EU & Finnish policy developments regarding BECCS

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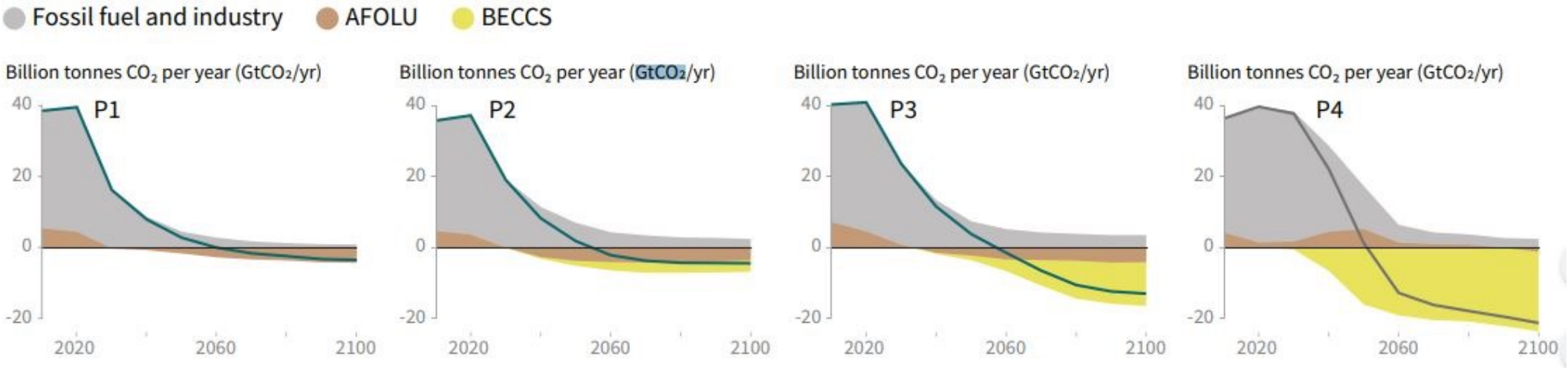
The Bioenergy Association of Finland

- Business association with 250 member organisations.
- We represents the entire bioenergy sector from land ownership to forest and energy companies, as well as technology and research in the field.
- Our goal: Finland is the best place in the world to create sustainable, bio-based & even carbon negative solutions!
- Carbon removal and CCUS – committee + biochar network facilitates development.

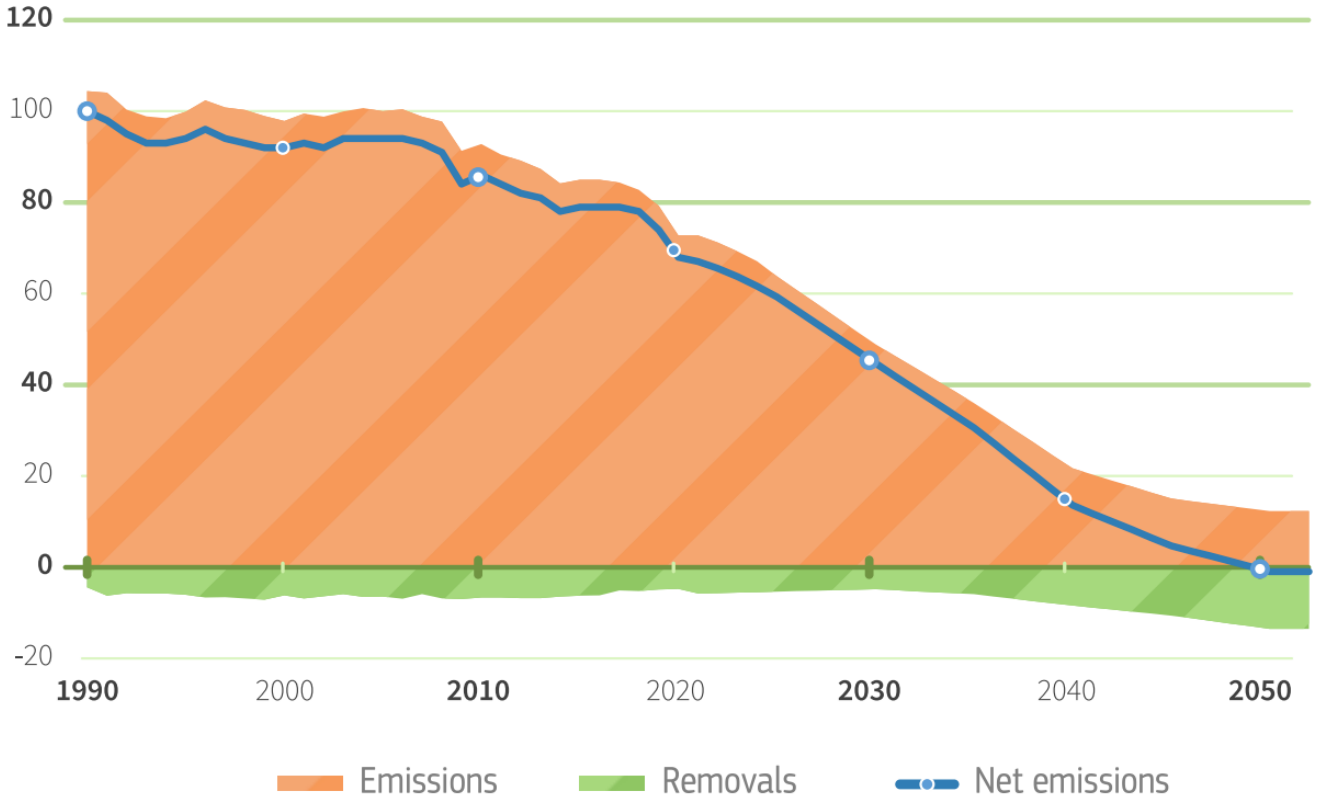
IPCC: All 1,5°C pathways require negative emissions

