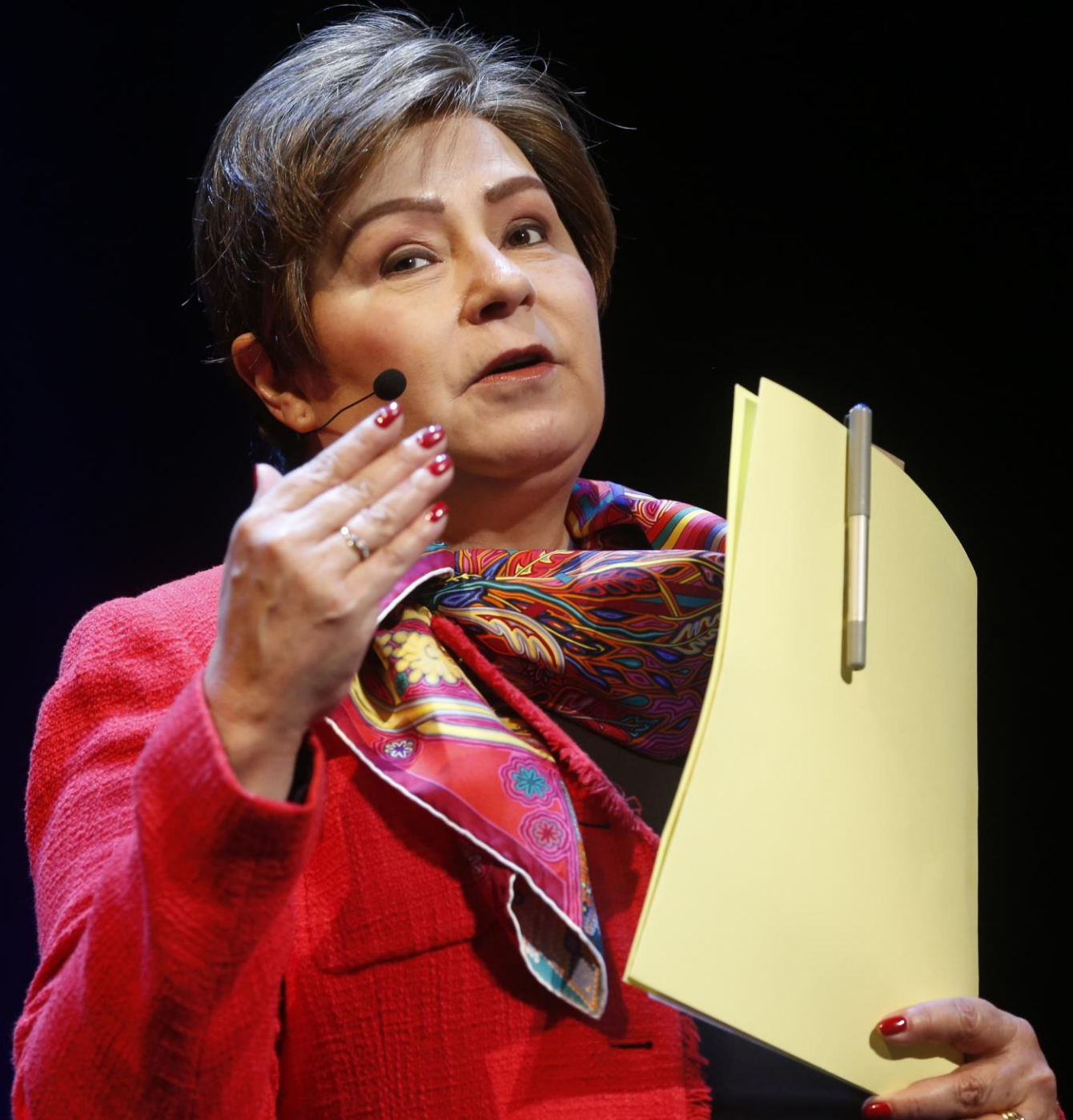
A person wearing an orange jacket and dark pants stands on a large, grey, textured rock formation. They are looking out over a scenic landscape featuring a body of water (fjord) and distant hills under a bright, hazy sky at sunset or sunrise. The sun is low on the horizon, creating a strong glow and lens flare effect. The overall mood is contemplative and serene.

