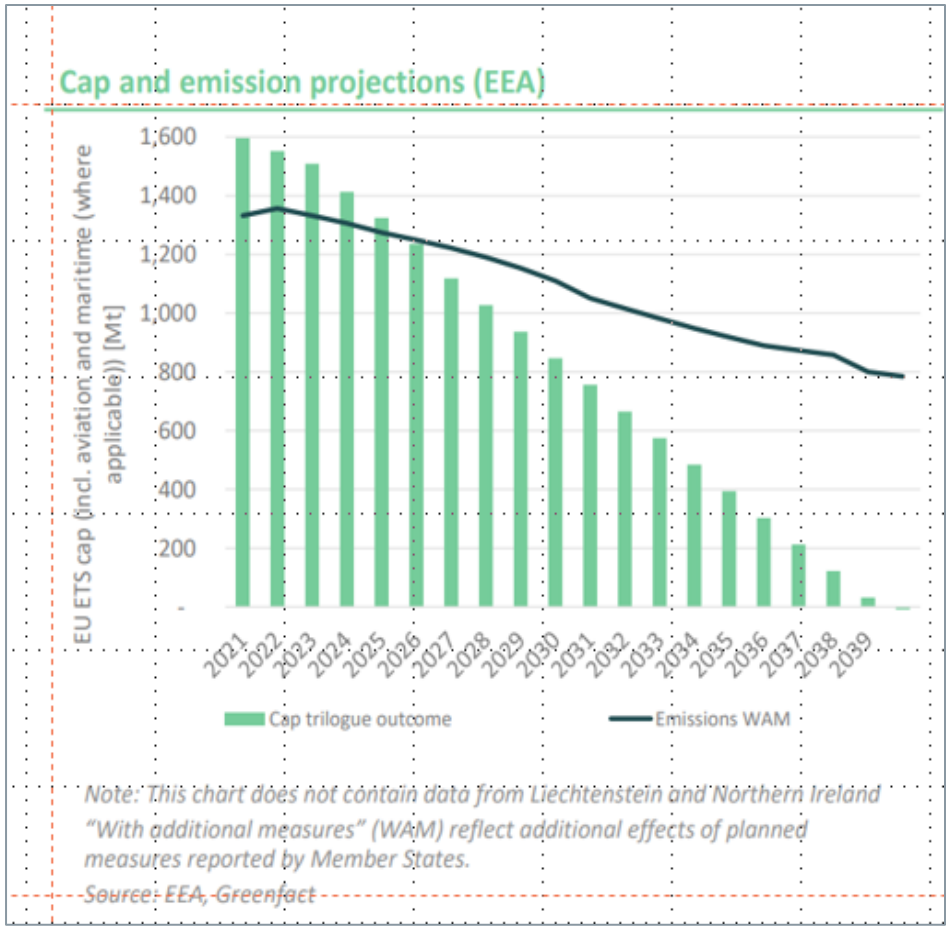
EU ETS CLOSE TO ZERO BY 2040 - the key challenge

A Competitiveness Concern



- **EU ETS compared with other ETS:**
  - Moving faster, steeper reduction curve, highest CO_2 price, no compliance flexibility: a competitiveness concern
  - Most European industries' have carbon footprint far below world's average, but face the highest carbon operational cost

- **Why allow removals (CDR) flexibility in the ETS?**
  - Likely high residual emissions in 2040 due to:
    - Slow new technology development/implementation, CCS residuals, and neither hydrogen, sustainable biofuel nor electrification are 100% cut options for all.
  - An option for each installation to reach net zero

