



The energy sector in Norway – a brief overview

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Change Programme, Dubrovnik, 13 April 2023

The Ministry of Petroleum and Energy

The Ministry's responsibilities:

- ***petroleum*** (offshore),
 - ***energy*** (mainland); licensing of production, transmission grid, market regulation etc
 - ***water resources*** management
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- **Overall objective:**
high value creation through efficient and environment friendly management of the energy resources



Starting point – the energy situation in Norway



40%

Oil and gas accounts for
40% of export income



25%

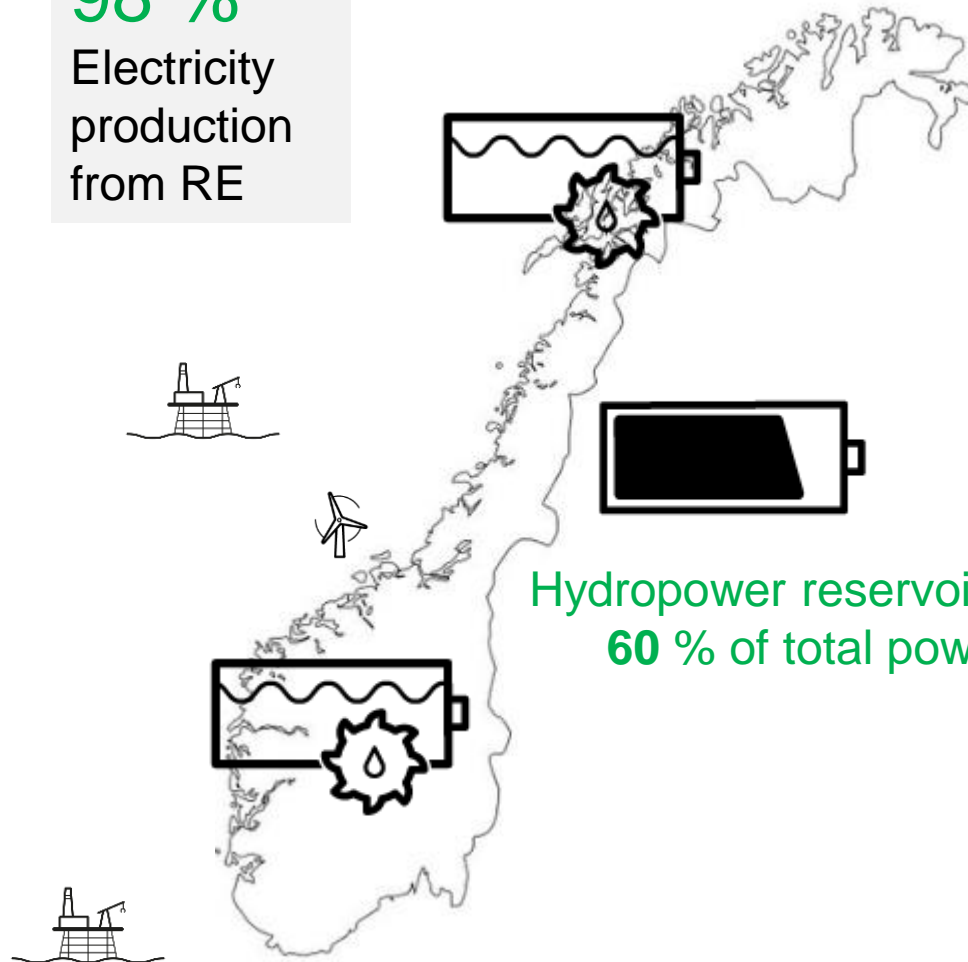
Norwegian gas covers ca.
35% of EU and UK gas
consumption



Norwegian Ministry
of Petroleum and Energy

98%

Electricity
production
from RE



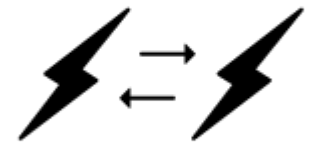
ca. 75%

RE share of total
energy
consumption



54% rate of electricity
in energy use

Hydropower reservoir capacity equals
60% of total power production

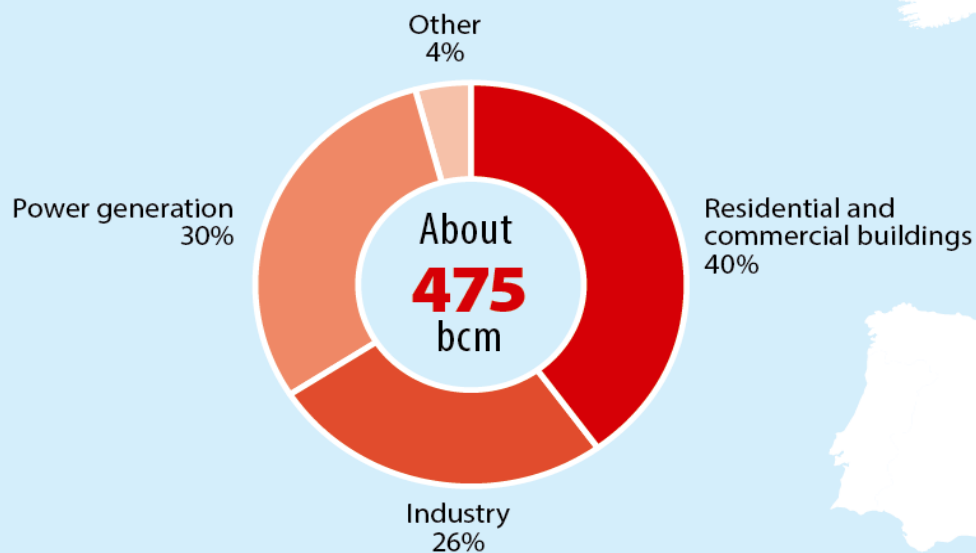


Norway is part of a well
integrated power market.

