



BECCS Stockholm

Erik Rylander, Head of CDR



Co-funded by the European Union
Emissions Trading System
Innovation Fund



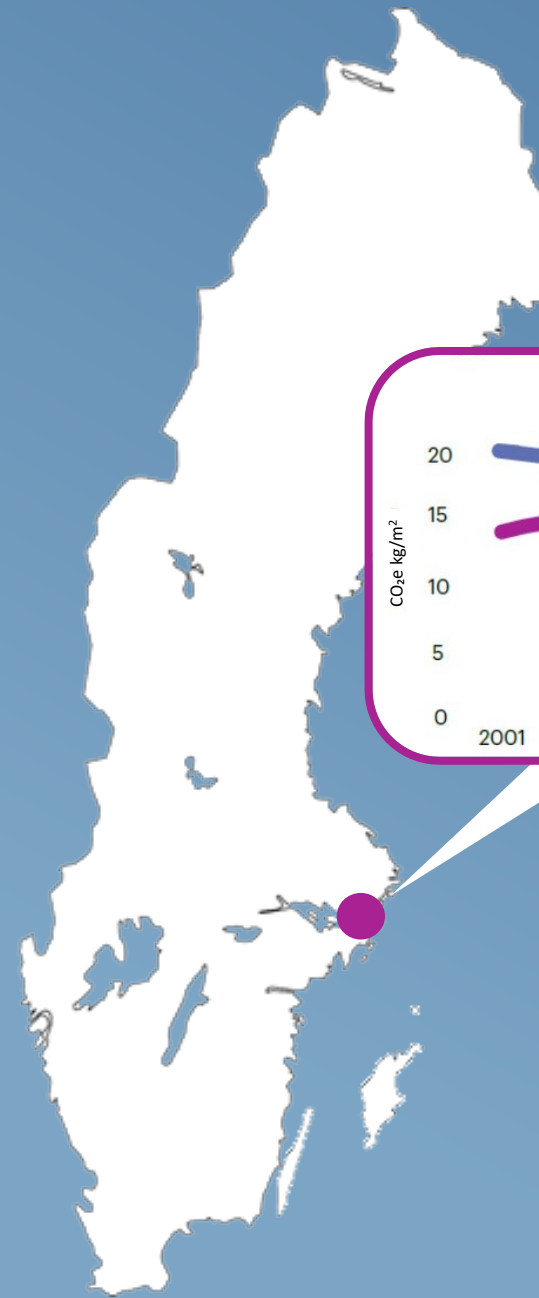
Swedish
Energy Agency

Beccs Stockholm

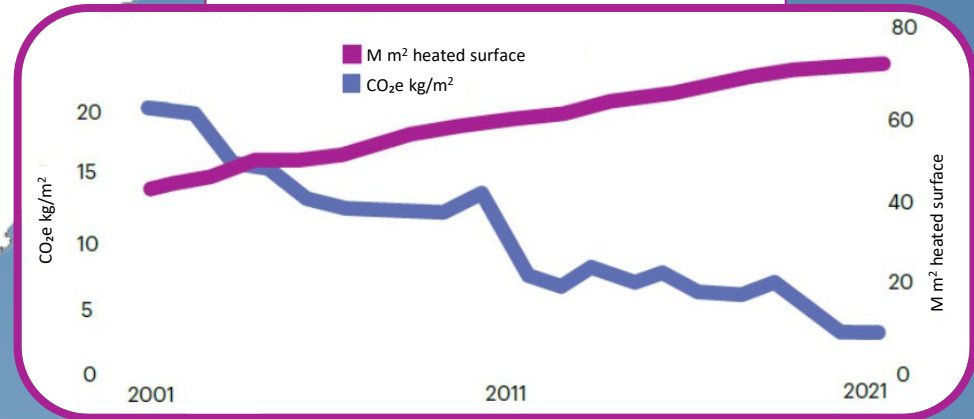
NEGATIVE EMISSIONS BY STOCKHOLM EXERGI

Stockholm Exergi

- District heating and cooling to 12 000 buildings and power to the electrical grid, totaling 10 TWh p.a.
- €700 m turn-over
- Last coal-fired plant phased out in 2020; now 99 per cent of production from recovered, reused and renewable sources
- Next step: Become EU's largest supplier of CO₂ removals with permanent storage



Stockholm's decoupling of growth and fossil emissions for heating



Stockholm Exergi has
two owners (each with
a 50% share)



