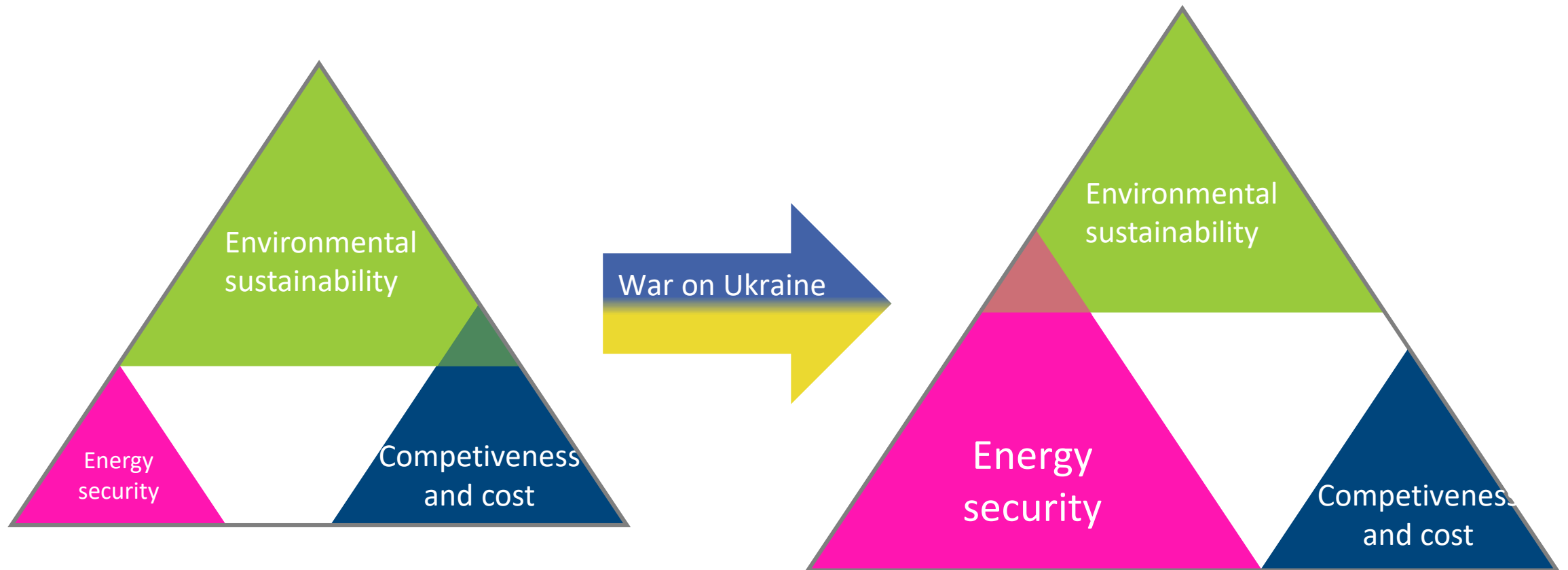




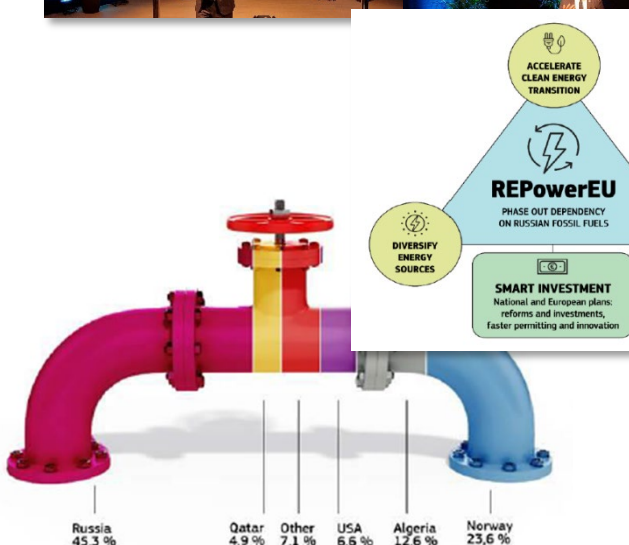
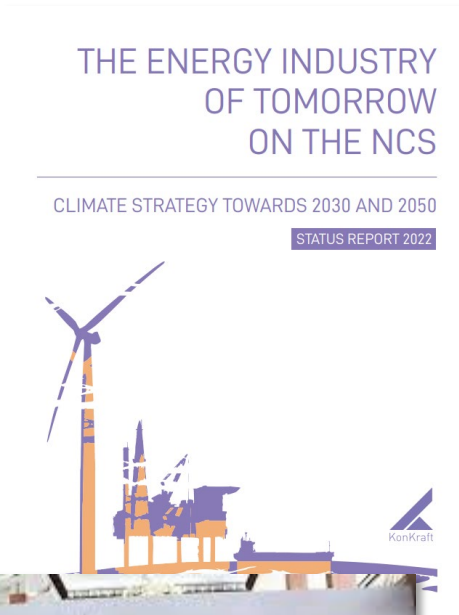
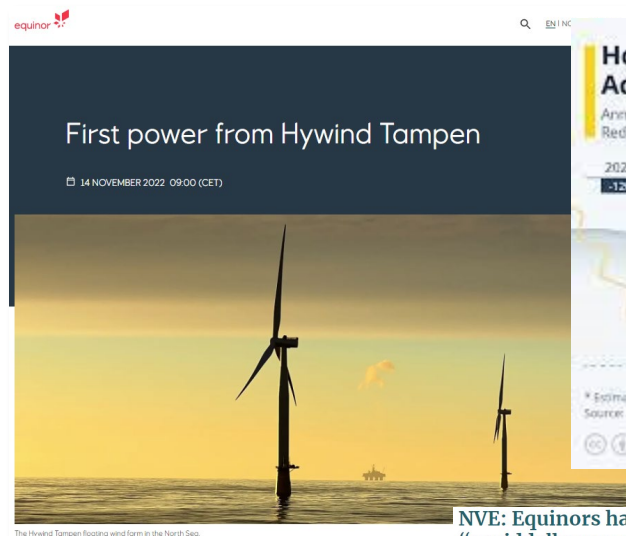
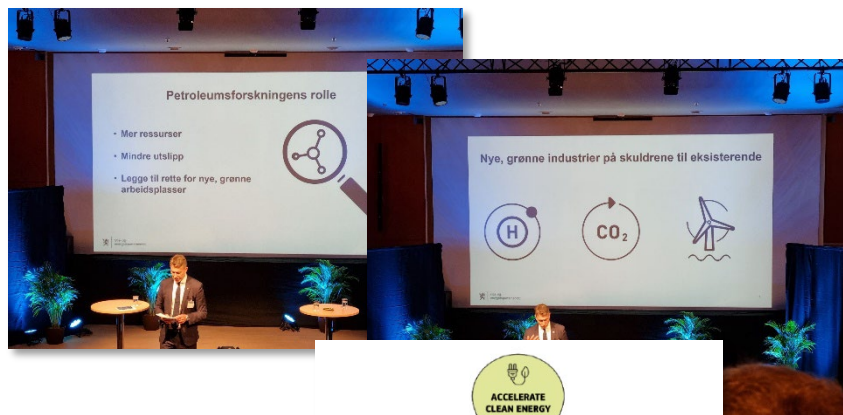
# *Veien mot nullutslippssamfunnet*

**Stefania Gardarsdottir**  
**Direktør *LowEmission* senteret**  
**Forskningsleder, SINTEF**  
**Innovasjonsdagen 2023**

# Accelerating emission reductions in times of conflict and energy crisis



# Accelerating emission reductions in times of conflict and energy crisis



NVE: Equinors havvindprosjekt vil ha "umiddelbar og gunstig effekt"

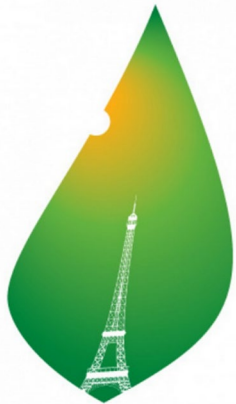
Havvindprosjektet Trollvind vil være positivt for kraftsystemet i Bergen og omland, mener NVE og Statnett.



