Challenges for Wind power integration in Europe: power vs gas grids

Giles Dickson, CEO, WindEurope

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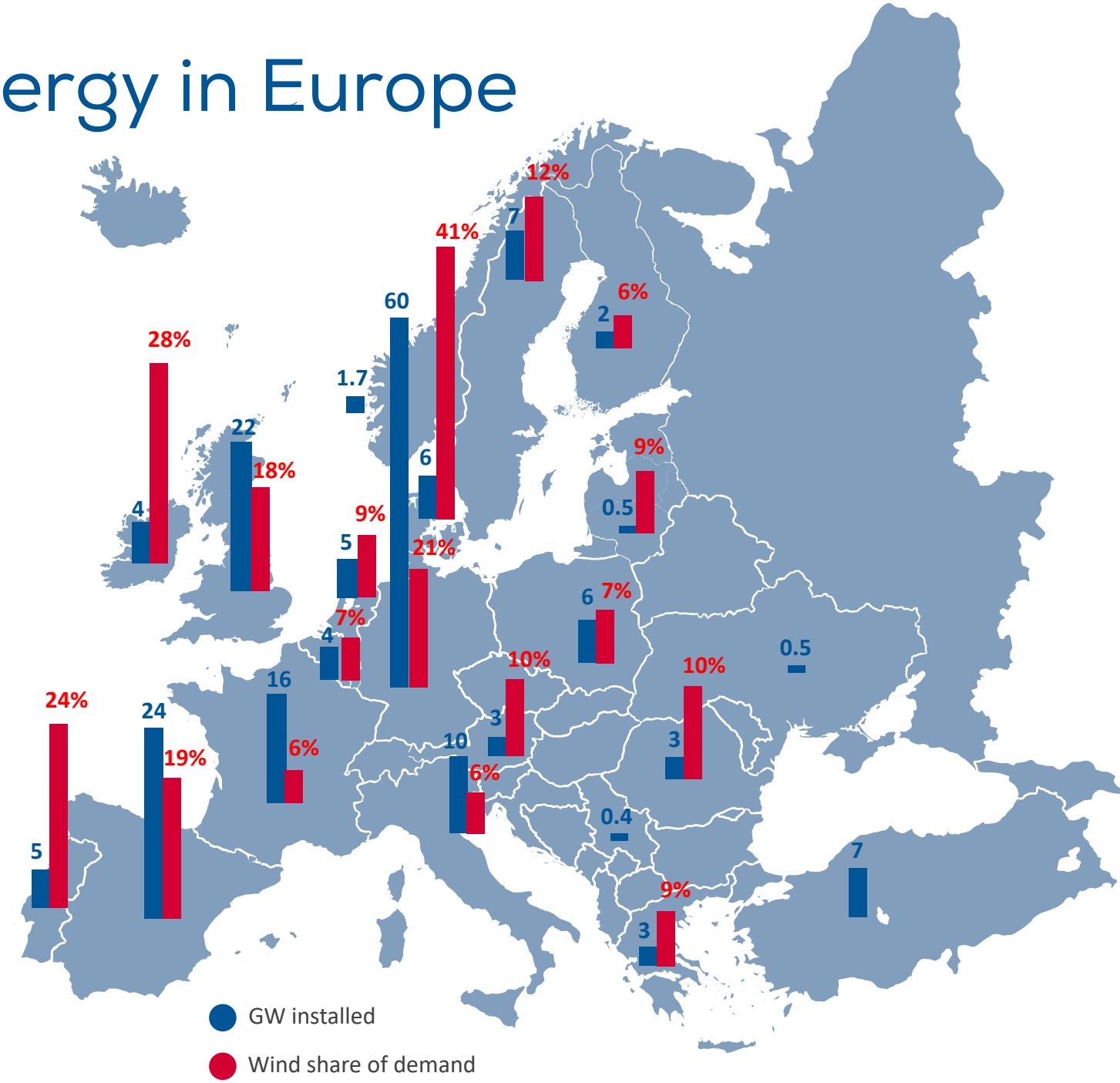
windeurope.org | October 2019