**Stockholms
stad**

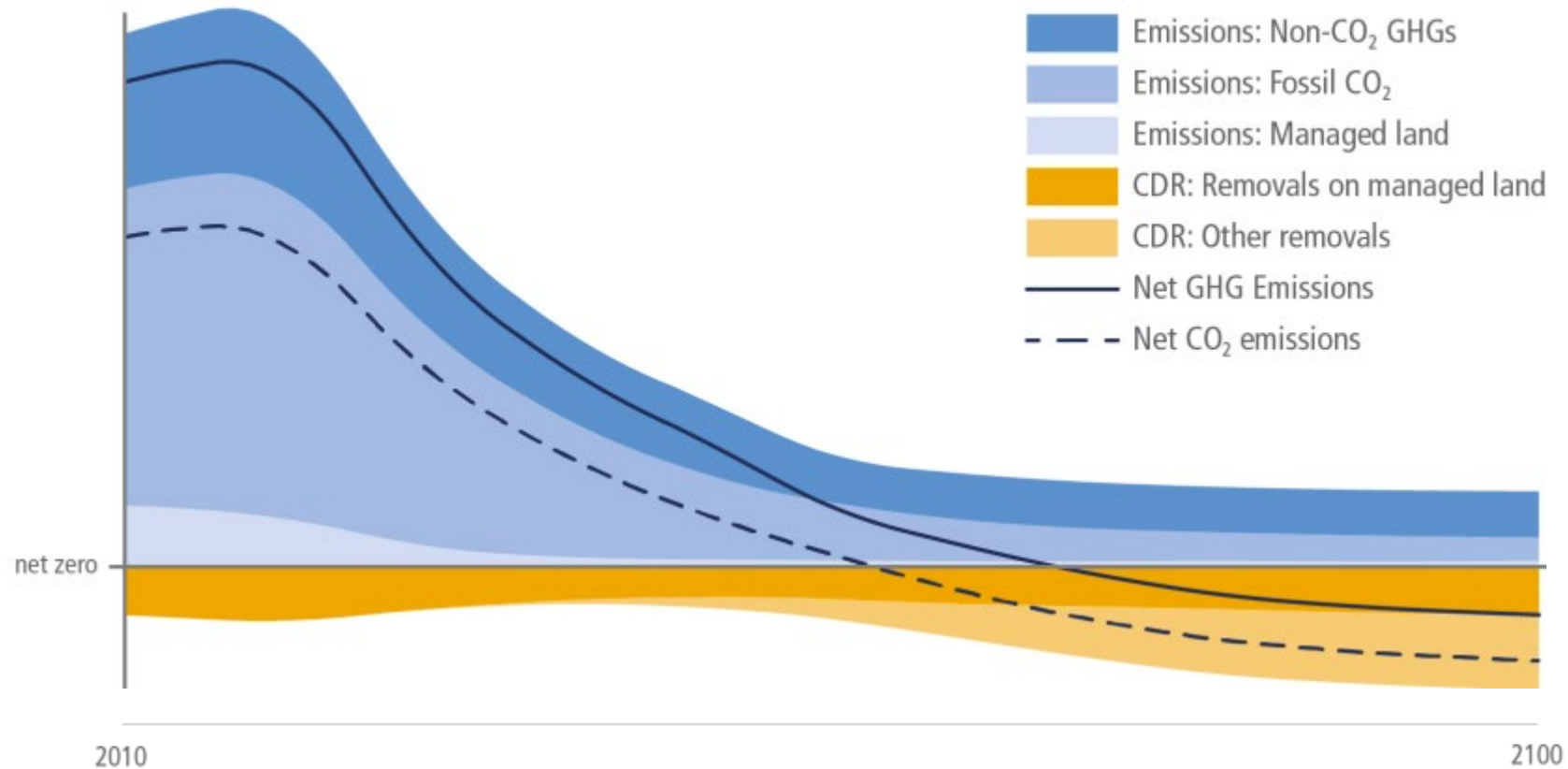
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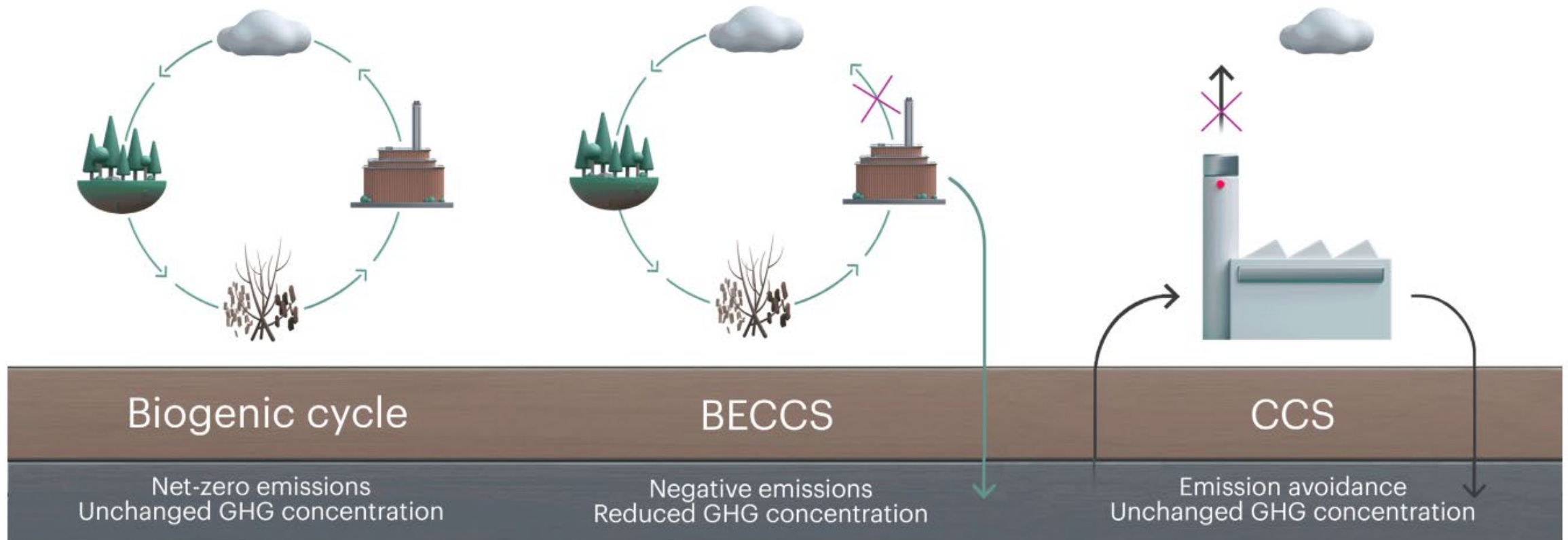


