



Norway Update

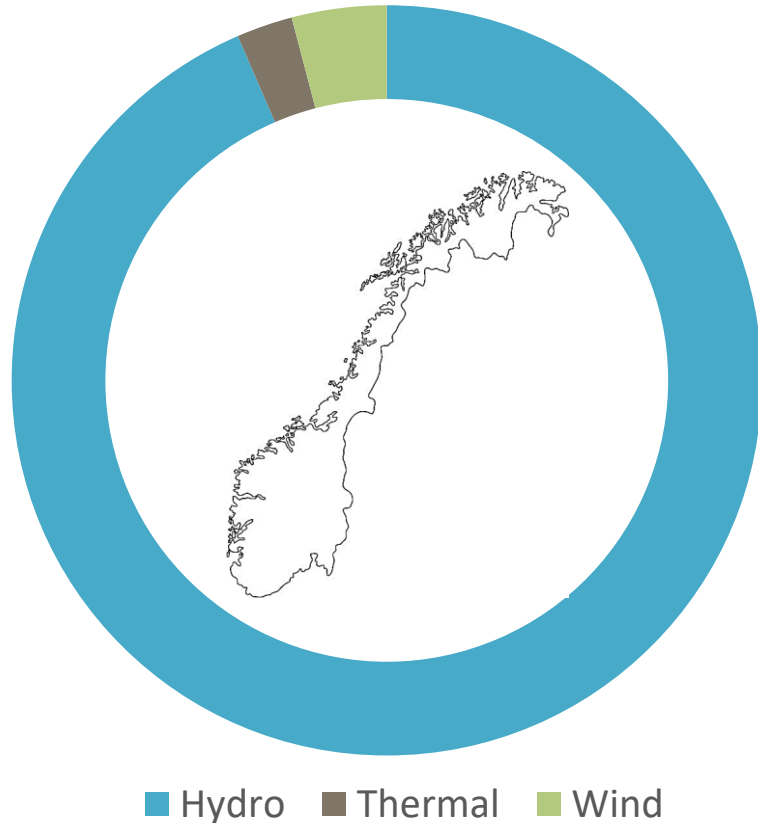
17. September 2020

Virtual Meeting

Martine Sørli Espeland, Ministry of Petroleum and Energy



Norwegian Electricity Production



- Total installed capacity: 36 400 MW
 - 90,1 % is hydropower
 - More than 75 % of the hydropower capacity is regulated reservoirs
 - Increasing share of wind power
- Electricity production in a normal year: 148,8 TWh

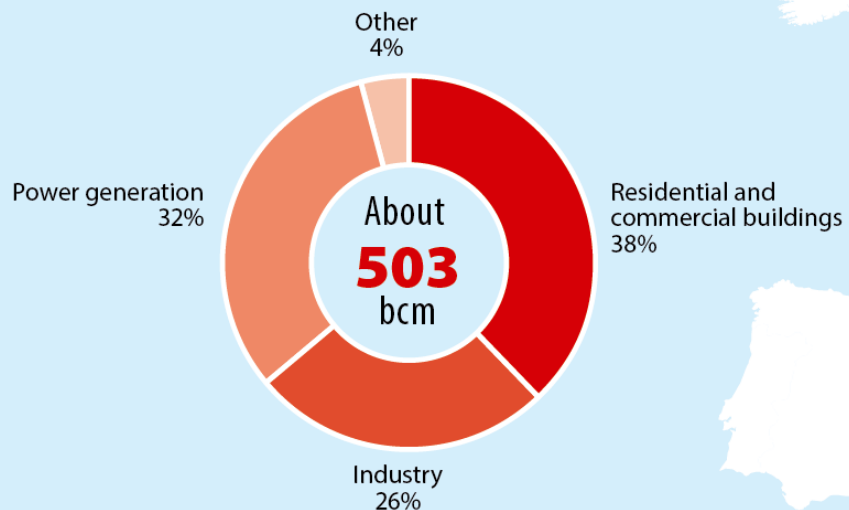
Norway-a unique base for renewable production