Wind energy in Europe

194 GW

14%
of 2018 EU power demand



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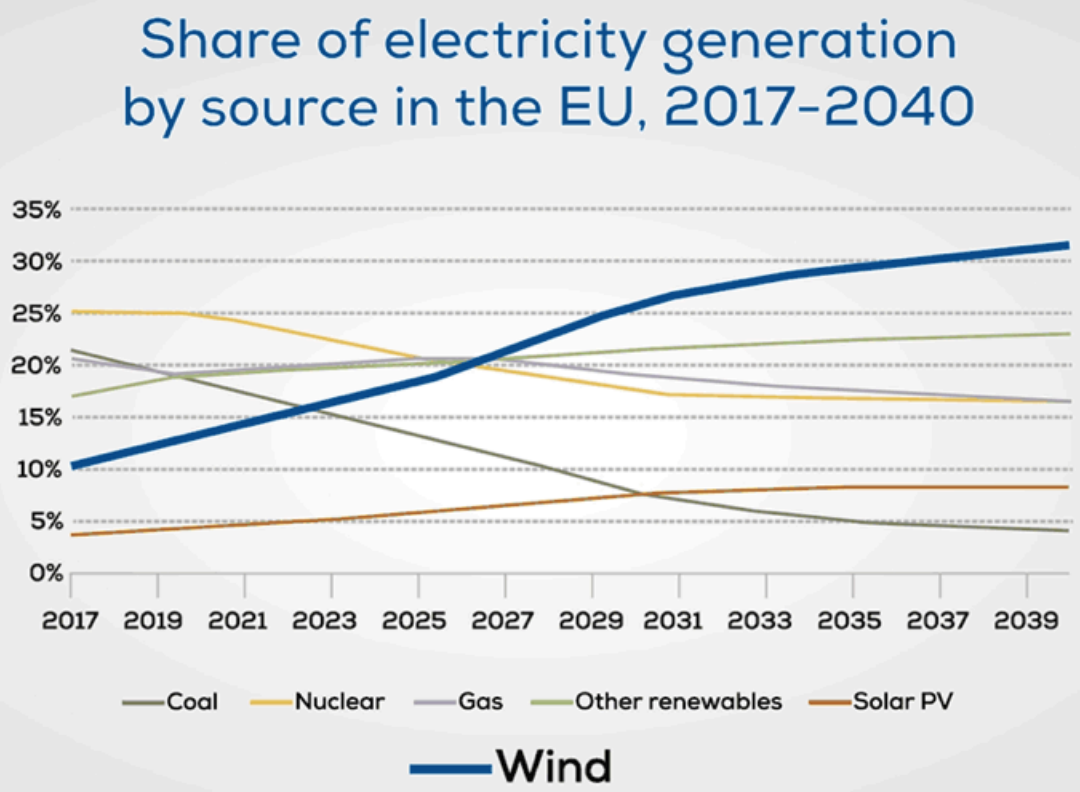
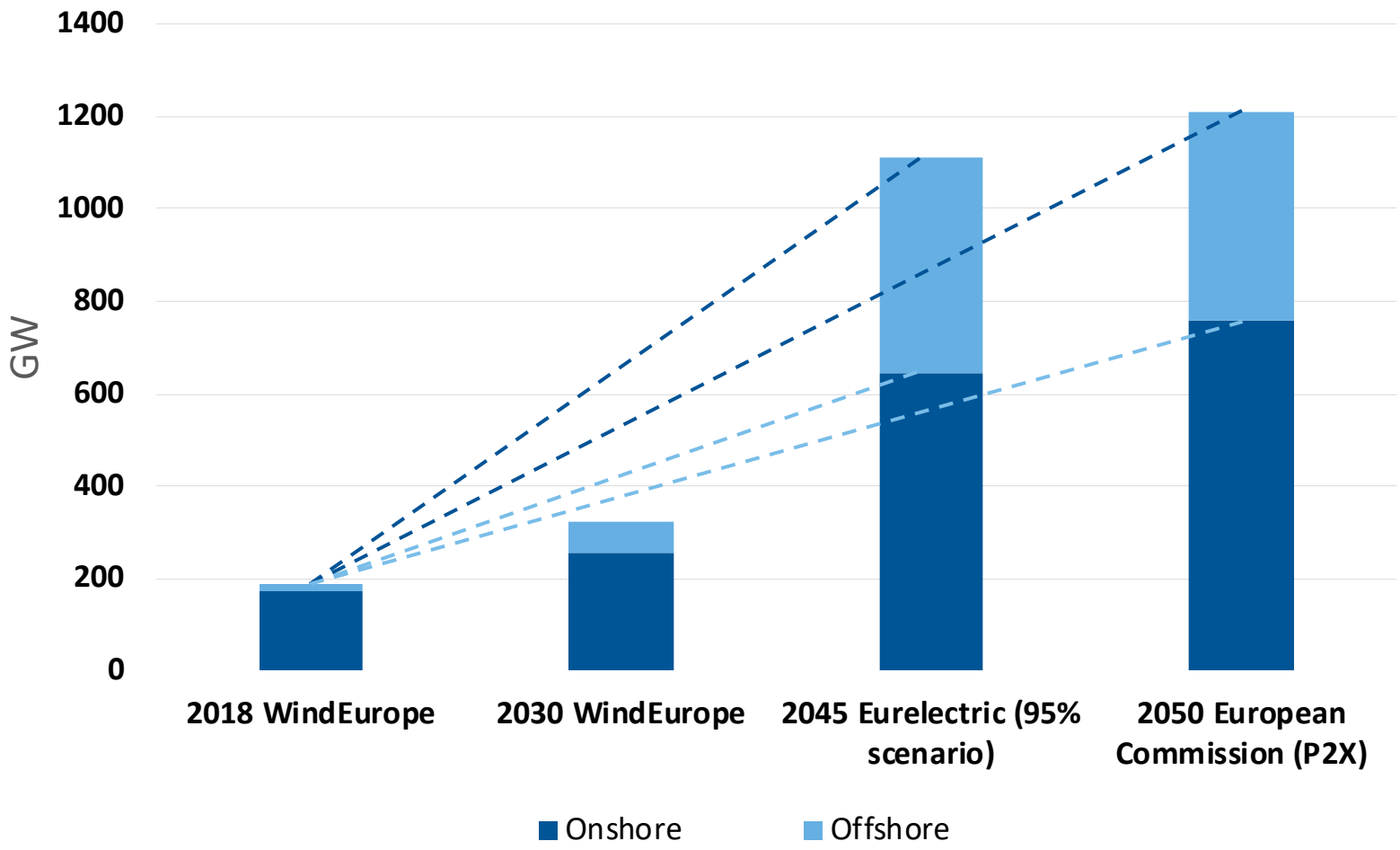
Wind the no. 1 power source in the EU by 2027