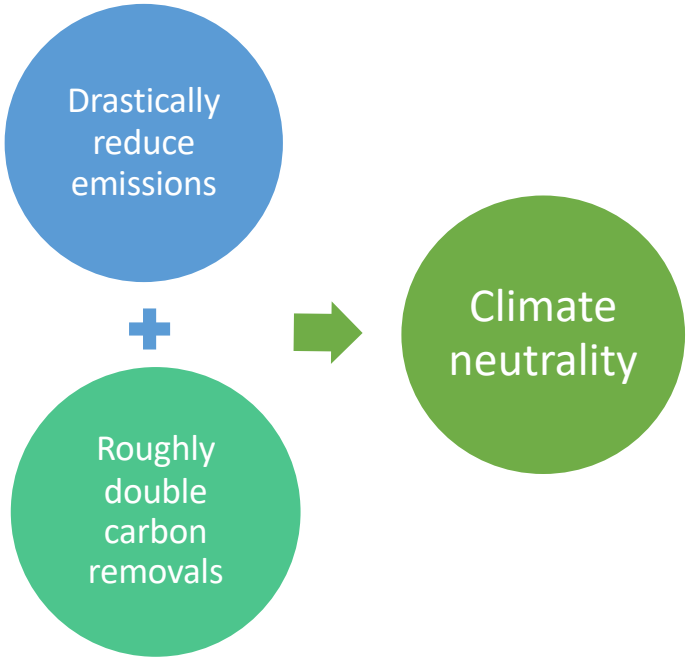


IPCC SR15

- The more we delay emissions reductions, the more we need to remove CO2 from the atmosphere.

Context in the EU





GHG projections for climate neutrality
1990 GHG emissions = 100
Source: EU 2030 Climate Target Plan

Background on EU Climate Policy

BioEnergy EUROPE

European Green Deal > EU Climate Law

- EU objective of **climate neutrality** by 2050 and net removal thereafter.

2040-target: All scenarios include rapidly scaling up CCUS-technologies!

