



GLOBAL CCS
INSTITUTE

WEBINAR

Feb
02

CO₂ Shipping Opportunities and Prospects for CCS Projects



Monday 2nd February 2026 2.00PM GMT | 3.00PM CET | 9.00AM EST

OUR MISSION

TO ACCELERATE DEPLOYMENT OF CCS

WHO



WE ARE AN
INTERNATIONAL
CCS THINK TANK

OVER

200

MEMBERS ACROSS
GOVERNMENTS, GLOBAL
CORPORATIONS, PRIVATE
COMPANIES, RESEARCH
BODIES, NGOS



WHAT



FACT-BASED
INFLUENTIAL
ADVOCACY



CATALYTIC
THOUGHT
LEADERSHIP



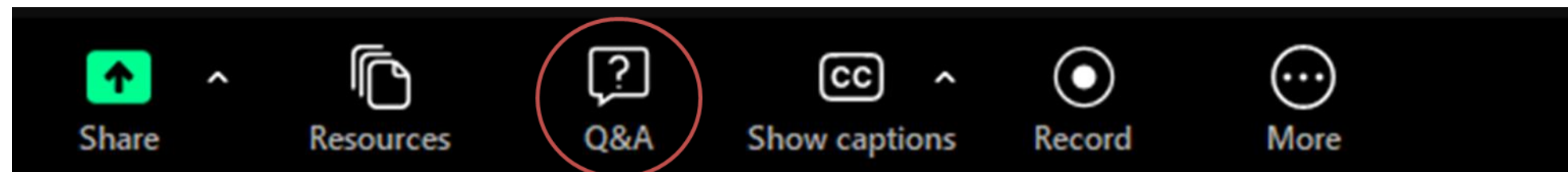
AUTHORITATIVE
KNOWLEDGE
SHARING

WHERE



BEFORE WE START

- Please note this webinar will be recorded and made available on our website in the coming weeks.
- We will collect questions during the presentation.
- After the presentation, and moderated discussion the moderator will pose questions to the presenter.
- Please submit your questions through the Q&A panel on Zoom.



AGENDA

Welcome from Global CCS Institute

- Angus Gillespie, Strategic Adviser, Global CCS Institute {Moderator}

Speaker Remarks

- Angus Gillespie, Strategic Adviser, Global CCS Institute
- Erik Mathias Sørhaug, Business Development Director CO₂. Shipping and OCC DNV Maritime, DNV
- Thomas Minsaas, Shipping & Logistics Operator Northern lights

Moderated Discussion

- Erik Mathias Sørhaug, Business Development Director CO₂. Shipping and OCC DNV Maritime, DNV
- Thomas Minsaas, Shipping & Logistics Operator Northern lights
- Angus Gillespie, Strategic Adviser, Global CCS Institute {Moderator}

Audience Q&A



Download the report on our website or scan the QR code below.



SPEAKERS



Angus Gillespie

Global CCS Institute

Strategic Adviser

* MODERATOR *



Erik Mathias Sørhaug

DNV

Business Development Director

CO₂ Shipping and OCC DNV

Maritime



Thomas Minsaas

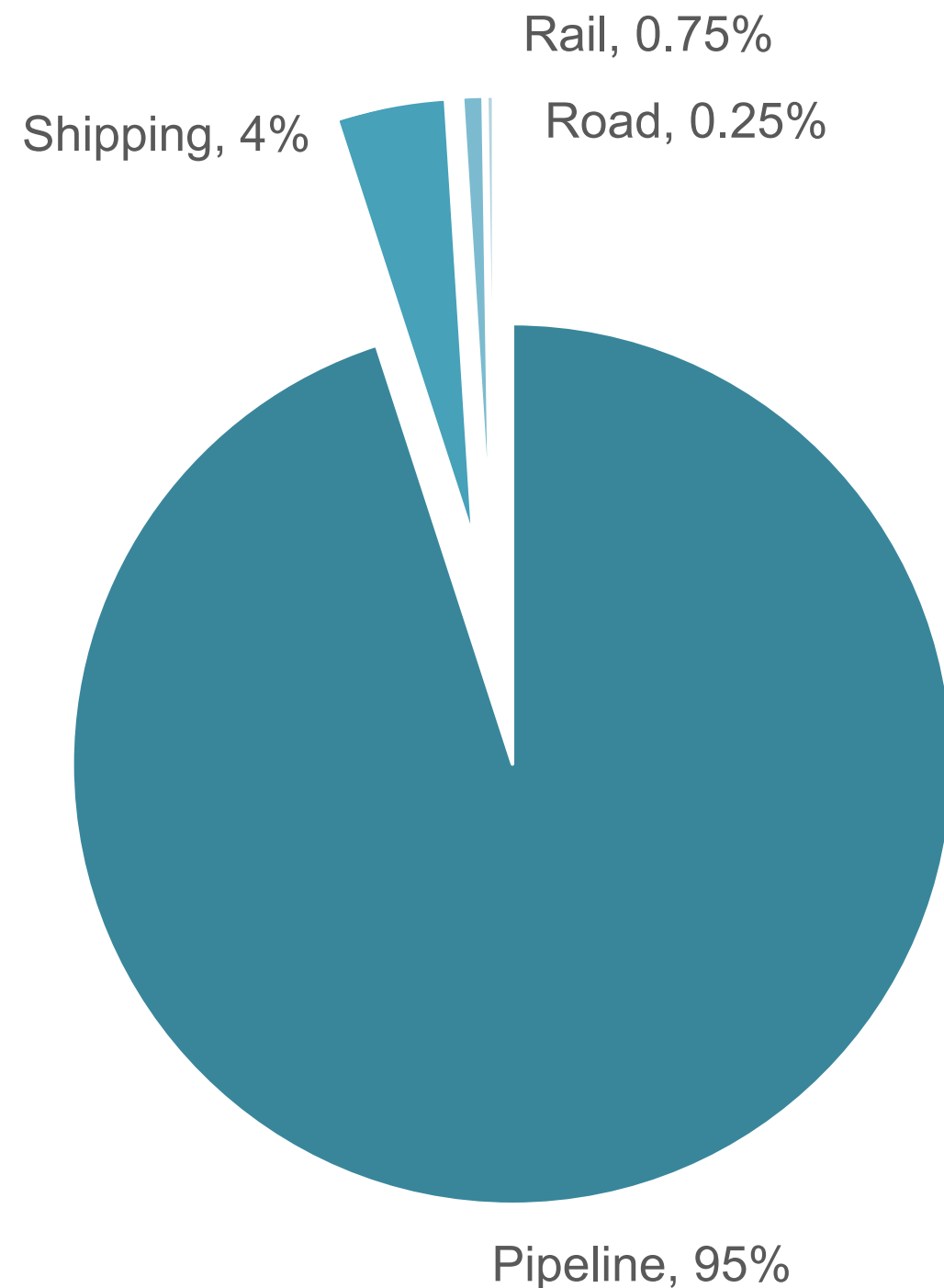
Northern Lights

Shipping and Logistics Operator



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PIPELINES DOMINATE CO₂ TRANSPORT AT PRESENT



- Pipelines have ca.95% share
- Rail and road likely to remain niche for very small movements
- Used in US and EU, single train can transport ca.3,000tonnes
- Trucks carry ca.20tonnes per trip



