

**Our vision: let's create a world  
that runs entirely on  
green energy**



# Ørsted develops energy systems that are green, independent and economically viable

■ Installed ■ Under construction

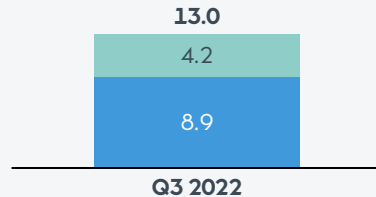


## Offshore wind



- Global leader in offshore wind
- Develop, construct, operate and own offshore wind farms
- Ambition to reach ~30 GW installed capacity by 2030

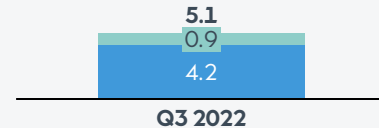
### Capacity, GW



## Onshore renewables



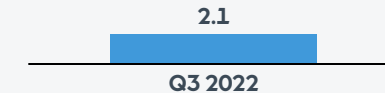
- Strong presence in the United States and Europe
- Develop, operate and own onshore wind, solar PV and storage projects
- Ambition to reach ~17.5 GW installed capacity by 2030



## Bioenergy & other



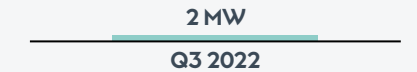
- Presence in Europe, including bioenergy plants, legacy gas activities and patented waste-to-energy technology
- Own and operate bioenergy and waste-to-energy plants, and optimise gas portfolio<sup>1</sup>



## Renewable hydrogen and green fuels








- Emerging platform with 10 pipeline projects (+3 GW) mainly in Europe
- Develop, construct, own and operate hydrogen facilities
- Ambition to become a global leader in renewable hydrogen and green fuels by 2030




1. We neither enter into new long-term gas sourcing contracts nor prolong expiring contracts, our focus is on maximising the value of our legacy natural gas portfolio

# Our global footprint

## United States of America

-  In operation: 30MW  
Under construction: 130MW  
Under development: 4,842MW
-  In operation: 3,013MW  
Under construction: 200MW  
Under development: 252MW
-  In operation: 647MW  
Under construction: 680MW  
Under development: 1,156MW
-  In operation: 40MW  
Under development: 300MW
-  Under development: 675MW







## Denmark

-  In operation: 940MW
-  In operation: our CHP plants, 2,865MW power and 3,560MW heat
-  Sales of energy
-  Under construction: 2MW  
Under development: 1300MW

## Ireland




-  In operation: 327MW  
Under construction: 45MW  
Under development: 466/298MW

## United Kingdom

-  In operation: 6,233MW  
Under development: 4,000-5,000MW
-  In operation: 62MW  
Under development: 195MW
-  In operation: Renaissance Northwich
-  In operation: 20MW
-  Sales of energy
-  Under development: 101MW

## Spain






## Sweden

-  Sales of energy
-  Under development: 3,000MW
-  Under development: 70MW

## Poland

-  Under development: 2,500MW

## Germany

-  In operation: 1,346MW  
Under construction: 1,166MW
-  In operation: 22MW
-  Under construction: 10MW
-  Sales of energy
-  Under development: 2700MW

## France

-  In operation: 34MW
-  In operation: 4MW

## Japan



## South Korea

-  Under development: 1,600MW










## Taiwan

-  In operation: 128MW  
Under construction: 900MW  
Under development: 6,590MW

## The Netherlands

-  In operation: 752MW
-  Under development: 1100MW

### Activities

-  Offshore wind
-  Onshore wind
-  Solar
-  Biomass-fired power plant
-  Fossil-fueled power plant
-  Renewable fuels
-  Bio plant
-  Storage
-  Sales of energy

### Status

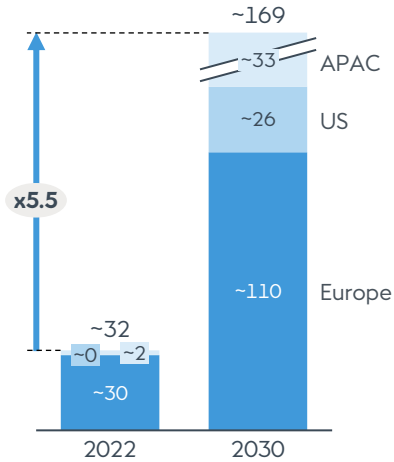
-  In operation
-  Under construction
-  Under development

# We target 50 GW by 2030, building out our position as the global Green Energy Major

All of our key technologies are expected to grow massively towards 2030...