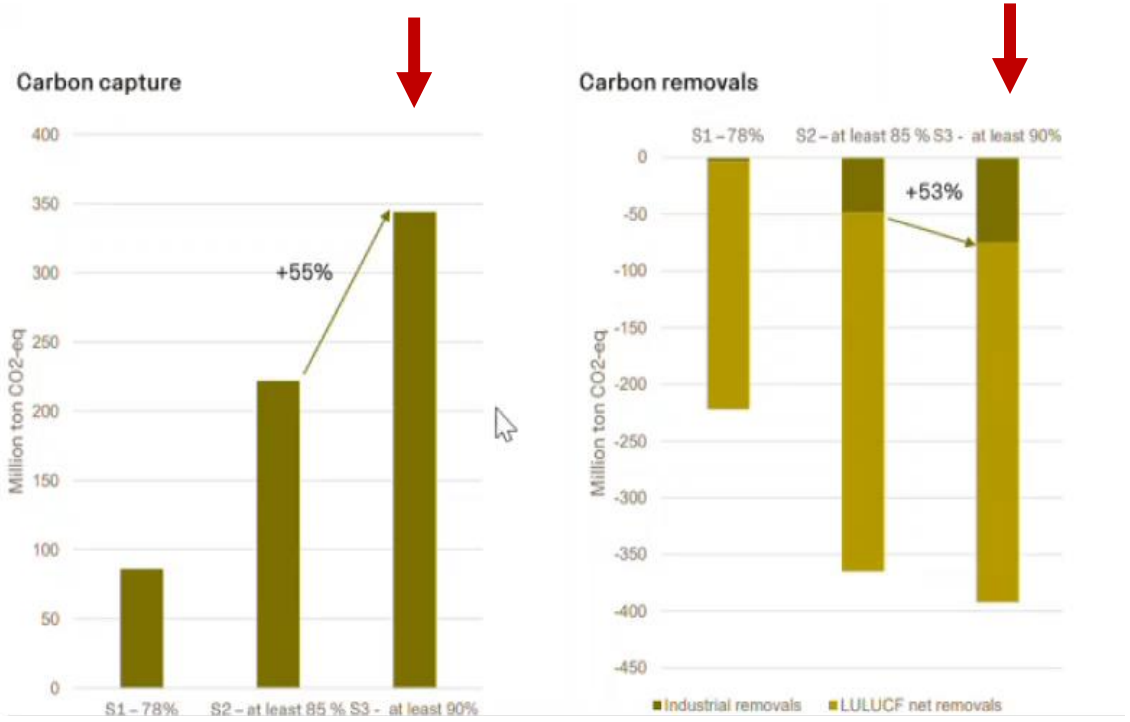
- Commission: "removals are **indispensable** for reaching the **2040 target".** Permanent **CDRs** are also **indispensable** for **industries** under **a new 2040 ETS** cap.

A total failure if Europe's climate policy leads to deindustrialization!

Source; EEA, Veyt (Greenfact), Norsk Hydro

2040 goal is highly dependent on CCS and CDRs

But they will not close the gap



- CCS and CDRs are vital for reaching 90% by 2040:
- CCS goal of 280 MT CO_2 by 2040
- 2026, Ørsted's Kalundborg Hub (DK) CCS > 430,000/year.
  - We need 651 similar projects to reach 280MT
- ~ 400 Mt worth of natural and engineered CO_2 removals
  - Technical removals to remove 75MT annually.
    - But permanent CDR costs are high and no market certainty
- 2040 strategy is totally dependent on a fully implemented Industrial Carbon Management Strategy
  - Far behind today - including funding
  - Delaying funding and regulation certainty for CDR use (in ETS), delays industries' actions and industrial technology scaling.

Source: Veyt, Norsk Hydro

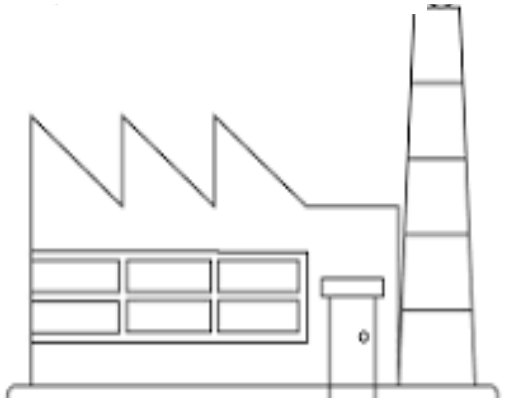
Industries' options for reaching net zero