Why do we need carbon removals?

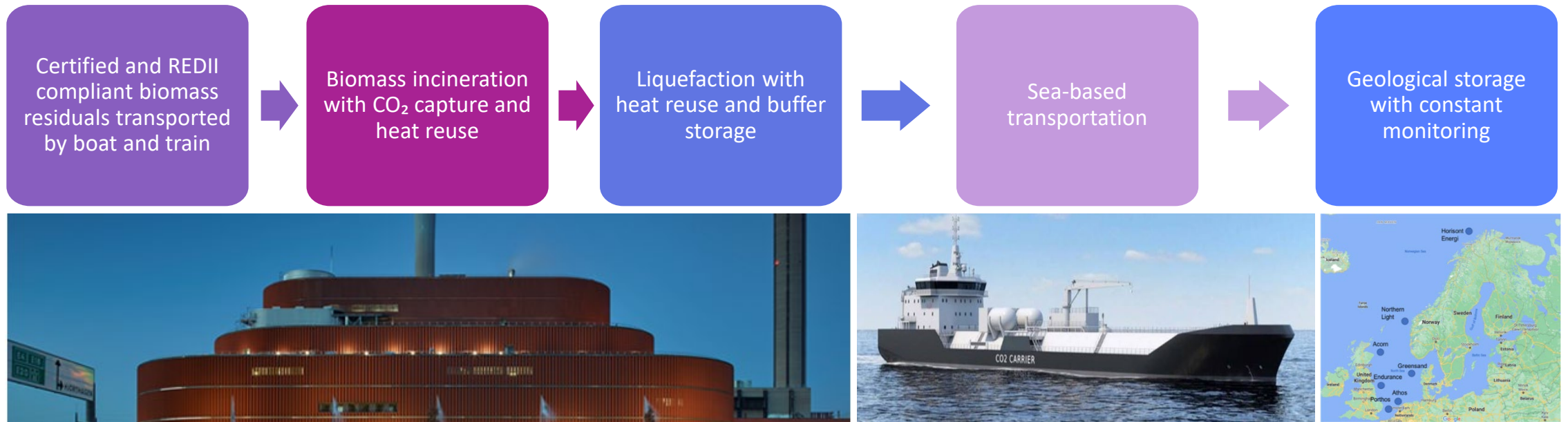


Source: IPCC Sixth Assessment Report

BECCS w. geological storage (Negative Emissions) remove carbon dioxide from the atmosphere permanently