according to IEA

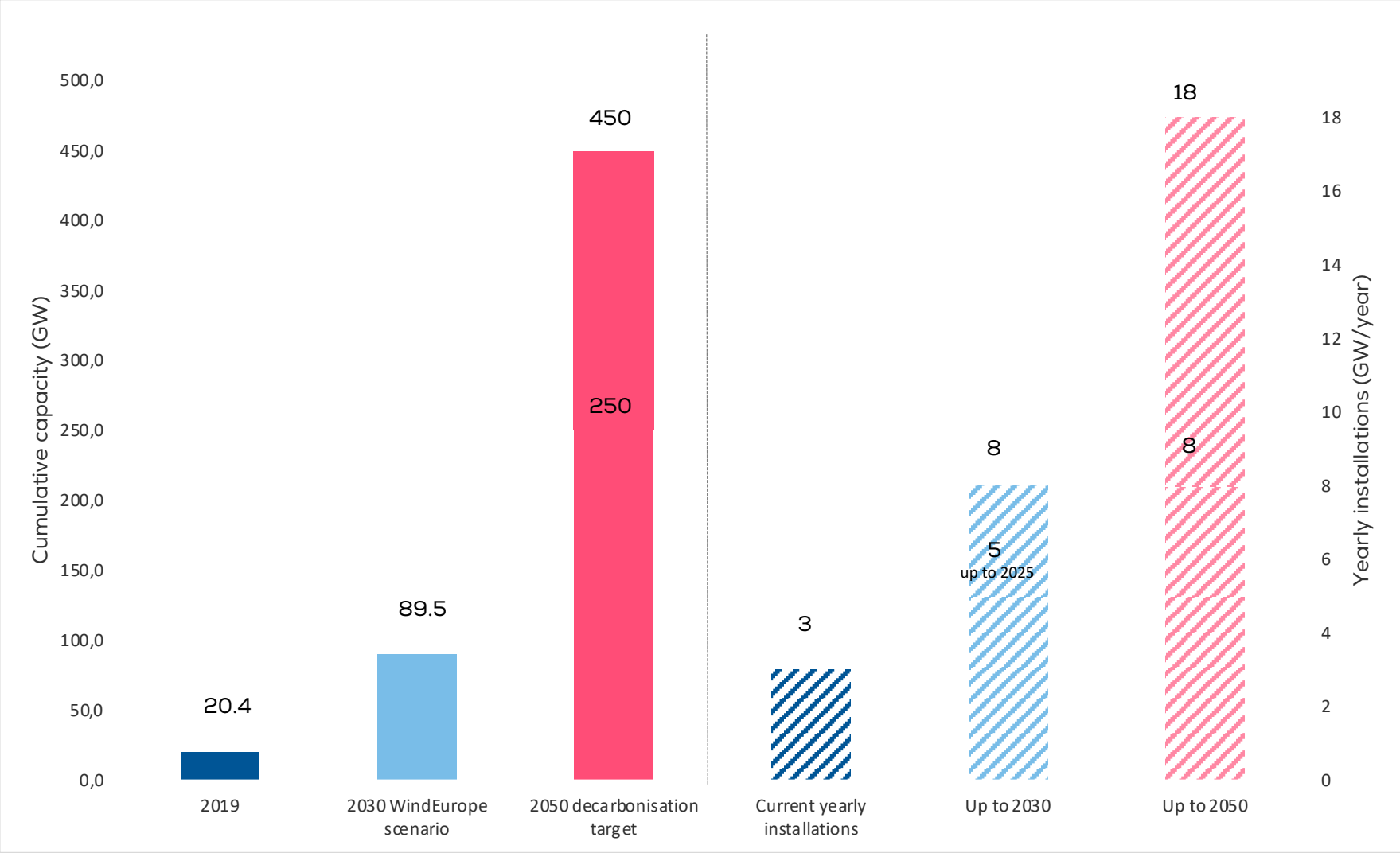
Wind capacity 2018 to 2050

50 GW pa between 2030 and 2050



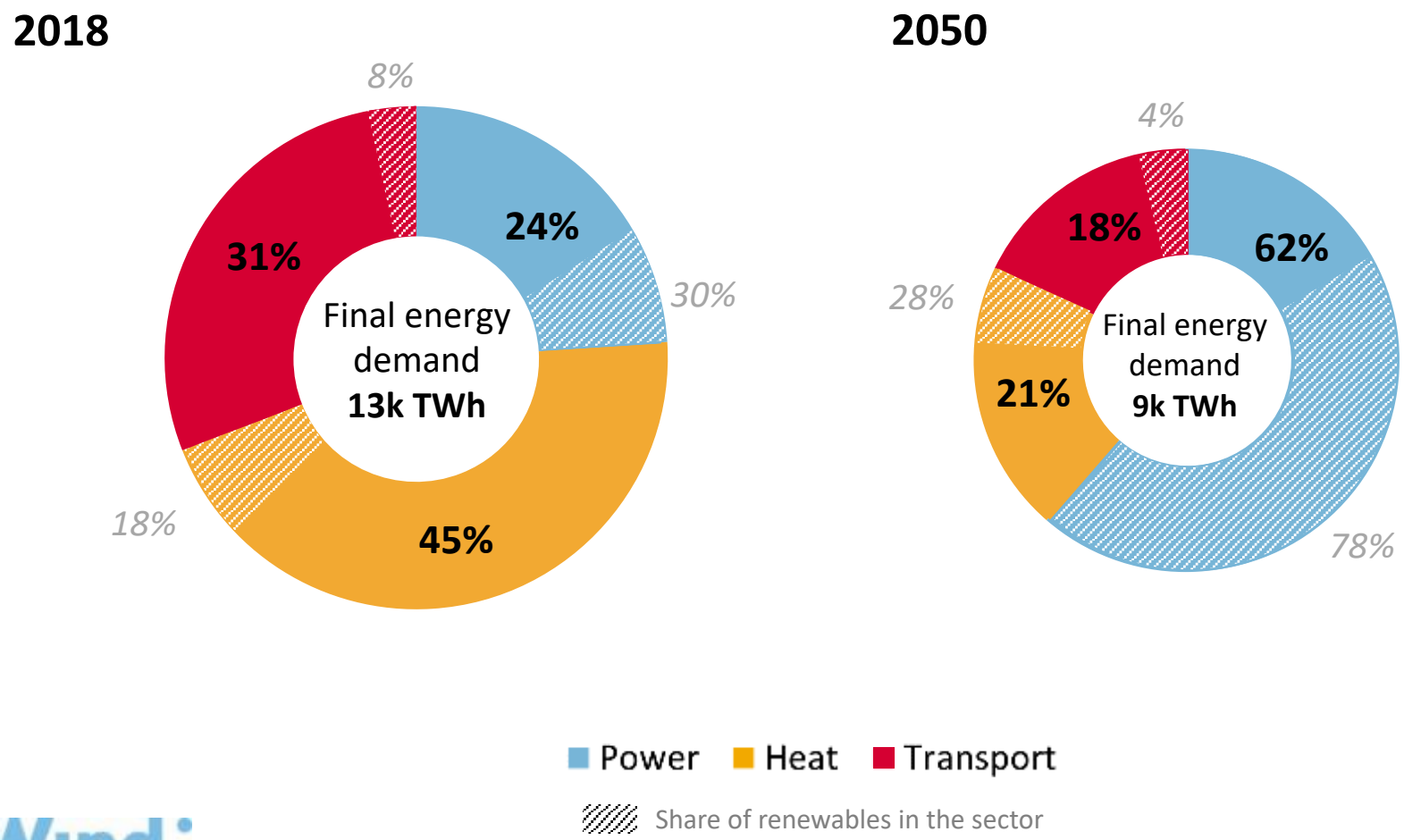
Sources: WindEurope, Eurelectric, European Commission

