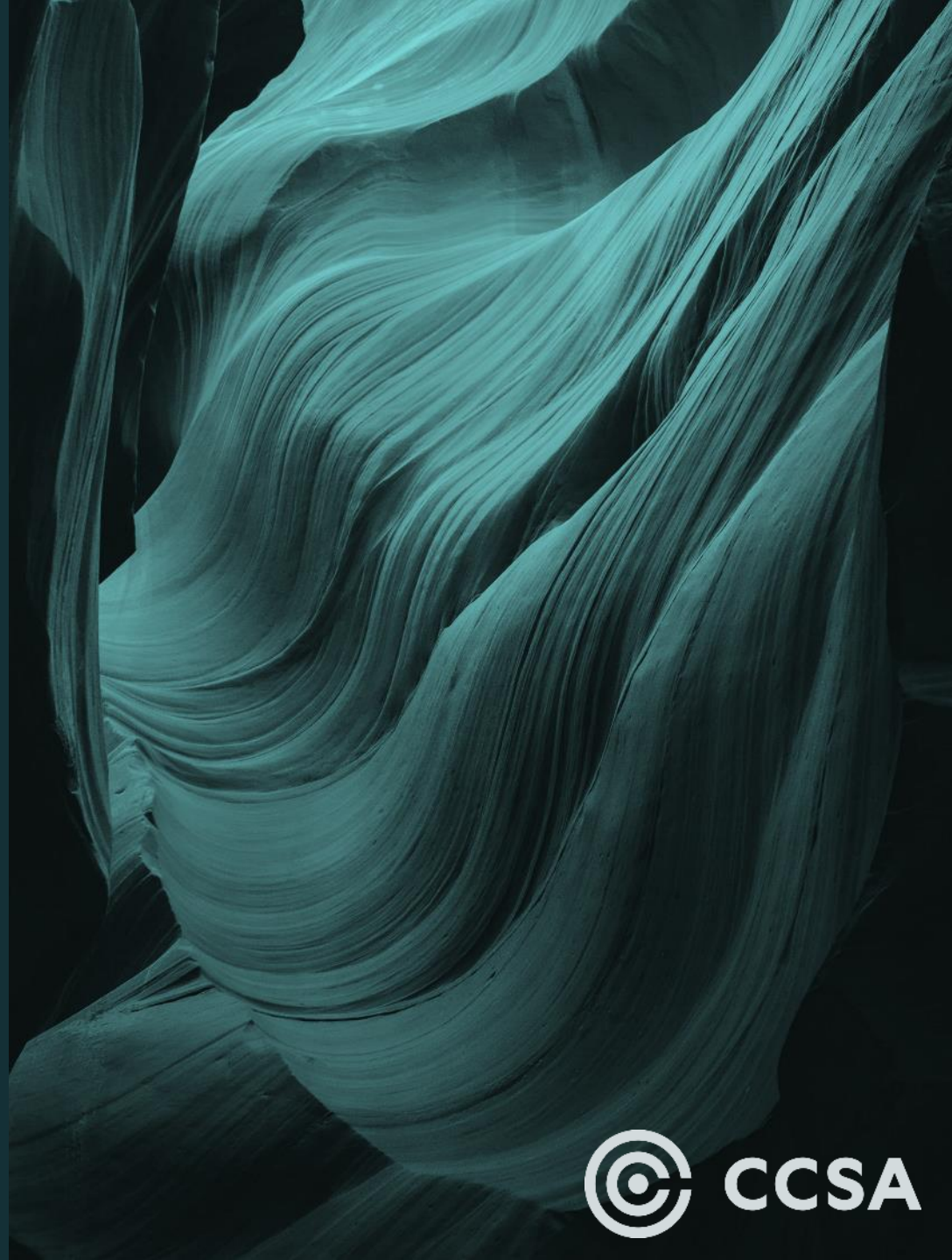
CCSA Carbon Capture and Utilisation (CCU) Task Subgroup

Virtual Meeting

16th January 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: Status of CCU regulatory frameworks in the EU and UK**	CCSA Secretariat Discussion: All
3	11.25 [10 min]	**CCSA positions and previous work related to CCU**	CCSA Secretariat Discussion: All
4	11:35 [20 min]	**Group discussion: role of the CCSA subgroup**	All
5	11.55 [5 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:

