



AKER CARBON
CAPTURE

Aker Carbon Capture Capital Markets Day

September 9, 2021



Agenda

Welcome and introduction

David Phillips, Aker Carbon Capture

Part 1: Market and Momentum

Strategy Outline

Carbon Capture and Storage – A growth industry

Valborg Lundegaard, Aker Carbon Capture

Jeff Erikson, Global CCS Institute

Part 2: Who we are - Technology & Partnerships

Technology and Innovation

Guest interview

Research and development

Guest interview

Jim Stian Olsen, Aker Carbon Capture

Karim Amin, Siemens Energy

Jim Stian Olsen, Aker Carbon Capture

Joanna Mainguy, Microsoft

Part 3: Business model innovation

Carbon Capture as a Service: Business model

Guest interview

Carbon Capture as a Service: Market outlook

Video guest interview

Carbon Capture as a Service: Finance

Jon Christopher Knudsen, Aker Carbon Capture

Helene Mørne, Carbonor

Jon Christopher Knudsen, Aker Carbon Capture

Edda Aradóttir, Carbfix

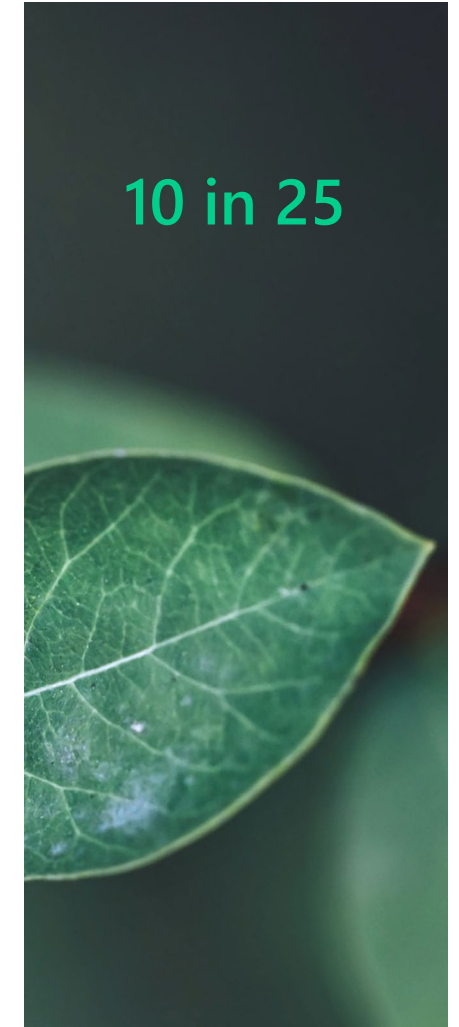
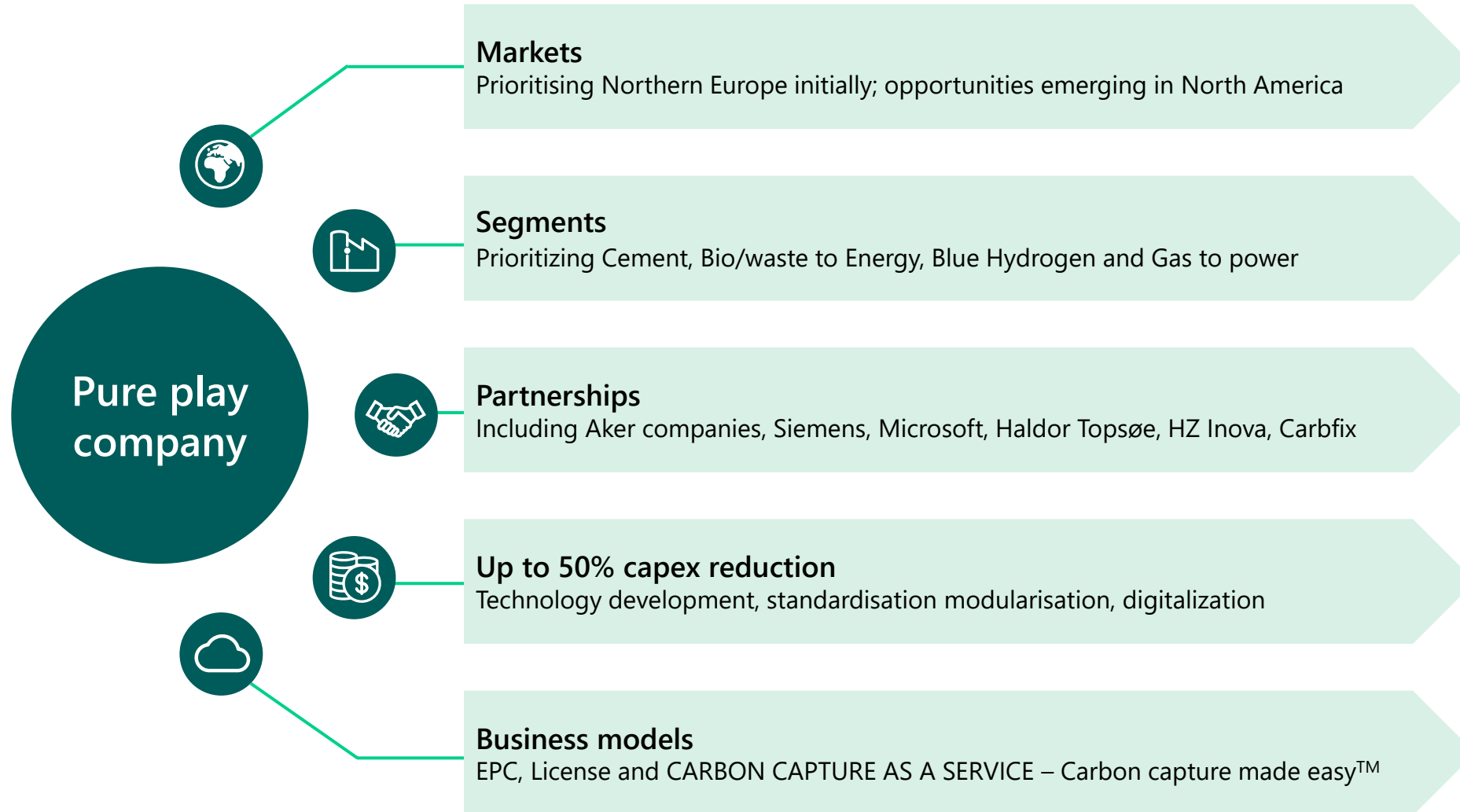
Egil Fagerland, Aker Carbon Capture

Q&A



Part 1: Market and Momentum

Strategy



CARBON CAPTURE AND STORAGE – A GROWTH INDUSTRY

**AKER CARBON CAPTURE SOLUTIONS
CAPITAL MARKETS DAY
SEPTEMBER 9, 2021**

**JEFF ERIKSON, GENERAL MANAGER
GLOBAL CCS INSTITUTE**

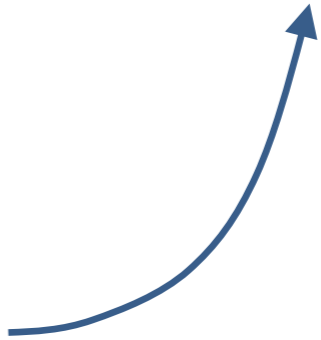
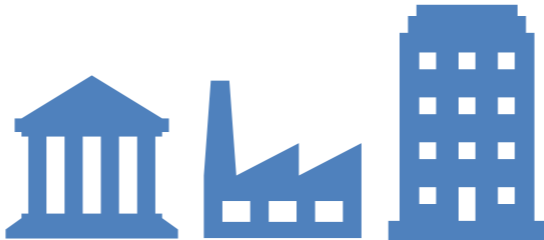


THE GLOBAL CCS INSTITUTE



International think tank

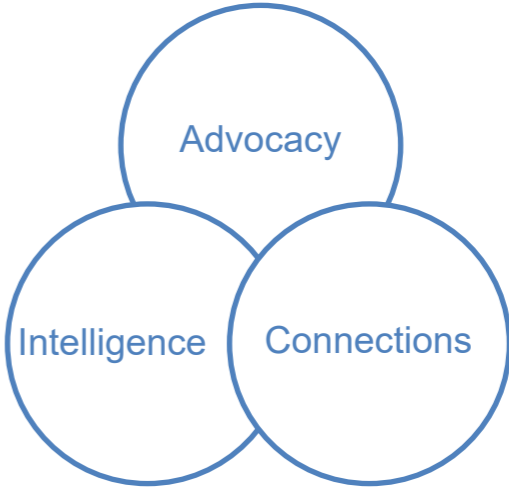
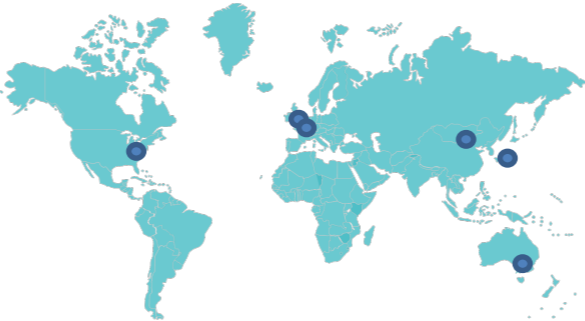
Backed by governments, businesses and NGOs



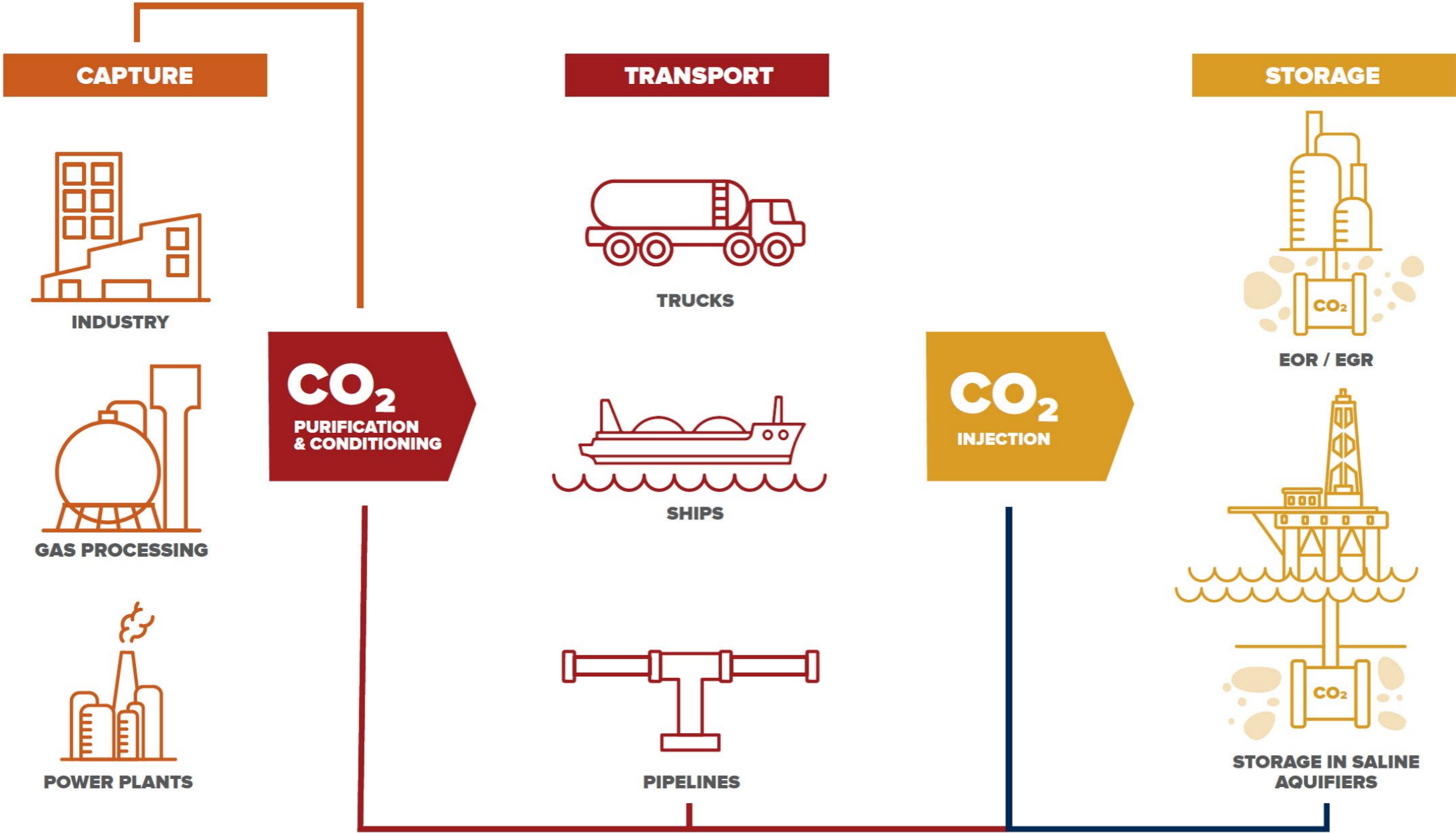
Mission: To accelerate deployment of CCS

