Wind across borders and sectors

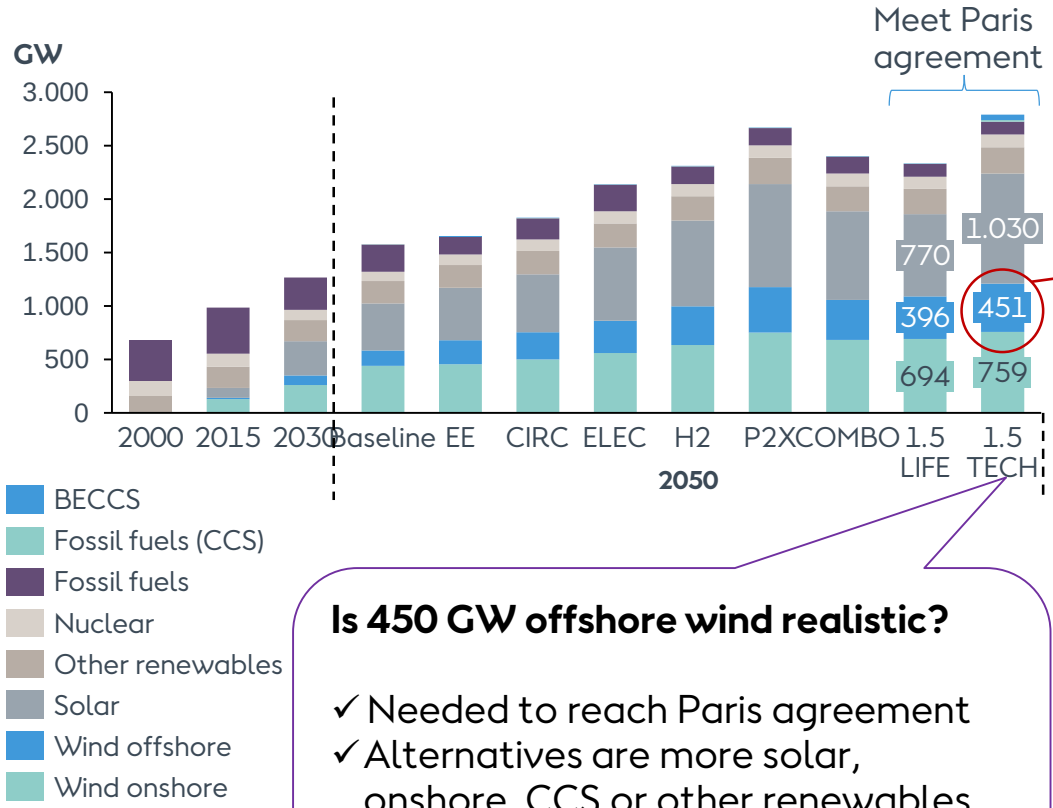
Wind Energy Denmark 2019

Ørsted

Ulrik Stridbæk
1st October 2019

450 GW offshore wind to reach the Paris Agreement

European Commission roadmap scenarios for 2050

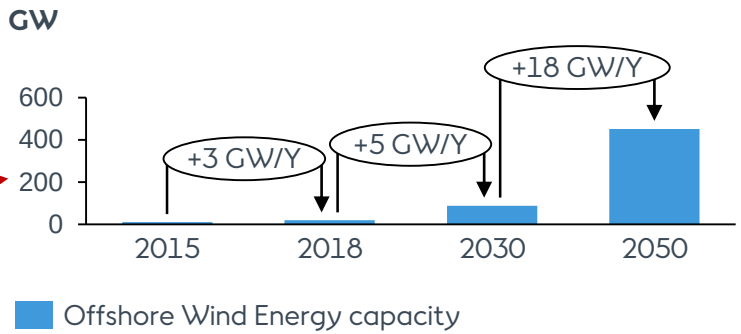


Is 450 GW offshore wind realistic?