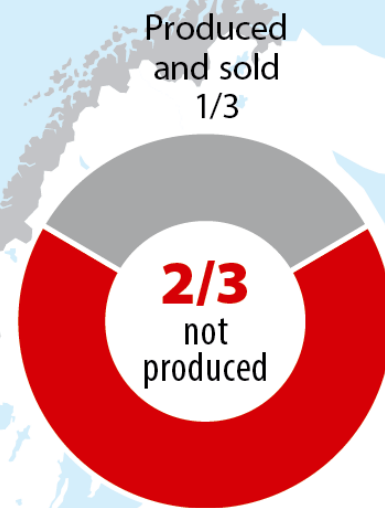
Norwegian gas export

Norway exported about 114 bcm in 2019, with a total value of over NOK 171 billion. This is equal to 19% of the total external trade in goods.

EU gas consumption by segment

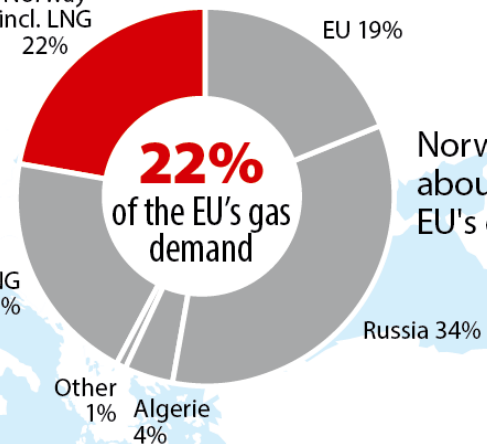


NORWAY



About 2/3 of the expected natural gas resources in Norway are yet to be produced

Norway incl. LNG 22%



Norway supplies about 22% of the EU's gas demand

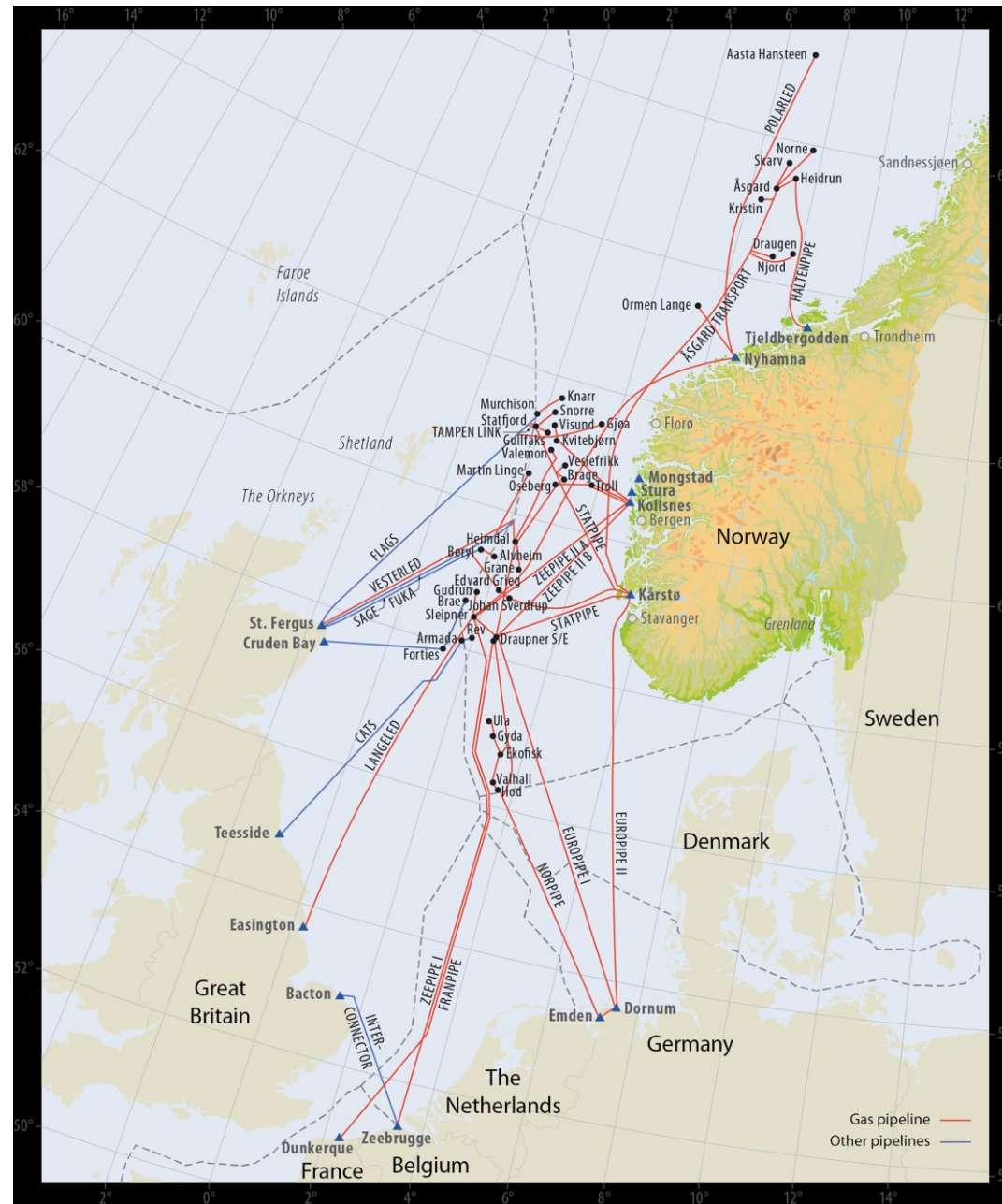
Sources: Statistics Norway/NPD/NVE/Gassco/IHS/IEA/BP