Expansion of offshore wind to 2050



Source: WindEurope

Accelerate RES-based electrification



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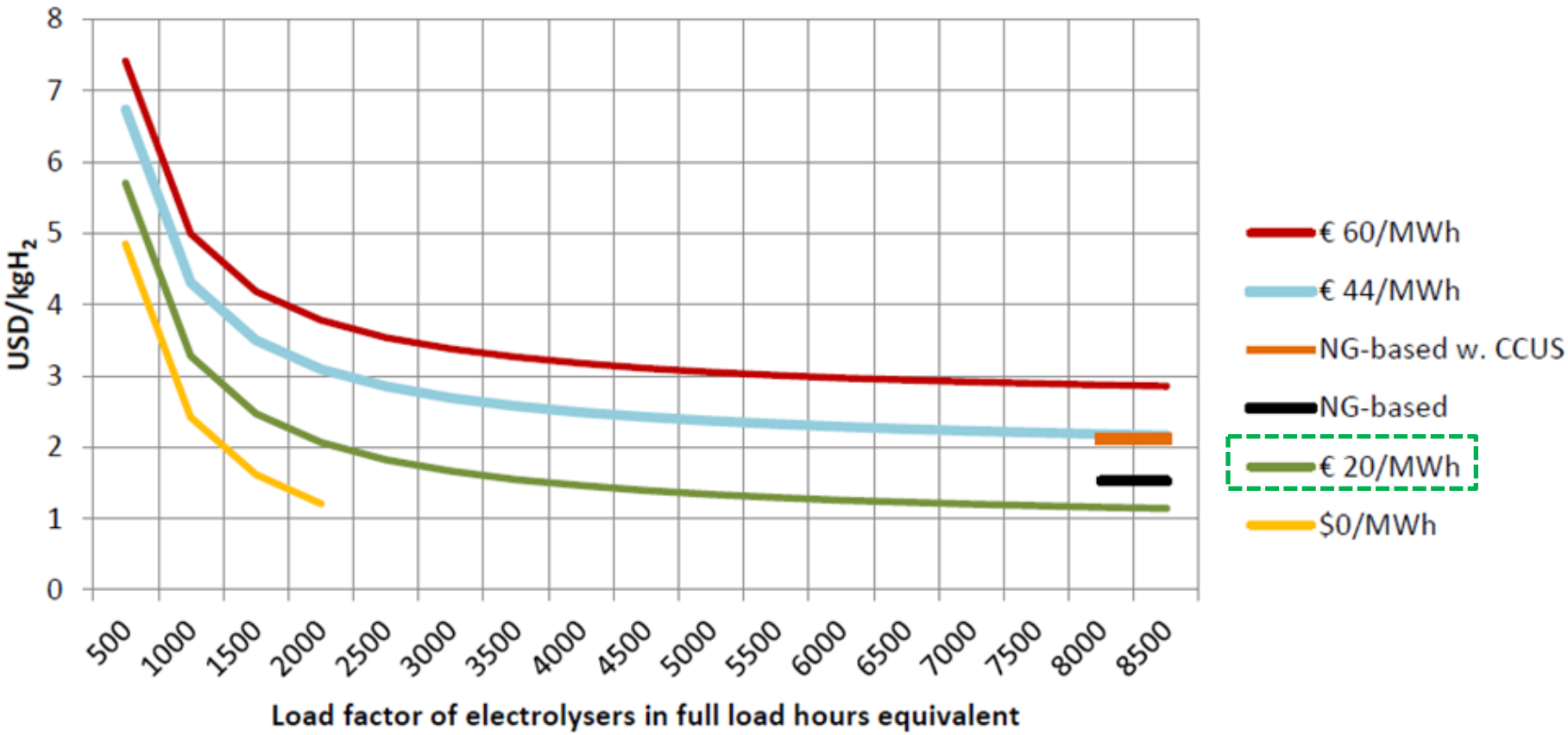
Direct electrification