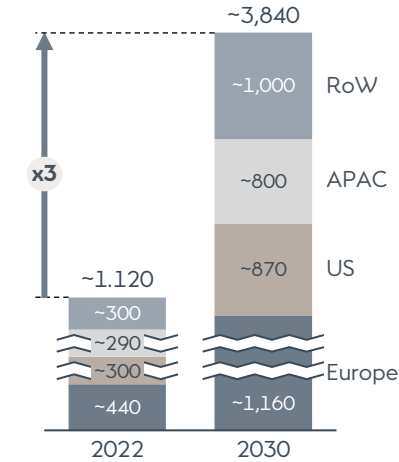
## Offshore wind

Installed capacity excl. China (GW)



## Onshore renewables

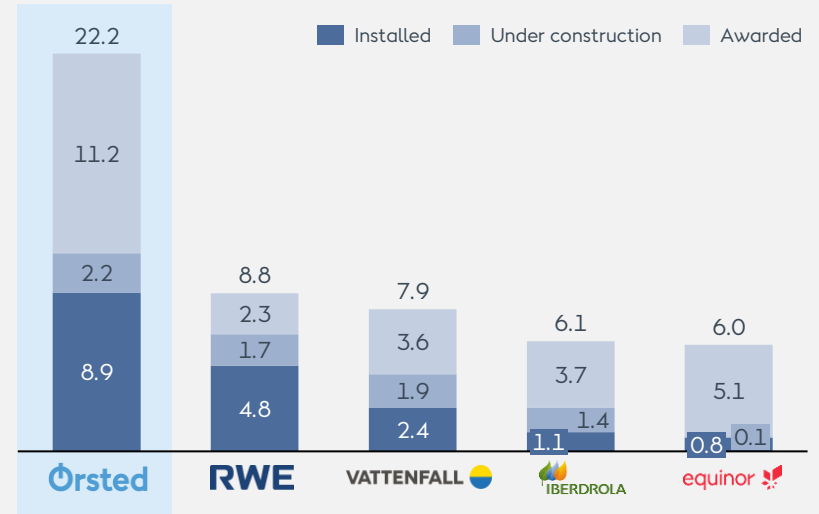
Installed capacity excl. China (GW)



...While we are retaining our position as market leader within offshore wind

## Global offshore wind portfolio<sup>1</sup>

Constructor capacity, GW, excl. China



- Notes: 1. Installed, under construction or awarded;
- Sources: BNEF New Energy Outlook 2022 for Onshore, Solar PV and Batteries; BNEF Offshore Wind Market Outlook H2 2022 for Offshore; Ørsted Market Outlooks, 2022; ESG Accounting 2023

