Offshore Wind Energy to 2030

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windeurope.org

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Support from government in the latest German offshore wind energy auction

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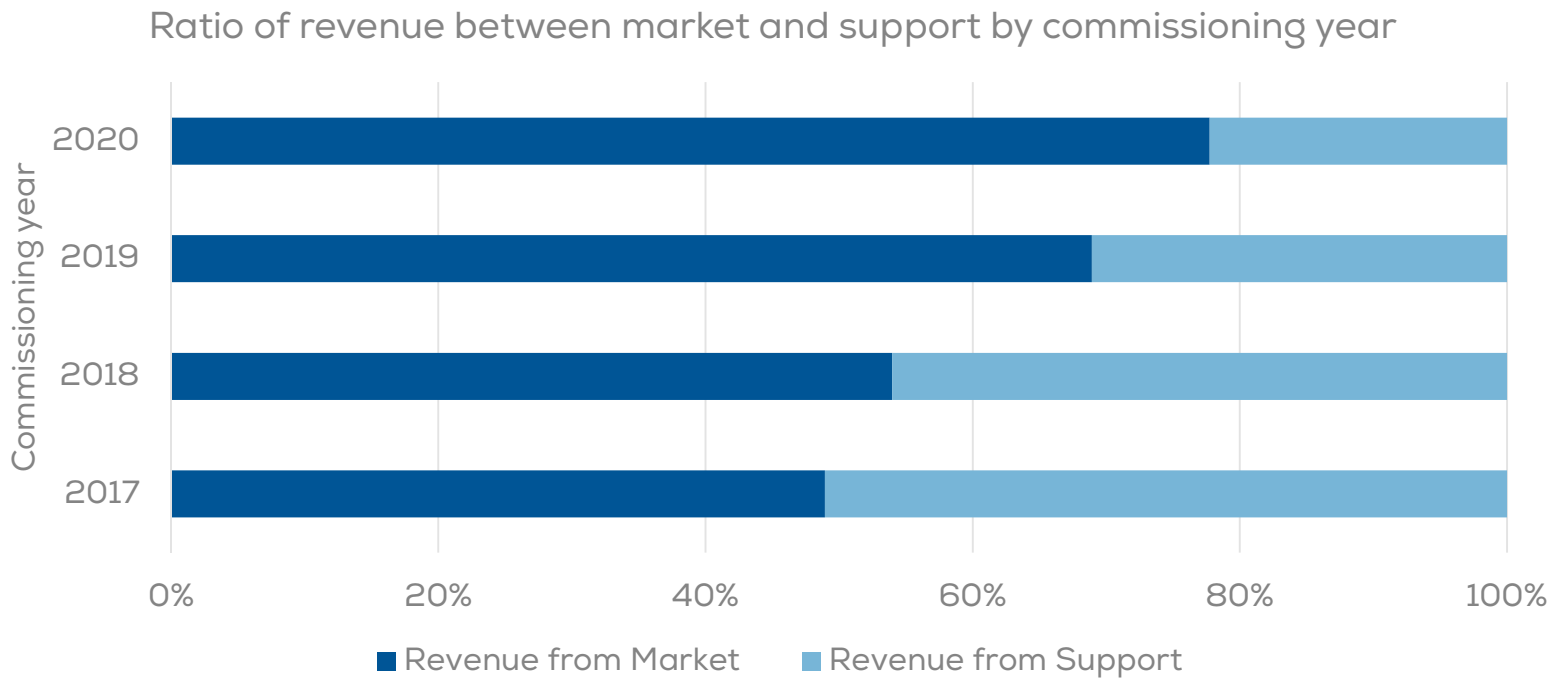
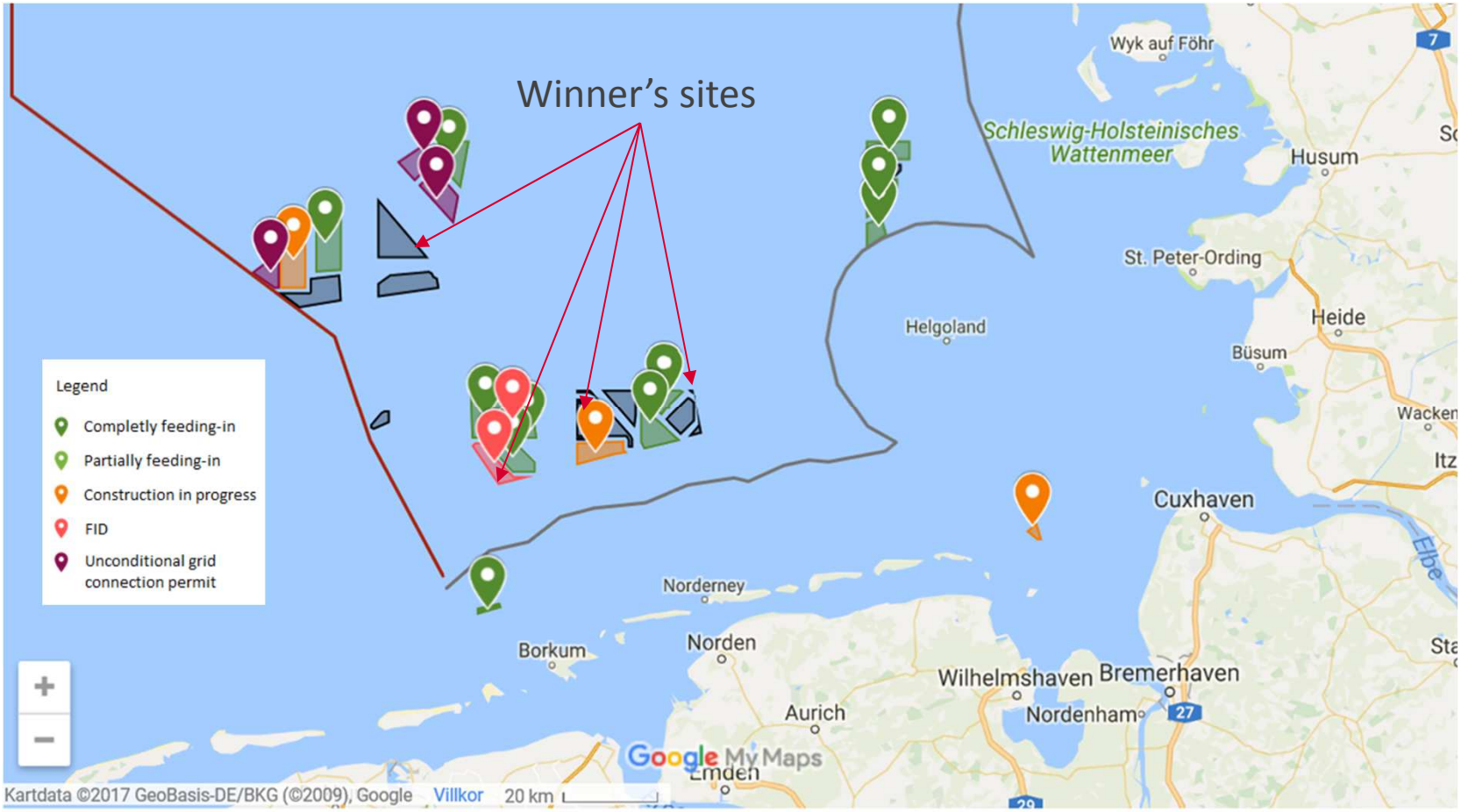
Revenue - three quarters are financed by the market