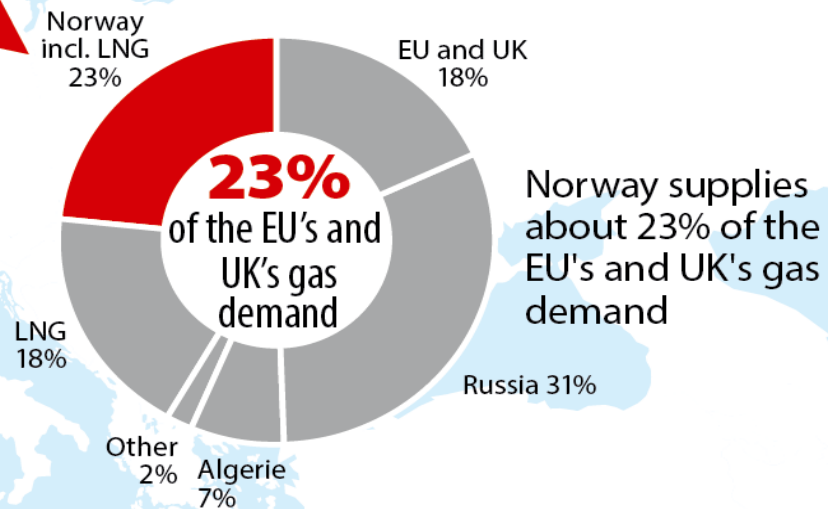
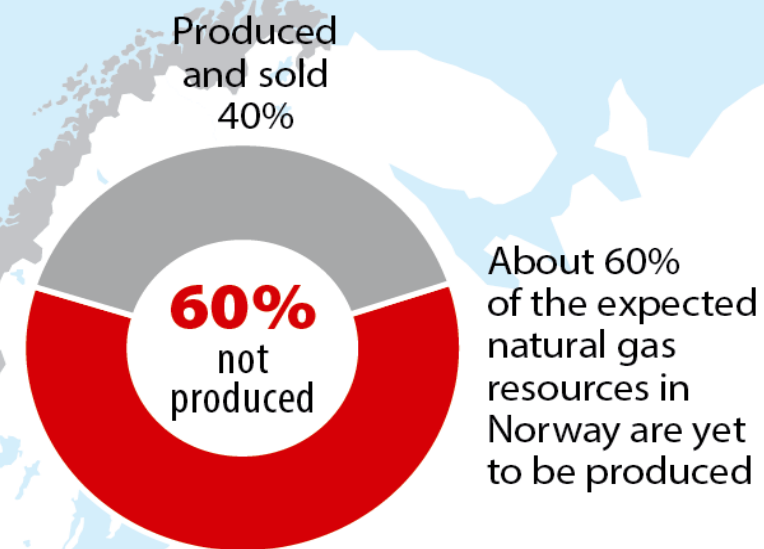
Norwegian gas export

Norway exported about 114.8 bcm in 2021, with a total value of NOK 475 billion. This is equal to 34% of the total external trade in goods.

