CCS in a crossborder European context

NEKST implementation forum for CCS

March 13th, 2025

Danish Ministry of Climate, Energy and Utilities

Agenda

09.30	**Welcome by Anders Hoffmann**
09.40	Introduction to the German CCS Alliance by Tobias Gerlach, Senior Advisor, Carbon Management Alliance Germany + Q&A
10.00	The CCS value chain in an ETS perspective – reductions and removals, by Lukas Matz Jensen, Advisor, Danish Energy Agency
10.15	Updates from the European Commission by Alexandre Paquot, Director, Innovation for a Low Carbon, Resilient Economy, DG CLIMA
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11.00	Round off

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Carbon Managament Allianz

The industry alliance to promote carbon management in Germany

CONTEXT: WHY A CARBON MANAGEMENT ALLIANCE?

Lack of a clear legal framework

- Federal Climate Protection Act (KSG) aims for net zero emissions by 2045, but until now, there is no clear regulatory framework enabling the use of CCS
- Traffic light coalition opened way for use of CCS by developing a Carbon Manage-ment Strategy which needs to be further developed under new government
- Bill to amend the Carbon Dioxide Storage Act (KSpTG), allowing for the use of CCS, still pending, due to be adopted by parliament after Feb 25 elections
- Funding instruments for carbon management technologies still to be defined

Controversial political debate

- Controversial political debate in Germany with the SPD and Greens only supporting a limited use of CCS for hard to abate emissions, e.g. in the cement and lime industry, basic chemicals and waste incineration.
- Controversial discussion as to whether CCS should also be used for gas-fired power plants (for which green hydrogen is not available in the foreseeable future)
- First indications show that new government (CDU/SPD) will focus the use of CCS on hard-to-abate sectors

A big opportunity for industry

- Creation of a new industrial sector that can be successfully organized only on a cross-sector basis
- Opportunity for participation and co-design, be it for new legal regulations or for the implementation and optimization of the CM strategy, which explicitly provides for industry participation
- Low level of information on CCS among policymakers and society requires industry to act as a source of expertise
- Need to develop the framework conditions in a cross-cluster design

OBJECTIVES OF THE ALLIANCE

Mission

- Help create a clear and transparent regulatory framework to provide for planning and investment security
- Promote the dialogue between policymakers, society, academia and NGOs to find joint solutions
- Enhance the awareness and acceptance for the role of carbon management technologies for Germany as a high-tech nation

Short-term goals (2025)

- Definition of a clear regulatory framework: Implementation of the Carbon Storage and Transport Act (KSpTG), and ratification of London Protocol Amendment 6.
- Integration of negative emissions into the EU ETS.
- Infrastructure expansion: planning and promotion of a CO_2 corridor for greater scalability.
- Focus on hard-to-abate sectors: support energy-intensive industries to enable initial investments in carbon management.
- Involvement of partners (e.g. Austria and Denmark)

Medium-term goals (until 2030)

- Ensure economic viability: Establish a viable business model for carbon management.
- Regulatory development: Harmonization of monitoring for biogenic CO_2, linking with the EU Industrial Carbon Management Strategy.
- Flexibility in sector demarcation: creating opportunities to integrate additional industrial sectors.
- Ramp-up of a carbon market in the sense of establishing a circular economy

KEY MEMBERS: COVERING THE WHOLE CCS VALUE-CHAIN

OUTLOOK: PLANNED ACTIVITIES

Preparation and Foundation Q4 2024 *(completed)*

- Launch website with basic information
- Creation of key content, FAQs, graphics, one-pagers, press releases etc. regarding the concept and benefits of Carbon Management
- Development of a social media profile and continuous use, possibly several channels
- Formal foundation of the association

Initial activities and coordination Q4/Q1

- Campaign: ‘KSpTG now’ with member companies and other supporters (press conference, etc.)
- Workshop with founding members to anchor ‘core objectives’ in the roadmap
- Open dialogue with NGOs
- Approach political and social stakeholders
- Call for the KSpTG to be adopted immediately after the election, inclusion in the ‘100-day programme’

