Models for hybrid assets combining offshore wind and interconnectors
Wind farms and interconnectors are currently developed independently of each other, which has led to calls for increased coordination.

Ambitious GB offshore infrastructure investment

- Interconnectors: 5 GW (2020) → 18-23 GW (by 2032)
- Offshore wind: 10 GW → 40 GW (by 2040)

Challenges with the status quo

- Under-utilised transmission
- Under-exploited economies of scale
- Excessive environmental footprint
- Inefficient way of meeting carbon reduction targets
Hybrids face several commercial and regulatory challenges, which require carefully designed solutions to overcome them.

**Commercial challenges**

Price differentials may not support interconnectors between countries

The optimal capacities of cables and the wind farm is a function of: (i) expected price differentials; (ii) expected wind speeds; and (iii) costs of the asset.

**Regulatory challenges**

Jurisdiction of the wind farm will need to be determined

Two markets
Wind farm dispatches to both price zones

National market
Wind farm ‘in’ one price zone

Offshore market
Wind farm ‘in’ own price zone

EC unbundling restrictions will need to be addressed

EU Directive 2019/944 – Article 43

Anticipatory investment

Full coordination of the asset

Sequenced development
Status quo model: Applying existing OFTO and interconnector Cap and Floor regimes to hybrid configurations could be a simple solution...

![Diagram](image)

**Asset configuration**

- DC connection to GB shore and two converter stations constructed by OWF as per Gen-build OFTO

**Regulation of revenue**

- Interconnector
  - C&F in GB / Regulated in EU
- GB Offshore transmission
  - Regulated (OFTO)
- GB Offshore wind farm
  - Regulated (CfD)

- **Easiest to implement**
- **Relies on attractive well-established regimes (such as OFTO)**
- **Suboptimal sizing and configuration**
- **Skills mismatch between the OFTO and the IC**
- **Limited interest among developers to extend the asset into an IC**

...but may not deliver optimal consumer outcomes
Anticipatory model (OFTO variant): GB offshore transmission could be ‘anticipated’ to help optimise the configuration...

...but requires additional regulatory mechanisms and incentive regimes to mitigate the risk of asset stranding.
Anticipatory model (IC variant): The entire IC could be ‘anticipated’ and constructed before, or while, connecting offshore wind farms...

Asset configuration

- Optimised Tx, for anticipatory offshore wind farm
- Some risk of asset stranding remains
- Offshore wind “squeezed”
- May not be able to access CFD

Regulation of revenue

- Interconnector
- GB Offshore transmission
- GB Offshore wind farm

- C&F in GB / Regulated in EU
- Merchant revenue (no CFD)

...which partly mitigates the risk of asset stranding, but may entail developing an entirely new “North Sea” price zone
Fully coordinated model: The entire hybrid asset could be jointly configured for optimal outcomes for developers and consumers...

...but it requires all parties (developers as well as regulators) to come onboard.
Any questions?

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