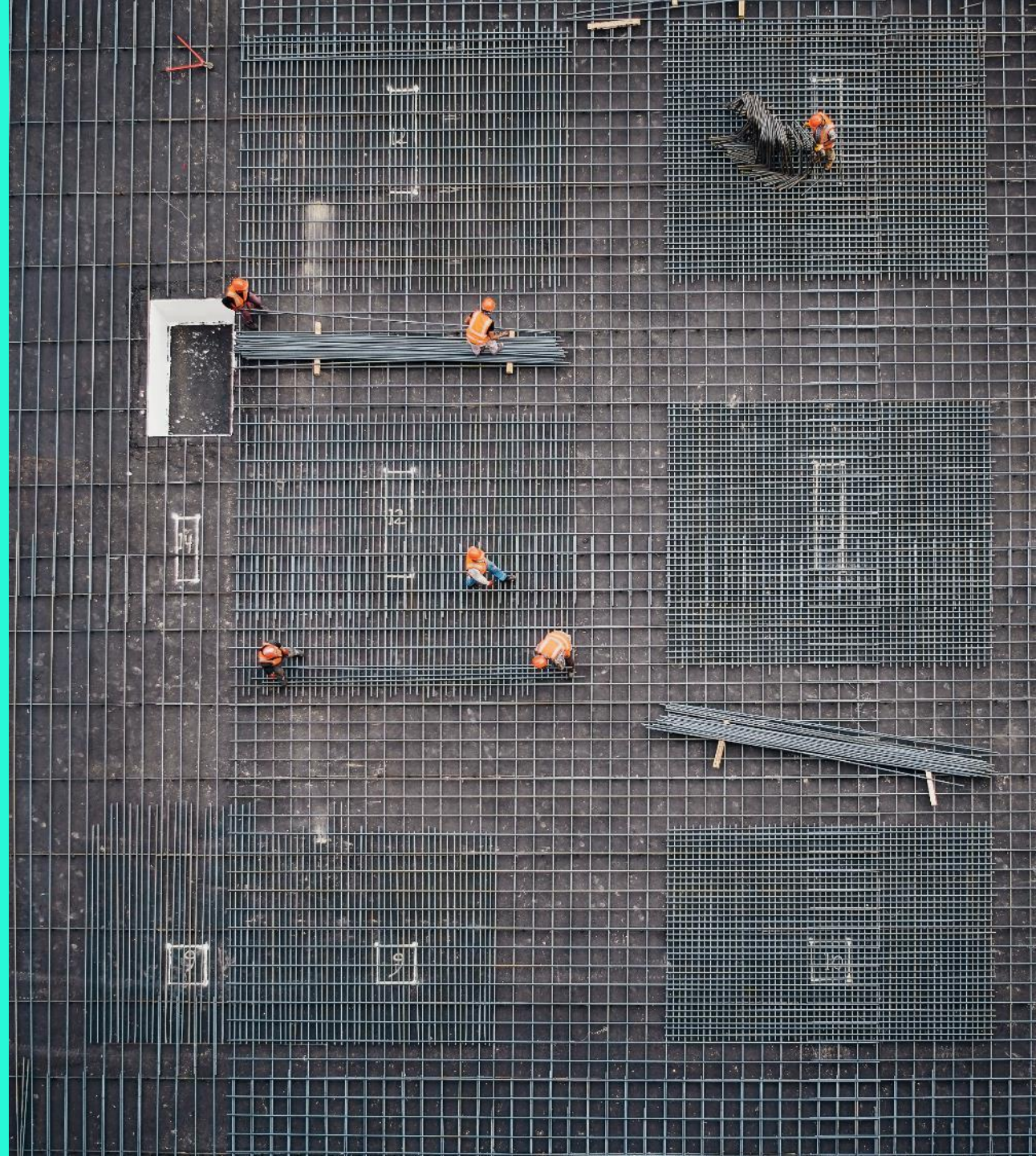
- Discuss matters of general interest and concern, e.g. market trends, the regulatory framework, proposed changes in the law, best practice, health and safety issues and public policy.
- Share non-sensitive information, e.g. information which is historic, anonymous, aggregated or publicly available.
- 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