Land Use, Land Use Change and Forestry (LULUCF) Regulation

- ambitious target for net carbon removals in soils, forests and wood products: **-310 MtCO2 by 2030**

Communication on Sustainable Carbon Cycles – December 2021

- roadmap to enable carbon removals:
- **carbon farming** should contribute to 2030 target for LULUCF
- **industrial solutions** should remove at least -5 MtCO2 in 2030

Carbon Removal Certification Framework (CRCF) – November 2022

Net-Zero Industry Act (NZIA) – March 2023

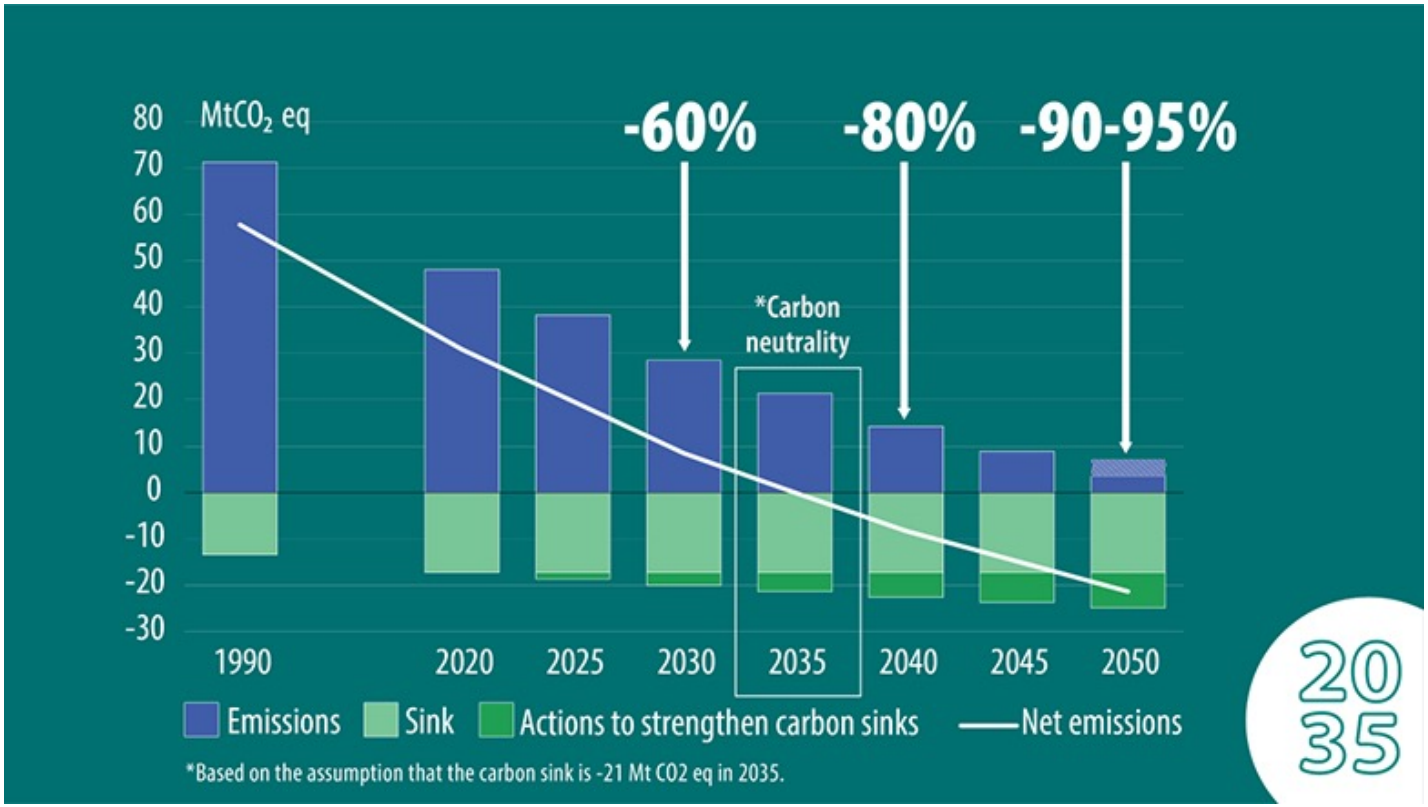
Net-Zero Industrial Carbon Management Strategy (February 2024)

The way forward

- Undertake an assessment of the need for negative emissions per economic sector and per country.
- Set ambitious targets for technological removals based on their assessment.
- Provide stronger policy support and market incentives for the development and deployment of BECCS technologies.
- Further support demonstration projects that showcase the viability and effectiveness of BECCS.
- Define and distinguish land-based removals and technology-based permanent removals to properly acknowledge the difference in permanence of different removal types and ensure the development of the technological removals sector.
- Foster collaboration between governments, industry players, research institutions, and civil society organizations.

