



Bright ideas.
Sustainable change.

Carbon capture: Market Design

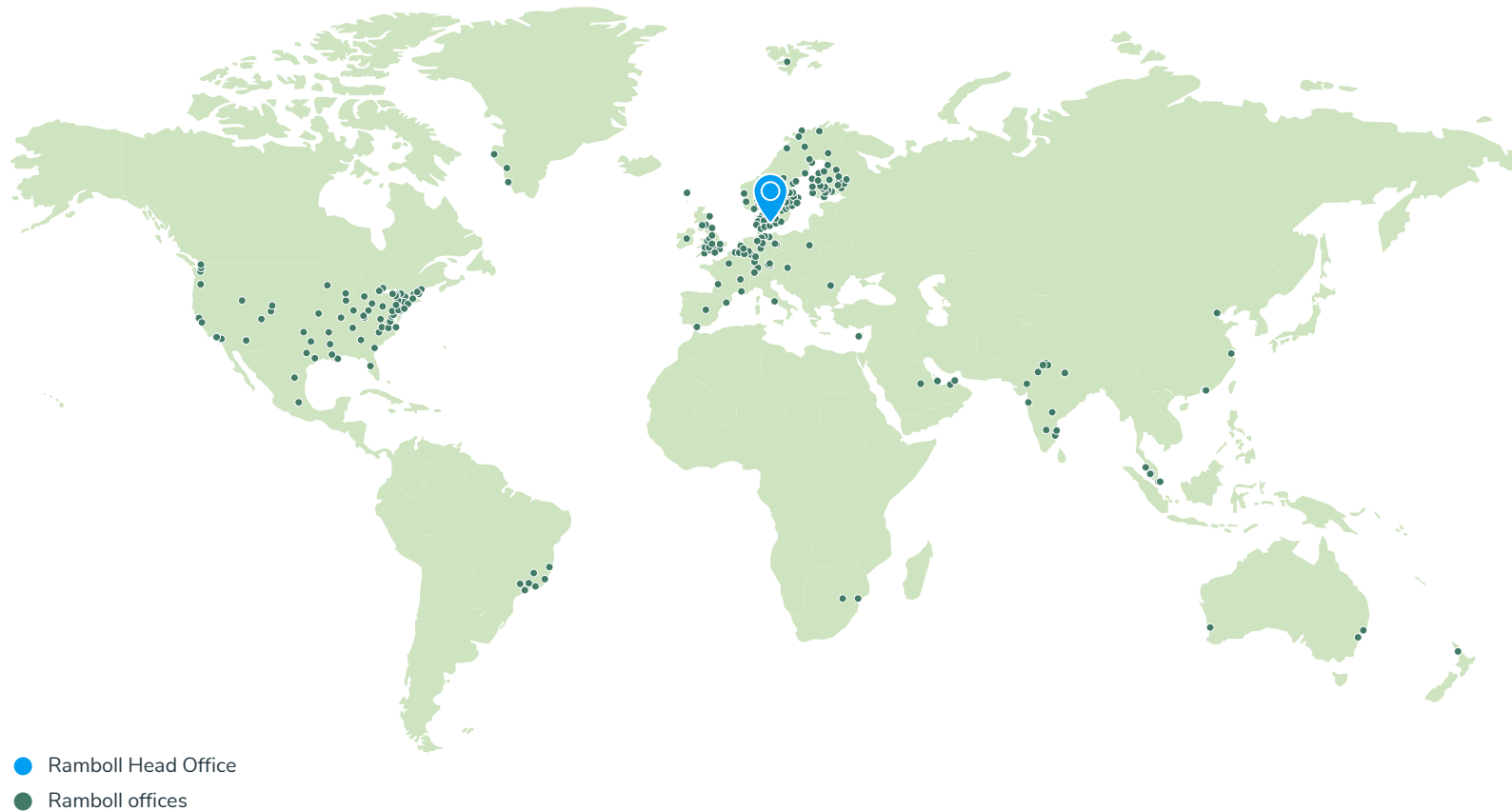
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Carbon Capture Competency Center, Energy, Ramboll

September 2026

CSEI Sustained 2026 event

Ramboll's 18,000 experts work globally across nearly 300 offices in 35 countries



Across the world, Ramboll combines local experience with a global knowledgebase to create sustainable cities and societies.

We combine insights with the power to drive positive change to our clients, in the form of ideas that can be realised and implemented.