The role of CCS seen from Norway

Trude Sundset, CEO
Gassnova SF

“CLIMATE CHANGE is
moving faster than we are.
We need to act now”

*Patricia Espinosa,
UNFCCC Executive Secretary*





Make the
World
breathe again

UND BODO BAGGERI
IMMER-
NOCH

We don't have
more time

I want a hot date
not a hot planet

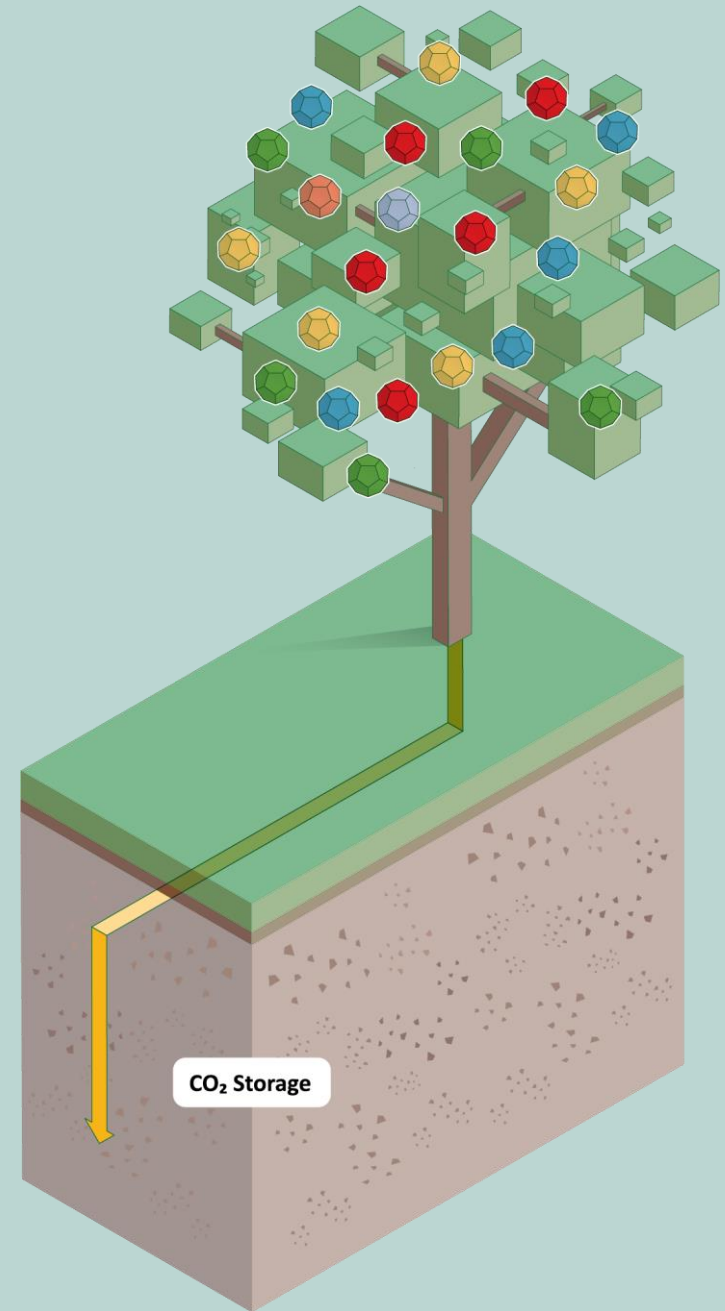
SAVE
THE
EARTH



CCS
what?

CCS applications

- Industry
- Bio-CCS (BECCS)
- Gas production and LNG
- Hydrogen
- CO₂ for EOR
- Clean Coal
- CCU(S)
- ...





