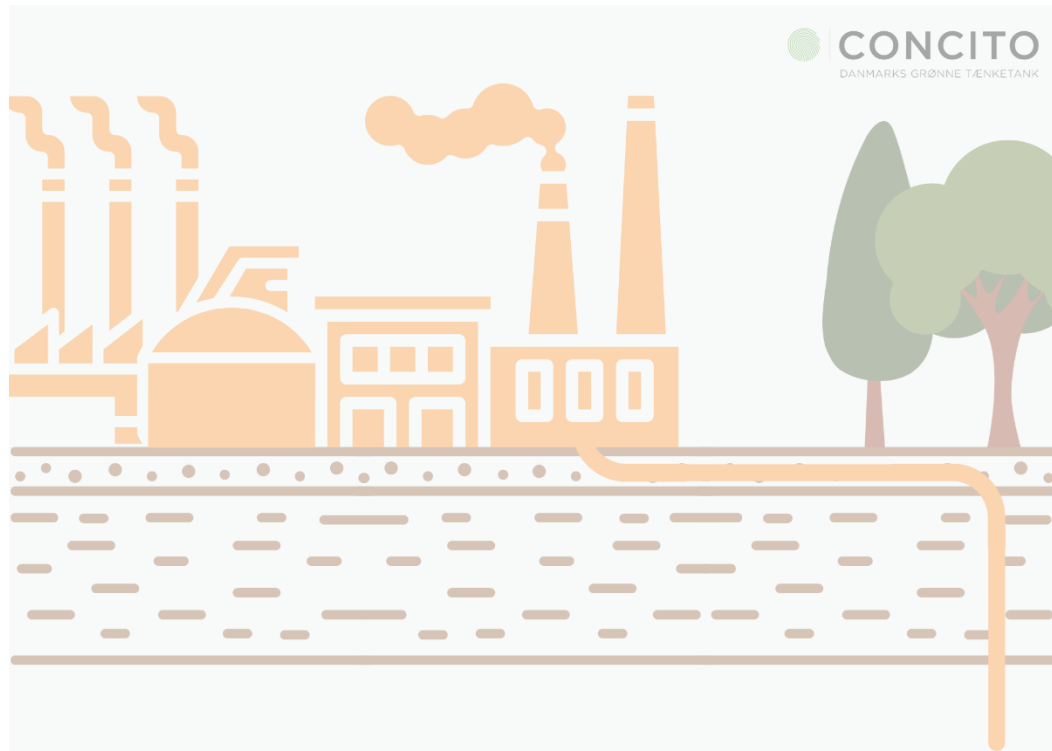


The Momentum for Carbon Removal in Denmark



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29.03.2023

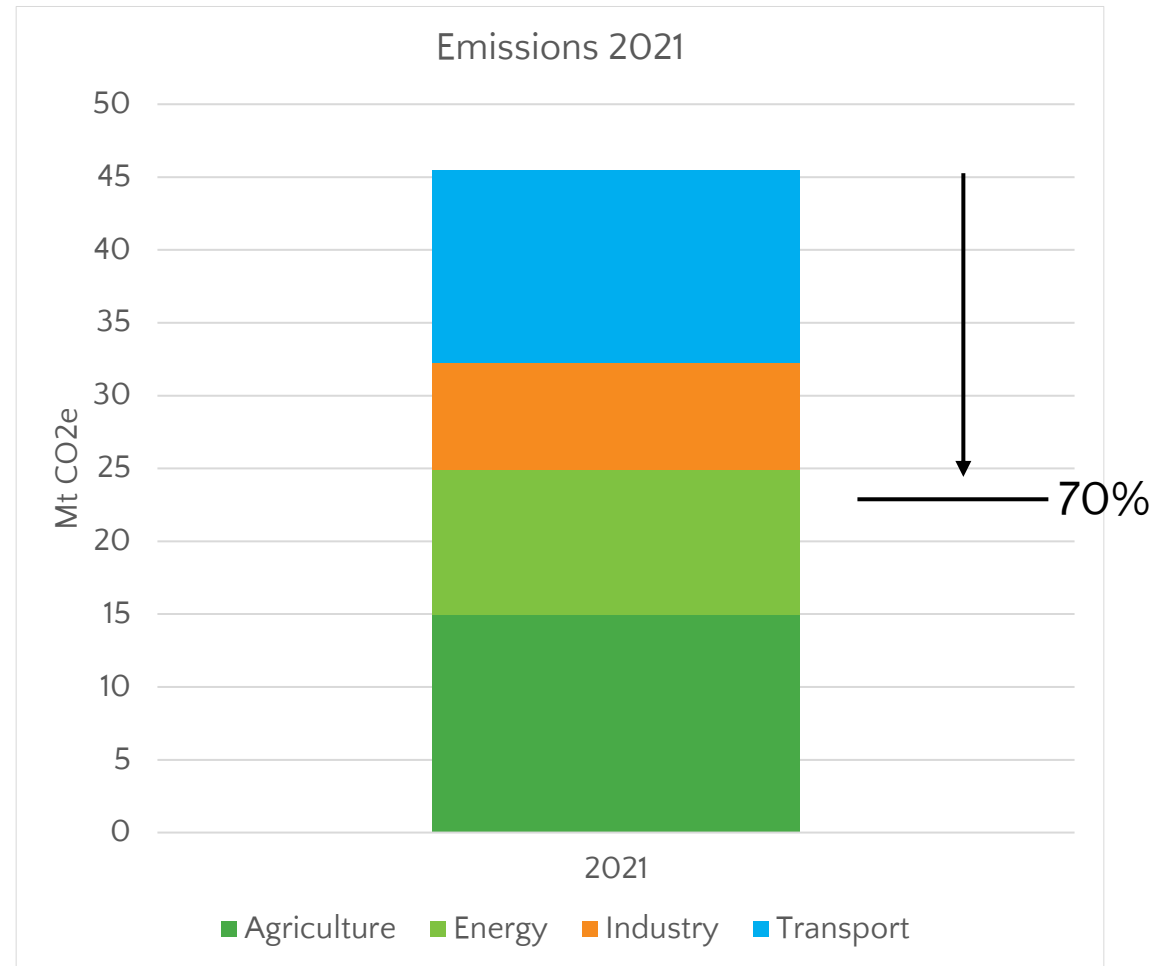


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DENMARK'S GREEN THINK TANK

Where are we now?

- Climate law:
 - 70% reduction by 2030 compared to 1990
 - Climate neutrality no later than 2050 (to be reviewed)
- Emissions today: 45 Mt and must be reduced to 23 Mt in 2030 (Figure)
- To achieve the 70% target in 2030 a big effort in all sectors is necessary
- This includes CCS on some applications (broad agreement)
- A major part of the CCS potential is on biogenic sources
- Three dedicated government funds approved within the last three years: estimated 3.2 Mt reductions in 2030
- EU ETS + Danish carbon tax reform also provides incentives



Danish Energy Agency: Climate Status and Outlook 2022



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DENMARK'S GREEN THINK TANK

Incentives for CDR and CCS

- Carbon Taxes
 - **The EU ETS:** 100 EUR/ton in 2030 (expected)
 - **Danish Green Tax Reform** (energy and industry):
 - 100 EUR/ton in 2030 for non-ETS
 - ETS sectors will pay 50 EUR/ton in 2030 – on top of ETS
 - Cement however pays 17 EUR/ton on top of ETS
 - No discount for Waste-to-Energy: They will pay 200 EUR/ton in 2030

→ Biogenic emissions are not covered
- Three funding schemes for CCS and CDR on the state budget
 - EUR 5.2 billion 2025–2050
 - 0.4 Mt CO₂ reductions in 2026
 - 3.2 Mt CO₂ reductions in 2030
 - Both for fossil and biogenic CCS (CDR)
 - First tender ongoing. Winner must deliver 0.4 Mt in 2026.
- Private market