Projects are relying less and less on support – analysis based on government wholesale price projections



*Grid charges are not modelled in this slide

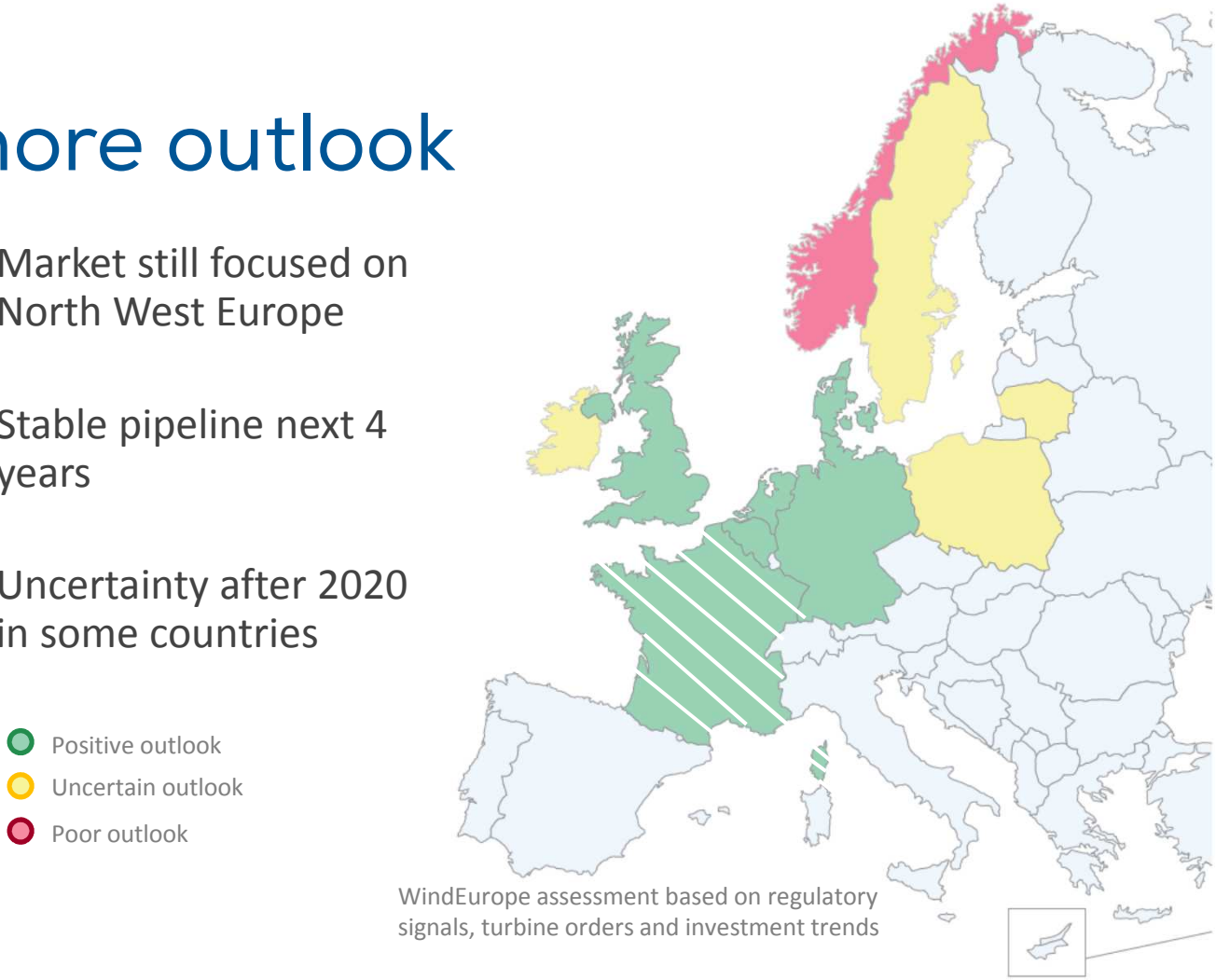
Source: WindEurope



Source: Offshore Wind Foundation
http://www.offshore-stiftung.de/en/status-quo-offshore-windenergy

Offshore outlook

- Market still focused on North West Europe
- Stable pipeline next 4 years
- Uncertainty after 2020 in some countries



WindEurope assessment based on regulatory signals, turbine orders and investment trends

