
- **Actions**
- **Date for next meeting**
- **Close Meeting**

This subgroup still needs a convenor. If anybody is interested, or would like to know more, please contact Beth Hebditch (beth.hebditch@ccsassociation.org).



CCU in the CCUS vision

Government will work with industry and other stakeholders to consider the role of CCU where CO_2 is permanently abated via non-geological storage.

Key points in the CCUS Vision report (December 2023)

- *CCU, in which captured CO_2 is used rather than stored in geological formations, may also* ***play a role for some industrial facilities in decarbonising, where the application of CCU results in the permanent abatement of CO2***
- *CCU technologies could offer a* ***complementary, yet smaller in scale, solution for net zero*** *to CCS.*
- *CCU could also represent an* ***alternative solution for dispersed sites that have limited transport and storage options*** *and have a role in aiding the* ***development of a low carbon products market.***
- *CCU is* ***currently ineligible for business model support*** *under the CCUS programme*
- *In the Industrial Carbon Capture (ICC) business model update published in October 2021, we set out that* ***further work is needed to determine whether the ICC business model is the most suitable form of support for CCU****, including evidence relating to the permanency of CO_2 stored.*
- *We will conduct further work in 2024, including committing to engage with industry, to* ***consider the potential role of CCU within the CCUS framework****.*

CCU definitions

Amendments were put forward* to establish a definition for permanent utilisation in the Energy Bill.

- ***"storage, either by geological storage or usage where the carbon dioxide is permanently chemically bound in a product so that it does not enter the atmosphere under normal use"***
- ***The drafting of the amendment reflects language in the recent revision of the EU ETS to incorporate CCU where it is stored in a manner intended to be permanent.***

May 2023: European Commission delegated act on "permanent" CCU:

"An obligation to surrender allowances shall not arise in respect of emissions of greenhouse gases which are considered to have been captured and ***utilised in such a way that they have become permanently chemically bound in a product so that they do not enter the atmosphere under normal use, including any normal activity taking place after the end of the life of the product****".*

Sub-definitions are provided for:

- *Captured and utilized*
- *Permanence*
- *Chemically bound*
- *Product*
- *Normal use*
- *End-of-life*

See appendix

** Note- amendments were withdrawn*