A BROAD RANGE OF FACTORS UNDERPIN THE PROSPECTS FOR GROWTH IN CO₂ SHIPPING

Drivers

- Evolution of CO₂ vessel designs
- Growth of ports with CO₂ handling facilities
- Growth in regional CCS hubs
- Supportive marine laws and regulation

Advantages

- Can lower CO₂ transport costs
- Can improve CCS project business case
- Support of CCS hubs
- Increased flexibility for CCS projects
- Helps manage stranded CO₂ emissions



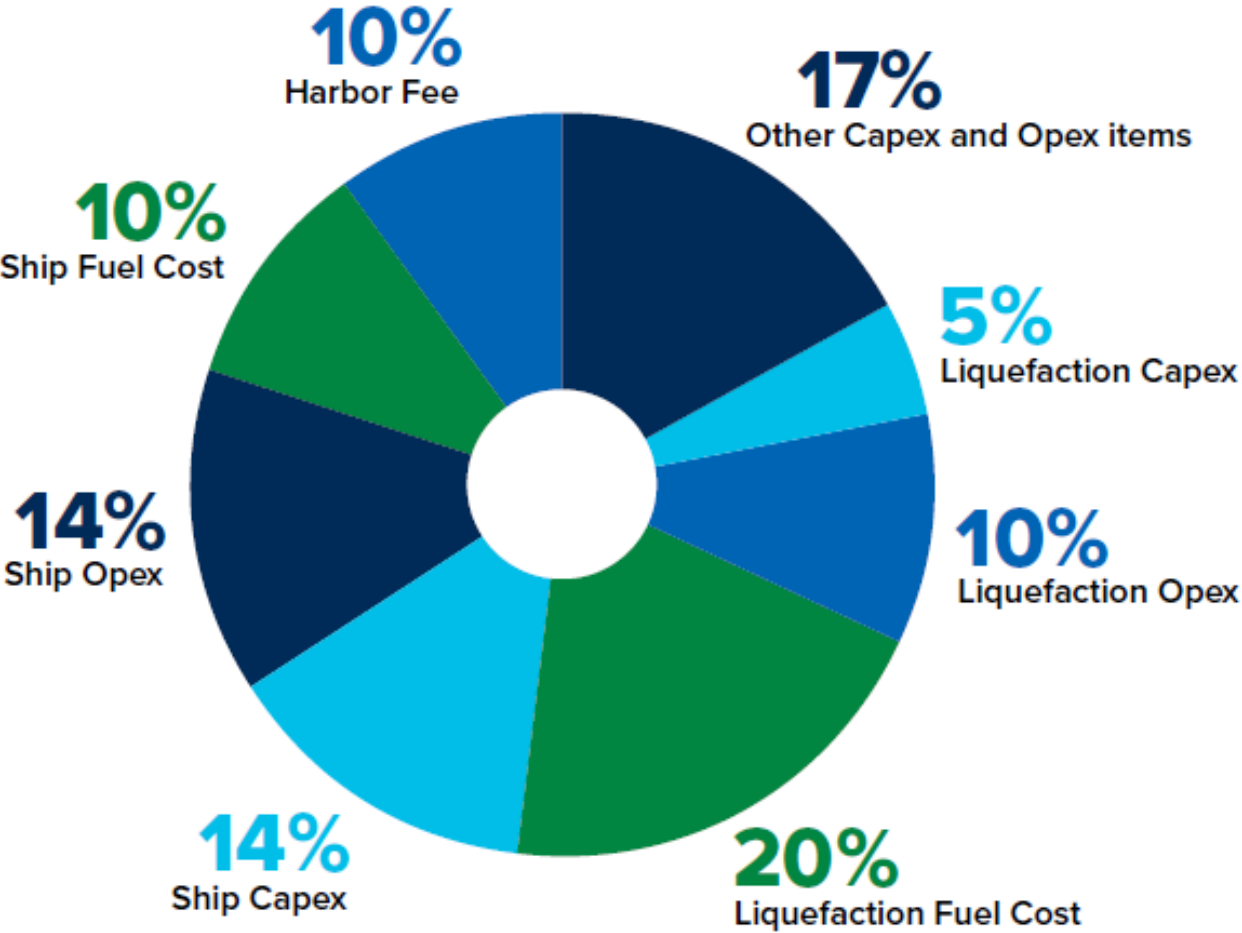
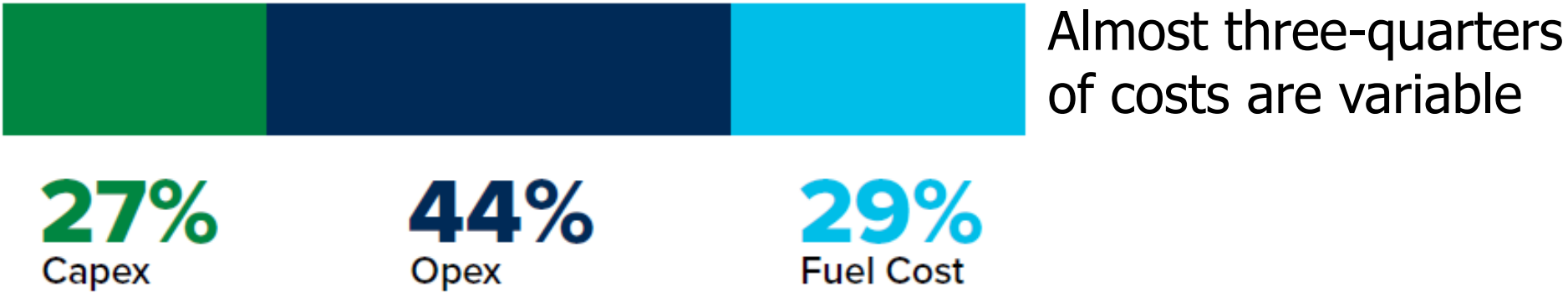
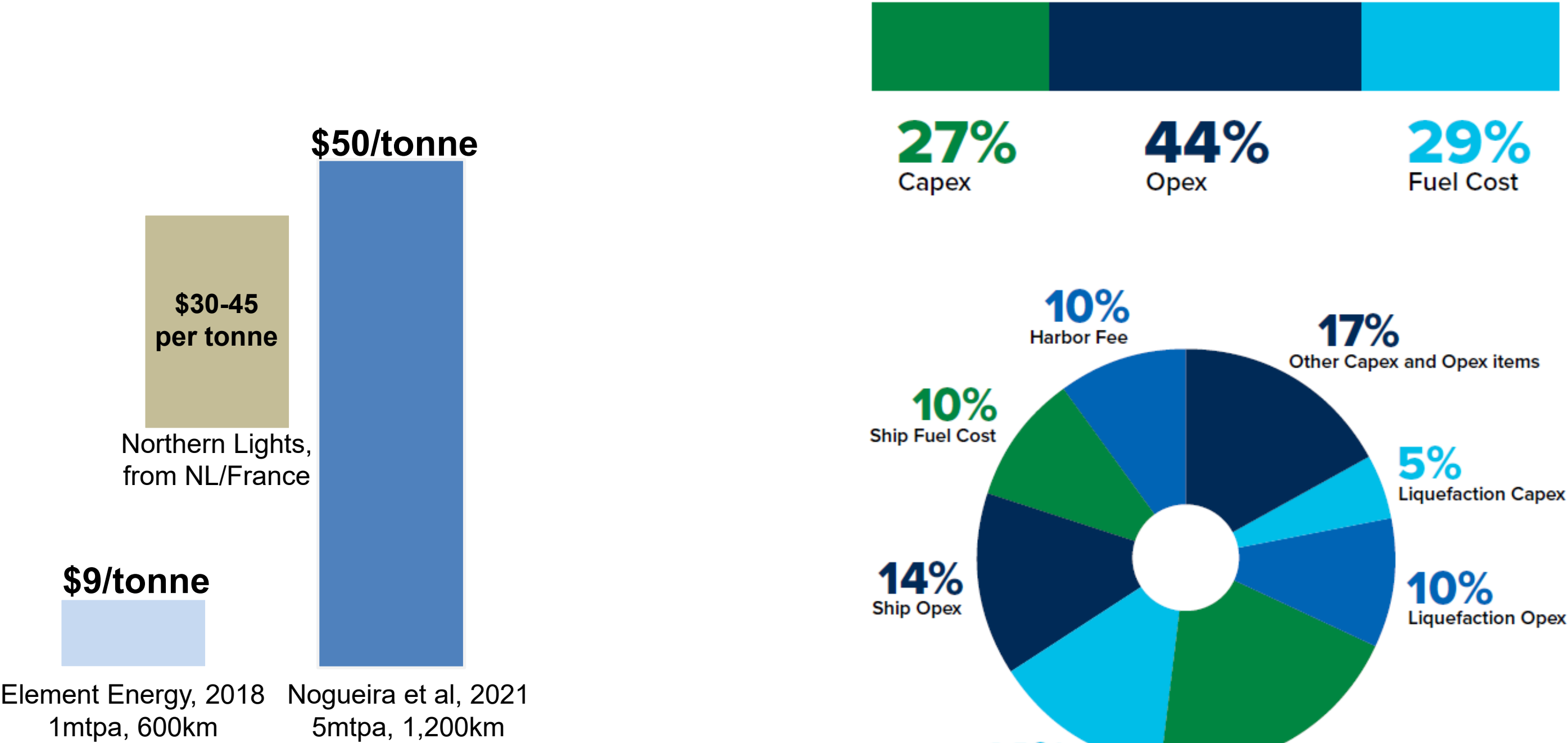
AN EXAMPLE OF A PIPELINE VS. SHIPPING TRADE-OFF MATRIX FOR CO₂ TRANSPORT IN CCS