✓ Needed to reach Paris agreement
✓ Alternatives are more solar, onshore, CCS or other renewables
- Already >1 TW solar in 2050
- Already 760 GW onshore in 2050

450 GW is a game changer

Annual growth rate to reach Paris agreement



3 must win battles to change the game

1. Scale up the industry
2. Find the space
3. Rethink onshore and offshore transmission

Source: EC Long term strategy

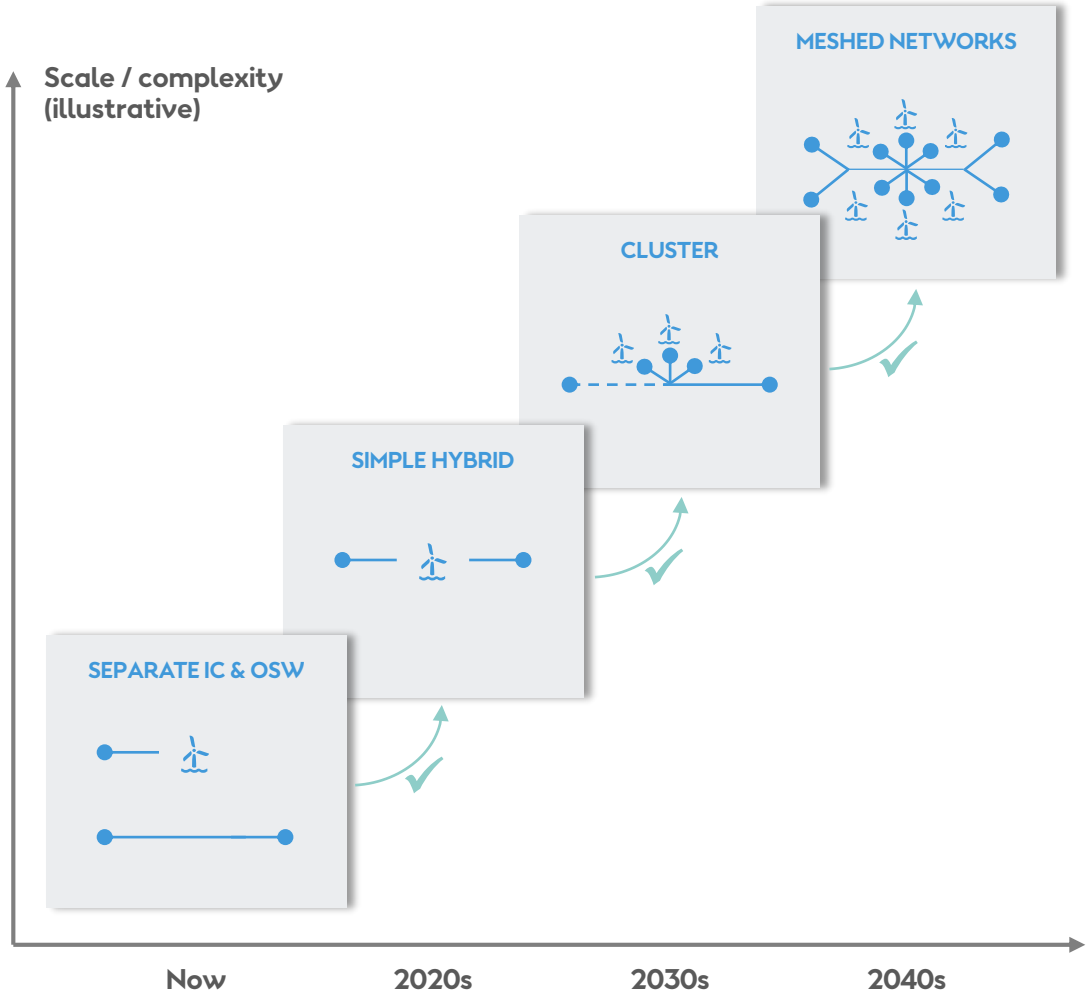
Ørsted

Broad support for sophisticated meshed offshore grids, but progress is too slow