Indirect electrification: heavy industry

Indirect electrification: transport

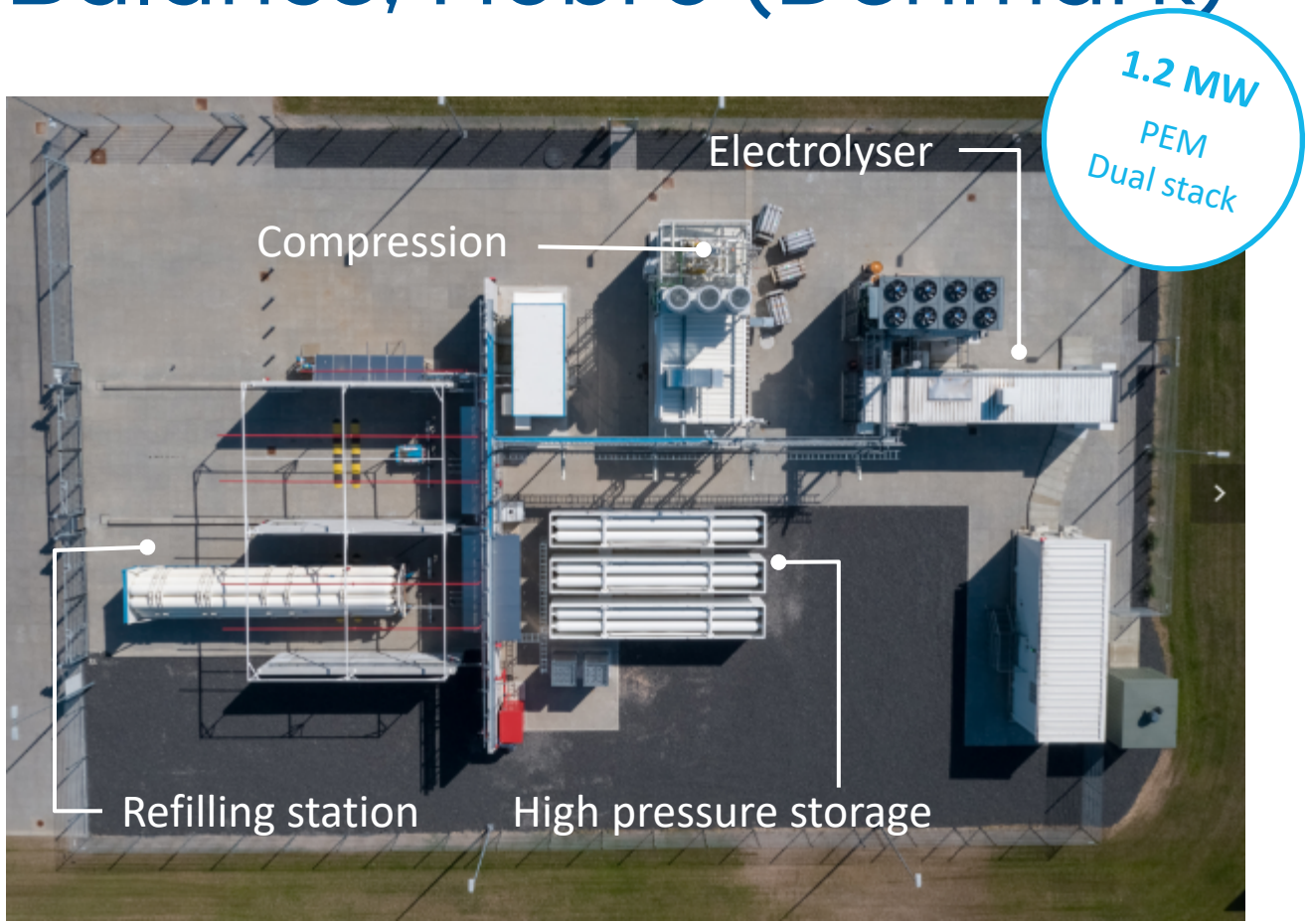
There is a business case for green hydrogen…