EU and UK gas consumption by segment

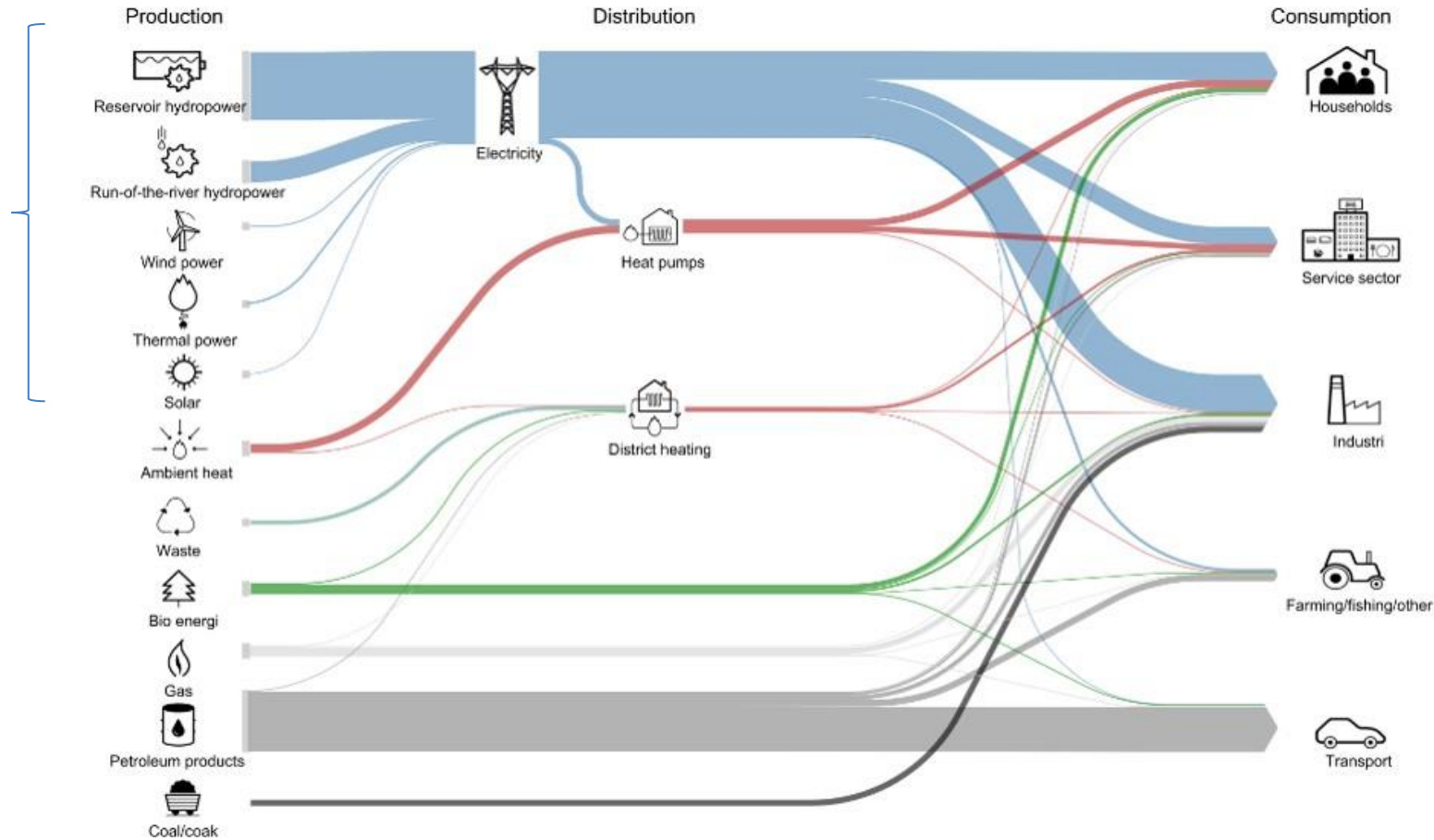


NORWAY



A large share of energy use in Norway is renewable – but more can be done

98 % of electricity from renewable sources.
Ca. 150 TWh/yr



Electricity makes up a larger share of energy use than in most countries.

Large hydropower-based industrial sector.

Renewable electricity used for heating and in parts of the transport sector.

Still a large fossil energy use in some sectors, especially heavy transport.

High renewable share = much lower greenhouse gas emissions from energy use than in many countries.

Effective policy instruments are driving a continued transition to more renewable energy use.



Water - a major natural resource



50



Norway: Europe's main hydropower producer

More than 100 years of hydropower production.

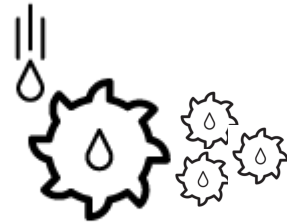
World's 7th largest hydropower producer.

High reservoir capacity gives flexibility: electricity can be produced as needed. Production can be adjusted to demand in only seconds. Flexible hydropower production can be combined with other renewable energy sources while maintaining stability in the power supply system.



1885

First Norwegian
hydropower plant
constructed



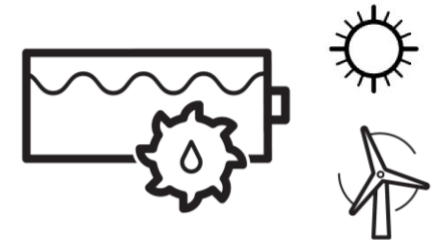
33 700 MW

Installed capacity



84 TWh

Total reservoir capacity.
Corresponds to **60 % of total**
power production. Ca 50 % of
Europe's reservoir capacity