Establishing the alliance in 2025

- Positioning in the relevant Federal States (opt-in)
- Accompanying the formation of political positions in the democratic parliamentary groups in the Bundestag
- Co-operation with existing initiatives and associations
- Gaining support and high-level supporters
- Establishment as key contact and coordinator for Federal Ministries

CMA Carbon Management Allianz

Association represented by the chairwoman A. Decker and the Managing Director Georg Ehrmann
c/o vBColl Beratungs- GmbH & Co KG, Friedrichstr. 55 A, 10117 Berlin

Lobby register at the German Bundestag-register number: R007209

Questions?

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The CCS value chain in an ETS perspective

Reductions and removals

19. marts 2025

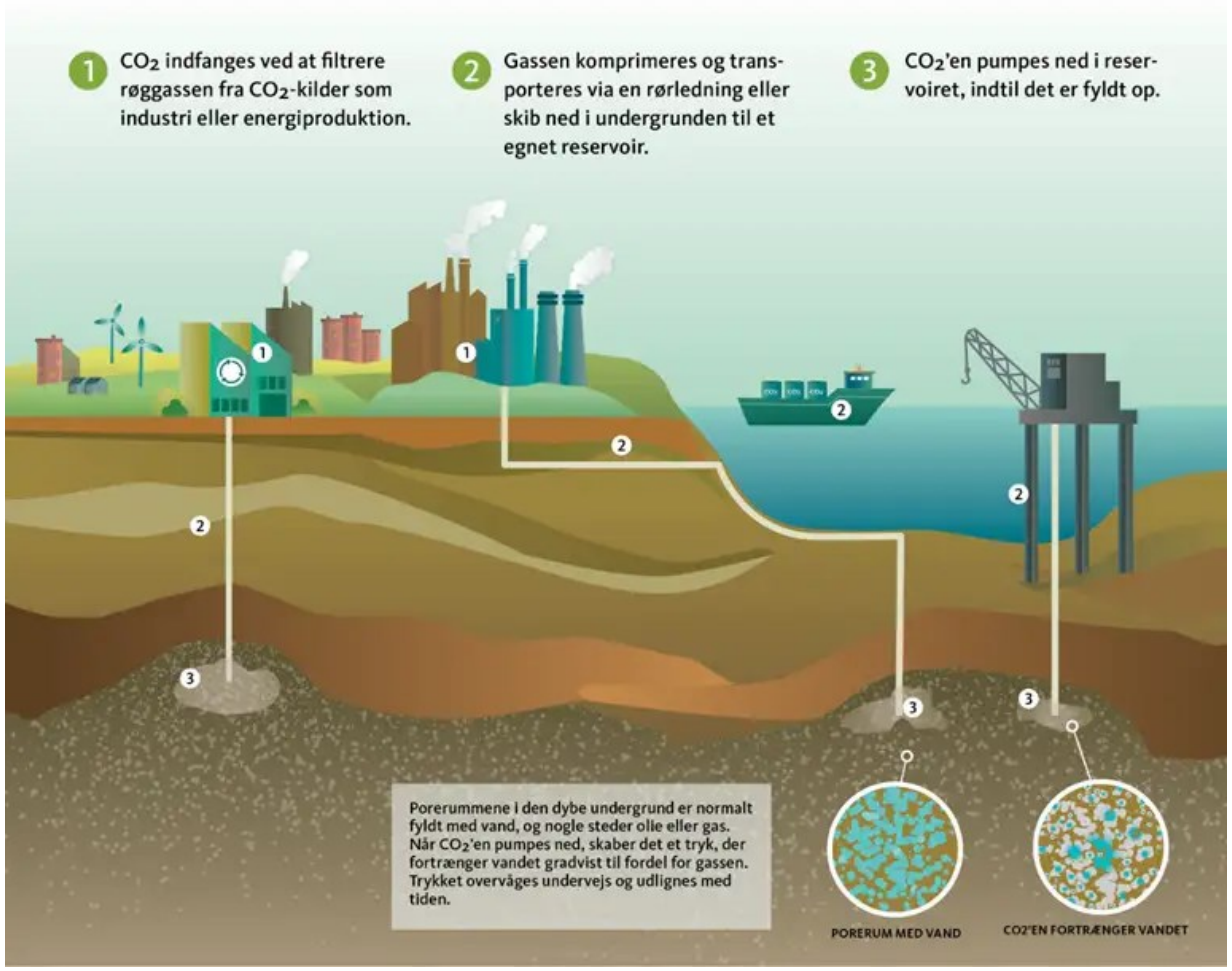
Danish Energy Agency

Carbon Capture & Storage

- **CCS:** Capture, transport & storage of CO_2
- **CCU:** Capture and reuse of CO_2 in specific products

<u>”Negative emissions”</u>

- **BECCS:** Capture and storage of CO_2 originating from sustainable sources (biomass/RFNBO’s etc.)
- **DACCS:** Direct air capture
- **Carbon farming:** biological storage (not part of the EU ETS)



CCS in the EU ETS

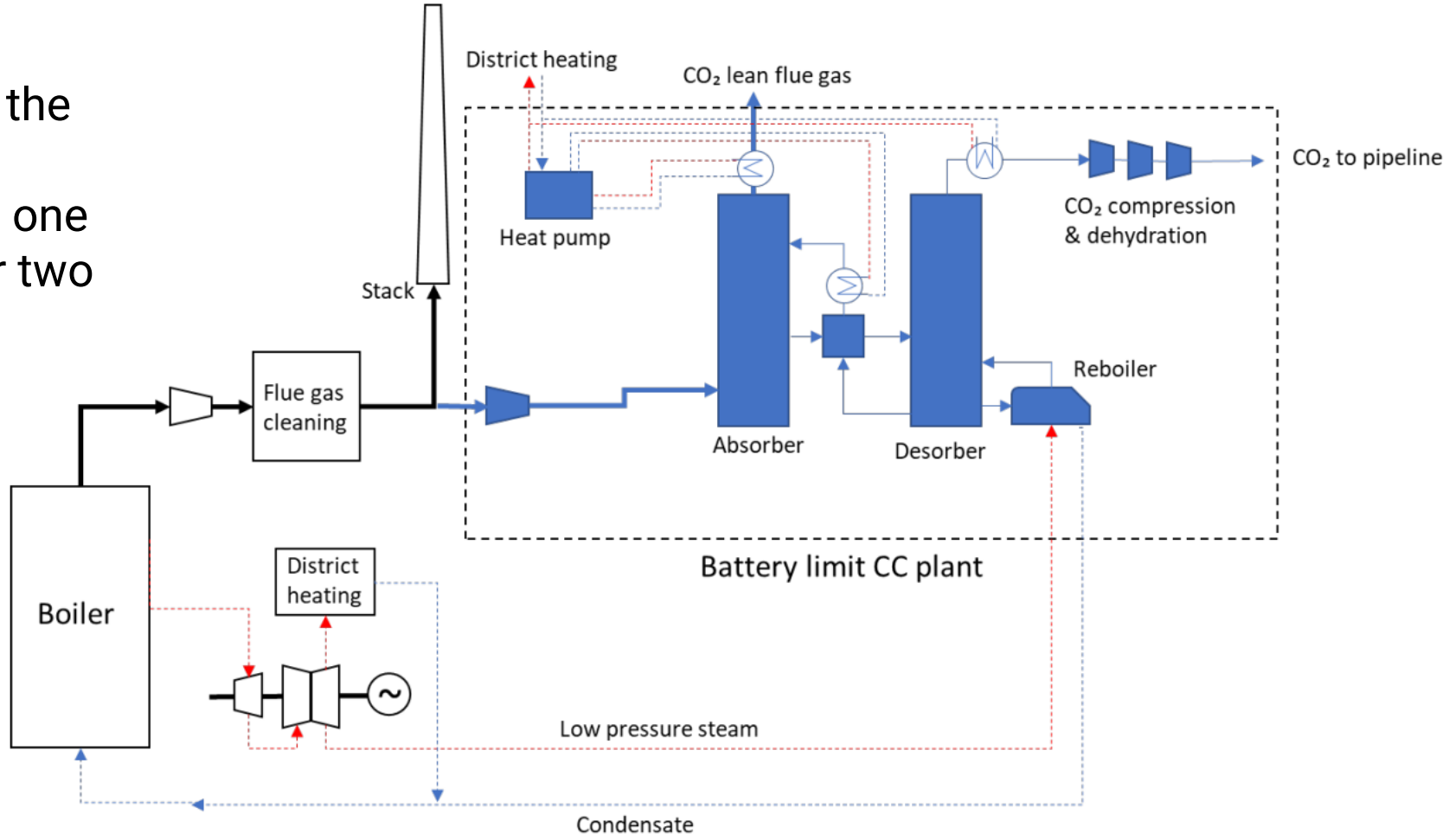
- **Transport og geological storage** of greenhouse gasses are ETS covered activities: annex I in the ETS directive