We work multidisciplinary across our seven markets:



Buildings



Transport



Energy



Environment
& Health



Water



Management
Consulting



Architecture
& Landscape

Ramboll is a world leading advisor within Carbon Capture Utilisation & Storage

Ramboll offers world-class experience in carbon capture, utilisation (PtX), transport, and storage as a frontrunner of the technologies used at all phases of CCUS.

Our expertise builds on many years of experience within e.g. capture of CO₂ from power- and Energy-from-Waste plants, on- and offshore handling and transport of gasses, on- and offshore oil- and gas operations and Power-to-X projects.

We are more than [50 dedicated carbon capture project managers and specialists](#) serving the market through our centre of excellence in Copenhagen and more than [200 project manager and specialists offering transport, interim storage, shipping, geological storage, e-fuels services, and 650 detailed engineering resources](#) in connection to CC.

Globally in Ramboll, we have more than 2,000 specialists working with energy production, energy efficiency, renewable energy, power transmission, and district energy.

Ramboll has within the past few years worked on more than 200 carbon capture projects and more than 210 successful hydrogen projects.



Global offices in
9 countries



Project managers
and specialists



CCUS projects





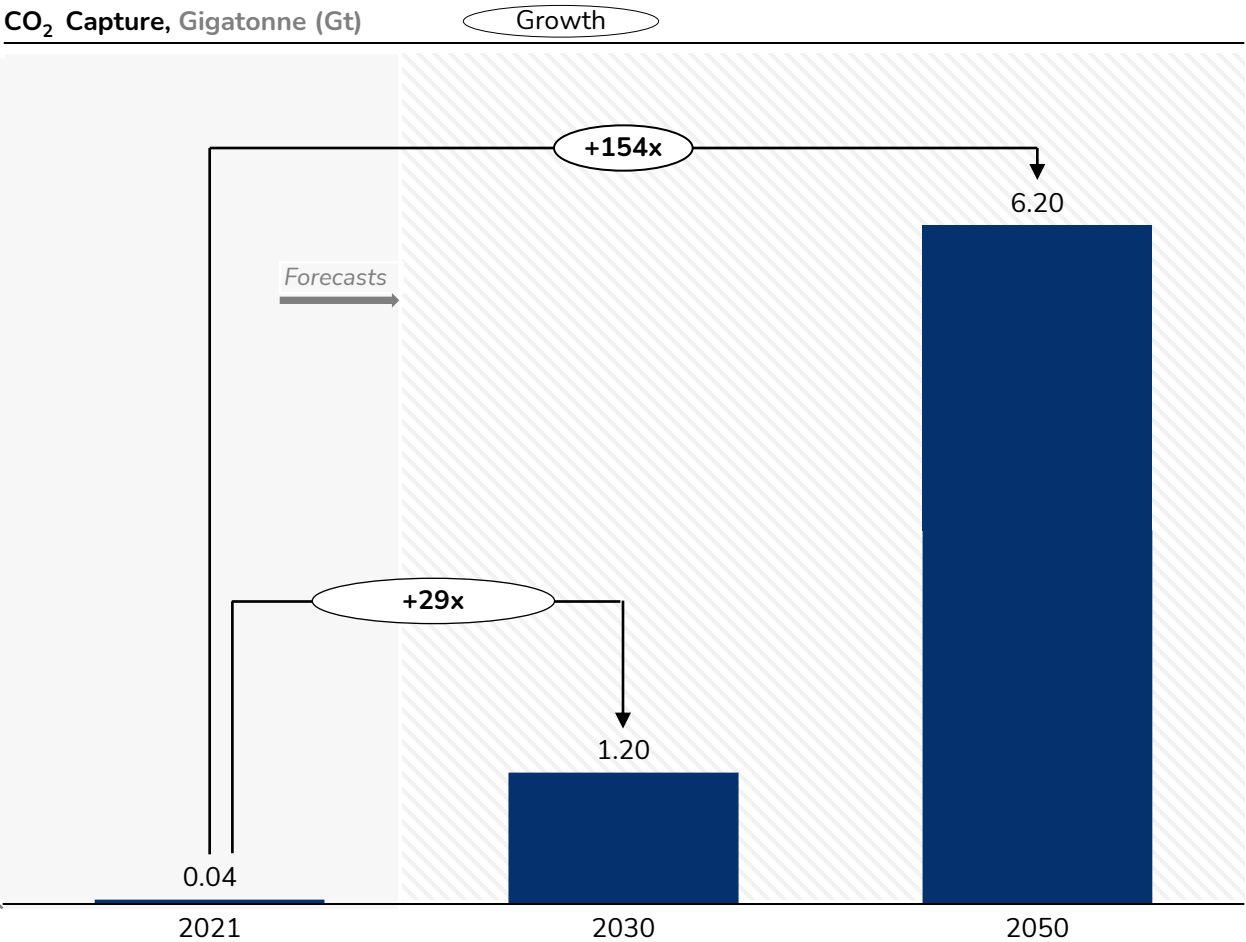
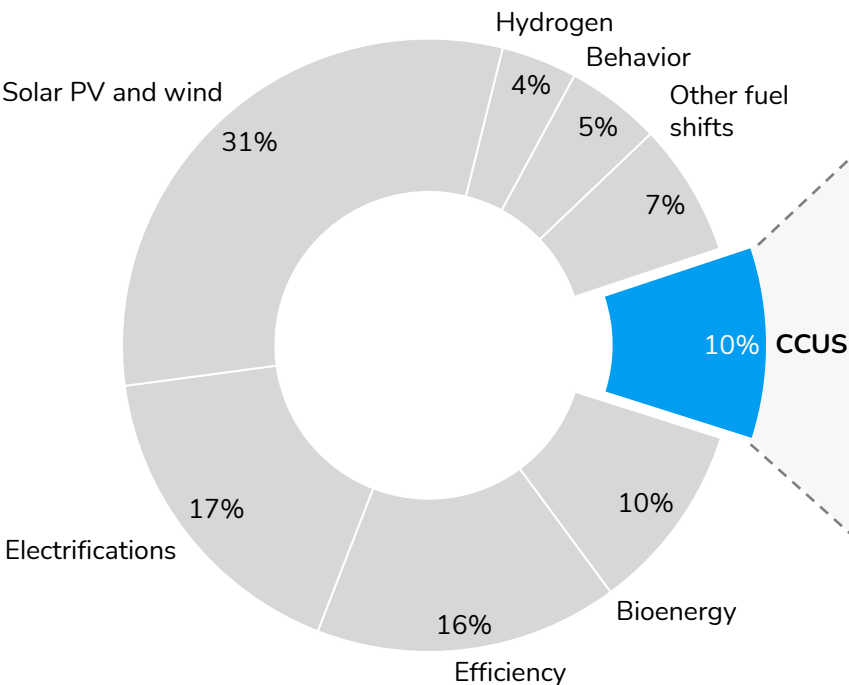
Why Carbon Capture?

