



Pathways to accelerating CCS in the US

Challenges and Opportunities

Equinor
10/31/2023

Equinor's CCS scale-up road map

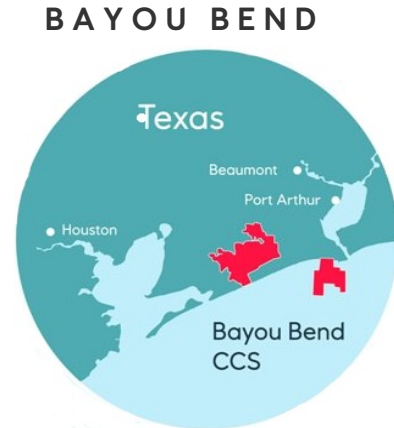
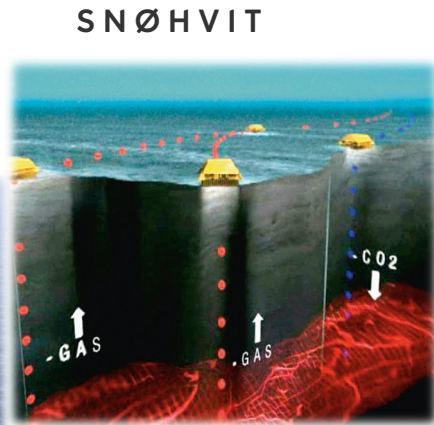
Building on 27 years of operational experience in CCS with the Northern Lights project as a market opener

The challenges of significant scale-up

15-30 Mtpa

CO₂ transport and storage capacity by 2035

Equinor share



Bringing scale

Northern Lights – Market opener

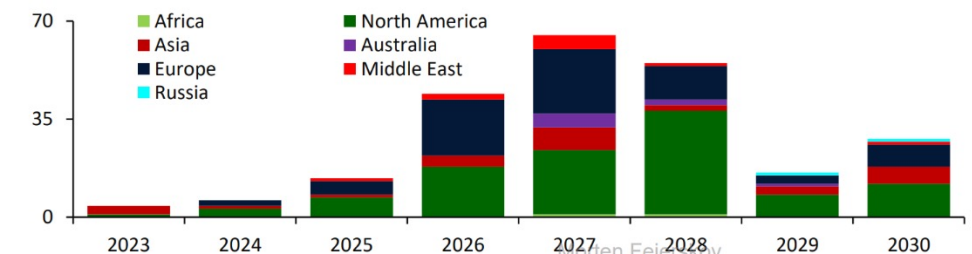
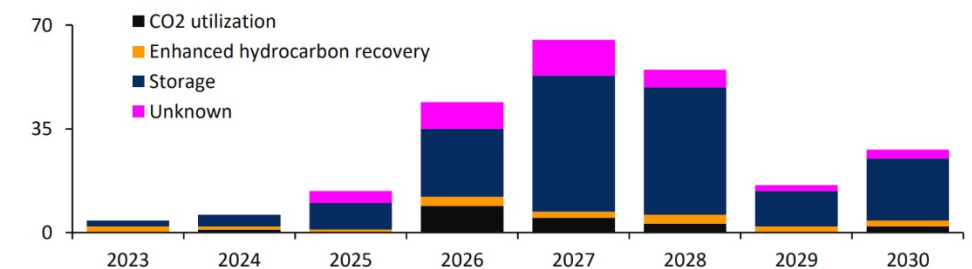
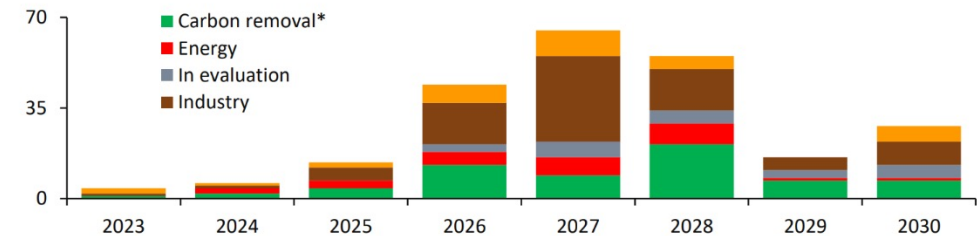
Operation experience – technology works!

