# ACCSION CAPTURE PROJECT AT AALBORG PORTLAND

#### UPSCALING OF CCS IN DENMARK

JESPER SAND DAMTOFT CEMENTIR HOLDING



Funded by the European Union Emissions Trading System Innovation Fund

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Climate, Infrastructure and Environment Executive Agency (CINEA). Neither the European Union nor the granting authority can be held responsible for them.



#### **Production capacity**

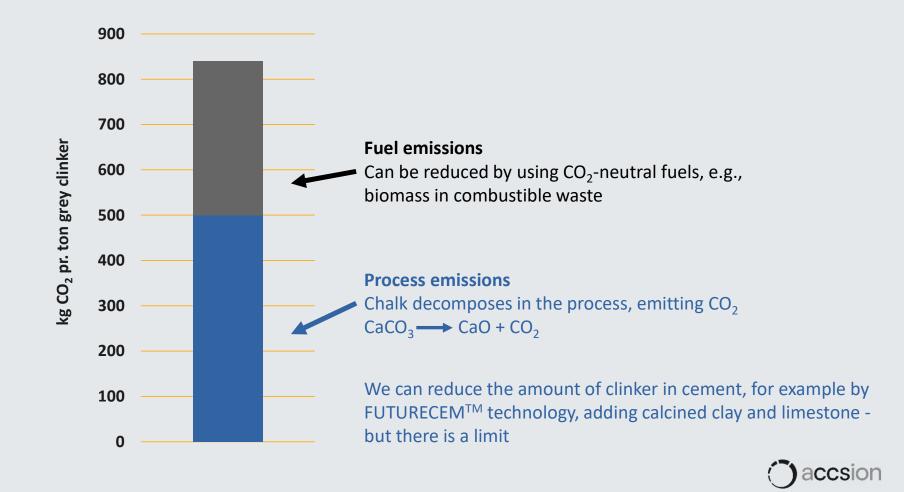
GHER

- 1.8 million tons grey cement
- 0.8 million tons white cement

# CO<sub>2</sub> emissions:

- 2021: 2.3 million tons CO<sub>2</sub>
- 2023: 1.7 million tons CO<sub>2</sub>
- 2024: 1.4 million tons CO<sub>2</sub>

#### CO2 EMISSIONS FROM CEMENT MANUFACTURING ARE HARD TO ABATE





CORT

2022-2023

Innovation Fund Denmark

Portland, DTU, Ørsted, Aalborg

University, Force

INNO-CCUS Carbon capture, utilisation and storage

Project participants: Pentair, Aalborg



ConsenCUS 2023-2024



This project has received funding from the European Union's Horizon 2020 research and Innovation programme under grant agreement N° 101022484

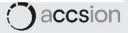
Industrial and academic partners from The Netherlands, Denmark, United Kingdom, Romania, Greece, China and Canada



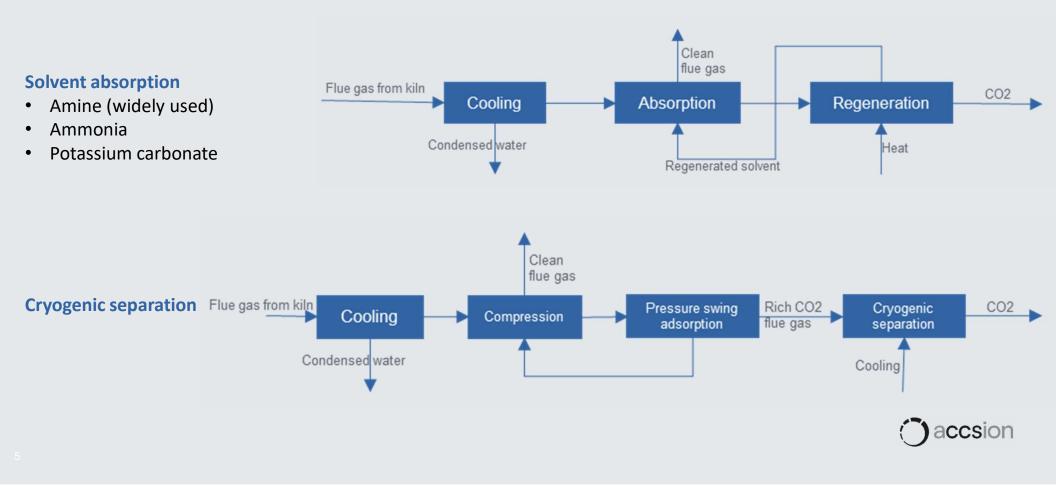
2024-2026 INNO-CCUS Ourbon capture, dilation and storage