National and EU frameworks are not ready for complex assets…

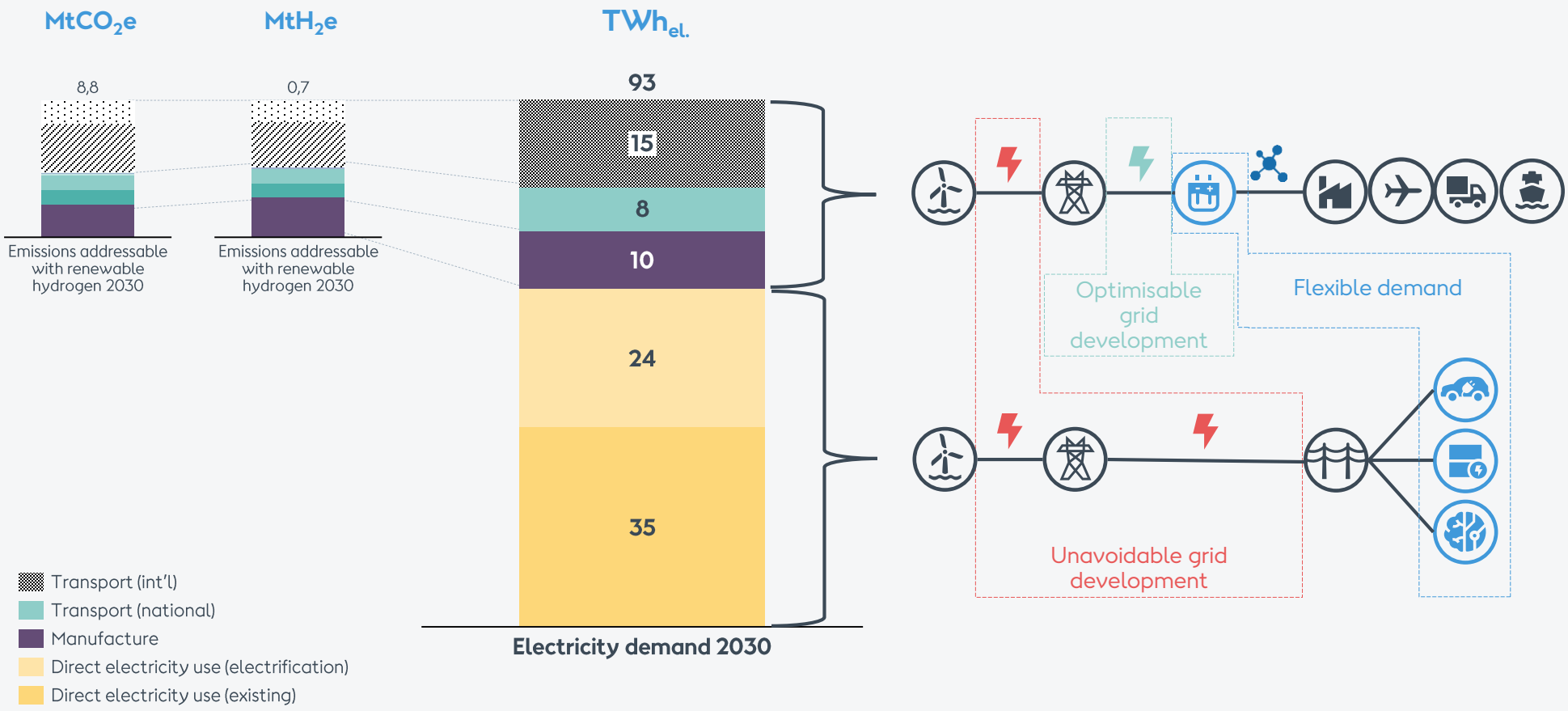
- No **regulatory models** in place for 'meshed' hybrid solutions; and even simple hybrids require new models
- Cross-border **political coordination** required in the context of strong national interests; potentially requiring EU's steer
- **Technology not industrialised** – supply chain development and maturation needed (comparable to OSW in the past)