Finland's key climate policy targets

- Climate neutrality by 2035 (The Climate Act). Specific emissions reduction targets for 2030, 2040 and 2050.
- Assumption that LULUCF sector remains a carbon sink of 21 Mt → uncertainties regarding the future development & achieving the target!
- Currently no targets for technological sinks.



Source: Finnish Ministry of the Environment

National policy & CCUS developments

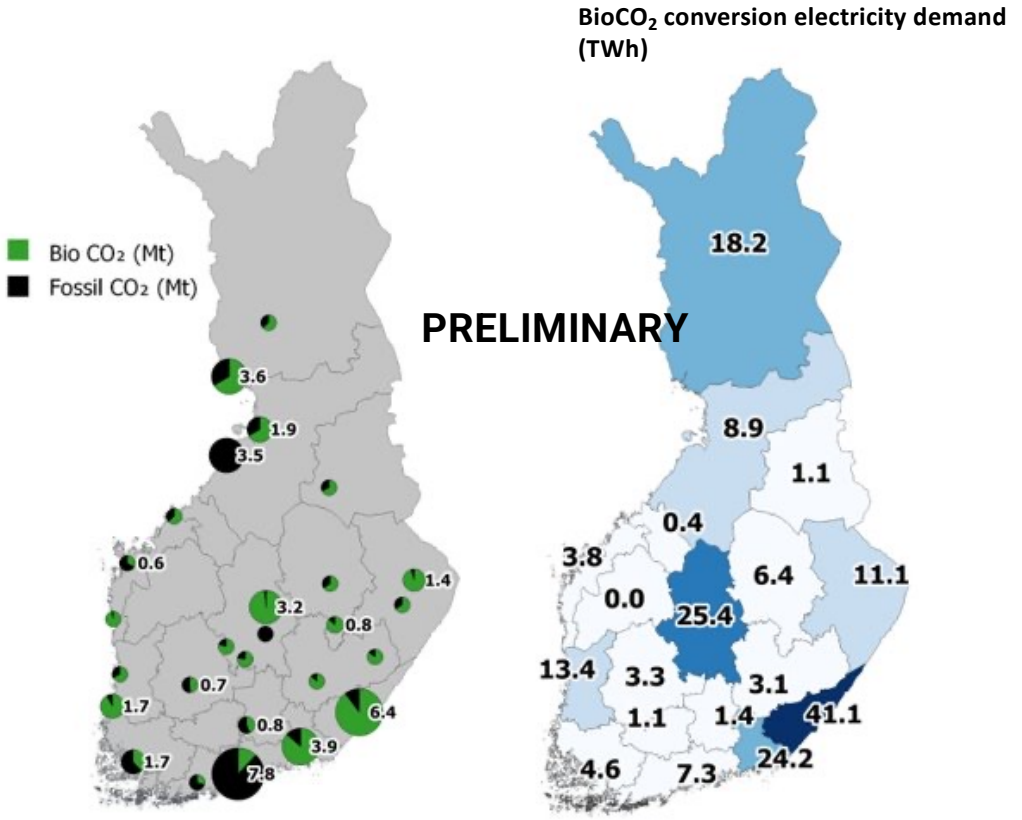
- The Finnish Climate Change Panel:
  - Government should create a strategy for negative emissions and set separate targets for them.
  - 5-6 Mt of negative emissions needed in order to reach the 2035 target.
- The Government adopted a resolution on hydrogen in February 2023. Finland aims to become the European leader in the hydrogen economy in the entire value chain. Finland has the capacity to produce at least 10 % of the EU's clean hydrogen in 2030.
  - The Sustainable Growth Programme for Finland allocated EUR 150 million to hydrogen and carbon capture and utilisation projects (RRF funding).
- Priority treatment of projects that promote investments in the green transition in permit procedures (Environmental Protection Act/Water Act) 2023-2026, includes CCUS. Urgent status also in the administrative courts.