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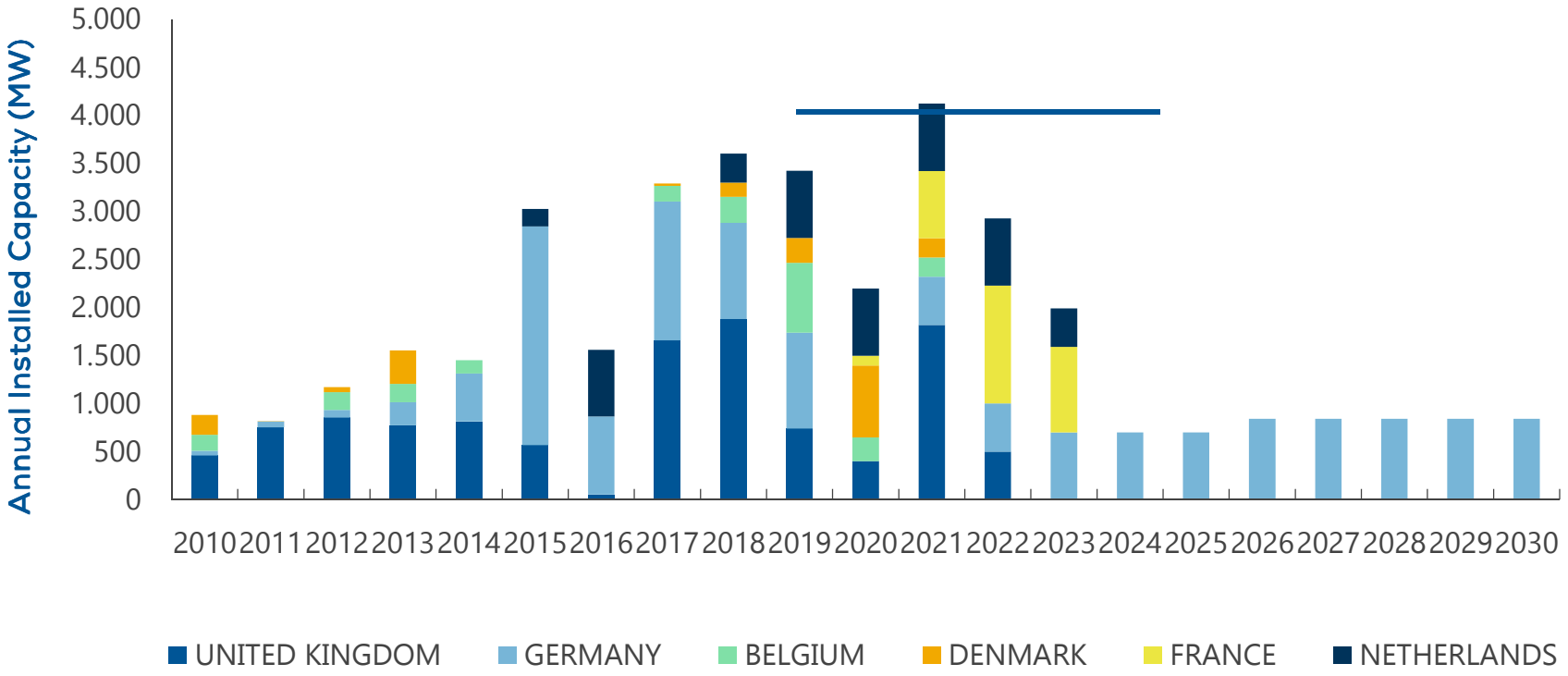
Market outlook to 2030