113 MEMBERS

7 locations



CARBON CAPTURE AND STORAGE – FUNDAMENTALS

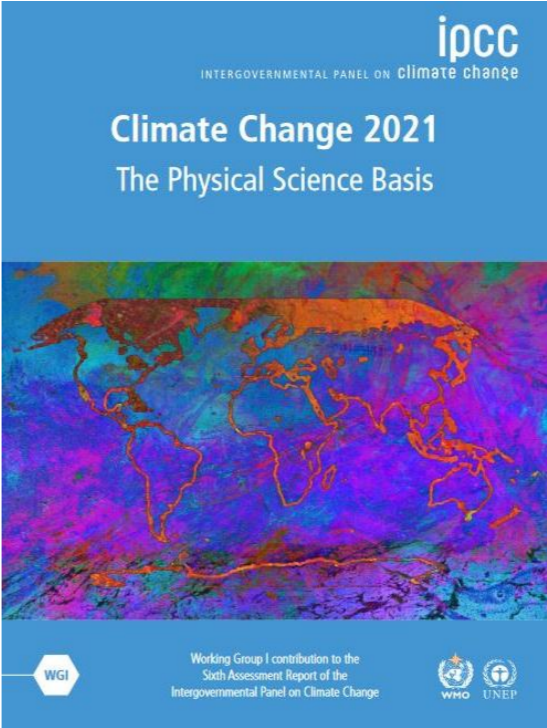
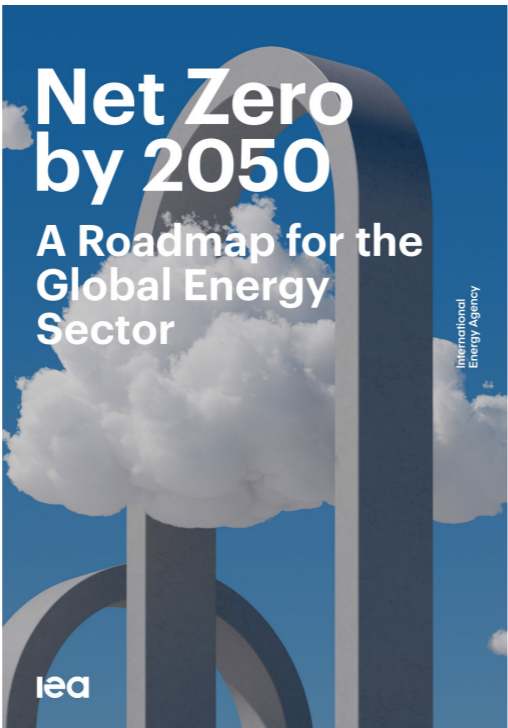
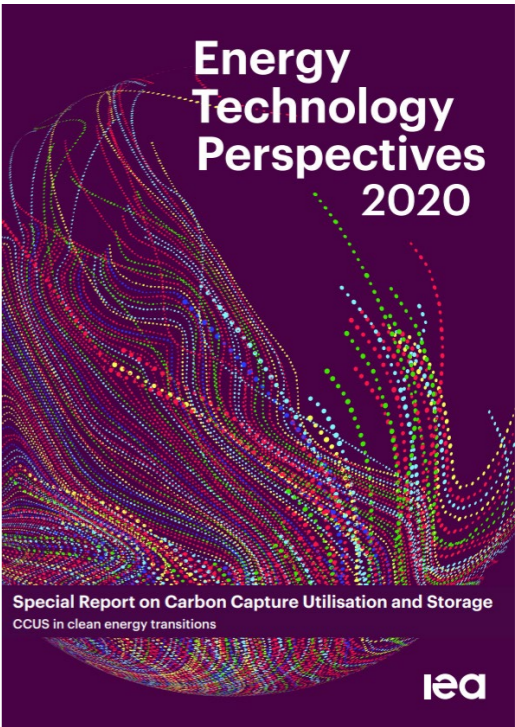
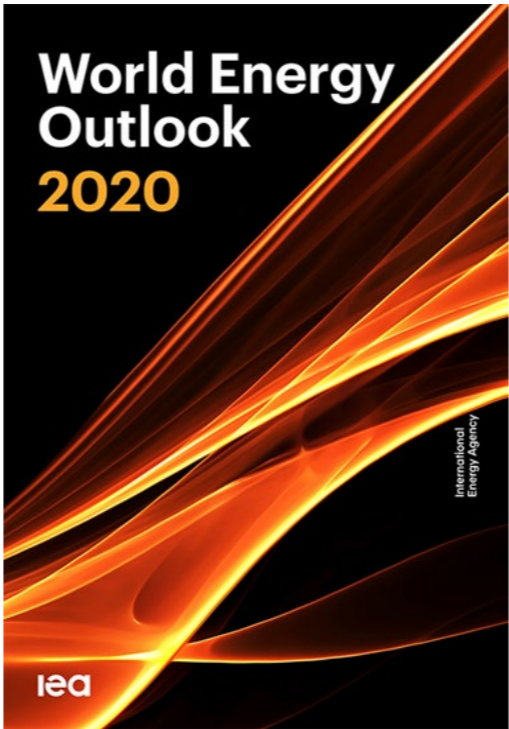
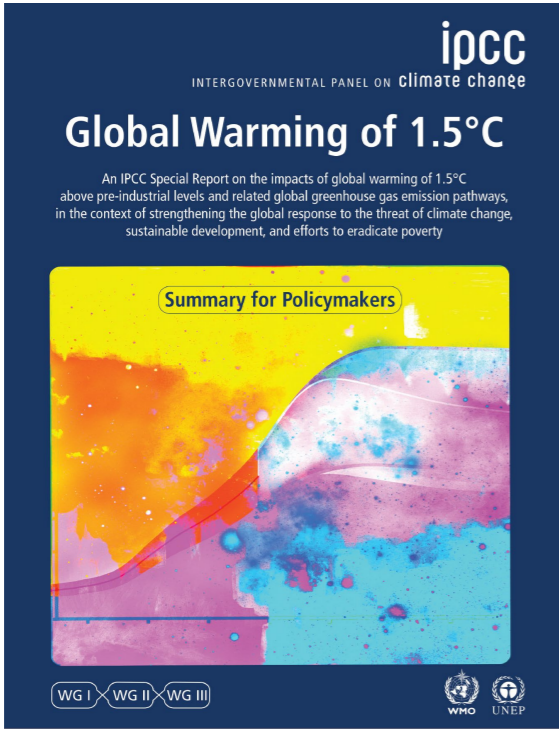


HEADLINES

- Tremendous growth – now and projected
- Climate change and net-zero emissions commitments – driving interest and investment
- Policy and funding support building – notably UK, Norway, Netherlands, EU, US, Canada, China, Japan
- Key developments
 - Enhanced tax credit in the US (45Q)
 - Langskip, Porthos, UK Clusters
 - China's 30/60 goals
 - Networks
 - Hydrogen