# Biodiversity

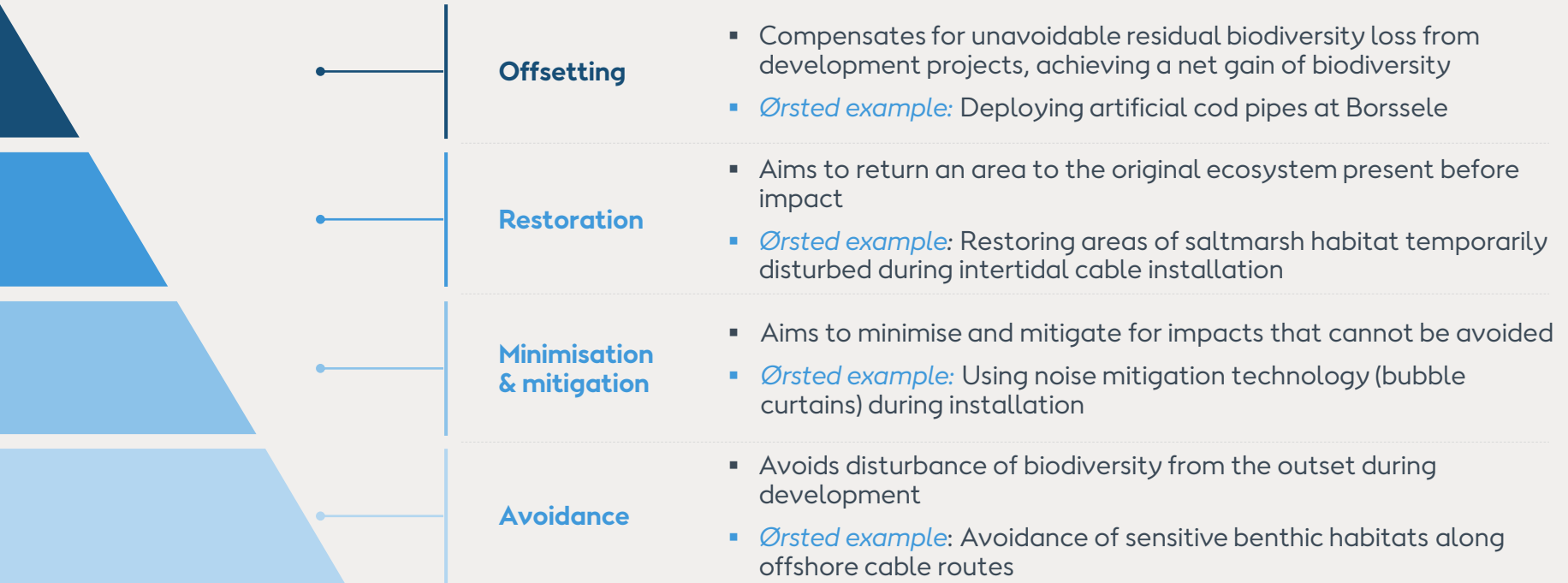


# Our biodiversity ambition

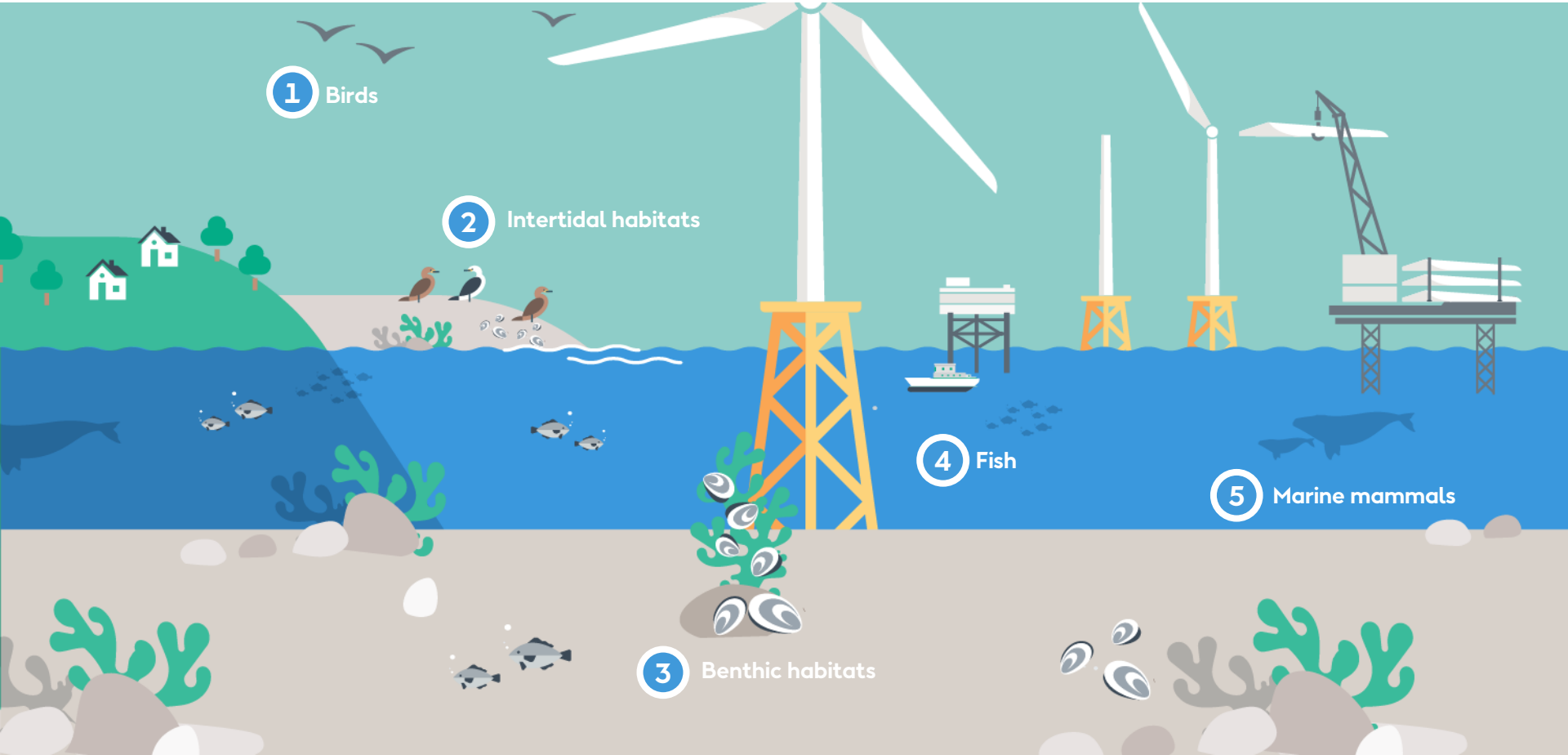
As part of Ørsted's new 2030 strategy, the company has set **the ambition that all new renewable energy projects we commission from 2030 onwards should deliver a net-positive biodiversity impact**, strengthening the green energy build-out in balance with nature



