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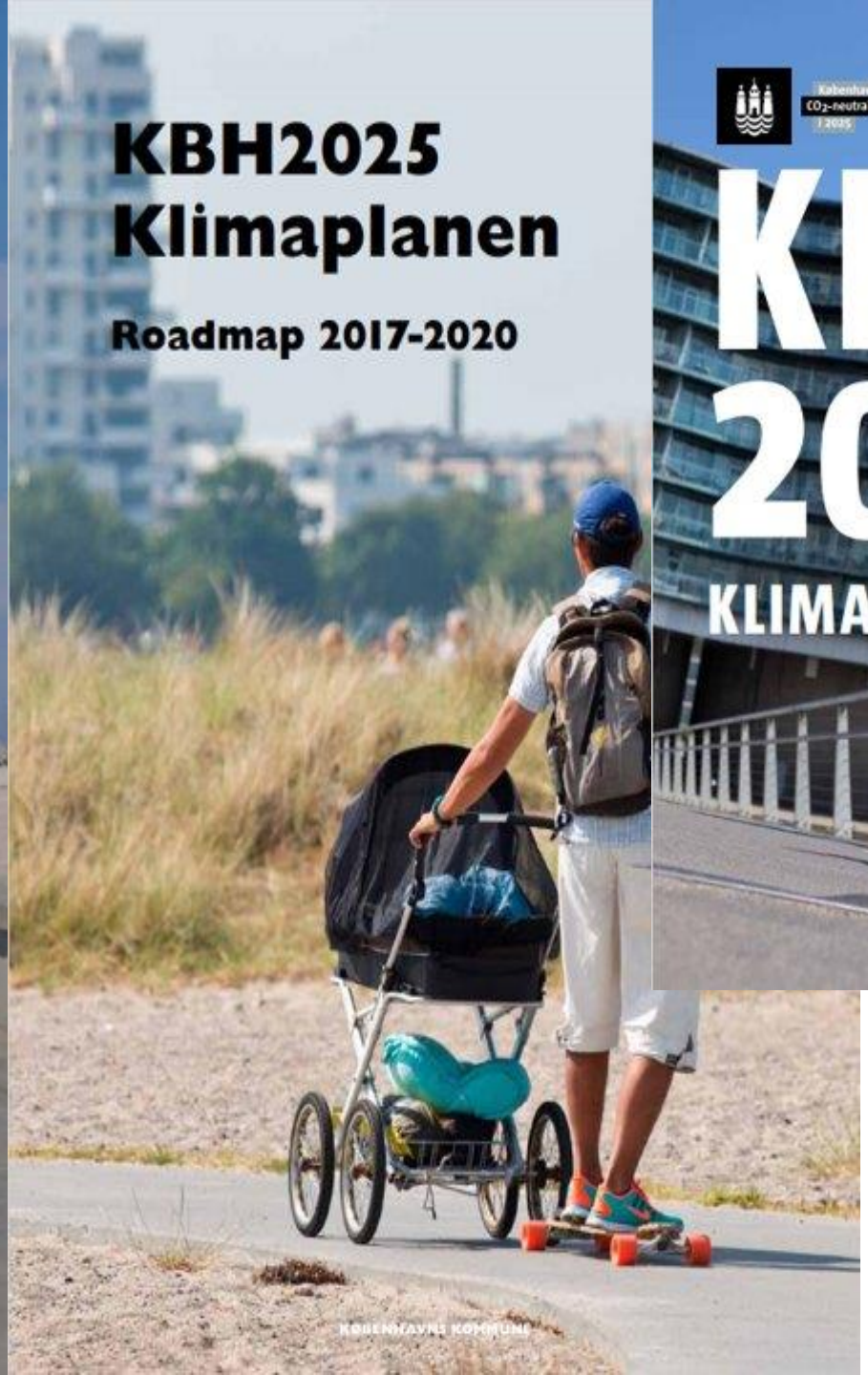
-alt med affald


KBH
2025
KLIMAPLANEN
EN GRØN, SMART
OG CO2-NEUTRAL BY


KBH2025
Klimaplanen
Roadmap 2017-2020
KØBENHAVNS KOMMUNE

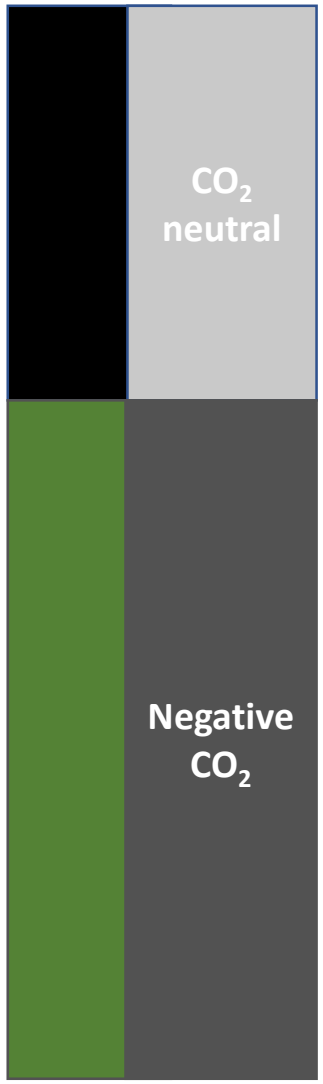

KBH
2025
KLIMAPLANEN
EN GRØN, SMART
OG CO2-NEUTRAL BY

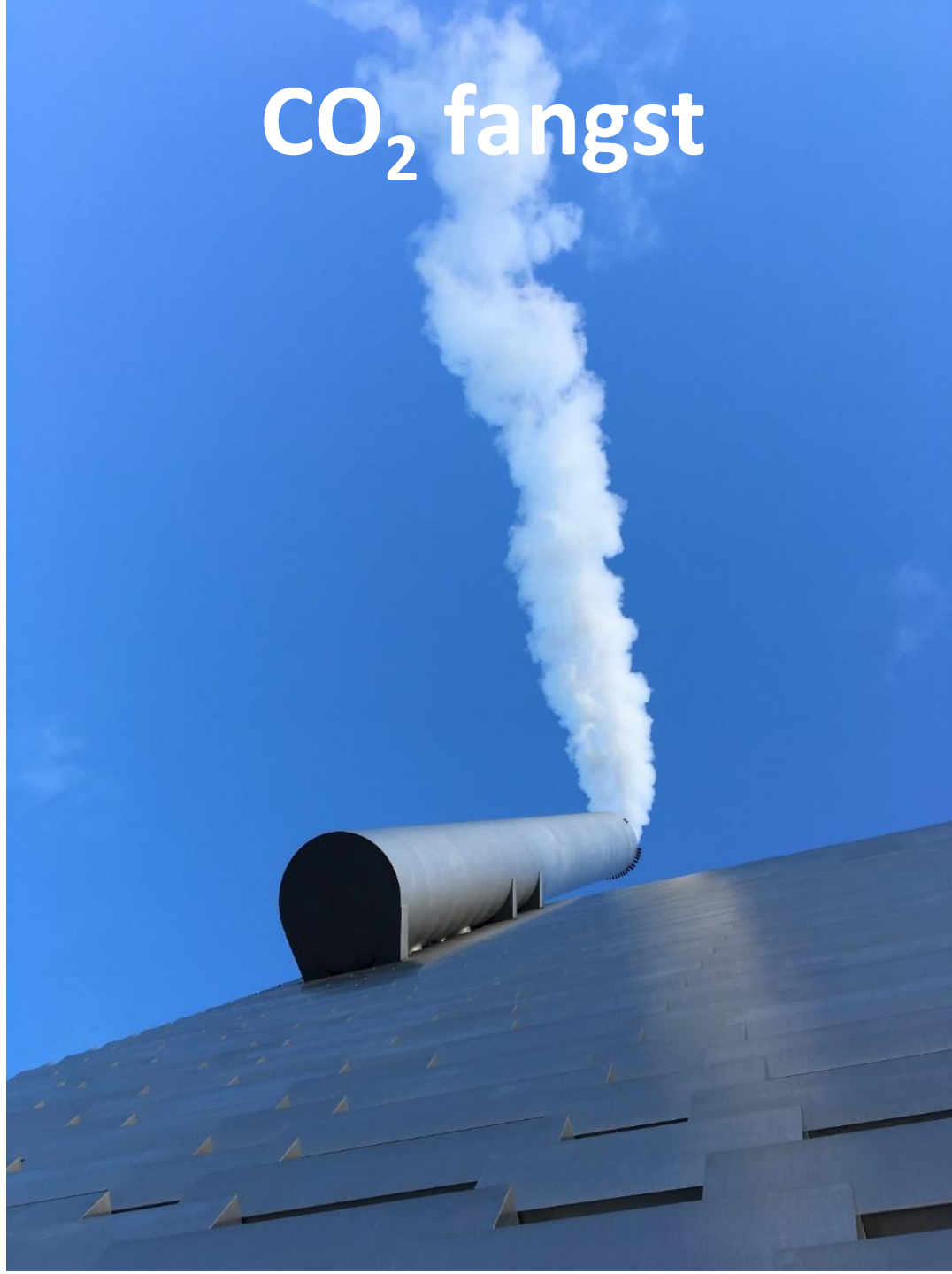
CO_2 fangst

480.000 ton/år

Fossile CO_2
(160.000 t/år)

Biogent CO_2
(320.000 t/år)





Fortum Oslo Varme’s CCS project

From waste to energy to negative emissions

Jannicke Gerner Bjerkås
Director CCS
Fortum Oslo Varme

The Norwegian CCS project

Infrastructure for Europe

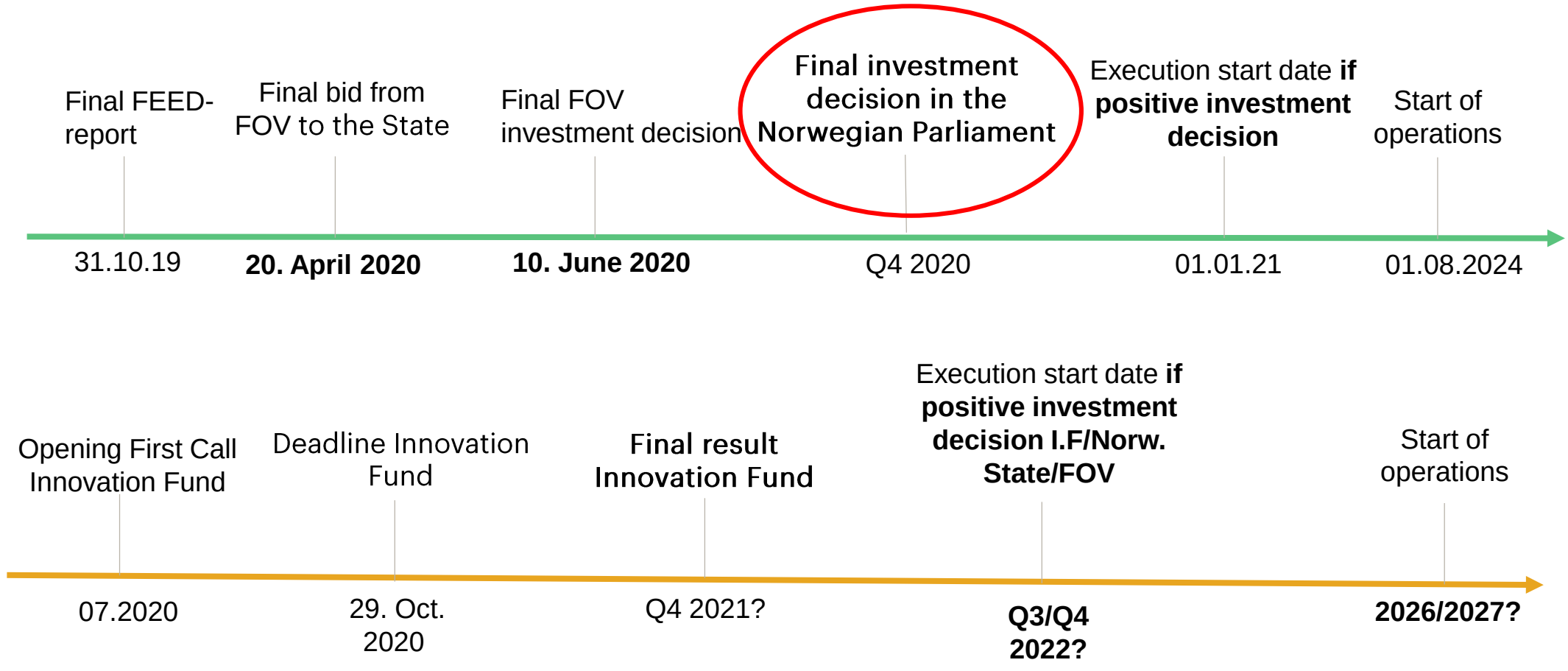
Paris agreement

- Below 2° C
- CCS key technology

Carbon Capture in Oslo

- Goal to capture about 400 000 tons CO_2 per year, 90% cleaning of CO_2
- CCS at Waste-to-Energy plants will capture both fossil and biological CO_2 (50 % BIOCCS)
- CO_2 transport to port via emission free cars
- Successful pilot testing on real flue gas; 5500 test hours, up to 95 % capture
- Technology supplier with full-scale experience (Shell's amine), EPC contractor TechnipFMC

Project timeline – two alternative possibilities



- Same overall goal, but different criteria and parametres
- Increased uncertainty and risk related to delay

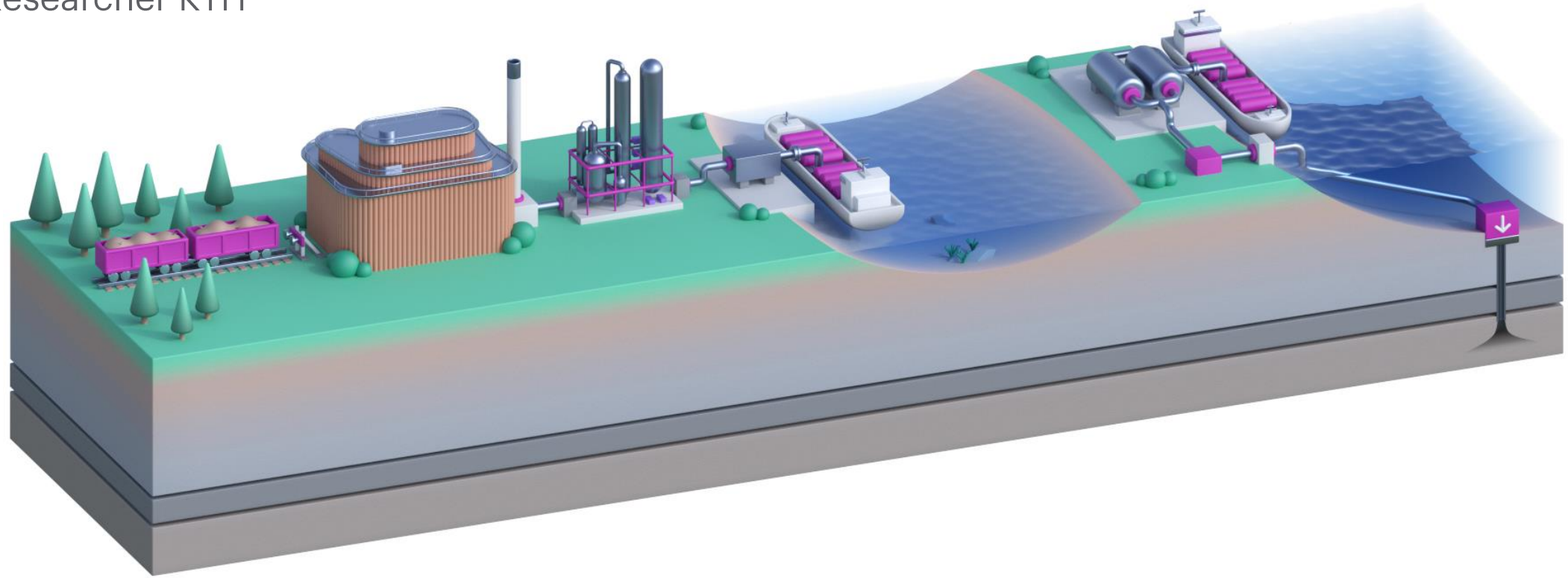
Large potential in an international perspective

- Our unique technical and industrial advantages:
  - Replicability. Operationalization and standardization directly transferable to other facilities and cities in Norway and Europe – 450 similar plants in Europe
  - BIOCCS is becoming more and more important - CCS on Waste-to-Energy will in practice remove CO2 from the atmosphere
  - Cities can reduce emissions from waste management as part of sustainable urban solutions, and close the cycle in a circular economy
  - Utilizes the heat from the capture process back into the district heating system
  - Demonstrates capture of CO2 transport to port - relevant to many emission points in Norway and Europe
  - CCS on Waste-to-Energy can cut large emissions outside the ETS