DISTANCE (KM)	FLOW 1 MTPA	FLOW 2.5 MTPA	FLOW 5 MTPA	FLOW 7.5 MTPA	FLOW 10 MTPA
100km	PIPE	PIPE	PIPE	PIPE	PIPE
250km	PIPE	PIPE	PIPE	PIPE	PIPE
500km	SHIP	PIPE	PIPE	PIPE	PIPE
750km	SHIP	SHIP	SHIP	SHIP	PIPE
1000km	SHIP	SHIP	SHIP	SHIP	SHIP
1500km	SHIP	SHIP	SHIP	SHIP	SHIP
2000km	SHIP	SHIP	SHIP	SHIP	SHIP

PIPE SHIP

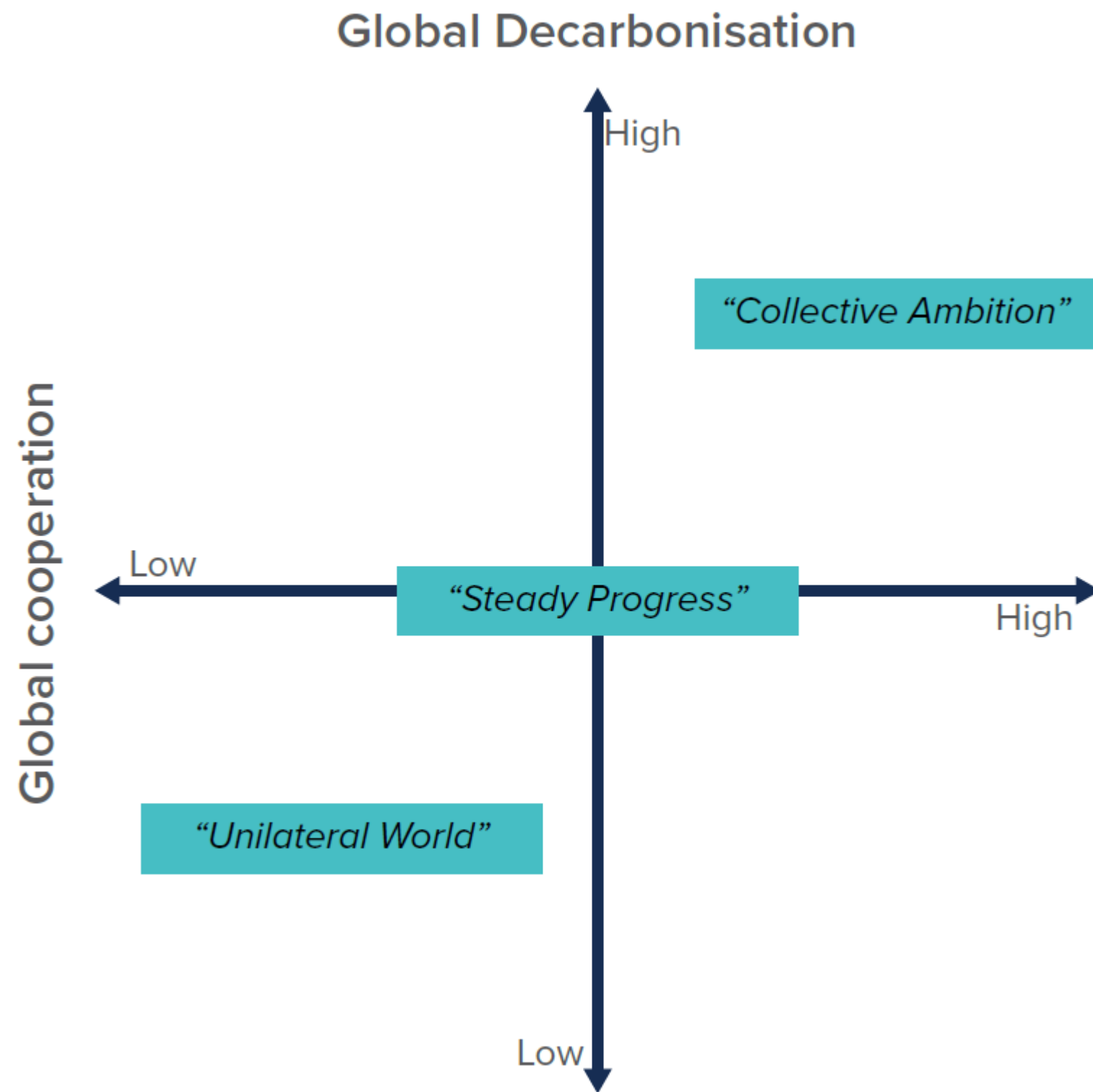
Source: GCCSI analysis, 2025

COSTS OF CO₂ SHIPPING DRIVEN MOSTLY BY SHIP EXPENSES AND LIQUEFACTION PROCESSES



Source: Element Energy, 2018

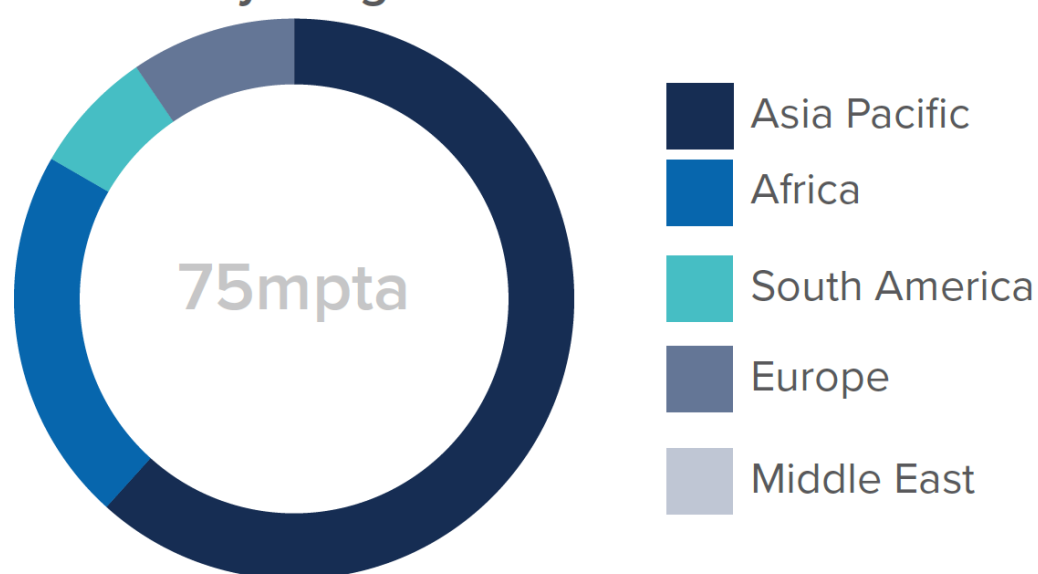
RECENT GLOBAL CCS INSTITUTE CO₂ SHIPPING PAPER USED SCENARIOS RATHER THAN PROJECTIONS



- Scenarios used in situations of high uncertainty
- Key unknowns – intensity of global decarbonization and collaboration
- Narrative leads data analysis
- Used GENZO, the Institute's optimisation model for quantitative illustration of scenarios