23
years of CCS
experience

Gassnova – The state enterprise for CCS

- Advisor for the Norwegian Ministry of Petroleum and Energy
- Leads and coordinates research and development in CLIMIT
- Tests technologies from around the world at TCM
- Tracks and coordinates the full-scale CCS value chain
- 42 employees



GASSNOVA

Technology development and knowledge-sharing

R&D&D



CLIMIT

FME's

ACT

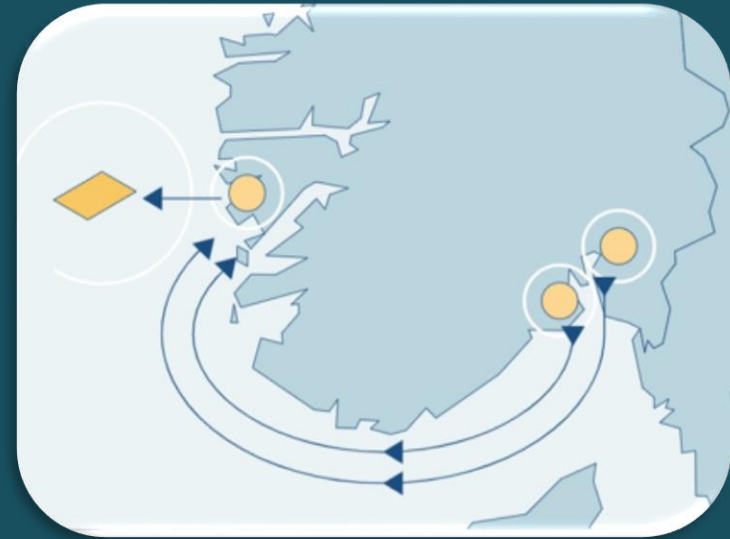
EEA and Norway
Grants: the Baltics

DEMO



Technology
Centre
Mongstad

Full-scale



The Full-scale project in Norway