CARBON CAPTURE PLAYS A KEY ROLE IN ACHIEVING CLIMATE GOALS

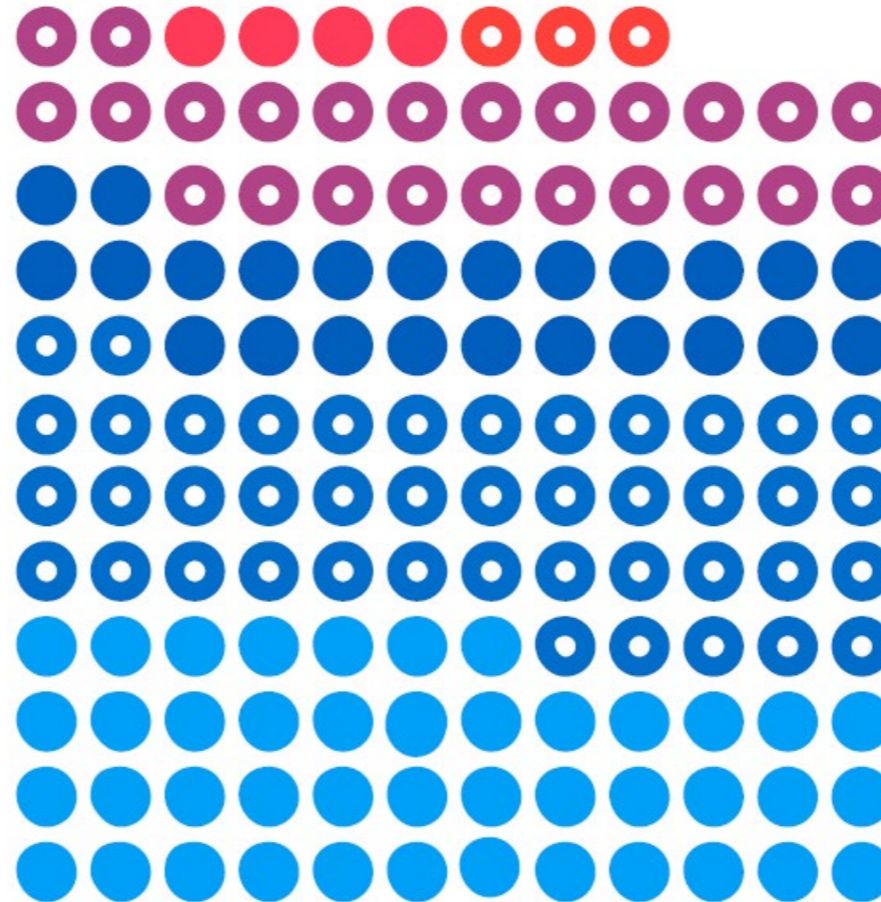


MASSIVE SCALE-UP REQUIRED

2020
40 Mtpa

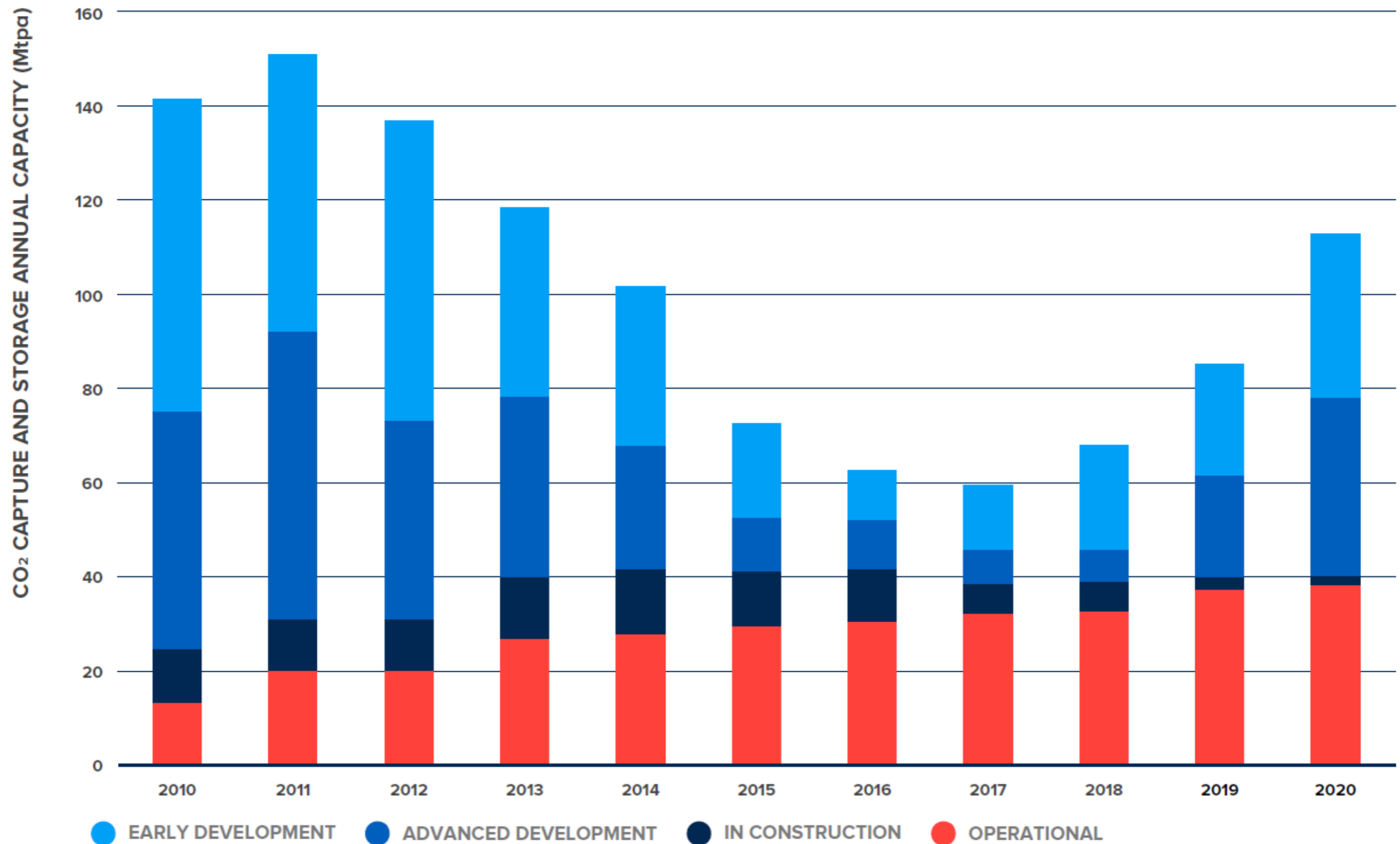


2050
5,635 Mtpa



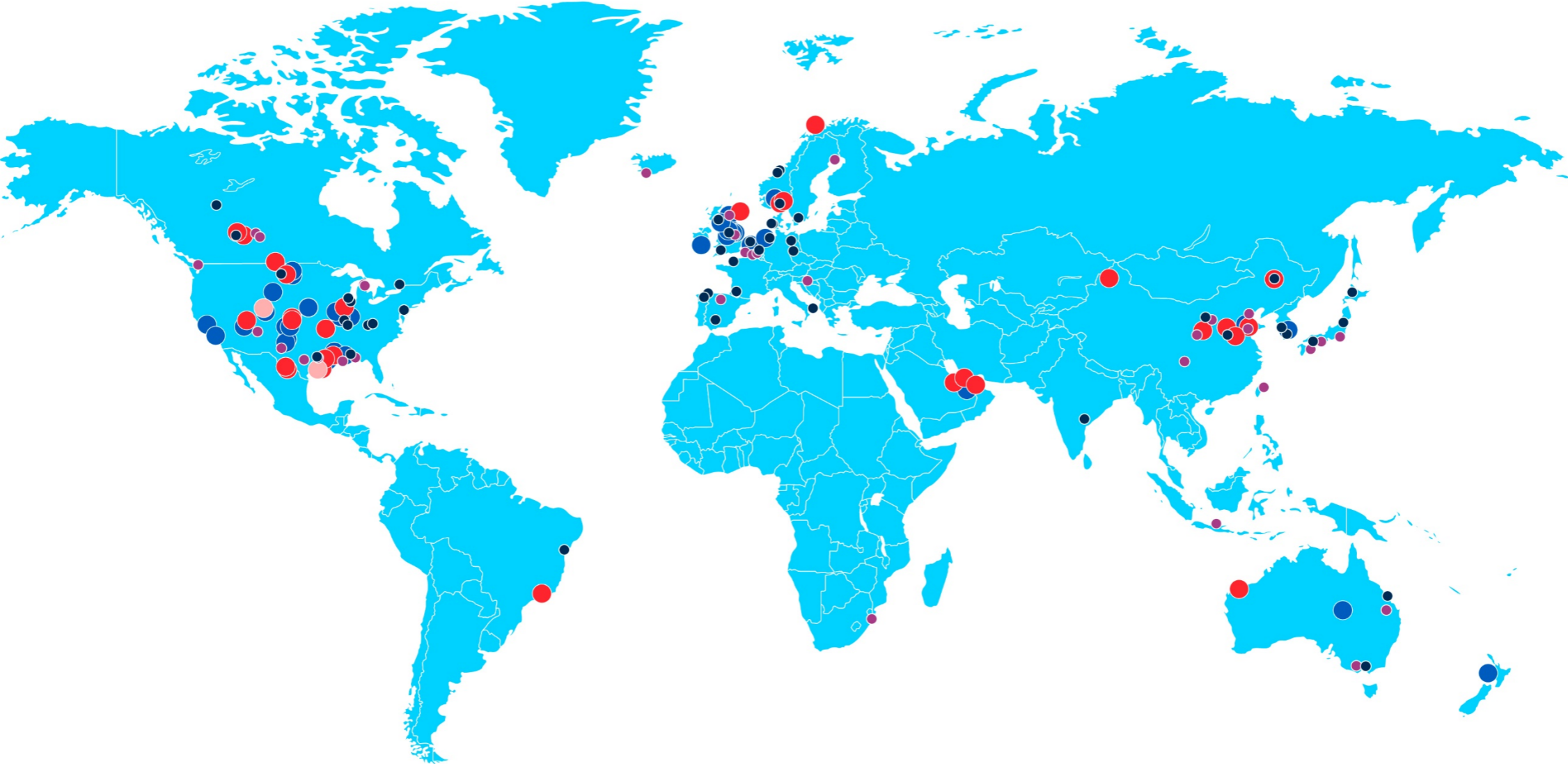
- COAL
- NATURAL GAS
- BIOMASS
- INDUSTRIAL PROCESS
- OIL
- DIRECT AIR CAPTURE

EARLY DAYS OF A STRONG GROWTH TRAJECTORY



THE CAPACITY OF FACILITIES WHERE OPERATION IS CURRENTLY SUSPENDED IS NOT INCLUDED IN THE 2020 DATA.

CARBON CAPTURE FACILITIES IN OPERATION AND DEVELOPMENT



- COMMERCIAL CCS FACILITIES IN OPERATION & CONSTRUCTION
- COMMERCIAL CCS FACILITIES IN DEVELOPMENT
- OPERATION SUSPENDED
- PILOT & DEMONSTRATION FACILITIES IN OPERATION & DEVELOPMENT
- PILOT & DEMONSTRATION FACILITIES COMPLETED

26 commercial-scale facilities
40 million tonnes per year

CARBON CAPTURE FACILITIES IN OPERATION AND DEVELOPMENT

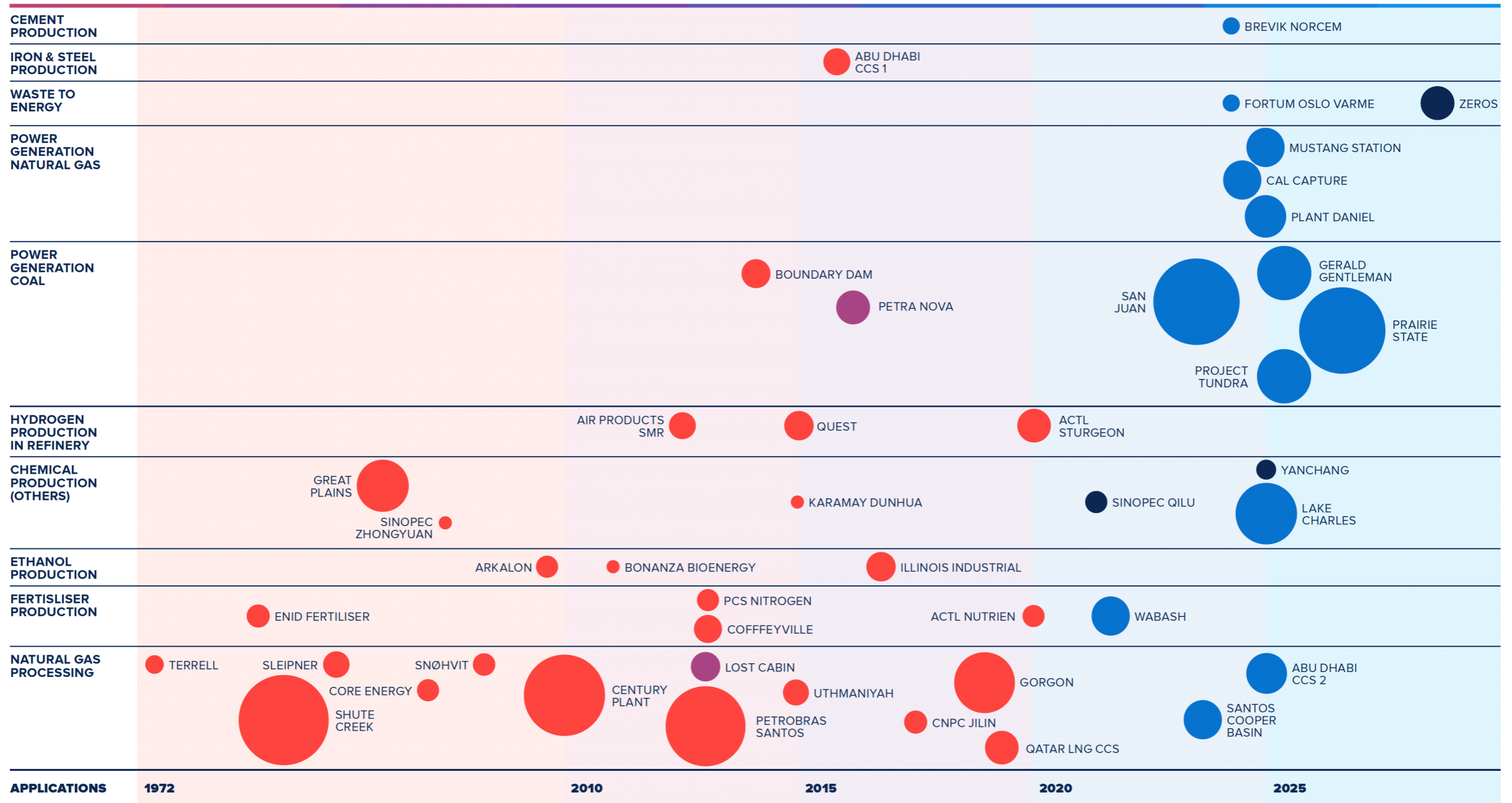


Chart indicates the primary industry type of each facility among various options.

- IN OPERATION
- IN CONSTRUCTION
- ADVANCED DEVELOPMENT
- OPERATION SUSPENDED

Size of the circle is proportionate to the capture capacity of the facility.



