CCS in EU ETS

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European Union Emissions Trading Scheme
Some basics

Installations covered need a
Permit to emit carbon dioxide (or other GHG covered)

Permit:
- Monitoring requirements specifying
  - Monitoring methodology
  - Monitoring frequency
- Reporting requirements
- Obligation to surrender allowances equal to the total emissions

Issuance of allowances
Party's (a country) holding account
allowance to emit one (1) tonne of CO2
Retirement account

Possible to trade with. Anyone can trade!
However; The allowance does not include a permit to emit GHG gases, only an allowance to emit.
If covered by the trading directive installations must cover emissions with allowances.
If an installation is covered by the directive it also needs a permit!

Not possible to buy, sell or transfer in any way without getting a national authority involved!!
A non-flexible limit for the emissions (28 ton) from the collective!
Could be explained as individual conditions on emissions where each allowance symbolizes the allowance to emit one ton GHG.

If covered by the EU ETS the installation must:
- Monitor emissions
- Report emissions
- Surrender allowances

If you fail to

You must not participate in the trading (you may not sell!)

This part of the system: Command and control!
A non-flexible limit for the emissions from the collective!

Within in this limit; flexibility!
The possibility to trade obligations!
The EU ETS - 2005-2012

- Based on NAP:s.
- Only carbon dioxide
  - Exceptions: Netherlands and Austria opted to include nitrous oxide (N2O) emissions from some specific installations.
- 2012: Aviation into the EU ETS
The EU ETS - 2005-2012

• Based on NAP:s.
• Only carbon dioxide
• 2012: Aviation into the EU ETS

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The EU ETS post 2012

- Extended with some new gases and sectors.
- Eight years instead of five years.
<table>
<thead>
<tr>
<th>Activities (capacity limits apply)</th>
<th>Greenhouse gases</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Combustion of fuels in installations</td>
<td>Carbon dioxide</td>
</tr>
<tr>
<td>• Refining of mineral oil</td>
<td>Carbon dioxide</td>
</tr>
<tr>
<td>• Production of coke</td>
<td>Carbon dioxide</td>
</tr>
<tr>
<td>• Metal ore (including sulphide ore) roasting or sintering, including pelletisation</td>
<td>Carbon dioxide</td>
</tr>
<tr>
<td>• Production of pig iron or steel (primary or secondary fusion) including continuous casting.</td>
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</tr>
<tr>
<td>• Production of primary aluminium</td>
<td>Carbon dioxide and perfluorocarbons</td>
</tr>
<tr>
<td>• Production of secondary aluminium</td>
<td>Carbon dioxide</td>
</tr>
<tr>
<td>• Production or processing of non-ferrous metals, including production of alloys, refining, foundry casting, etc.</td>
<td>Carbon dioxide</td>
</tr>
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<td>Greenhouse gases</td>
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<td>--------------------------------------------------------</td>
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<tr>
<td>• Production of cement clinker.</td>
<td>Carbon dioxide</td>
</tr>
<tr>
<td>• Production of lime or calcination of dolomite or magnesite.</td>
<td>Carbon dioxide</td>
</tr>
<tr>
<td>• Manufacture of glass including glass fibre.</td>
<td>Carbon dioxide</td>
</tr>
<tr>
<td>• Manufacture of ceramic products by firing, in particular roofing tiles, bricks, refractory bricks, tiles, stoneware or porcelain.</td>
<td>Carbon dioxide</td>
</tr>
<tr>
<td>• Manufacture of mineral wool insulation material using glass, rock or slag.</td>
<td>Carbon dioxide</td>
</tr>
<tr>
<td>• Drying or calcination of gypsum or production of plaster boards and other gypsum products.</td>
<td>Carbon dioxide</td>
</tr>
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<tr>
<td>Production of pulp from timber or other fibrous materials.</td>
<td>Carbon dioxide</td>
</tr>
<tr>
<td>Production of paper or cardboard.</td>
<td>Carbon dioxide</td>
</tr>
<tr>
<td>Production of carbon black involving the carbonisation of organic substances such as oils, tars, cracker and distillation residues</td>
<td>Carbon dioxide</td>
</tr>
<tr>
<td>Production of nitric acid</td>
<td>Carbon dioxide and nitrous oxide</td>
</tr>
<tr>
<td>Production of adipic acid</td>
<td>Carbon dioxide and nitrous oxide</td>
</tr>
<tr>
<td>Production of glyoxal and glyoxylic acid.</td>
<td>Carbon dioxide and nitrous oxide</td>
</tr>
<tr>
<td>Production of ammonia.</td>
<td>Carbon dioxide</td>
</tr>
<tr>
<td>Production of bulk organic chemicals by cracking, reforming, partial or full oxidation or by similar processes.</td>
<td>Carbon dioxide</td>
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<tr>
<td>• Production of hydrogen ($H_2$) and synthesis gas by reforming or partial oxidation.</td>
<td>Carbon dioxide</td>
</tr>
<tr>
<td>• Production of soda ash ($Na_2CO_3$) and sodium bicarbonate ($NaHCO_3$).</td>
<td>Carbon dioxide</td>
</tr>
<tr>
<td>• 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.</td>
<td>Carbon dioxide</td>
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<tr>
<td>• Transport of greenhouse gases by pipelines for geological storage in a storage site permitted under Directive 2009/31/EC.</td>
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<tr>
<td>• Geological storage of greenhouse gases in a storage site permitted under Directive 2009/31/EC</td>
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<td>• Aviation</td>
<td>Carbon dioxide</td>
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The EU ETS post 2012

Carbon dioxide emissions from new sectors:

- Installations producing bulk organic chemicals, hydrogen, ammonia and aluminium.
- Carbon Capture and Storage

New gases:

- Nitrous oxide emissions from the production of nitric, adipic and glyocalic acid production
- Perfluorocarbons from the aluminium sector.