N P

Norwegianpetroleum.no



Gas pipelines from Norway





The Norwegian Government's hydrogen strategy



- A situational overview of the past, present and future status on hydrogen in Norway.
- The Norwegian Government has identified hydrogen as an area of interest where Norway have comparative advantages and potential for green value creation.

Minister of Petroleum and Energy
Tina Bru

Minister of Climate and Environment
Sveinung Rotevatn





Norwegian Ministry of Petroleum and Energy
Norwegian Ministry of Climate and Environment

Strategy

The Norwegian Government's hydrogen strategy

towards a low emission society

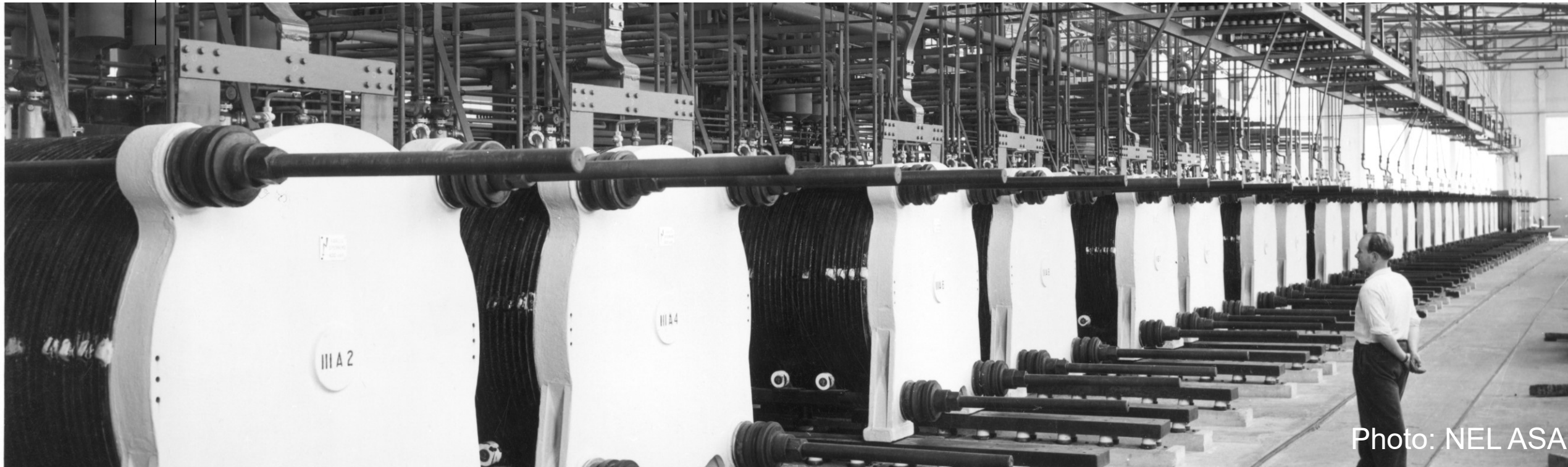
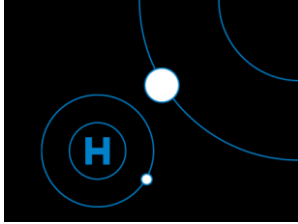
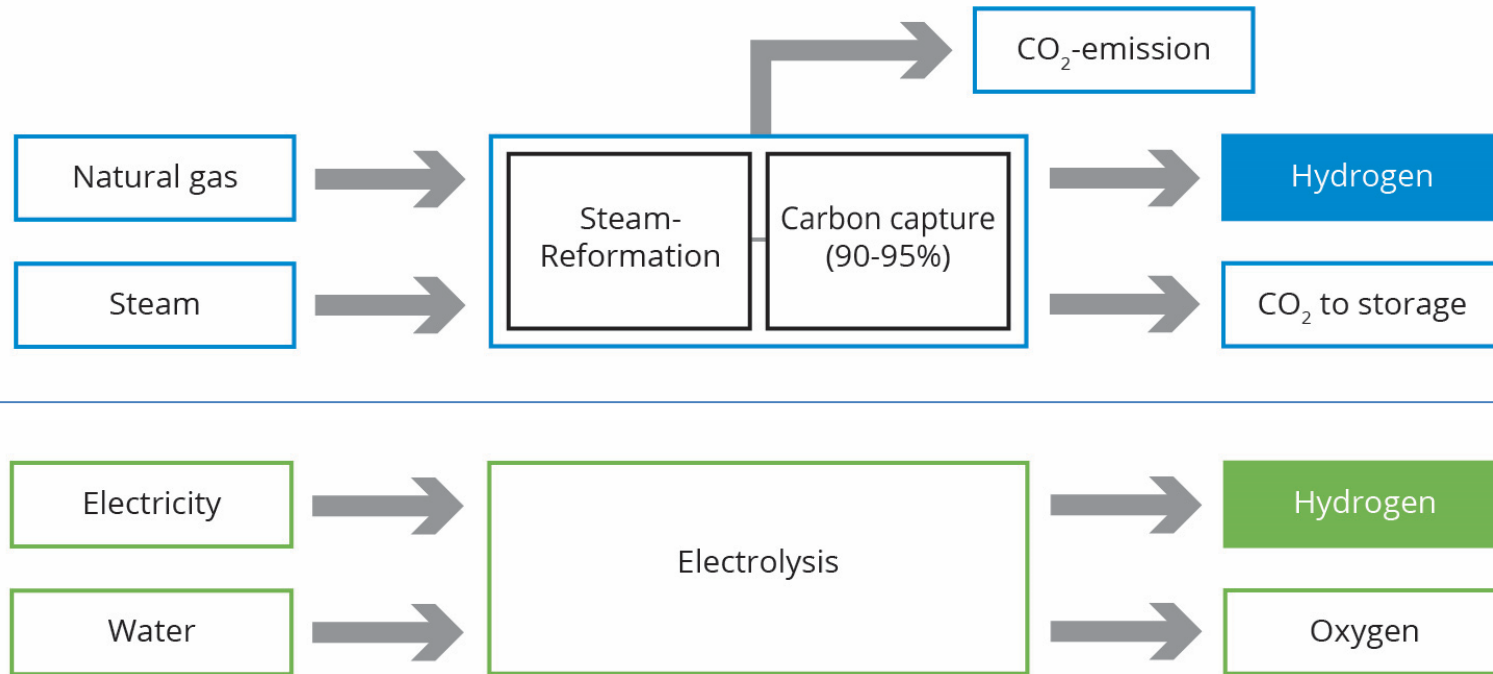


Photo: NEL ASA



Clean hydrogen

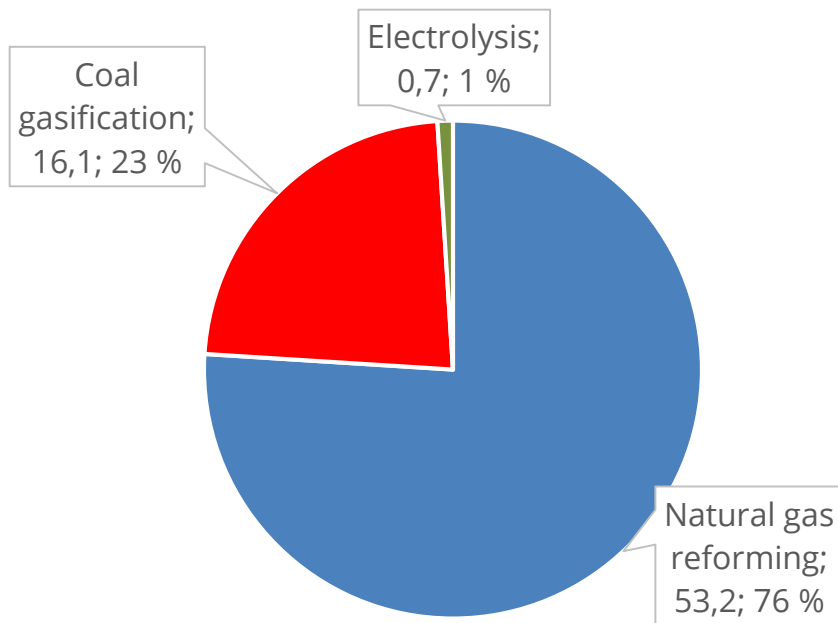
If hydrogen is to be a low or zero emission energy carrier, it must be produced with zero or low





Hydrogen with low emissions

Global hydrogen production today
70 mill. tonnes = 830 mill. tonnes CO₂



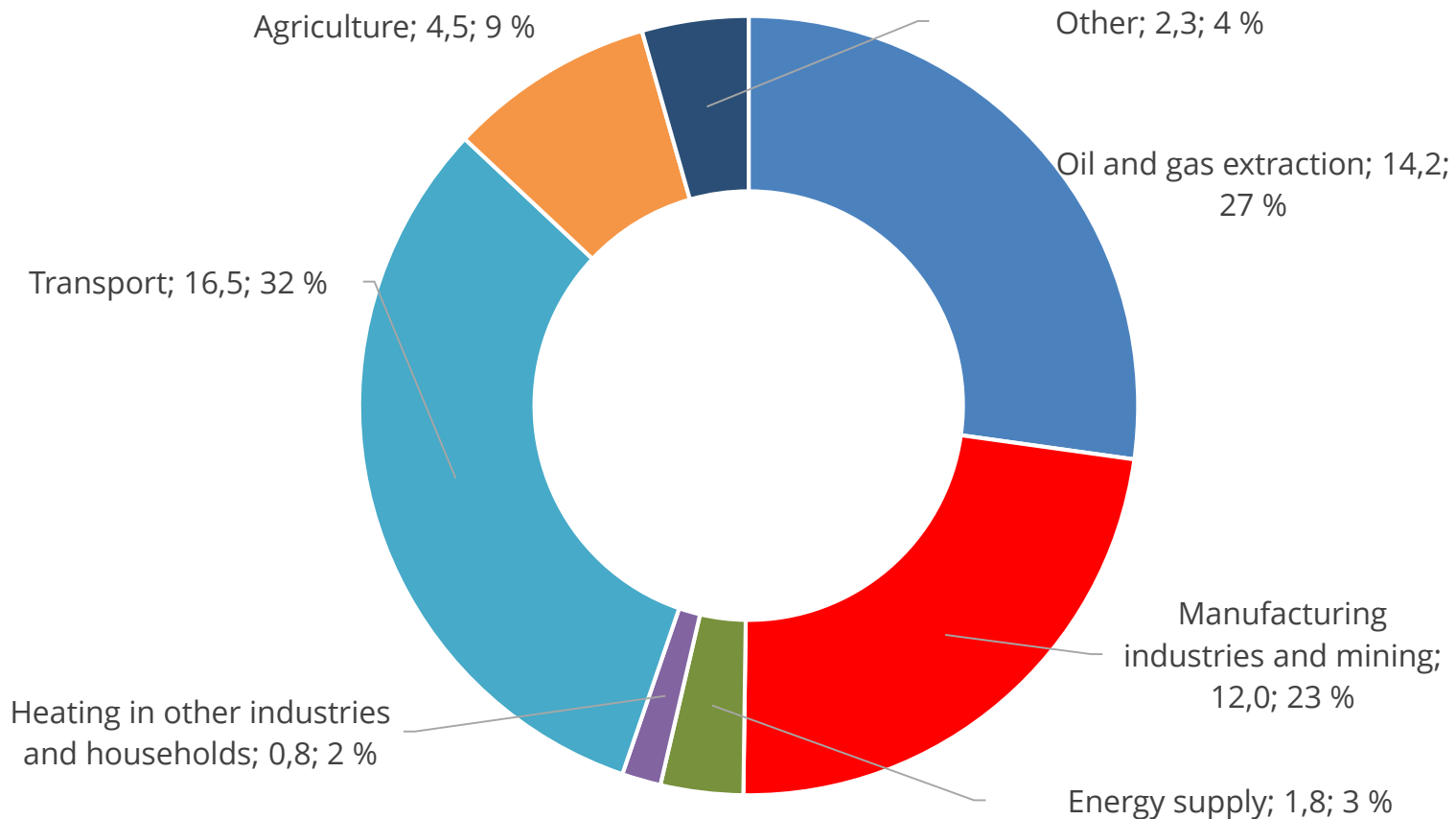
- The competitiveness of different production methods is dependent upon costs to inputs (gas- and electricity prices), transport, storage and conversion.
- The IEA estimates that hydrogen produced from fossil sources with no CO₂ capture will be competitively priced by 2030.
- A higher price for CO₂ emissions, applicable globally, is needed to make hydrogen produced from renewable energy or from fossil sources with CO₂ capture and storage profitable.





Greenhouse gas emissions

Norwegian greenhouse gas emissions, 52 million tonnes of CO₂ equivalents in 2018 (Statistics Norway)



- In alignment with the Norwegian Government's strengthened climate goal for 2030 and the climate goals for 2050, Norway must reduce its emissions further.
- Transport, manufacturing industries and oil and gas extracting industries has the highest emissions.
- Heating and energy supply has almost zero emissions as a consequence of the abundance of renewable hydropower.



Maritime hydrogen projects

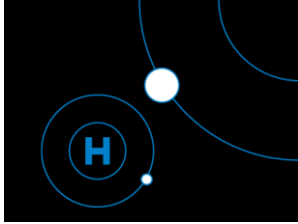


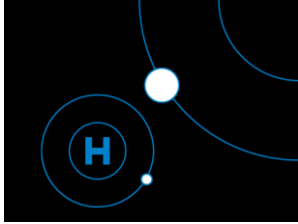
Photo: NORLED



The Viking Energy Vessel
(Photo: Eidesvik Offshore)



The Norwegian Government increases its efforts



	Funding (in million NOK) 2008-2013	Funding (in millioner NOK) 2014-2019
Research Council of Norway	251	269
Enova	0	360
Transnova	48	10
Pilot-E (Research Council of Norway and Innovation Norway)	0	170
Total	371	809
Additional commentary	<ul style="list-style-type: none"> • On the 29th May 2020, the Norwegian Government proposed a 3.6 billion NOK funding package for a "green transition", amongst of which was funding aimed at hydrogen-related research and technological development projects. • The Norwegian Government will continue to support and monitor the developments and adjust the poilcy instruments if needed. 	



Export?

- The Norwegian authorities will work to ensure that natural gas reforming combined with CCS can compete on equal terms with hydrogen from water electrolysis in the European energy market.
- It is up to the market actors to assess whether it will become commercially attractive to export blue (or green) hydrogen from Norway in the future.

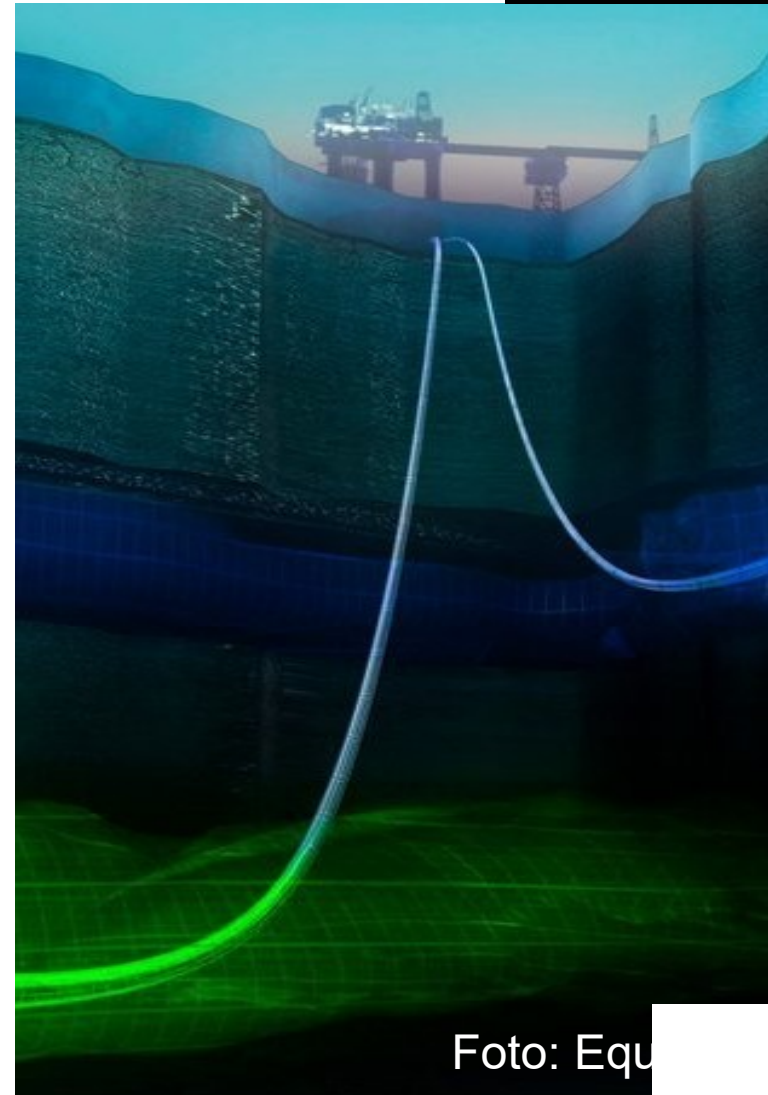


Foto: Equ





Prime Minister and
Minister of Petroleum and
Energy drawing potential
hydrogen hubs in Norway



Norwegian Ministry
of Petroleum and Energy Foto (DN): Hanna Kristin Hjardar