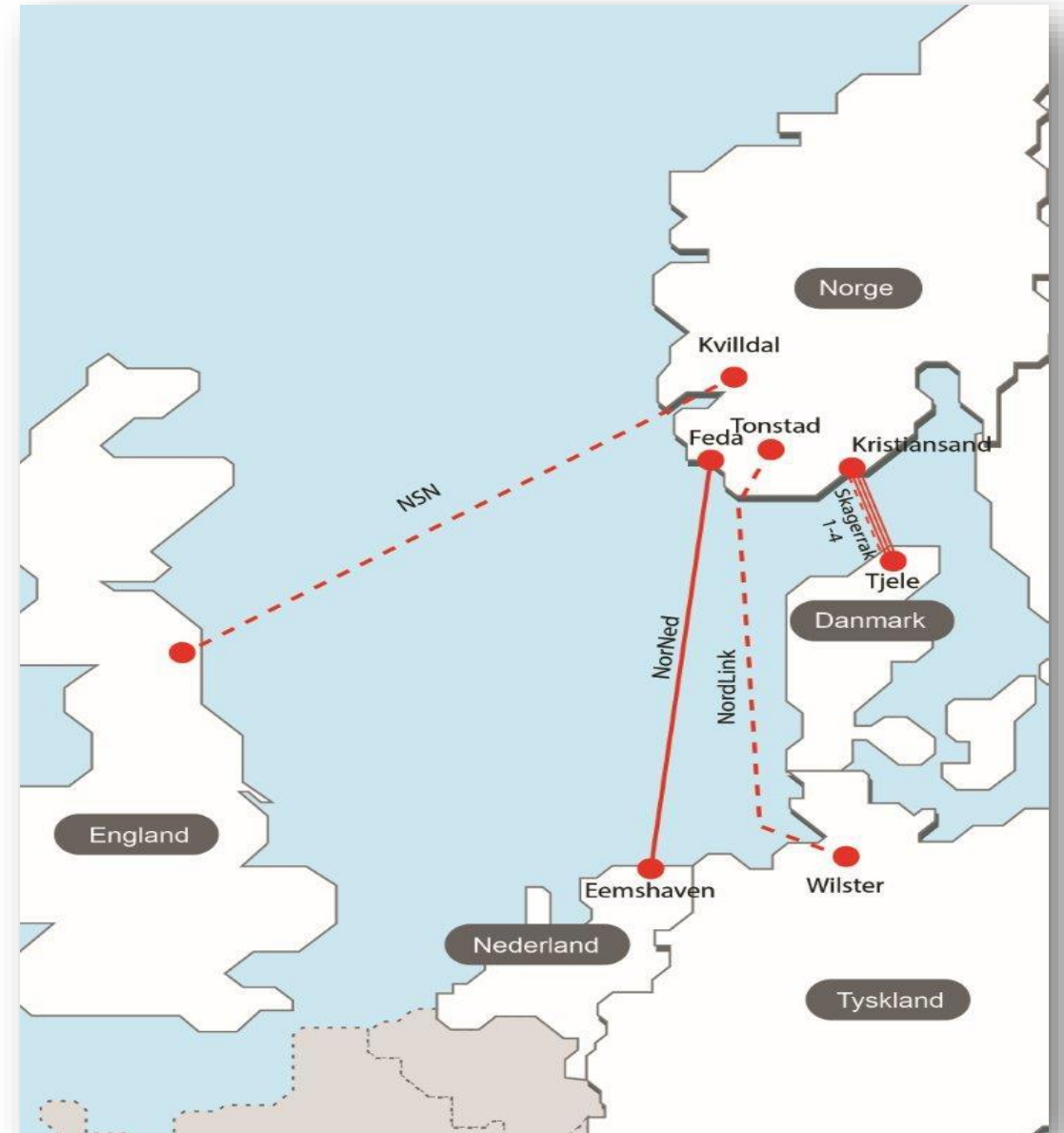


Flexibility

is increasingly important.
Hydropower much more
flexible than solar and
wind power



Market integration and new Interconnectors (2 x 1400 MW)



Report from the Energy Commission



“More of everything – Quicker”

- We need more renewable energy,
- larger and more powerful grids,
- a more efficient use of energy

The commission has also examined:

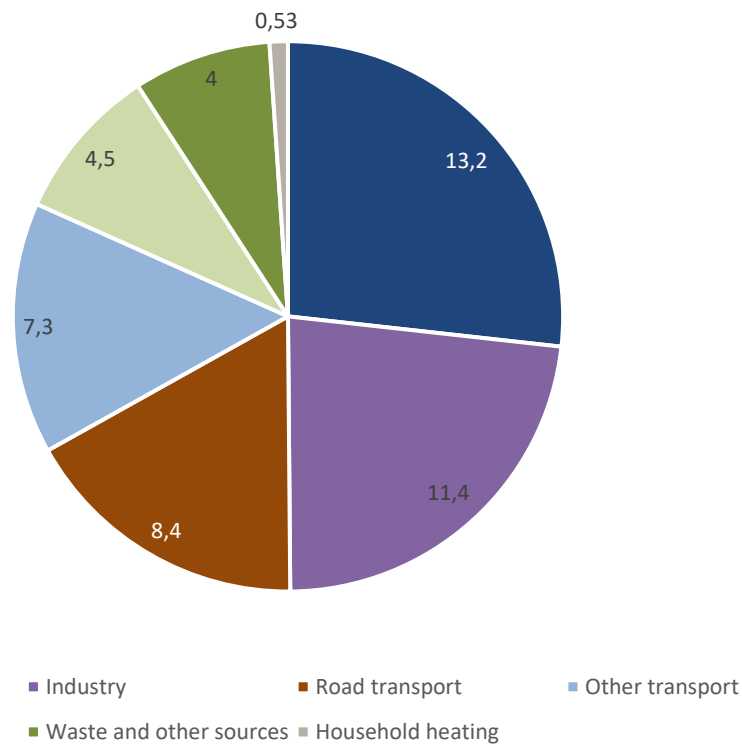
- How Norway is affected by rapidly changing energy markets
- Perspectives on the development of power consumption
- The potential for socio-economically profitable power
- Perspectives for the security of electricity supply
- Key conflicts of interest within the energy policy field