Join the change!
Thank you
fortum

Bio-CCS

Dr Fabian Levihn,
Head of R&D Stockholm Exergi
Researcher KTH



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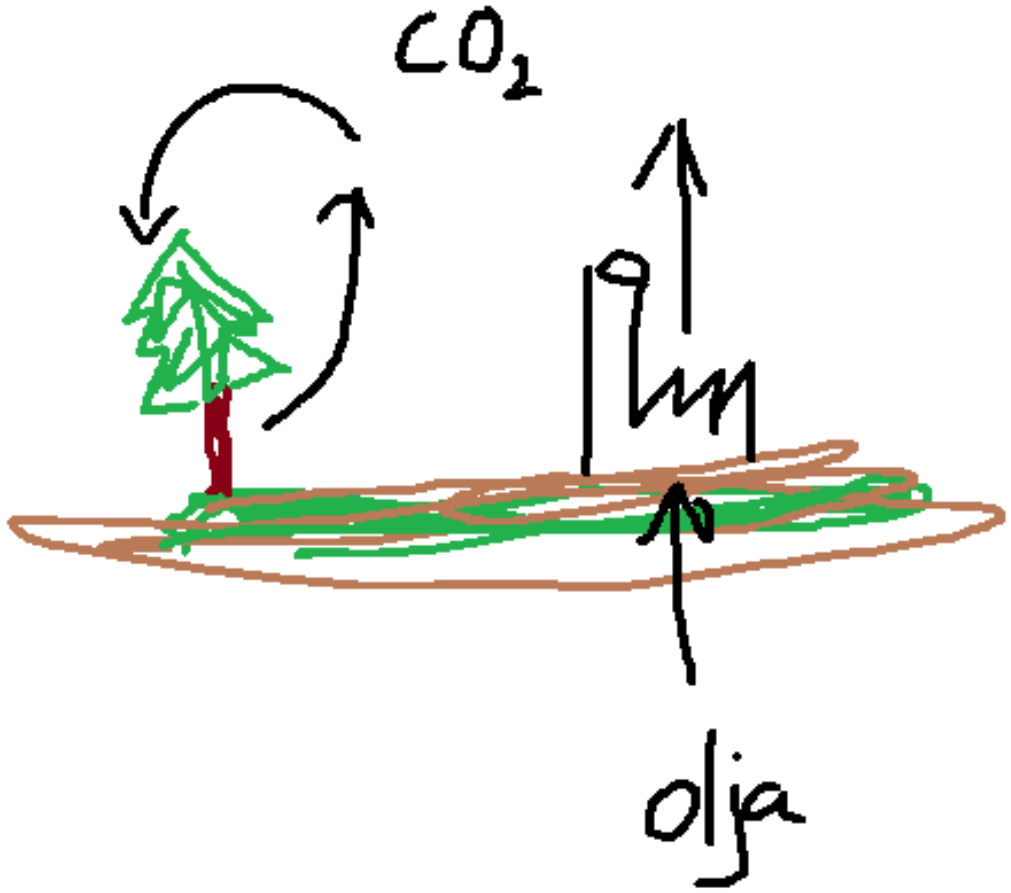
Bio-CCS vs CCS



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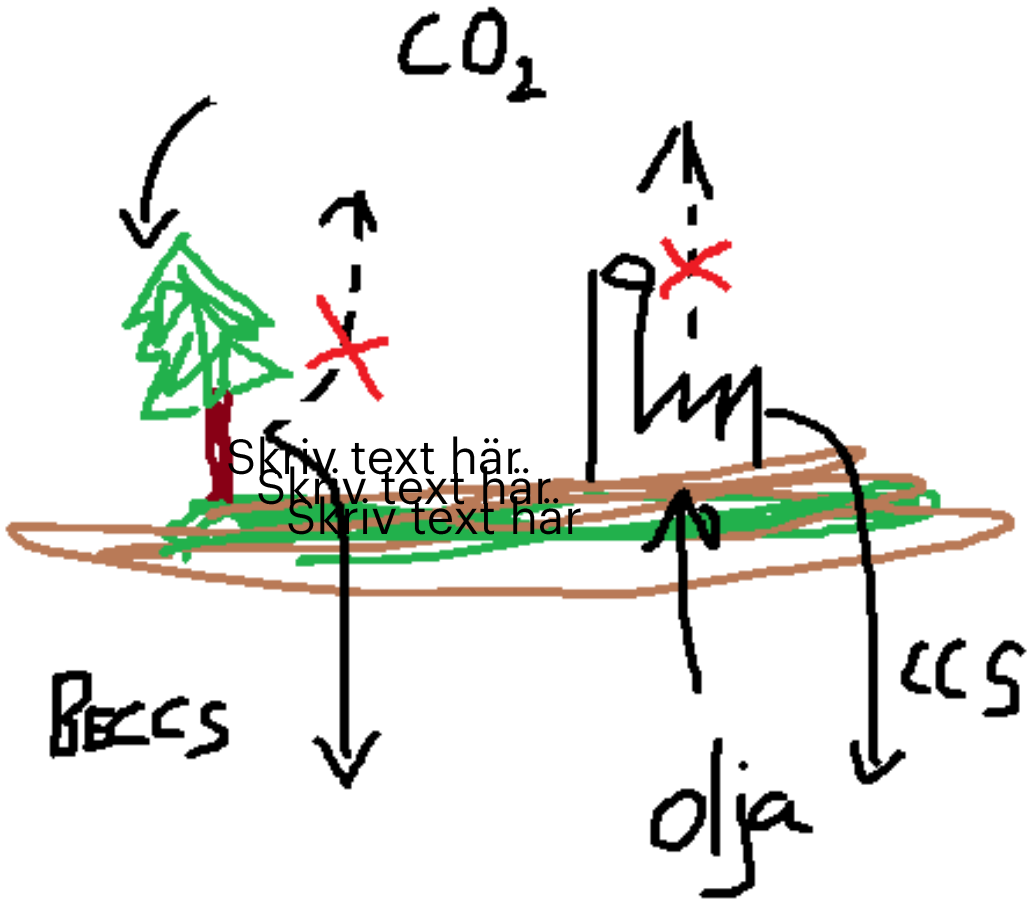
Bio-CCS vs CCS



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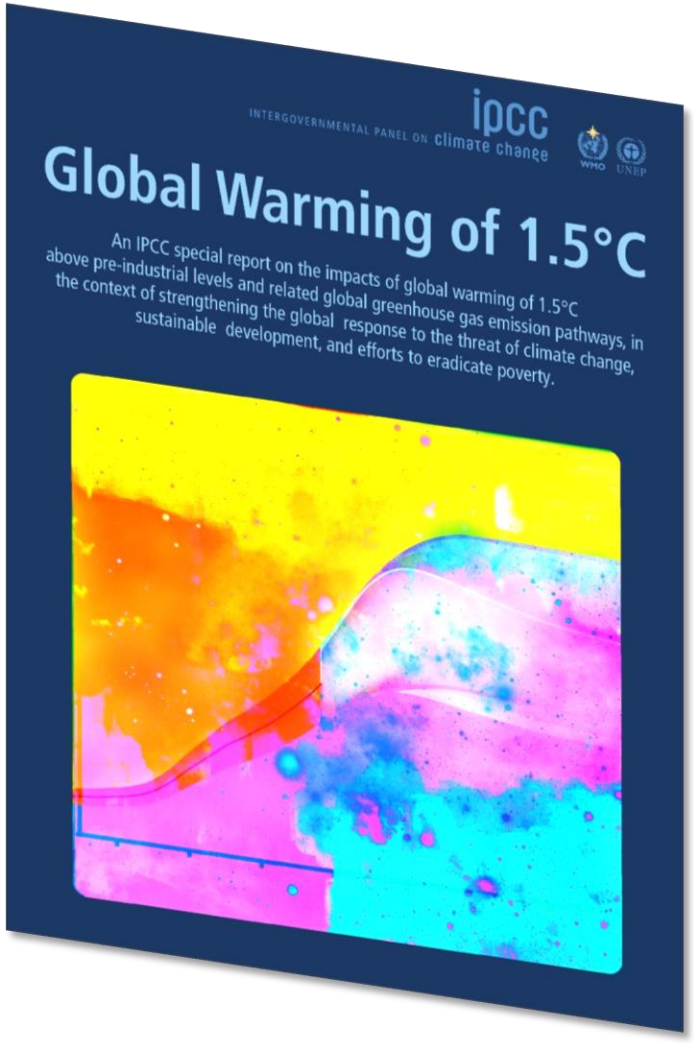
Background for bio-CCS

- Most pathways to limit global warming according to the COP21 and the Paris agreement relay on carbon dioxide removal (CDR) from the atmosphere through BECCS
- EU long term strategy requires 281-606 kton CO_2 p.a. of CDR.
- SOU 2020:4 show Swedish climate change targets requires up to 10 Mt p.a.
- Great regional differences in potential for different CDR.



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+ Great potential for heat recovery from a CCS process
+ Energy loss <2% possible
+ Avaialability of steam and electric power
+ Port (largest vessel handled 40 000 tonnes)
+ Big point source of biogenic CO2

- Crowded
- Proximity of the city

Thanks

fabian.levihn@stockholmexergi.se
+46725498582

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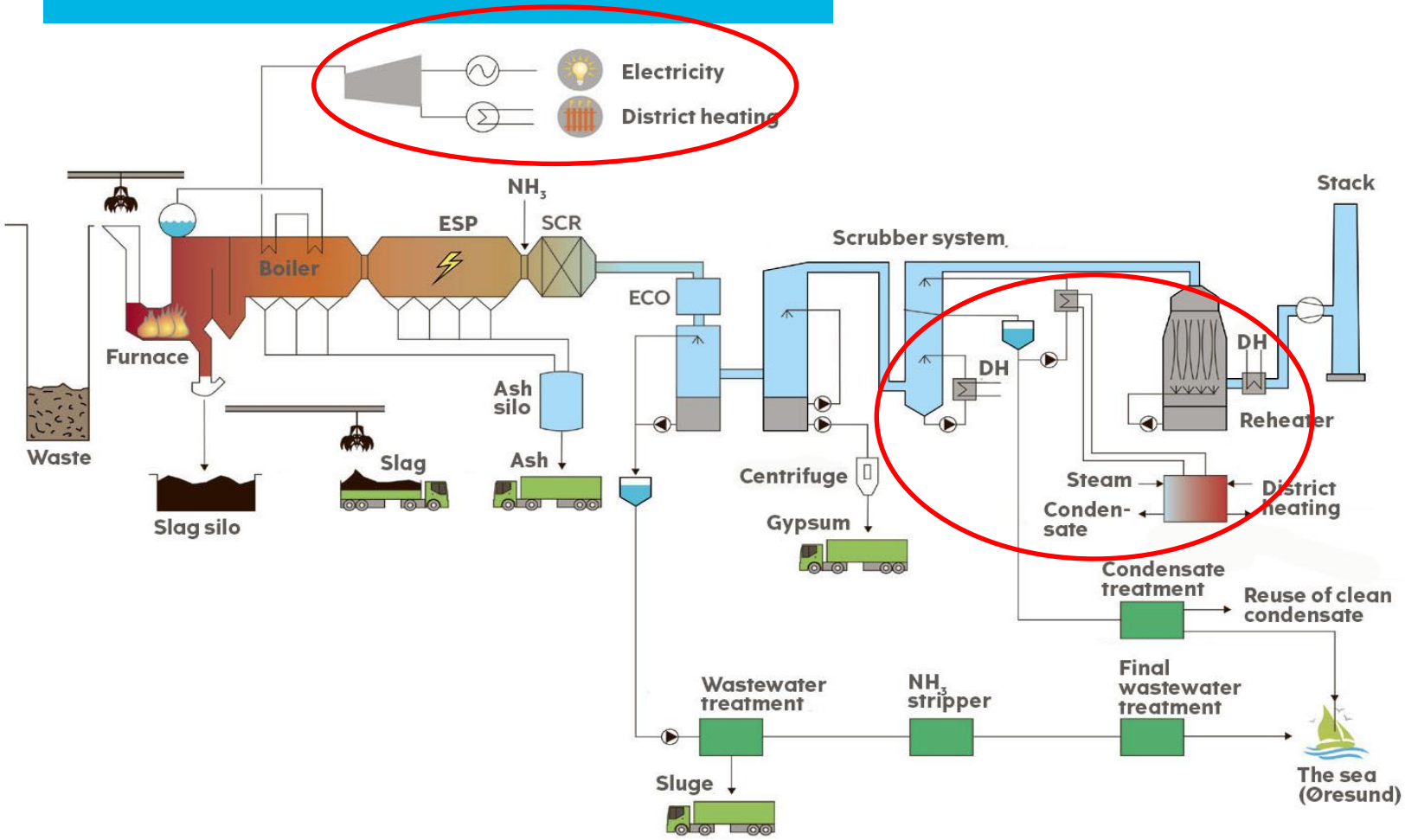
En kort introduktion til og status for **ARC – CCS**

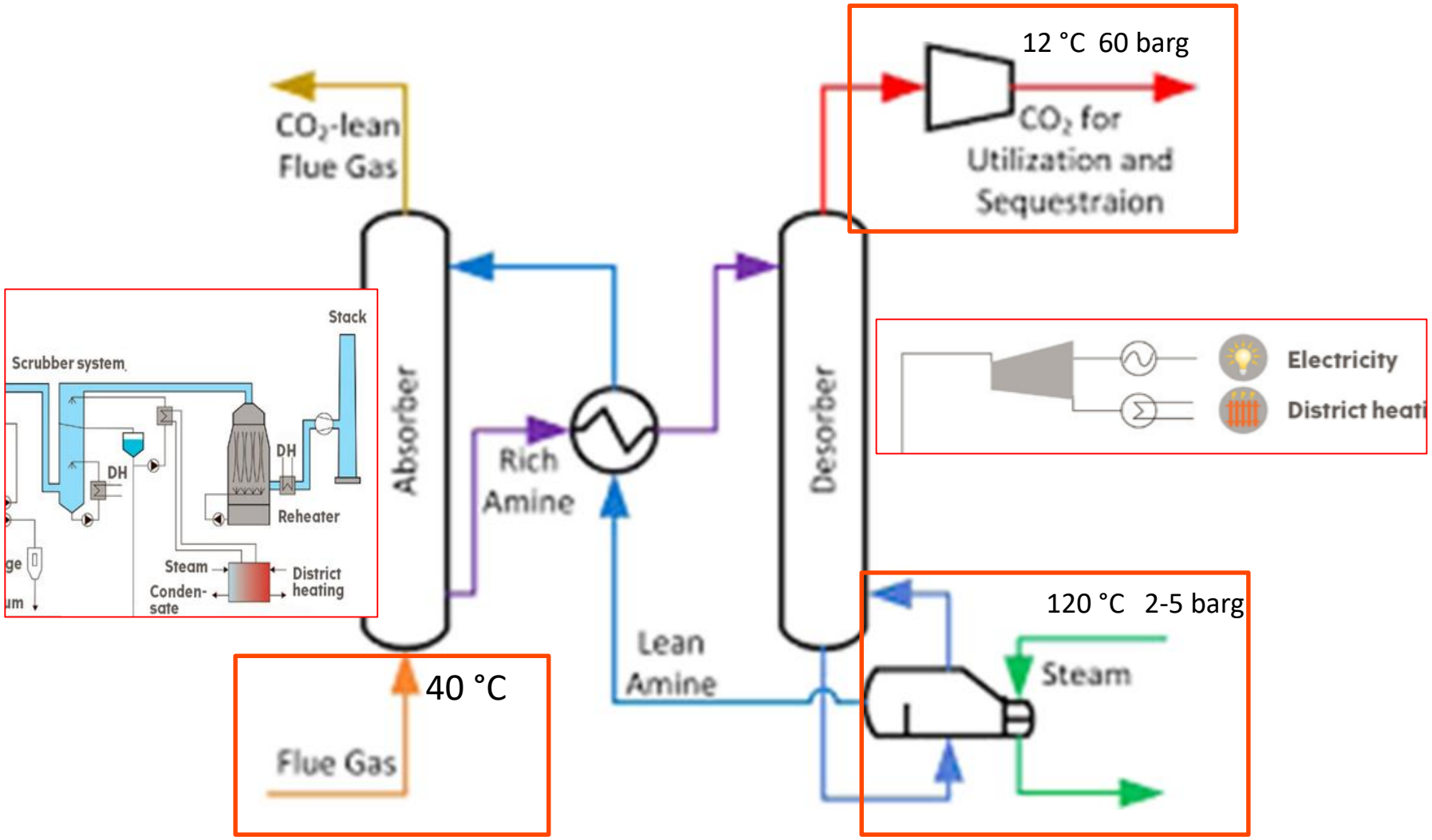
Peter Blinksbjerg, Quality Manager

amager ressource center

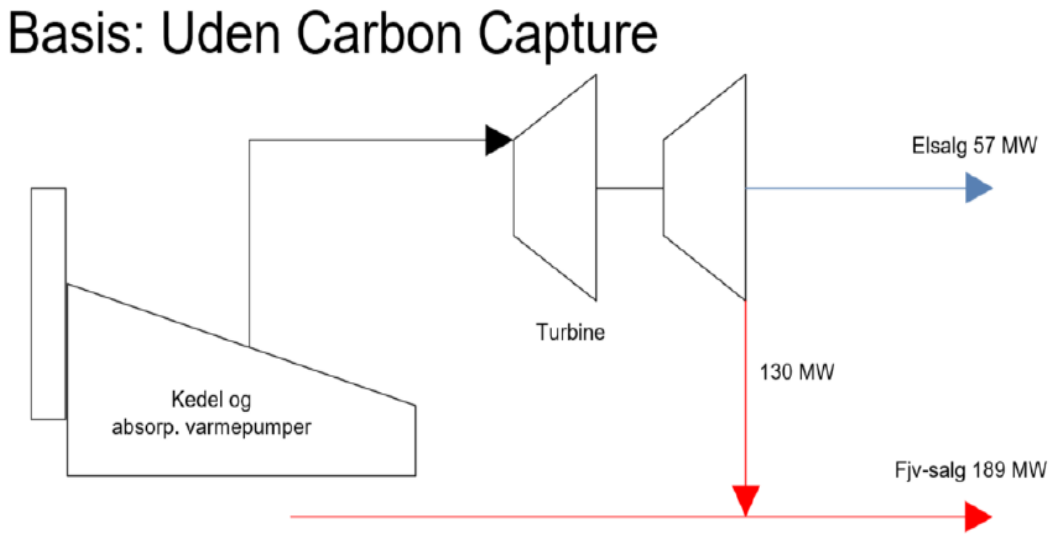
How it all works



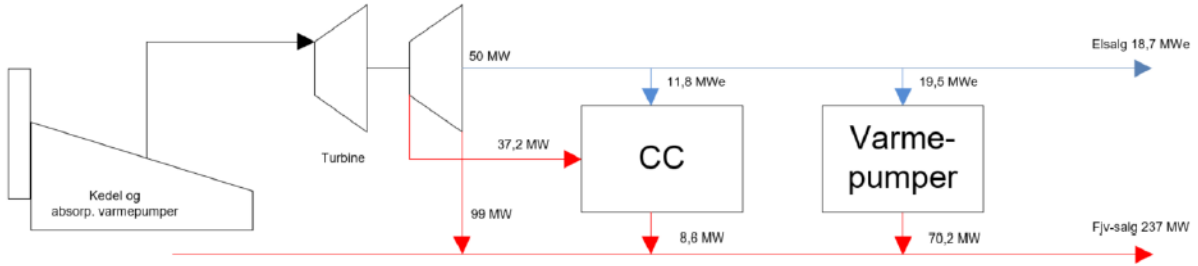
ARC CO_2-capture and heat balances



ARC: med og uden CO_2-fangst

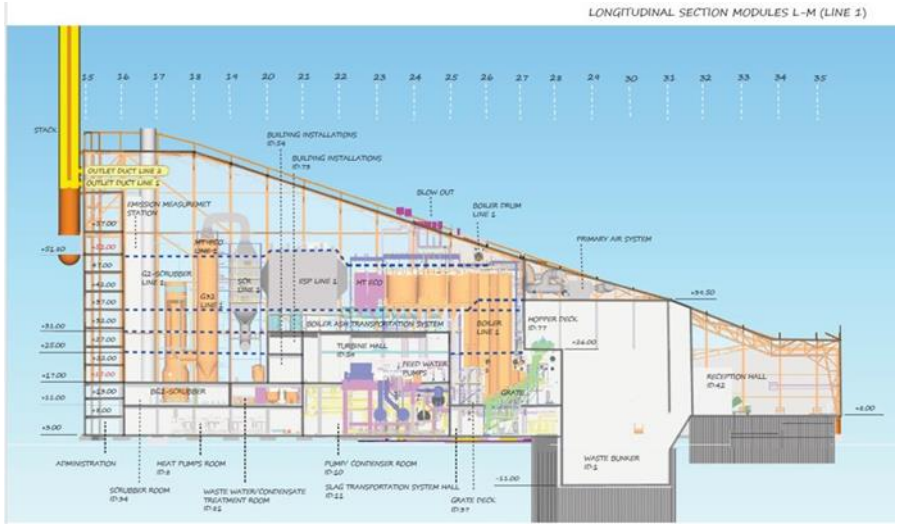


Scenarie 1: Dampudtag og fuld varmepumpeudnyttelse



Conclusion

The study shows that implementation of a CO_2 capture and conditioning plant recovering 78 ton CO_2/h with neutralization of the penalty on the existing WtE district heat system by advanced heat integration is feasible. Heat integration includes internal heat integration within the carbon capture and liquefaction plant in order to minimize steam extraction, as well as heat integration with the district heat system and upgrade of waste heat from the carbon capture plant, by use of new heat pumps or reuse of four of the eight existing absorption heat pumps at ARC.