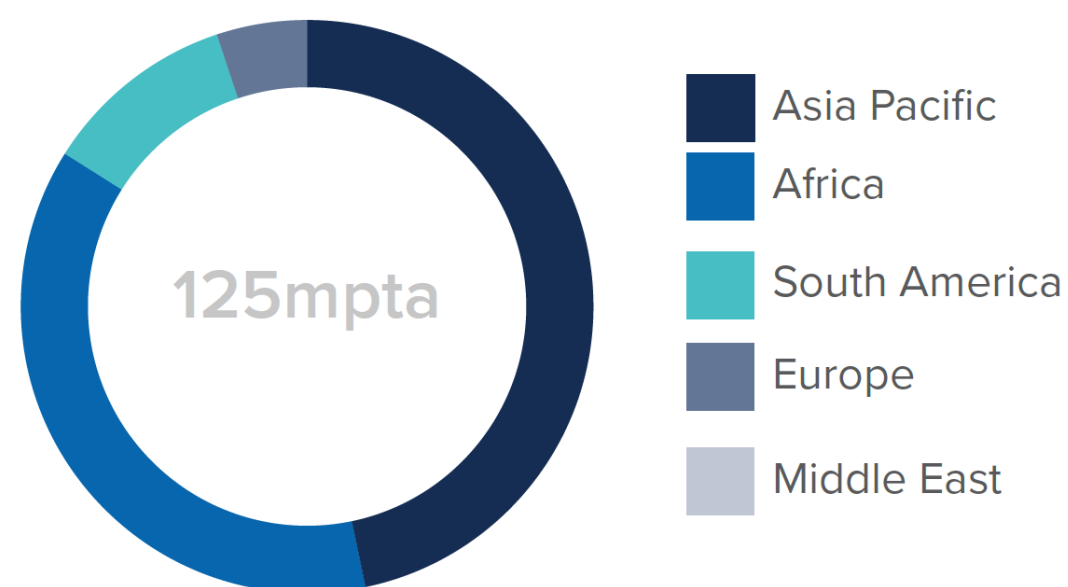
ALL SCENARIOS RESULTED IN A MAJOR RISE IN CO₂ SHIPPING BY 2040

Steady Progress



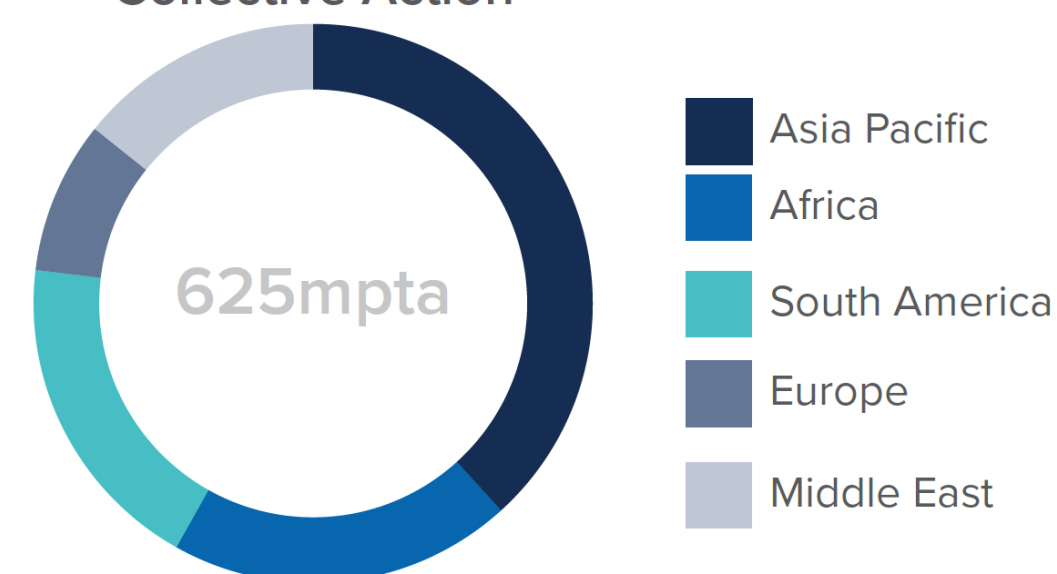
- Climate policies continue at incremental pace
- Political and economic cycles impeded sustained progress on CCS
- CCS deployment rate helped by cost reductions and rising carbon prices

Unilateral World



- Energy populism drives fragmentation of policies
- UNFCCC weakens and NDCs are diluted
- Cross-border trade barriers persist and are even reinforced
- Shipping boosted by CBAMs and development of storage hubs

Collective Action



- Urgent, focused, unified climate response
- UNFCCC strengthens and accelerates its programs
- CCS deployment rate approaches IEA NZ scenario
- International network of CCS hubs emerges



CO₂ Shipping - DNV

Erik Mathias Sørhaug – Business Development Director CO₂ shipping and OCC
DNV Maritime

02 February 2026

A global assurance and risk management company

~15,000

employees

100,000+

customers

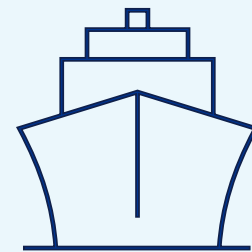
100+

countries

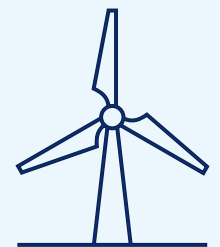
5%+

of revenue to R&D

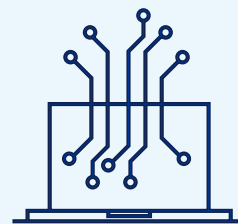
Ship and offshore
classification and advisory



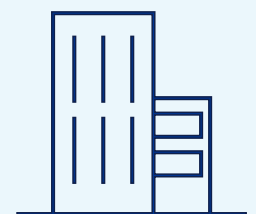
Energy advisory, certification,
verification, inspection and
monitoring



Software, cyber security,
platforms and
digital solutions



Management system
certification, supply chain and
product assurance



How DNV work support the development of the CCUS value chain

- **Classification**

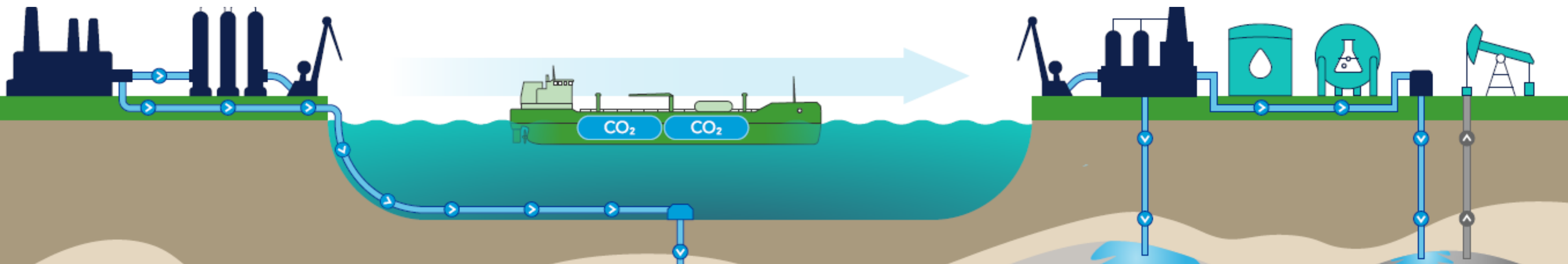
- Approval in Principle & General Approval for Ship Application
- Classification - Newbuilding & Fleet in operation
- Developing rules and class guidelines

- **Advisory**

- Independent advisor for CCUS projects across the value chain
- Green Shipping Program
- Laboratories and testing
- Developing standards and recommended practices

