Renewable Energy Auctions: Lessons from Germany, the UK, and the Netherlands

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Principal
Plenty of variation in recent offshore wind auction results  
Delivery year, auction year and local specifics hold more explanatory power than size

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**UK auctions use fixed prices not floor prices and include the cost of connection → limited comparability; **inferred
Germany: Zero subsidy pioneer
2017 round had the first ever “zero bids” based on likely “real options” view of the auction

**First round (2017)**

- First of two auction rounds for “existing projects” to be delivered between 2021 and 2025; bids for guaranteed floor prices
- 1,380 out of 1,490 MW at “zero subsidy” (zero floor); Ørsted had 110 MW at 60 EUR/MWh
- Only projects in the North Sea were successful; most with delivery dates towards the end of the period
- Zero floor bids likely factor in significant technological progress and increasing wholesale prices
- Long lead times until realisation and (relatively) low penalties may mean bids are viewed as “real options” → how to ensure delivery?

**Second round (2018)**

- 1,610 MW awarded to 6 winning projects owned by Iberdrola, innogy, Ørsted, and a consortium of municipal utilities
- Larger range of successful bids (0 to 98.30 EUR/MWh) and higher average price (46.60 EUR/MWh) than in 2017*
- Co-location with prior projects seems to hold more explanatory power than lead time / size in this round
- No bifurcation between Baltic Sea and North Sea projects despite Baltic Sea quota
  → Under current rules for the future “central model” the reference price for future auctions is fixed at zero with only a random draw to break a tie

*Comparable level to recent solar/onshore auction, which closed at 46.70 EUR/MWh
UK: The last of “ye olde worlde”

UK use of fixed price CfD and inclusion of the connection cost in the bid means zero bid equivalent is a bid below the wholesale price.

### Latest auction outcomes

- In April 2017, UK carried out a cross-technology auction covering offshore wind as well as biomass and energy from waste.
- 3.2 GW of capacity awarded for three offshore wind projects:
  - Triton Knoll (860 MW, innogy): 94 EUR*/MWh for delivery in 2021/22
  - Hornsea 2 (1,386 MW, Ørsted), Moray Firth (950 MW, EDPR/ENGIE): both 72.30 EUR*/MWh for delivery in 2022/23
- The lowest bid was half the strike price of the previous auction in 2015 but...
- Bids look higher on a headline level than the German bids although significant differences between schemes need to be taken into account (see RHS).

### Key take-aways

- Key features that differ from rest of Europe:
  - "Two-sided" CfDs (fixed prices not floor prices) rule out zero bids
  - Cost of connection included in price
  - Earlier delivery dates than Germany, rd 1 but similar to rd 2
  - Contracts in the UK are inflation-indexed
  - Under a budget rather than a volume target lower prices allowed all eligible wind projects to “fit in”
- Penalty regime differs too (exclusion from future auctions for up to 24 months instead of financial penalties) but not clearly harsher.
- Last country to retain auction format with different sites competing for a budget → bigger role for strategic bidding than elsewhere.

*Original prices in GBP; we used an exchange rate of 1.20 to convert GBP (2016) to EUR (2016).
The Netherlands: Fully embracing zero subsidy
After several auctions for subsidies, the Dutch government explores the option to auction site licences for off-shore wind parks

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<th>Past auction outcomes</th>
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| • Prior to „zero subsidy“ NL led the reduction in offshore pricing with  
  – Borssele 1&2 (Ørsted, 2020) at 72.70 EUR/MWh floor price; and  
  – Borssele 3&4 (Shell-led Consortium, 2020) at 54.50 EUR/MWh floor price  
| • Significant interest in zero subsidy auctions even for 2022 delivery but some specifics to be borne in mind:  
  – Cost of connection covered by the government  
  – Availability of PPAs in NL  
  – Size and co-location of sites  |
| • In 2017, Hollandse Kust Zuid 1&2 (700 MW; to be built by 2022) became the first explicitly “zero bid” auction  
  – Vattenfall beat other zero bids from Statoil, innogy and Eneco-led consortium  
  – Project was awarded the option to build the wind farm based on non-price criteria:  
    - Cost-efficiency of the bid (*highest weight*)  
    - Risk analysis (incl. PPA; *biggest differences*)  
    - Four others  | • Where next for auction formats?  
  – Non-price criteria lose some of the efficiency; re-consider price-based rule  
  – Continuing to auction two licenses adds complexity to format (aggregation risk)  
  – Multi-round ascending bid auctions could support price discovery  |

Key take-aways

- Past auction outcomes
- Key take-aways

Is PPA market well enough developed to make bidders willing to pay for development rights?
What’s next for Germany and beyond
A selection of key questions going forward

High level policy questions

• Coalition agreement (albeit not the draft EEG revision) envisages additional offshore wind auction \( \rightarrow \) an option to re-include some of the projects shut out by the WindSeeG but need to consider ex post change to value of projects successful in first two rounds

• EEG 2017 limits pricing for “central model” to zero with ties to be broken by random draw \( \rightarrow \) more efficient mechanism required

Longer-term questions

• General auction design (sizing, sealed bid vs. multi-round, pre-developed vs. multi-location, tech-specific vs. tech neutral)

• Trading off probability of delivery and ensuring low prices (lead times, 1-way/2-way CfD, bidding on the size of the penalty?, …)

• Price-based (with connection included?) or other selection criteria (probability of delivery, regional criteria, sustainability, …)

• Who offers PPAs (state via two-way CfD vs. market, size of corporate PPA market, political / counterparty risk insurance

• Which players remain active (BigOil vs. pension funds will depend on availability of risk mitigation, benefits of co-location may limit future competition / potential for repeat in new markets)
About Us

Your speaker – Dominik Huebler

- Principal in the Energy, Environment, Communications & Infrastructure (EECI) Practice in Berlin
- 10 years of experience in consulting for infrastructure companies, investors, law firms and public institutions, e.g.,:
  - Regulatory and market due diligence for off-shore wind projects, cogeneration and regulated networks in Germany and Europe
  - Advice on economic questions regarding the German Renewable Energy Act (EEG) and Combined Heat and Power Act (KWK-G) for different clients
  - Economic consulting in legal, arbitration and regulatory proceedings, e.g., on WACC estimation, the German nuclear moratorium and gas storage contracts
  - Several publications in energy economics, e.g., on §24 Renewable Energy Act (reduction of the support in the case of negative prices), evaluation of incentive regulation, etc.
- Economist with a double master’s degree from the Universities of Oxford and Cambridge

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