# The biodiversity mitigation hierarchy



# Our impacts on offshore biodiversity can largely be grouped into five key biodiversity features



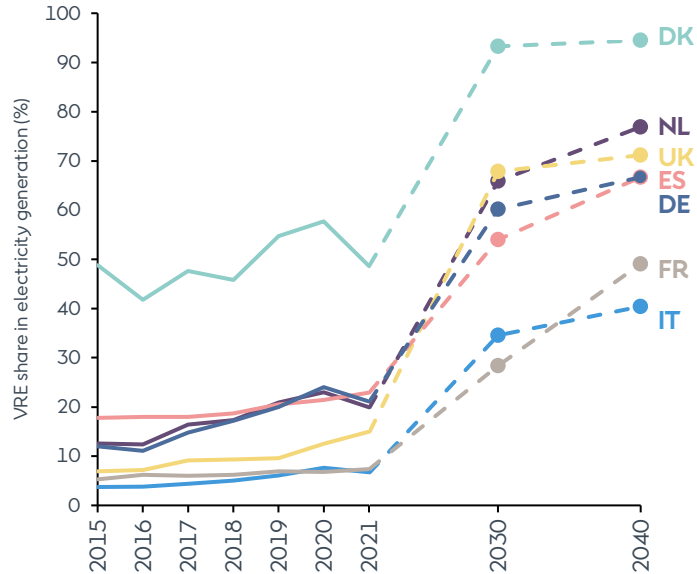


# System integration

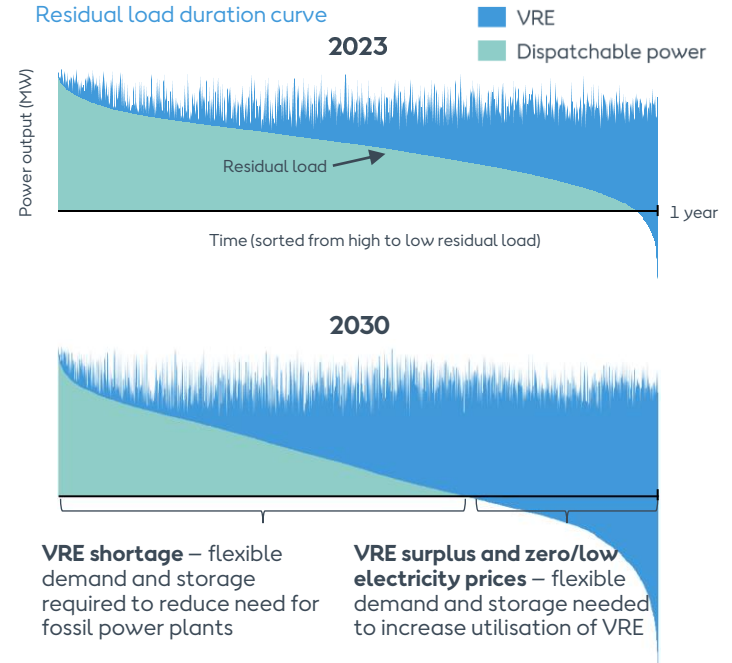


# Rapidly increasing VRE<sup>1</sup> penetration will drive radical changes in the power system already by 2030, increasing the need for flexibility and storage

VRE share in electricity generation expected to rapidly increase in this decade...