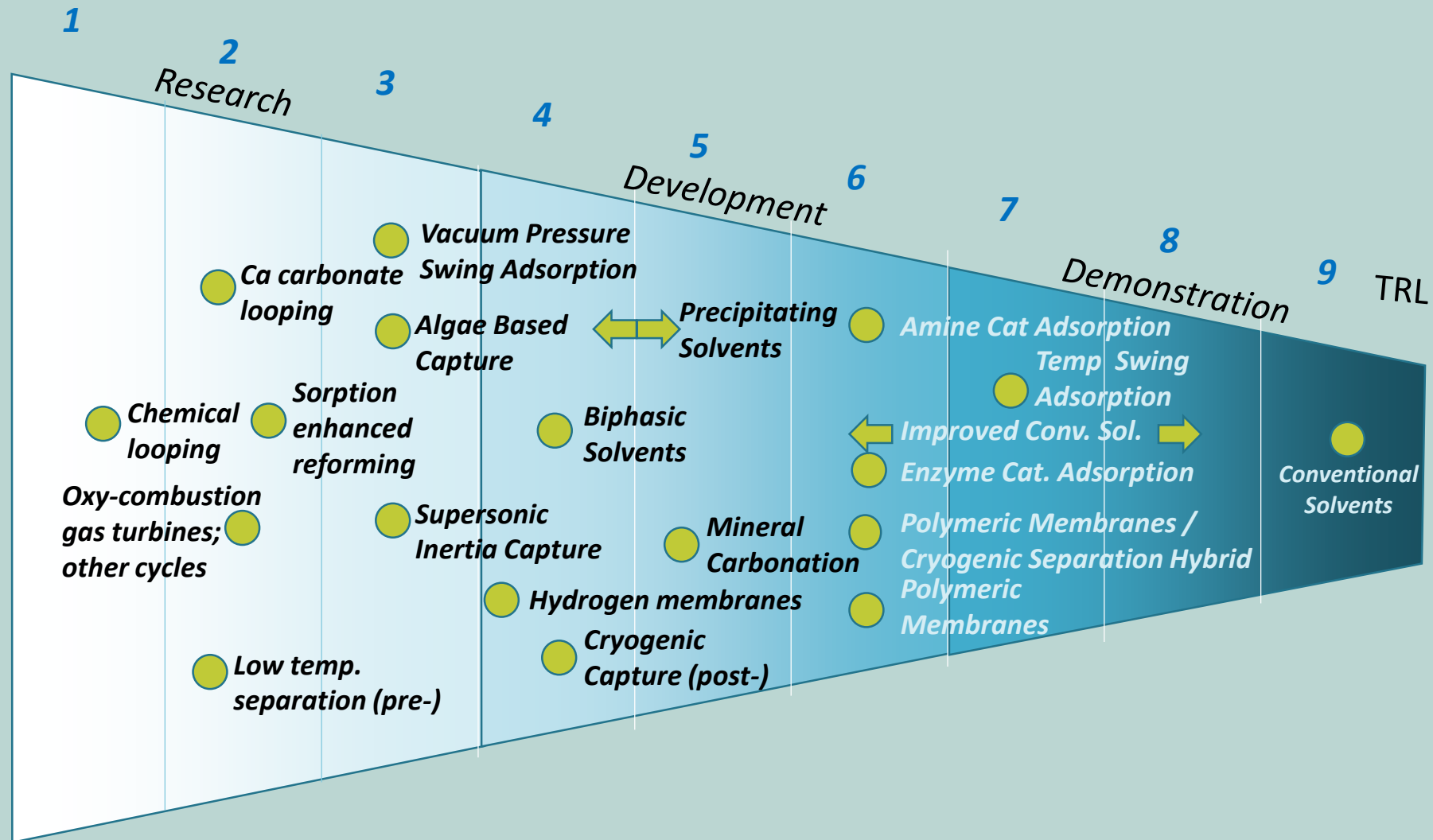


The CLIMIT programme

- Collaborative partnership between Gassnova and the Research Council of Norway
- Set up international top-class level CCS actors
- Over 500 projects have received support
- Annual budget: approximately NOK 150 million



CO₂ Capture



TCM; more than 7 years of operation



Vendors Proprietary Test Campaigns

- Aker Solutions (Norway)
- Alstom/BHGE (US)
- Cansolv Technologies (Canada)
- Carbon Clean Solution (UK/India)
- ION Engineering (USA)
- Fluor (USA)