NETWORKS: THE FUTURE OF CARBON CAPTURE AND STORAGE

STORAGE TYPE

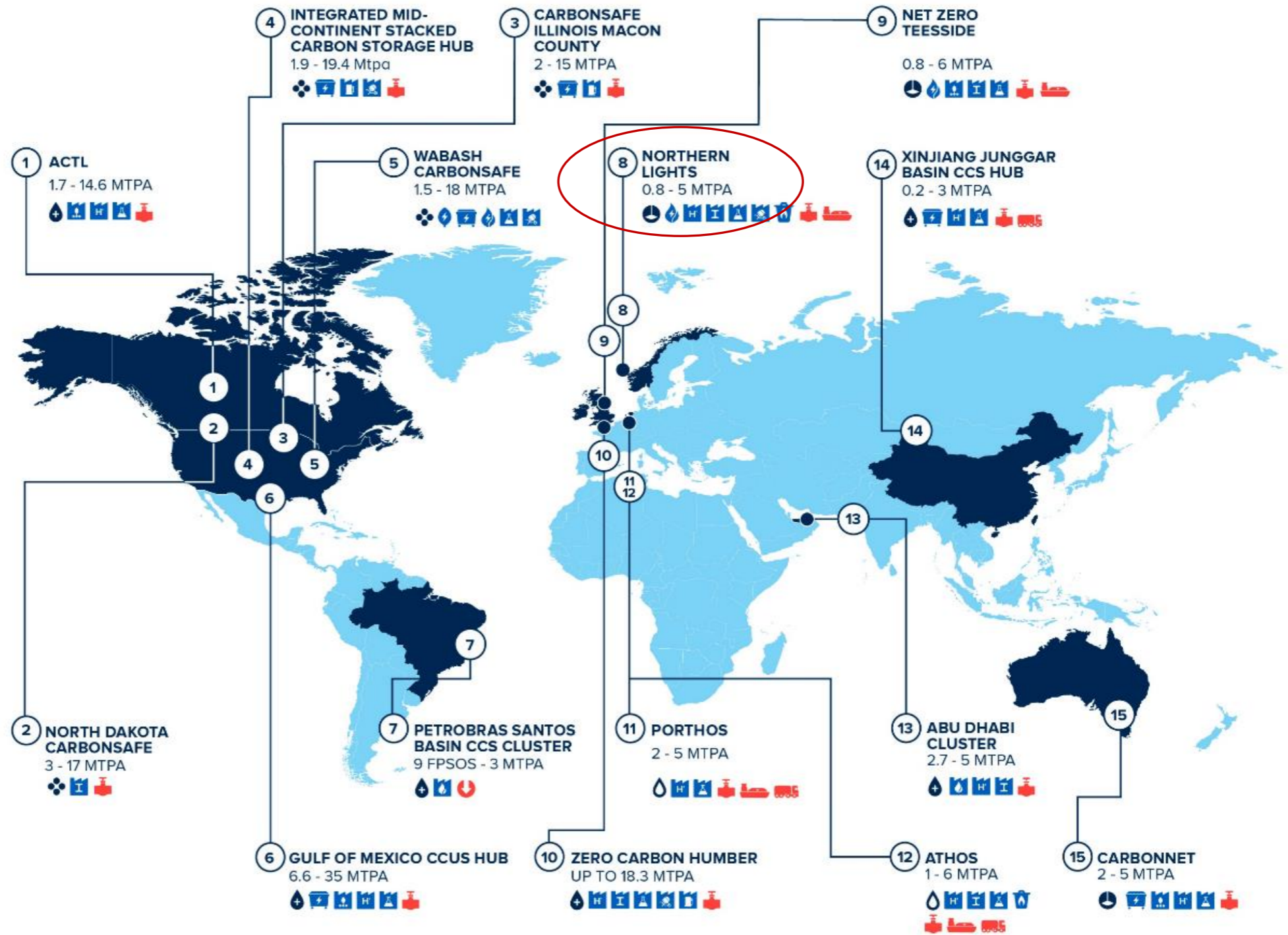
- DEEP SALINE FORMATIONS
- ENHANCED OIL RECOVERY
- DEPLETED OIL & GAS RESERVOIRS
- VARIOUS OPTIONS CONSIDERED

INDUSTRY SECTOR

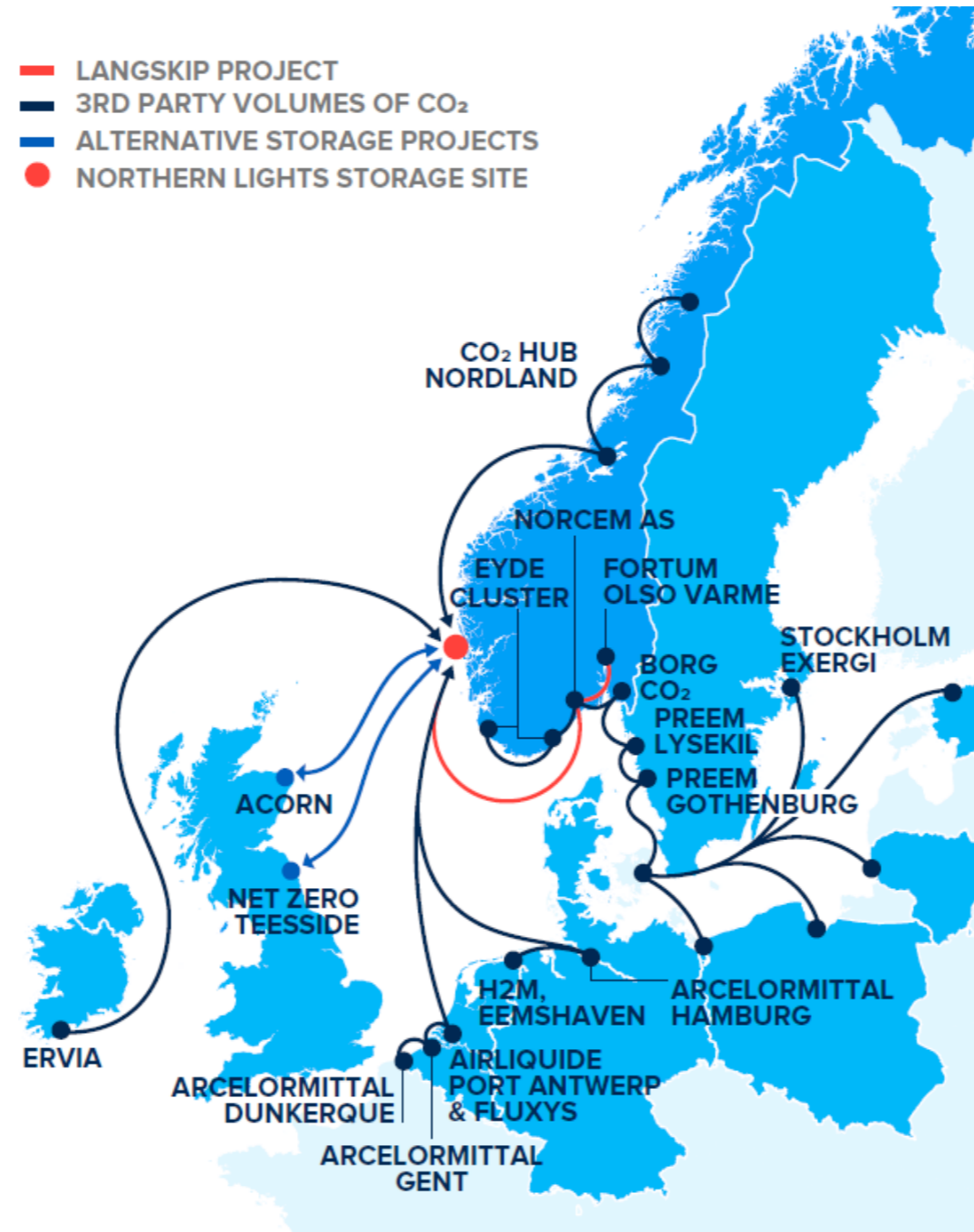
- COAL FIRED POWER
- NATURAL GAS POWER
- NATURAL GAS PROCESSING
- FERTILISER PRODUCTION
- HYDROGEN PRODUCTION
- IRON & STEEL PRODUCTION
- CHEMICAL & PETROCHEMICAL PRODUCTION
- CEMENT PRODUCTION
- WASTE INCINERATION
- ETHANOL PRODUCTION
- BIOMASS POWER

DELIVERY

- PIPELINE
- SHIP
- ROAD
- DIRECT INJECTION



NETWORKS: THE FUTURE OF CARBON CAPTURE AND STORAGE



HEADLINES

- Tremendous growth – now and projected
- Climate change and net-zero emissions commitments – driving interest and commitment
- Policy and funding support building – notably UK, Norway, Netherlands, EU, US, Canada, China, Japan
- Key developments
 - Enhanced tax credit in the US (45Q)
 - Langskip, Porthos, UK Clusters
 - China's 30/60 goals
 - Networks
 - Hydrogen
- Watchlist
 - CCS on LNG
 - Shipping
 - New geographies – Russia, Lithuania, Timor-Leste
 - As support grows, so does opposition



THANK YOU

JEFF.ERIKSON@GLOBALCCSINSTITUTE.COM



GLOBAL CCS INSTITUTE



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GLOBAL CCS
INSTITUTE





Part 2: Who we are - Technology & Partnerships

Why do we need Carbon Capture?

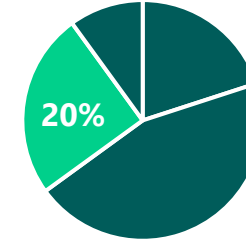
Energy Optimization

Renewable Energy

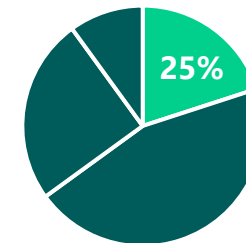
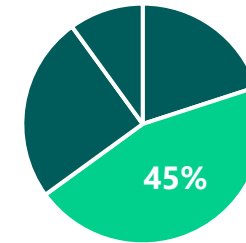
Carbon Capture and Storage



Industries
(Cement, steel mills)



Power and heat
generation



Transportation

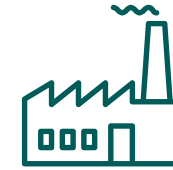
Buildings and
others (10%)

Why do we need Carbon Capture?

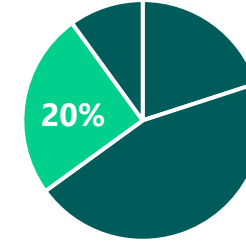
Energy Optimization

Renewable Energy

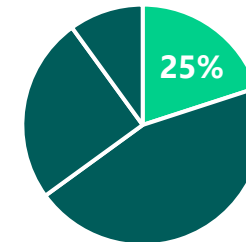
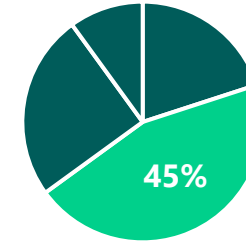
Carbon Capture and Storage



Industries
(Cement, steel mills)