Montering av flytende vindmølle til prosjektet Hywind Tampen i Gulen i Vestland fylke, mai 2022. (Foto: Jan Arne Wold/Equinor)

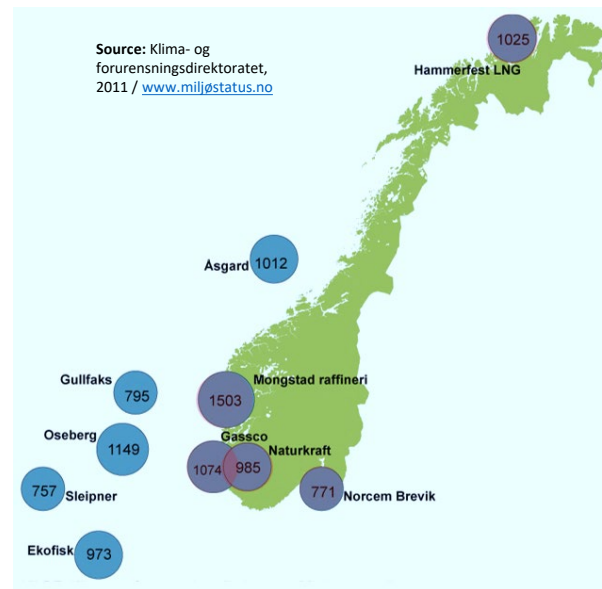


# Emissions in Norway – *The role of the Norwegian Continental Shelf*



PARIS2015  
UN CLIMATE CHANGE CONFERENCE  
COP21·CMP11

*Norway committed to  
reduce GHG emissions*



*Over 25% of emissions caused by  
offshore oil and gas production  
- Increase despite production decline*

DET KONGELIGE  
OLJE- OG ENERGI-DEPARTEMENT

**Meld. St. 36**

(2020–2021)

Melding til Stortinget

Energi til arbeid – langsiktig verdiskaping fra  
norske energiresurser



**Renewed 2030 ambition:  
55% emission reductions**

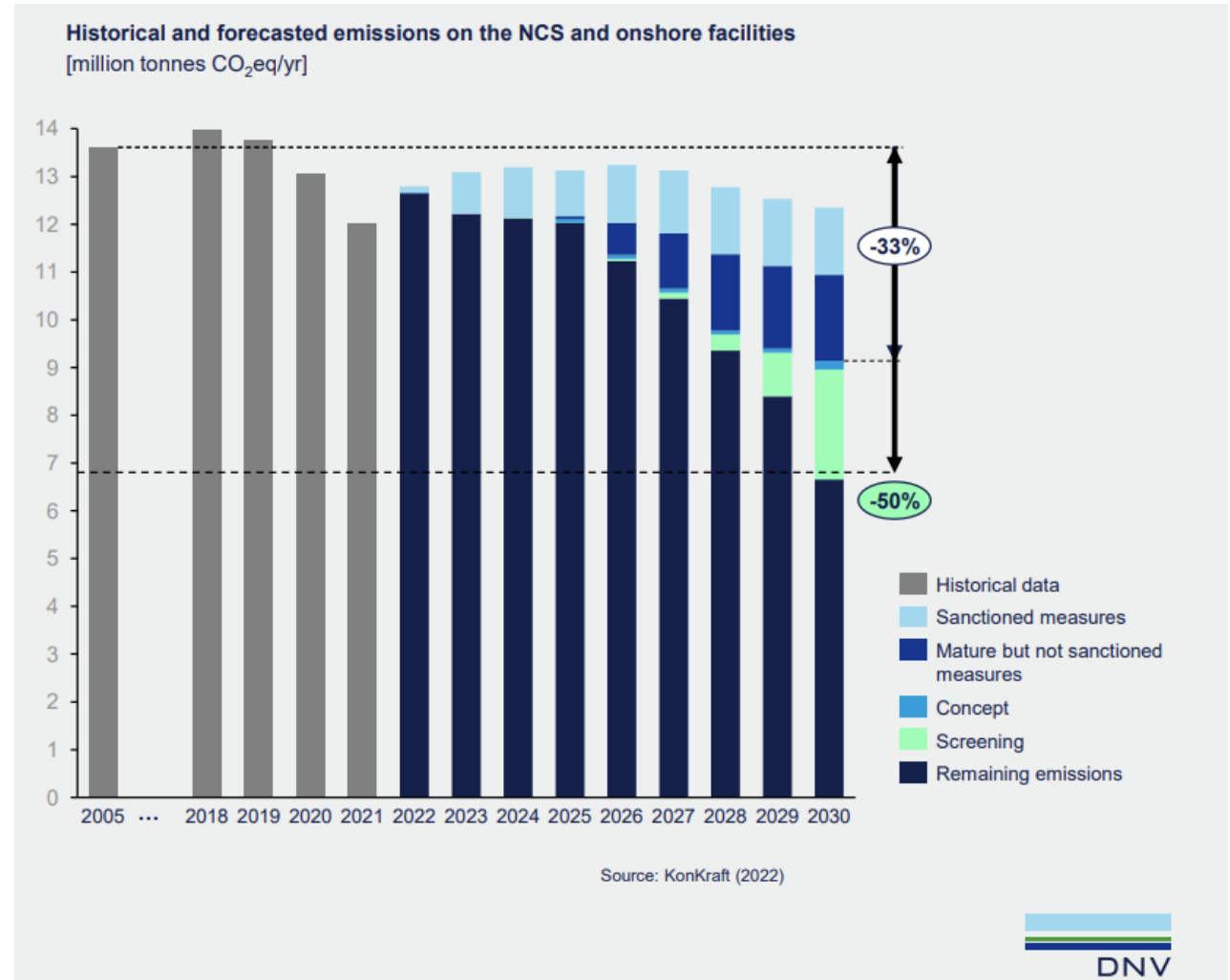
# Status quo – Towards the NCS 2030 targets