Non-proprietary Test Campaigns

- Mono Ethanol Amine (MEA)
- Aerosolve
- Align
- DOCPCC
- CCSI2



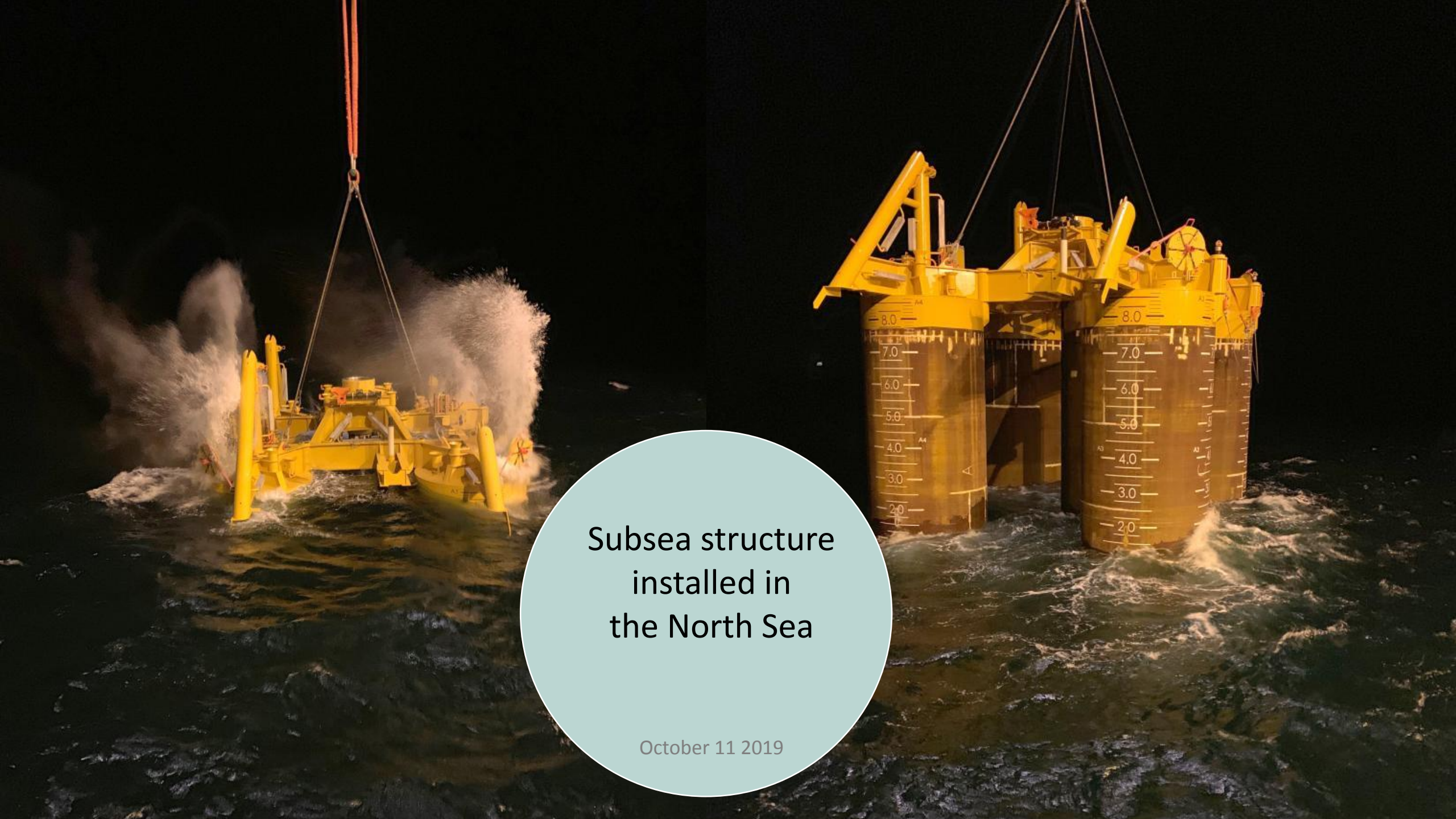
Global Competence Centre

- Fortum Oslo Varme
- Heidelberg Cement Norcem
- Guandong, China
- OGCI-CI
- DNV GL

The Full-scale CCS project in Norway



ccsnorway.com



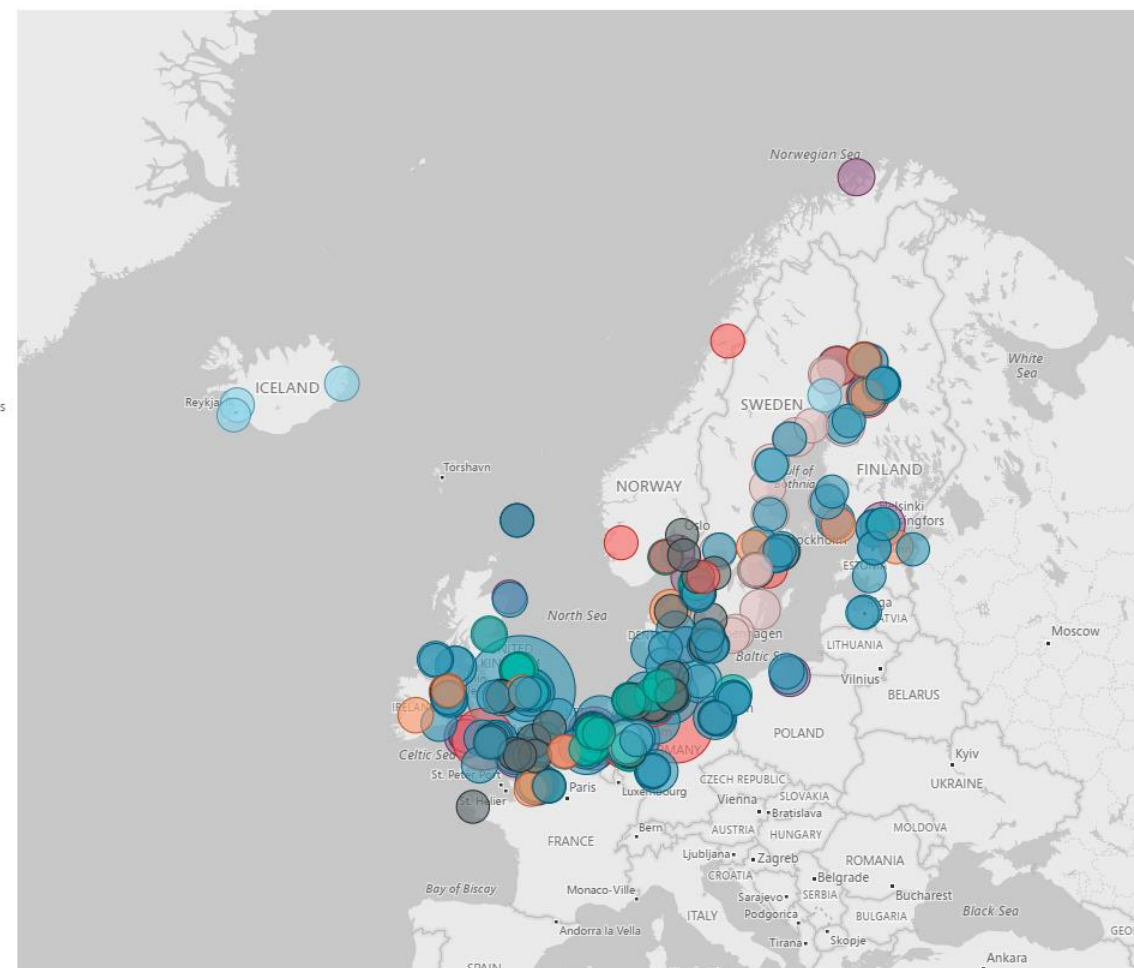
Subsea structure
installed in
the North Sea

October 11 2019

Large potential for CCS

Available CO₂, 1500 km from Kollsnes, 10 km from harbor

300 618 kt CO₂/year
(75 % capturable)






Northern Lights
A European CO₂ transport and storage network

Northern Lights

Memoranda of understanding
have been signed with:

- Air Liquide
- Arcelor Mittal
- Ervia
- Fortum Oyj
- HeidelbergCement AG
- Preem
- Stockholm Exergi



The London Protocol

Temporary solution:
CCS chains across
boarders legal



EVENTS

Oil and Gas Climate Initiative sets sights on carbon capture

The Oil and Gas Climate Initiative (OGCI), a group of leading energy companies, recently introduced new measures to address climate challenges at its fifth annual conference in New York and said it was making progress curbing methane emissions

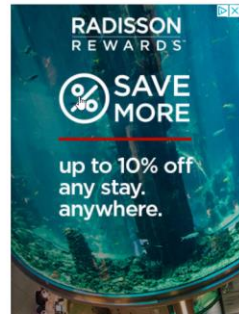


by Martin Menachery

02 OCT 2019



"We are committed to helping to meet society's lower carbon goals while reliably meeting the energy needs of billions of people for decades to come," said Saudi Aramco chief technology officer Ahmad O Al-Khwaiter.



Published on The Parliament Magazine (<https://www.theparliamentmagazine.eu>)

Home > Carbon Capture and Storage technology could solve EU decarbonisation issues

Carbon Capture and Storage technology could solve EU decarbonisation issues

Written by Jon Benton and Ana Gallego on 12 September 2019 in News

European climate commissioner Miguel Arias Cañete discussed the EU's plans to reduce CO2 emissions last week and the role ca



"I am firmly convinced that this can only be done if one is **WILLING TO CAPTURE AND STORE CO₂**. The countries in question do not deny this. The method is called CCS – and for many in Germany it is a highly charged term."

Source: The Guardian

Merkel: Europe must unite to stand up to China, Russia and US

German chancellor also shares views on Brexit and climate crisis in New



▲ "There is no doubt that Europe needs to reposition itself in a changed world," said Merkel. Photograph: Hannibal Hanschke/Reuters