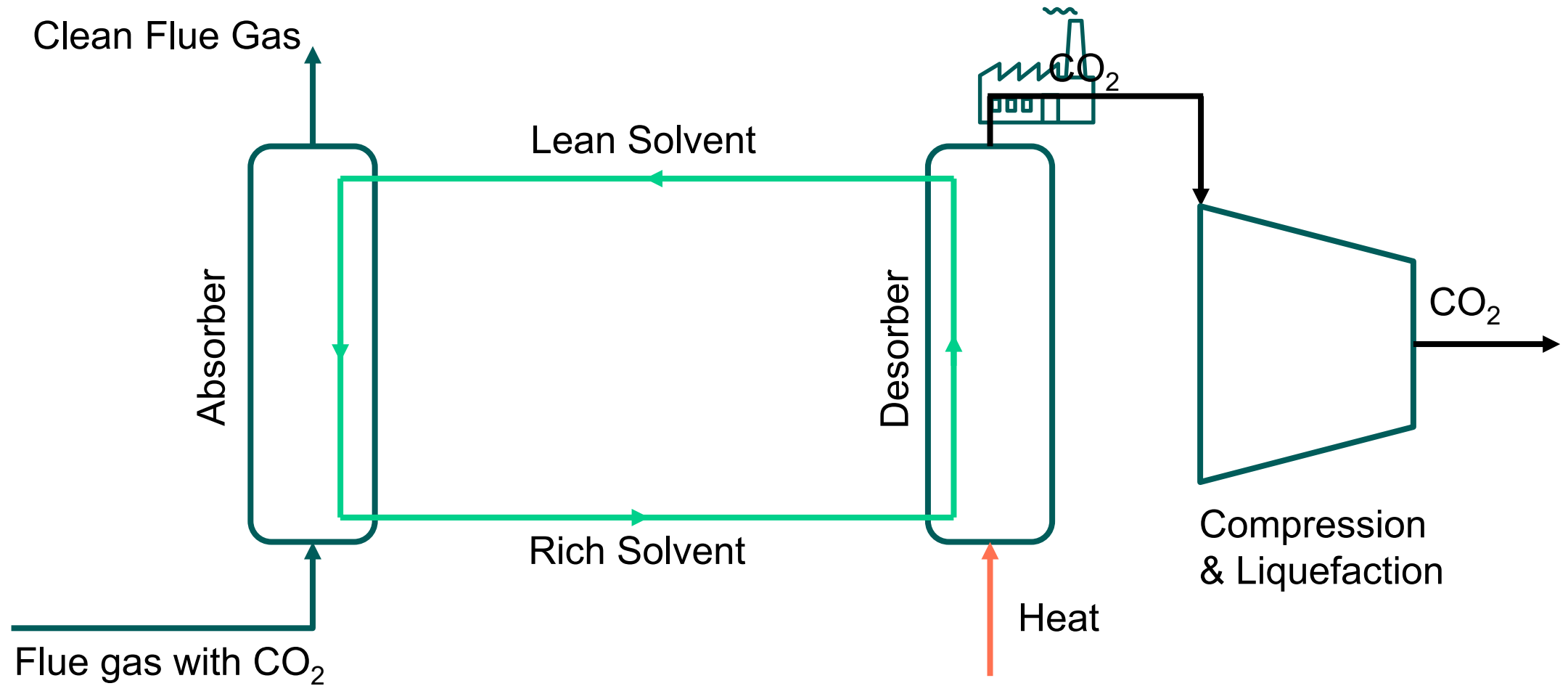
Power and heat
generation



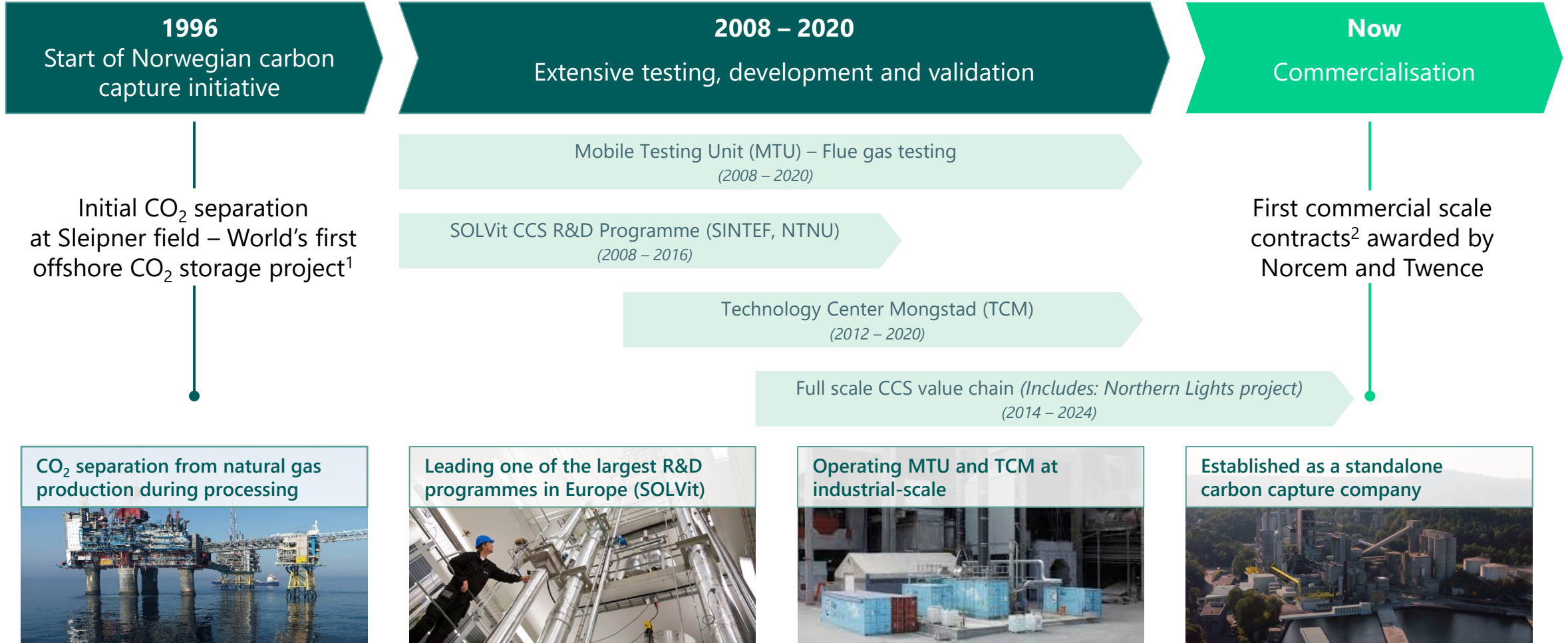
Transportation

Buildings and
others (10%)

How does it work?

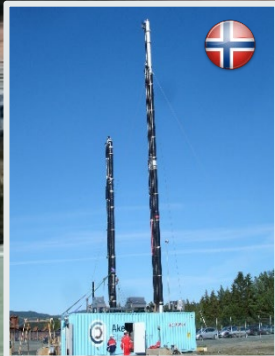


A long-term Norwegian technology initiative





50 000 operating hours



Natural gas
Risavika Gas Center



Coal
Longannet Power



Coal
National CCC



**Natural gas
& Heavy oil
cracker**
Dong CHP
Equinor oil refinery



Cement
Heidelberg/
Norcem



**Waste to
Energy**
Klemetsrud WtE



Hydrogen
Preem refinery

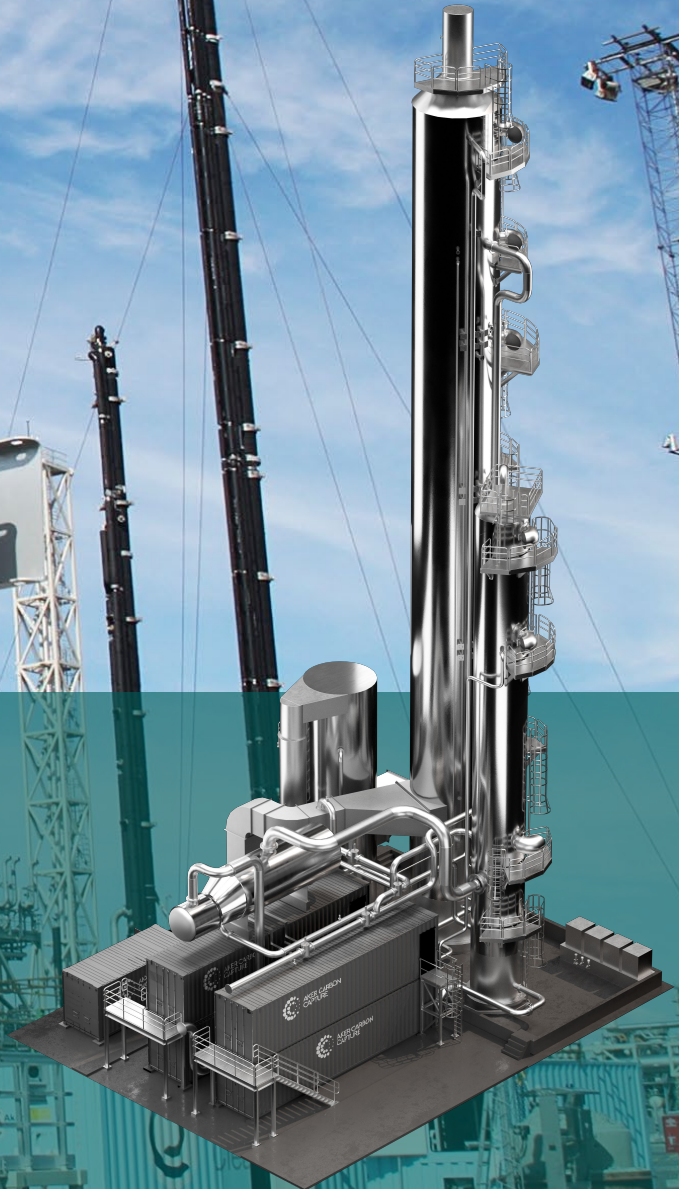


Char
Polchar (2021)