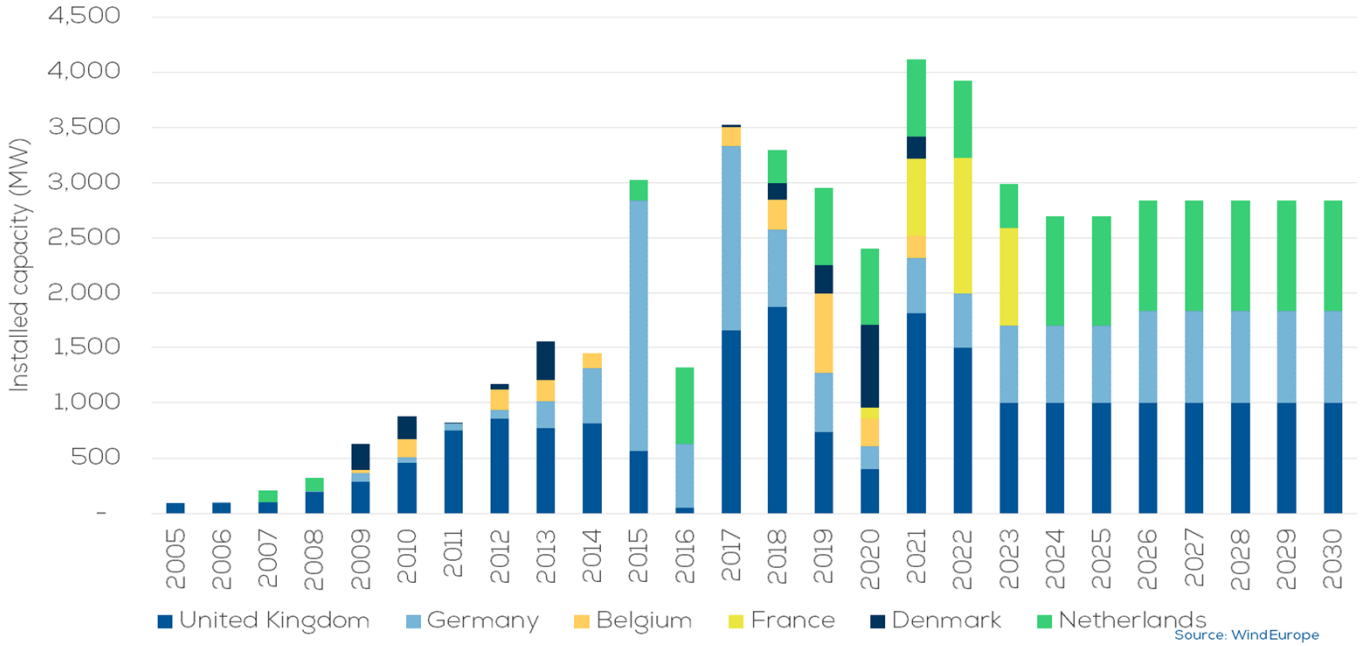
Projection based on real project data and firm government commitments



For presentation clarity, countries with deployment below 100 MW are not included here.

Source: WindEurope

Annual deployment of offshore wind 2005-2030



For presentation clarity, countries with deployment below 100 MW are not included here. Source: WindEurope

TENDER SCHEDULE

- **UK: Next CfD round** — **Bids opened 3 April 2017**
- **NL: Zuid-Holland I +II** — **Bid open 2017 for 700MW**
- **FR: Third tender at Dunkirk** — **Selection process in progress**
- **DE: Transitional tenders**
  - **1st tender April 2017 (1.55GW) -Done**
  - **2nd tender April 2018 (1.55GW)**
- **NL: Zuid-Holland III + IV** — **Bid open 2018 for 700MW**
- **UK: Additional two CfD rounds before 2020**

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Drivers in cost reduction

- **Economy of Scale**
  - Large projects (800+ MW)
  - Improved and more efficient installation & O&M
  - Improved procurement
- **Increase in energy production**
  - Larger turbine sizes
  - Latest technology and continuous innovation
- **Political commitment and planning**
  - 2020 targets under NREAPs providing visibility
  - Investments secured by market visibility
  - A transparent one-stop shop

Market volume and lower risk lead to cost reductions

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Scale is key to lower cost and sustain innovation throughout the supply chain

- A market size of at least **4 GW/a from 2020 onwards**
  → ~one turbine per day [1)]
- A market size of at least **7 GW/a**
  → ~accommodates sufficiently large volume for future development

Supply industry

To ensure competition, the market needs several manufacturers and a larger number of suppliers

At least 4 GW/a in Europe is minimum for a sustainable industry from 2020 onwards
In the future at least 7 GW/a will be necessary for EU to remain the global leader of the offshore wind industry

1) Assumed a calculatory average turbine size of 10 MW in the period from 2020 onwards

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