“CCUS is one of the few technology options that can significantly reduce direct CO₂ emissions (including process emissions) from the industry sector, which produces one-quarter of global CO₂ emissions.”

The International Energy Agency (IEA)

CCUS is expected to account for 10% of the global cumulative CO₂ reductions in the net zero scenario

Global cumulative energy sector CO₂ emissions reductions by decarbonization pillar 2050, %



Sources: IEA (2022)
Notes: “Other fuel shifts” include other renewables, nuclear, and switching from coal and oil to natural gas. “Behaviour” includes energy service demand changes from user decisions (e.g., changing heating temperature), as well as avoided demand, which refers to energy service demand changes from technology developments (e.g. digitalisation).

Waste to Energy offers a unique opportunity to reduce carbon footprint

- 24/7 - operation

Most WtE facilities operate 8000 h/t.

With constant load

A CC installation will get max operation hr and be in steady operation

- Fossil and biogenic CO₂

Typical WtE facility that treats MSW will have fossil/biogenic CO₂ in 50:50.

With e.g. 90 % capture and storage WtE becomes carbon negative

- Someone to pay

Waste suppliers, WtEs, “green power/heat/waste” customers

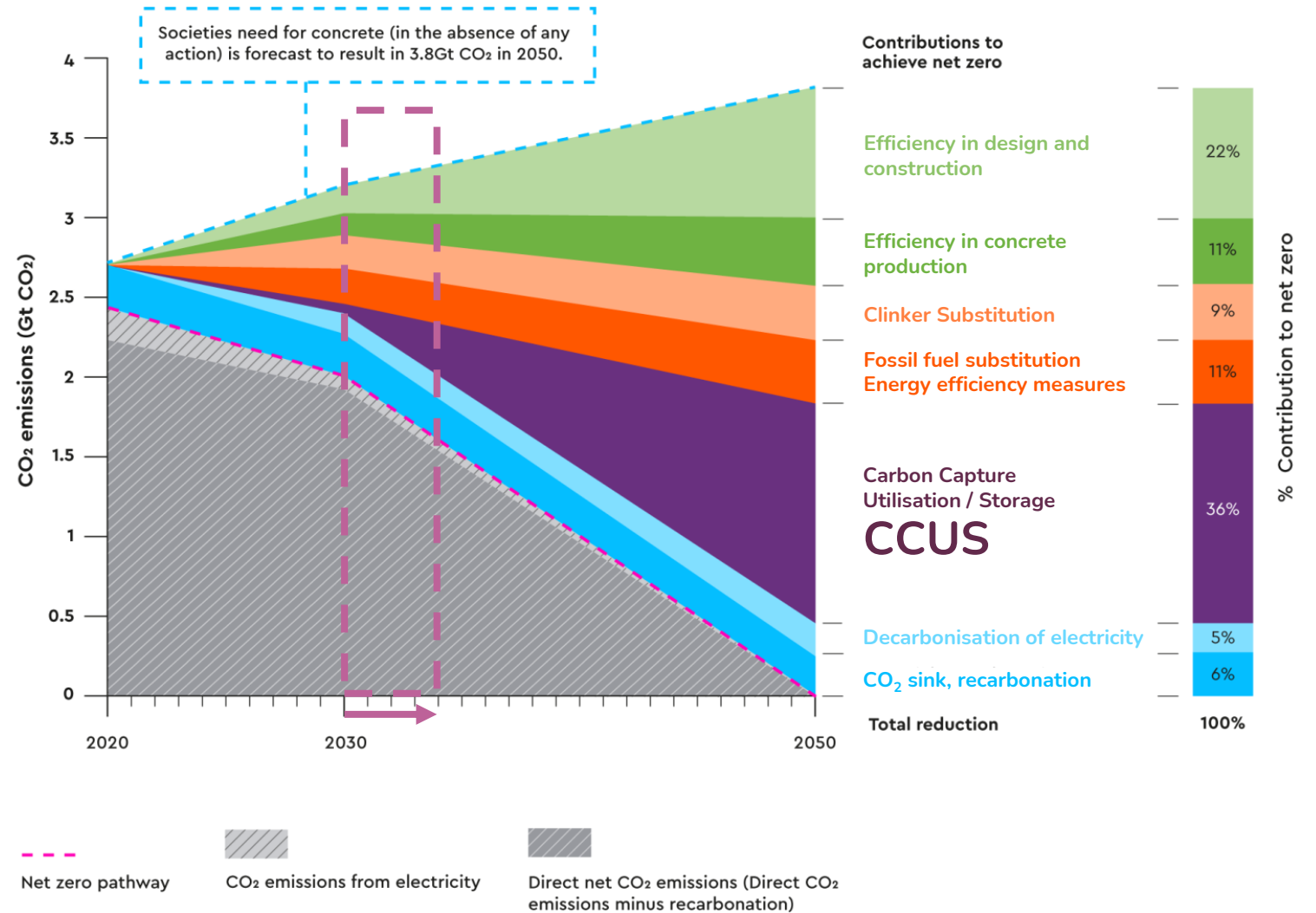


Cement getting to NET ZERO

Fuel emissions can be avoided: 40%

Process emissions can not be avoided: 60%

CCS is a must for cement production



CCS outlook in Europe

Operating:

- 2 smaller scale operating plants in Netherlands
 - AVR Duiven (~150 kt/y)
 - Twence (100 kt/y)
- Heidelberg Materials Brevik (400 kt/y) in Norway
- Yara Sluiskil (800 kt/y) in Netherlands

Under commissioning:

- Ørsted Asnæs (240 kt/y) in Denmark
- Ørsted Avedøre (150 kt/y) in Denmark

Under construction:

- Hafslund Oslo Celsio (400 kt/y) in Norway
- Stockholm Exergi (800 kt/y) in Sweden

More to come:

- Aalborg Portland Cement (1 250 kty/y) in Denmark



Why are there so few projects?