- **Capturing of** CO_2 is only covered by the ETS if the activity is carried out on installations already covered by the directive
- Operators of ETS installations must ensure compliance with the MR-regulation and monitor CO_2 source streams

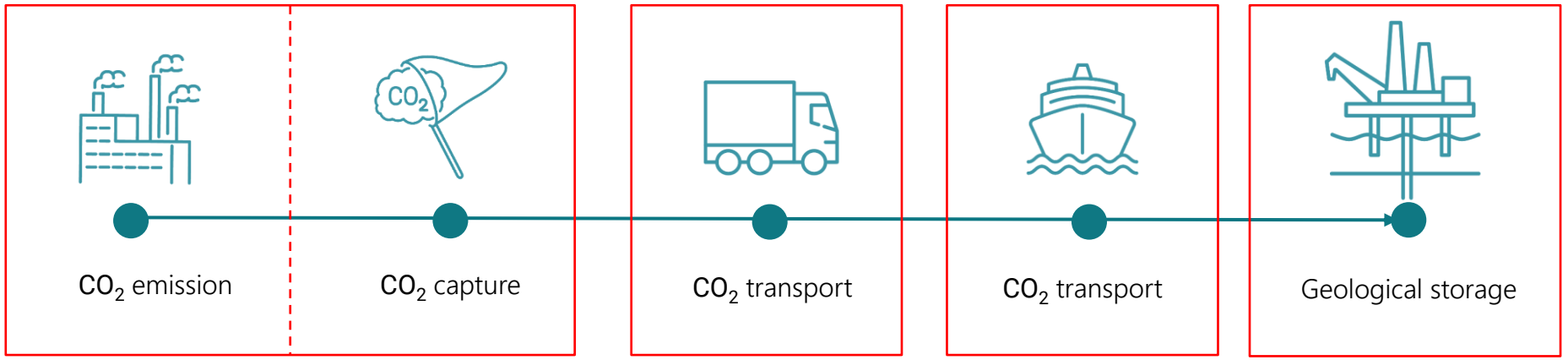
Activities	Greenhouse gases
Capture of greenhouse gases from installations covered by this Directive for the purpose of transport and geological storage in a storage site permitted under Directive 2009/31/EC	Carbon dioxide
Transport of greenhouse gases by pipelines for geological storage in a storage site permitted under Directive 2009/31/EC	Carbon dioxide
Geological storage of greenhouse gases in a storage site permitted under Directive 2009/31/EC	Carbon dioxide

Delimitation of carbon capturing plants

- The CO_2 capture facility and the CO_2-emitting facility can be considered in the EU ETS as one combined production unit or two separate units (stand-alone capture facilities).
- Delimitation depends on the distribution of ownership etc.