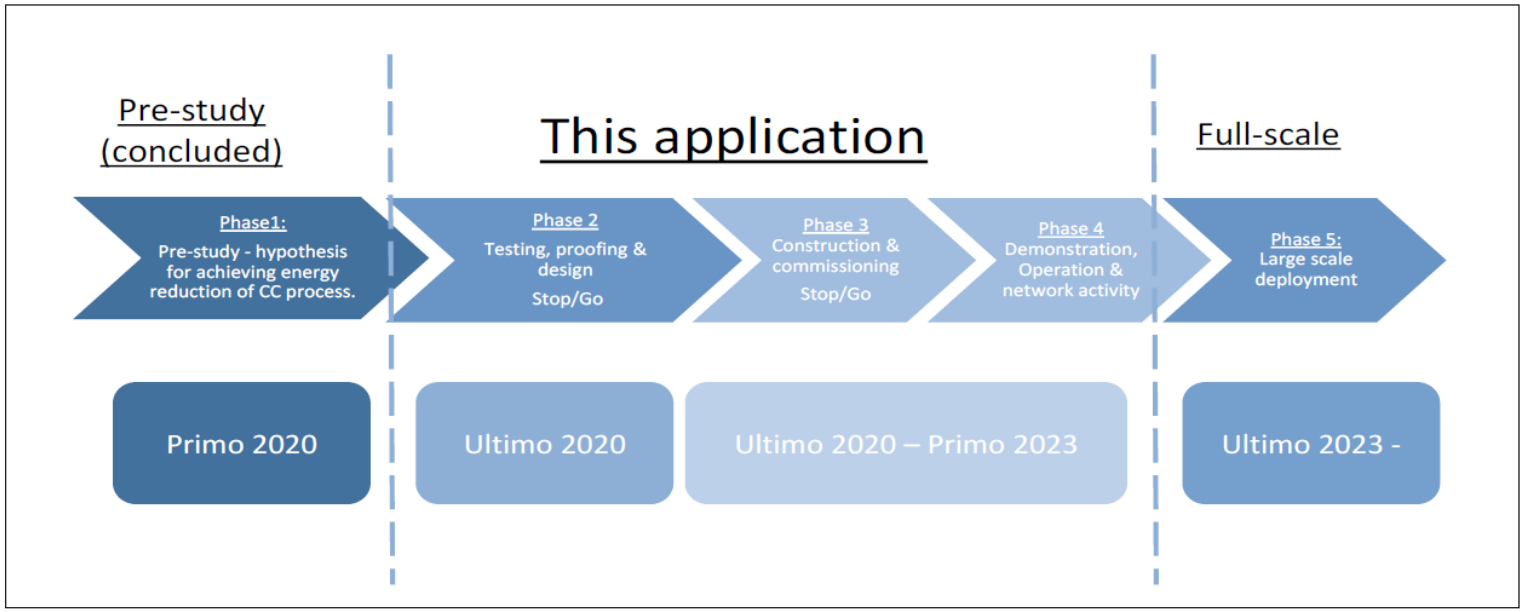
Overordnet plan

The applied project in a broader, collaborative perspective

The applied project is the second, third and fourth phase in ARCs journey to eliminate CO_2 from ARCs operations. These phases are:

- Phase 1: Pre-study and initial preparations (completed by Rambøll prior to this application)
- Phase 2: Testing, proofing and design – Stop/Go decision (this application)
- Phase 3: Construction and commissioning of 12 tons CO_2 per day pilot plant (this application)
- Phase 4: Demonstration & Operation of pilot plant and network activity
- Phase 5: Full-scale 480,000 tons/year CO_2 carbon capture at ARC and Project Greensand (2023 -)

The timeline in these five phases is shown in Figure 2.



amager ressource center

Northern Lights CCS

A European CO_2 transport and storage network

Carbon capture and storage: the Northern Lights project
Kjetil Wilhelmsen, Deal Delivery Manager
11 September 2020

https://northernlightsccs.com

Northern Lights CCS FID – a major milestone

Text size English

Government.no

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Important milestone in the CO2 storage project

Press release | Date: 15/05/2020
| No: 027/20

The Ministry of Petroleum and Energy has received and started our assessment of the development plan for the Northern Lights CO2-storage project.

Ministry of Petroleum and Energy

CONTACT
Press enquiries MPE
E-mail: info@oed.dep.no
Phone: +47 415 73 500

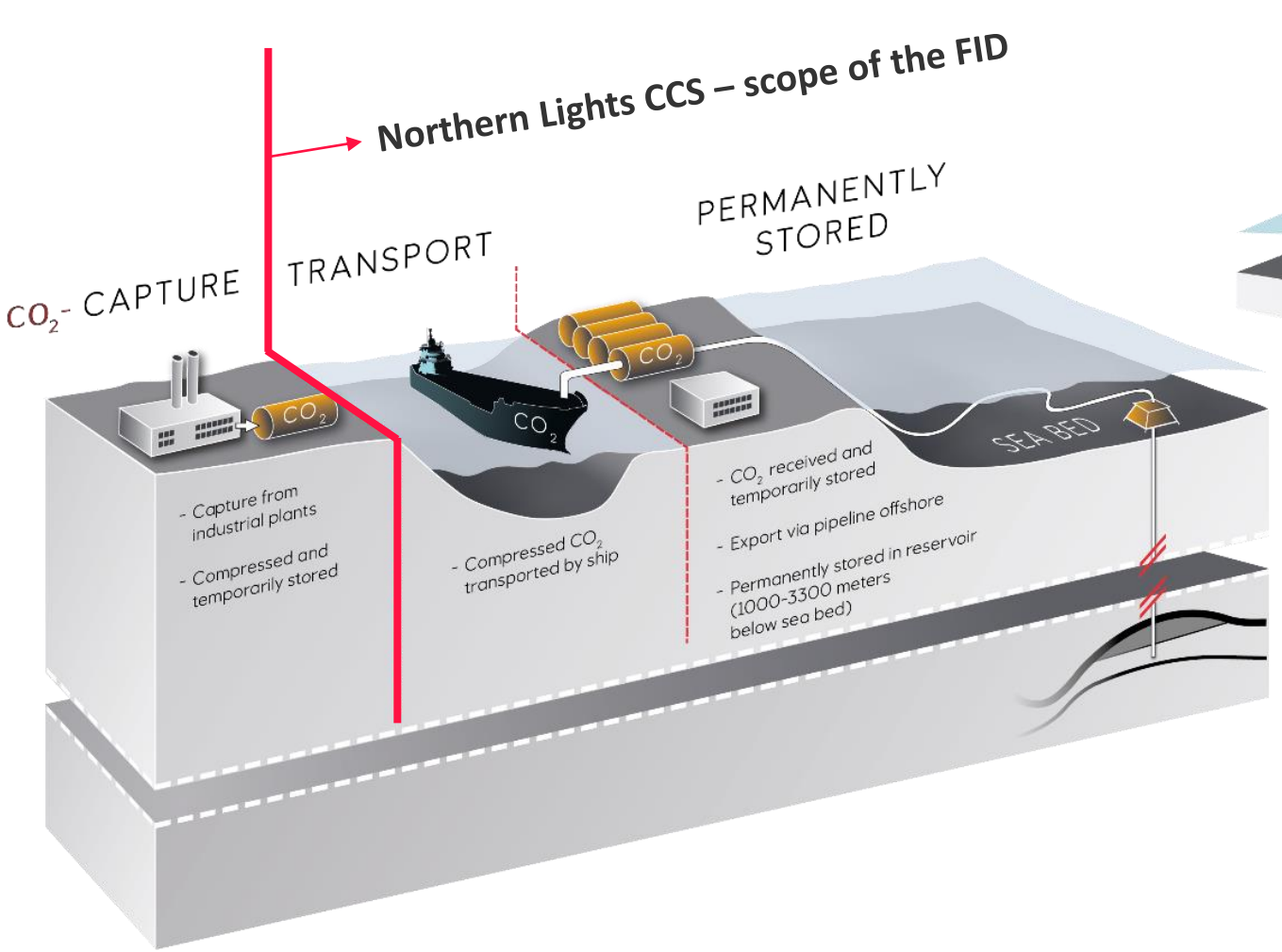
The energy transition – the role of CCS

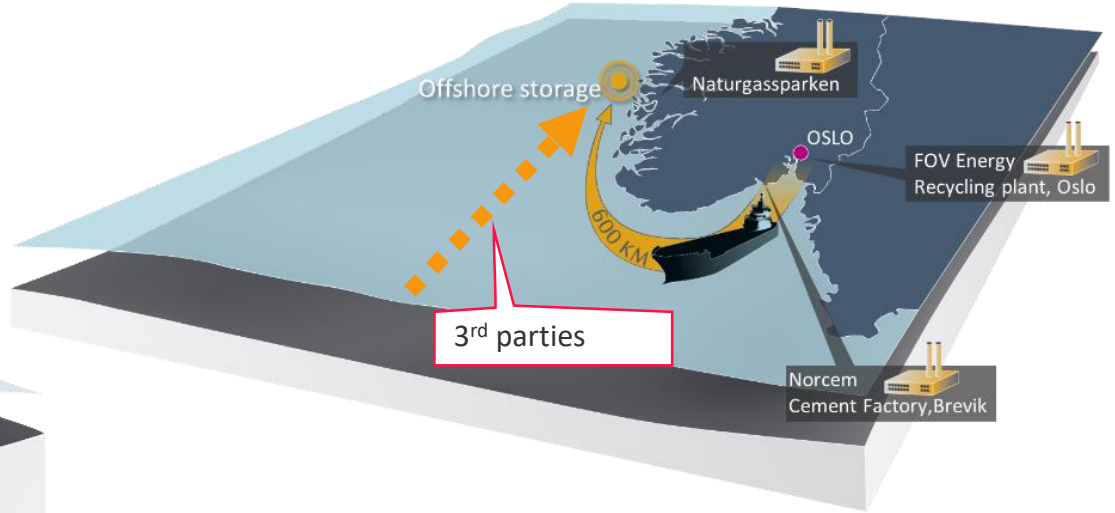
- Aggregate level: How do we de-carbonize the economy while at the same time maintaining industrial activities, value creation, jobs?
- Company level: What's our role? What will our shareholders want us to do? What can we afford?

Source: https://markets.businessinsider.com/commodities/co2-european-emission-allowances

- **What will the ETS price do in the future?**
- **Availability of subsidies?**
- **Is there a market for decarbonized end products?**
- **Covid-19 economic impact?**

The Norwegian full scale CCS demonstration project



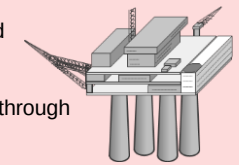


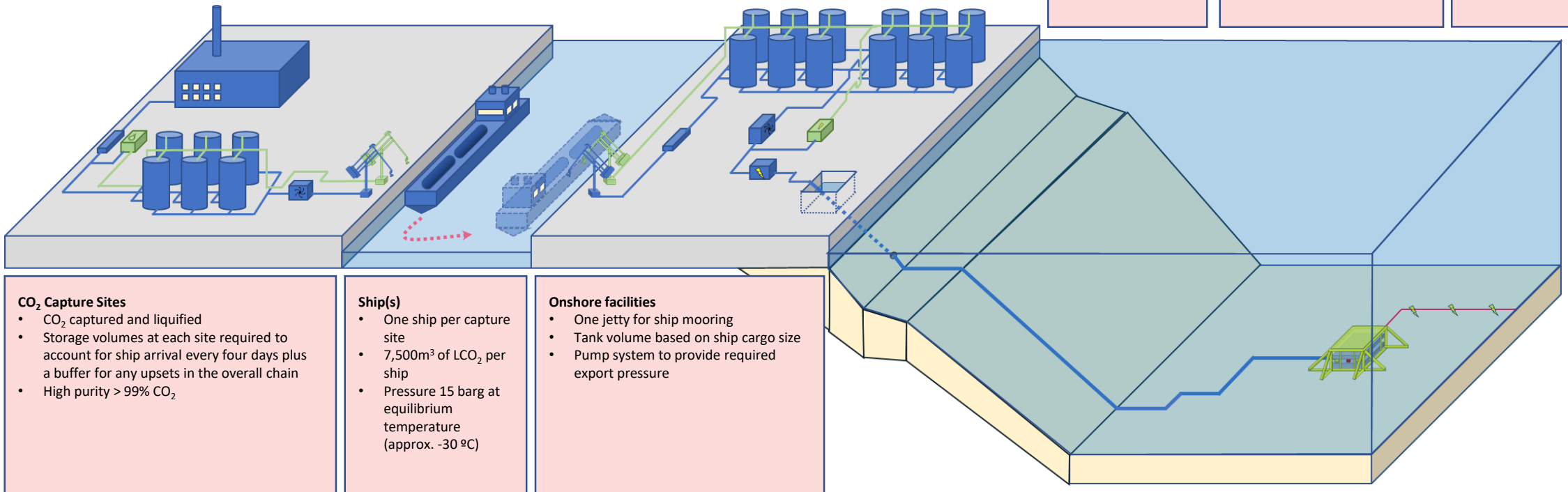
Northern Lights CCS concept overview

Pipeline
- 110km un-insulated pipeline
- 12 ¼ inch
- Single phase (liquid) CO_2

Subsea facilities
- Connecting pipeline, umbilical and well(s)
- Water depth ~300m
- Connection for future step-out

Umbilical to Oseberg
Connection from Oseberg-field providing power and signal from DC/FO and fluids through umbilical system



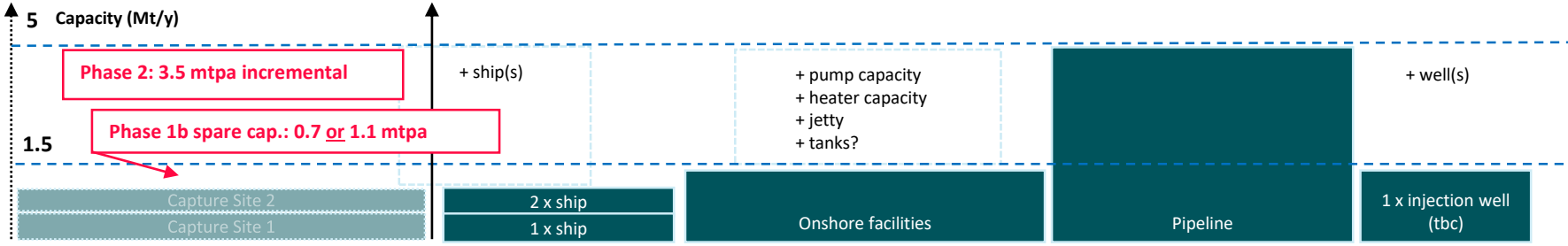


Subsea injection well
- Injection of CO_2 into reservoir at ~2-3000m depth
- Pressure in reservoir ~2-300bar
- Temperature in reservoir ~100 ºC

CO_2 Capture Sites
- CO_2 captured and liquified
- Storage volumes at each site required to account for ship arrival every four days plus a buffer for any upsets in the overall chain
- High purity > 99% CO_2

Ship(s)
- One ship per capture site
- 7,500m³ of LCO_2 per ship
- Pressure 15 barg at equilibrium temperature (approx. -30 ºC)

Onshore facilities
- One jetty for ship mooring
- Tank volume based on ship cargo size
- Pump system to provide required export pressure