Emitters

Expect public funding and subsidies

Not accustomed to procurement models for an immature market

Publicly owned emitters cannot bring bank guarantees

EU ETS uncertainty

Infrastructure

No easy way to transport captured CO₂

Northern Lights require long term commitments

On-shore DK storage not ready yet

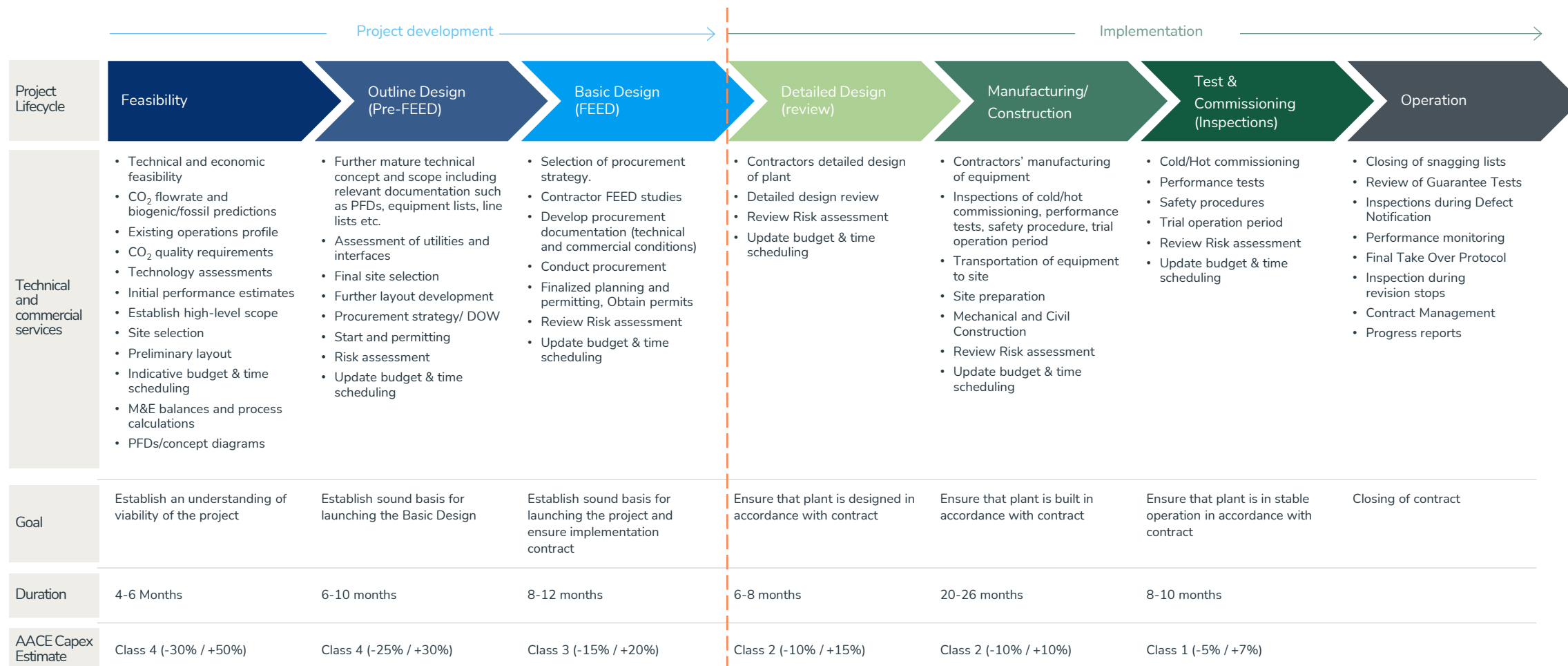


Key considerations and decisions for each project phase

Ramboll has the ability to work efficiently with a range of industries, to provide the full palette of services required to deliver projects and to cover the full CCUS value chain from capture, via transport to storage and/or utilization coupled with hydrogen production.



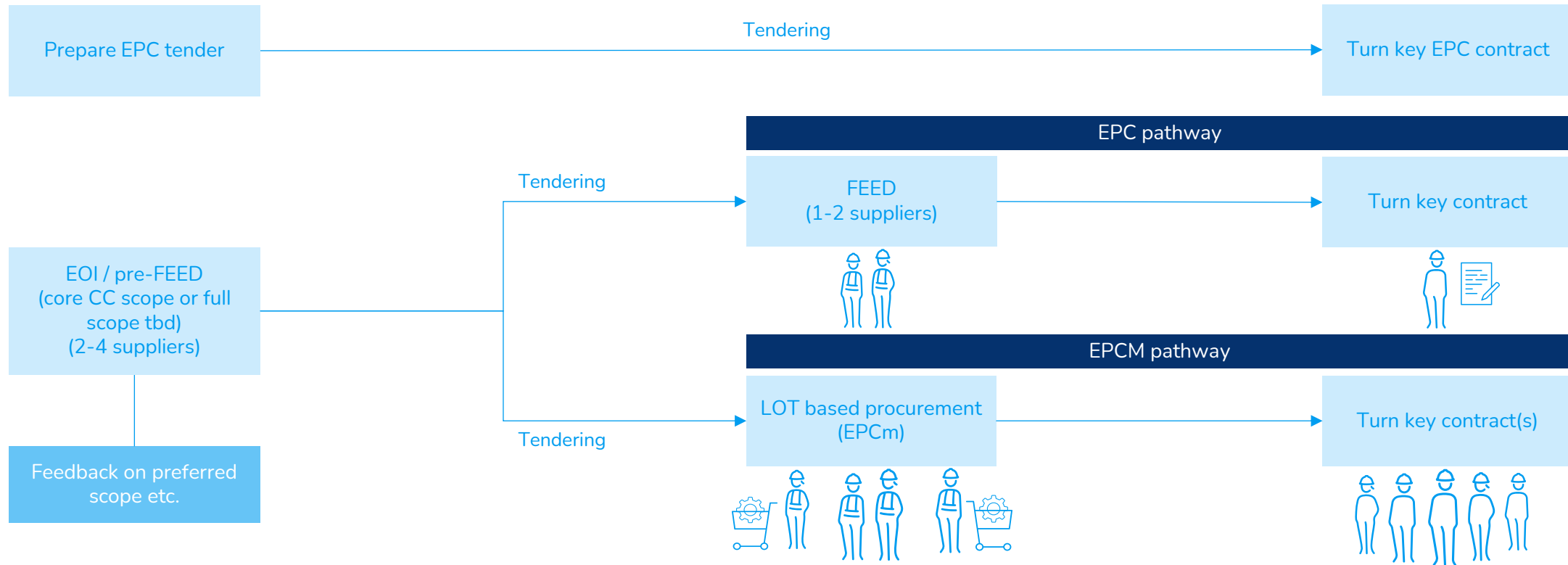
Ramboll's project execution model for successful development and implementation of CCUS projects