Norwegian gas demand stronger for longer

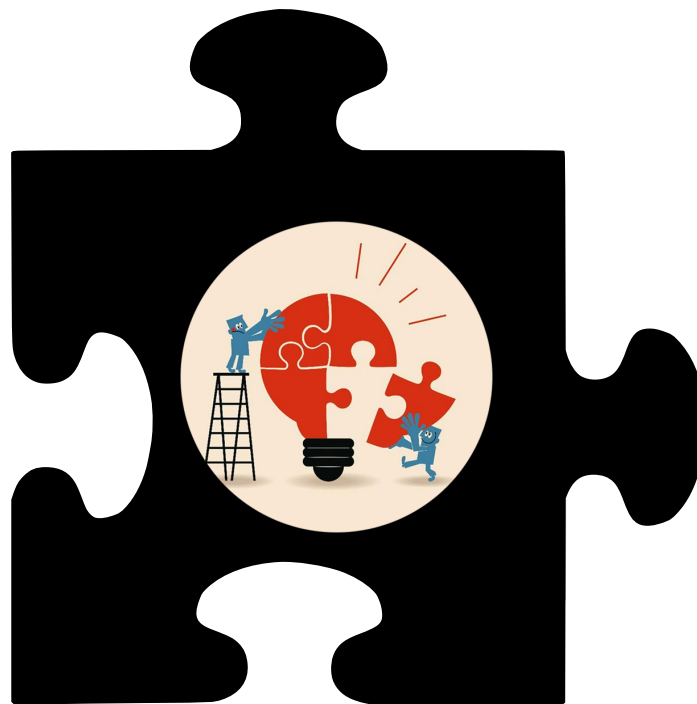
Pace of EU gas demand contraction still a key question-mark