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EU ETS and CCS

The Trading Directive applies to:

– Capture of greenhouse gases from installations covered by this Directive for storage in a storage site permitted under the CCS- Directive (2009/31/EC).
EU ETS and CCS

The Trading Directive applies to:


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EU ETS and CCS

The Trading Directive applies to:

- Capture of greenhouse gases from installations covered by this Directive.
- Transport of greenhouse gases by pipelines for geological storage in a storage site permitted under the CCS- Directive.
EU ETS and CCS

The Trading Directive applies to:

- Capture of greenhouse gases from installations covered by this Directive.
- Transport of greenhouse gases by pipelines.
- Geological storage of greenhouse gases in a storage site permitted under the CCS- Directive.
Storage site permitted under the CCS- Directive

• The Directive applies to:
  – the **geological storage** of carbon dioxide
  – within the **territories** of the Member States,
  – within their **exclusive economic zones**, and
  – on their **continental shelves**.

Storage of CO2 in the water column shall not be permitted.
Storage site permitted under the CCS- Directive

• The Directive applies to:
  – the geological storage of carbon dioxide
  – within the Territories of the Member States,
  – within their Exclusive economic zones, and
  – on their Continental shelves.

UNCLOS:

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EU ETS and CCS

The Trading Directive applies to:

– Capture of greenhouse gases from installations covered by this Directive.
– Transport of greenhouse gases by pipelines.
– Geological storage of greenhouse gases.
Installation covered by EU ETS
Must surrender allowances equal to its CO2 emissions.

.. If not the emissions are verified as captured and transported for permanent storage.

Installation gets the value of allowances not needed to surrender:
If free allocation – money from allowances sold.
If auction – don’t have to buy!
Being covered by the trading directive means e.g. that:
1. The installation needs a **permit to emit** $CO_2$.
2. The directives **regulations on monitoring and reporting and accreditation** are applicable.
3. If carbon dioxide is emitted, the operator must **surrender allowances** equal to the $CO_2$ emissions.
Installation covered by EU ETS
Must surrender allowances equal to its CO2 emissions.

If not the emissions are verified as captured and transported for permanent storage.

From installation covered by the Trading directive

The obligation to surrender allowances shall not arise if emissions are verified as captured and transported for permanent storage to a facility with a permit in accordance with the CCS-Directive.

The obligation does not arise since the CO2 doesn’t reach the atmosphere!

Which means that the emissions must not reach the atmosphere and if they do they must be covered!
This is why all the steps are covered by the EU ETS. If carbon dioxide is emitted somewhere along the system the obligation to surrender allowances will arise.
EU ETS and CCS

• **Principal allocation rule**: No free allocation to installations for the capture of, for transport in pipelines of or for storage of CO2.

• **Exception (“NER 300”)**: 300 million allowances from the new entrants' reserve available to stimulate the construction and operation of up to 12 commercial demonstration projects for CCS in the territory of the Union.

• Projects selected on the basis of objective and transparent criteria that include requirements for knowledge-sharing.
Transport by ship!? 

Not covered by the trading directive!
Thus probably not possible...

Installation covered by the trading directive

Capture covered by the trading directive

Transport by ship is NOT covered by the trading directive

Might leak here and not be covered!

If carbon dioxide is emitted, the operator must surrender allowances equal to the CO₂ emissions

If carbon dioxide is emitted, the operator must surrender allowances equal to the CO₂ emissions

If carbon dioxide is emitted, the operator **is not obliged to surrender allowances** equal to the CO₂ emissions

If emissions that should have been covered here

.. If not the emissions are verified as captured and transported for permanent storage.

... at least not if the installation wants to avoid the obligation to surrender allowances!
Member States may apply emission allowance trading in accordance with this Directive to activities and to greenhouse gases which are not listed in Annex I, taking into account all relevant criteria, in particular the effects on the internal market, potential distortions of competition, the environmental integrity of the Community scheme and the reliability of the planned monitoring and reporting system, provided that inclusion of such activities and greenhouse gases is approved by the Commission "opt in"
EU ETS - Monitoring and reporting

- The principles for monitoring and reporting are set out in the Trading Directive Annex IV.
- The Trading Directive article 14: the Commission shall adopt guidelines for the monitoring and reporting of greenhouse gas emissions under the ETS.
- Monitoring and Reporting Guidelines: “MRG”.
- Article 14: Requires Member States to ensure that operators report their emissions in accordance with these guidelines (those guidelines are legally binding!).

Applies to CCS covered by the directive!
Leakage at Storage Sites

Some issues:

– lack of experience with quantification of CO2 released from storage sites into air or water column.

– This uncertainty concerning quantification can be considerably higher than average uncertainty of CO2 monitoring in the existing EU ETS.

  • Which might potentially endanger the systems environmental integrity of the system.

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- If covered by the Trading Directive; no emissions without permit to emit!

- Permission requires: monitoring & reporting of emissions plus surrender of allowances equal to emissions.

- Capture of greenhouse gases from installations covered by the Trading Directive for storage covered by the CCS-Directive..., Transport of greenhouse gases by pipelines for storage covered by the CCS-directive... Geological storage of greenhouse gases in a storage site covered by the CCS-directive is covered by the Trading Directive.

- The installation covered by the EU ETS does not have to surrender allowances for emissions that are not emissions but captured!

- The allowances will be surrendered “along the road” if emissions occur since the capture, pipeline transport and storage is covered by the trading directive.

- Since ship transportation is not covered by the directive there is no obligation to surrender allowances – and so uncovered leakage might occur. Unlikely that transport by ship will free the original installation from the obligation to surrender allowances.
Thank you!

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