Other energy sources

- Hydropower has potential for Upgrading and Extension
- Geothermal
- District heating (bio energy and waste incineration)
- Energy efficiency and energy savings – households and industry
- Solar energy - PV

Potential for decarbonisation in Norway

Norway's total GHG emissions in 2021
Million tonnes CO₂-equivalent 48,9

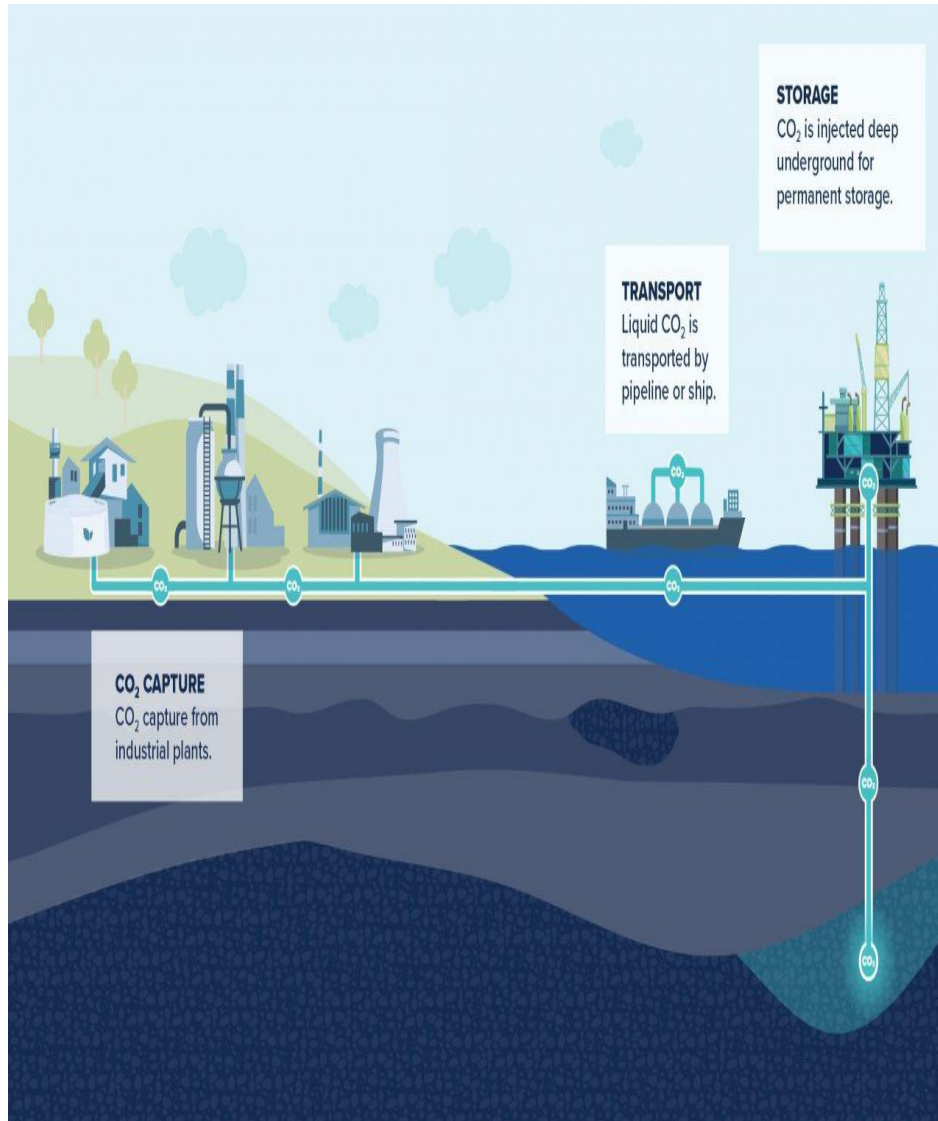


- **Climate target for 2030:**
Greenhouse gas emissions to be reduced by at least 50-55% by 2030 from the level in the reference year 1990.
- **Climate target for 2050:**
Reductions of greenhouse gas emissions of the order of 90-95% by 2050 from the level in the reference year 1990.

Source: The Norwegian Environment Agency and
Statistics Norway 2022/Miljøstatus.no