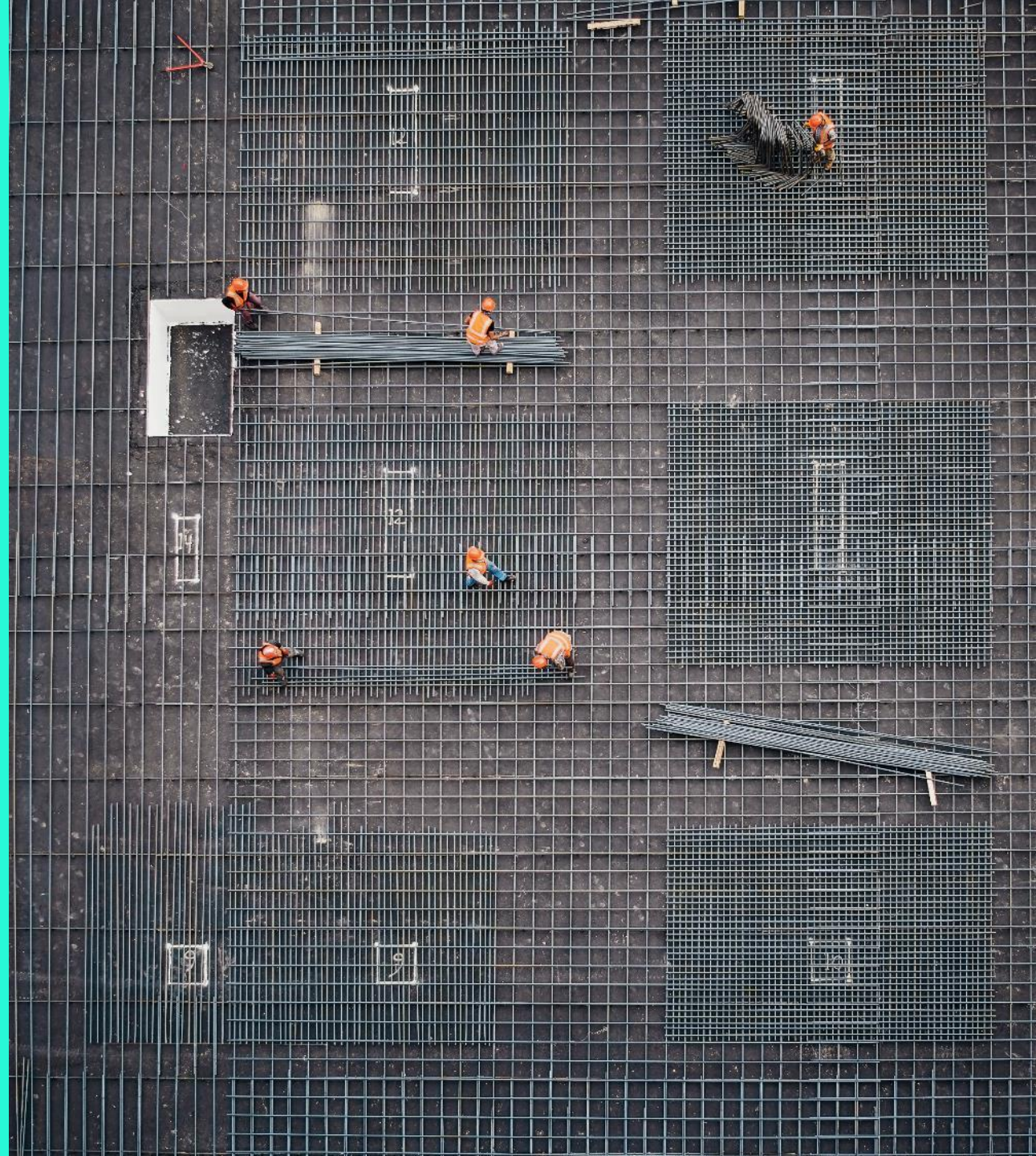
Introductions

All



Setting the scene

CCSA Secretariat



Summary: UK framework

2018:

UK CCUS Deployment Pathway: An Action Plan outlines the UK's approach to CCUS, an action plan for deployment at scale during the 2030s

- Highlights the role of CCU in improving the economics of projects and in enabling permanent sequestration (cement and aggregates)
- £20 million CCU Demonstration Programme to fund design and construction of demonstration plants in the UK

2020:

The Ten Point Plan for a Green Industrial Revolution (2020): sets out UK's ambition to capture and store 10 MtCO2/year by 2030, cluster sequencing programme, decarbonising aviation with sustainable aviation fuels (SAF)

- Funding for SAF production through Green Skies competition

2023:

UK SAF mandate consultation, aiming to build demand and supply and kickstart a domestic SAF industry

- Requiring jet fuel suppliers to blend SAF into aviation fuel; targets for 2025 and trajectory to 2030
- Link to UK ETS: SAF is zero-rated on UK ETS routes; aircraft operators can claim a corresponding reduction in their UK ETS obligations.

CCUS Vision recognises that CCU may play a role for some industrial facilities in decarbonising, where the application of CCU results in the permanent abatement of CO2

Summary: UK and EU CCU framework

2021:

Sustainable Carbon Cycles Communication: An action plan on how to develop sustainable solutions to increase carbon removals

- By 2030, at least 20% of the carbon used in products has to come from sustainable non-fossil sources
- Technical assessment highlights that the EU climate-neutrality objective will require the industrial capture of 300-500 MtCO2 for storage or to produce materials and fuels.