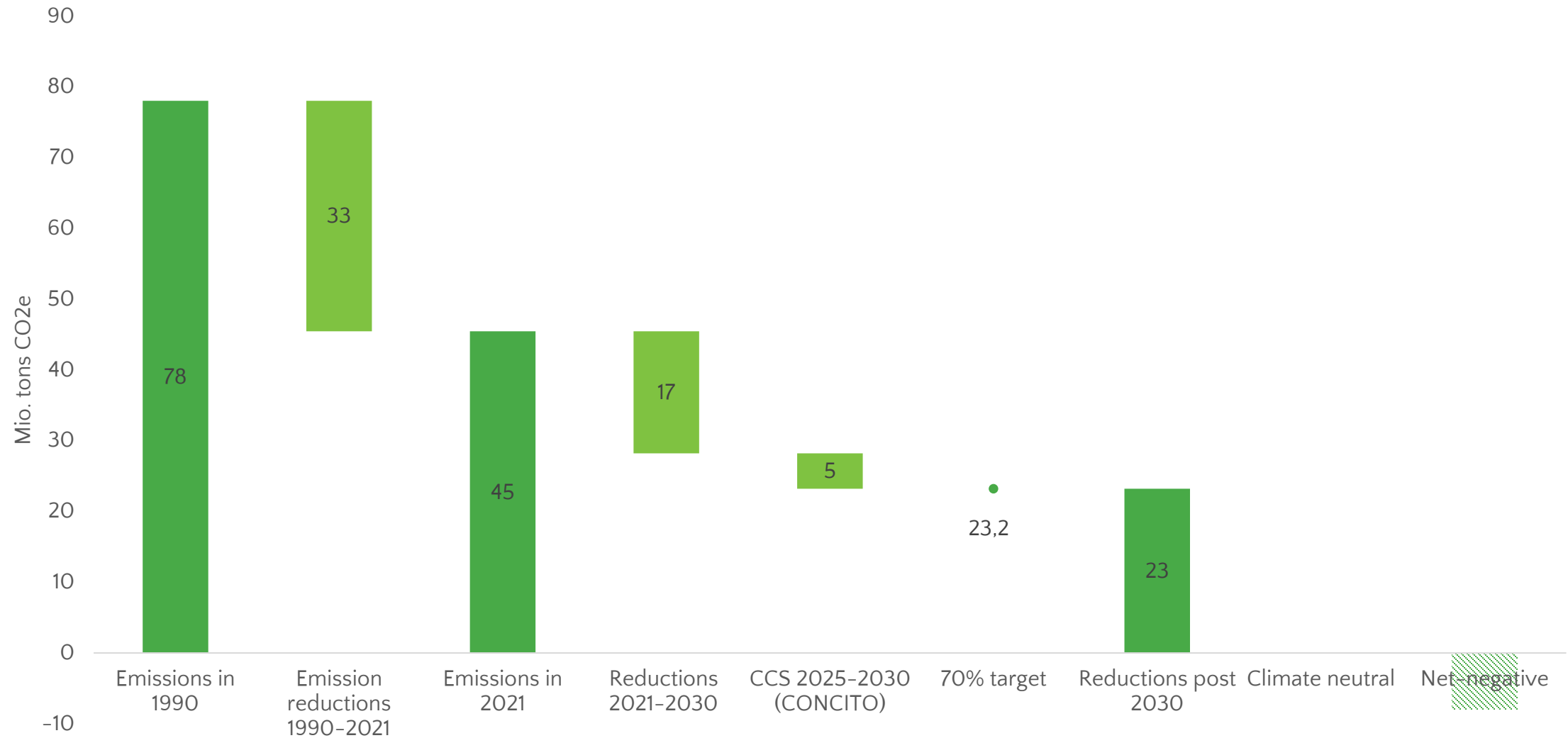
CONCITO's estimate of the feasible CCS potential by 2030

"CCS Hierachy"

