# Credit for carbon capture and storage/utilisation

## Overview and calculation

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# Carbon Capture and Storage (CCS)
# Carbon Capture and Use (CCU)

- Some projects in the energy intensive industries or renewable energy categories may include elements of carbon capture and storage or utilisation
- Credit for CCS (in accordance with the CCS Directive) may be given when:
  - $CO_2$ generated within the system boundary of a project is captured and will be transferred to a storage site
  - A project does not include carbon capture from a process but involves the development of CO2 transport infrastructure and/or $CO_2$ storage sites
- Under IF23 if applicants from different parts of a single $CO_2$ storage chain may apply and are no longer required to divide the $CO_2$ avoidance between themselves
  - E.g., three projects could apply to capture, transport and store a single $CO_2$ stream, and would be treated as independent projects


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# CCS/U sectors

- Projects that capture $CO_2$ within the system boundary and transfer it for storage
  - Sector and category determined by the principal product
  - The $CO_2$ stream that is subject to capture should be included as a project emission under processes (EII methodology) or the $Proj_{bio/geo}$ term (RE methodology) (biogenic $CO_2$ would be zero rated)
- Projects that transport or store $CO_2$ that is captured outside the system boundary
  - Sector 'other', product '$CO_2$ transport' / '$CO_2$ storage'
  - The amount of $CO_2$ entering the system boundary should be included as a project emission under processes (it is not relevant whether the original source was biogenic)

- EII projects that capture $CO_2$ within the system boundary and transfer it for utilisation
  - Sector determined by the principal product
  - The $CO_2$ stream that is subject to capture should be included as a project emission under processes (EII methodology) (biogenic $CO_2$ would be zero rated)
  - The CO2 utilisation may be by a third party (i.e. outside the system boundary)
  - The CO2 utilisation must be additional (e.g. it cannot be for an existing $CO_2$-utilising facility)
- EII projects that utilise captured $CO_2$
  - Sector determined by the principal product
  - The $CO_2$ may be utilised in producing principal and/or non-principal products

- **A CCS/U credit should be calculated following the rules in Chapter 3 of the GHG methodology**

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# Calculating a carbon capture credit ($CC_{credit}$)

$$CC_{credit,y} = CC_{storage,y} + CC_{use,y} - (CC_{capture,y} + CC_{pipeline,y} + CC_{transport,y} + CC_{injection,y} + CC_{EHR,y})$$

- $CC_{storage,y}$: $CO_2$ permanently stored
- $CC_{use,y}$: $CO_2$ incorporated into products
- $CC_{capture,y}$: emissions from the $CO_2$ capture activities
- $CC_{pipeline,y}$: emissions from transport of $CO_2$ by pipelines
- $CC_{transport,y}$: $= Proj_{transport,road,y} + Proj_{transport,rail,y} + Proj_{transport,maritime,y}$
- $CC_{injection,y}$: emissions from injection at the geological storage site
- $CC_{EHR,y}$: emissions when storage is associated with EHR

- Note: the $CC_{storage,y}$ and $CC_{use,y}$ terms should already exclude $CO_2$ lost to leakage
- It is therefore not obligatory to explicitly characterise leakage at each step
- You should still justify your assumptions, including as they relate to leakage rates

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# $CC_{transport,y}$ calculation

| Parameter | = | Equation |
|---|---|---|
| $CC_{transport,y}$ | = | $CC_{transport,road,y} + CC_{transport,rail,y} + CC_{transport,maritime,y}$ |
| $CC_{transport,road,y}$ | = | $\sum_{L=1}^{I} (Kroad_{,L} * CO_{2road,L} * EFroad * 10-3)$ |
| $CC_{transport,rail,y}$ | = | $\sum_{L=1}^{I} (Krail_{,L} * CO_{2rail,L} * EFrail * 10-3)$ |
| $CC_{transport,maritime,y}$ | = | $\sum_{L=1}^{I} (Kmaritime_{,L} * CO_{2maritime,L} * EFmaritime * 10-3)$ |

# Reference emissions for DACCS and BECCS

- Where a project consists solely of the installation of a direct air capture facility or of a carbon capture unit at a biomass power facility, with the captured $CO_2$ sent for permanent storage, then the reference scenario emissions shall be set to zero
- For these cases, the relative emission saving cannot be calculated in the normal way, and therefore it shall be declared as 200%
- This makes DACCS and BECCS projects eligible to record bonus points for net carbon removal

# Net carbon removals

- Applicable if total project emissions are negative…
  - …excluding any credit for timed operation
  - …and where non-principal products are not the only source of negative emissions

$$\widehat{\Delta \mathrm{GHG}_{\mathrm{rel}}} = \frac{\Delta \mathrm{GHG}_{\mathrm{abs}} + \sum_{y=1}^{10}(\mathrm{TO}_y)}{\sum_{y=1}^{10}(\mathrm{Ref}_y)} (> 100\%)$$

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$$\Delta GHG_{abs} = \sum_{y=1}^{10} f \left( \text{Reference } (Ref_y) - \text{Project } (Proj_y) \right)$$

| Reference ($Ref_y$) | Project ($Proj_y$) |
| --- | --- |
| Inputs | Inputs |
| + | + |
| Processes (incl. carbon capture) | Processes (incl. carbon capture) |
| + | + |
| Combustion (principal products) | Combustion (principal products) |
| + | + |
| | Change to in-use (principal products) |
| | + |
| End of life (principal products) | End of life (principal products) |
| + | + |
| Non-principal products | Non-principal products |

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