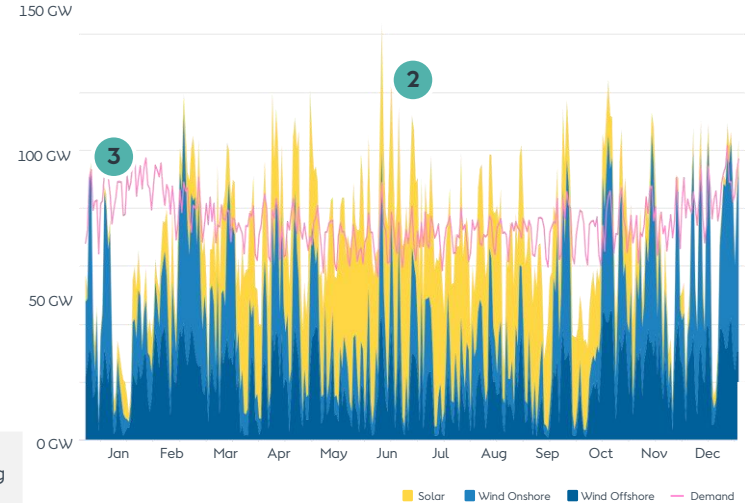
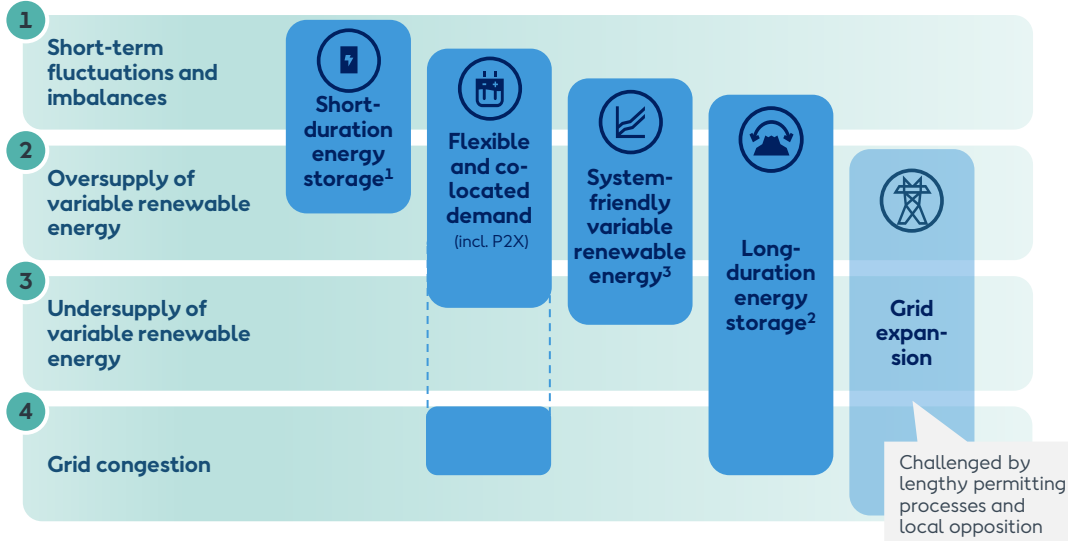
...leading to an increase in VRE integration challenges



# No silver bullet for system integration: a combination of technologies is needed to tackle the VRE integration challenges

## Challenges

## Solutions



➔ Governments and TSOs will be **challenged to fulfil VRE build-out targets** while maintaining a balanced power system

1. Short-duration energy storage (<4h), 2. Long-duration energy storage (>4h), 3. Geographical diversification of deployment, choice of system-friendly technologies (e.g. low wind speed turbines, west-facing PV), hybrid plants e.g. wind+solar

# P2X at landing point: reduced need for grid expansion and value creation through sector coupling

## SeaH2Land

GW scale green hydrogen hub powered by offshore wind in Zeeland, for the largest hydrogen industry cluster in the Benelux