The CCS-chain



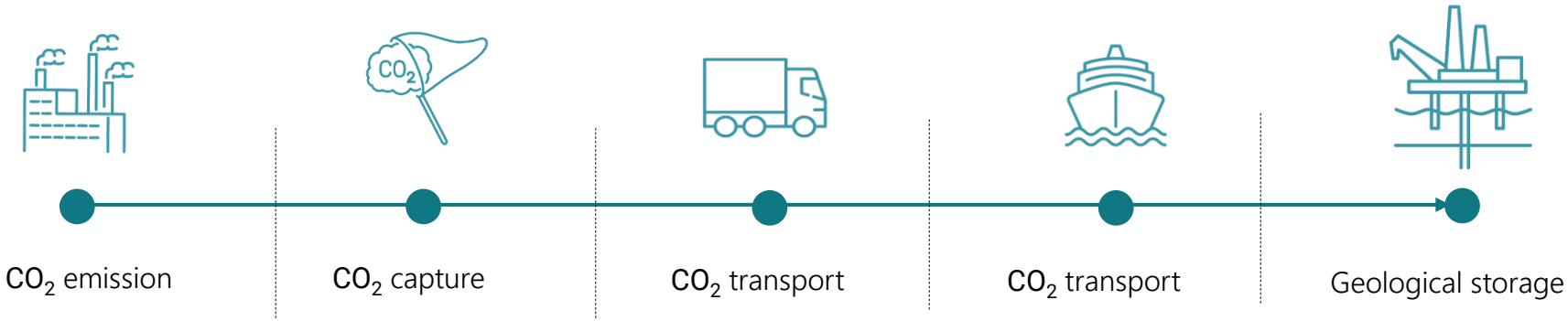
— Individual ETS installations with separate monitoring plans and emission permits

CO_2 accounting and responsibility allocation

- All “non-zero-rated” CO_2 emissions (fossil/unsustainable) results in an obligation to surrender CO_2 allowances

- There is no obligation to surrender allowances for captured CO_2 transported to storage
- Zero-rated (sustainable) CO_2 is already “free” to emit – no extra benefits from storing sustainable CO_2