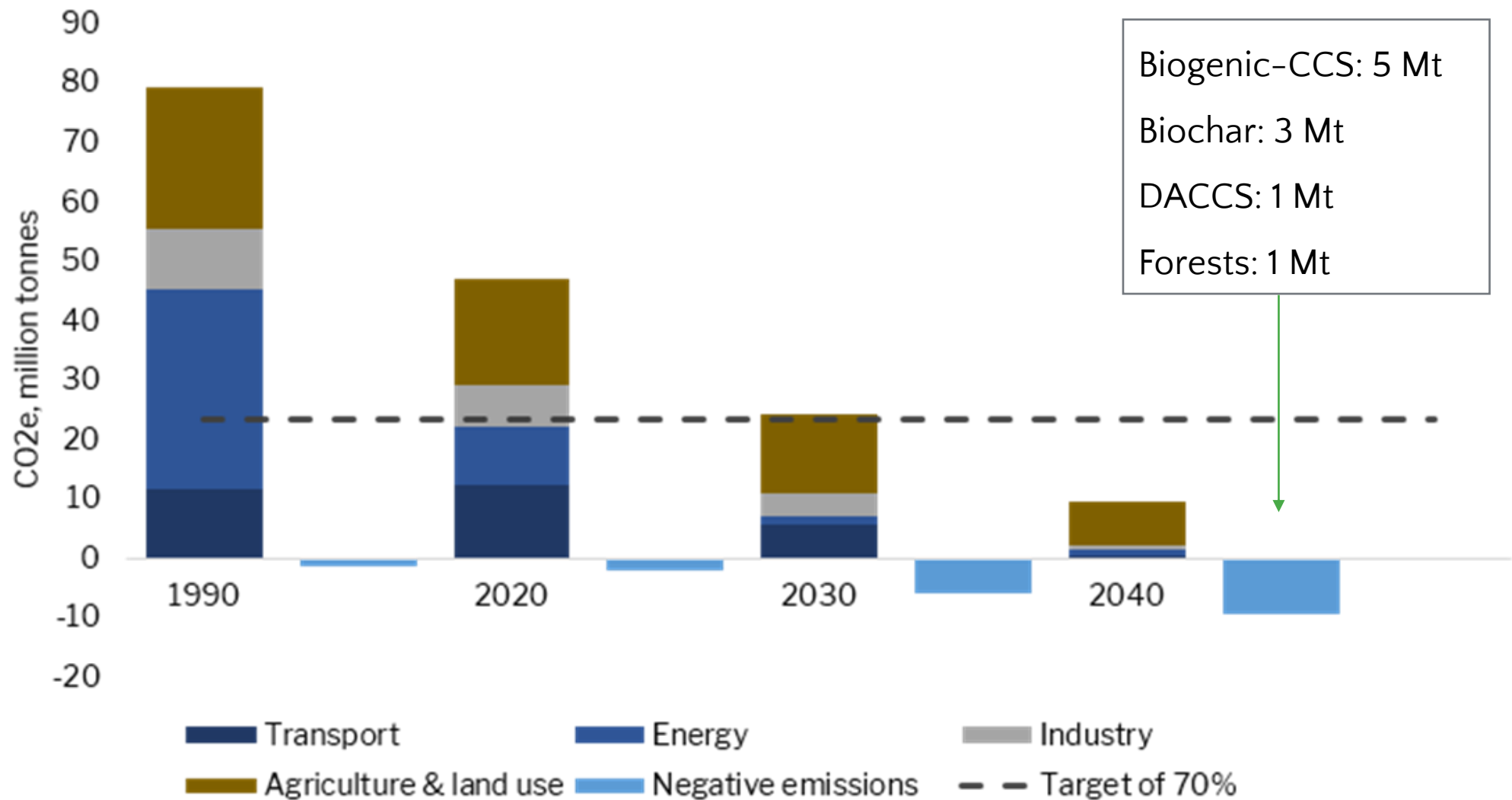
1. Are there many operating hours and a long lifetime?
2. Are there any better and cheaper alternatives?
3. What is the actual climate benefit?

CCS in 2030 (Mt CO ₂)	Fossil CO ₂	Biogenic CO ₂ (CDR)	Total
Waste-to-Energy	0.5	1.5	2
Biogas upgrading		1.5	1.5
Industrial processes (cement and refineries)	1	0.5	1.5
Biomass CHP	0	0	0
Total	1.5	3.5	5