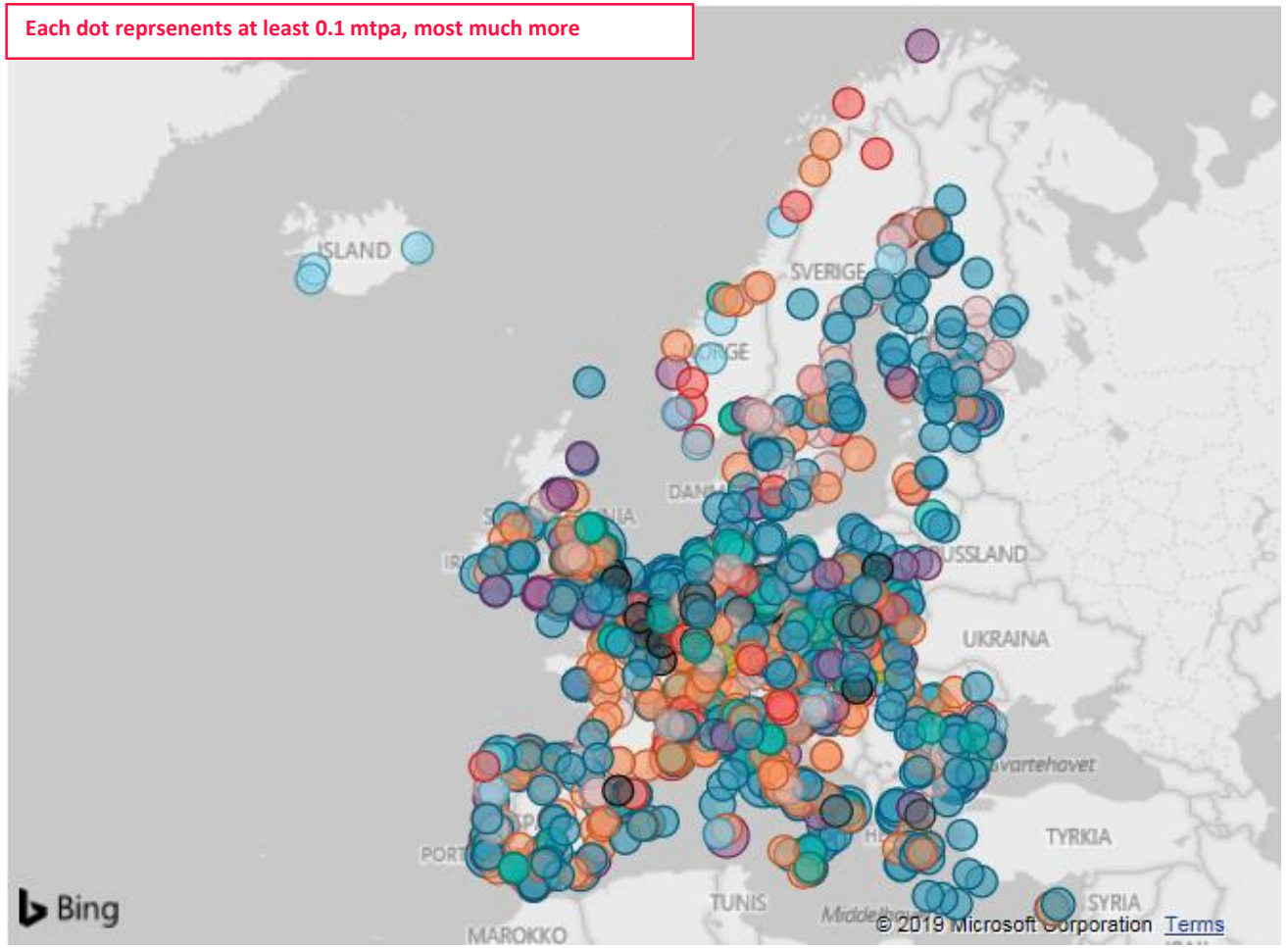


Storage complex
- Saline aquifer (Johansen formation) south of Troll ("Aurora")

Is there a business opportunity?

- There is no lack of CO2 in Europe
- The ship based solution means access for CO_2 emitters across Europe

Each dot reprsenents at least 0.1 mtpa, most much more



endrava CARBON LIMITS

Sectors with the largest potential

- Waste incineration / WtE
- Cement
- Biomass and biofuel
- Refineries
- Steel
- Natural gas
  - Hydrogen
  - Electricity
- Fertilizers
- Data centers
- DAC

Is there a business opportunity?

- There is no lack of CO2 in Europe
- The ship based solution means access for CO_2 emitters across Europe

For the entire Europe map:

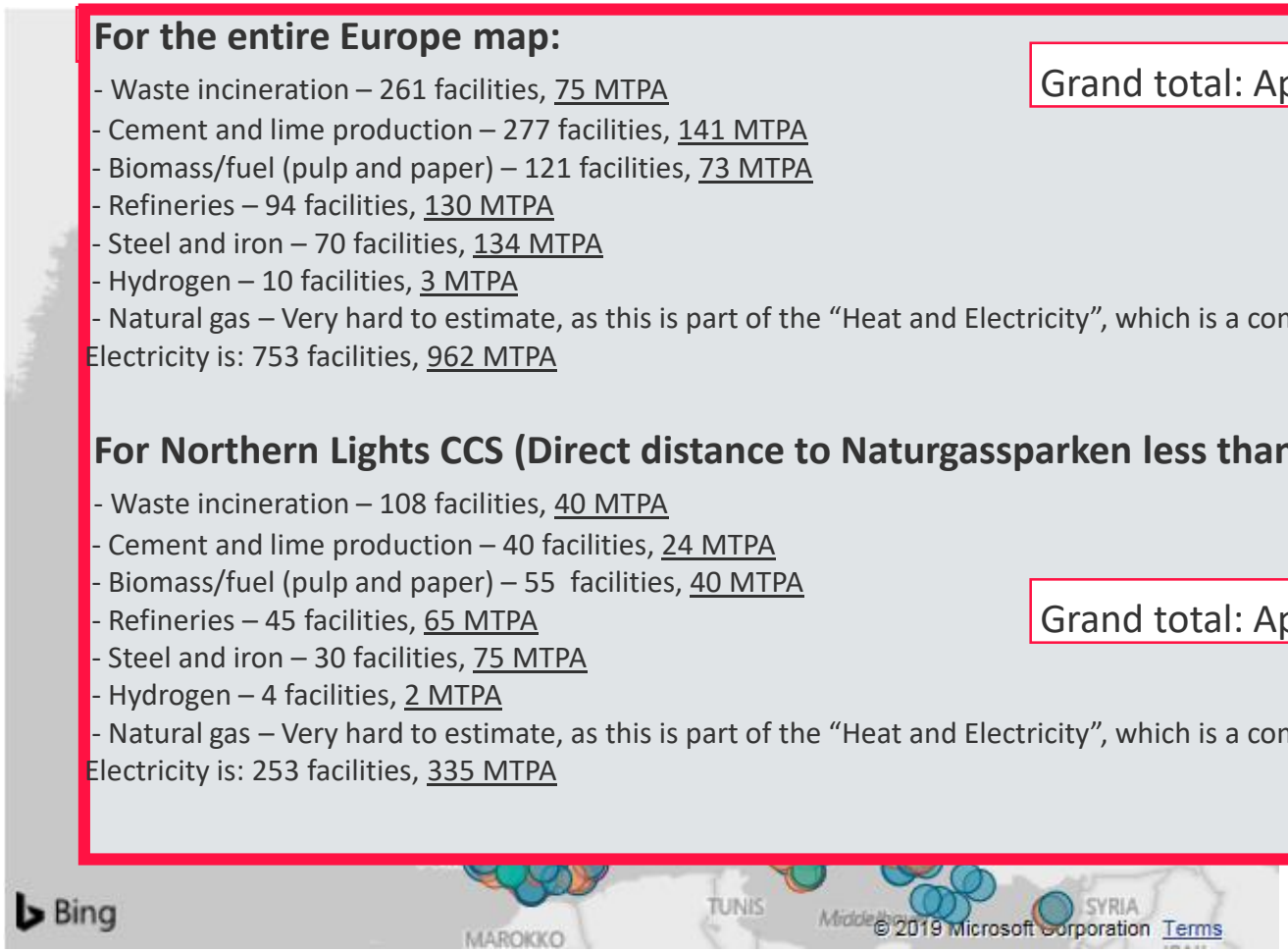
Grand total: Approx. 1 500 MTPA

- Waste incineration – 261 facilities, 75 MTPA
- Cement and lime production – 277 facilities, 141 MTPA
- Biomass/fuel (pulp and paper) – 121 facilities, 73 MTPA
- Refineries – 94 facilities, 130 MTPA
- Steel and iron – 70 facilities, 134 MTPA
- Hydrogen – 10 facilities, 3 MTPA
- Natural gas – Very hard to estimate, as this is part of the "Heat and Electricity", which is a combination of several fuel sources (coal, gas etc). Total for Heat and Electricity is: 753 facilities, 962 MTPA

For Northern Lights CCS (Direct distance to Naturgassparken less than 1500 km, closest port within 25 km):

Grand total: Approx. 580 MTPA

- Waste incineration – 108 facilities, 40 MTPA
- Cement and lime production – 40 facilities, 24 MTPA
- Biomass/fuel (pulp and paper) – 55 facilities, 40 MTPA
- Refineries – 45 facilities, 65 MTPA
- Steel and iron – 30 facilities, 75 MTPA
- Hydrogen – 4 facilities, 2 MTPA
- Natural gas – Very hard to estimate, as this is part of the "Heat and Electricity", which is a combination of several fuel sources (coal, gas etc). Total for Heat and Electricity is: 253 facilities, 335 MTPA



endrava CARBON LIMITS

Eight MoUs signed

COMPANIES

1. Fortum Group; Finland
2. Ervia, Ireland
3. Air Liquide, Belgium/France
4. Stockholm Exergi, Sweden
5. ArcelorMittal, Luxembourg/Belgium
6. Preem, Sweden
7. Heidelberg Group, Germany

ACADEMIC INSTITUTIONS

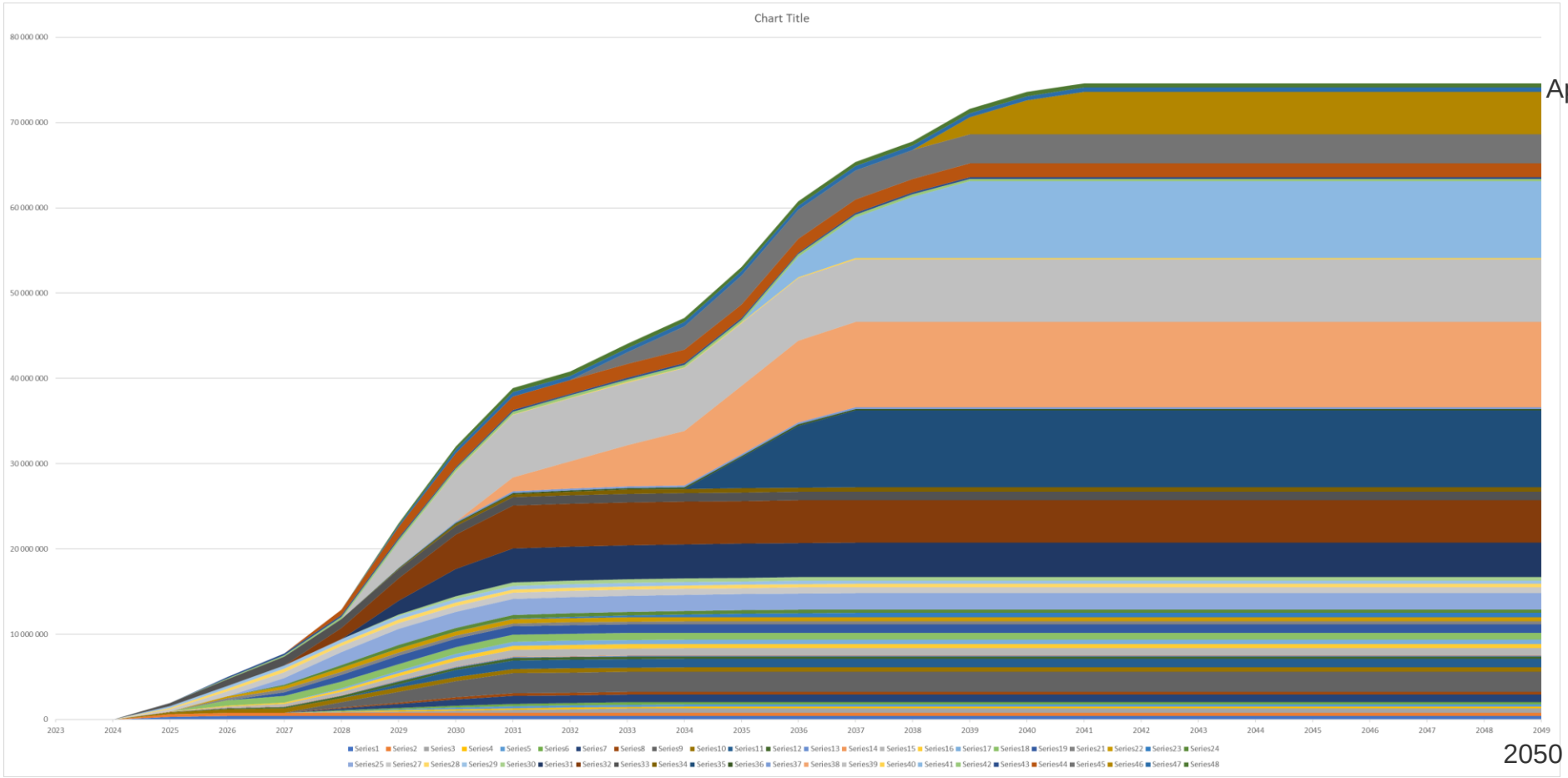
1. ETH Zurich, Switzerland

TYPICAL CONTENT

- Logistics studies
- CO_2 specifications optimized across value chain
- Roadmap towards potential start of operations, including key activities
- Joint advocacy for CCS and its importance for the successful decarbonization of European industry
- Initiate dialogue with National Government and dialogue with Norwegian government

NW Europe based companies that NL CCS have a positive dialogue with, MoU-partners ++

- *This is a dynamic picture, subject to change*
- *Will not be realized, but provides an impression of the scope/size of the prize*



Approx. 75 mtpa

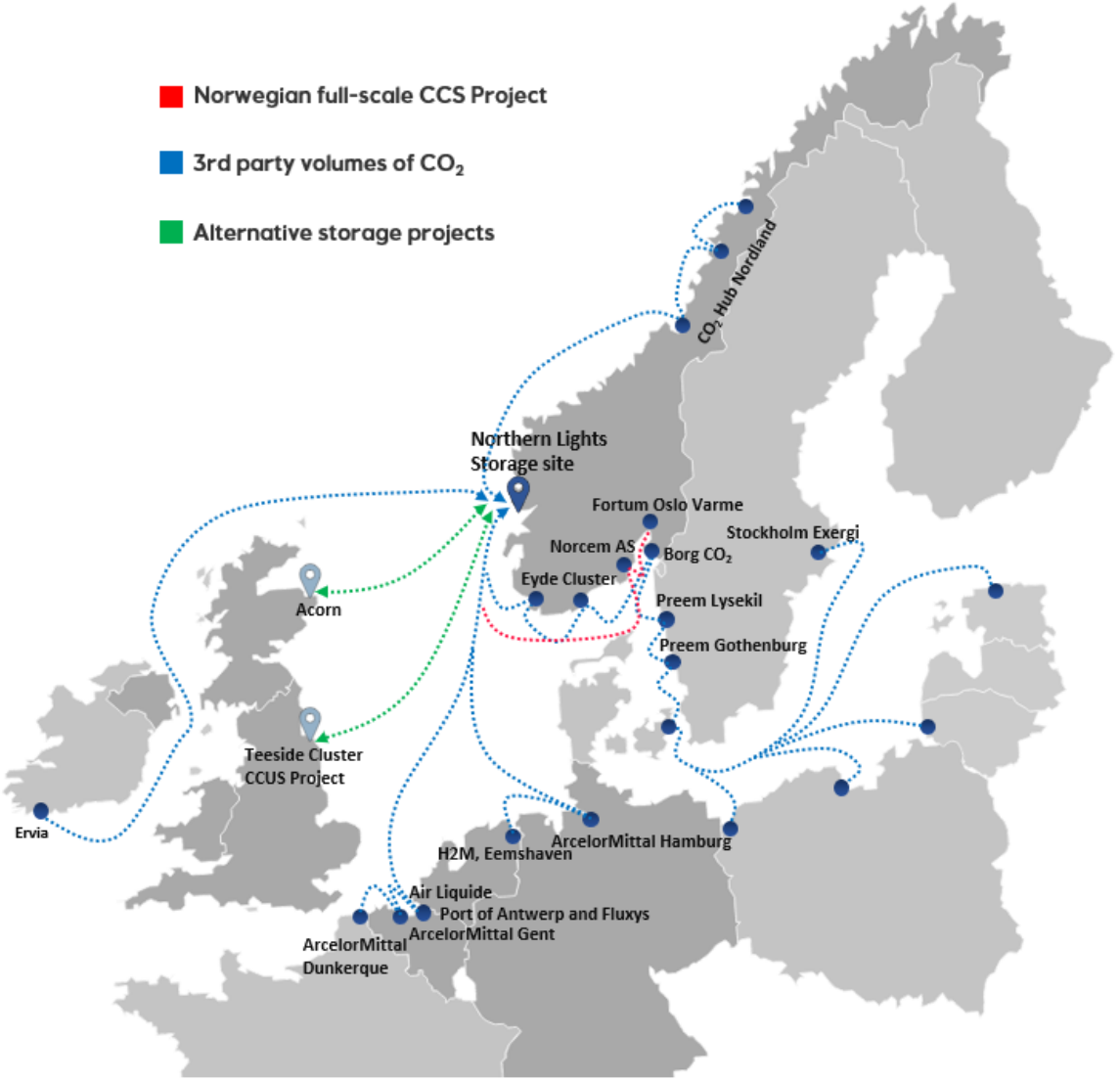
2050

Creation of a European CCS ecosystem and a virtuous circle

- Northern Lights CCS are being contacted by a number of companies that would like to play a role in the value chain
  - Capture
  - Transportation
  - Storage
  - Non-technical disciplines

- We believe this will stimulate
  - Innovation
  - Cost reductions
  - Jobs creation

- A ship based solution means access for CO2 emitters across Europe



Danmarks CCS-strategi og igangværende projekter

Nordisk webinar om CO2 fangst

11-9-2020

Lars Henrik Nielsen

Afdelingsleder,

De nationale geologiske undersøgelser for Danmark og Grønland, GEUS

G E U S

Danmarks CCS-strategi – en status

Med klimaaftalen for energi og industri mv. af 20 juni 2020 er der sket et paradigmeskift for CCS i Danmark:

- Aftalen ligger i forlængelse af en tidligere folketingsbeslutning fra 2010, hvor folketinget dengang besluttede at udskyde en drøftelse og beslutning vedrørende CCS til 2020
- Bag aftalen står et meget bredt flertal i Folketinget
- Politisk enighed om, at der skal være mulighed for fangst, transport og lagring i Danmark under forudsætning af forsvarlige sikkerheds- og miljømæssige forhold
- Enighed om, at det skal være muligt at transportere indfanget CO2 på tværs af landgrænser under samme forudsætninger

GEUS

Danmarks CCS-strategi – en status

Med klimaaftalen for energi og industri mv. af 20 juni 2020 er der sket et paradigmeskift for CCS i Danmark:

- Der afsættes en markedsbaseret teknologineutral pulje til at støtte CO2 reduktioner gennem CCUS
- Puljen indfases fra 2024 og vil når den er fuldt indfaset i 2029 være på 800 mio. kr. pr. år. Løbetiden er 20 år.
- Det skønnes at puljen i 2030 og fremefter vil levere årlige CO2 reduktioner på 0,9 mio. ton. Pr. År.
- Der skal udarbejdes en samlet dansk CCS, CCU og PtX strategi
- Der pågår et større udredningsarbejde i Klima, Energi og Forsyningsministeriet ift. lovgivning, sikkerhedsspørgsmål, incitament strukturer, ejerskab til lager etc., som skal lede frem til et regeringsoplæg vedr. en samlet strategi for CO2-fangst, lagring og anvendelse (CCUS) og PtX i Danmark
- Når udredningsarbejdet er afsluttet vil regeringen fremlægge en konkret CCS-strategi til drøftelse og forhandling mellem folketingets partier indenfor den nuværende folketingssamling; strategien skal understøtte udbredelsen af fremtidens grønne løsninger.