- **Joint Industry projects**

- Facilitating, leading and participating in Joint Industry Projects



DNV are leading a range of JIPs addressing core challenges along the value chain



Pipeline and wells



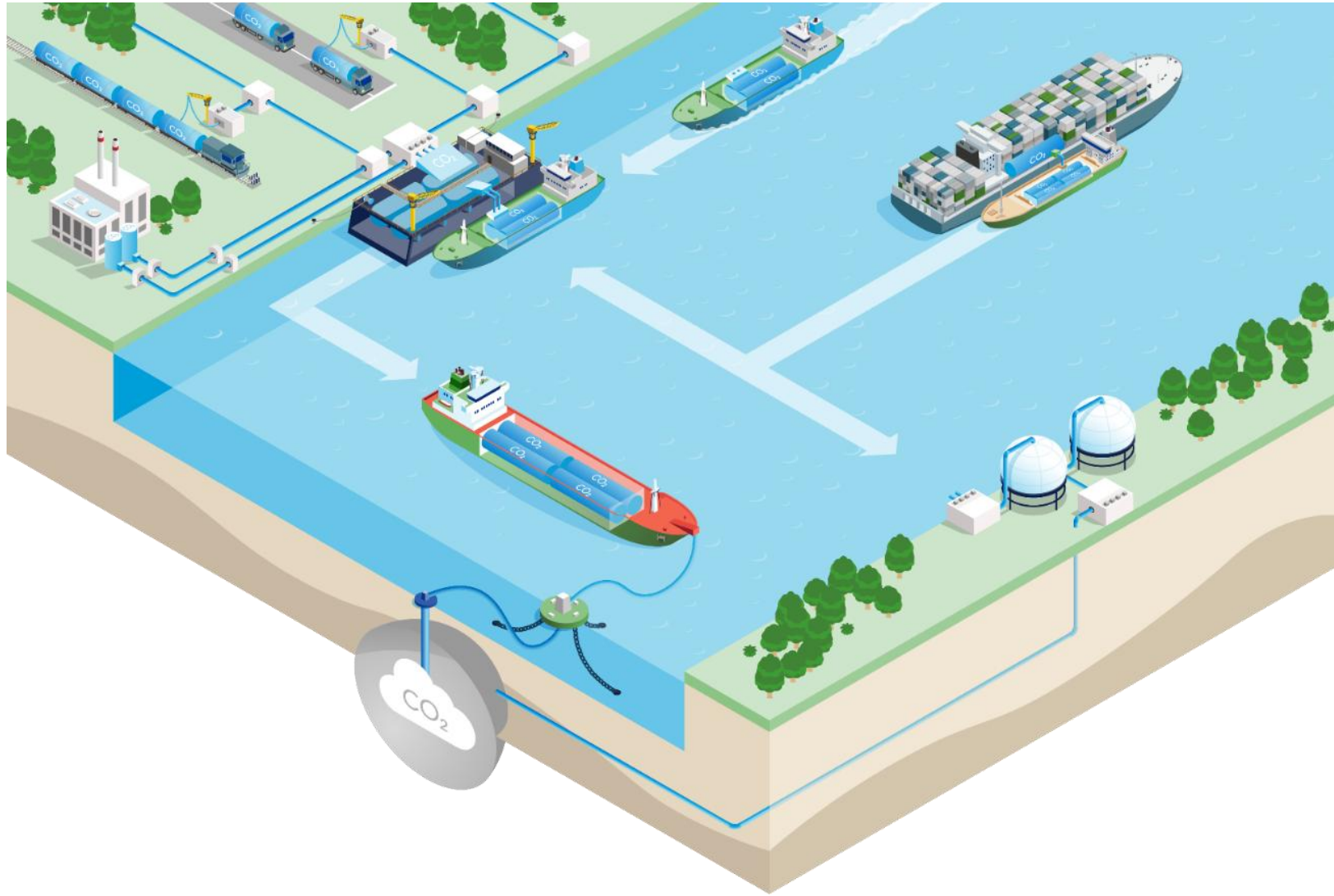
CO2Safe&Sour - Hydrogen sulfide challenges in carbon dioxide pipelines
Investigate the integrity of carbon dioxide pipelines subjected to hydrogen sulfide from the CCS stream

CO2SafePipe - Design and Operation of CO2 pipelines
Close knowledge gaps in the transportation of CO2 in pipelines.

Materials Performance in CCS Wells
This JIP is to address the damage modes associated with downhole and well head materials for CCS applications.

CO2-SCC - Innovations in subsea flexible pipe technology
Small-Scale Testing Qualification
Methodology for Armor Wires in CO2-SCC

CO-CO2 Cracking - CO2 Pipelines
Establish a comprehensive guidelines for mitigating CO/CO2 cracking in CO2 pipelines.



Skylark – CO2 Dispersion
Pioneering excellence to address crucial challenges related to the safe operation of CO2 pipelines.

KFX CO2 - CO2 CFD simulation software
increase CCS safety by providing software that can perform simulation of complex thermodynamics and heat transfer processes and dry ice formation.

CO2Gasmet/Liqmet - Establishing flow meter traceability along the CO2 value chain
DNV takes the lead in CO2 flow meter qualification.

CO2MET - Mastering CO2 Fluid Compositions – Quality monitoring
Performance evaluation and guideline development for effective sampling and analysis.



Dispersion



Meetering



COOFFIN - CO2 offshore injection
develop a common approach to assess and qualify concepts for offshore injection of CO2.

CETO - CO2-efficient transport via ocean
Technology Qualification Low pressure value chain. Phase II to establish basis for CO2 specification at low pressure.