The BECCS Stockholm value chain



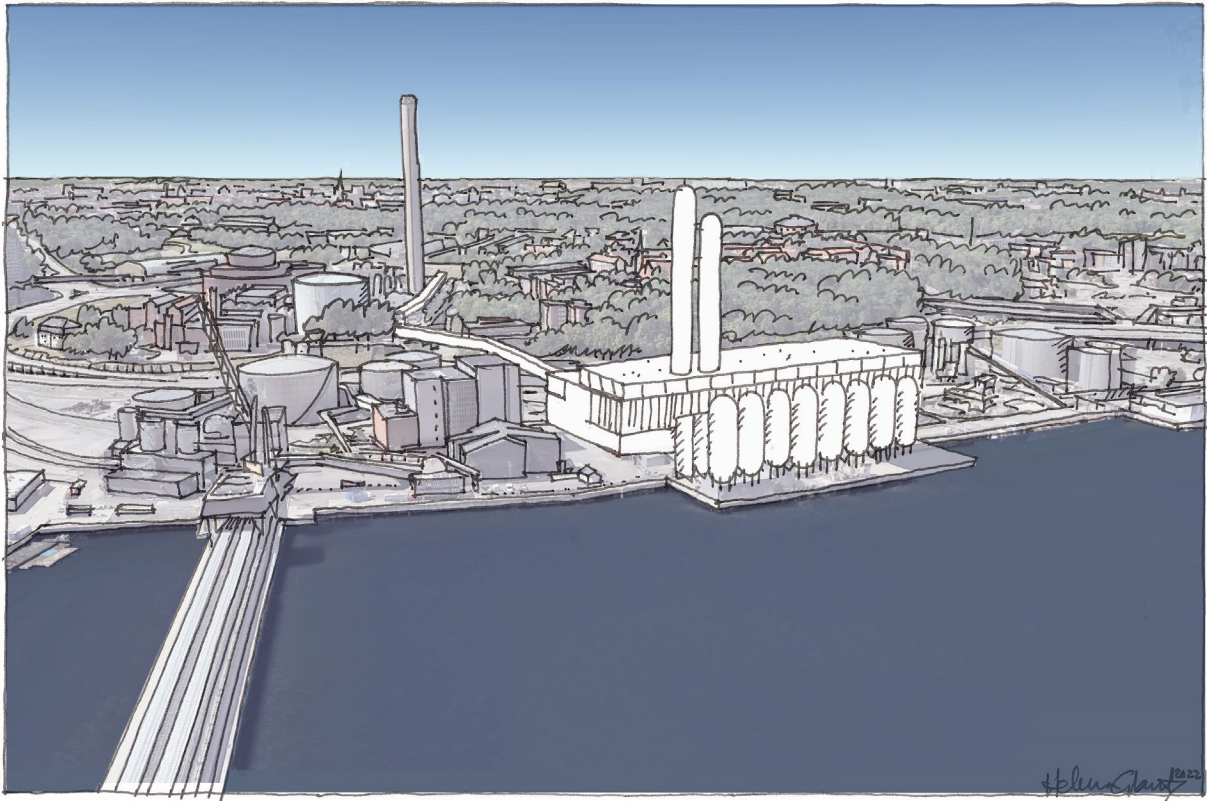
BECCS Stockholm in short

Key Benefits

- Removal of 800 000 tonnes CO₂ per year
- Heat recovery to district heating network – no energy loss
- Sustainable biomass. No additional outtake
- Proven and environmentally friendly capture technology
- High concentration of CO₂, around 19%.
- 90-95% capture
- Ownership of steam, electricity and harbor

Funding legs

- EU Innovation Fund (BECCS Stockholm)
- Swedish state aid – Reversed auction
- Sales of Carbon Removal Certificates (CRC) to Voluntary Carbon Market (VCM)