GEUS

Igangværende projekter

- GreenSand – Ineos´ projekt, anvendelse af et udtjent oliefelt til permanent lagring af CO2
- SKANDICCS – En ansøgning til H2020 vedr. modning af struktur til permanent lagring af CO2
- Havnsø - GEUS arbejder på at modne strukturen til lagring af CO2
- ConcenCUS – En ansøgning til H2020 vedr. analyse af mulighederne for midlertidig lagring af CO2

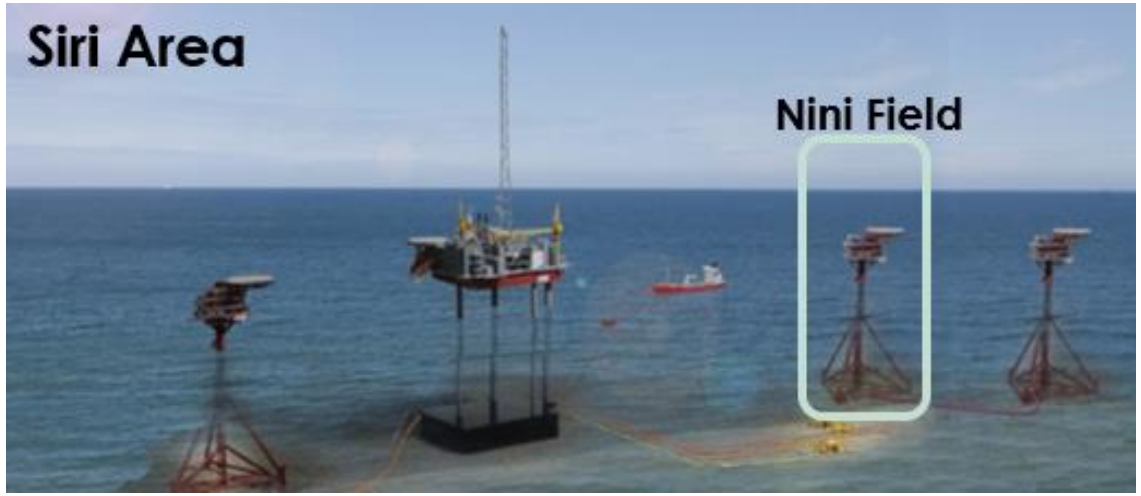
Project Greensand – CO_2 storage in depleted oil field

Project Consortium

INEOS Oil & Gas · wintershall dea · MAERSK DRILLING

Research Partner

GEUS

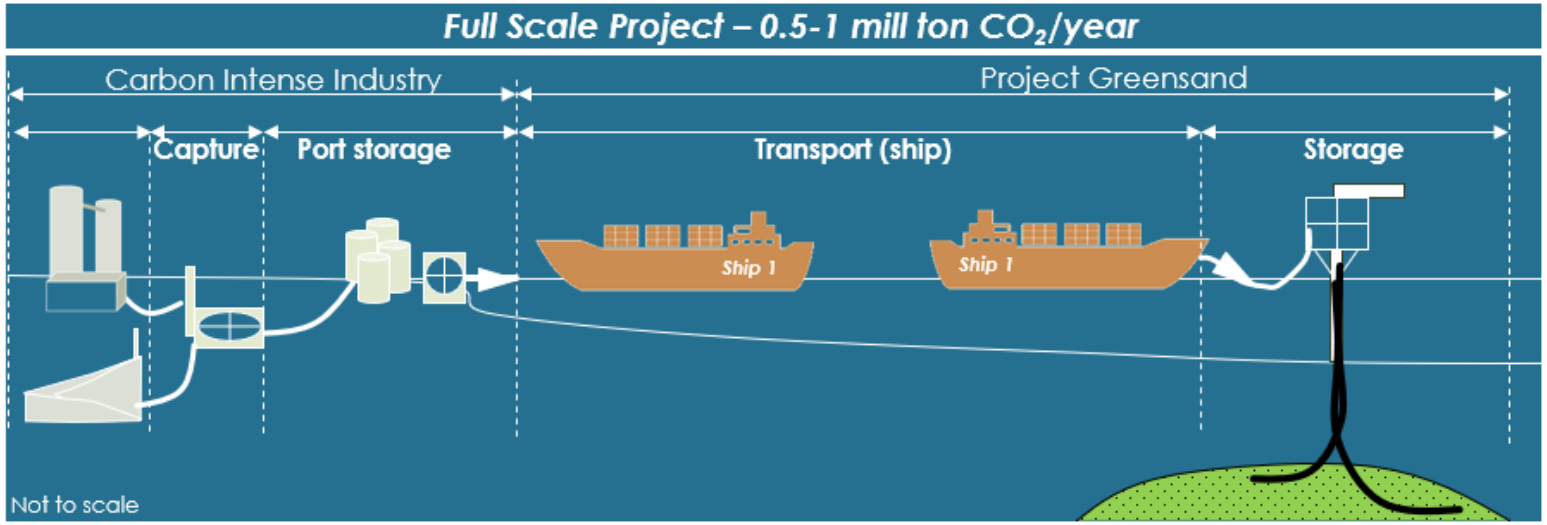


✓ **Fast-track storage site maturation**

- CO_2 storage within 4-6 years

✓ **Direct scalability and exploitation**

- Up to 4mt CO_2/y when fully developed



✓ **Cost effective CCS**

- Use of existing drill center
- Use of existing wells (full or partly) for injection and monitoring
- Significant data acquisition already done

Project Greensand – Storage setup

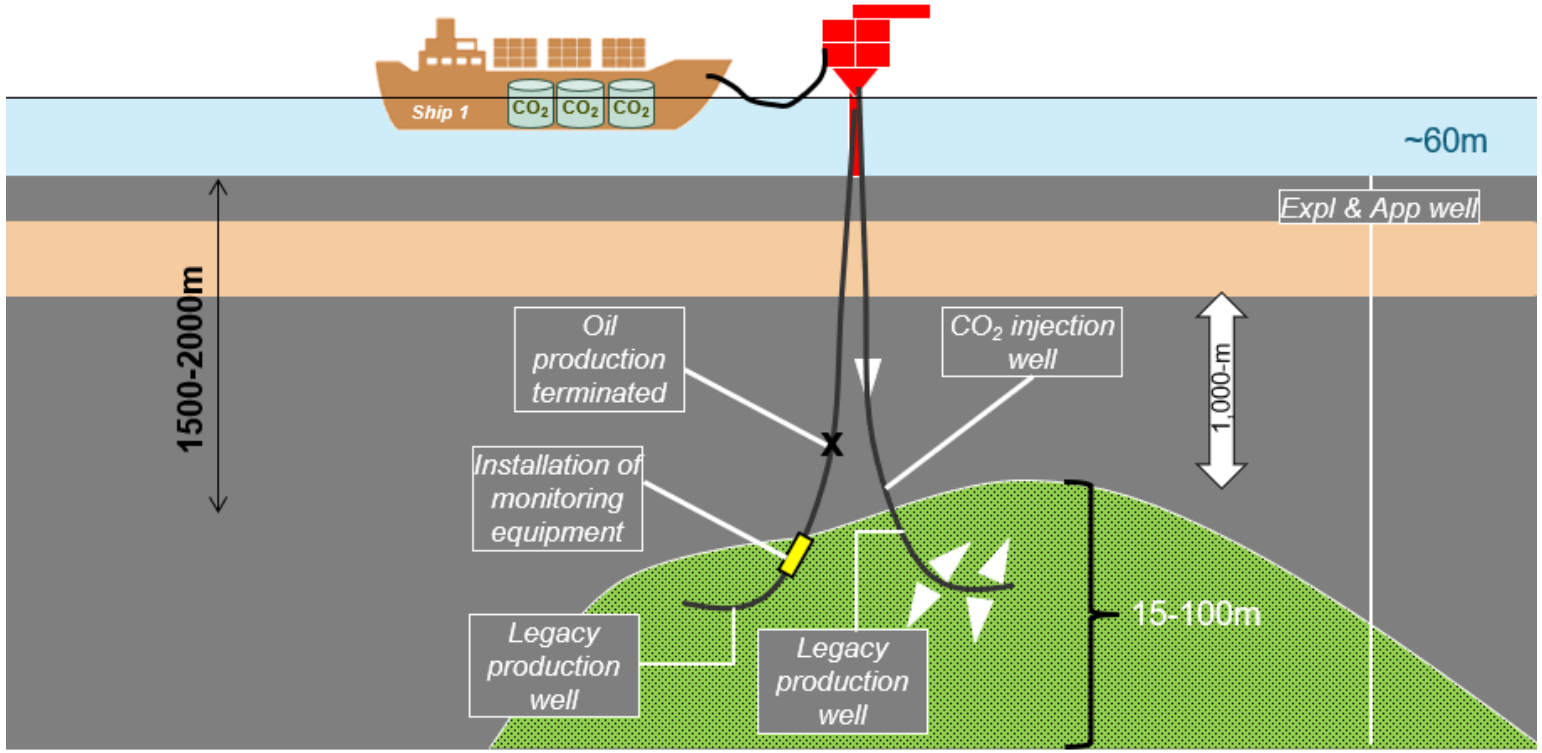
Project Consortium

INEOS Oil & Gas · wintershall dea · MAERSK DRILLING

Research Partner

GEUS

- ✓ Documented trap for hydrocarbons (10-20 my) + large aquifer
- ✓ 2 production wells – known injectivity and connectivity
- ✓ 8 Exploration & Appraisal wells with intensive data package (cores & logs)
- ✓ Multiple seismic cubes
- ✓ 15 years of production data → Documentation of large coherent sand body



CO_2 Storage in the Nini Field can be a reality by 2025 given:

- **Regulatory framework allowing use of existing licences**
- **Funding beyond Danish State Pool**

Mature the Hanstholm structure near-coast of Denmark, to support subsequent application of a CO_2 storage permit

1. Bring the Hanstholm structure from maturity class Play to Prospect in the SRMS classification system[a]
2. Develop guidelines for a data acquisition strategy that provides sufficient information for a reliable site assessment to a minimum cost
3. Suggest a Business model for the Hanstholm storage site
4. Contribute to positive CCS awareness in Denmark and the Thisted region

[a] SPE CO_2 Storage Resources Management System, 2017

https://data.geus.dk/nordiccs/map.xhtml

SKANDICCS

Mature the Hanstholm structure near-coast of Denmark, to support subsequent application of a CO_2 storage permit

- WP1 Seismic acquisition
- WP2 On-shore pilot well
- WP3 Geological characterisation
- WP4 CO_2 storage assessment
- WP5 Business models
- WP6 Social analyses
- WP7 Dissemination
- WP8 Management

https://data.geus.dk/nordiccs/map.xhtml

SKANDICCS

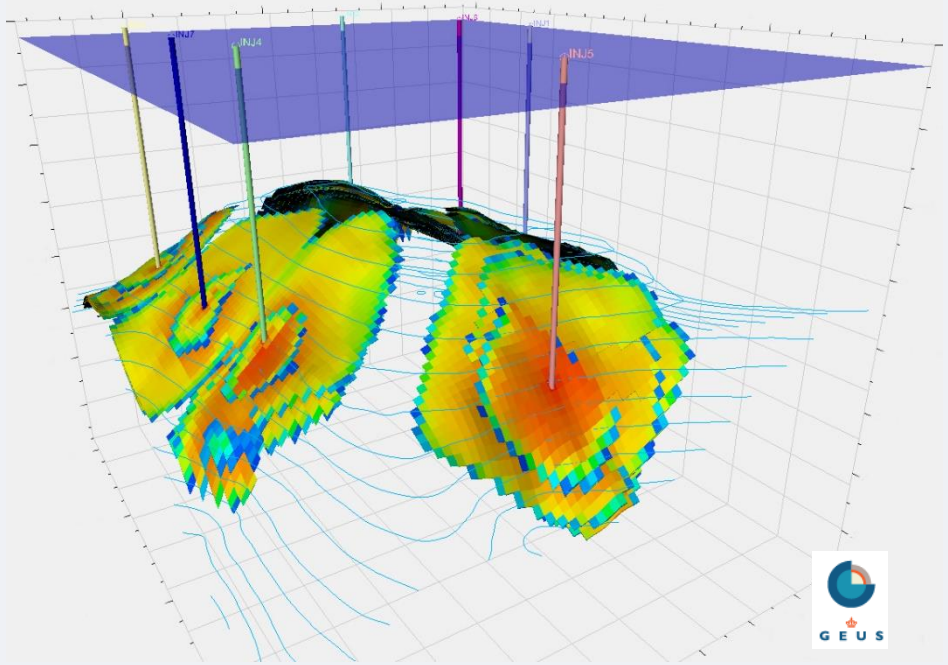
Mature the Hanstholm structure near-coast of Denmark, to support subsequent application of a CO_2 storage permit

WP4
CO_2 storage assessment

WP lead
Uppsala University

Task 4.1	Regional pressure response
Task 4.2	Injectivity and injection performance
Task 4.3	Geomechanical response
Task 4.4	Fault behavoiur
Task 4.5	Dynamic storage capacity
Task 4.6	Storage risk assessment and draft monitoring plan

HANSTHOLM STRUCTURE



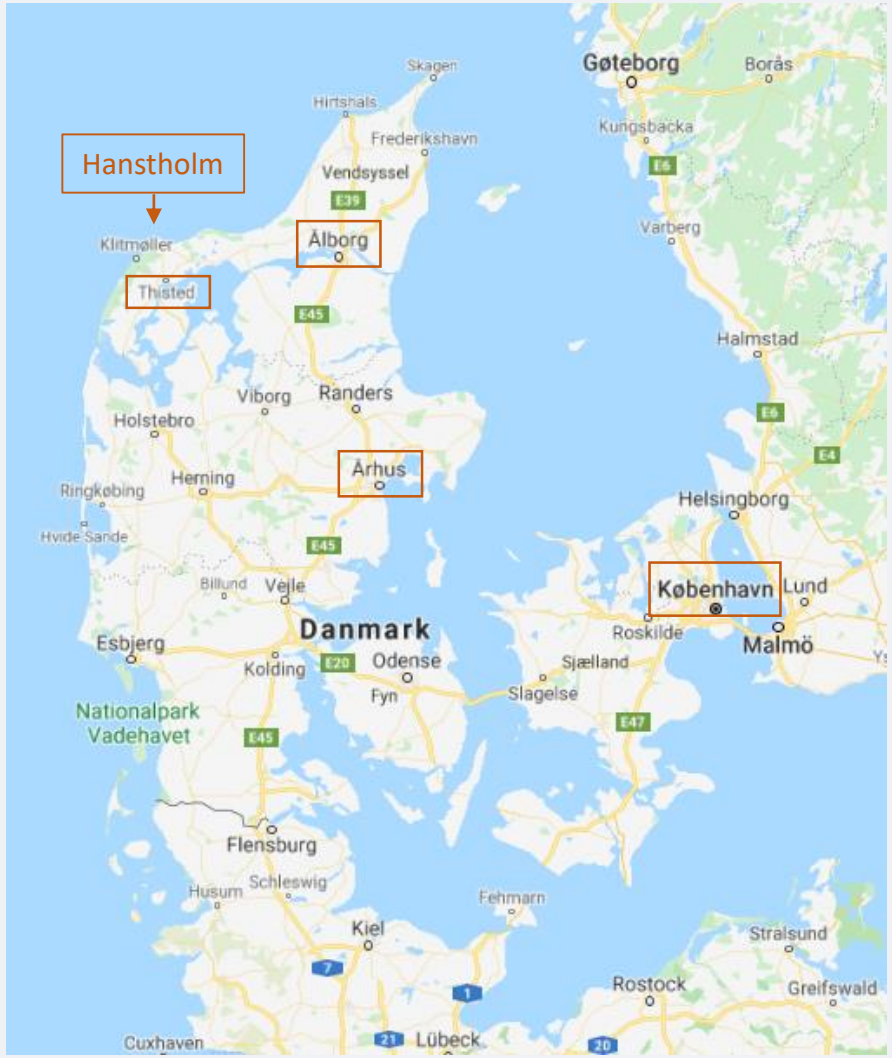
Simulation results after injection of CO_2 into the Hanstholm structure using seven injection wells. The CO_2 plumes show varying saturation from high (red) to low (blue). Depth contour lines for the structure is shown as thin blue lines.