/nnovation Fund Denmark

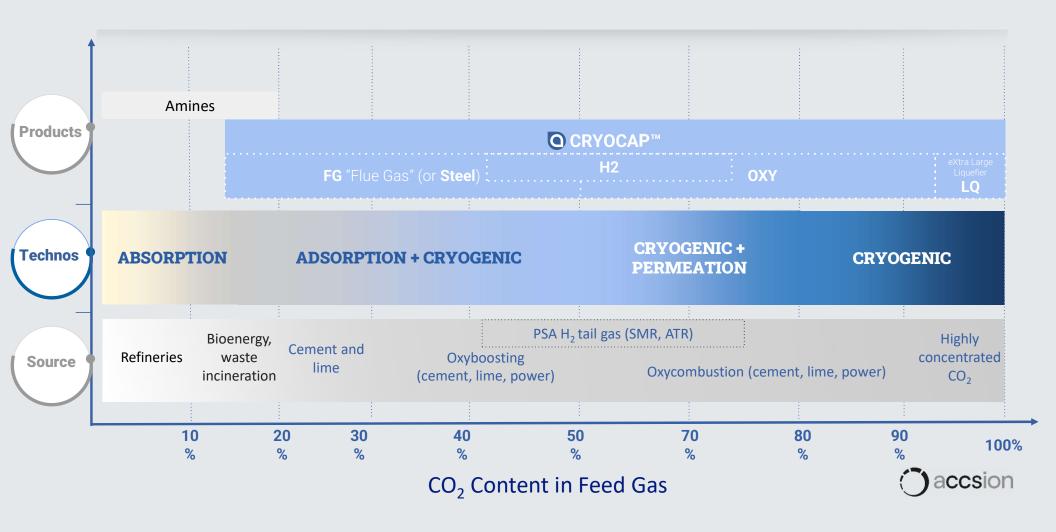
Project participants: Pentair, Aalborg Portland, DTU, DTI, Evida, DGC, Gas Storage Denmark



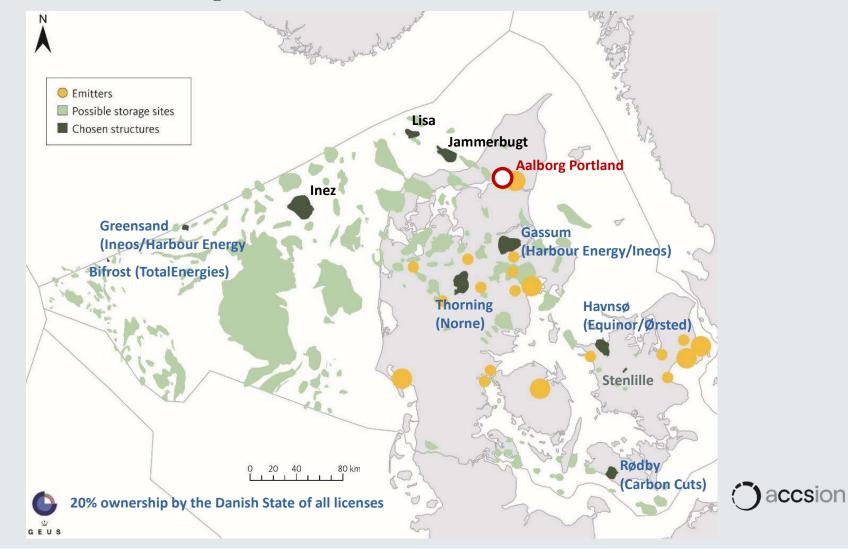
## MOST MATURE CARBON CAPTURE TECHNOLOGIES FOR CEMENT



# AIR LIQUIDE TECHNOLOGY MAPPING FOR CO<sub>2</sub> CAPTURE ON LOW PRESSURE STREAMS



# CO<sub>2</sub> STORAGE IN DENMARK



Nina Skaarup, GEUS



Aalborg CCS using Infrastructure Onshore in North Jutland

## EU INNOVATION FUND

Funded by revenue from the **EU Emissions Trading System** 

€ 40 billion for investments in EU's climate neutral future

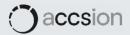
To be used in:

- Energy intensive industries
- Renewables
- Energy storage
- CCS
- Net-zero mobility and buildings

#### **GRANT DISTRIBUTION**

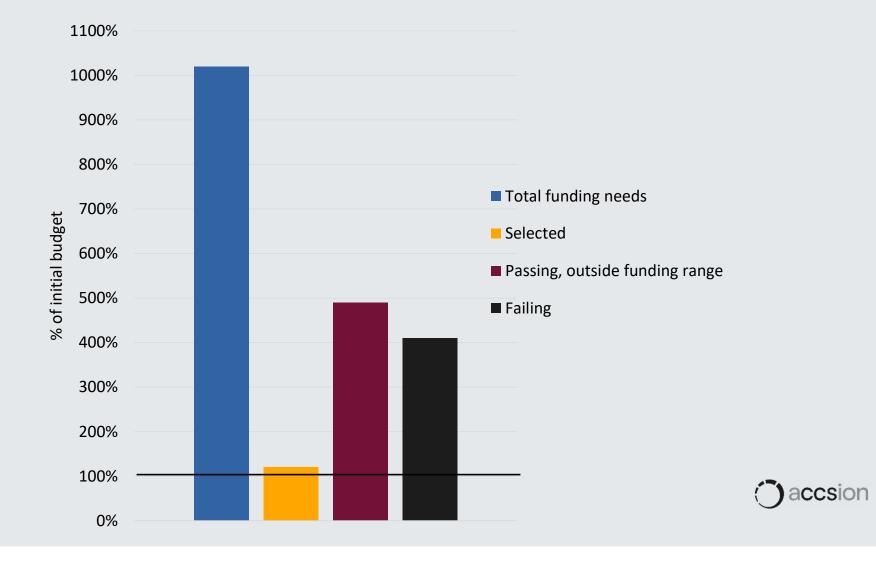
# LUMP-SUM contribution grant up to 60% of relevant costs

- up to 40% of grant at financial close
- remaining amount of at least 60% after financial close
- generally, at least 10% after entry into operation



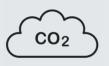
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#### € 1.7 BILLION BUDGET FOR LARGE PROJECTS WERE HEAVILY OVERSUBSCRIBED



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# ACCSION - AALBORG CCS USING INFRASTRUCTURE ONSHORE IN NORTH JUTLAND



01

1.4 million tonnes
CO<sub>2</sub> captured
both white and grey cement kilns



02

Recover **1250 TJ of waste heat** for district heating to Aalborg Municipality



03

Power consumption 649 GWh in capture plant and 850TJ Biogas used in fuel mix



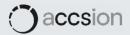
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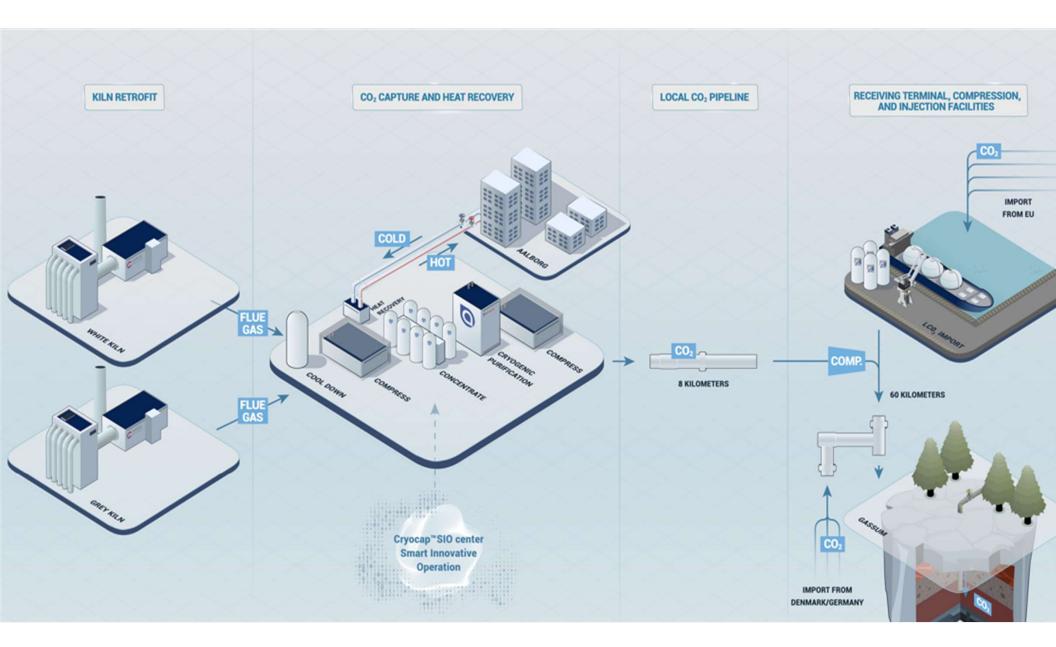
Funding of € 220 million from the EU Innovation Fund