More measures needed

GHG reduction measures must focus on gas turbines and big emitters

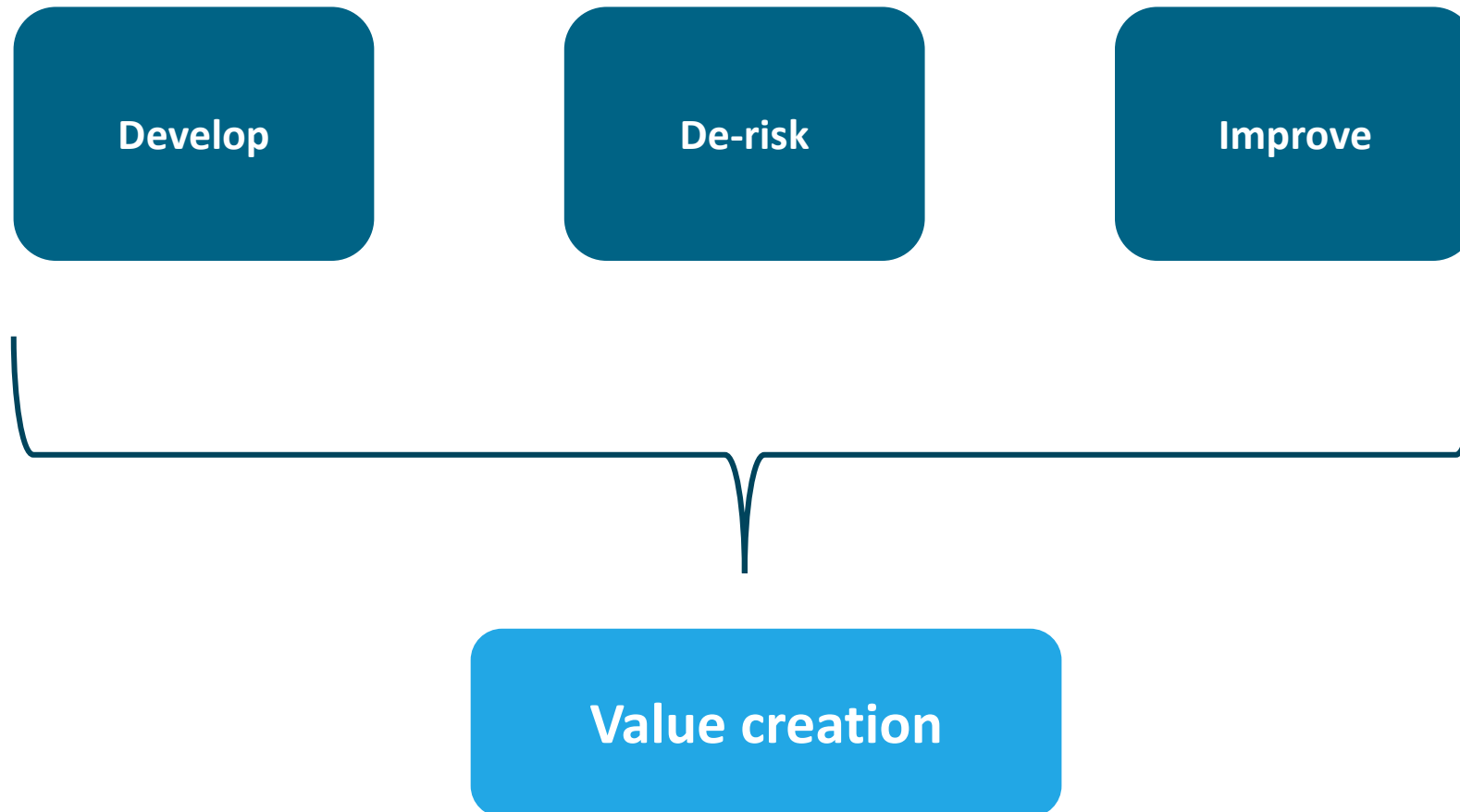


# More measures are needed to reach our climate targets...



## ...innovation is an important piece of the puzzle!

# *Why R&D and innovation?*

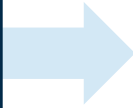


# LowEmission – PETROSENTER

 **SINTEF** Research Centre for a Low Emission Petroleum Industry on the Norwegian Continental Shelf

 **NORCE** Centre for Sustainable Subsurface Resources

 **UiS** National Centre for Sustainable Subsurface Utilization of The Norwegian Continental Shelf  
Universitetet i Stavanger



-  **33** INDUSTRY PARTNERS
-  **2** RESEARCH PARTNERS
-  **316** MNOK
-  **8** YEARS



**Goal:** Develop technologies and solutions for reducing climate gas emissions on the Norwegian Continental Shelf with **50% within 2030** and move **towards zero-emission within 2050**