Maritime and offshore

Technical and regulatory readiness CO₂ Shipping

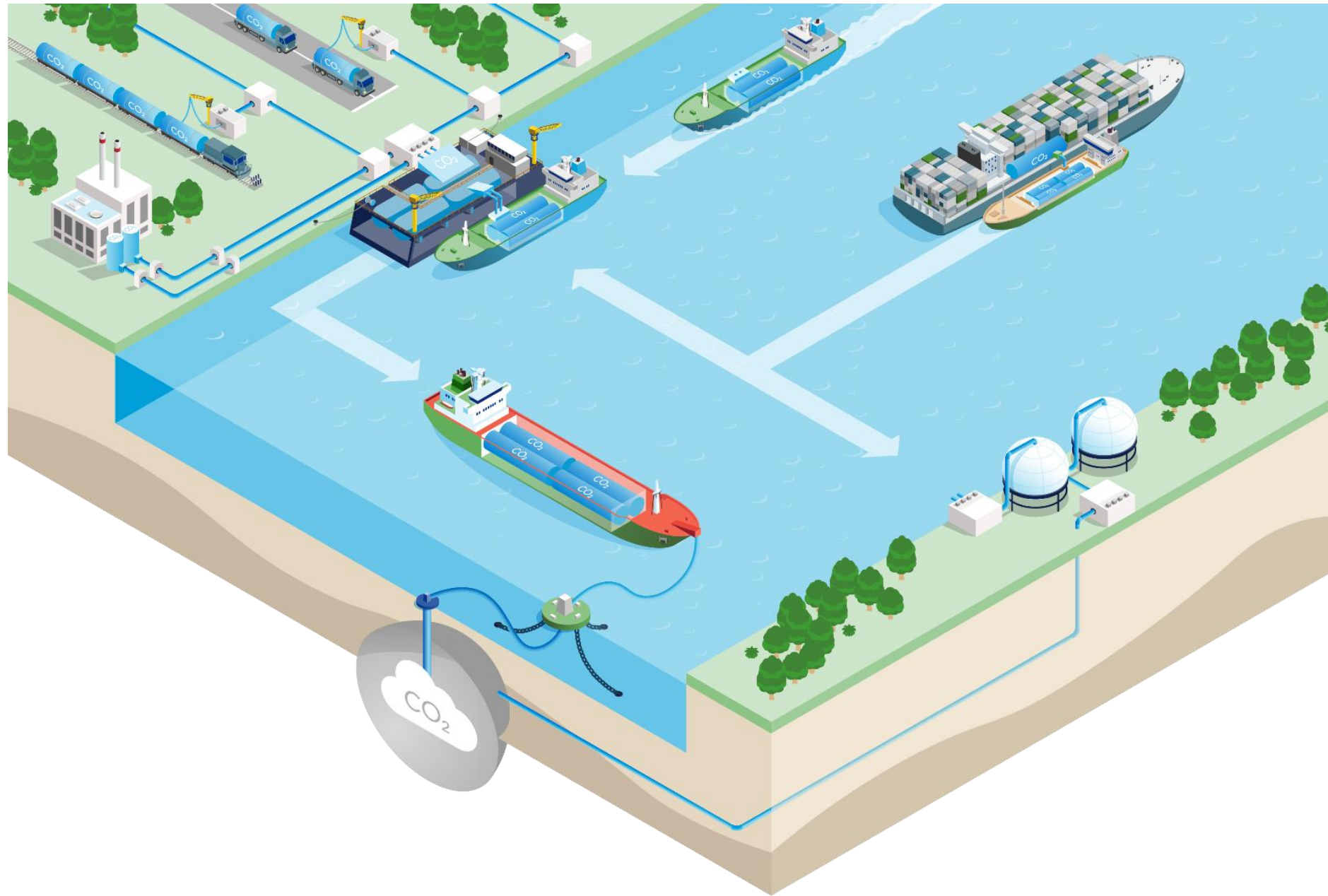
Status – Experience, regulations, guidelines and standards:

- CO₂ has been transported in small-scale onboard ships since late 80s
- Transportation of CO₂ in liquid state covered by existing rules and regulations
- Standards and guidelines for gas carriers and terminals are also applicable for CO₂ Shipping
- Moving from a small-scale food & beverage value chain to large scale CCS value chain introduce some new challenges to ship design and operation



Source: Northern Lights

Technical and regulatory readiness CO₂ Shipping



CO₂ carriers for CCS:

- First **MP CO2 carriers** dedicated for CCS transportation have been **delivered and are in operation**.
- Larger **MP** vessels up to **20k+ m³** can be built based on same technology
- Maturity for **LP** ships has been **demonstrated**. First **LP vessel** design delivered
- Further **technology development** may reduce **cost of CO₂ shipping**
- **CCS Cross-cutting** challenges relevant also for shipping

Thank you for listening!

**Erik Mathias Sørhaug – Business Development Director CO₂ shipping
and OCC DNV Maritime**

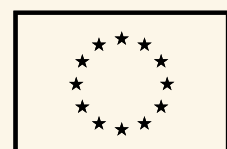
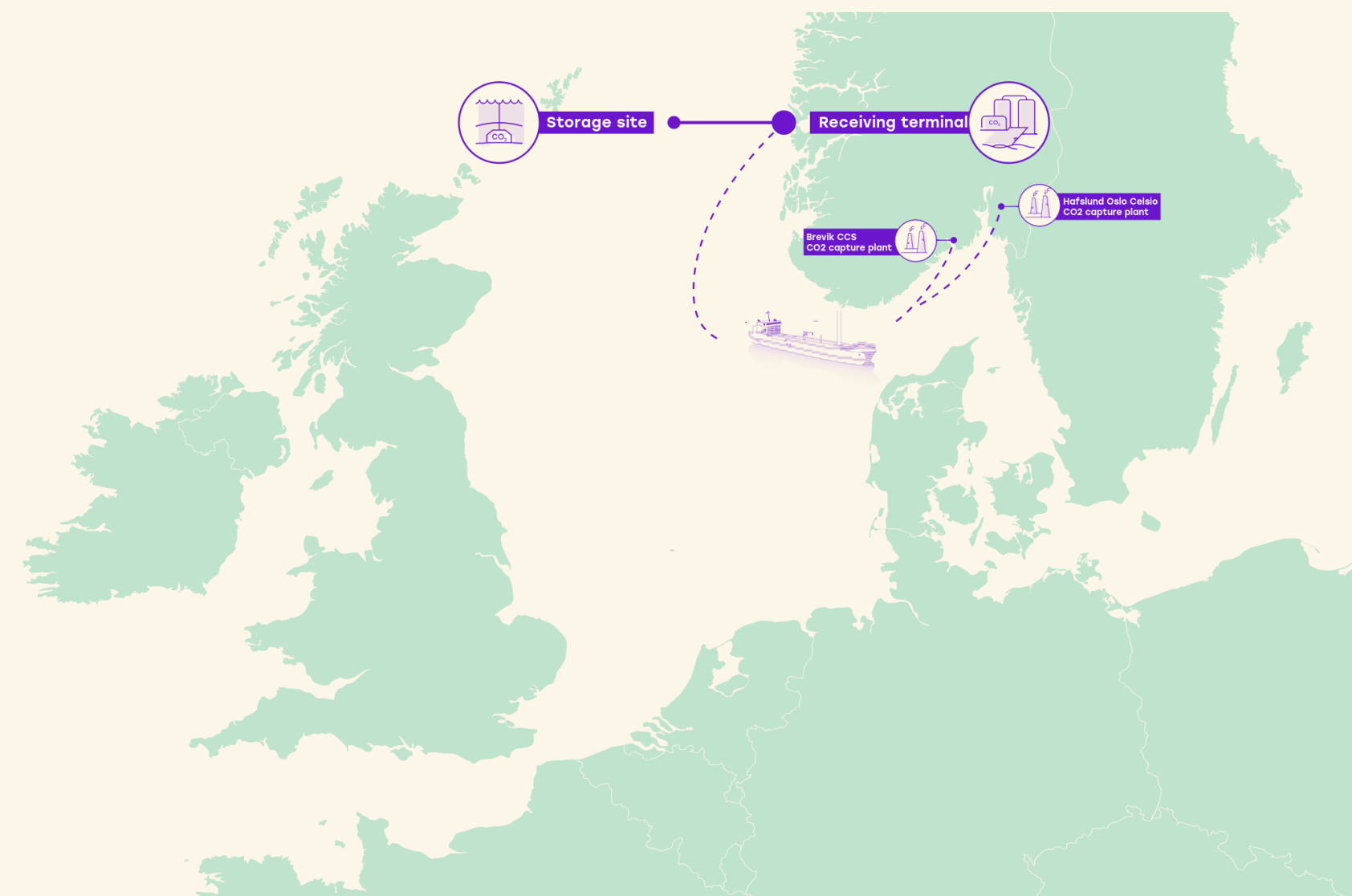