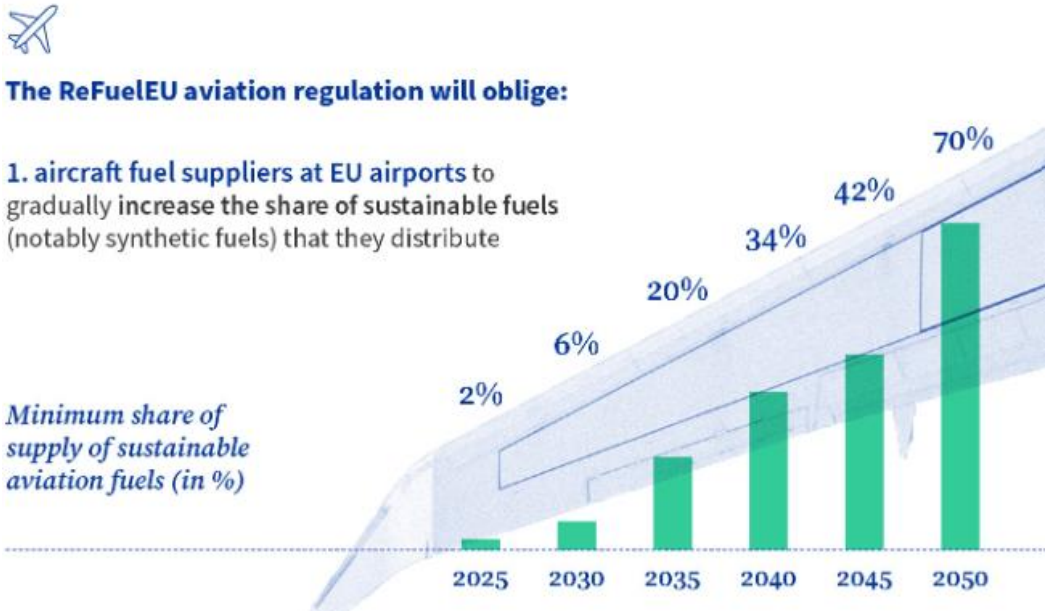
2023:

EU ETS Directive revision to include provisions on different types of CCU:

- No obligation to surrender allowances for GHG emissions *"which are considered to have been captured and utilised to 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 life of the product."*
- Accounting for other types of CCU will be assessed by the EC by July 2026

Revision of the Renewable Energy Directive (REDIII) Delegated Act to specify that GHG emission saving calculations from RFNBOs discounts all CO2 captured and incorporated into the fuel, to avoid double counting

ReFuelEU Aviation Initiative aims to increase demand and supply of sustainable aviation fuels (SAF), with a minimum share of SAF from 2025 and a minimum share of synthetic fuels from 2030



"RFNBO" means renewable liquid and gaseous fuels of non-biological origin.

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*

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****.*

Discussion point: extent of CCSA input, via this subgroup

State of Play across the CCUS Business Models

CCSA

Near Final

CO_2 T&S Regulated Model (TRI) – updated *HoT published & Consultation published **1 Dec 2023.***

Dispatchable Power Agreement (DPA) – *Last updated Nov 2022. Consultation published **4 Dec 2023** proposes integration of the TRI model in to the DPA Business Model.*

Industrial Carbon Capture (ICC) (excl EfW) – *ICC Standard T&Cs, Front End Agreement – **17 Oct 2023** (key update areas: Free allowance treatment/MRV/GGRs). Next update due Feb 2024.*

Advanced

Industrial Carbon Capture (EfW) – *Full form draft Waste ICC contract (T&Cs, Front-End Agreement) **17 Oct 2023**. Next update due Feb 2024.*

Low Carbon Hydrogen Production –*Draft Low Carbon Hydrogen Agreement **9 Nov 23** – LCHS updated (Version 3) **12th Dec 2023***

Hydrogen Production Roadmap *published **14th Dec 2023***

Early Phases

Engineered GGRs – *Indicative Heads of Terms, and business model update, **published 20 Dec 2023**. Next update due Q1-2024.*

Power BECCS *(< 100MW not eligible in Phase 2 / T1 Exp) business model update **published 20 Dec 2023**. Next update due Q1-2024.*

Hydrogen T&S – *Hydrogen strategy market update report/ Hydrogen T&S networks pathway report/ Storage & transport market engagement consultations/ technoeconomic report – **published 14 Dec 2023***

Not Started/No Updates

Non-Pipeline Transport – *according to CCUS vision (**published 20 Dec 2023**), NPT projects are expected to be eligible for selection under the government support process from 2025. Call for evidence due to be launched in 2024.*