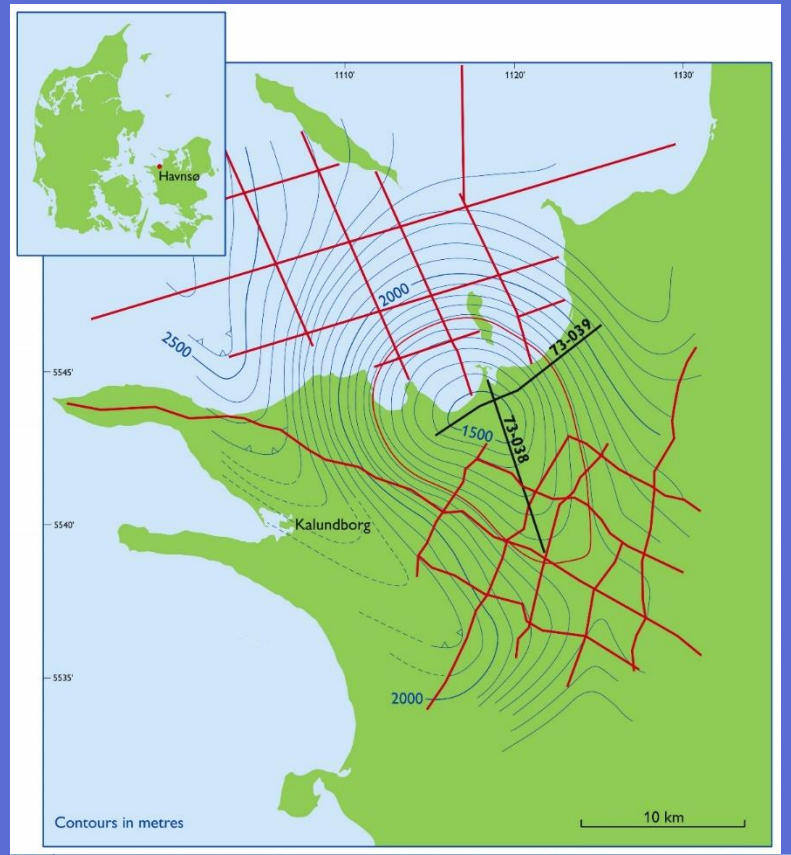
SKANDICCS

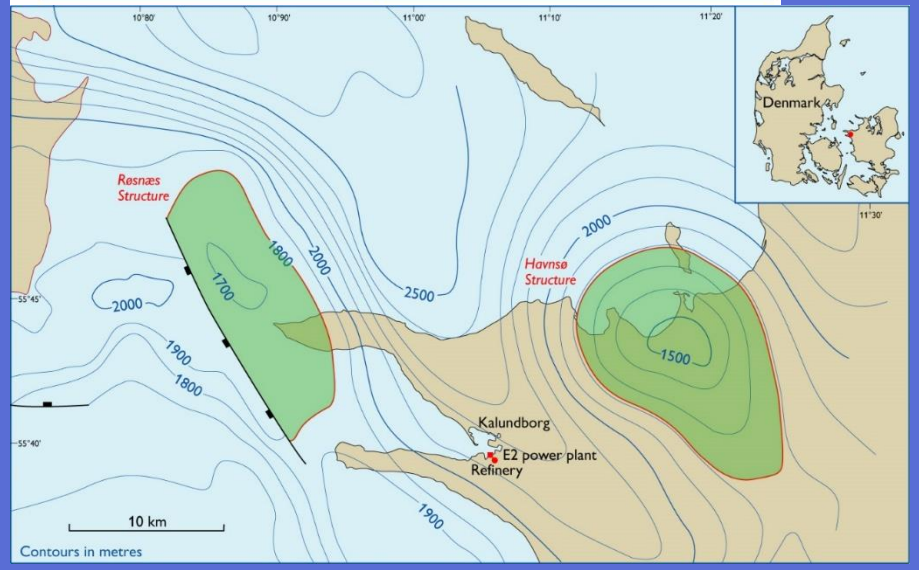
PARTNERS AS PER 01.09.2020

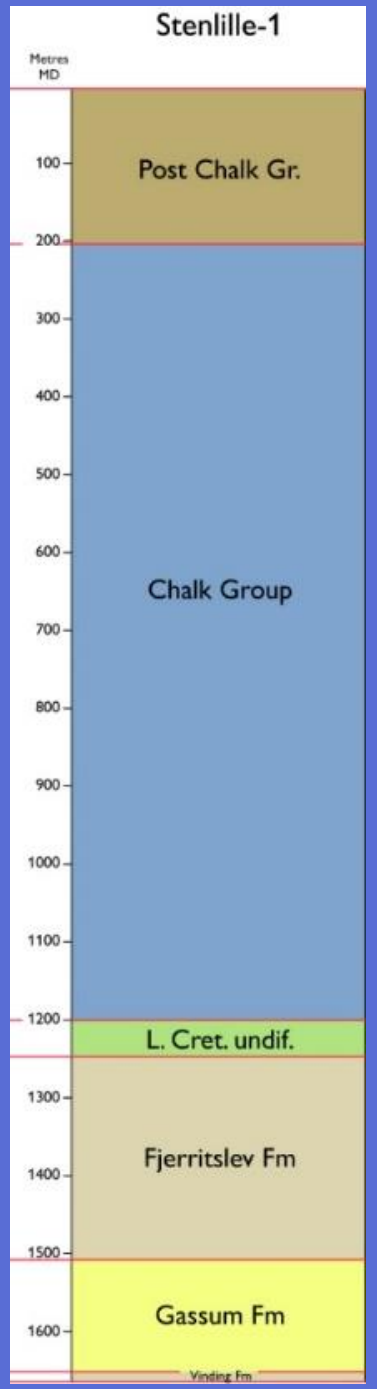
Research partners	Industry
SINTEF	Equinor
GEUS	TOTAL
Aarhus University	Ørsted
Uppsala University	Ålborg Portland Cement
University of Greifswald	Amager Resource Centre
NGO's	Gas Storage Denmark
Bellona	Hanstholm Havn
Zero	Mærsk Supply
Service providers	**Authorities**
WellPerform	Thisted municipality
Rambøll	Aarhus municipality
Petricore	

DENMARK









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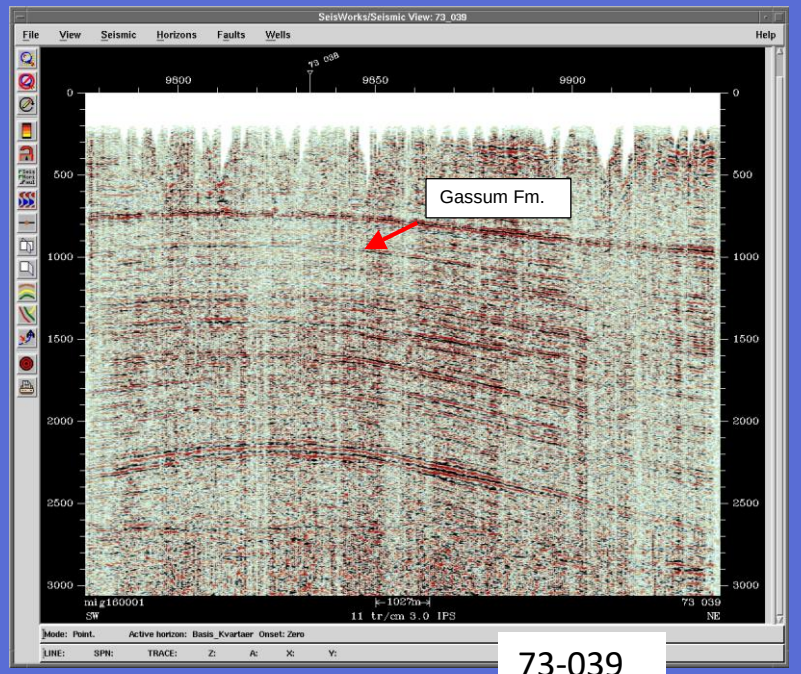

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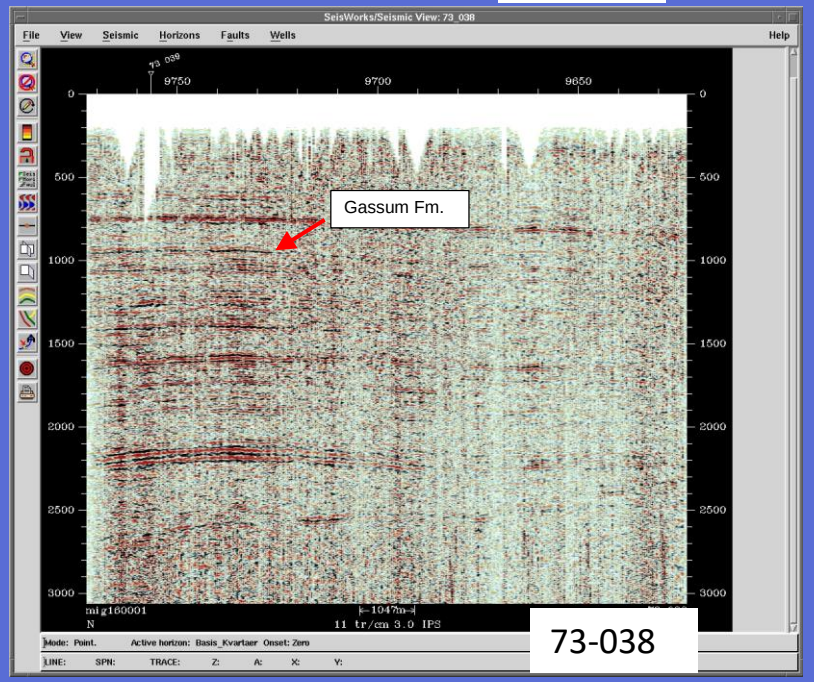

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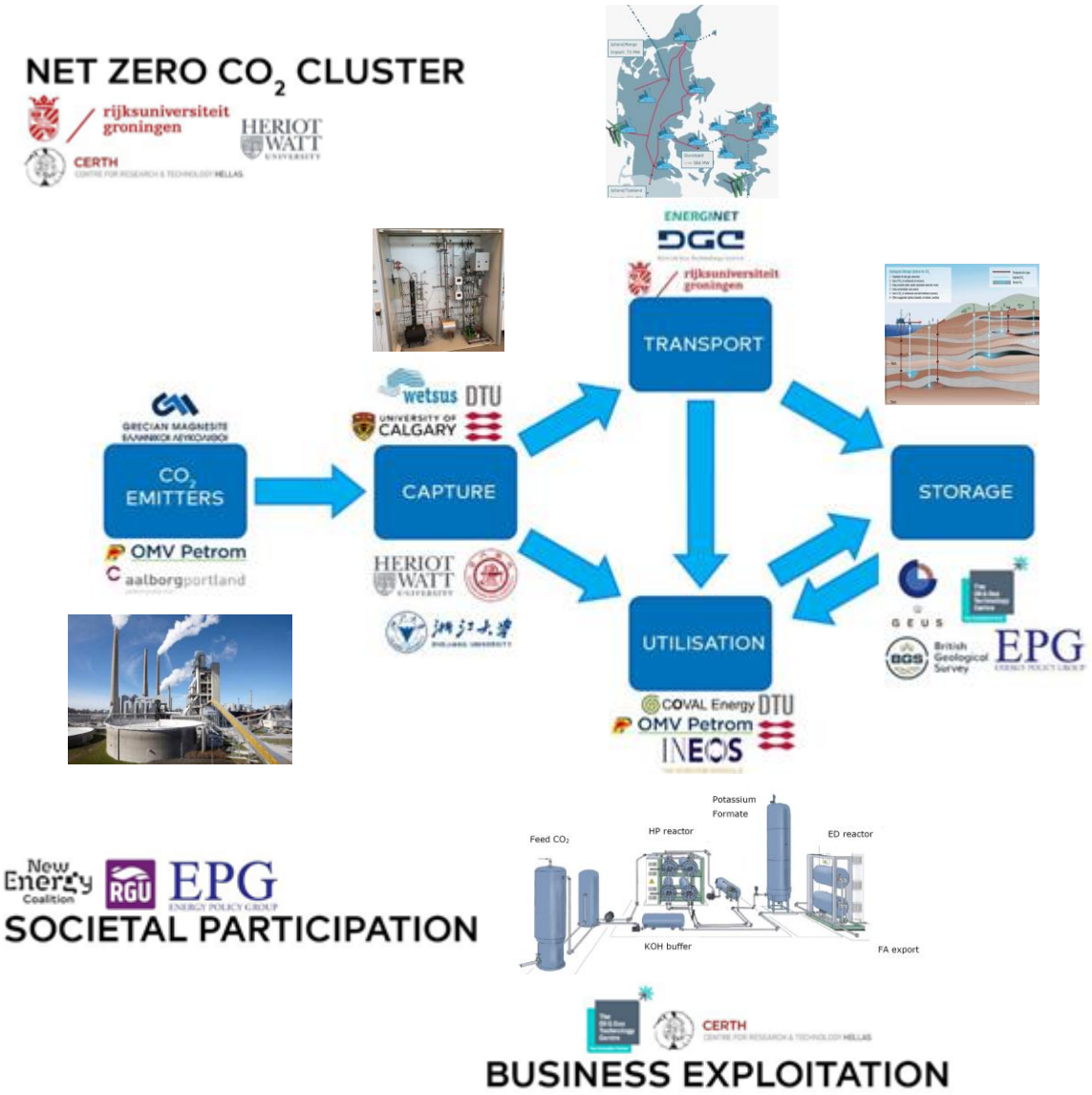
GEUS

ConsenCUS – CarbOn Neutral cluSters by Electricity-based iNnovations in Capture, Utilisation and Storage



Project goals

- Address the EU goal of climate neutral industry by 2050
- Integrate a demonstration unit at major CO2 emitters
- Design CO2-neutral clusters in NW and SE Europe
- Provide life cycle analysis and techno-economic evaluations
- Promote CCUS awareness in local communities

Technology innovations

- Efficient CO2 capture with potassium hydroxide
- Novel electrochemical purification of CO2 stream
- Converting CO2 to high added-value products
- Temporary CO2 storage to add flexibility by introducing buffering capacity
- Developing a joint infrastructure in CO2 storage, transportation, and utilization to drive down costs

GEUS

Finansiering av CO_2-fangst og -lagring

BELLONA

Climate neutrality the Scandinavian way: How Stockholm, Oslo and Copenhagen are working towards capturing CO_2

Webinar, 11. september 2020

Olav Øye, seniorrådgiver klima og industri

Miljøstiftelsen Bellona


ASJA

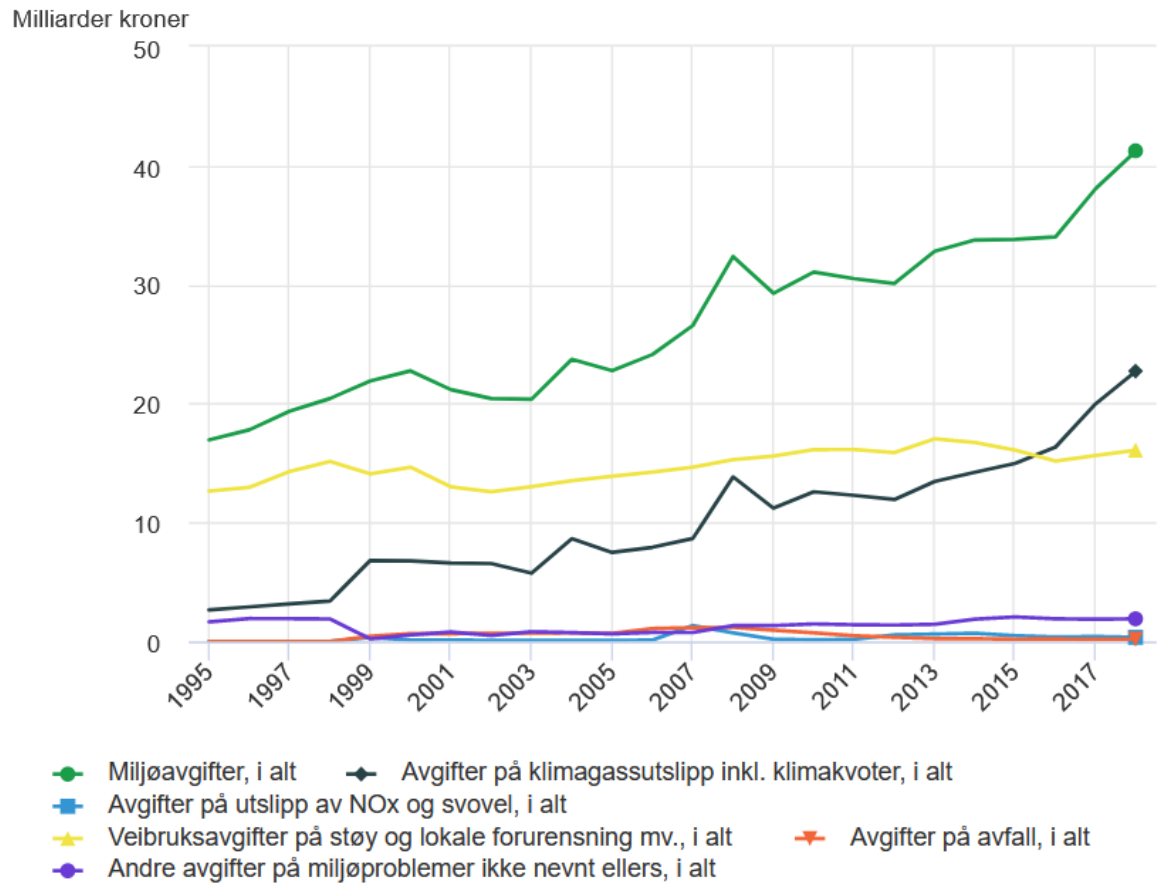
Nasjonal finansiering: utvikling og fullskala

- Norge: Climit FoU og Demo (Norges Forskningsråd og Gassnova)
  - 160 MNOK i 2020
  - Har støttet Fortum Oslo Varme, Norcem, Preem….
- Enova: Delte ut 5,6 mrd NOK i fjor

- *CO_2-fond?*
- *Statlig innkjøp av bio-CO_2/negative utslipp?*
- *Avgifter?*

Hvor skal pengene komme fra?

Figur 1. Miljøavgiftene, historisk utvikling



Kilde: Miljøøkonomiske virkemidler, Statistisk sentralbyrå.