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Entry into operation by **2030** 







#### THE INNOVATION BEHIND

# DUAL CEMENT PRODUCTION CAPTURE



## REUSING EXCESS HEAT



#### **ONSHORE STORAGE**



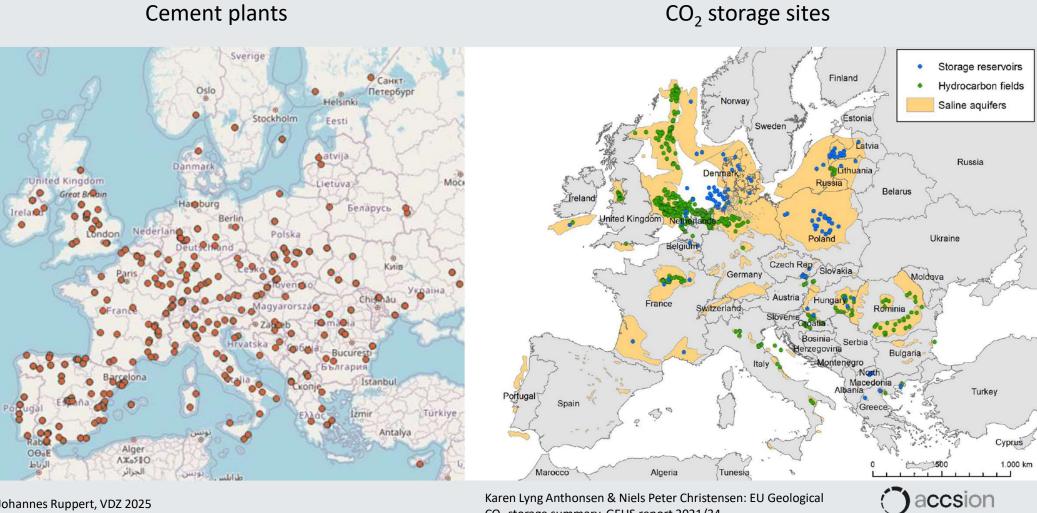


# EU CLIMATE ACTION

- The European Climate Law turns into law the goal set out in the European Green Deal for Europe's economy and society to become climate neutral by 2050.
- Net greenhouse gas emissions must be reduced by at least 55% by 2030, compared to 1990 levels
- The Net-Zero Industry Act stipulates that a CO<sub>2</sub> storage capacity of 50 million tons shall be available by 2030

	Captured	Geologically stored	
	Million tons/year	%	Million tons/year
2030	50	100%	50
2040	280	67%	187
2050	450	50%	225