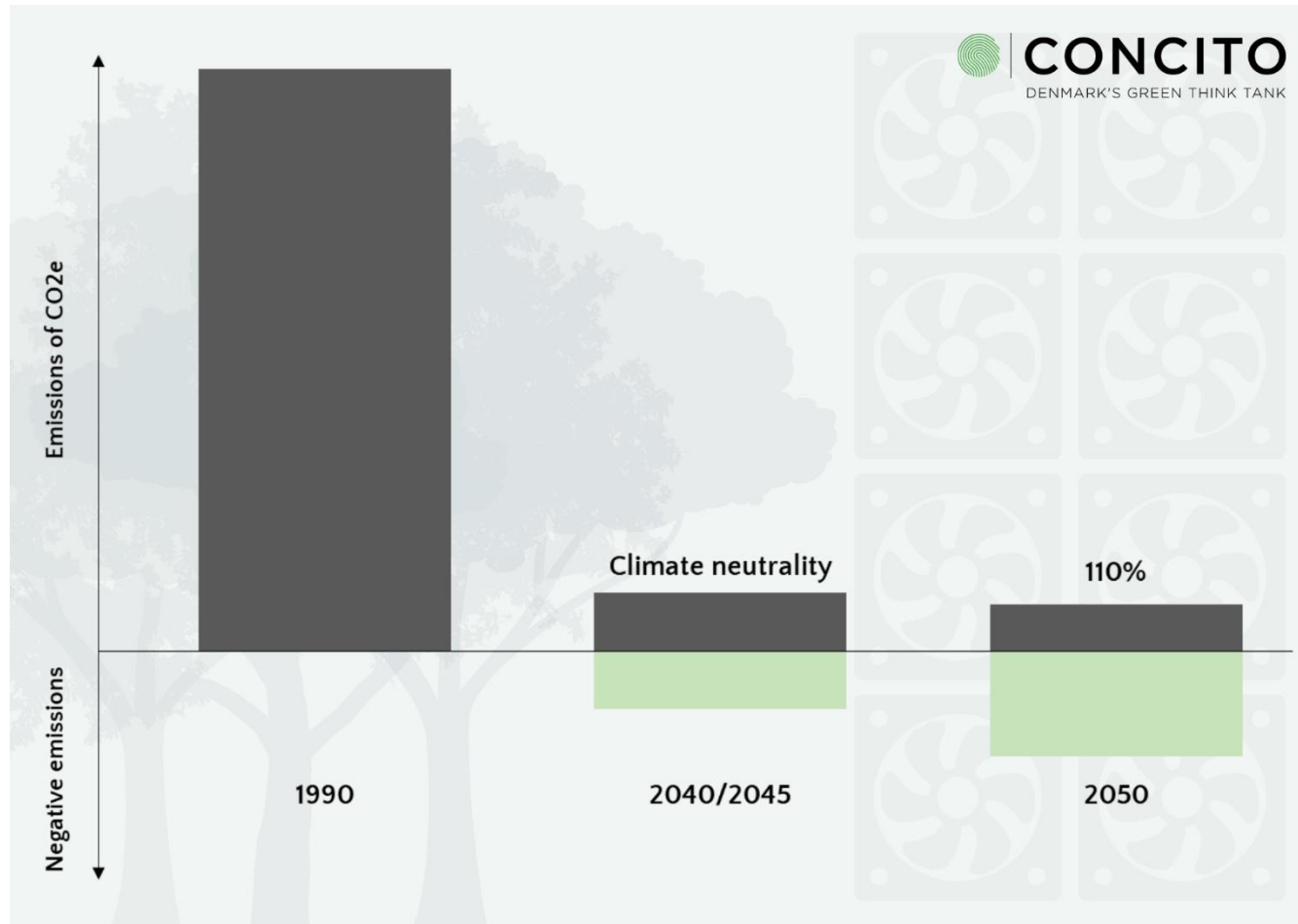
The role of CCS in achieving the Danish 70% target in 2030



Large scale CDR is needed for Climate neutral Denmark



New Government climate target: 110% in 2050



- 110% = 8 Mt net-negative emissions
- Residual emission in 2050: 6 Mt
- Total negative emissions in 2050: 14 Mt