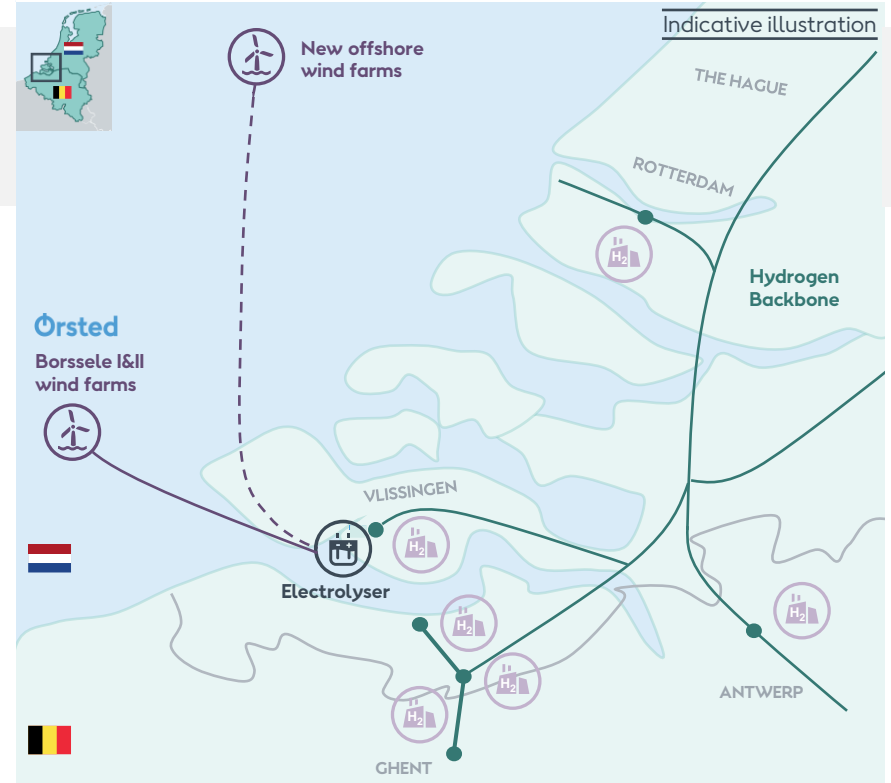
**Co-located demand at landing point** supports integration of offshore wind, reducing strain on the grid and need for grid expansion



**Sector coupling** allows to take advantage of low-cost renewable electricity and turn it into hydrogen to decarbonize industry








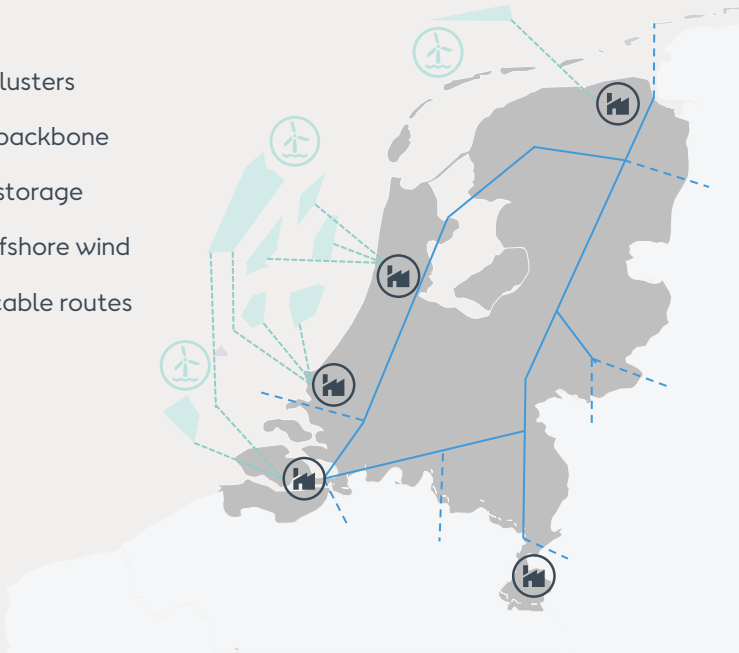
**Connection to hydrogen backbone** allows to transport large amounts of energy to other locations, complementing the power grid



# Nederland is een strategische markt voor Ørsted

## Offshore wind en waterstof potentieel

-  Industrial clusters
-  Hydrogen backbone
-  Hydrogen storage
-  ~21 GW offshore wind
-  Proposed cable routes