Hypotetisk regnestykke: energigjenvinning

- Capture rate 400 000 tons CO_2/year
- Levelized cost of CCS (LCOCCS) is 100 EUR/tonne
- The WtE serves:
  - 280 000 customers (households and businesses) with waste treatment services
  - 100 000 customers with district heating services
  - 10 000 customers with electricity services, and
  - 10 000 customers with district cooling services

Approximation: 400 000x100/(280000+100000+10000+10000) = **100 Euros/year/customer**

Kilde: Potential Business Models [for CCS]. Københavns kommune m.fl.: http://carbonneutralcities.org/wp-content/uploads/2020/01/Potential-Business-Models.pdf

EU-finansiering

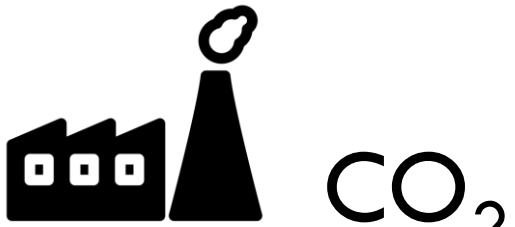
	CO_2 Capture	CO_2 Transport	CO_2 Storage	CO_2 Utilisation	Project development (including feasibility studies)	Specific Cities Theme
Innovation Fund	✓	✓	✓	✓	✓	X
CEF	X	✓	X	X	✓	X
Horizon Europe	✓	✓	✓	✓	✓	✓
ERDF	X	?	?	✓	X	✓
Cohesion Fund	X	?	?	✓	X	✓
EFSI	✓	✓	✓	?	?	X
Other EIB	✓	✓	✓	✓	✓	X

CEF: Connecting Europe Facility
ERDF: European Regional Development Fund
EFSI European Fund for Strategic Investments
EIB: European Investment Bank

Kilde: Cities Aim at Zero Emissions: How carbon capture, storage and utilisation can help cities go carbon neutral: http://carbonneutralcities.org/wp-content/uploads/2020/01/EU-Funding-Opportunities.pdf

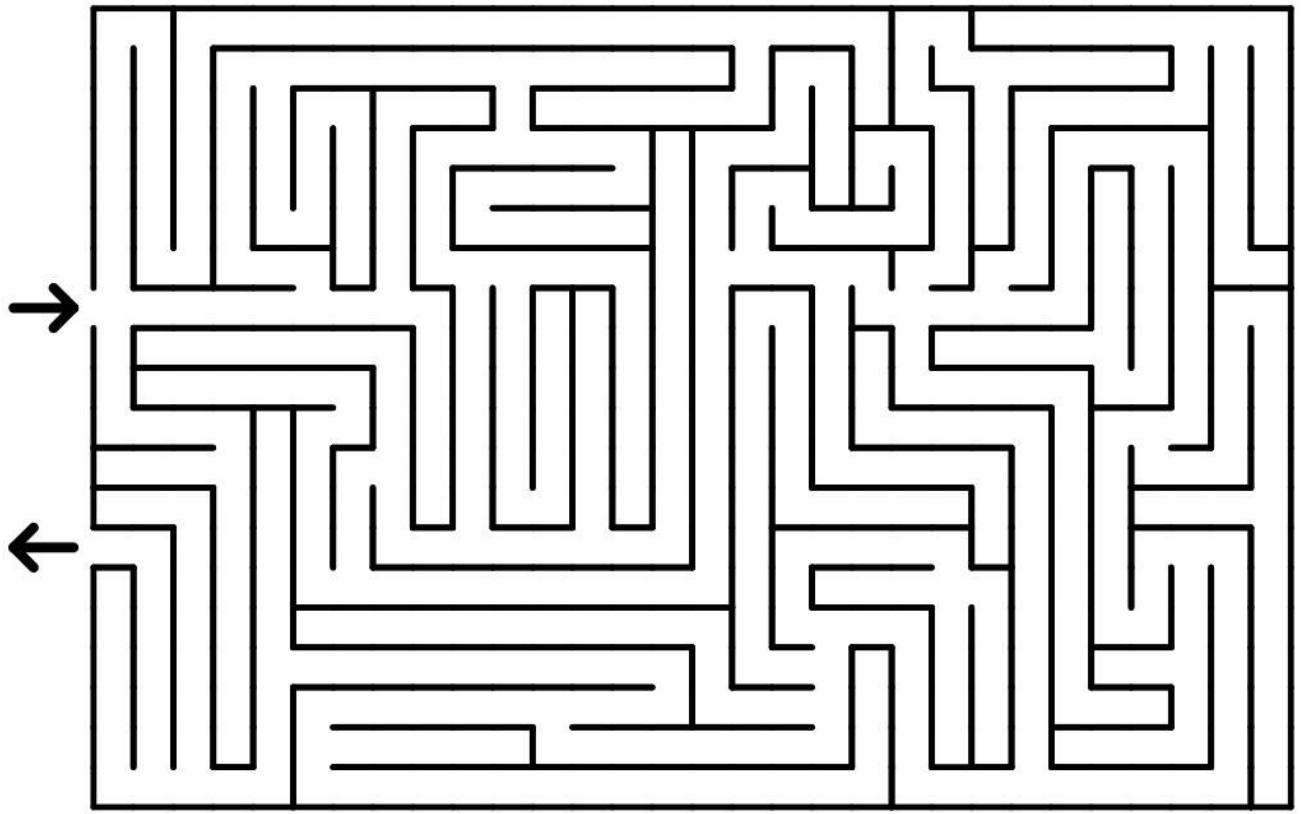
«Forretningsmodell»: skal vi tjene penger på CCS?

CO_2 utilisation? Beregn totalt CO_2-fotavtrykk først.



CO_2

CO_2



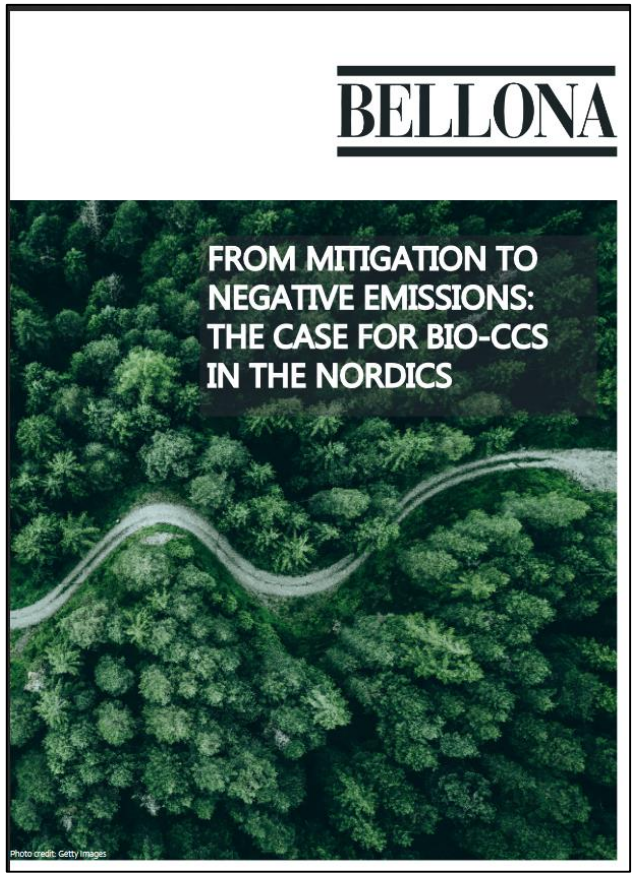
CO_2-transport og –lagring som offentlig ansvar

In the early 19th century, London planned to expand its sewage system, yet faced widespread public opposition. Particularly wealthier people, living uphill, did not see why a general sewage system was needed and hence did not want to pay to improve the property of private individuals 'downhill'. In fact, ***sewage was not seen as a public good****, and so the government initially considered it improper to use public money.* ***It took several cholera epidemics, thousands of deaths, and the 'Great Stink' of 1858 for London to finally modernize and upgrade its sewage system****, at last stopping the unchecked dumping of human waste into the city and the river Thames.*

"[The principle] was of diverting the cause of the mischief to a locality where it can do no mischief."

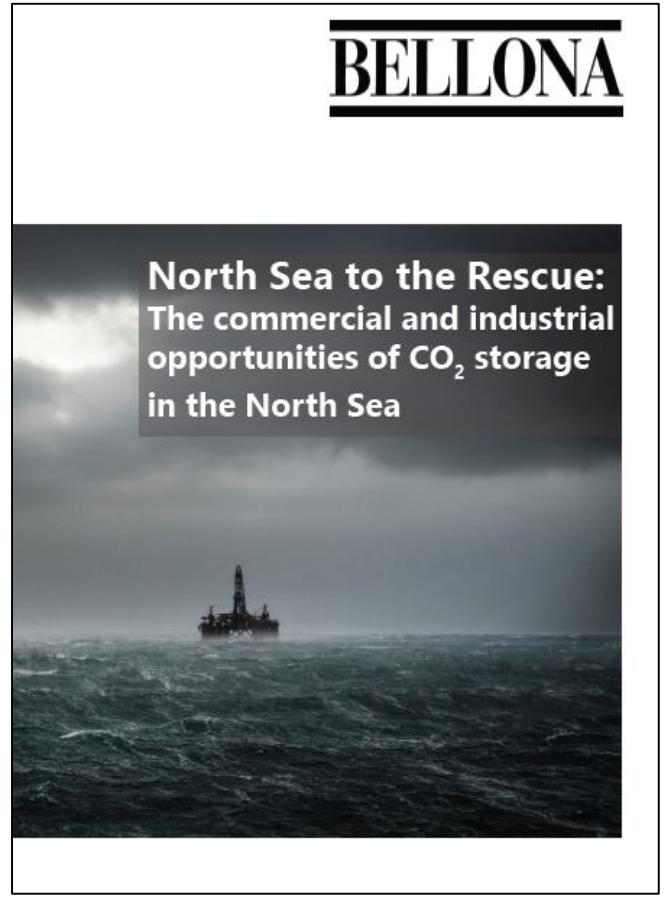
Sir Joseph Bazalgette, Civil Engineer

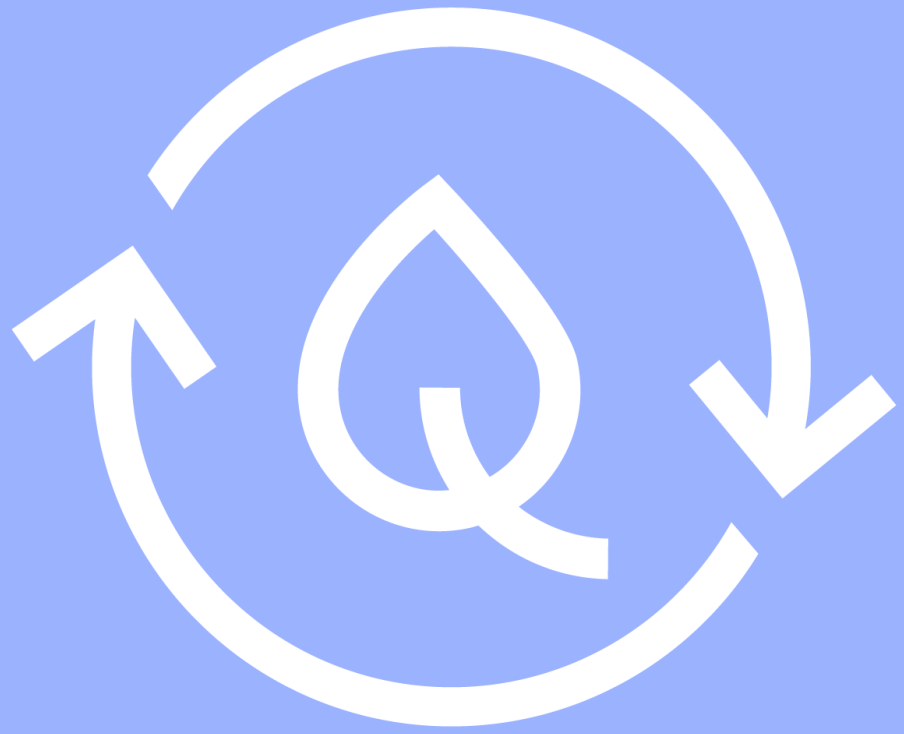
Videre diskusjon: ta kontakt



olav@bellona.no

https://bellona.org/publications-and-archive





Vägen till en klimatpositiv framtid

Klimatpolitiska vägvalsutredningen

En öppen och inkluderande utredning

- Expertgrupp med 34 nominerade från näringsliv, intresseföreningar, akademi och myndigheter
- Stort antal möten med forskare, myndigheter, miljöorganisationer, företag, branschorgan, institut och andra utredningar

Strategi och handlingsplan för nettonegativa utsläpp i Sverige

- Förslag till strategi för arbetet med kompletterande åtgärder
- Handlingsplan med 52 åtgärdsförslag som kan genomföras i närtid
- 4 författningsförslag

Avskiljning och lagring av biogen koldioxid (bio-CCS)

- Inför styrmedel för att stödja fullskaliga projekt (omvänd auktionering)
- Undanröj legala hinder för CCS/bio-CCS
- Gör Energimyndigheten till samordningsansvarig myndighet med förtydligat uppdrag på området
- Inrätta centrum för CCS/bio-CCS som del av Energimyndigheten

Mål för kompletterande åtgärder

- Följande mål för kompletterande åtgärder bör fastställas:
  - År 2030 ska Sverige åstadkomma kompletterande åtgärder som motsvarar minst 3,7 miljoner ton koldioxid per år
  - År 2045 ska Sverige åstadkomma kompletterande åtgärder som motsvarar minst 10,7 miljoner ton koldioxid per år. Nivån ska kunna öka efter 2045
  - Mellan 2021 och 2045 ökar volymen årligen genererade kompletterande åtgärder kontinuerligt

Inriktning till 2030

Typ av kompletterande åtgärd	**Mton CO_2-ekv./ år**
Ökad kolsänka i skog och mark	1,2 *
Bio-CCS	1,8
Utsläppsminskningar i andra länder	0,7 **
∑	**3,7**

* Inklusive användning av biokol som kolsänka.

** En större kvantitet används som resultatbaserad klimatfinansiering.

Uppskattade åtgärdskostnader 2030 för utredningens huvudsakliga förslag

- Ökad kolsänka: 200-500 kr/ton CO_2 (varierar mellan olika åtgärdstyper)
- Bio-CCS: 1000 kr/ton CO_2
- Åtgärder utomlands: Från 200 kr/ton CO_2
- Kompletterande åtgärder bedöms öka kostnadseffektiviteten i klimatpolitiken

Vägen till en klimatpositiv framtid

- Enligt IPCC krävs globala negativa nettoutsläpp för att begränsa uppvärmningen till maximalt 1,5°C
- Sverige har särskilt goda förutsättningar för vissa åtgärder och tekniker för negativa utsläpp av växthusgaser
- Klimatutmaningens omfattning innebär att sådana goda förutsättningar behöver tas tillvara

Tack!