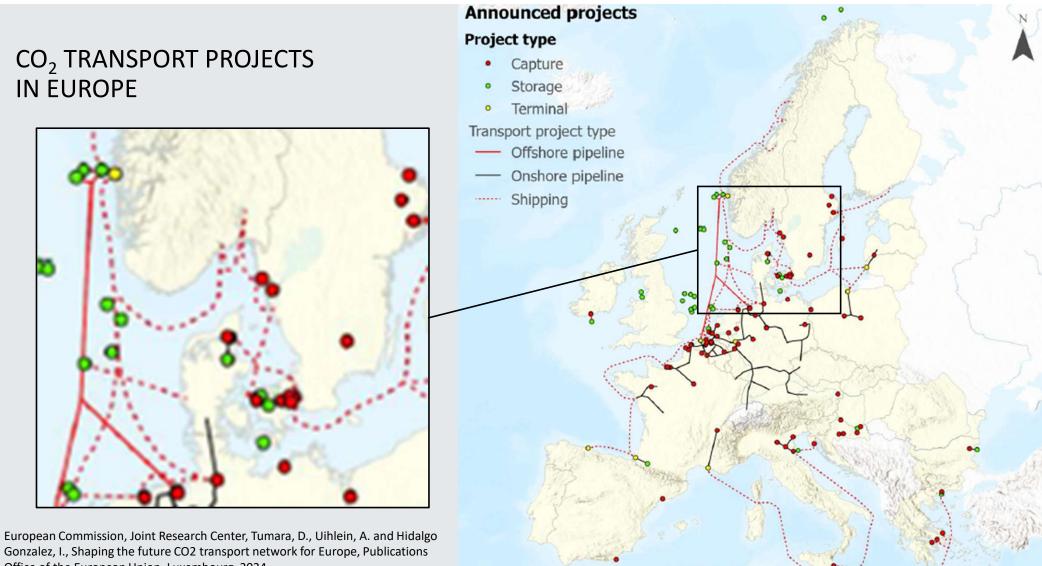




Johannes Ruppert, VDZ 2025

Cement plants

Karen Lyng Anthonsen & Niels Peter Christensen: EU Geological CO<sub>2</sub> storage summary. GEUS report 2021/34



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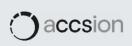
500

750

1.000 km

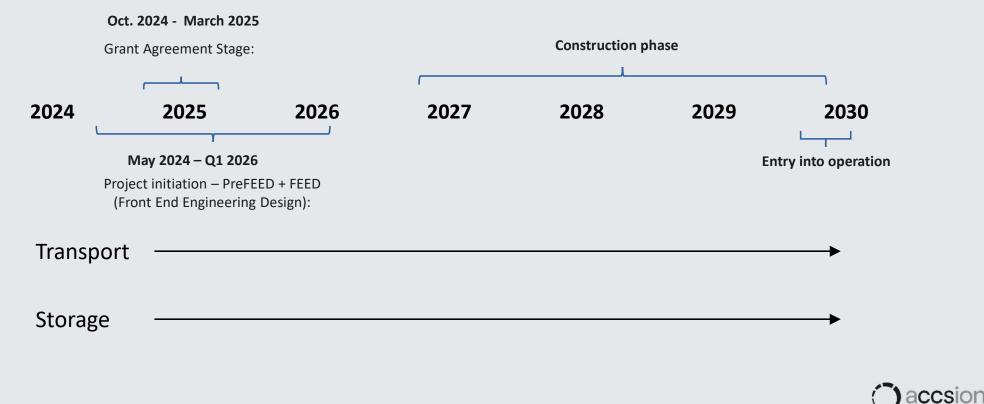
Office of the European Union, Luxembourg, 2024, https://data.europa.eu/doi/10.2760/582433, JRC136709.





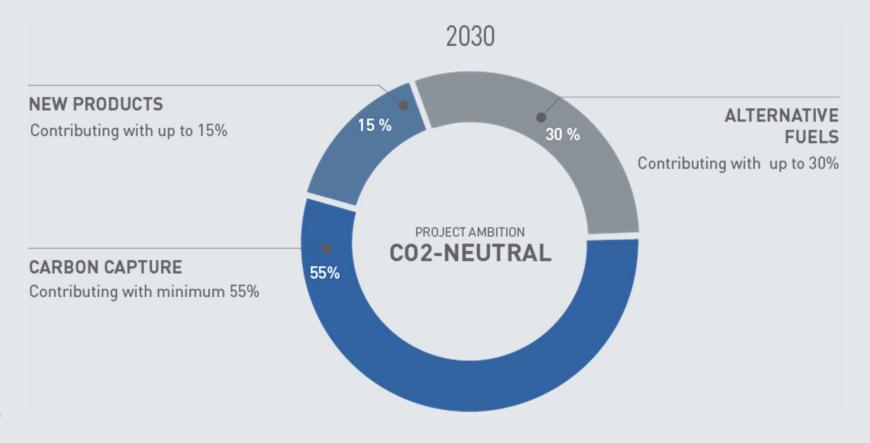
#### **PROJECT TIMELINE**

#### Aalborg Portland



## AALBORG PORTLAND CLIMATE TARGET

#### - ACHIEVING CO2-NEUTRALITY ON SCOPE 1 EMISSIONS



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