”Finland to lead the way in carbon capture”

- New strategic opening in the Government’s programme: CCUS solutions as one of the key priorities in the Finnish climate policy. Highlights the role of BioCCUS.
- The Government will set a target for the use of technological sinks to a significant extent already during the 2020s.
- BioCCU combined with increased hydrogen production will create a platform for producing fuels, chemicals and materials from a sustainable carbon source and will reduce dependence on fossil raw materials.
- The programme emphasises aim to develop incentive scheme during the mandate: “The Government will explore and introduce policy instruments to ensure **that carbon dioxide emissions to atmosphere from large industrial sources are eliminated by the mid-2030s**. The Government is preparing to introduce sufficient incentives to advance investments. After conducting a study on the matter, the Government will introduce **a reverse auction of negative emissions** or a similar mechanism to encourage the capture of carbon dioxide.”
  - Government states that carbon removal market should be used to fund the mechanism, where applicable.
  - “The functioning of voluntary carbon reduction and carbon sequestration market will be enabled in a way that is encouraging and transparent. “
- 140 M€ for Clean Energy Finland key projects (total amount for the 4 years).

Large point sources of CO2 in Finland

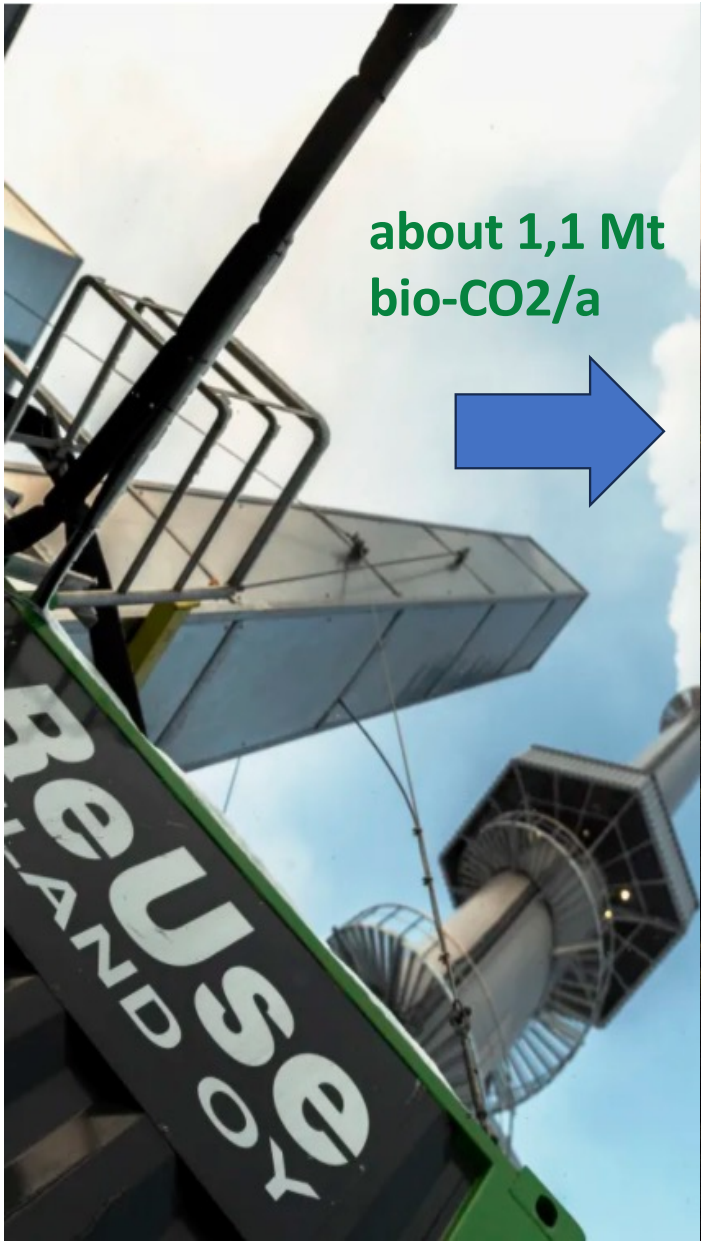
- Large point sources could provide about 28 Mt/a of biogenic CO2.
  - Forest industry 19,6 Mt
  - Energy industry 8 Mt
  - WtE 0,6 Mt
  - → Huge potential for CCUS!
- About half of the point sources located in the coast.
- Regional mismatch for CCU: renewable power vs CO2.
- No geological storage sites have been identified in Finland. → Partners and international co-operation a must!