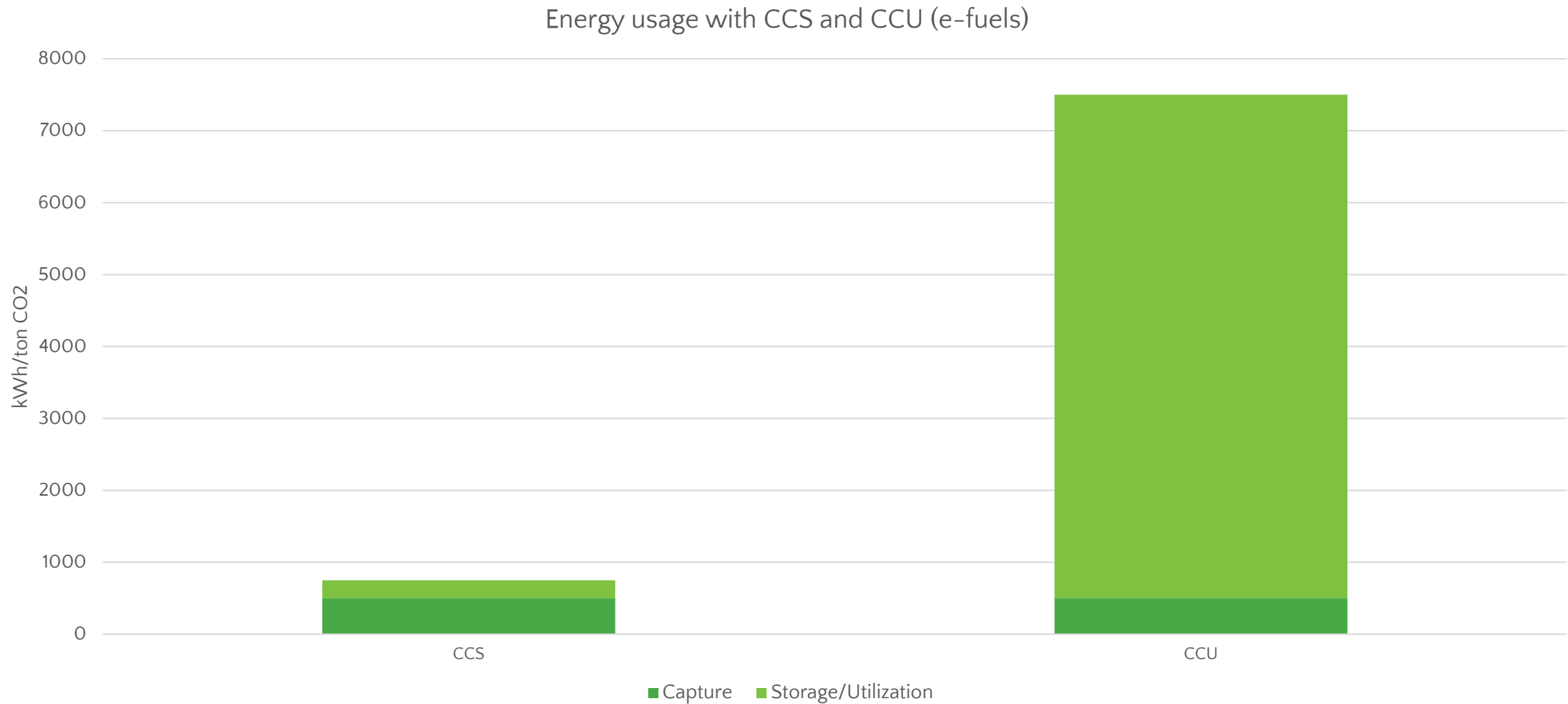
Net-negative emissions is the end goal.
How we get there matters:

→ Reduce, Reduce, Remove

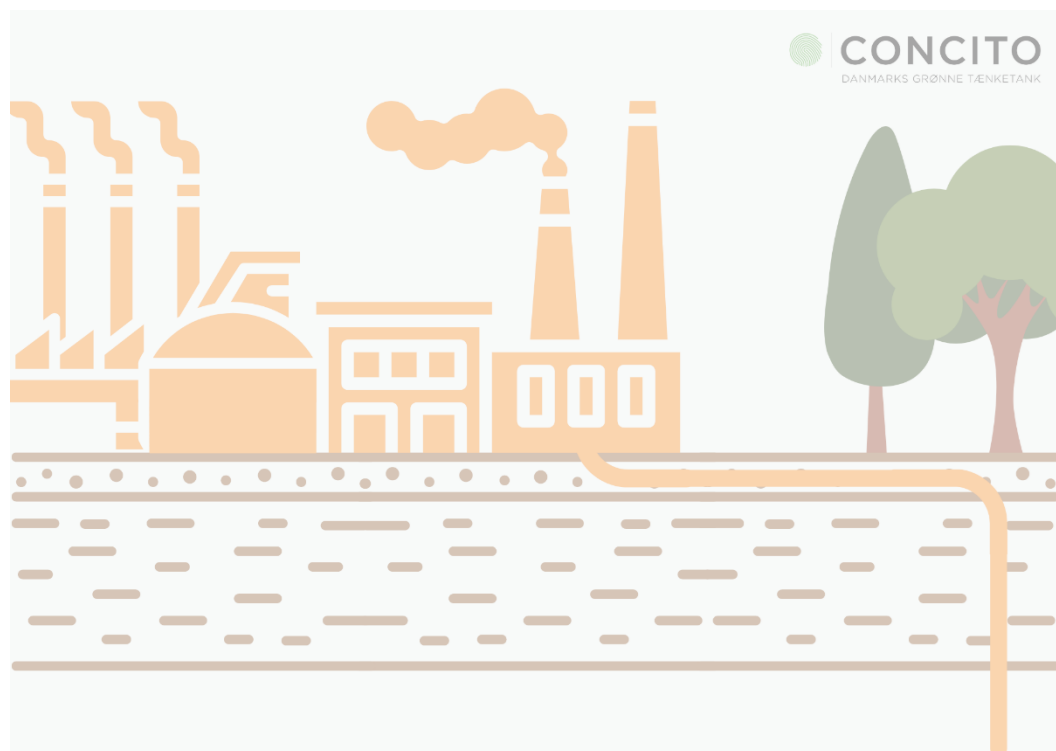
→ Get CDR right

- Permanent Removals
- "Low quality CDR" cannot compensate for residual emissions

Storage > Usage (e-fuels)



Thank you for your attention!