… why individual demonstration projects are needed to pave the way



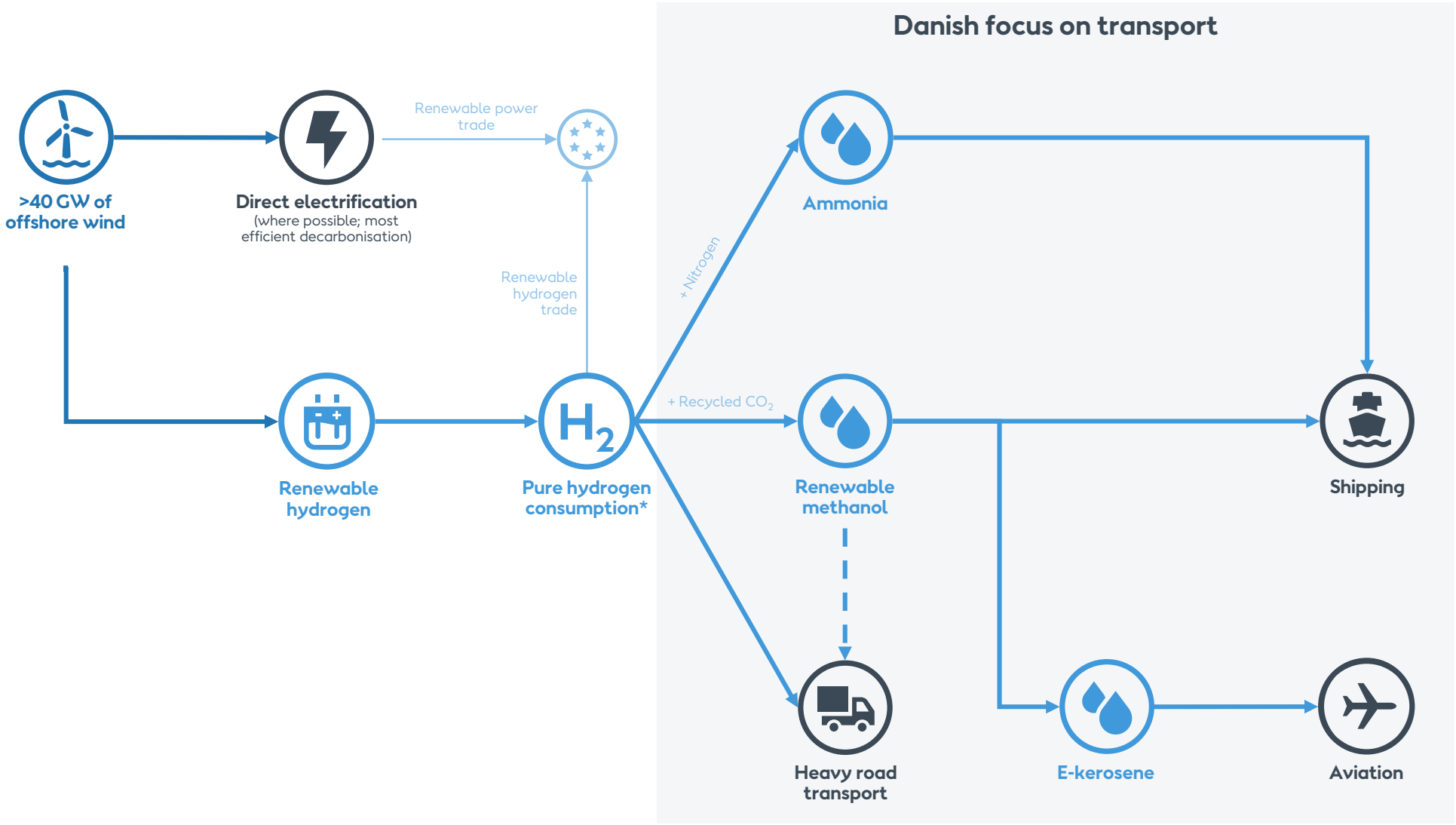
Ørsted

Denmark to 70%



Ørsted

A Danish vision for decarbonisation



*Expected minor role in DK:
1. Feedstock (incl. refineries and steel);
2. some heavy transport; potentially minor role in light transport
3. Industrial heat