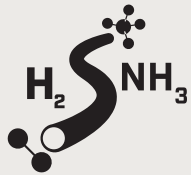


# LowEmission – Targeted solutions

## Energy supply



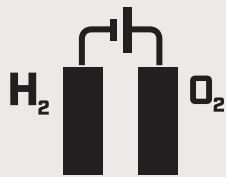
10-20 %



40-60 %

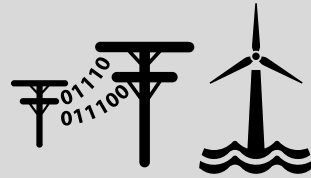


40-80 %



5-10 %  
Hybrid Solutions

## Energy system

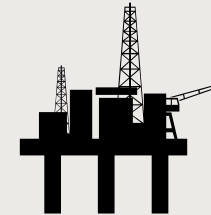


40-60 % Energy Systems  
5-10 % Digital Solutions

## Energy demand



10-20 %



5-10 % Topside  
10-20 % Subsea



5-10% Supply logistics  
5-10 % Hybrid vessels

Most of the technologies can contribute towards the 2030 goals

Note: Technologies outside of *LowEmission* scope, such as CCS, will play a key role in reaching 2050 emission targets

# When ambitious industry meets R&D = Innovation!



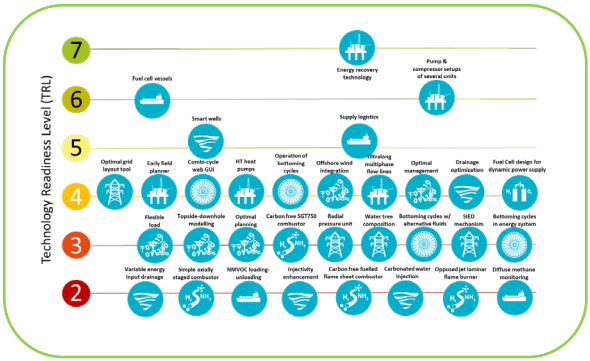
17 Industry-driven case studies

**TotalEnergies** **SIEMENS energy**

**SIEMENS energy** **CYBERNETICA**  
**ConocoPhillips** **TEN TECHNIP ENERGIES**



30 innovations



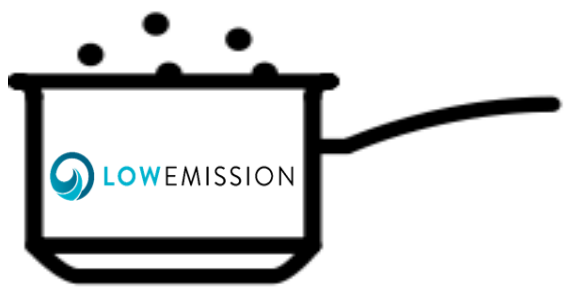
18 Spin-off projects

**Nexans**

**equinor**

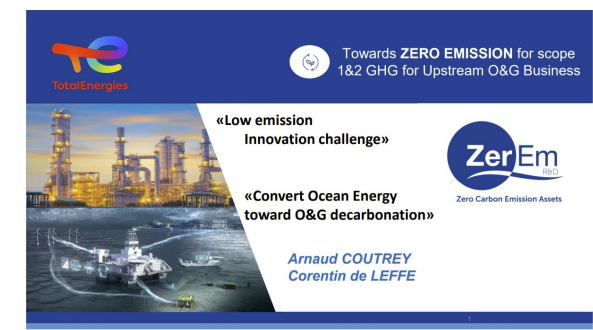
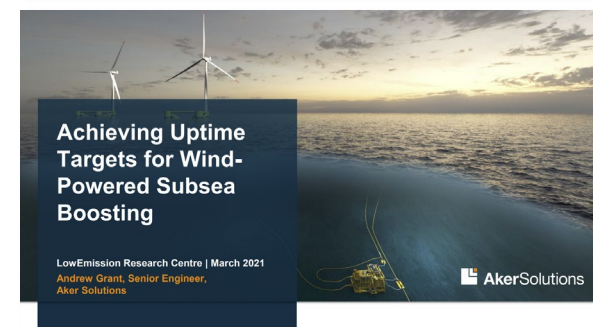
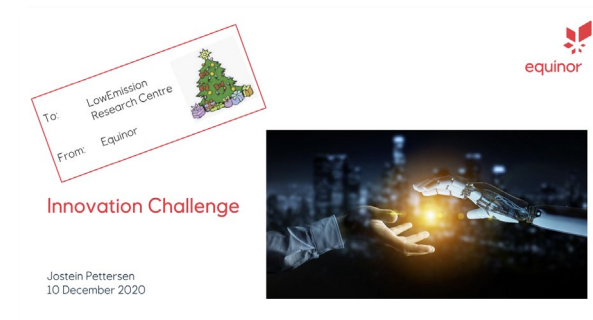
export processing injection wells production wells gas turbines wind energy