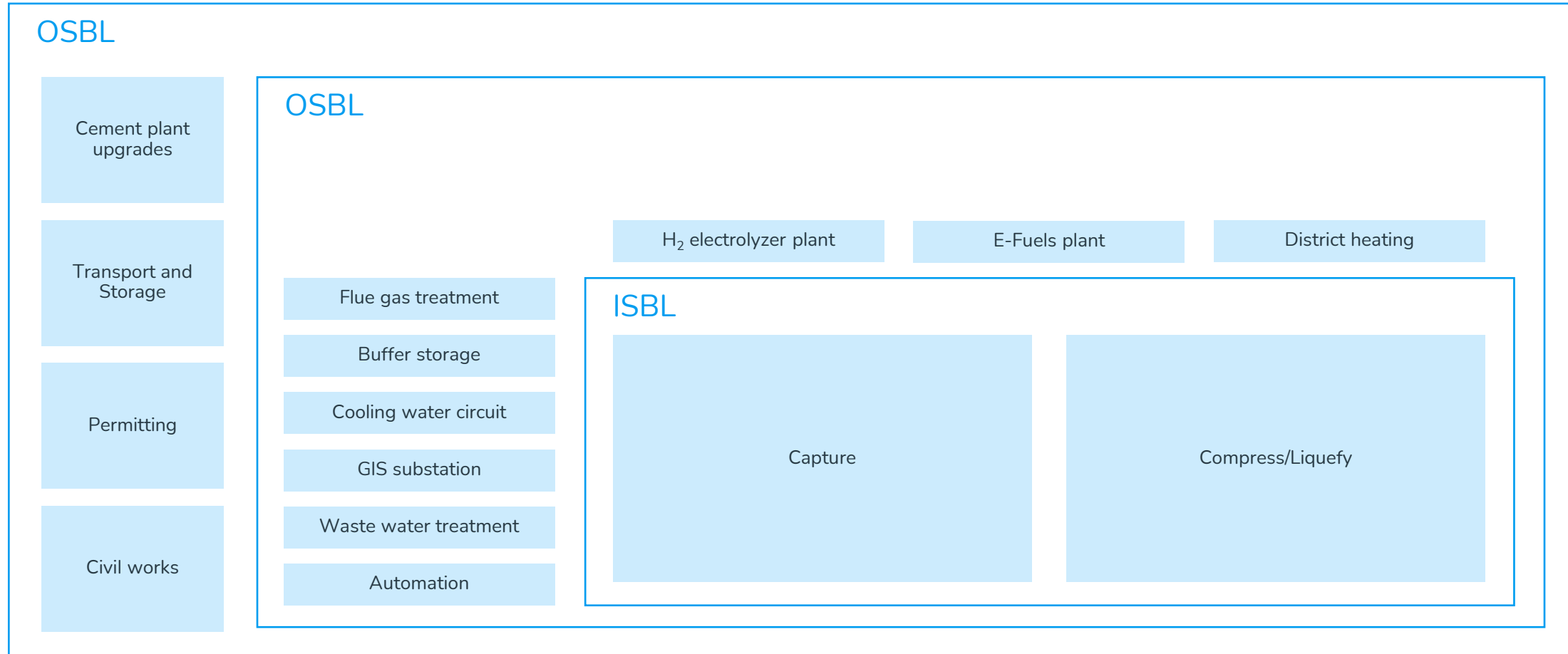
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Procurement models in Carbon Capture

CO₂ capture technology choice (& risk)



What are the EPCM lots?