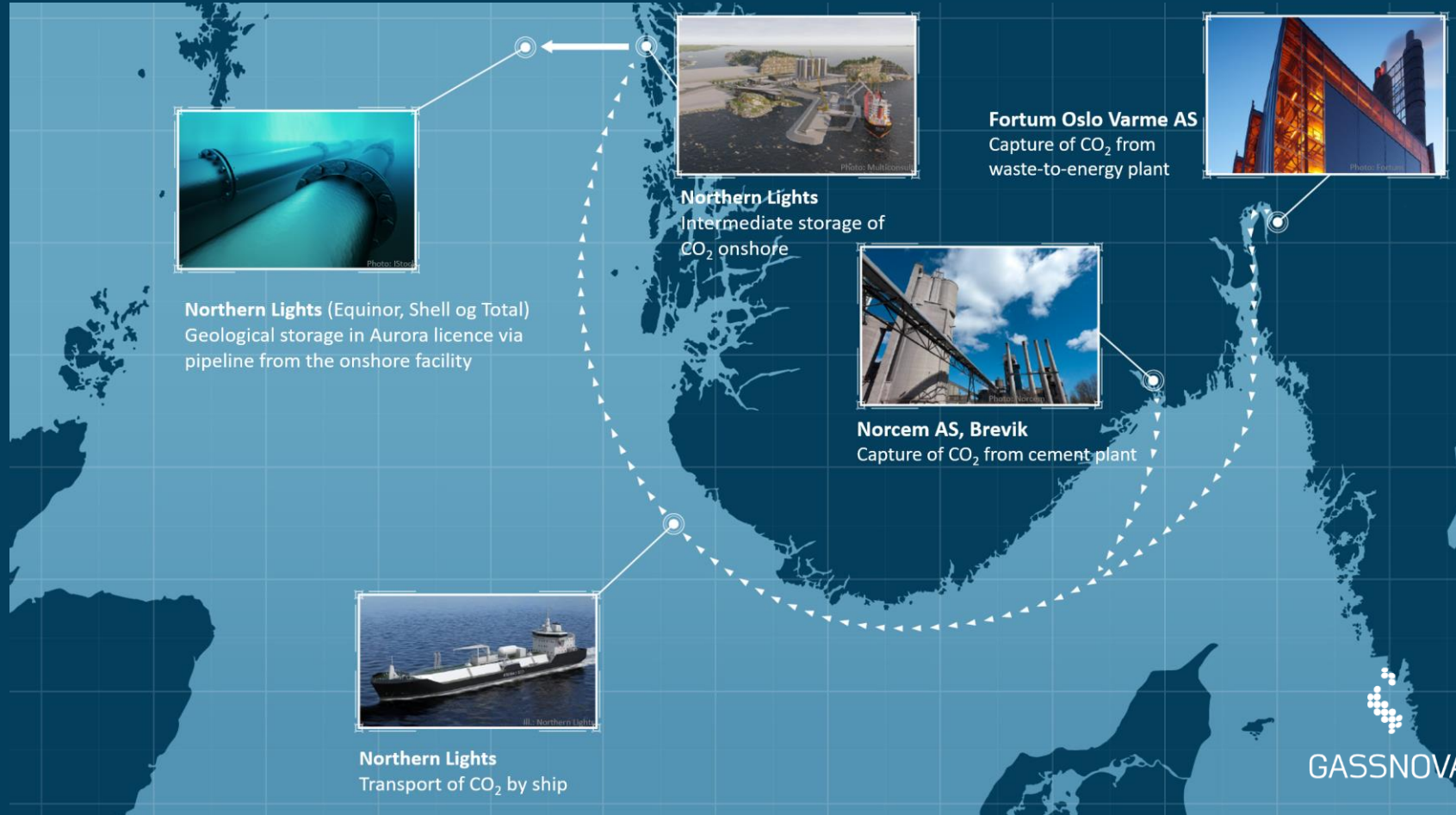
«New» technologies – Towards the Green shift



