



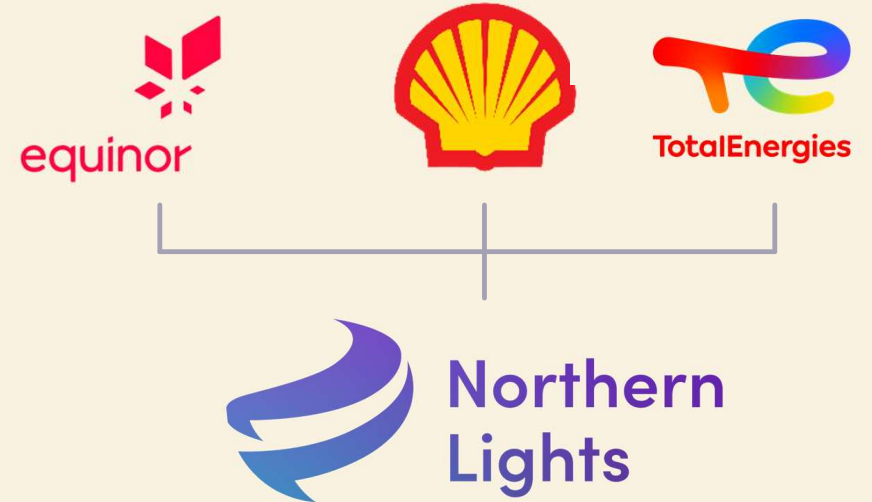
Northern Lights

Ragni Rørtveit

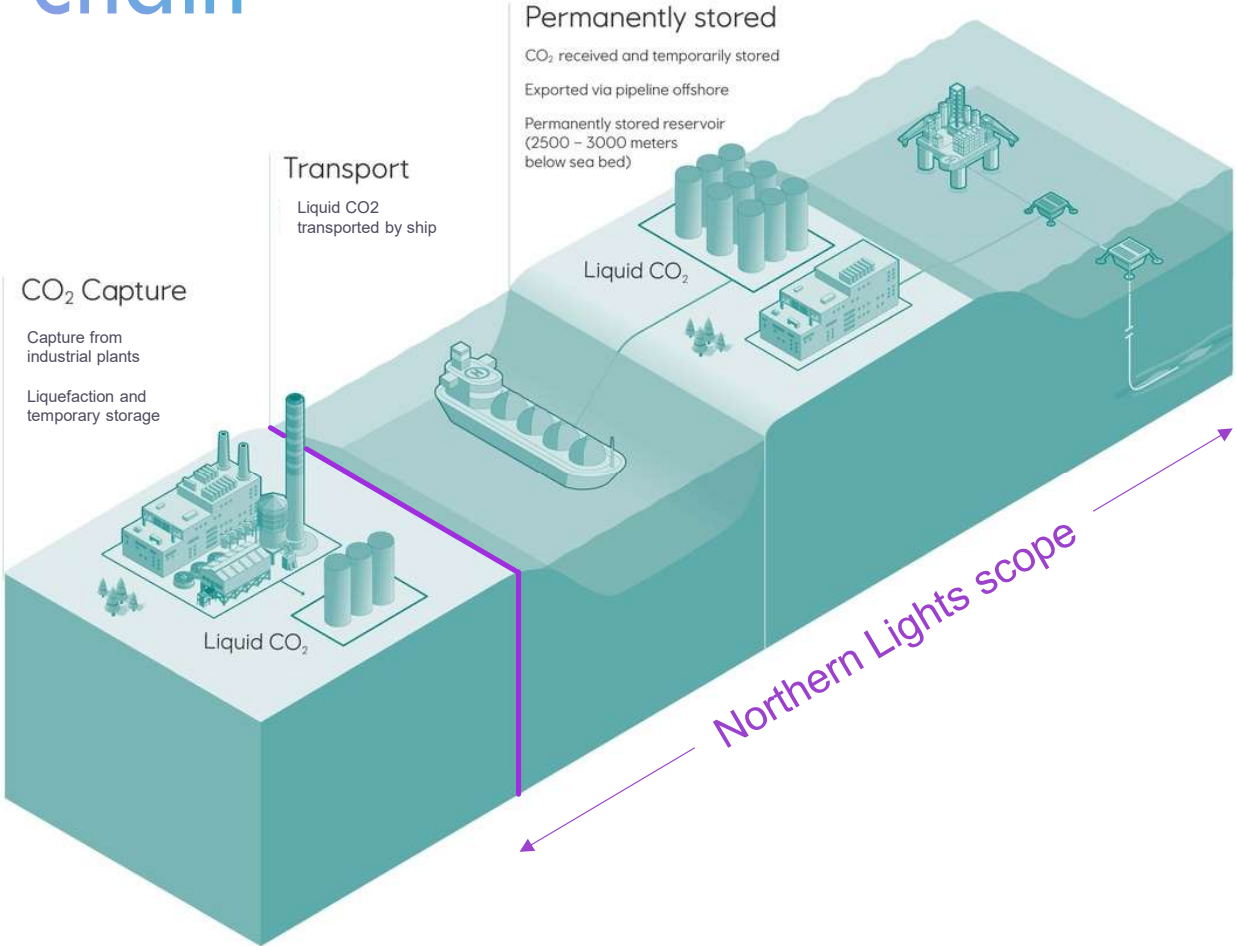
Business Development Advisor

Northern Lights

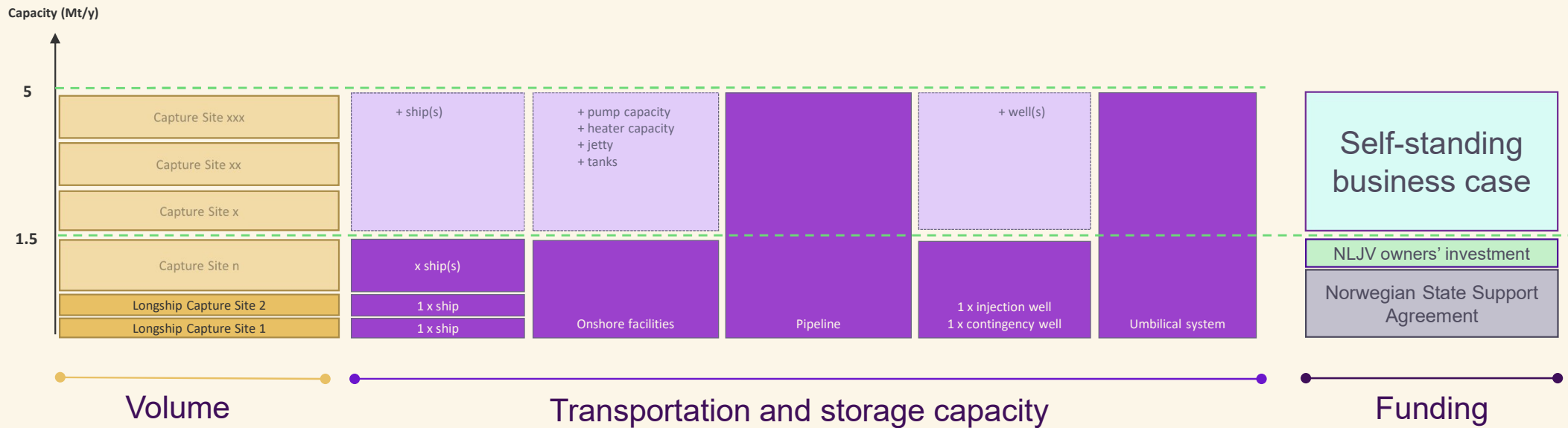
- The Northern Lights project passed FID 1,5 years ago
- Since then, we have started construction as the world's first open-source CCS project
- In June 2021 the Northern Lights JV was formally established
 - Owned by Equinor, Shell and TotalEnergies
- The Norwegian state contributes with considerable funding for first phase



CCS value chain



Volume and future ramp-up



→ **Demand and funding capabilities** will bring the 5 MTPA and potential future phases forward in time

CO₂ ship transport

Cargo Systems for CO₂

- 2 ships x 7500 m³ capacity initially
- Cargo at 13-15 barg (approx. -26°C)
- Offloading @ max 800 m³/hr
- Evaluating future ship sizes up to 15 000 m³