What about transport and storage?

Ramboll supports with

- Identification of relevant transport possibilities (pipeline, road, rail, shipping)
- Assessment and cost evaluation of alternative transport solutions
- Assessment of storage potentials
- Cost evaluations of various storage locations and sizes (onshore, nearshore and offshore)
- Technical, regulatory, market and risk assessments



Transporting the CO₂ to final storage (or towards utilization) is affected by the physical circumstances

Multiple storage options:

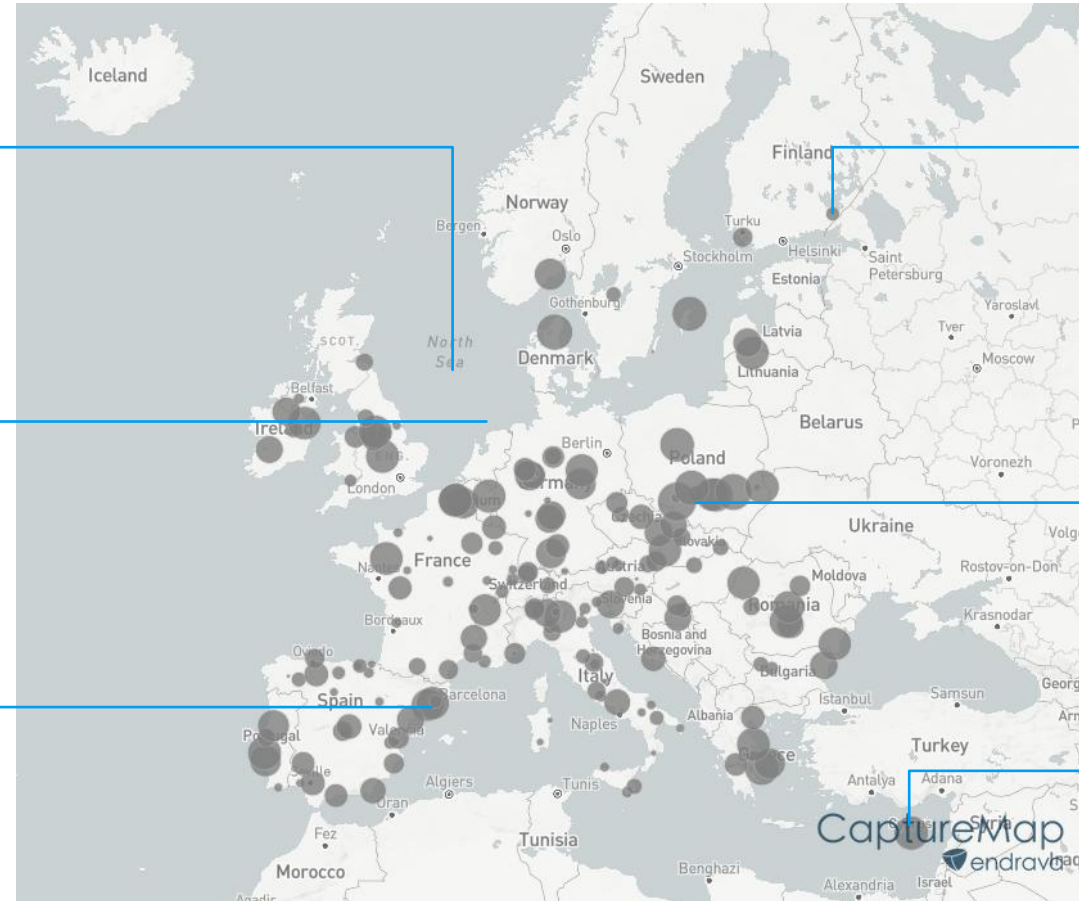
Delay decision as many possibilities are reachable with a similar investment?

Shallow water:

Small ships and many?
Access to pipelines?

Cluster of emitters:

Economies of scale?
Willingness to cooperate in a competitive funding environment?



Remote:

Synergies with other emitters?
Local solution (CCU)?

Landlocked:

Local solutions (CCU)?
Access to roads or rails?
Access to rivers?
Access to pipelines?
Form clusters to achieve economies of scale?