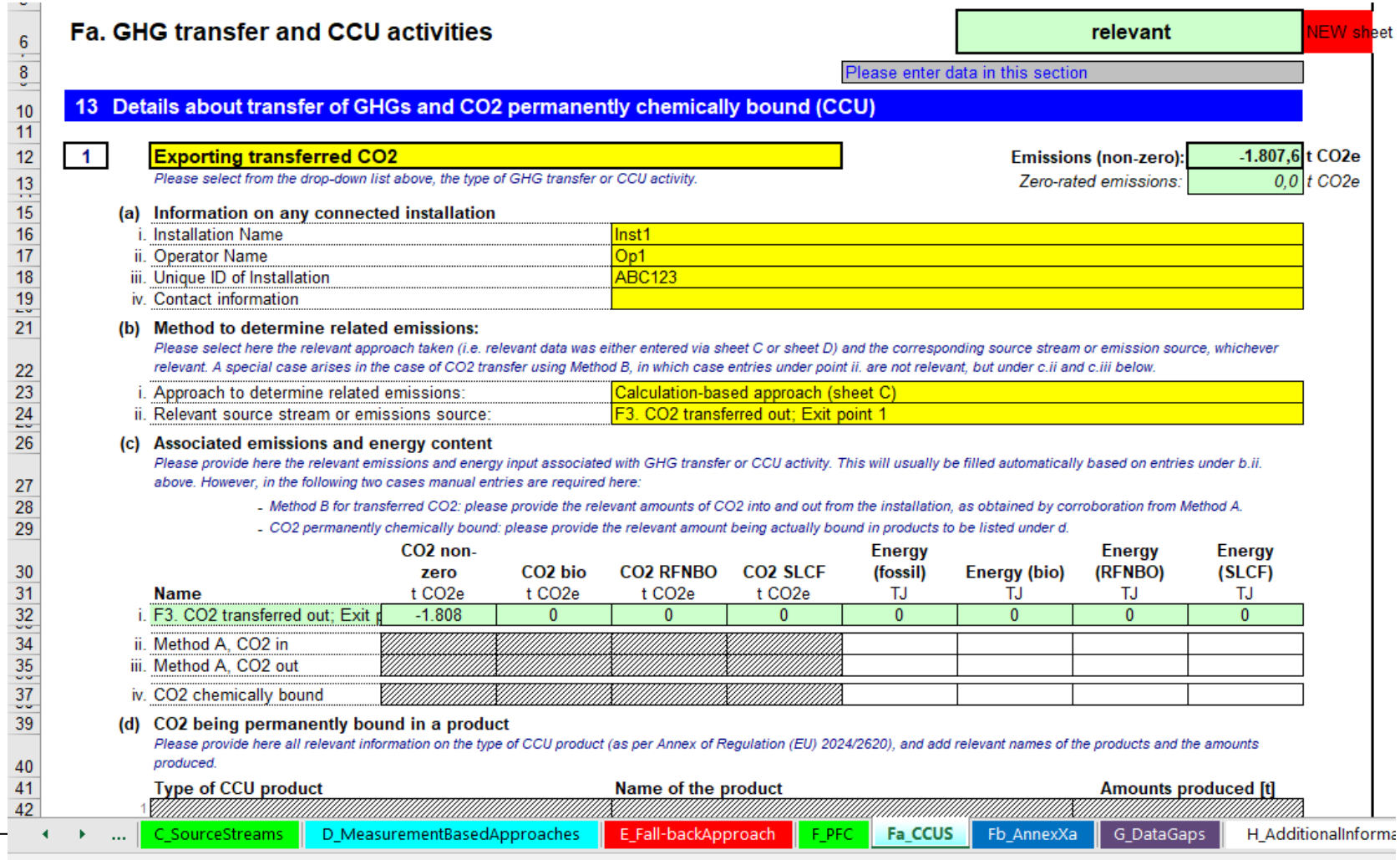
CO_2 accounting and responsibility allocation



- The delimitation of responsibility, including start and end points and the installations or CO_2 transport infrastructure to which they are connected, is determined in the greenhouse gas emission permit
- Each link in the CCS chain has a defined boundary --> no unmonitored "links" in the chain
- Leaks and seepage are detected by measurements at each "link" - the responsible operator pays CO_2 allowances for leaks, including for leaked sustainable CO_2
- The storage facility are obliged to monitor and report leakage during and after CO_2 storage.

CO_2 reporting

- CCS plants must complete an annual CO_2 emissions report and be verified by a 3rd party
- Includes data on amounts of CO_2 transferred, received and recipient plant ID
- Functions as a mass balance (CO_2 in/ CO_2 out)



Fa. GHG transfer and CCU activities

relevant | NEW sheet

Please enter data in this section

13 Details about transfer of GHGs and CO2 permanently chemically bound (CCU)

1 **Exporting transferred CO2**

Please select from the drop-down list above, the type of GHG transfer or CCU activity.

Emissions (non-zero): -1.807,6 t CO2e

Zero-rated emissions: *0,0* *t CO2e*

(a) Information on any connected installation

i. Installation Name	Inst1
ii. Operator Name	Op1
iii. Unique ID of Installation	ABC123
iv. Contact information	

(b) Method to determine related emissions:

Please select here the relevant approach taken (i.e. relevant data was either entered via sheet C or sheet D) and the corresponding source stream or emission source, whichever relevant. A special case arises in the case of CO2 transfer using Method B, in which case entries under point ii. are not relevant, but under c.ii and c.iii below.

i. Approach to determine related emissions:	Calculation-based approach (sheet C)
ii. Relevant source stream or emissions source:	F3. CO2 transferred out; Exit point 1

(c) Associated emissions and energy content

Please provide here the relevant emissions and energy input associated with GHG transfer or CCU activity. This will usually be filled automatically based on entries under b.ii. above. However, in the following two cases manual entries are required here:

- *Method B for transferred CO2: please provide the relevant amounts of CO2 into and out from the installation, as obtained by corroboration from Method A.*
- *CO2 permanently chemically bound: please provide the relevant amount being actually bound in products to be listed under d.*

Name	CO2 non-zero t CO2e	CO2 bio t CO2e	CO2 RFNBO t CO2e	CO2 SLCF t CO2e	Energy (fossil) TJ	Energy (bio) TJ	Energy (RFNBO) TJ	Energy (SLCF) TJ
i. F3. CO2 transferred out; Exit p	-1.808	0	0	0	0	0	0	0
ii. Method A, CO2 in								
iii. Method A, CO2 out								
iv. CO2 chemically bound								

(d) CO2 being permanently bound in a product

Please provide here all relevant information on the type of CCU product (as per Annex of Regulation (EU) 2024/2620), and add relevant names of the products and the amounts produced.

	Type of CCU product	Name of the product	Amounts produced [t]
1			

C_SourceStreams | D_MeasurementBasedApproaches | E_Fall-backApproach | F_PFC | Fa_CCUS | Fb_AnnexXa | G_DataGaps | H_AdditionalInforma

Storage in products (CCU)

- CCU is monitored and reported in the same manner as CCS activities
- CCU is only allowed within the EU ETS if the emissions are stored in approved products
- Requirement that CO_2 remains chemically bound in a product so that it is not released into the atmosphere during normal use of the product or after disposal
- Approved products and criteria are stated in the CCU regulation (2024/2620): https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32024R2620

ANNEX

PRODUCTS CONSIDERED TO PERMANENTLY CHEMICALLY BIND CO_2

Mineral carbonates used in the following construction products:

(a) carbonated aggregates used unbound or bound in mineral based construction products;

(b) carbonated constituents of cement, lime, or other hydraulic binders used in construction products;

(c) carbonated concrete, including precast blocks, pavers or aerated concrete;

(d) carbonated bricks,tiles, or other masonry units.

Known issues

CCS and mixed CO_2-streams

- Captured CO_2 from mixed fuels cannot be split up in after capture
- 50/50 distribution of a sustainable and fossil CO_2 stream, will remain a 50/50 distribution throughout the entire CCS chain
- It is not possible to assume a mass balance distribution of CO_2 streams: "we only store the fossil share of CO2 and resell the sustainable CO_2 to the other side"
- Leaks of sustainable CO_2 are treated as fossil CO2
- Streamlining across member states when sharing responsibility for CCS in cross-border transport
- Can complicate the CCS business case for some companies

Negative emissions

Capture, transport and storage of sustainable CO_2 are activities covered by the EU ETS

Capture of CO_2 directly from the atmosphere – only the transport to storage is covered by the EU ETS

Land use planning to optimize CO_2 absorption in crops and vegetation
- Not covered by the EU ETS

Negative emissions in the EU ETS

Can negative emissions be includeded in the EU ETS?

- The EU ETS is a cap & trade scheme that sets a ceiling on positive fossil emissions with the ultimate goal of reducing (limiting) the number of emissions (allowances).
- Negative emissions, on the other hand, are certified as climate credits, and these are not intended to be limited as a general rule.
- It is not possible to introduce climate credits directly into a cap & trade system without compromising the ETS “cap” system

- ETS Directive: by 31 July 2026, the EU Kommission must submit a report, possibly with legislative proposals and impact assessment, to the EU Parliament and the Council on how to take into account the integration of negative emissions into the EU ETS

Questions

Danish Energy Agency

Contact information:

CO2-Kvoteservice@ens.dk

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Thank you!

Contact information in the Ministry:

Jasmin Sharzad (jasha@kefm.dk, +45 21 31 84 51)
Emil Bundgaard Ipsen (emips@kef.dk, +45 23 99 39 56)
Erika Dalsgaard Brunner (erdbr@kefm.dk, +45 21 43 33 99)

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