H₂



Longship – CCS Project



Northern Lights

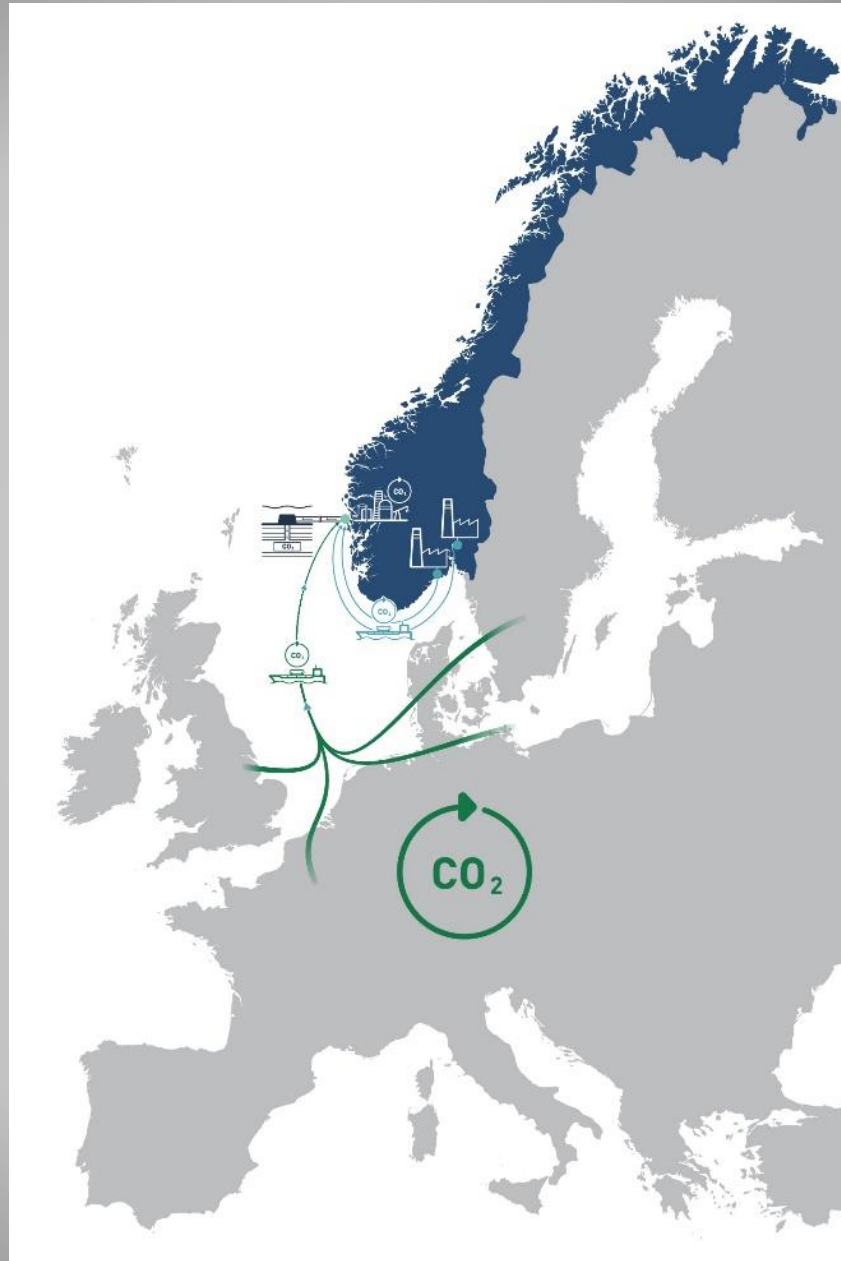
equinor

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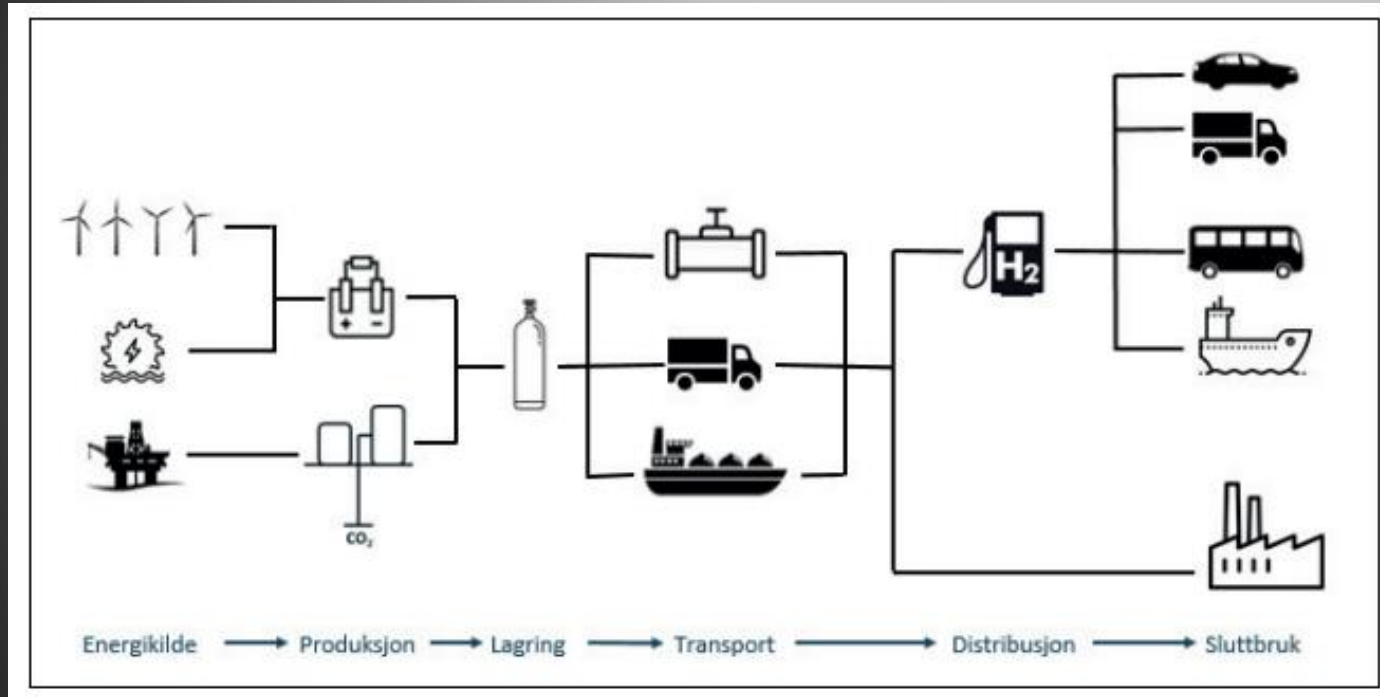
Hafslund Oslo
Celsio