'LPG standard' design

Proven concept

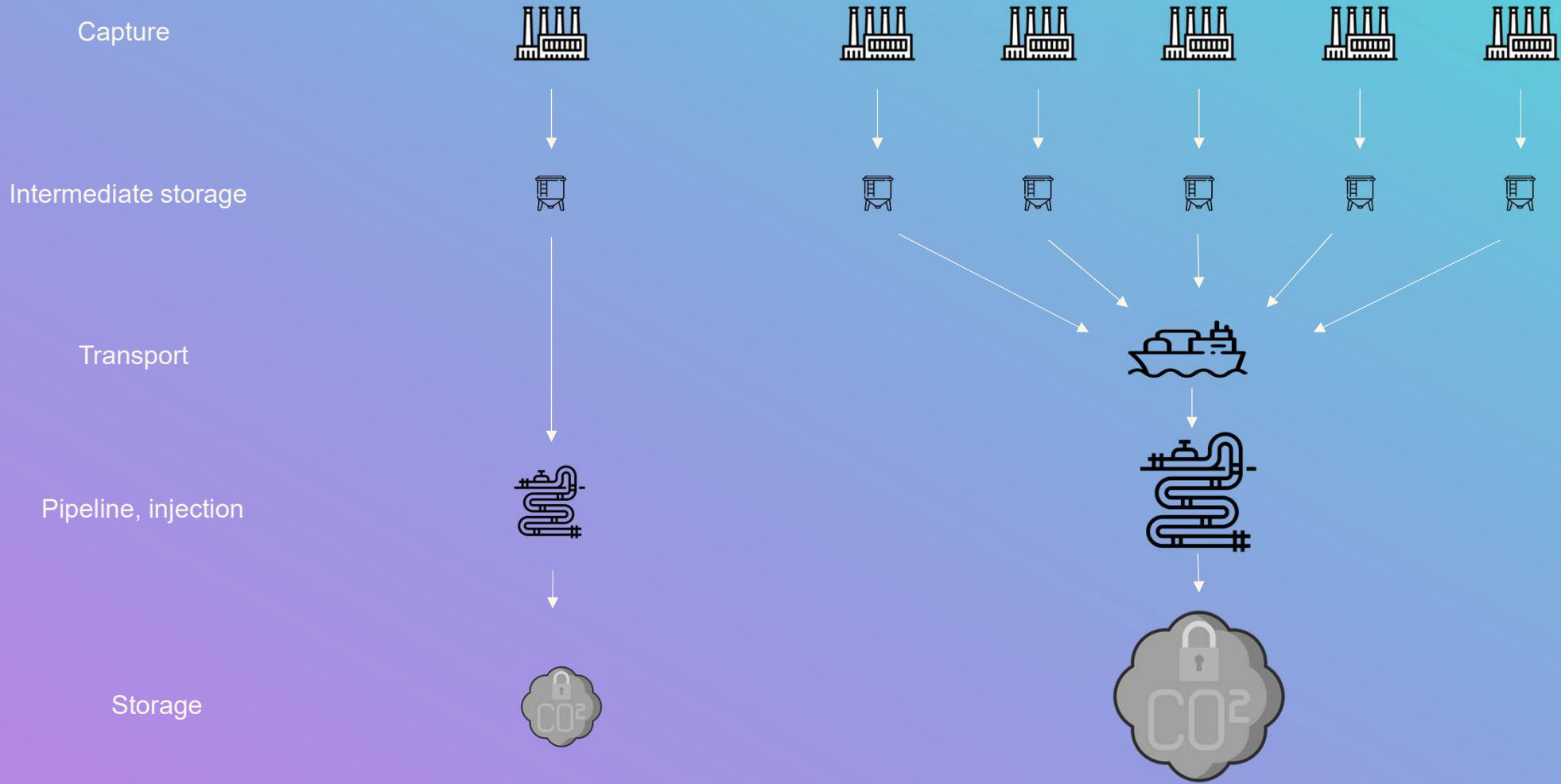
Emission reduction measures

- LNG dual fuel combustion
- Air lubrication
- Rotor sails
- Shore power



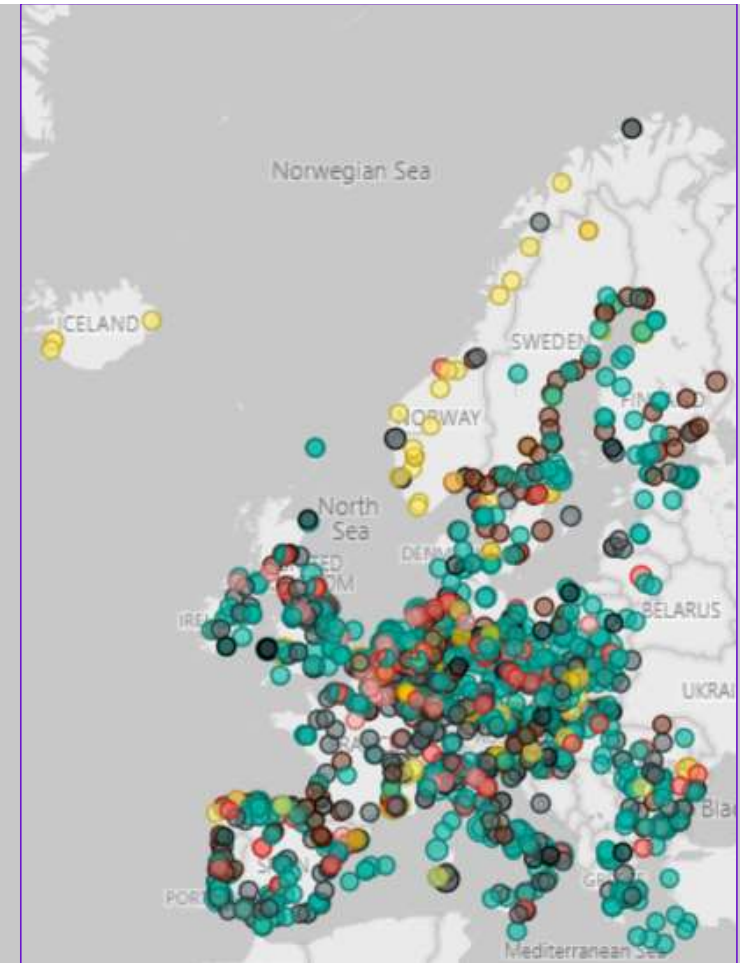
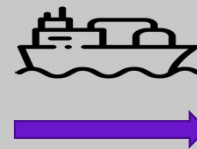
Traditional

Northern Lights open-source infrastructure





Oil and gas operators with potential access to reservoirs
 135 facilities
 149MTPA



Industrial emissions less than 300km from port
 2200 facilities
 1 687MTPA

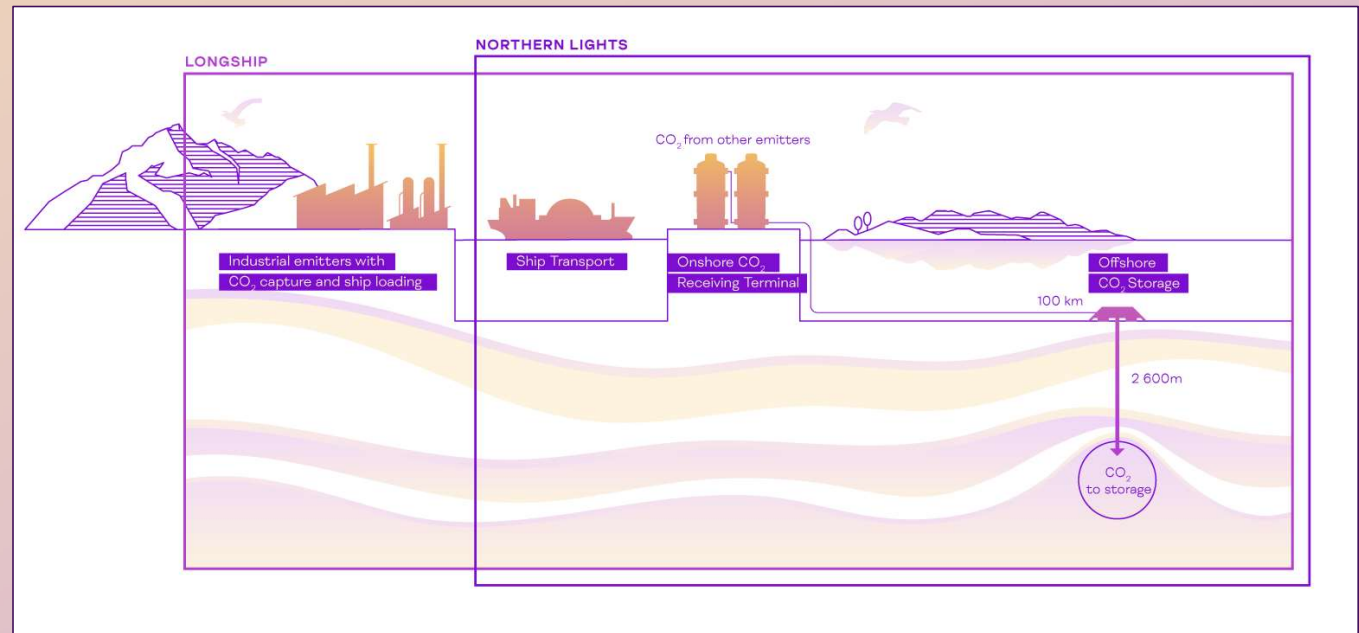
Future European CCS

- CO₂ from many industries and countries
- Logistics optimized through hubs, intermediate storage, small ships, large ships, pipelines, train, etc
- Multiple storages – providing reciprocity, standardization and increased learning
- Primary markets
 - **Hard to abate industry**
 - **Enabling new industry**
 - Large scale, clean hydrogen
 - Negative emissions through BECCS and DAC



Longship

- Norwegian government's demonstration project of full-scale CCS value chain by 2024
- Full support to Norcem cement factory, and partial support to Fortum Oslo Varme waste to energy facility – both on the Norwegian east coast
- Includes CAPEX and OPEX support for the first 10 years



“ Longship is a milestone in the Government’s industry and climate efforts. The project will lead to emission cuts, and facilitate development of new technology and thus new jobs ”

- Prime Minister Erna Solberg.