**Lundin Energy Norway** **equinor**  
**Aker Solutions** **WÄRTSILÄ**  
**LINCCS**



# LowEmission – Innovation challenge

- The **LowEmission Innovation Challenge** series started in autumn 2020
- **Goal:** Sharing of *LowEmission* relevant challenges from industry to the consortium
- **Expected outcome:** New activities, case studies and/or spin-off projects



# LINCCS - Spin-off from Innovation Challenge

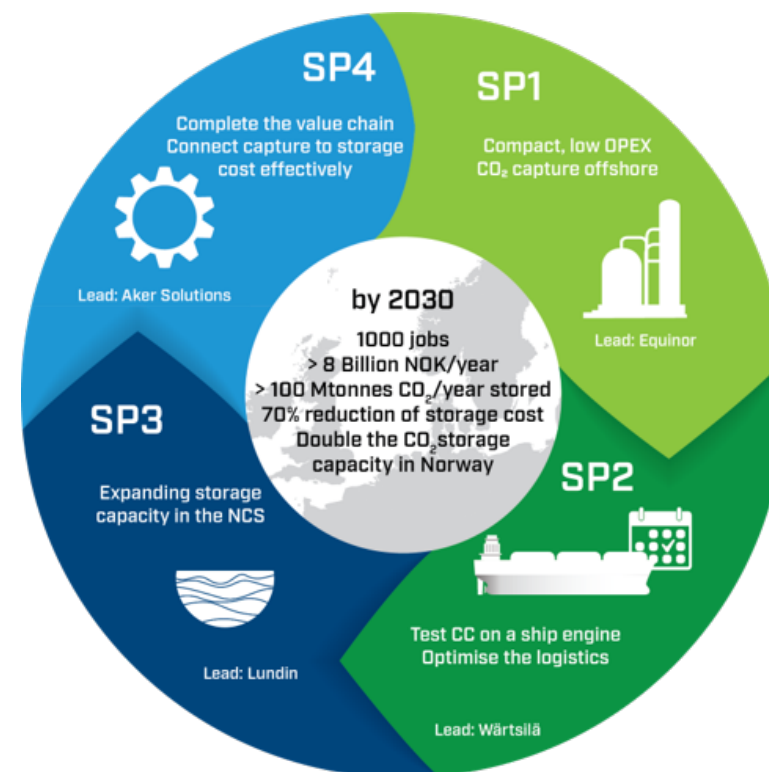
ENOVA

Forskningrådet

Innovasjon Norge

siva

- Carbon Links (LINCCS)-Linking large-scale, cost-effective, permanent offshore storage across the value chain
- Collaborative initiative launched between the centres NCCS and *LowEmission*
- Operator partners in both centres were invited to shape initiative
- Inspired by Equinor's LowEmission innovation challenge
- Aker Solutions has the role of a project owner
- Granted funding in 2021 through the Green Platform funding programme
- Project duration 2021-2024
- Total budget ~200 MNOK



AkerSolutions™

wintershall dea

equinor

COGNITE

SUSTAINABLE ENERGY | NORWEGIAN CATAPULT CENTRE

WÄRTSILÄ

Lundin Energy

TOTAL

vår energi

Aize

agr

OpenGoSim

SINTEF

# A few take-away messages

- Reaching climate targets and implementing effective policy measures is high on the global agenda despite current conflict in Europe
- Reaching the 2030 and 2050 emission reduction targets requires:
  - a portfolio of solutions is needed, including alternatives to electrification – every platform and field is different
  - significant increase in tempo in all phases of project development and execution
  - a balance of R&D, innovation and fast-tracking implementation