Akersgaten

From technology center
to efficient carbon capture solutions





Working together to succeed

Hitachi Zosen
INOVA

HALDOR TOPSØE 

 Carbfix

 Microsoft

 SINTEF

 AkerSolutions



SIEMENS
ENERGY


MAN Energy Solutions
Future in the making

 COGNITE

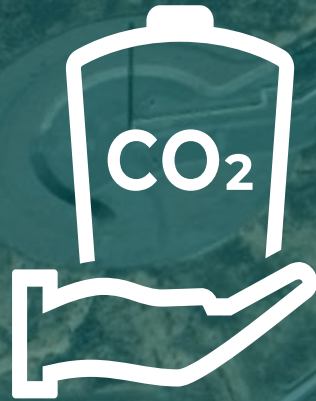


Strengthen technology portfolio for strategic market opportunities

Expand technology to capture opportunities in adjacent markets

Explore new technology to enter new markets

Aukra Hydrogen Hub

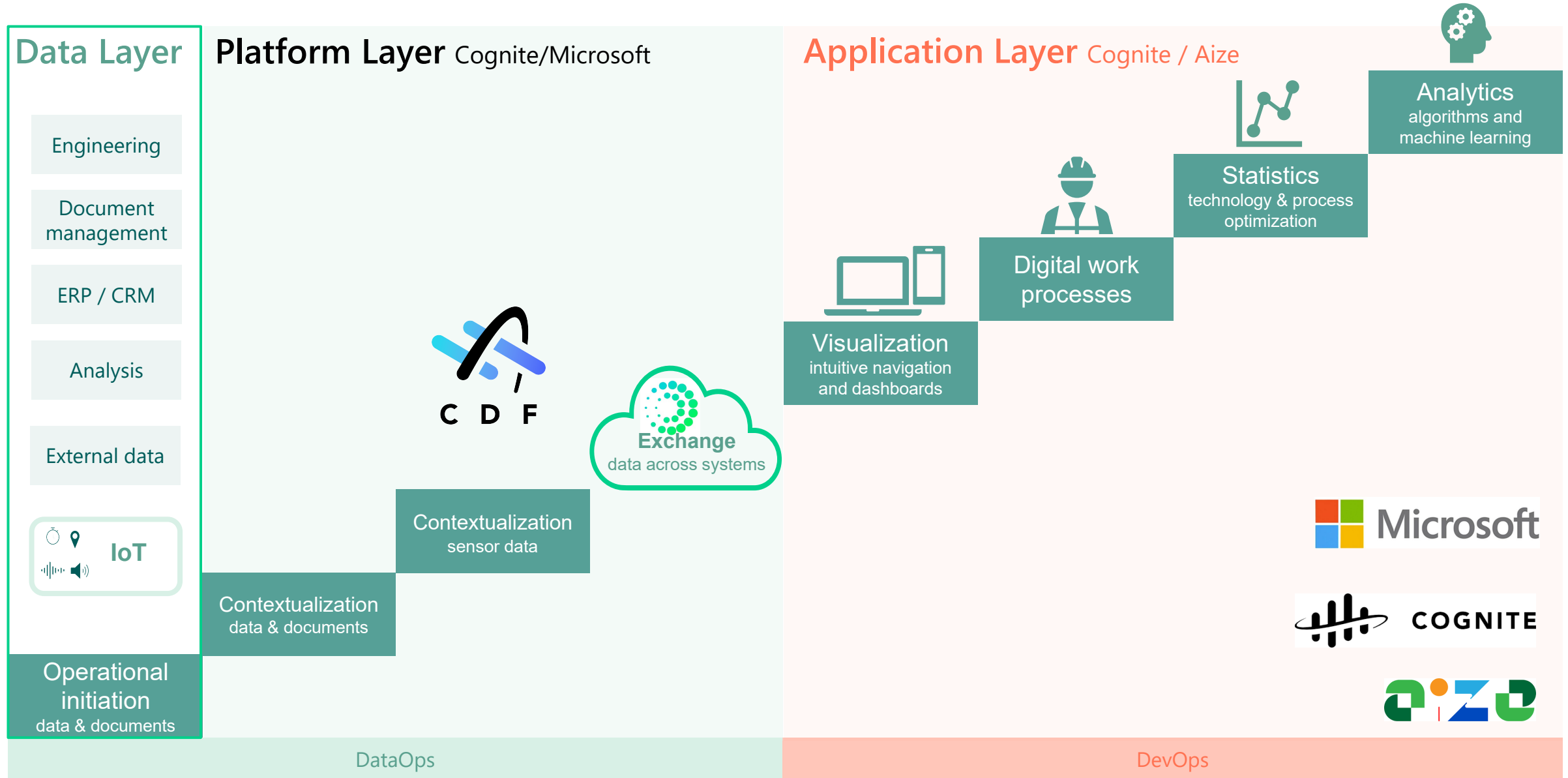


Nyhamna

Blue Hydrogen with innovative pre-combustion capture technology



Building a digital ecosystem for carbon capture





Part 3: Business model innovation

One product – several offerings

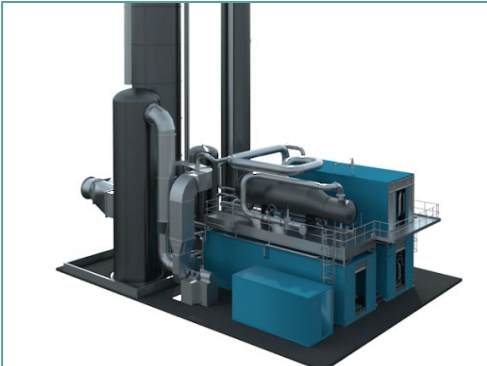
Key offerings



Big Catch

Capacity: > 400,000 tonnes/year

- Made to order
- ~30-36 months delivery time¹
- Larger footprint
- Using bulk materials – cost efficient
- Retrofit potential



Just Catch™

Capacity: 40,000 & 100,000 tonnes/year

- Modularized and cost efficient
- ~15 months delivery time
- Easy transport and installation
- Compact design – 25m x 18m
- 100% automated

Delivery models

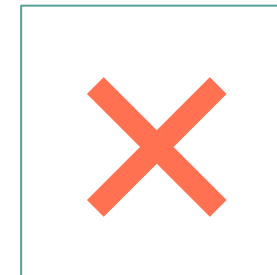
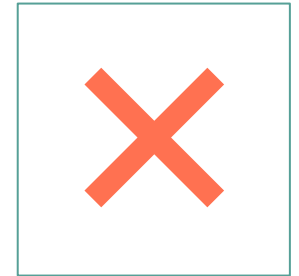
EPC



License and key equipment



Carbon Capture as a Service



Carbon capture made easy

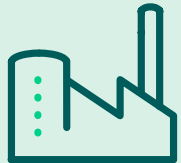
From a complex management of the full CCS value chain...



Interface, contracts and risk across the full CCS life-cycle



Financing



Carbon Capture



Liquefaction



Temporary storage



Transportation



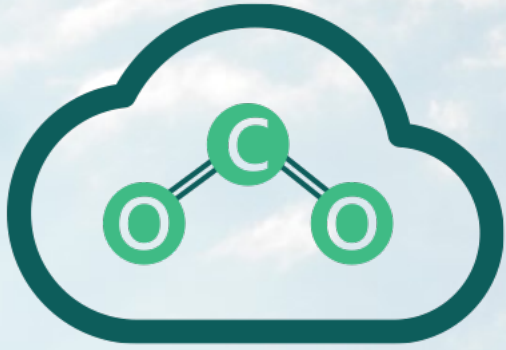
Permanent storage



...to carbon capture made easy



CARBON CAPTURE AS A SERVICE
Carbon capture made easy™



CARBON CAPTURE AS A SERVICE

Carbon capture made easy™

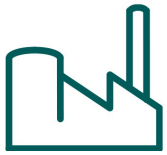
Full value chain CCS in one service

- Standard capture solution covering a range of flue gases
- Transportation and storage embedded through strategic partnerships
- Pay per tonne CO₂ captured

How does Carbon Capture as a Service work?

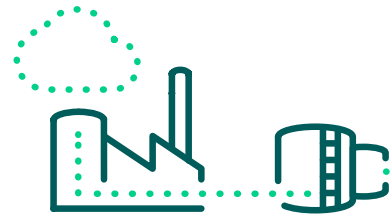
Pay per tonne captured CO₂

1. Delivery



Select the carbon capture service that fits your needs. Aker Carbon Capture will commission the carbon capture plant.

2. Operation



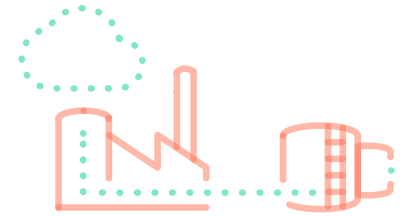
Aker Carbon Capture will operate the carbon capture plant and handle the transportation and storage value chain.

3. Growth



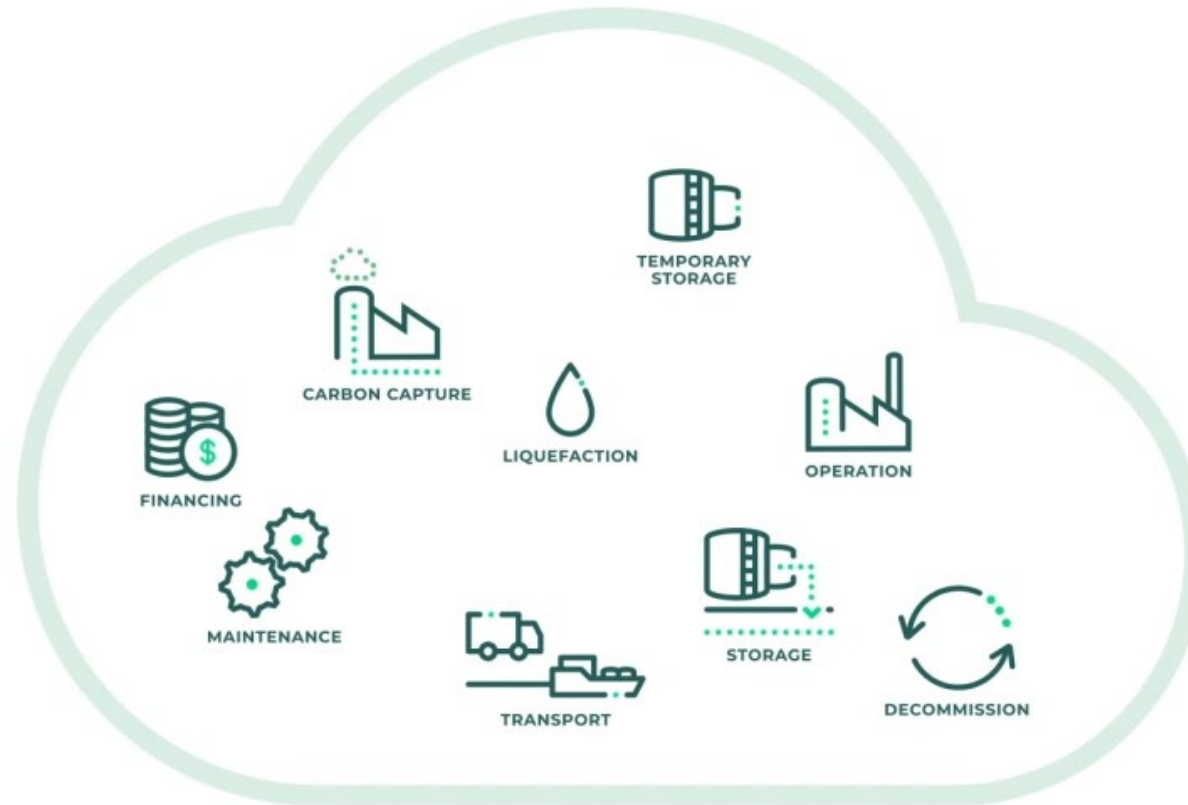
Expand carbon capture capacity by adding additional modules to the installation.

4. Flexibility



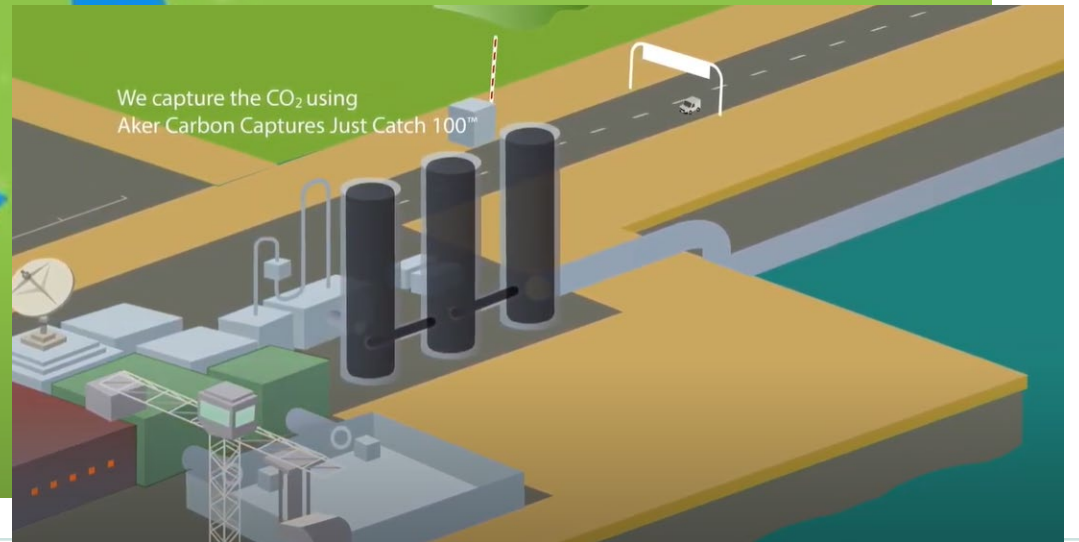
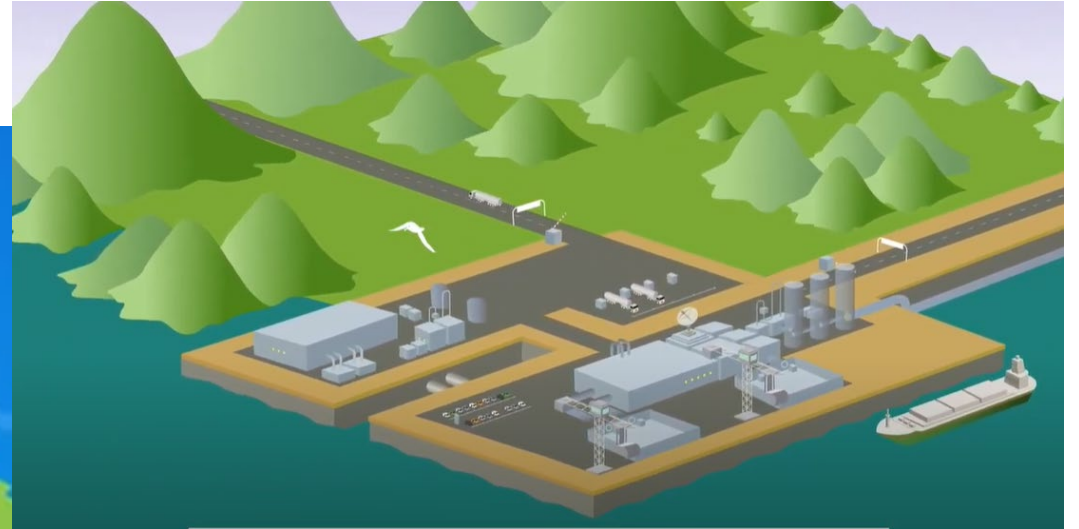
We understand that flexibility is key and have agreements in place to handle changes.