Source: IEA

Hydrogen from 100% renewable electricity

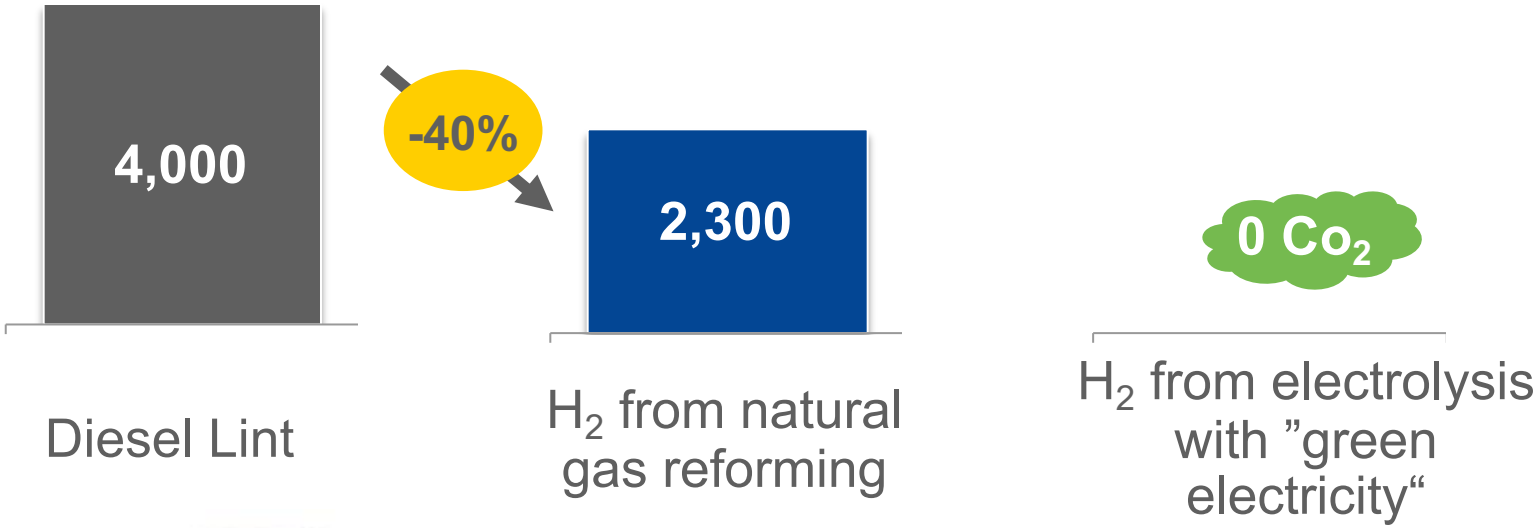
Clean H2 to refueling stations and H2 pipeline: HyBalance, Hobro (Denmark)



Source Hydrogenics

Clean H2 to rail transport: Coradia iLint

CO_2 emission per vehicle km (in gramme)



Source Alstom

Clean H2 to multiple applications (mobility, industry, gas grid): Energie Park Mainz

Demonstration

- Containerized version for demonstration projects (30-foot container size)
- Nominal load 100 kW_{el}
- Over-load capacity 300 kW_{el}
- Example: RWE Niederaußem
- **Commissioned in 2012**

Commercial reference

- Location: Mainz-Hechtsheim
- Partner: Stadtwerke Mainz, Linde, Siemens, Hochschule RheinMain
- 6 MW_{peak} elektrolysis (3x SILYZER 200, each 1.25 MW and 2 MW_{peak})
- **Direct connection to wind farm (8 MW)**
- 1000 kg hydrogen storage (33 MWh)
- Total budget: 17 Mio. EUR
- Funding: ~50 % (BMWi)
- **Commissioned in 2015**