AKER CARBON CAPTURE

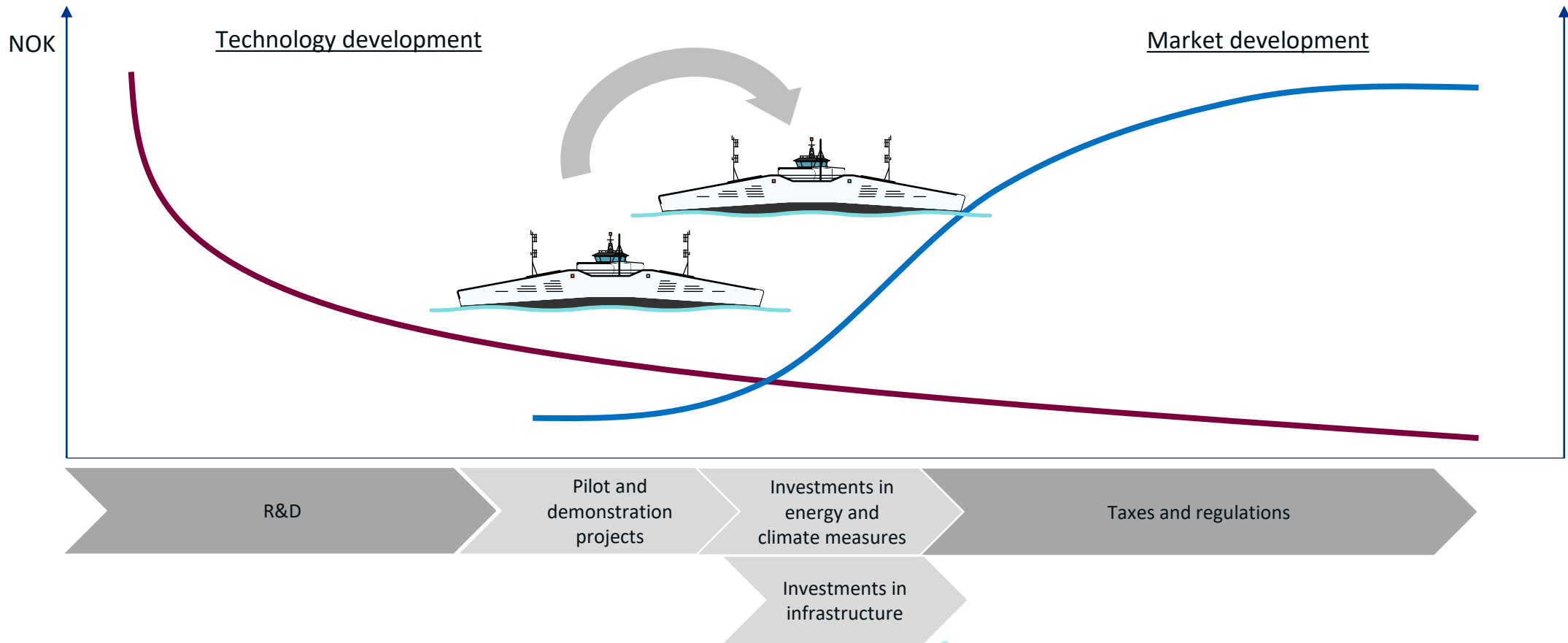
TechnipFMC



Hydrogen in Norway – *Green and Blue*



Support for hydrogen research and development



Olje- og energidepartementet



ENOVA



The Research Council of Norway

Examples of hydrogen projects



Photo: NORLED



Photo: Yara



Photo: TiZir v/Haavard Elstad



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Offshore Wind in Norway

The Government has high ambitions for offshore wind

Ambition: Award areas for 30 GW offshore Wind by 2040

- Areas will be awarded in several rounds.
- Utsira Nord and Sørlige Nordsjø II were opened for offshore wind in 2020. Licensing round announced 29 March 2023-open for competition
- The following round for awarding areas will be in 2025.

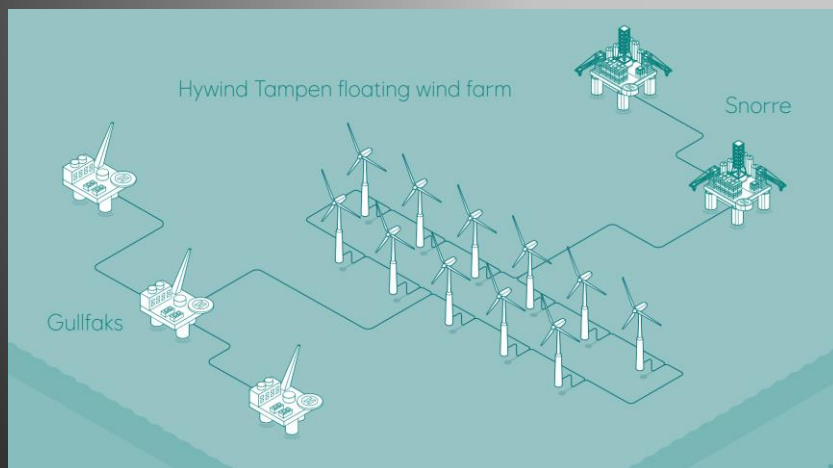
Auction is the main model for awarding areas

- Two-stage process: 1) Qualification-process and 2) Auction between the qualified companies/consortia- Contracts og Difference
- The auction winner gain the exclusive right to seek a concession for an offshore wind farm.
- In special cases the Government may award areas based on qualitative criteria.



Photo credit: NVE

Hywind Tampen – the world's largest wind farm (88 MW) is under construction



International co-operation

- Norwegian Energy Partners (www.norwep)



- ICH – International Centre for Hydropower (www.ich.no)



- MFA/Norad/NVE – providing capacity building in development or EEC-Cooperation

- Oter partners:

