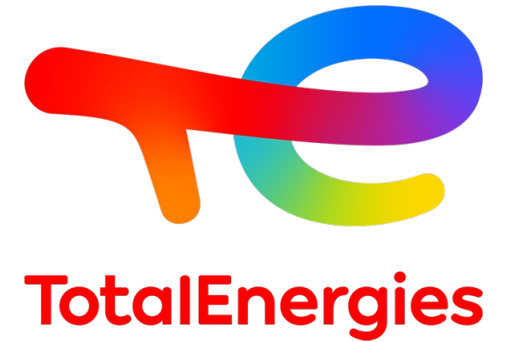
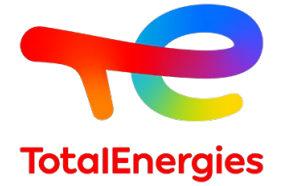
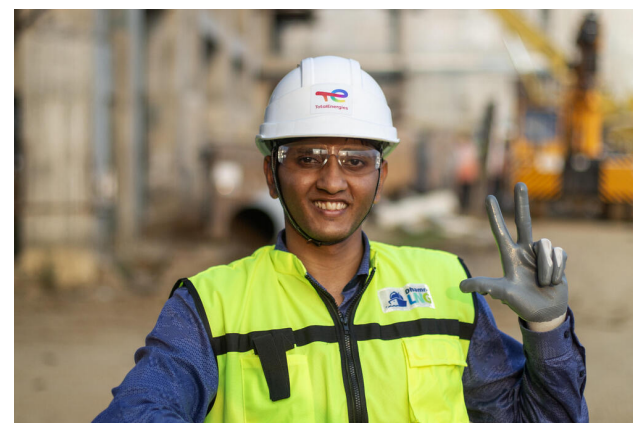


# Transforming Ourselves to Reinvent Energy



## Operatørkonferansen 2023

Øyvind Gundersen  
Renewable Explorer



**TotalEnergies** is a multi-energy company that produces and markets fuels, natural gas and electricity.

Our **100,000 employees** are committed to better energy that is **more affordable, more reliable, cleaner and accessible** to as many people as possible.

Active in more than **130 countries**, our ambition is to become **the responsible energy major** and reach **net zero emissions together with society within 2050**.

Energy is life.  
 We all need it  
 and it's a source of progress.  
 So today, to contribute to  
 the sustainable development of the planet  
 facing the climate challenge,  
 we are moving forward, together,  
 towards new energies.

Energy is reinventing itself,  
 and this energy journey is ours.

Our ambition is to be a world-class player  
 in the energy transition.

That is why

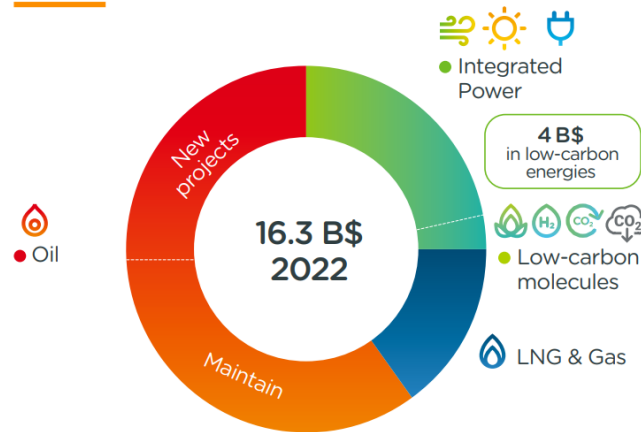
Total is transforming and  
 becoming TotalEnergies.



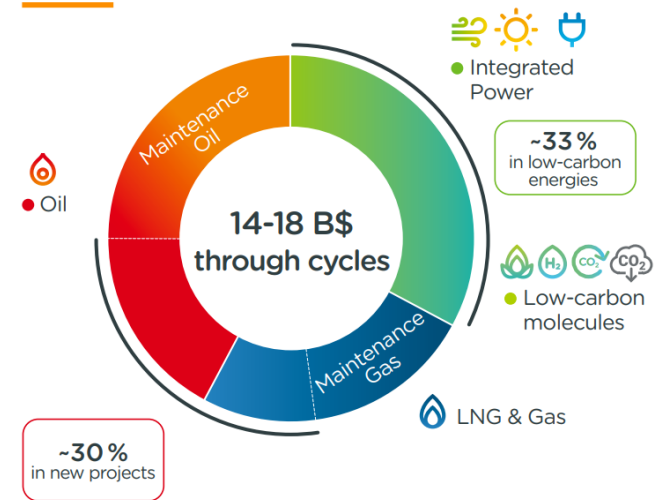
**TotalEnergies**

# Investing to Build a Sustainable Multi-Energy Company

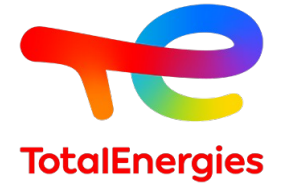
## 2022 CAPITAL EXPENDITURE



## OUTLOOK 2030



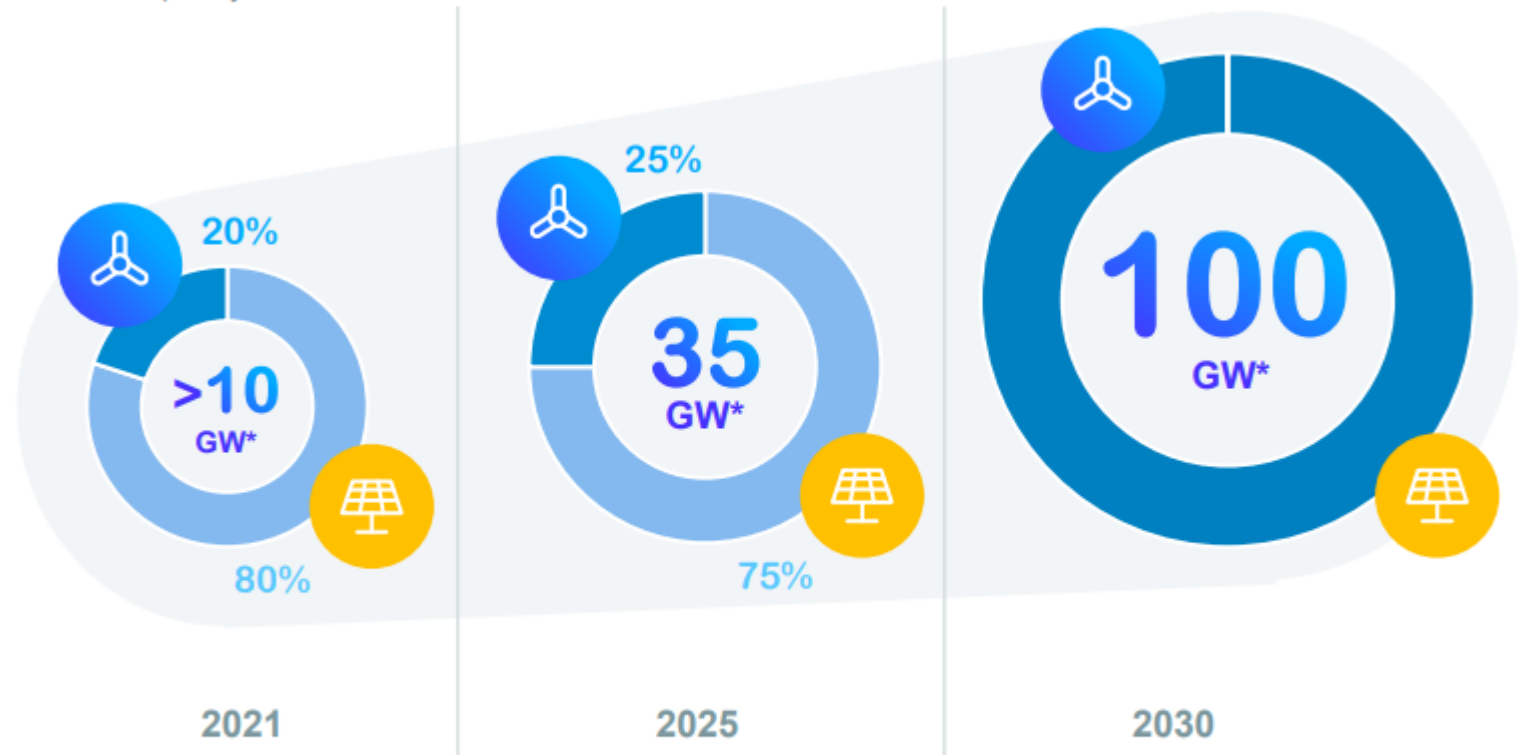
# Getting to net zero: more energy, less carbon



- 2050** Net Zero ambition
- >\$3** bn/yr net investment in electricity and renewables
- Becoming a **global multi-energy company**
- Active in **renewables** since 2011
- >50%** electricity in TotalEnergies' sales mix by 2050
- Fastest start on clean energy** among European energy majors
- Set to cover with **renewable electricity** all power needs of its industrial sites in Europe (by 2025) and in the USA
- 2,700** TotalEnergies stations already solarized worldwide
- Teams and expertise across the **entire electricity value chain:** production, storage, trading, supply

## Becoming one of the world's top 5 producers of renewable energy

Gross capacity



\*>42 GW secured pipeline (gross capacity) with >26 GW under Power Purchase Agreements

# TotalEnergies in Norway

*Add value together for TotalEnergies and Norway's shared energy future.*



**63** Licenses in the Norwegian continental Shelf



Positioning for **Offshore Wind** on the NCS



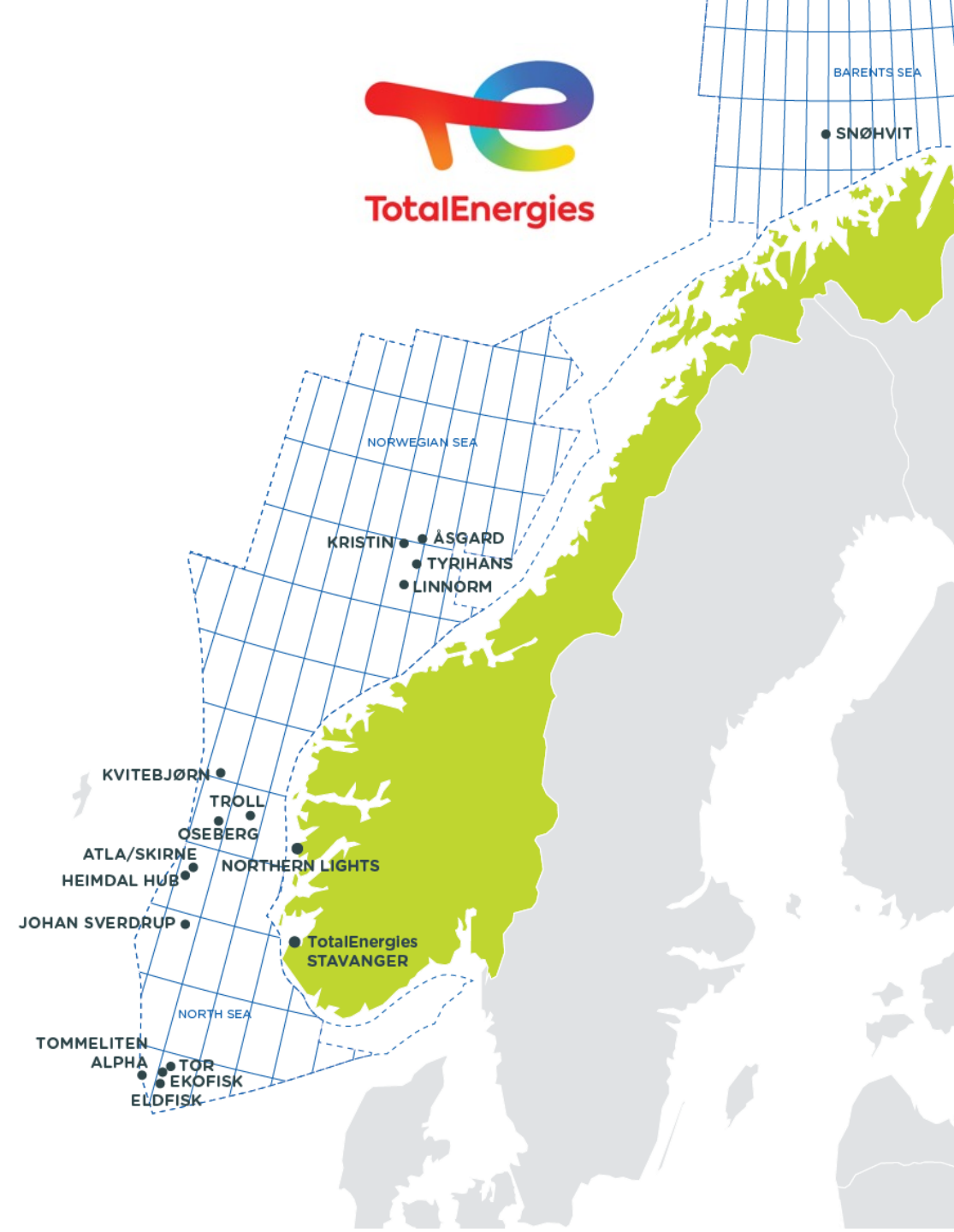
**Skjoldblad**



Delivering **Northern Lights** and looking to grow in Norway

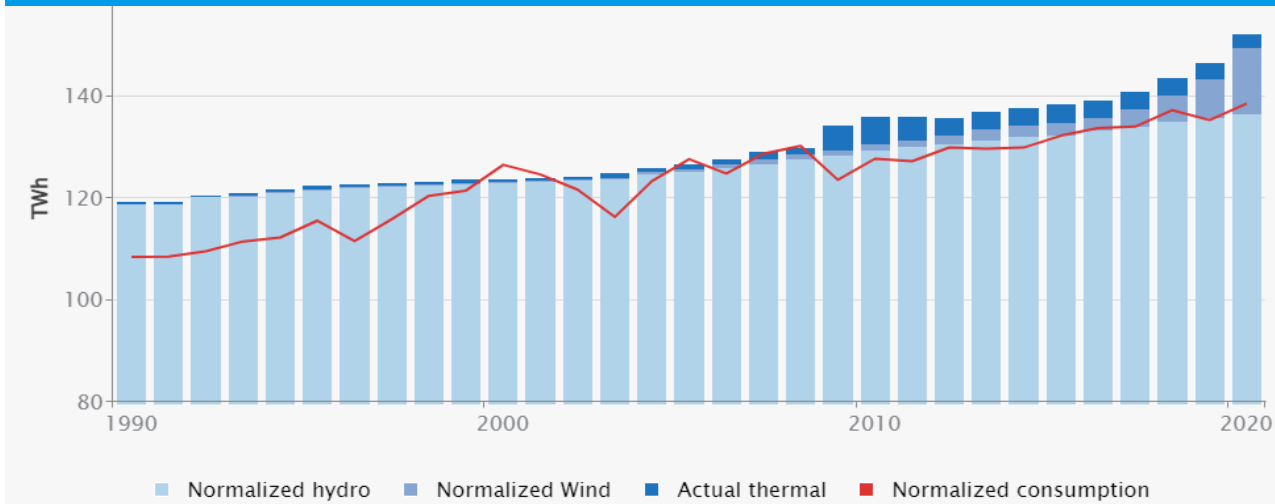


**Northern Lights**



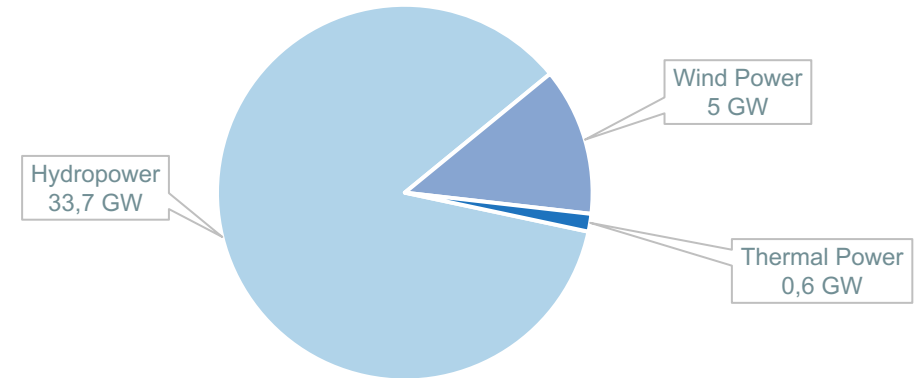
# Renewables in Norway

## Norway electricity production mix evolution



Source: *Energifaktnorge*

## Renewables installed capacity (2023)



Source: *NVE*



**98%** of electricity production in Norway comes from renewable sources.



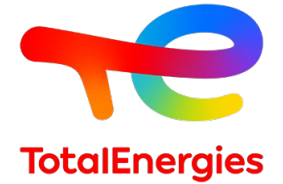
**1st** European country in terms of hydropower production with 34GW installed



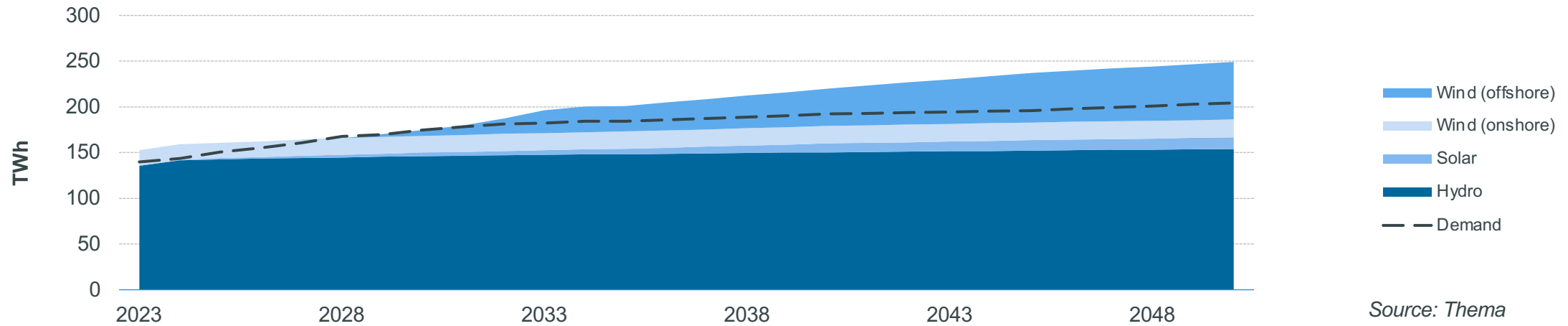
**Onshore wind** grown to become a significant factor in the production mix

First licensing round for **offshore wind**

# Norway renewables looking forward

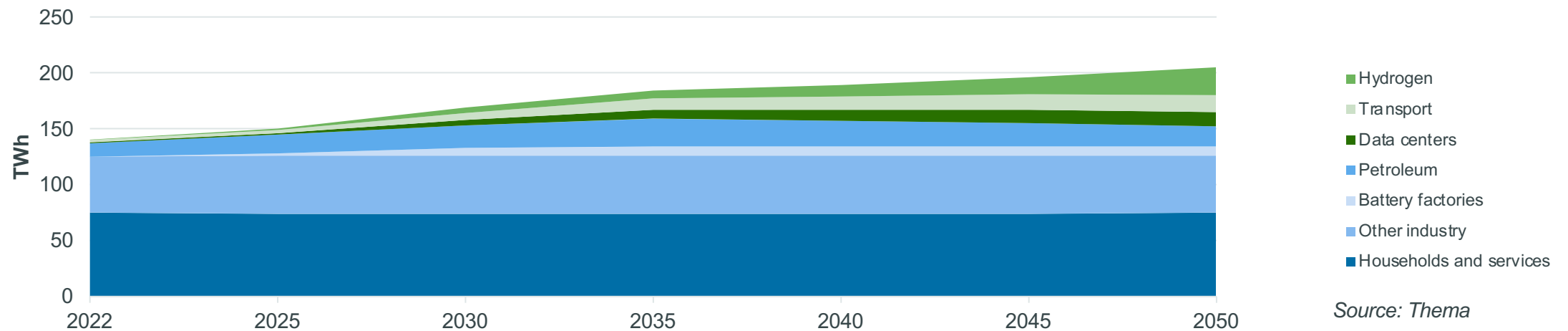


## Offshore Wind and Solar drives supply side growth



Source: Thema

## Electrification + green industry development drives demand



Source: Thema

# Why Offshore Wind in Norway

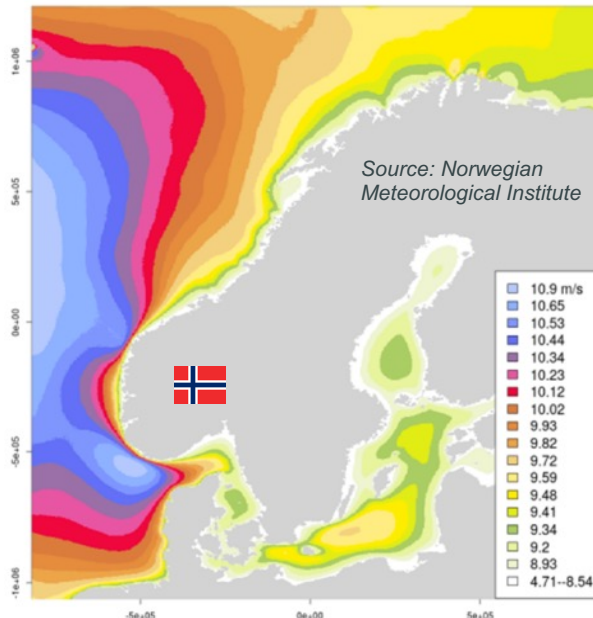


Norwegian Ministry  
of Petroleum and Energy

**NORD  
POOL**

## Norway's Ecosystem

- Good wind conditions and a long coastline
- World class supply chain for large, complex offshore projects
- Pioneers in floating wind



## Regulatory and markets

- Government targets 30 GW of offshore wind award by 2040
- Stable regulatory environment with low political risk
- Liquid, transparent day-ahead market for physical power

Utsira North  
License Rd 1  
3\*500 MW  
Floating

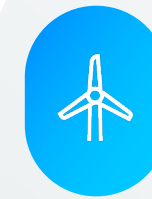
South North  
Sea II  
License Rd 1  
1500 MW  
Bottom-fixed



- Future Licensing rounds expected

## TotalEnergies OW in Norway

- Good fit with TotalEnergies' ambitions in Offshore Wind



Floating

**>15 GW**

from projects  
in development or  
under construction

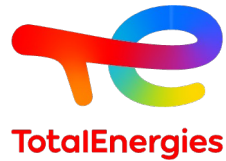
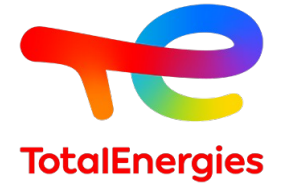


Fixed

- Relations with authorities and supply chain since 1965
- Skjoldblad Consortium in place for Licensing Round 1



# TotalEnergies has teamed up with renewables leader Iberdrola and local developer Norsk havvind



**>55 years in Norway**  
developing industry

**300 projects** within renewables  
in >26 countries

**100 GW** renewables ambition  
for 2030

**Net Zero** in 2050



**World leader** in  
renewable energy

**95 GW** renewables  
ambition for 2030

**€15 bn/yr** investment  
in renewables

**20 years** committed  
to clean energy



**Norwegian leader** in  
renewable markets

**>20 years** track record

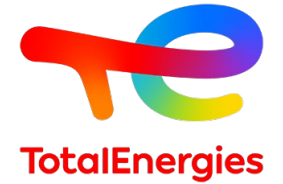
**5 GW** in pipeline

**Worldwide presence**  
through Valinor



**Skjoldblad**

# Offshore Wind facing challenges...



## Ørsted cancels two US offshore windfarm projects at £3.3bn cost

Danish company's CEO cites escalating costs in global offshore wind industry as shares fall

## Down but not out: Equinor takes hit on U.S. offshore wind, but hope remains

By Nora Buli and Nerijus Adomaitis

Energy | Wind

## Siemens Energy's wind turbine problems could cost 4.5 bln euros -report

Reuters

August 23, 2023 4:38 PM GMT+2 · Updated 3 months ago

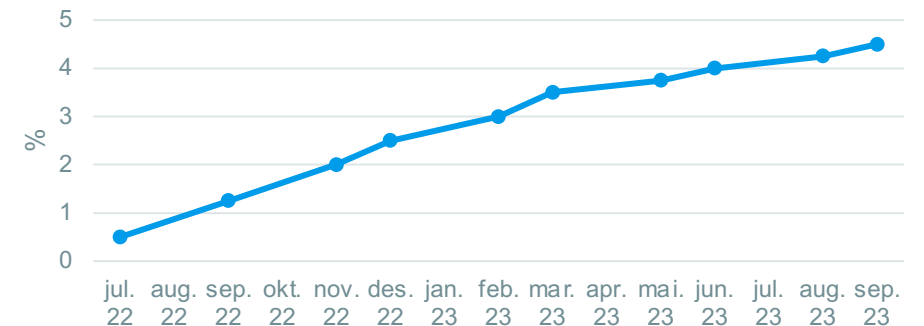
## Vattenfall halts project, warns UK offshore wind targets in doubt

Impact of inflation, interest rates and tax credits on US offshore wind LCOEs



BloombergNEF

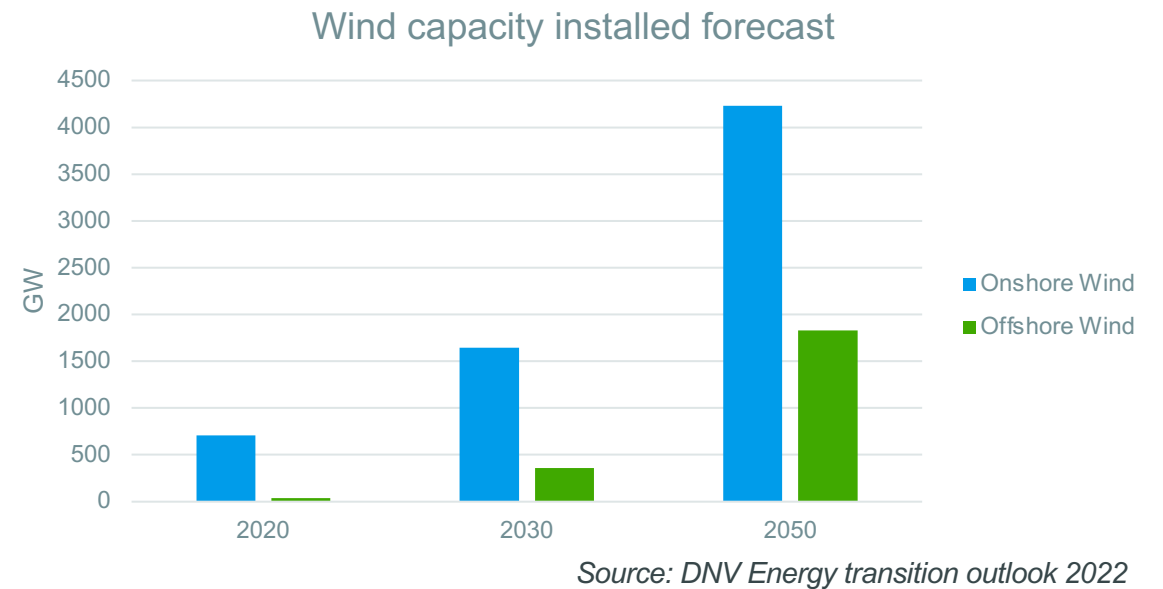
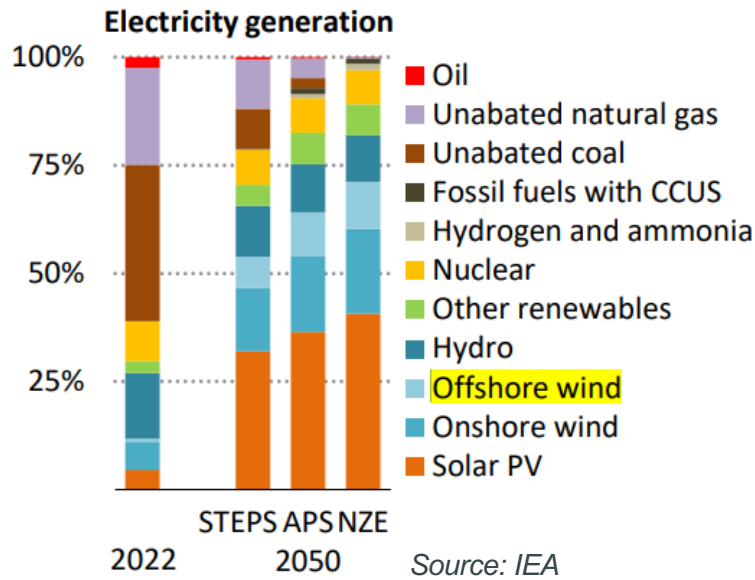
European Central Bank Interest rate last year



Source: ECB

# ...but still expected to play a key role to reach climate goals

The share of offshore wind capacity is expected to grow tremendously



**2020:**

- Small share of Offshore Wind in the mix
- Approx 35 GW capacity installed



**2050:**

- 3rd largest share in the mix depending scenarios
- Approx 1800GW will be installed

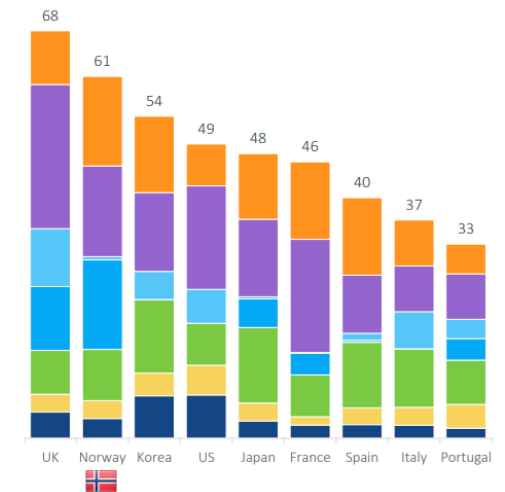
# Future areas for Offshore Wind

## 20 Proposed areas for offshore wind Norway



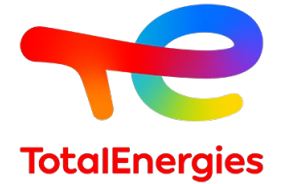
- April 2023: NVE released **20 new OW areas** for future rounds,
- Areas of **54,000 km<sup>2</sup>** have been identified.
- A **2025** license round communicated by the MPE
- Strategic impact assessments before opening areas for OW.
- Norway ranked as the **2<sup>nd</sup> most attractive floating offshore wind market**

CATEGORY	CRITERIA	MAX POINTS	COUNTRIES								
			UK	NORWAY	KOREA	US	JAPAN	FRANCE	SPAIN	ITALY	PORTUGAL
POTENTIAL	- Technical potential - Wind resource - 4C outlook	10	4.4	3.3	7.1	7.2	2.9	2.2	2.3	2.2	1.7
AMBITION	- Floating targets (explicit and implicit), - Market openness	5	3.0	3.0	3.8	5.0	3.0	1.4	2.8	3.0	4.0
CONTEXT	- Decarbonisation drivers - Substitution by alternatives - Cost context	15	7.3	8.6	12.3	7.0	12.7	7.0	11.0	9.8	7.4
DEPLOYED	- Volume of projects post-FID	15	10.7	5.0		4.8	3.6	0.3			3.6
PIPELINE	- Volume with site exclusivity / leasing underway - Volume of proposed projects	10	9.7	0.6	4.7	5.7	0.4	0.1	1.2	6.2	3.2
REGULATORY	- Process maturity in (i) leasing, (ii) consenting and (iii) offtake.	25	24.2	15.2	13.2	17.4	13.0	19.0	9.7	7.7	7.6
SUPPLY CHAIN	- Domestic capability	20	9.0	15.0	12.8	7.0	11.0	13.0	13.0	7.7	5.0
<b>Total Available Points</b>		<b>100</b>	<b>68</b>	<b>61</b>	<b>54</b>	<b>49</b>	<b>48</b>	<b>46</b>	<b>40</b>	<b>37</b>	<b>33</b>



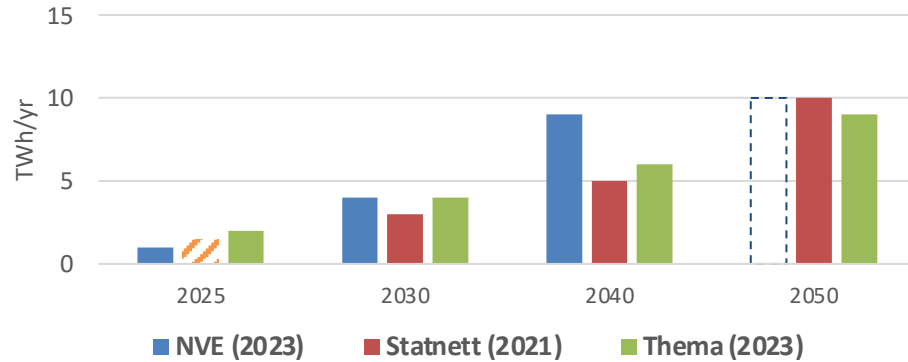
Source: TGS/4C Offshore

# Other renewables overview



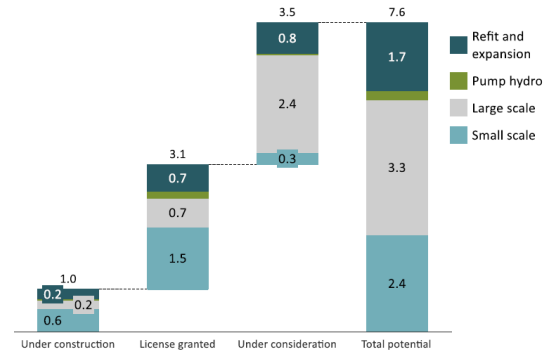
## Solar

Projected Norwegian power production from Solar

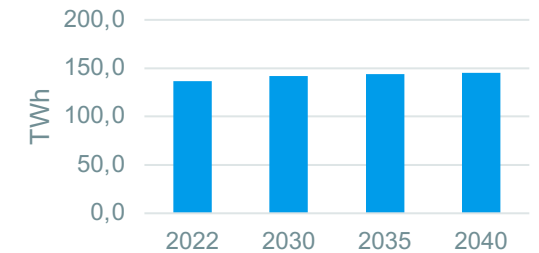


## Hydropower

Generation potential in TWh of all the hydropower power plants in NVE's database



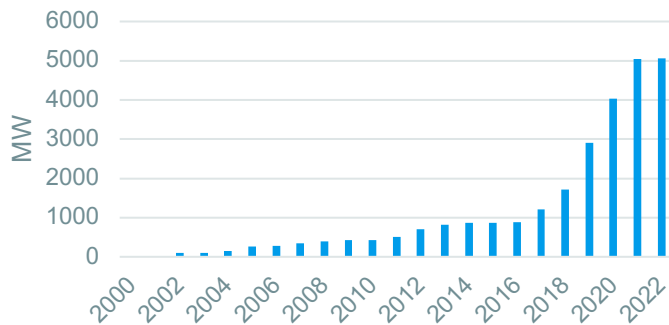
NVE Hydropower production forecast



Source: THEMA and NVE

## Onshore Wind

Onshore Wind capacity installed evolution



Source: SSB Norway

Rapid development of onshore Wind  
-> From 0 to 10% of annual generation

Onshore Wind projects stopped because of local resistance

2008-2019

2019

2022

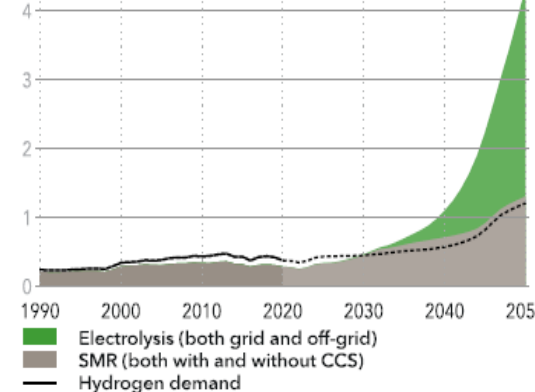
2050

Reopening of Onshore Wind

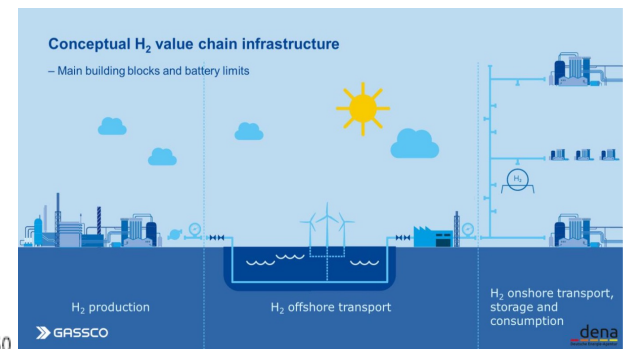
Growth expected going forward

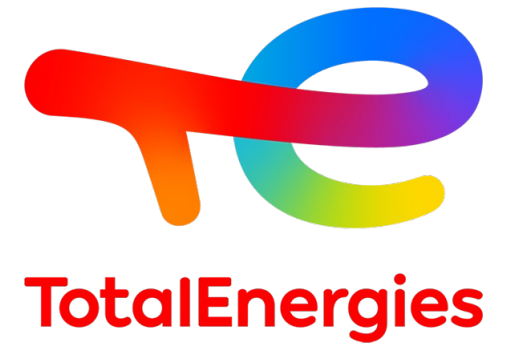
## Hydrogen

Norway's H2 production forecast (MT H2/y)



Source: DNV Energy transition Norway 2022





Thank you