Ein Forschungsprojekt von

MAINZER STADTWERKE · Hochschule RheinMain · Linde · SIEMENS

Gefördert durch Bundesministerium für Wirtschaft und Energie

ENERGIESPEICHER Forschungsinitiative der Bundesregierung

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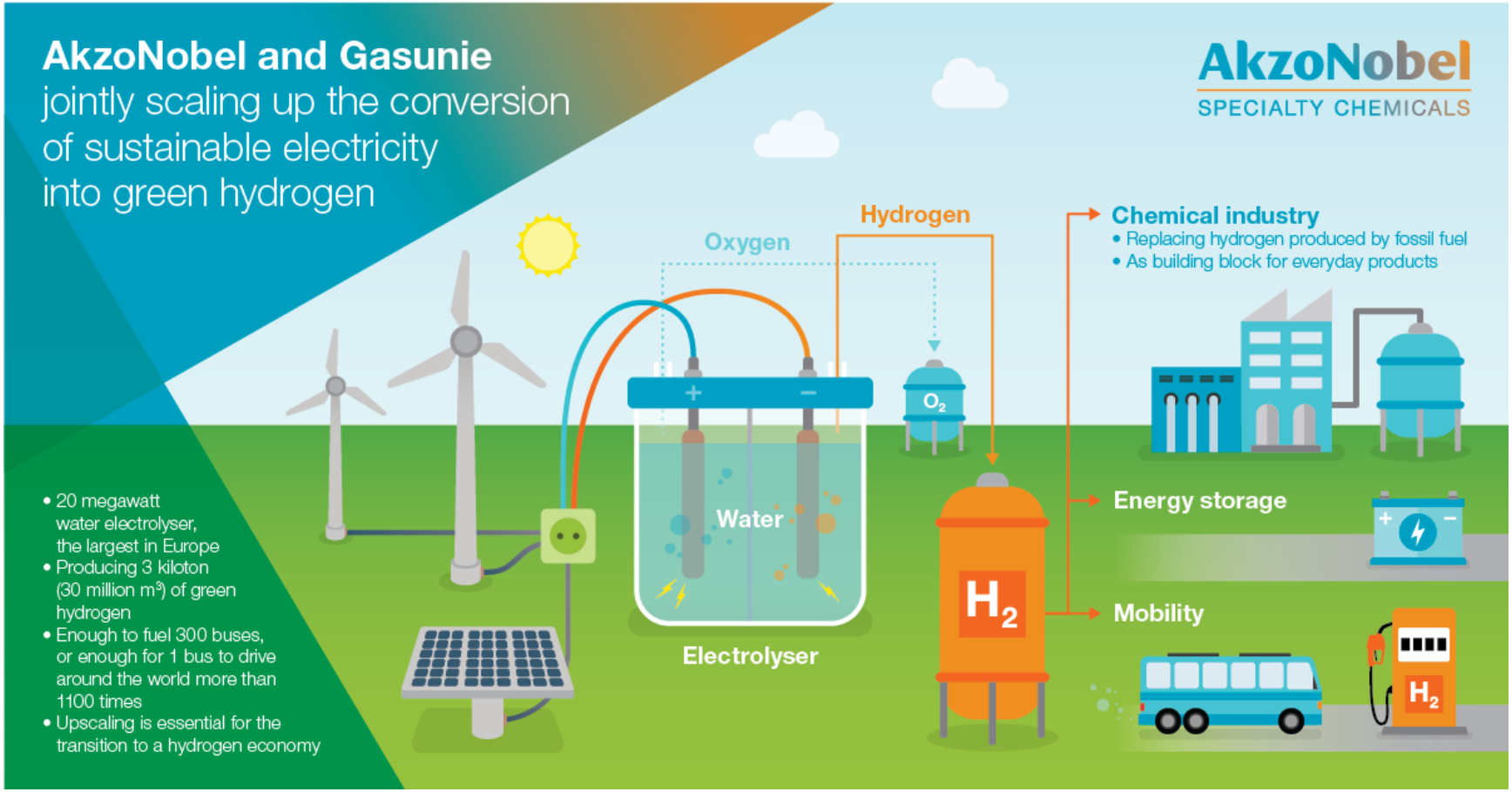
Source Siemens AG

Clean H2 to industry: Nouryon plant in Delfzijl (The Netherlands)



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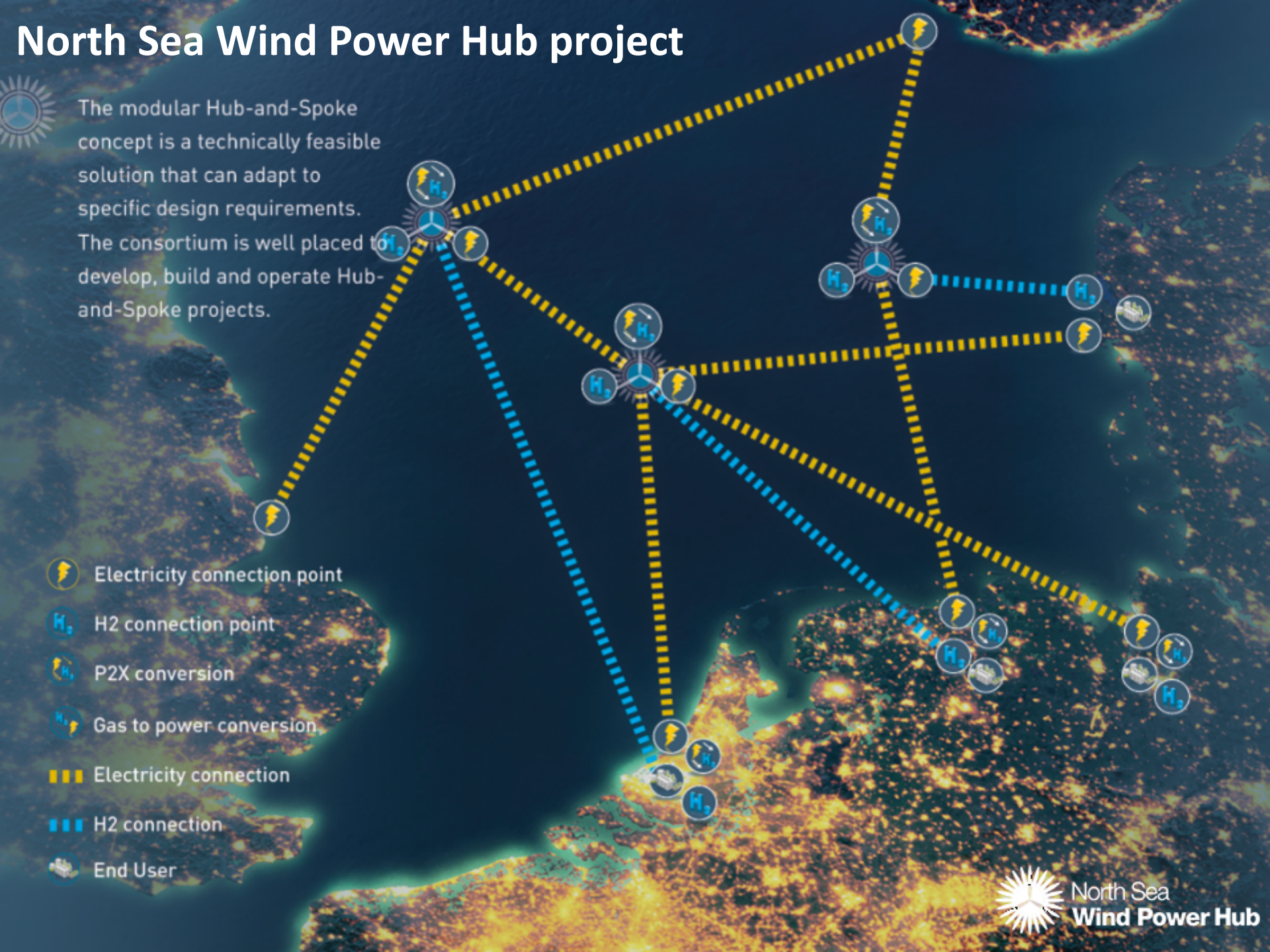
North Sea Wind Power Hub project