Source: Hannu Karjunen, LUT, Hygcel-project

CCUS projects foreseen in Finland

- Ongoing research for P2X hubs, biogenic CO2 value chains, CO2 storage in minerals in the soil or in products, such as concrete.
- Today there are about 15 announced CCU-projects in Finland where the majority plans to use biogenic CO2 source as feedstock. Most of these plants target to enter the market by end of 2020's. Most of the projects aim to produce synthetic methane for heavy transportation. **Summed up figure for all the announced projects indicates the use of roughly 1,1 Mt/a CO2.**
- According to the industry, it is still possible technically and planning wise to have significant BECCS-projects ongoing before 2030. Access to storage needs to be addressed fast!



Sample of announced biofuels & synthetic fuels projects

- Pori: 63 000 m3 bioethanol, 22 000 t biomethane, 70 000 t lignin
- Pori: Power-to-Gas plant 20 MW, 20 000 t CCU **CCU**
- Haapavesi: 65 000 t bioethanol ja 11 000 t biomethane, 100–200 000 t/a synt. methanol **CCU**
- Kokkola: 400 000 (?) tn/a synt. Metanolia **CCU**
- Ranua: 100 000 tn/a synt. Metanolia **CCU**
- Hamina: 130 000 t renewable pine diesel (in operation since 2022)
- Kerava: 12 000 t synthetic methane (start of operation 2027?) **CCU**
- Lahti: 35 000 t synthetic methane (start 2024?) **CCU**
- Tampere: : 12 000–35 000 t synthetic methane (start 2024?) **CCU**
- Mikkeli: 12 000 t synthetic methane (start of the project 2024) **CCU**
- Vaasa: 15 000 t synthetic methane (start of the project 2024) **CCU**
- Kotka: 35 000 t synthetic methane (start of the project 2024) **CCU**
- Äänekoski: 12 000 t biomethane, ethanol, fertilizers (in operation 2024)
- Joensuu: 30–50 MW production of hydrogen together with bio-CHP. **CCU**
- Vantaa: 80 000 MWh synthetic methane **CCU**
- St1, Lappeenranta: 25 000 synthetic methanol (study) **CCU (ei bio)**
- Metsä Group – Fortum: Bio-**CCU** – pre-feasibility study
- Porvoo: 120 MW green hydrogen (start 2026?) **CCU**