Hydro

Need to rethink emissions "abatement" to reach net zero

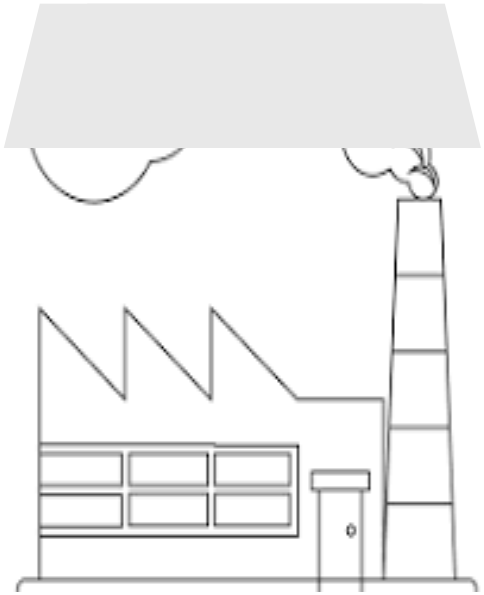
1. CO_2 Mitigation

No CO_2 emitted

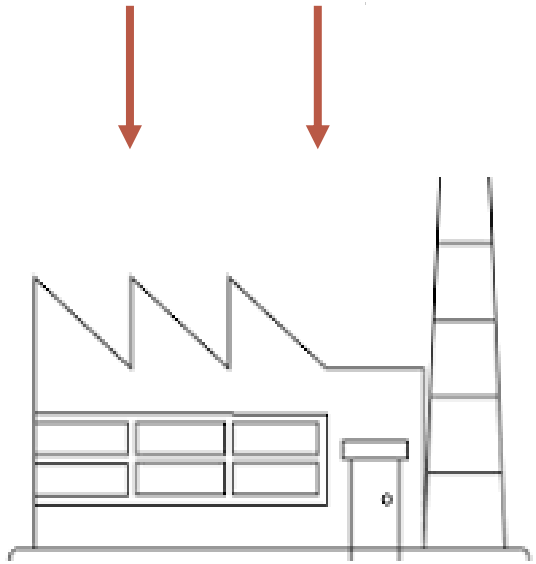


2. CO_2 Captured and storage

40-95% CO_2 off-gases captured and stored



3. Residual CO_2 removed and stored



Hydro considers CCS technology as a transitionary technology suited for retrofitting **existing plants** and thus faster CO_2 reductions, and CCS + permanent CDR solutions for reaching net zero

New ETS Regulation and Funding might lead the way to 2040

Today no ETS flexibility for industries

Time is running out.
Market certainty and funding required now.
Beneficial for both climate and industrial protection

Must allow CDRs, with some restrictions e.g.:

- First, permanent removals (BECCS and DACCS)
  - Safely and permanently stored.
    - Same infrastructure as CCS
- Secondly; long-term durability removals (35 years<) with ETS adjustments
- Permanent and temporary CDR distinction in ETS.
- Permanent CDRs equal to EUAs in ETS compliance
  - Neither a low-cost option nor the first option
- Initially generated and stored in EU + EEA.
- No quantitative limitations per installation
  - As abatement possibility varies from 0% to 100%
- New funding e.g. CCfD and auctions, while learning-by-doing and economies of scale
- Allow them when CRCF regulations are in place - late 2020ties
  - BECCS and DACCS MRV easier - comparable to CCS
  - Follow the CRCF QU.A.L.ITY criteria
- No subsequent ETS cap adjustment .
- Establish EU CDR registry now and a Carbon Central Bank in mid- 2030s.

We have to rethink ETS compliance with a bold 2040 ETS target

Reaching a green transition is an impossible industrial revolution without removals

Support demand by creating market certainty.
Reduce technology costs by scaling
Mitigate residual emissions

- Allow carbon removals for ETS flexibility in form of compliance

Removals are unlikely to reduce ETS price as technical removals represents a high cost and a low supply option

Hydro's views on different options going forward:

1. Integrating industrial carbon removals into the ETS
2. Creating a separate compliance mechanism for removals and connecting it "in one way or another" to the ETS
3. Having "no integration at all".

Hydro Support Option 1: If it is without any quantitative restriction and gradually making long-term durability credits eligible.

Hydro Support Option 2: As 1 and if it neither leads to a price increase nor further quantitative restrictions

Hydro Against Option 3