Unlocking the value of offshore wind

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Offshore wind recently made headlines in Germany when three projects became the first of their kind to be deployed without the support of government subsidies.

How long before we can expect to see the same thing in the UK?

There are plenty of reasons for optimism. Having largely pulled the plug on subsidies for onshore wind and solar projects, the Government's continued financial support for offshore development is a clear indication that they expect it to play an important role in the UK's transition to a diverse and low-carbon energy mix.

Meanwhile, continuing CAPEX and OPEX reductions have left some analysts wondering whether the next round of CfD auctions might see developers celebrating winning bids in the order of £70-80 per MWh—a figure that would have seemed impossible just a few years ago in the 2014/15 round one auction, when the average clearing price for offshore wind was £117/MWh. How much longer will it be before offshore wind becomes 'subsidy-free' in the UK?

Despite this significant progress on cost reduction, there remain at least three key challenges that various stakeholders must contend with if offshore wind is to establish itself as a mature technology in a post-subsidy world:

- First, the threat from other green technologies is growing. Aurora's analysis suggests subsidy-free solar could enter the GB market from the early-to-mid-2020s. This entry is likely to be accelerated by the penetration of cheap, grid-scale batteries that help set a floor on solar capture prices. If subsidy-free solar enters at scale it has the potential both to reduce the need for other zero-carbon technologies to hit emissions targets, and to depress wholesale prices thereby undermining the economics of other low carbon technologies such as offshore wind.
- Second, offshore wind already faces the prospect of price cannibalisation, even without uncontrolled subsidy-free solar. Aurora Energy Research estimates that under relatively conservative capacity growth profiles, the 'capture price' that offshore wind is likely to achieve could be 10-15% below baseload prices by the late 2020s.
- Third, policy-makers and the System Operator are increasingly conscious of the rising integration costs imposed on the system by intermittent renewables. These costs include additional demand for balancing services, growing frequency response requirements to compensate for loss of system inertia, and the need to procure additional back-up generation capacity for periods when the wind doesn't blow.

Relying on further cost declines alone is not the only course of action available to developers looking to chart a course through these headwinds. The first step is to recognise that offshore wind may have latent value waiting to be unlocked by smart policy and innovative finance.
Traditionally seen as an intermittent technology, many turbines can ramp-up and down, thereby enabling offshore wind farms to play in markets previously seen as the exclusive domain of dispatchable technologies. For instance, DONG Energy's 90 MW Burbo Bank wind farm in Liverpool Bay recently demonstrated its ability to provide frequency response to help balance the grid.

This flexibility has two main implications. First, for project owners and operators, controlling output could allow offshore wind to avoid some of the costs associated with curtailment and price cannibalisation, while also opening up additional balancing service revenue streams. Second, from a System Operator perspective, incentivising wind to act more like a dispatchable technology could help to mitigate rising system integration costs.

Given the potential advantages to controlling output then, why aren't more wind developers doing it already? Much of it has to do with the current regulatory system. While some onshore wind operators are experimenting with new business models, the market is not yet set-up to enable intermittent renewables to provide balancing services in earnest. With revenues derived wholly from dispatching in the wholesale market for the CfD strike price, offshore wind currently has no incentive to turn down output as long as the wind is blowing. So, what needs to change?

Ireland offers a model where regulators are trying to get ahead of the curve. The Irish DS3 reforms create significant opportunities for wind to provide ancillary services—for example, DS3 targets wind providing 35-40% of fast frequency response. GB is now playing catch-up – with National Grid's recently published System Needs and Product Strategy indicating a raft of future reforms to open up balancing and ancillary markets to new technologies such as wind.

Beyond regulatory changes, investors also need to get more comfortable with merchant risk. As the certainty provided by subsidy-backed investment cases increasingly gives way to new business models based on revenue optimisation across multiple markets, smart investors will need to get to grips with the relatively more complex array of balancing and ancillary services. With the right regulatory framework in place, however, significant returns are potentially on offer for wind operators and investors capable of grasping and monetising the trend towards increasing system flexibility.

Aurora Energy Research is currently undertaking a major multi-client study to investigate the potential for offshore wind operators to access additional revenues from balancing and ancillary markets, building on our Distributed and Flexible Energy research service. Email contact@auroraer.com for more details.