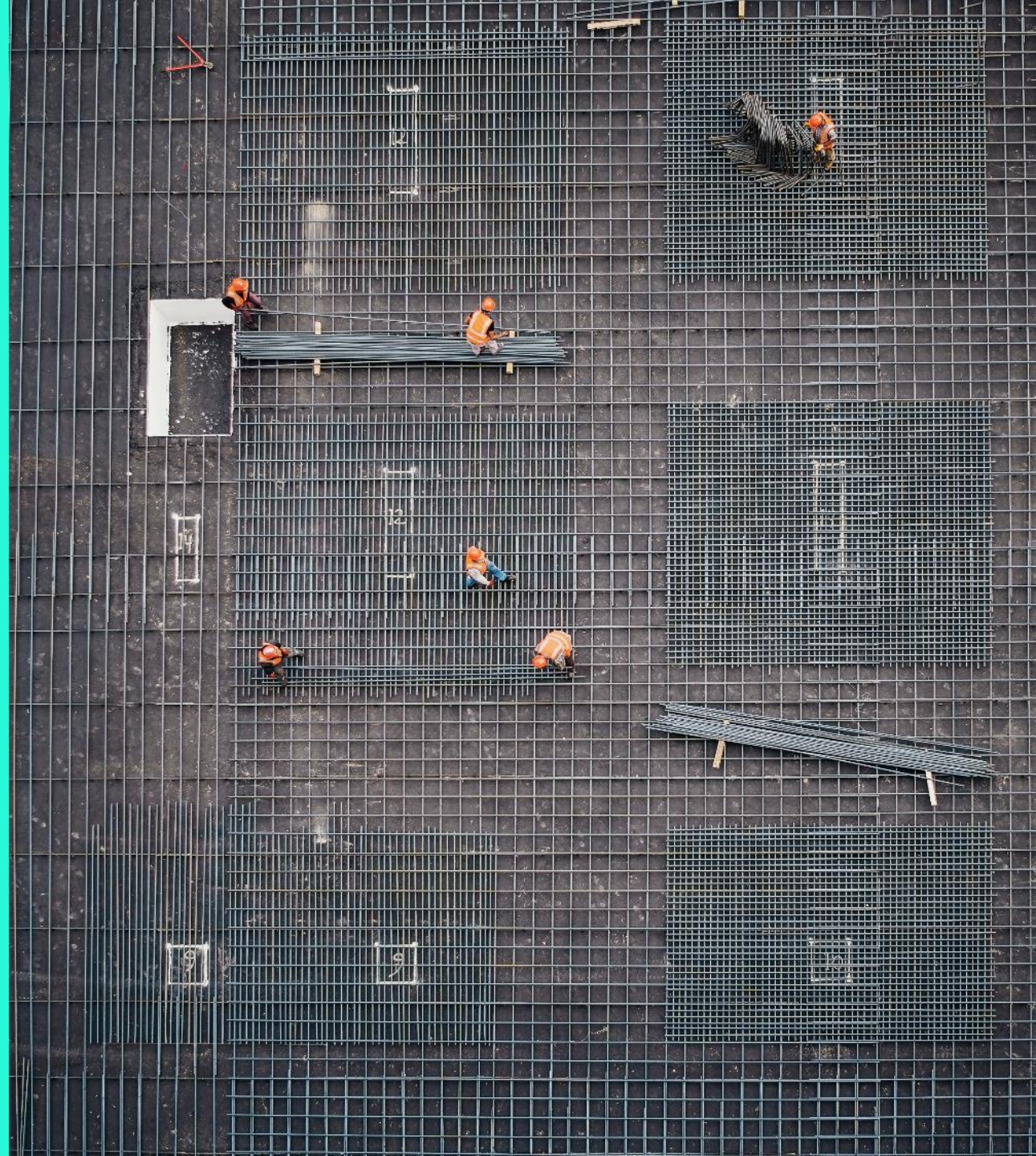
CCU *–currently ineligible for business model support but CCUS Vision (**20 Dec 2023**) highlights commitment for government to engage with industry in 2024 to consider the potential role of CCU within the CCUS framework*

Dispersed Sites – *CCUS vision report **(20 Dec 2023)** highlights need for rapid advancement of NPT to support dispersed sites*

CCSA position paper

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.

"There are potential synergies between CCU and CCS:

- *Within industrial regions, CCU may offer a number of economic opportunities for private sector investment in CCS clusters.*
- *Where infrastructure and resources are shared, there may be opportunities to reduce capture and transport costs and de-risk investments.*
- *CCU could add value at dispersed sites, offering a method to reduce emissions in remote areas where access to nearby, cost-effective CCUS infrastructure may be limited during the early phases of construction, particularly for local biogenic CO2, which in its nature is usually produced at dispersed locations.*
- *In order use CCU as another tool in the box to reach Net Zero* ***it is critical that Government incorporate CO2 utilisation into the CCUS business models. A clear definition and position in the wider CCUS framework will be an important enabler for the success of a varied CCUS sector****"*