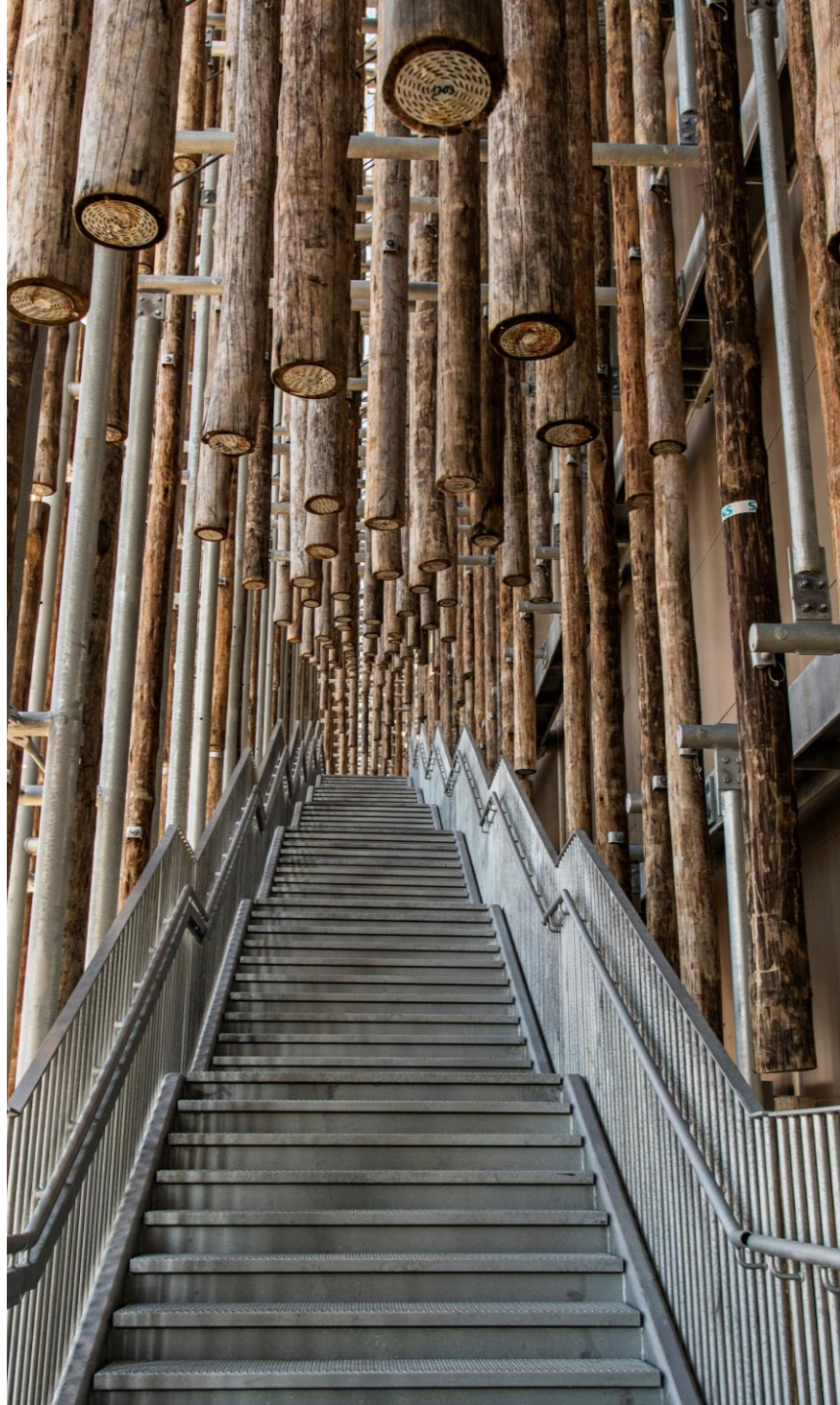
07 September 2020

Hvordan CO_2-fangst kan bidrage til storbyers målsætning om CO_2-neutralitet

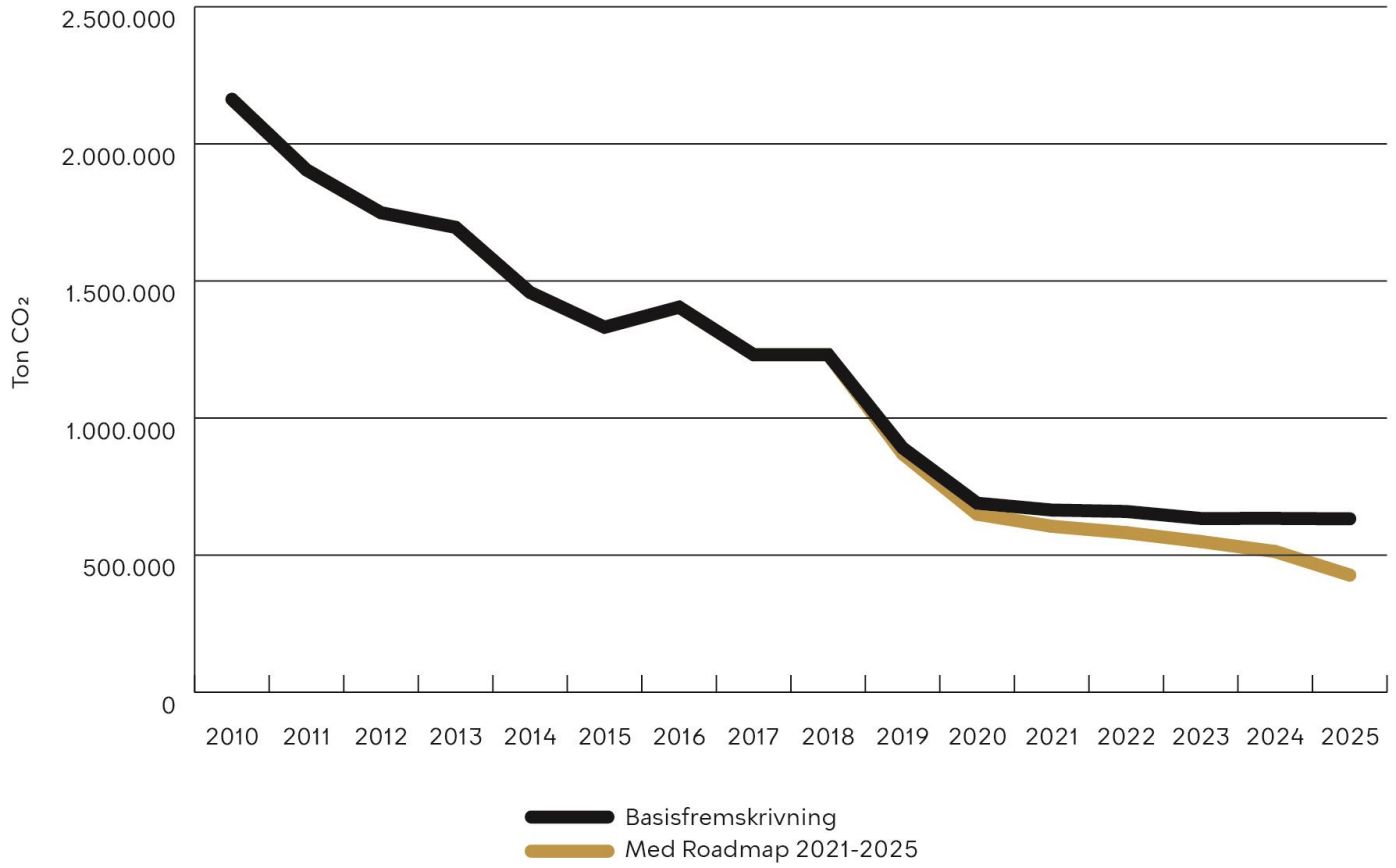
Klaus Bundgaard
Klimarådgiver og Projektleder
Klimasekretariatet i København

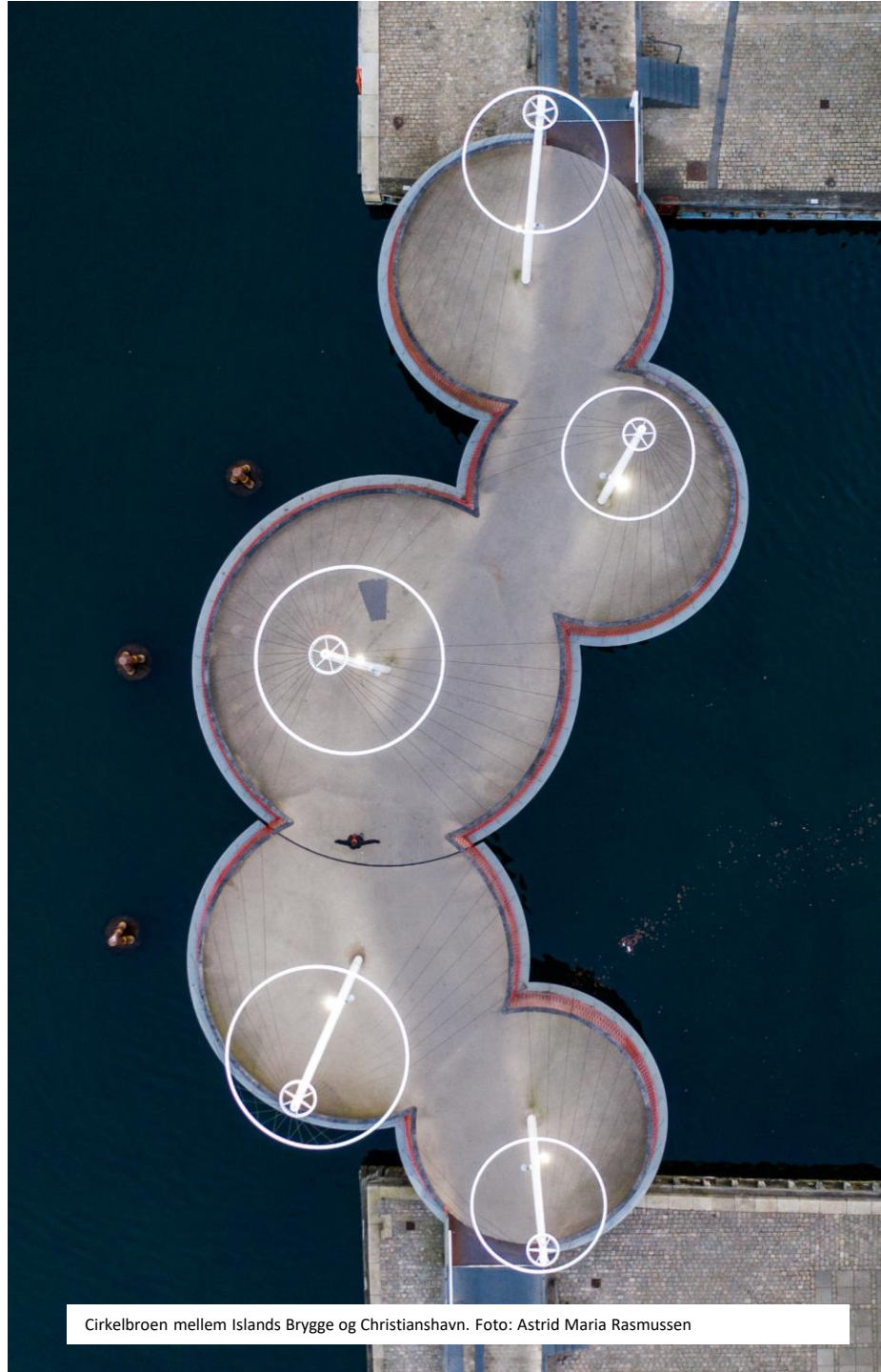
Hvorfor skal byer have CO_2-fangst?

- Globalt er byerne ansvarlige for mere end 70 % af CO_2-udledningen
- Begrænsede muligheder for at lovgive på de 'svære' områder
- Det bliver svært at reducere de sidste 10-20 % af CO_2-udledningen
- CO_2-fangst giver mulighed for at skabe negativ udledning



CO_2-udledning i København 2010-2025



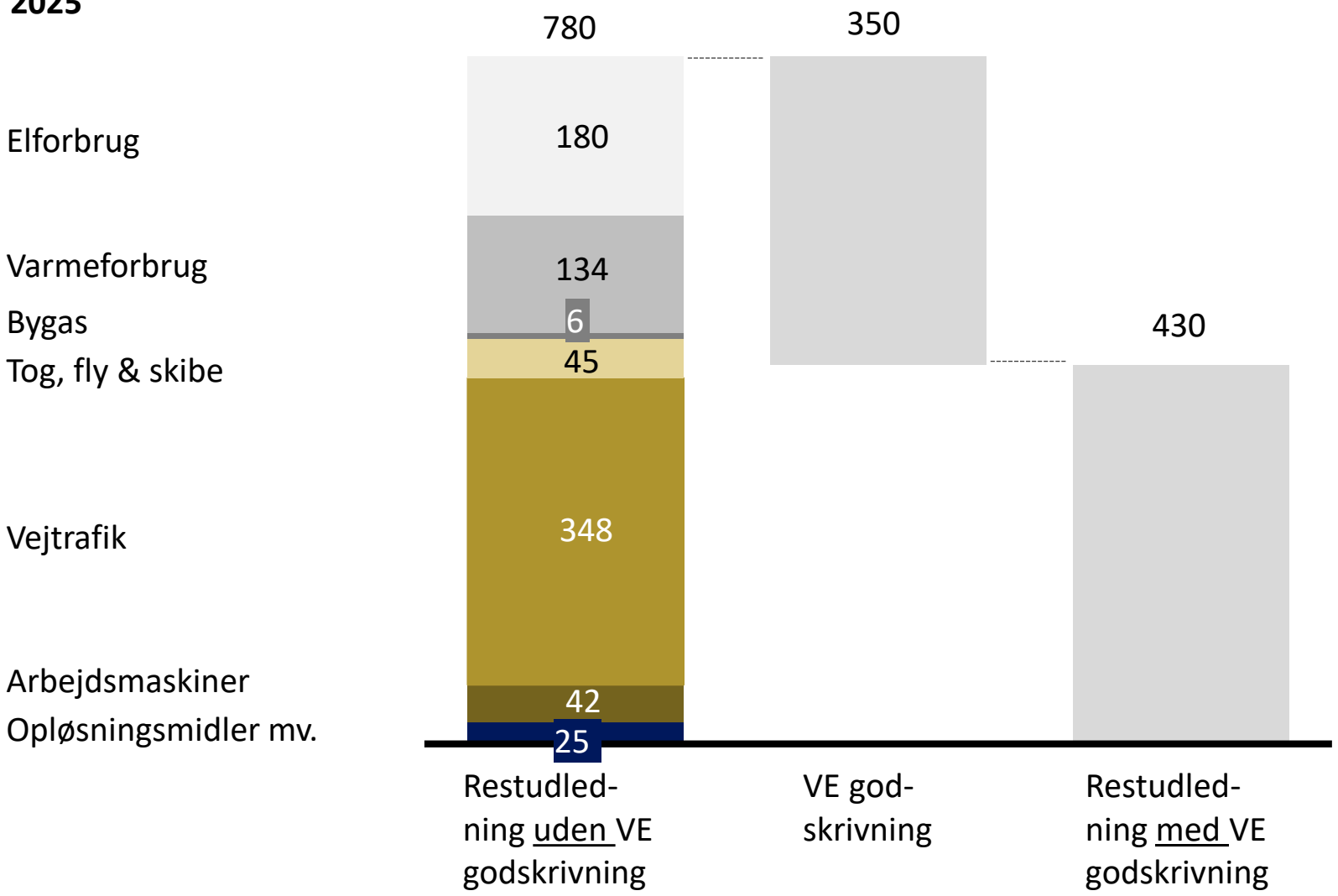


Cirkelbroen mellem Islands Brygge og Christianshavn. Foto: Astrid Maria Rasmussen

Restudledningen er ca. 430.000 ton CO_2 i 2025 inkl. VE-godskrivning

CO_2-udledningen i København i 2025

1.000 tons CO_2

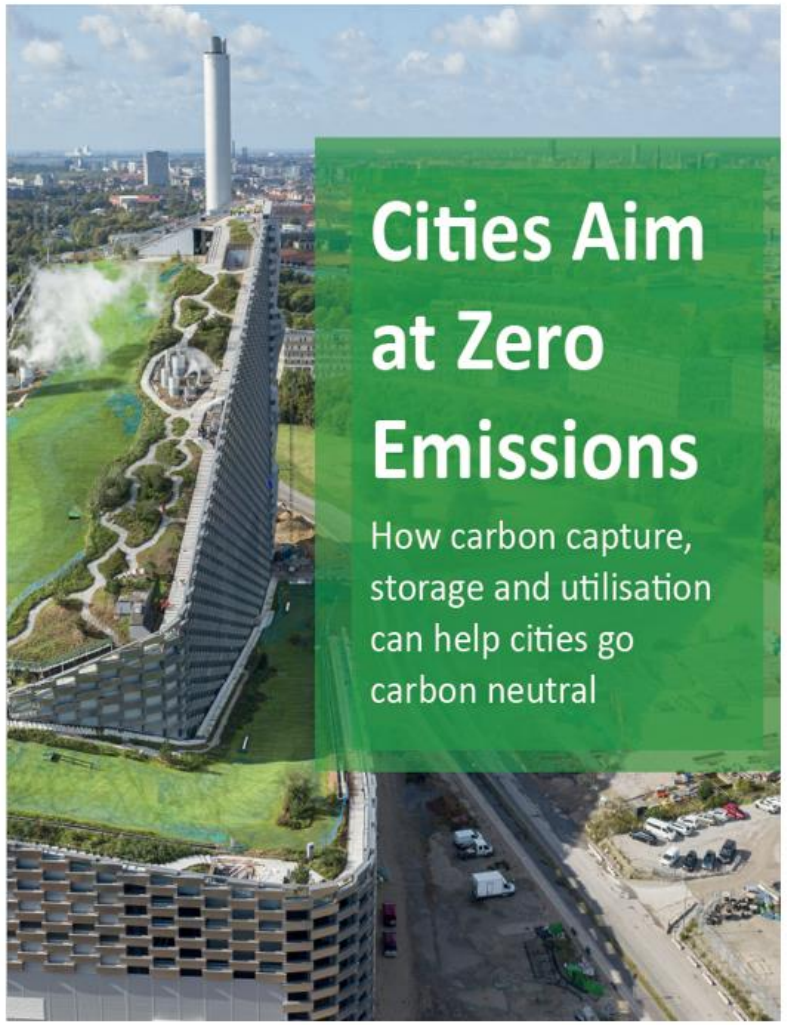


Amager Bakke

& Carbon Capture (160.000 – 480.000 tons CO_2)

Fælles nordeuropæisk projekt

- Finansieret med 120.000 USD af Carbon Neutral City Alliance innovations fond
- Deltagende byer: Amsterdam, Helsinki, København, Oslo og Stockholm
- Alle fem byer med en målsætning om CO_2 neutralitet
- Anerkender at det bliver svært at komme i mål uden CO_2 fangst
- Alle undersøger muligheden for at realisere et projekt



Background material:

Note 1 - City profile of the five cities and their ongoing work with CCSU
Note 2 – Measures to Encourage CCSU in cities
Note 3 – Barriers to CCSU from a city perspective
Note 4 – Carbon capture storage in city-based carbon accounting
Note 5 – The role of CCS in transforming cities
Note 6 – How to address emissions from industry from a city perspective
Note 7 – Barriers to transport and storage of CO_2 within the EU
Note 8 – Carbon Capture in the EU ETS
Note 9a – Potential business models for CCS and CCU
Note 9b – EU funding opportunities for CCS and CCU
Note 10 – Recommendations for cities
Technical Report: Screening of carbon capture technologies
Fact sheet: Screening of carbon capture technologies

Founders: CNCA

Authors: København Kommune, BELLONA

Partners: City of Amsterdam, Oslo, Helsinki, Stockholms stad, NIRAS

Fotograf Daniel Rasmussen / Copenhagen Media Center

Perspektiver fra Nordisk projekt

- CO_2-fangst skal indarbejdes specifikt i internationale CO_2-beregnings standarder (GPC)
- Der er et behov for national understøttelse og strategi på området
- Byer har en unik mulighed for sammenspil imellem systemer og infrastruktur
- Den biogene CO_2-udledning skal indarbejdes i EU ETS

Skalering af nordiske løsninger

C40 CITIES *account for*

96
affiliated cities

25 %
of global GDP

1 in 12
people worldwide

10,000
actions to combat climate change

TAKE ACTION IN YOUR COMMUNITY

Fotograf Martin Heiberg / Copenhagen Media Center

Skandinaviske avfallsforbrenningsanlegg oppfordrer til en ambisiøs satsning på karbonfangst

- Avfallsforbrenning/energigjenvinning i kombinasjon med karbonfangst og lagring (CCS) kan bidra til å løse byers avfallsproblem, produsere elektrisitet og varme husene våre på en bærekraftig måte, samt fjerne CO_2 fra atmosfæren.

- Spredningspotensialet for teknologien er stort. Kun i Europa finnes det rundt 500 anlegg hvor teknologien kan implementeres, noe som kan bidra til betydelige kutt i og motvirke EUs klimagassutslipp.

- Samtidig må klimapolitikken, både nasjonalt og innen EU, utformes slik at negative utslipp har en langsiktig og stabil markedsverdi.

- De skandinaviske landene bør utvikle strategier og støtteordninger for bidra til å øke utbredelsen av CCS ved sine forbrenningsanlegg og i industrien, samt se på muligheten til å gjøre CO_2-fri avfallshåndtering til en skandinavisk eksporttjeneste.

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-alt med affald

Climate neutrality the Scandinavian way: How Stockholm, Oslo and Copenhagen are working towards capturing CO_2

2020-09-11