The modular Hub-and-Spoke concept is a technically feasible solution that can adapt to specific design requirements. The consortium is well placed to develop, build and operate Hub-and-Spoke projects.



On-site production

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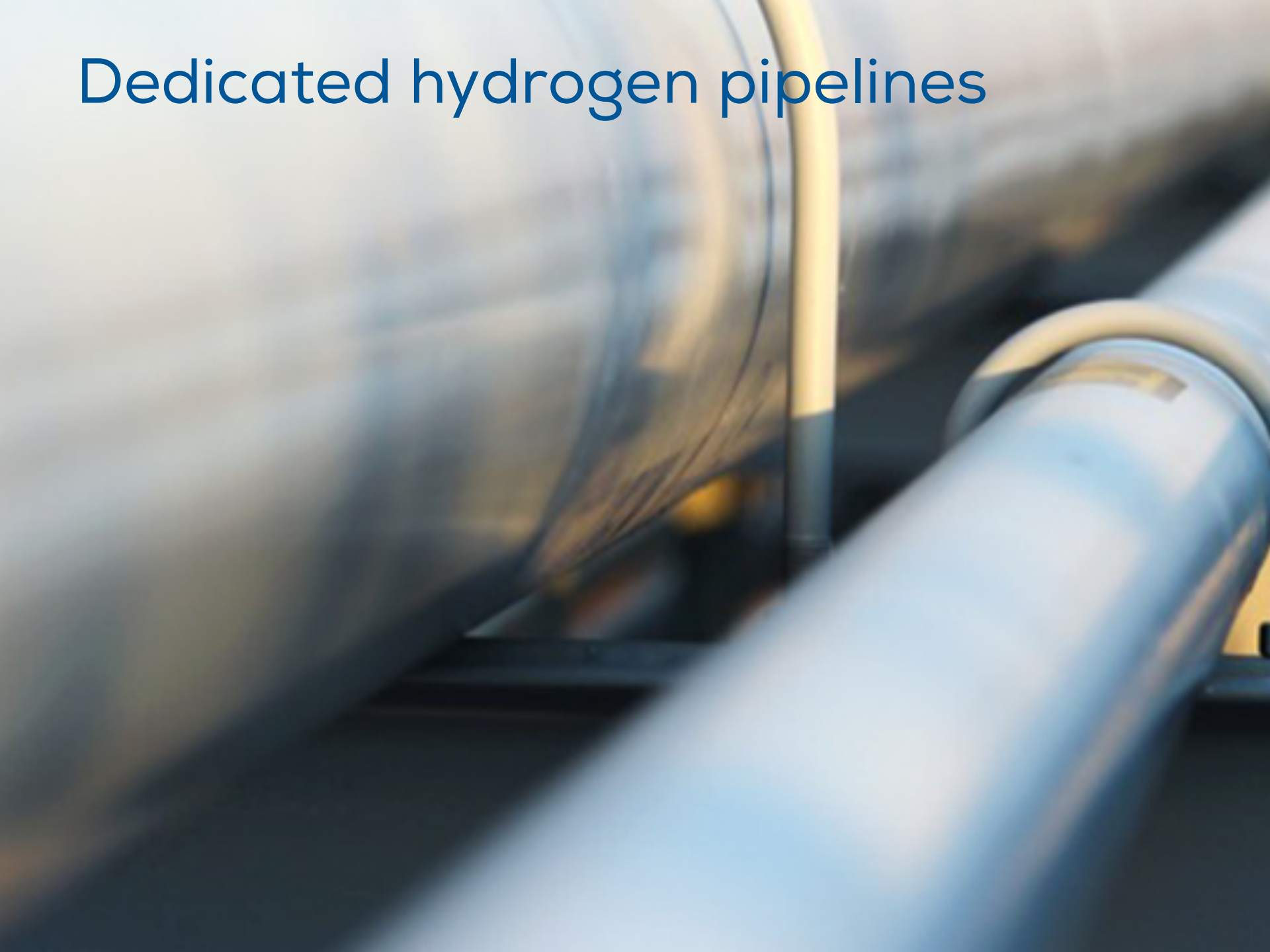
Using natural gas infrastructure

Dedicated hydrogen pipelines



Liquefied Hydrogen vessels

THANK YOU

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