




CCS and CCU activities in Denmark

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Bergen, Norway

Making CCU and CCS happen!
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Agenda

- Political agreements supporting CCS and CCU
- Legislation and regulation
- Funding

- CCS and CCU projects in Denmark

Carbon Capture, utilization and Storage (CCUS)

Political strategies

Climate agreement on energy and industry, june 2020 ("Klimaaf tale for energi og industri")

- CCS strategy finalized in june and december 2021
- PtX strategy finalized in December 2021

- CCUS funds
- PtX tender

Agreement on a Roadmap for Capture, Transport and Storage of CO₂ (2021)

("En køreplan for lagring af CO₂ - Første del af en samlet CCS-strategi")

- Plethora of initiatives, including enablement of CO₂ storage in Danish subsoil and CO₂ import/export.
- First bilateral agreement regarding CO₂-trade with Belgium
- Permission for pilot and demo project storing CO₂ in the North Sea
- First tender for full scale offshore investigation and storage licenses

Agreement on green hydrogen and e-fuels (2022)

("Aftale om udvikling og fremme af brint og grønne brændstoffer")

- Adoption of the PtX-strategy by the parliament
- Target of 4-6 GW electrolysis capacity by 2030
- Direct connections of RE-production and consumption
- Geographically differentiated electricity tariffs
- 57 mill. DKK in 2022-2026 for a PtX-taskforce
- First steps towards establishing hydrogen infrastructure enabling exports to Germany

Carbon Capture, utilization and Storage (CCUS)

Further financing

Agreement as part of national budget for 2022

("Investeringer i et fortsat grønnere Danmark")

- Funds for Negative Emissions Through CCS
- NECCS funds

Political agreement on the Green Tax Reform, June 2022

("Aftale om Grøn Skattereform (GSR) for industri")

- CCS funds

Overview over CCS and CCU/PtX funding

Overview of national funding schemes

CCS

	CC(U)S – phase 1	NECCS	GSR	CCUS – phase 2
Purpose	CO2-reductions and negative emissions	Negative emissions.	CO2-reductions and negative emissions	CO2-reductions and negative emissions – possibly through carbon usage
Carbon sources	Fossile and biogenic carbon storage	Biogenic carbon storage	Fossile and biogenic	Fossil and biogenic carbon usage and storage
Funds	8 bill. DKK	2.5 bill. DKK	18 bill. DKK	8 bill. DKK
Funding period	Up to 20 years	Up to eight years	Up to 15 years	Up to 20 years
First year of operation	2025/2026	2024/2025	2026/2027	2029/2030
Expected reductions	0.4 Mt/year	0.5 Mt/year	1.8 Mt/year	0.5 Mt/year

Overview of funding schemes

PtX

Tender for PtX (Climate agreement, 2020)

Competitive tender for support of production

- 1,25 billion DKK.
- Funded from sales of renewable energy shares to the Netherlands.
- Operational support for Danish production of PtX products.
- Competition on support for quantity of hydrogen – no matter the end product.
- Fixed price premium for up to 10 years.
- Contribution to the 70 pct. objective is unknown.

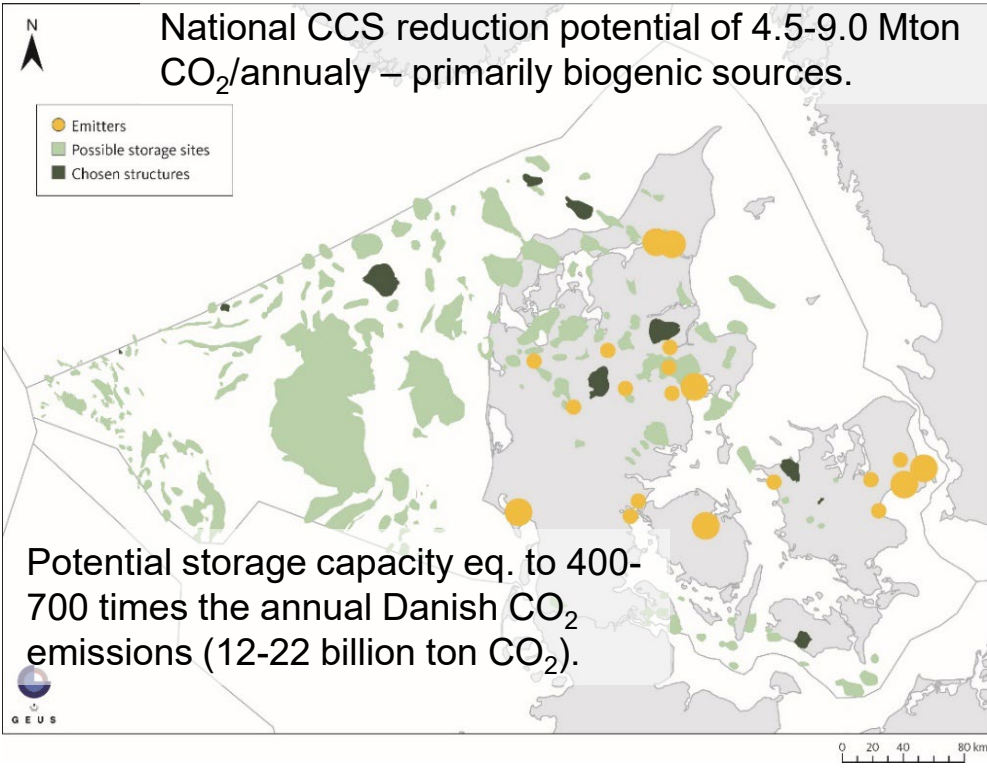
Examples of other funds for PtX:

- Energiteknologiske Udviklings- og Demonstrationsprogram (EUDP) 300 mill DKK
- Energilagingspuljen 128 mill DKK
- Allocation of funds for research to PtX ca. 500 mill (2021/2022)
- **Important projects of common European interest (IPCEI) 850 mill DKK**
- React-EU 225 mill DKK (2022)

CCS and CCU projects in Denmark

CCS activities in Denmark (Not an exhaustive list... - just a few highlights)

Great potential for national CCS reductions and geological storage of CO₂



- First round of CCUS-fundst w three pre-qualified suppliers
- ARC (2021): CO₂ capture pilot plant
- Aalborg Portland (2022): Capture pilot unit installed
- Project Greensand (2022): Pilot project - 15.000 ton CO₂ injection offshore
- Project Bifrost (2022-2023): Long-term solution for CCS in Denmark based on existing infrastructure in the Danish North Sea.
- Gas Storage Denmark: Onshore CO₂ storage
- Other stakeholders (eg. Fidelis) are looking into the opportunity for storage in Danish subsoil.

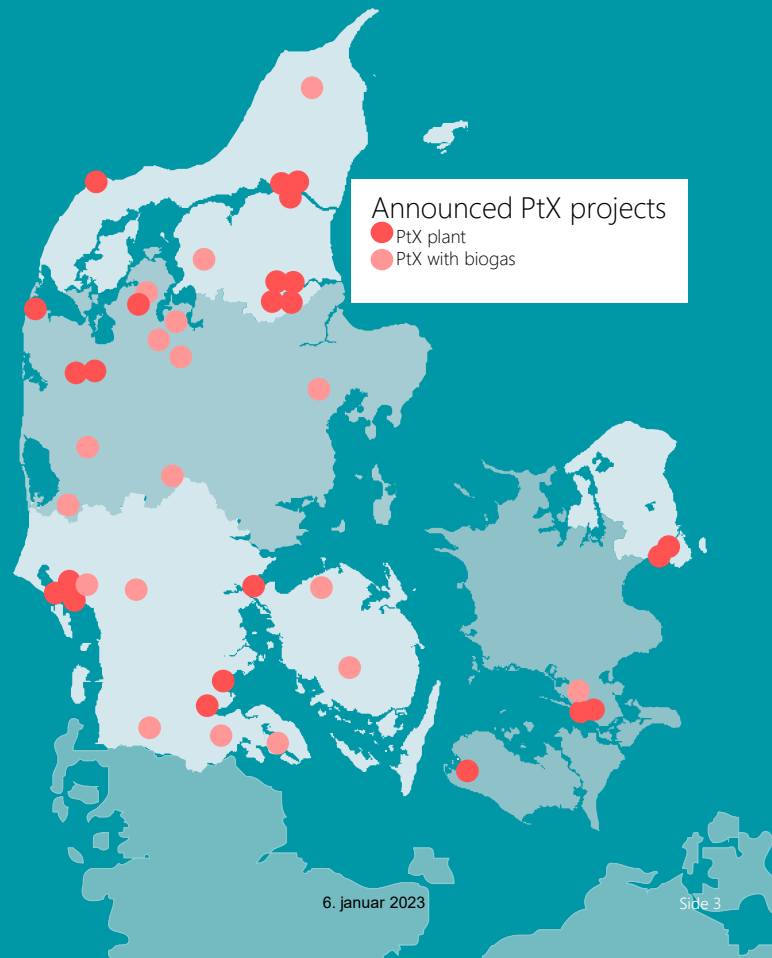
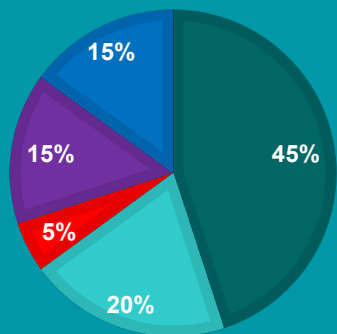


Power-to-X activities in Denmark

CCU and other PtX-activities

- Political target of 4-6 GW electrolysis capacity by 2030
- More than 30 Power-to-X projects has been announced in Denmark totalling more than 7 GW combined
- Different projects and end products – hydrogen and ammonia do not require input of carbon
- Market dialogue about hydrogen infrastructure indicates ambitions about 14 GW from project developers

■ Hydrogen ■ Methanol ■ Methane ■ Ammonia ■ E-kerosene



Finalising remarks

- Fruitful interaction between the governmental initiatives and activities in the sector
- The one line of activities cannot stand alone
- We have to get up early to keep pace

Thank you for
your attention! ●