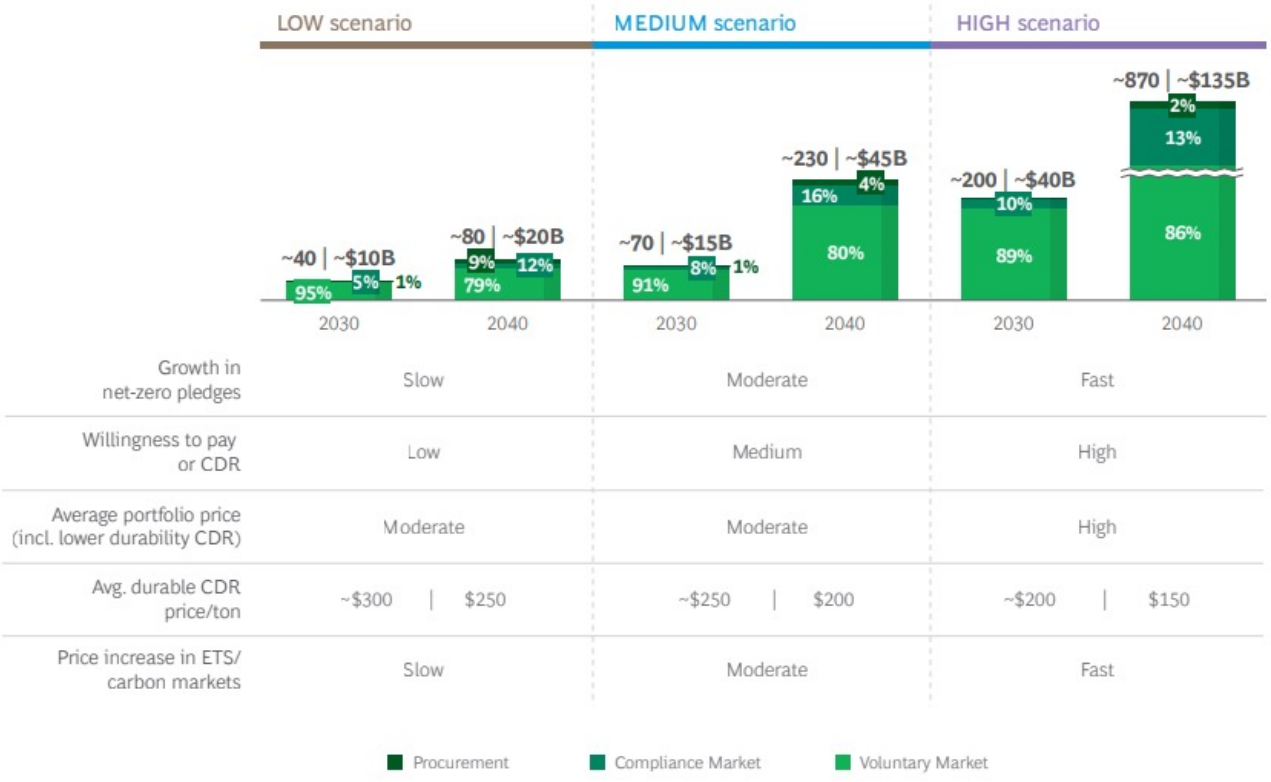
Clarity needed to proceed with CCS in FI

- Clear CCUS-strategy needed (for FI & EU), including targets and how to address public acceptance.
- Financing model for negative emissions needed:
  - EU legislation does not reward the capture and storage of biogenic CO2, instead of capture of fossil CO2. ETS review in 2026!
  - Technology neutral Carbon removal framework (CRCF) sooner than later.
  - Government level vs company level targets and claims, double claiming should not create an obstacle.
  - VCM the main finance flow until early 2030's.
  - Clarity on Paris Agreement NDC allocation between Member States.
- CCS chain from point sources to storage requires decisions on planning and investments + permitting on Finnish ground + collaboration with storage countries (eg. bilateral agreements).

Carbon Dioxide Removal -market and how it can contribute?

- Demand for durable CDR is projected at 40–200 Mt CO2 ($10 billion–$40 billion) in 2030, growing significantly to 80–870 Mt CO2 ($20 billion–$135 billion) in 2040. Estimated annual demand of 40–200 million tons (Mt CO2) for durable CDR in 2030, which is very likely to outstrip the announced supply of 15–32 Mt CO2.
- Most of the demand for CDR from the voluntary market until 2030. In the 2030s' the role of compliance markets to increase.
- Estimated demand for voluntary market is significant but won't be enough to reach the 1,5 degree pathway levels (5-16 Gt by 2050). The governments and the EU also have a clear role to play in creating demand.
- Public funding will not be sufficient to build the amount of CDR needed → guidance needed from governments on how the private sector can contribute. Both needed to make the most for the climate.

Figure 3 - 2030-2040 durable CDR demand (Mt CO_2) and market size ($B) across scenarios



Source: BCG analysis, June 2023.

In Summary

Finland has huge potential for BECCU & BECCS and can become a massive force in reducing emissions & producing negative emissions.

Political support for BECCUS in FI has grown. Still sufficient incentives for large-scale projects seem unlikely. → Decisive role for the voluntary market.

Infrastructure needed for both U&S -pathways: clear need to assess the optimal system for the Finnish industry in synergy with hydrogen network and electricity network/production. EU's CO2 infrastructure plans need to address the needs of biogenic CO2 as well!

Enabling the private sector's credible financing pre-2030 and ensuring access to storage sites are the key elements for bringing up carbon removal projects in time.

Thank you!

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