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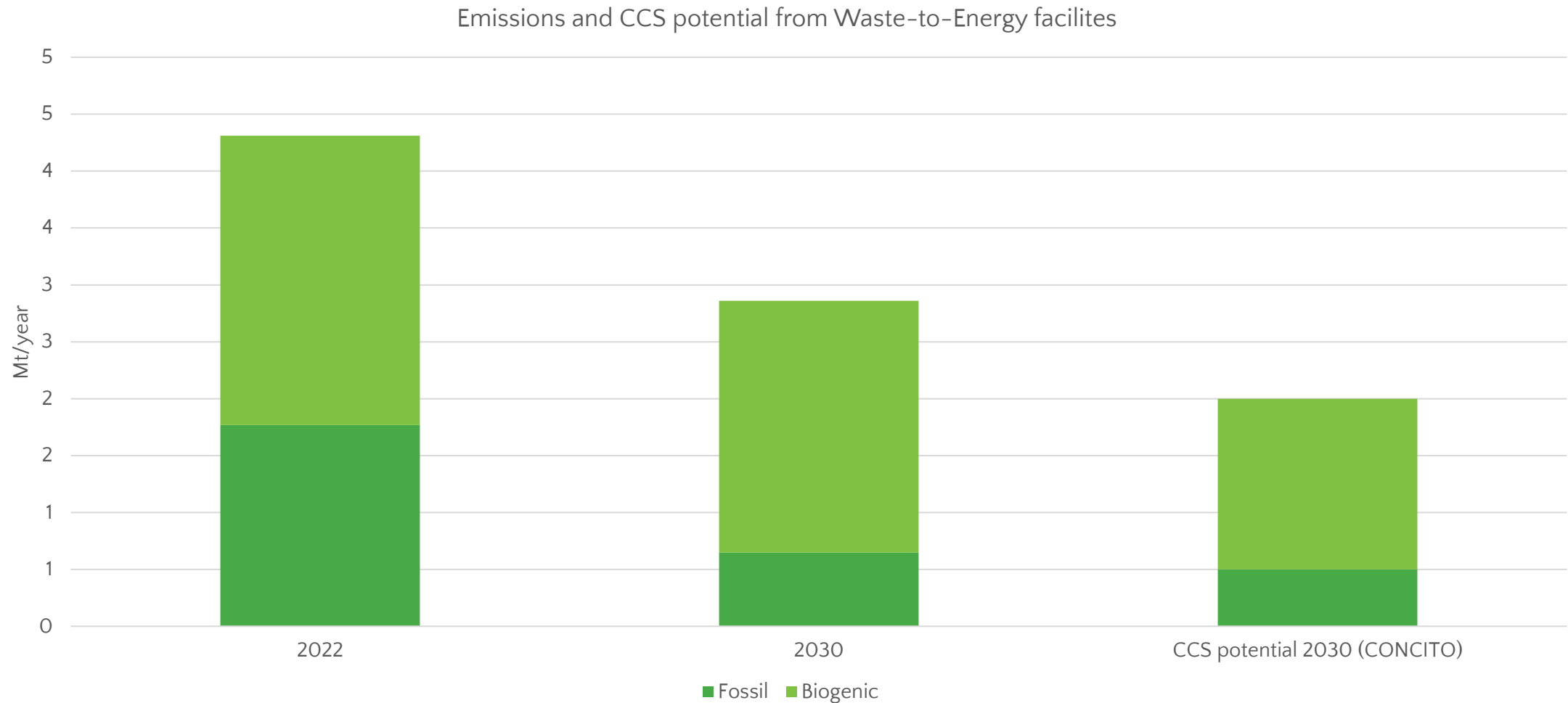
Extra slides