Ørsted

Example of concrete project: Westküste 100

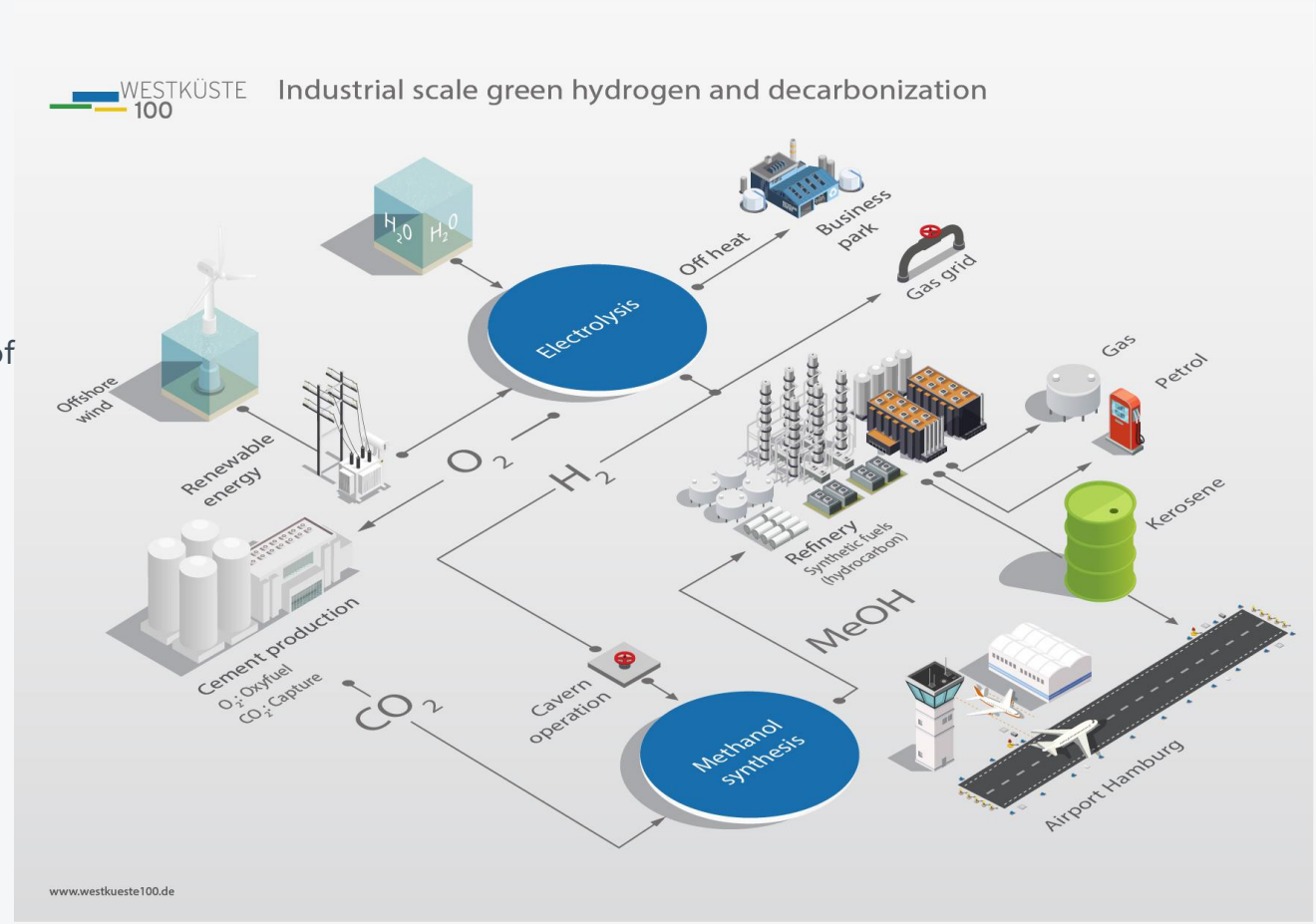
05 April 2019 — Submitted application for Reallabore support programme