Carbon Capture Made Easy™ - flexibility also in scope

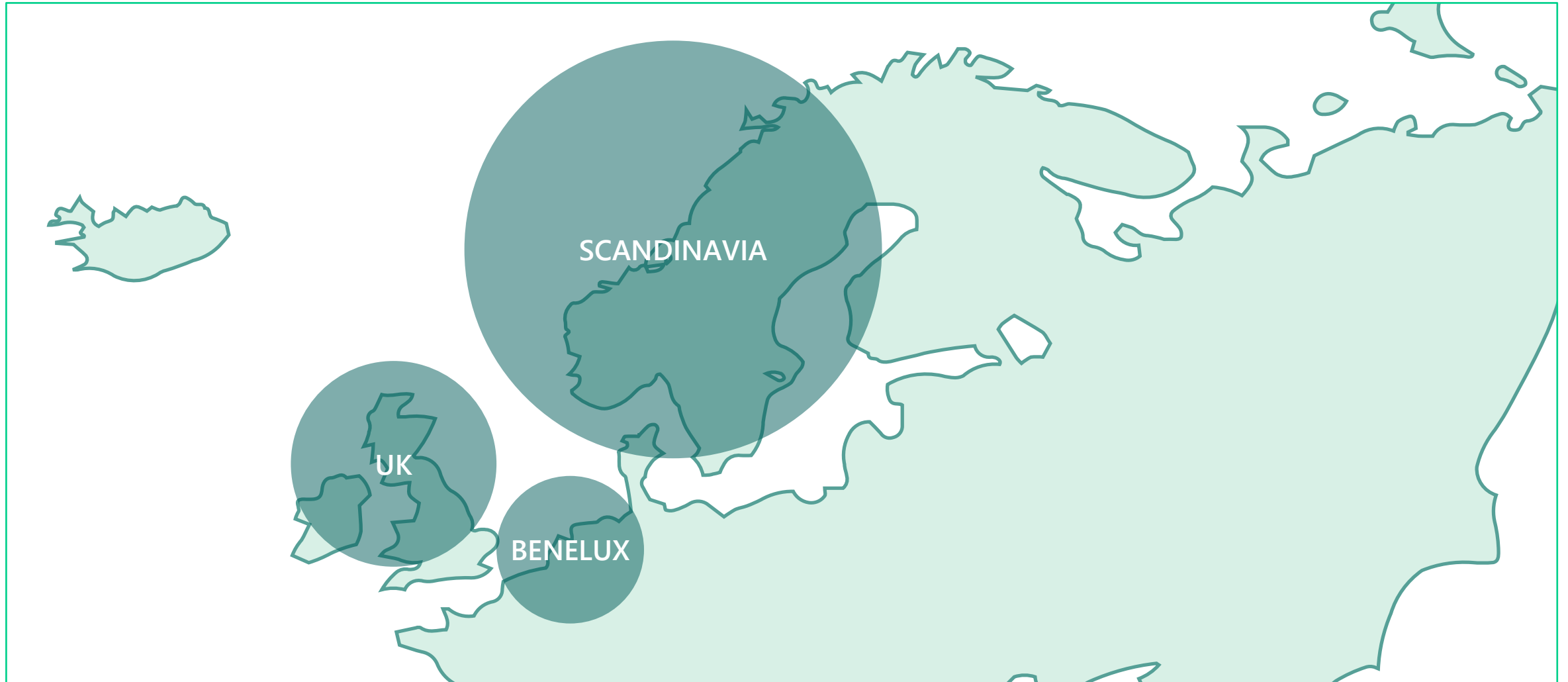


Customized CaaS

Carbonor



Market drivers and infrastructure must be in place



Untapped market potential for standardized solutions

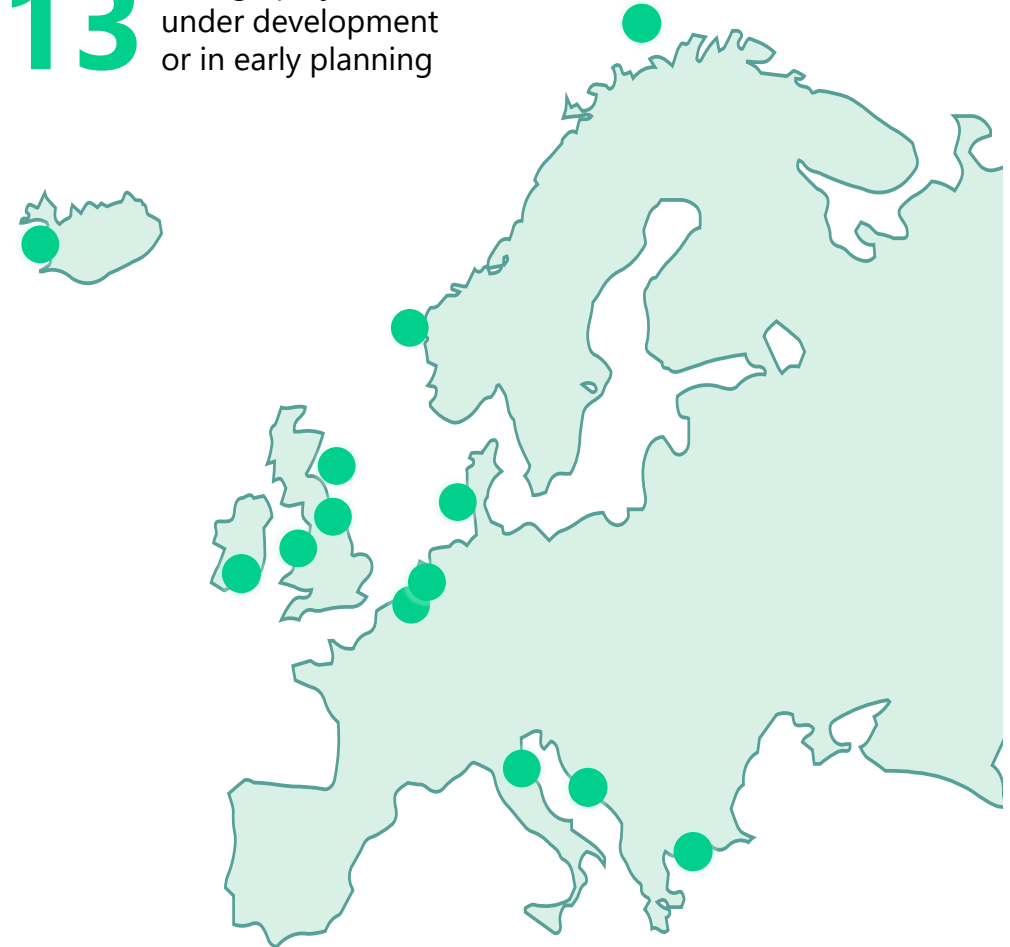
Market has focused on **large emitters** so far

More than 700 relevant emitters across Europe

Potential to **unlock synergies** across CO₂ hubs and portfolios

Flexibility

13 storage projects under development or in early planning



Carbon Capture as a Service delivery model



End-customer

- No up-front investment required
- Transparent pricing model
- Reduced requirement for in-house CCUS expertise

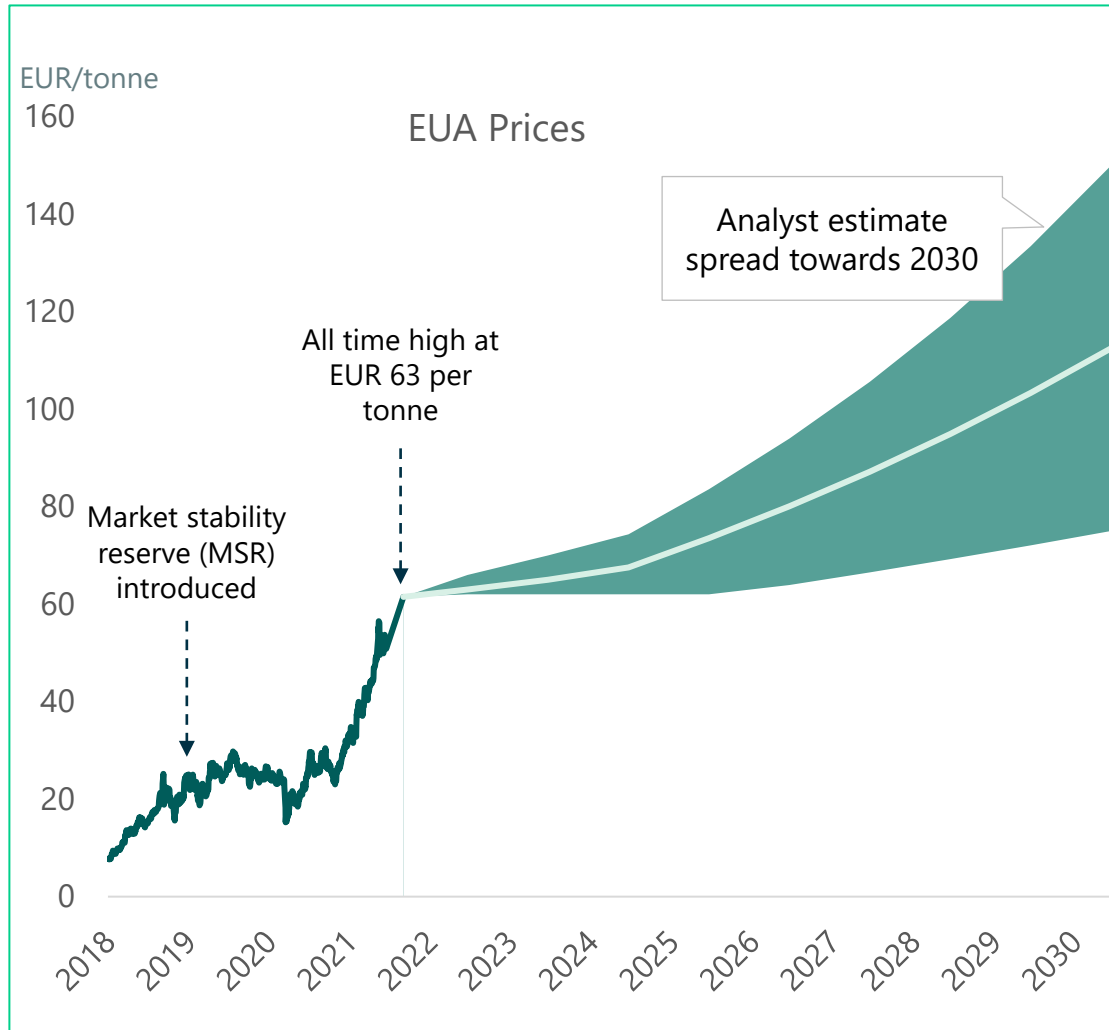
CCaaS provider

- Long-term revenue base throughout operations
- Further revenue potential from carbon price increases
- Remains capital-light