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**

Discussion: role of the subgroup

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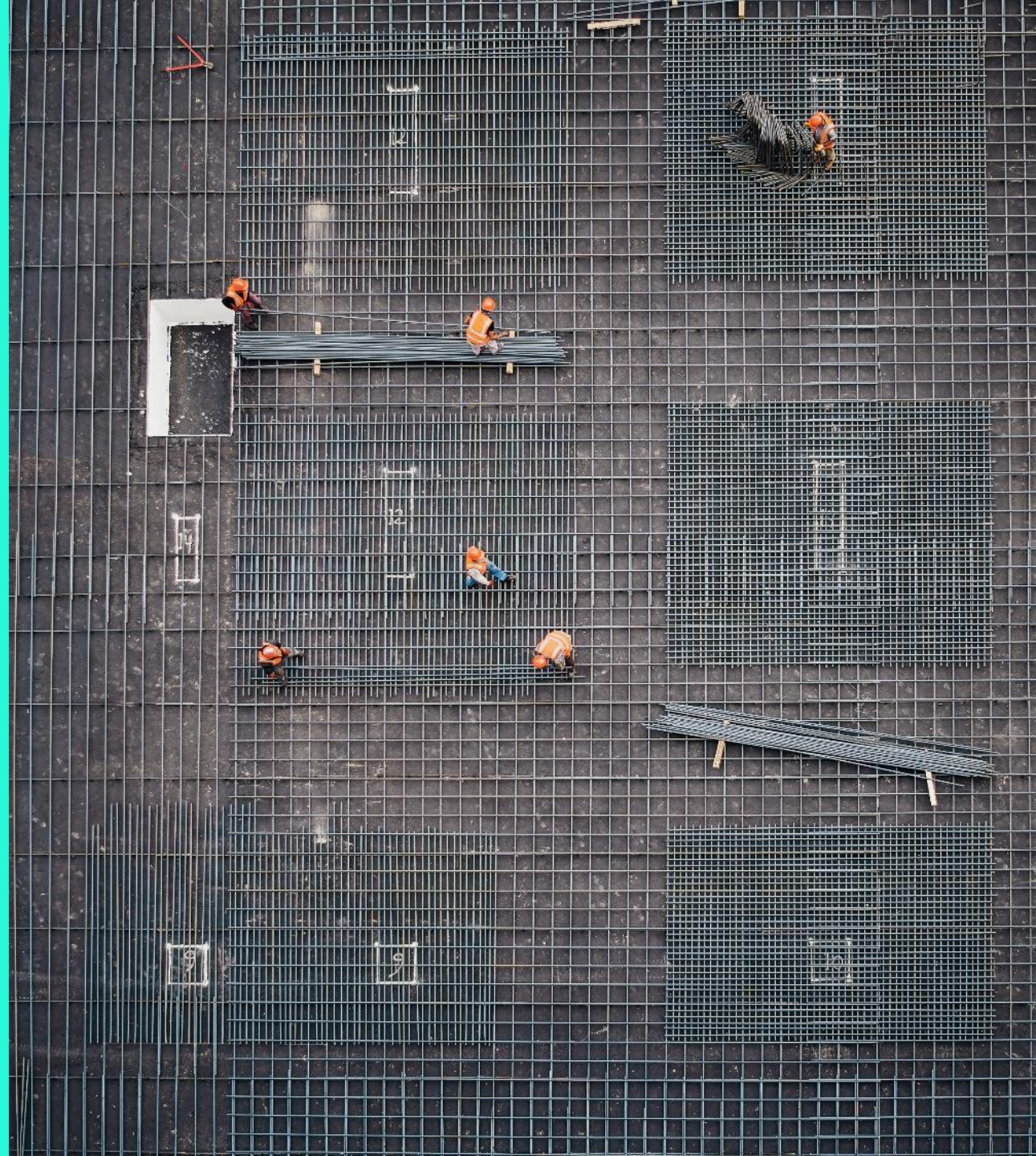


Key Topics Discussion

Considerations for the group:

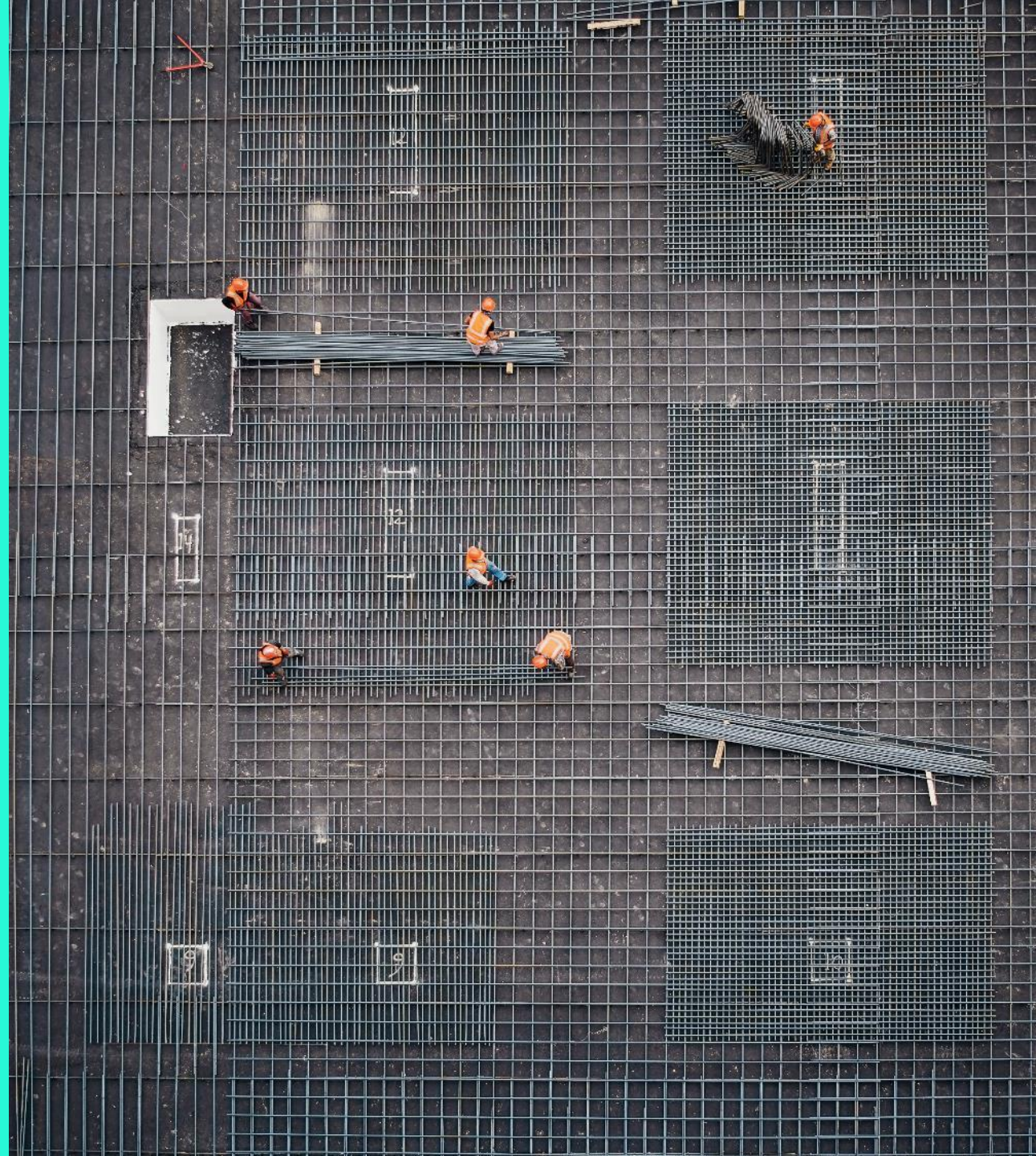
- **Where should the CCSA focus?**
  - *Categories of CCU: mineralisation, conversion of CO2 to fuels, use of CO2 as chemicals feedstock, use in food and beverages*
  - *Long term CCU?*
  - *CCU that benefits the climate?*
- **Is there a clear CCSA message across the membership?**
- **Topics for consideration?** Examples:
  - *Where can CCU add value?*
  - *Contribution of CCU towards climate targets*
  - *Need for CCU at dispersed sites*

Roles and priorities for the subgroup?

- **What is the role of the subgroup, and what outputs should it be tasked with?** Examples:
  - *Updating CCSA position papers*
  - *Seeking alignment with EU positions*
  - *Input to the CCUS Vision work areas*