Challenges when taking BECCS to the market

Technical value chain

- Catch 22 – Carbon Capture companies need T&S for FID, and T&S companies need CC volumes for their FID
- All building-blocks sufficiently high TRL, but no off-the-shelf products for large scale implementations and never been put together in a full commercial chain before
- Uncertainty in permitting timeline and injection capacity in storage complicates CRU off take contracting

Business and funding

- New contractual set-ups with dependence on other parties in the value chain makes allocation of risks and rewards challenging
- Trepidation surrounding the purpose of funds contributed by institutions and governments. A clearer strategic intent would help – be inspired by the business approach taken by the US IRA program.
- In the absence of compliance markets, Public funds needed to drive down the price and increase private sector demand for permanent CRUs
- High interest from financial actors to participate in funding, but many uncertainties to tackle like the global political landscape

Standards and Accounting

- Lack of methodology, including for sustainable biomass
- Lack of clarity on relationship between reductions and removals in nations' climate targets creates unnecessary pushback against removals. Make it clear that:
 - Permanent removals cannot be used to reach Fit for 55
 - Permanent removals will be used towards hard-to-abate emissions, the timing and quantity of which should be estimated asap in separate targets for removals
- Double claiming/Co-claiming debate must be settled – significant impediment for large off-take agreements

A Conservative Methodology for Sustainable BECCS

- Defines a Net Carbon Removal Unit (CRU) with permanent storage based on BECCS with sustainable forest biomass
- A cooperative initiative by Stockholm Exergi, Drax, Eco Engineers and McKinsey open to all BECCS developers with the objective to unleash CRU off-take agreements with customers looking to become Net-zero
 - Developed in parallel with customer engagements to ensure market acceptance
- Relies heavily on existing EU laws and regulations
- Special Annex on Sustainable Biomass (forest). New Annex for Waste under development
- Validated by DNV on compliance with ISO standards giving CRU buyers confidence in the removals' integrity.
- Input to the EU CRC-F process and invitation to Standard bodies to adopt the Methodology as a basis for their certification of BECCS projects



BECCS Stockholm has secured significant off take, including one of the world's largest permanent removal deals with Microsoft



3.33 million tonnes of permanent carbon removals signed with Microsoft in world's largest single agreement

"We are extremely proud to announce this carbon removal offtake with Stockholm Exergi from its pioneering Värtan BECCS project. Leveraging existing biomass power plants is a crucial first step to building worldwide carbon removal capacity. In this case, we are pleased with the efficiency of recovering heat from carbon capture and adding it into district heating networks. Finally, it is crucial to sustainably source the biomass for BECCS projects and we were impressed with Stockholm Exergi's commitment in this regard"

- Brian Marrs, Microsoft Senior Director, Energy & Carbon Removal

In addition, BECCS has signed a 500 mSEK 3-year contract facilitated with **Frontier** on behalf of buyers including **Stripe, Alphabet, Shopify, Meta, JP Morgan, H&M** and **McKinsey Sustainability**

Alphabet

Meta

workday

shopify

stripe

McKinsey
Sustainability

H&M

J.P.Morgan

In January 2025 Swedish state aid was secured – subsidizes the CRC market price



20 miljarder kronor i stöd för lagring av 11 miljoner ton koldioxid

Den första omvända auktionen inom det nya stödet för lagring av biogen koldioxid, bio-CCS, är avgjord. Stockholm Exergi får stöd för hela värdekedjan för avskiljning, transport och lagring.

27 januari 2025 [Pressmeddelande](#)

Dagens industri START BÖRS MARKNADSNYTT BEVAKNINGAR LEDARE

Publicerad: 27 januari 2025, 12:03

Stockholm Exergi får 20 miljarder i unikt utsläppsprojekt

Stockholm Exergi cashar in i den första omvända auktionen för svensk koldioxidlagring. Bolaget tilldelas 20 miljarder kronor för att fånga in och lagra utsläppen från sitt värmeverk i Värtahamnen.

March 27, 2025 - A historic Final Investment Decision



THURSDAY | March 27, 2025

Stockholm Exergi to Build One of the World's Largest Facilities for Removing Carbon Dioxide from the



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2025-05-07



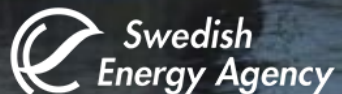
Beccs
Stockholm

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