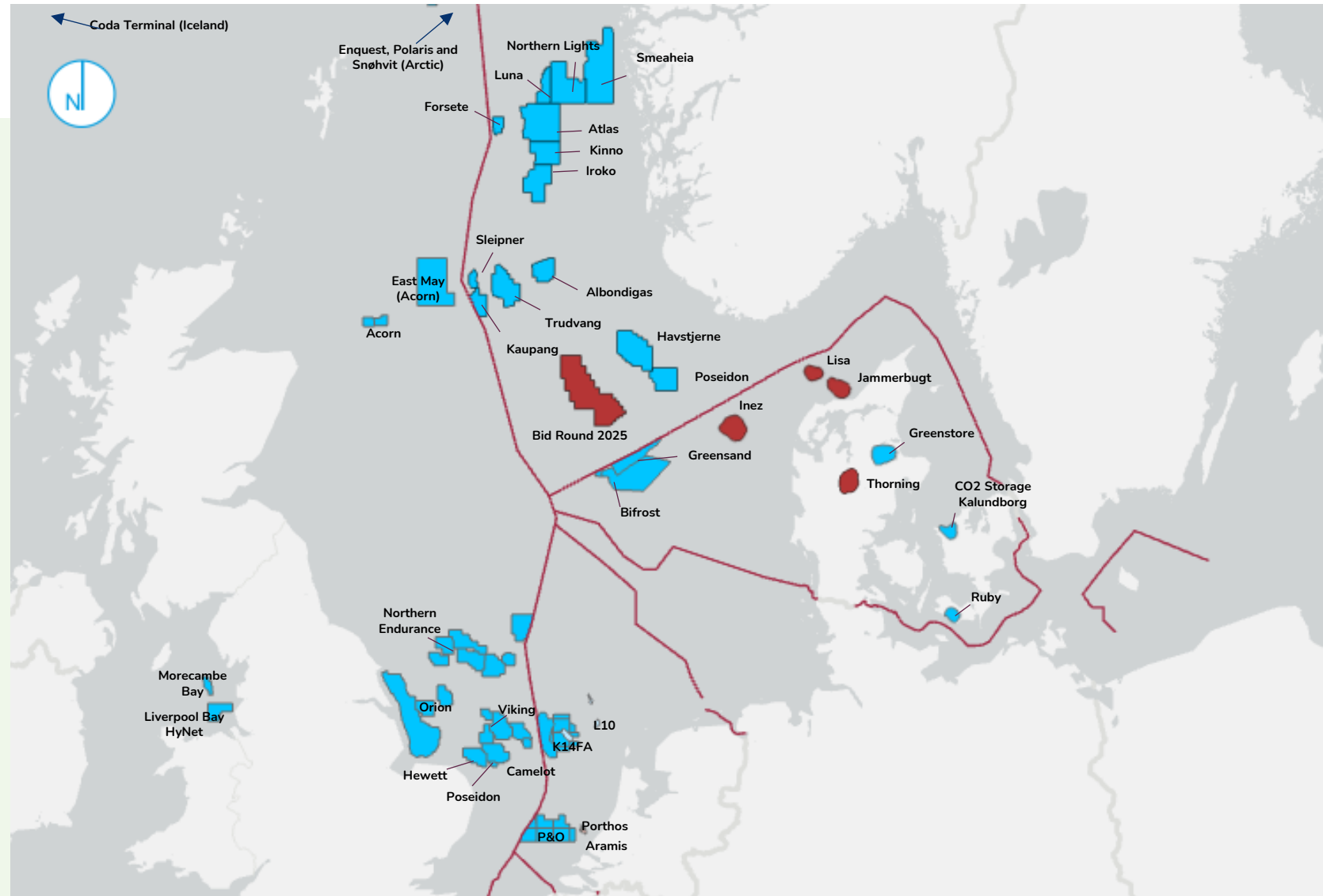
Far away from storage:

Local solutions (CCU)?
Use huge ships?

Storing CO₂ in the North Sea

North Sea Region
CO₂ Storage licenses –
executing exploration work
programmes 2022-2028.

Storage permits awarded in
Northern Lights N (2020),
Porthos NL (2022), Northern
Endurance UK (2024) and
Greensand pending (DK)



Let's close the gap on decarbonisation

How to de-risk the procurement and manage a carbon capture project successfully?

<https://webinar.ramboll.com/decarbonising-cement-how-to-manage/join>

What are the best practices for transport and storage?

<https://webinar.ramboll.com/decarbonising-cement-transporting/join>

Visit our website

<https://www.ramboll.com/energy/carbon-capture>



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