Challenges: (Globally) Most Projects Online 2028+

- Majority of projects have start year after 2026
 - Can expect project delays as well
 - How to expedite the project delivery?
- IEA's scenario asks for 25%+ CO₂ emission reduction by 2030
 - Do the announced projects cover this?
- US current CO₂ emissions are over 2.5 billion ton/year, while the announced projects cover <10% of these emissions
 - More projects are needed to truly 'moving the needle'

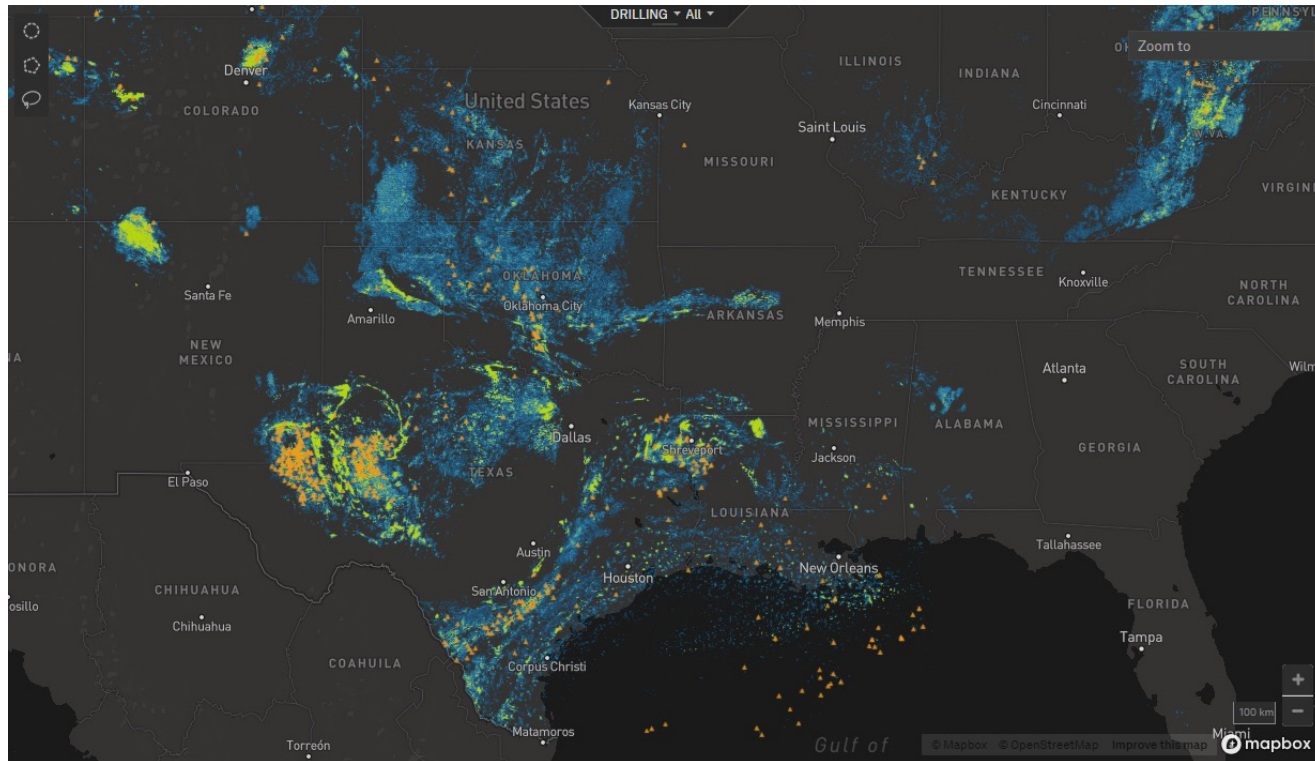
Count and start-up year for the CCUS projects announced in 2022

Split by carbon source, offtake, and region



*Carbon removal entails BECCS, DAC
Source: Rystad Energy CCUS solution

Opportunities: Technology Development



US well coverage
Source: S&P Energy Studio Impact

- **Legacy wells:** there are high numbers of existing well penetration across US, what is the most cost-effective way to mitigate them as potential leak?
- **Induced seismicity:** need cost effective ways to monitor induced seismicity
- **Impacts of CO₂ leakage:** in the unlikely event of CO₂ leakage/vertical migration above the seal formation, what really are the true consequence?
- **Far field monitoring:** how to map out the pressure front movement?