Financing partners

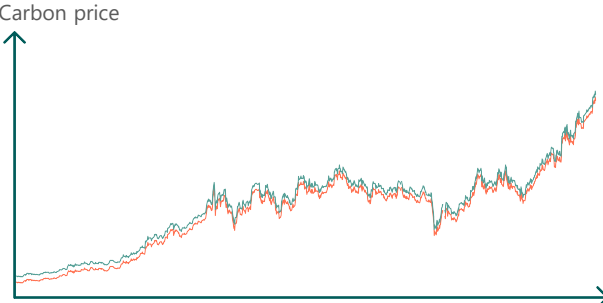

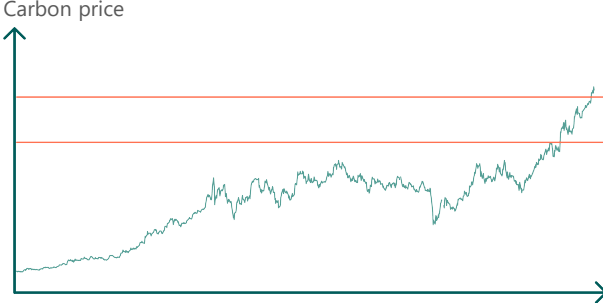
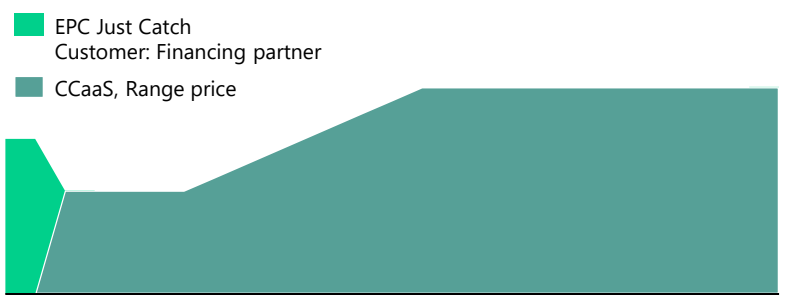
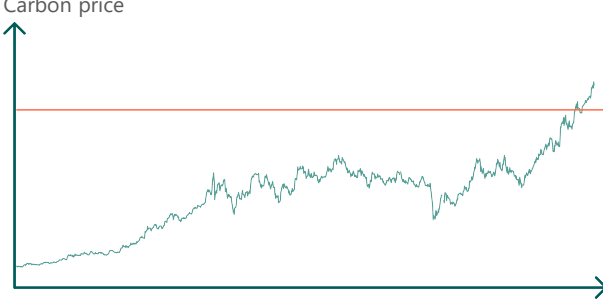
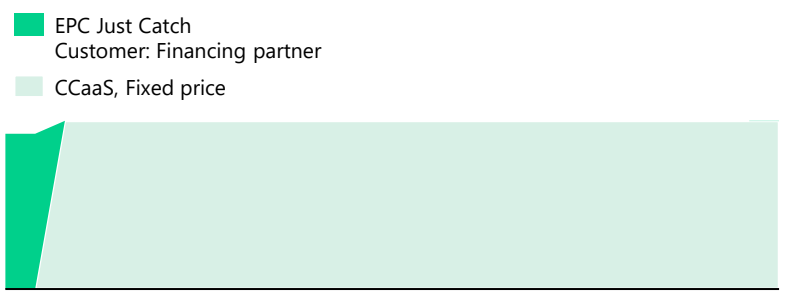
- ACC will seek the lowest cost of financing through:
- Green Yield with support from Aker Horizons
 - Other “green” asset investors
 - Project financing partners

CCaaS supported by potential EUA allowance shortage

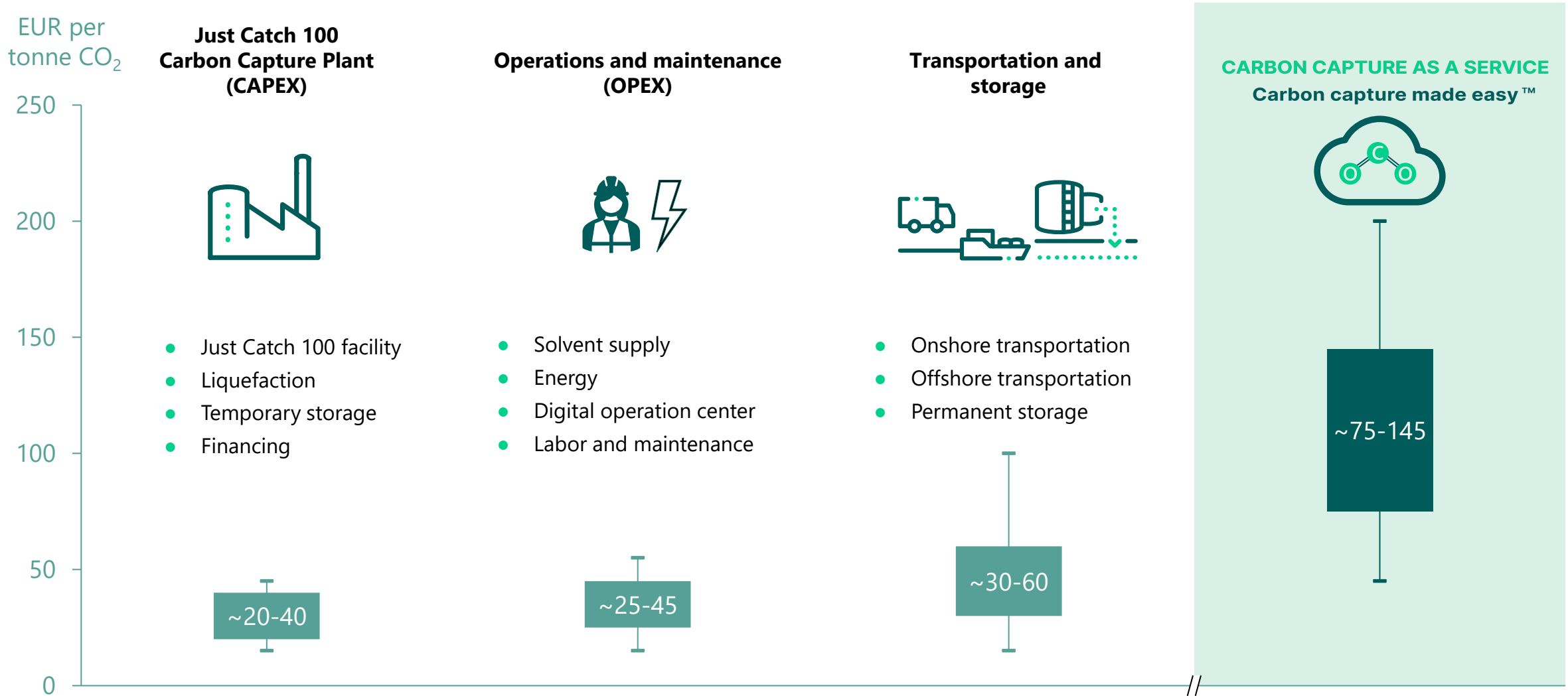


- Analyst 2030 targets range from EUR 75 to EUR 150 per tonne
- IEA sustainable development scenario requiring EUR 110 per tonne¹
- Role of the ETS emphasized in EU's "Fit for 55" climate policy proposal:
 - Further tightened allowance supply from 2023
 - Allowances in MSR above the previous year's auction volume no longer be valid from 2023
 - Carbon border adjustment mechanism introduced
- Complementary local carbon taxes and carbon contracts for difference increasingly being discussed

Pricing scenarios with focus on transparent cost for the customer

Scenarios	Illustrative pricing models per tonne CO ₂	Illustrative Aker Carbon Capture revenue profile	Description
Variable price	 <p>Carbon price</p>	 <p> ■ EPC Just Catch Customer: Financing partner ■ CCaaS, Spot price </p>	<ul style="list-style-type: none"> • CCaaS price can be derived as a function of the applicable carbon price or a pre-determined price curve • A variable price model would likely include a minimum "base fee"
Range price	 <p>Carbon price</p>	 <p> ■ EPC Just Catch Customer: Financing partner ■ CCaaS, Range price </p>	<ul style="list-style-type: none"> • CCaaS price bound within a defined minimum and maximum range, acting as a hedge against major swings in the carbon price
Fixed price	 <p>Carbon price</p>	 <p> ■ EPC Just Catch Customer: Financing partner ■ CCaaS, Fixed price </p>	<ul style="list-style-type: none"> • CCaaS with flat rate per tonne CO₂ captured throughout the life of the project allowing predictability and ease of budgeting

Indicative Levelized Cost of Carbon Capture as a Service¹



¹) Levelized Cost of Carbon Capture as a Service calculated as:
 Cost discounted over 25 years divided by the amount of CO₂ captured discounted over 25 years;
 Discount rate: 7.5%

Accounting guidance

EPC contract from financing partner – Revenue recognition Aker Carbon Capture

Fixed price contract for services provided by Aker Carbon Capture to financing partner (e.g. Green Yield) for engineering, procurement and construction of Just Catch 100 modules and equipment:

- Revenue recognised over time, using cost progress method – ordinary project accounting

Lease accounting Aker Carbon Capture

Aker Carbon Capture leasing a carbon capture module from financing partner (e.g. Green Yield) accounted for according to IFRS 16:

- Lease liability equal to present value of future lease payments
- Right of use asset in line with lease liability
- Cost reflected in P&L as depreciation of right of use asset and interest on lease liability
- No need for funding of right of use asset, i.e. ACC will remain capital light

Revenue recognition Carbon Capture as a Service

CCaaS contract with pricing linked to a variable price range, or fixed pricing method per tonne captured:

- Revenue recognised over time, linked to captured CO₂
- Costs recognised as incurred per tonne captured



CARBON CAPTURE AS A SERVICE
Carbon capture made easy™



Introducing new offering with lower customer barrier to entry



Building foundation for long term service revenues



Increasing exposure to full CCUS value chain



Providing technology, EPC and service offerings and maintain a capital-light business model

We are devoted to:

**Doing the
right thing**

**Working
together**

**Bold
innovation**

Our guest speakers



Jeff Erikson, General Manager, Global Carbon Capture and Storage Institute

Global Carbon Capture and Storage Institute is an international thinktank whose mission is to accelerate the deployment of CCS. Jeff joined the Institute in January 2016, and is responsible for the growth of the Institute's membership, which now numbers more than 100 companies and governments.



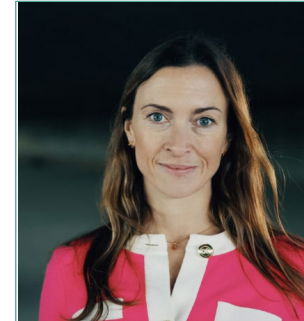
Edda Aradóttir, CEO, Carbfix

Carbfix is a company that mitigates climate change by turning CO₂ emissions into stone underground. Prior to taking on her current role, Edda was the Head of Innovation and Strategic Planning at the department of Research and Innovation at Reykjavik Energy while also being the project manager for the international Carbfix project. Edda has extensive experience in research related to reservoir management and engineering, chemistry and hydrology as well as project management in the field of renewable energy.



Karim Amin, EVP, Siemens Energy

Karim joined Siemens in 2001 and his responsibilities include supporting customers with their energy transformation through a wide portfolio of products across fossil and distributed power generation. He currently oversees a global team of almost 30,000 employees, active in major industrial sectors including public utilities, independent power producers, oil and gas as well as industrial power generation.



Helene Mørne, CEO, Carbonor AS

Carbonor has been established to build green production facilities of engineered chemical carbon for industry using carbon capture and storage. Helene has a 20 year history in public and private sector corporate and project management, including M&A, environmental projects and CCS-related industry.



Joanna is Industry Director, EMEA, Microsoft

Joanna has over 15 years of industry experience in Process Industries and Oil & Gas in particular, including work as Business Development and Sales Representative for major System Integrators and Software companies. She has working experience in the entire Oil & Gas value chain. Her recent experience and training focus on energy transition.

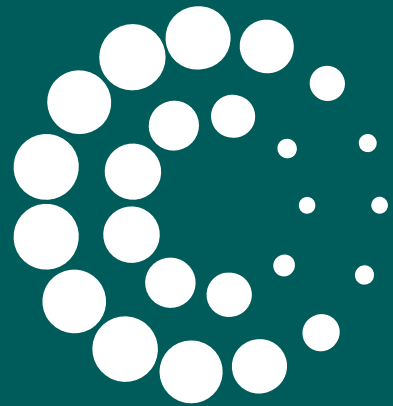
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