15 July 2019 — Pre-qualified for Reallabore (20 pre-qualified projects out of ~100 applicants)

Dec. 2019 — Submission of final application

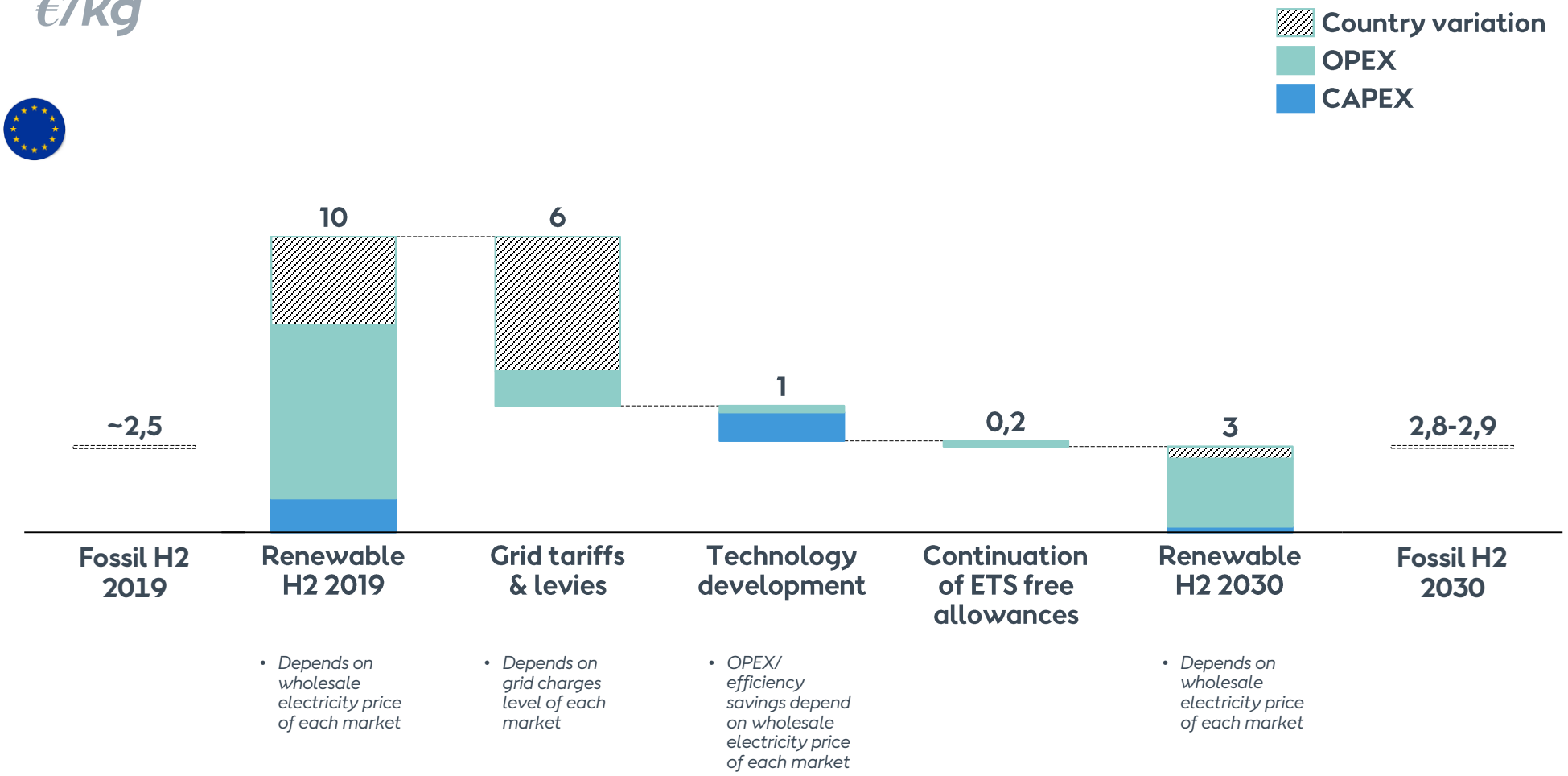
H1 2020 — Award

H2 2022 — Commercial operation date



LCOH: renewable hydrogen cost-out – Generic/EU

€/kg



Averages/ranges for DE, DK, NL and UK. 2019 cost includes ENTSO-E Transparency Platform wholesale electricity prices; 2030 cost includes wholesale electricity price estimated based on market intelligence (average over newer benchmarks); other values result from internal calculations an assumptions, including electrolyser efficiency of 65% in 2019 and 70% in 2030, and EU ETS price of 20 €/t.

Ørsted