AOB & Next meeting date

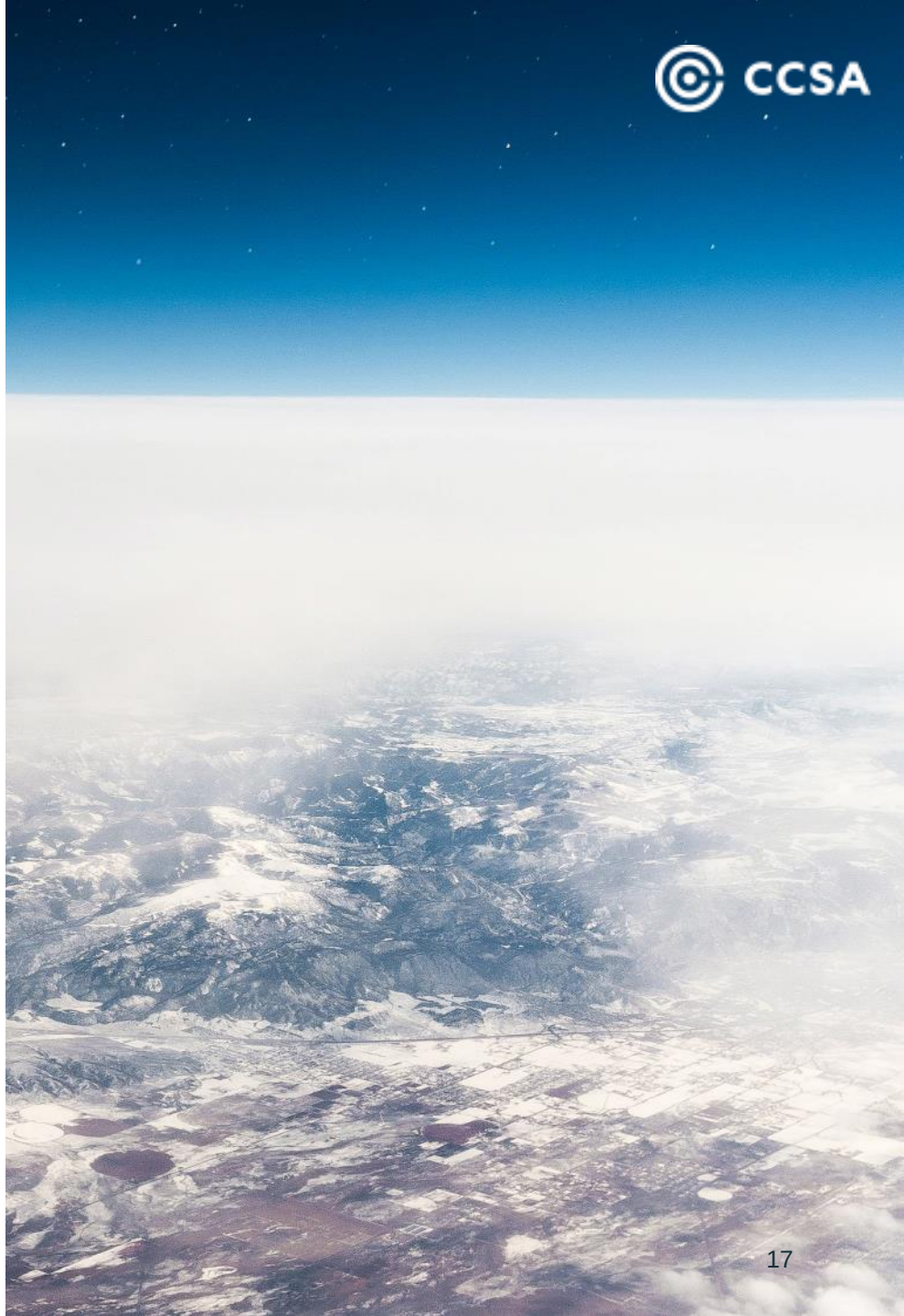
CCSA Secretariat



AOB & Conclusions

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

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



Delegated act on "permanent" CCU

Background

Revised ETS Directive:

- Recital 16 - **GHGs not directly released into the atmosphere are considered emissions** and ETS allowances should be surrendered for these emissions **unless** *"they are stored in a storage site in accordance with Directive 2009/31/EC **or they are permanently chemically bound in a product** so that they do not enter the atmosphere under normal use and do not enter the atmosphere under any normal activity taking place after the end of the life of the product."*

- Limited form of CCU equivalent to CCS in terms of reward (no surrender obligation)

Delegated act on "permanent" CCU

Defining key concepts

a) Captured and utilized

- **Carbon capture** is a set of technological processes that are required to capture, separate and purify (if necessary) carbon from flue gases or other emission sources resulting from ETS activities
- **Carbon utilisation** refers to the processes, technologies and procedures, which use captured CO2 as a feedstock in a range of applications or products providing an added value

N.B. Article 12(3b) and the provisions on CCU apply for GHG emissions within the scope of the ETS Directive, in line with the definition of emissions in Article 3(b), that are then captured.

Delegated act on "permanent" CCU

Defining key concepts

b) Permanence

- Concerns the capacity of products to store the utilized carbon out of the atmosphere for periods of time relevant to the mitigation of climate change
- Suggested approach: storage of carbon for **at least several centuries**
  - Firm number would create threshold effects
  - Ensure consistency with Carbon Removal Certification Framework

Delegated act on "permanent" CCU

Defining key concepts

c) Chemically bound

- Chemical fixation comes as an additional condition and basis for assuming permanent isolation from atmosphere (thus excluding CO_2 merely physically absorbed in products, such as beverages)
- Should apply to the *carbon atom* in general rather than only CO_2-molecule
- As the efficiency of the utilization process usually less than 100% → the deduction from reported emissions based on the *amount of carbon chemically bound* in the product, rather than the amount captured

Delegated act on "permanent" CCU

Defining key concepts

d) Product

- Definition in CRC-F: *'product' means goods or other such materials, including intermediates and derivatives thereof, that utilise by chemical bounding carbon and/or carbon dioxide derived from the capture of emission sources regulated under this Directive.*
- Issue: Individual products, especially when considering derivatives, may have a wide range of normal uses and disposal pathways.

Delegated act on "permanent" CCU

Defining key concepts

e) Normal use

- Describes the expected use of product by the end user (until it enters *end-of-life* stage)
- Important element in determining permanence of carbon storage in products
- The intended use of some products may imply that carbon (although chemically bound) is not stored for significant periods of time (e.g., e-fuels or urea)

Delegated act on "permanent" CCU

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Delegated act on "permanent" CCU

Defining key concepts

f) End-of-life

- It begins when a product is discarded by the user and it ends when the material is returned to nature as waste
- For most products it represents the essential stage for determining whether the requirements of Article 12(3b) are met. Many CCU-products are likely to release their embedded carbon at the end of life, e.g., through combustion in the process of waste incineration.
- "Normal" end-of-life activity to be determined taking also into account the EU waste management policies and objectives

It is important to note that the requirements set out in points a)-f) are cumulative.