Three funding schemes for CCS and/or CDR

Funding CCS / CDR	2025/2026 Mt	2030 Mt	Description
1. "The CCUS-fund" Fund for carbon capture, usage and storage	0.4	0.9	Budget: EUR 2,2 billion Aimed at large point sources, both biogenic and fossil. First tender ongoing with expected winner May 2023. First winner shall deliver 0.4 Mt in 2026 with approx. half the budget.
2. "The NECCS-fund" Fund for negative emission carbon capture and storage	0.5	0.5	Budget: EUR 0.35 billion. Only for CDR. Designed for CCS on biogas or biochar from pyrolysis. No tender yet. Funding over 8-year period corresponding to just below 90 EUR/ton CO ₂ .
3. "The GSR CCS-fund". Fund from the Danish National Green Tax Reform"	-	1.8	Budget: EUR 2.6 billion. Aimed at point sources both biogenic and fossil. Pending specifications. Awaiting experiences from the first tender of the CCUS fund
Total	2026: 0.9 Mt	2030: 3.2 Mt	Total EUR 5.2 billion over (25 years)

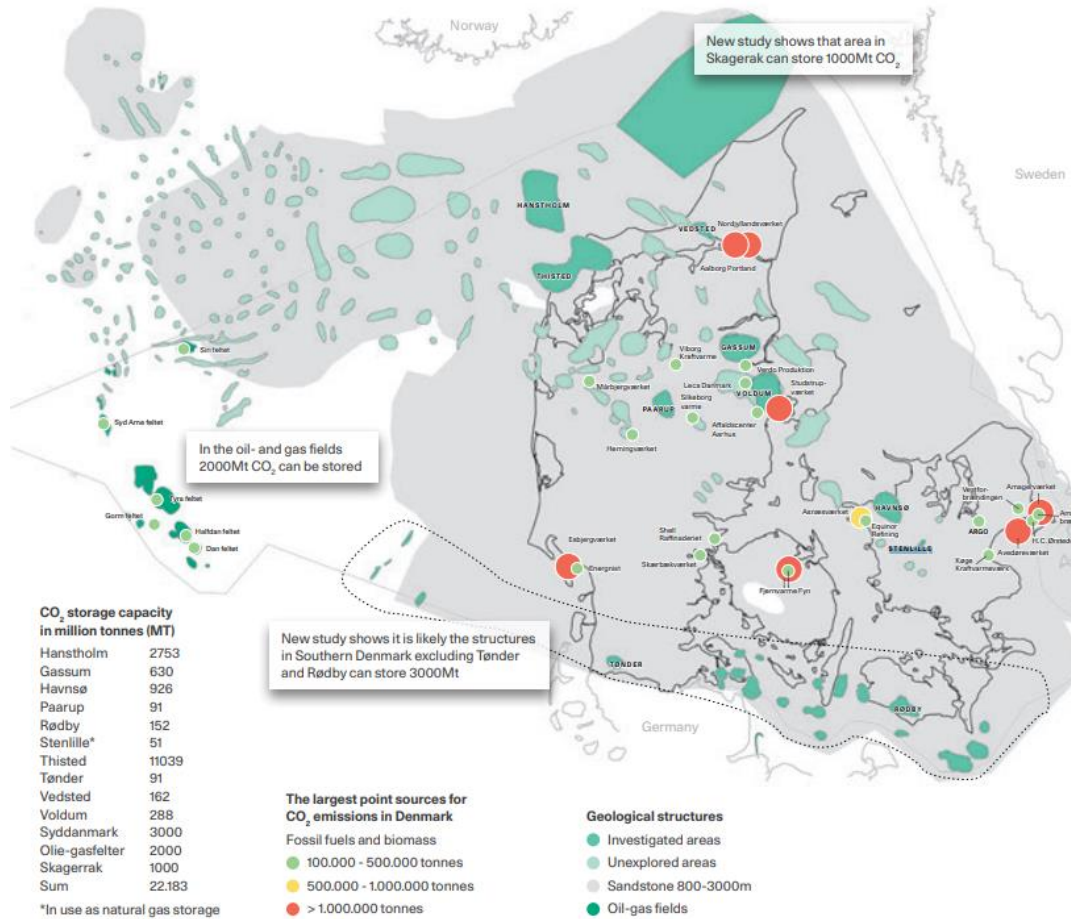


Example: CDR in Waste-to-Energy sector



Large potential for storage in Danish underground – and for import of CO2

Denmark from above



Danish potential for CCS and import of CO2 in 2030