Erik.mathias.sørhaug@dnv.com
+47 932 31 283
www.dnv.com



The Longship project

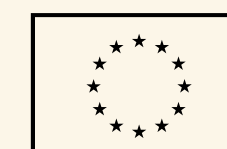
- Norwegian government's full-scale CCS project
- Launched in 2020 after vote in parliament with broad political support
- Largest climate project in Norwegian industry history
- Aims to demonstrate the potential of CCS to the world
- CO₂ capture from two industrial sources
- Transport and storage by Northern Lights



**Co-funded by
the European Union**

Phase 1 – part of Norwegian authorities' Longship project

Phase 2 – co-funded by the EU



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CCS heritage

- Joint Venture between Equinor, Shell, and TotalEnergies
- Partnership established in 2017 – JV established in 2021
- 28 years of operational CO₂ storage experience on the Norwegian Continental Shelf (NCS)

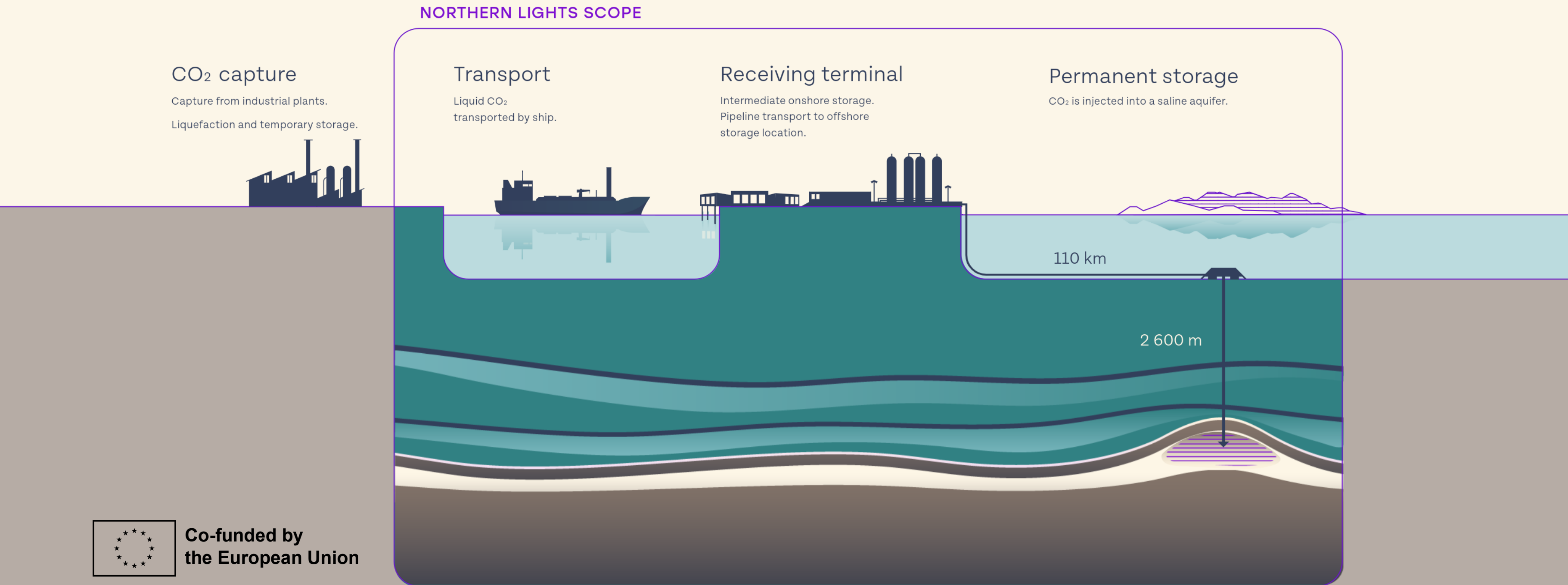


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Northern Lights value chain



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Phase 1 – part of Norwegian authorities' Longship project

Phase 2 – co-funded by the EU

Øygarden facility



Co-funded by
the European Union

Phase 1 – part of Norwegian authorities' Longship project

Phase 2 – co-funded by the EU

MODERATED DISCUSSION



Erik Mathias Sørhaug

DNV

Business Development Director
CO₂ Shipping and OCC DNV
Maritime



Thomas Minsaas

Northern Lights

Shipping and Logistics Operator



Angus Gillespie

Global CCS Institute

Strategic Adviser

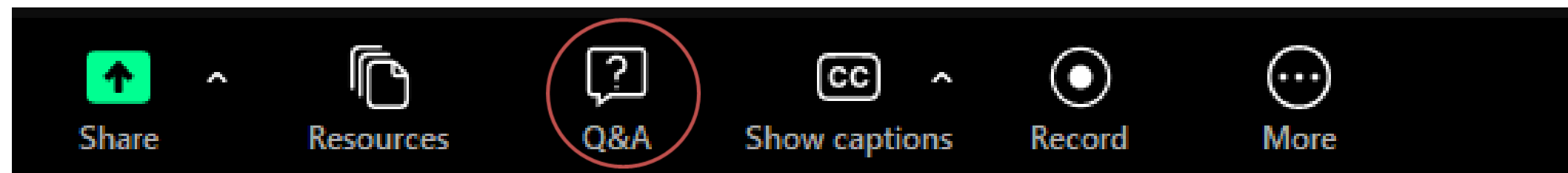
* MODERATOR *



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Q&A

**Please submit your questions via Q&A on Zoom control panel
at the bottom of your screen**



THANK YOU



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