- **Offshore wind:** Nederland streeft naar ~21 GW in 2030/2031, 50 GW in 2040 en 70 GW in 2050 – de exportkabels van offshore windparken landen aan in de industriële clusters
- **Waterstof:** er is een bestaande vraag naar waterstof – de clusters worden door Gasunie/HNS met elkaar verbonden via de waterstof backbone
- **Doelstellingen:** Nederlandse doelstelling voor 8 GW elektrolysecapaciteit in 2032 en nieuwe Europese doelstelling voor inzet duurzame waterstof in industrie en transport
- **Realiseren potentieel:** om de waterstofambities te realiseren is het cruciaal dat de instrumenten, regels en subsidiemogelijkheden hiermee in worden lijn gebracht

# Ørsted ontwikkelt project 'SeaH2Land' en kan daarmee voor systeemintegratie en meer dan 1 GW elektrolyse richting 2030 zorgen

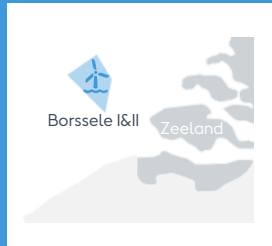


## Wind energie

### Track Record

752 MW

'Borssele'

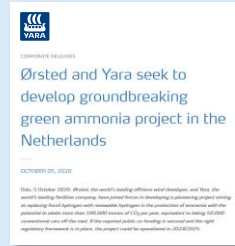


## Hernieuwbare waterstof

### Commercialisatie

100 MW

'Haddock'



Waterstofproductie opschalen voor industriële applicaties

### Regionale markt

400 MW

'SeaH2Land phase 1'

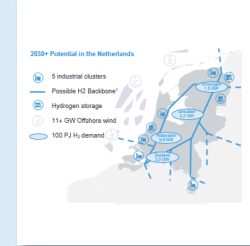


Grootschalige gecentraliseerde elektrolyse voor de regionale markt

### Nationale markt

1000 MW

'SeaH2Land phase 2'



GW schaal elektrolyse voor de (inter)nationale waterstofmarkt

2020

2030

# Wat is er nodig voor de realisatie van waterstofprojecten?



## Beleidszekerheid

RED II Delegated Acts formeel aangenomen en geïmplementeerd in Nederlandse regelgeving

RED III en ReFuelEU Aviation doelstellingen voor luchtvaart zorgt voor vraag naar waterstof

Stikstofruimte voor klimaatpositieve projecten zoals elektrolyzers



## Het prijsverschil met fossiel

Komende jaren zijn productiesubsidies voor waterstof nodig om de onrendabele top te dekken

Uitwerking instrumentarium voor gebruik van groene waterstof in transport en industrie (HBW/HWI)

Kostenreflectieve nettarieven elektriciteitstransport voor waterstofproductie



## Randvoorwaarden

Beschikbaarheid van voldoende hernieuwbare elektronen middels voortvarende uitrol wind op zee en aanlanding in industriële clusters

Richt wind op zee tenders op systeemintegratie om waterstofproductie op te schalen

Toegang tot de waterstof backbone uiterlijk in 2027

**Siemens Gamesa buffeted by rising costs as turbine launch problems deepen**

## *Europe's Wind Industry Is Stumbling When It's Needed Most*

Makers of wind turbines are reporting mounting losses, and fret about losing out to rivals from China, as countries chase ambitious clean energy targets.

**Soaring costs threaten offshore wind farm projects**

## **Europe Failing on Renewables as Cost Fears Bite, Vestas CEO Says**

- Clean energy developers in EU should be 'building like crazy'
- Vestas has raised turbine prices but is losing money: Andersen

## Siemens Energy warns on wind costs ahead of Gamesa acquisition

Group's chief says market is 'in dire straits' because of surging raw material prices



# Targets today. Turbines tomorrow. A 7 point action plan

- 1. **Acknowledge the challenges and mobilise political commitment to overcome them**, to instil market confidence and attract capital.
- 2. **Build a bridge from development to operation for existing projects**, to enable the all-important 'next wave' of projects to drive industry investment.
- 3. **Bring volumes to market and create foresight for demand**, to unlock supply chain growth and
- 4. **Design tenders for sustainable industry growth**, to de-risk the buildout for both developers and energy consumers.
- 5. **Introduce strong non-price criteria to ensure delivery and value creation**, while addressing long term structural barriers to offshore wind buildout.
- 6. **Ensure predictable, transparent, and fast permitting**, without compromising on environmental or social sustainability.
- 7. **Enable and empower a global and sustainable industry**, by carefully balancing domestic industrial policies with the needs for a level playing field and potential synergies of global supply chains.