Developing technology for seismicity monitoring offshore?

Summary of HNET project – a JIP focused on the Northern Lights offshore CCS project

- Finding solutions for cost-effective microseismic monitoring for offshore sites
- Using combinations of a few ocean-bottom nodes and fiber-optic sensing

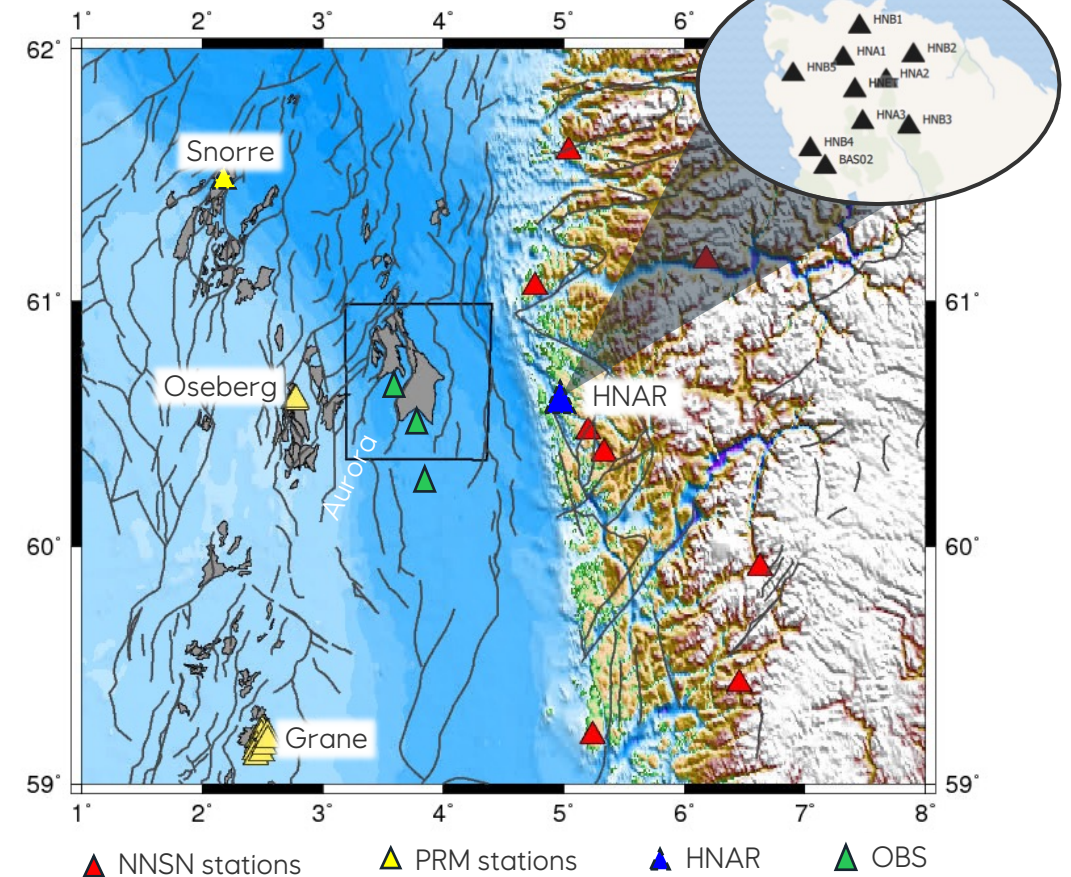
Our seismic station network



Coastal and offshore deployments of Broadband seismometers

Even though the expected risk of induced seismicity is very low we need to build trust/transparency and to avoid false association with natural earthquakes

For more info see [HNET project \(hordanet.no\)](http://hordanet.no)



Equinor's Strategy

Net Zero by 2050



Thank you!

Any questions?

