

# Comparing Regulatory Designs for the Transmission of Offshore Wind Energy

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Offshore wind energy plays an important role to meet global targets for renewable energy. For offshore wind energy to be successful, the total cost of offshore wind electricity produced needs to be low. This not only requires a cost-effective development and operation of the offshore wind farms themselves but also of the offshore transmission assets that transport the produced electricity ashore. An efficient regulatory design is crucial for this.

This paper compares different regulatory designs in order to determine what policy leads to the most cost-effective development and operation of offshore transmission assets. We argue that the regulatory design impacts cost-effectiveness in two aspects.

First, the market design shapes the degree of integration between the offshore transmission asset and the offshore wind farm. When the local transmission system operator (TSO) or a third party build the offshore transmission asset, development and operation of the transmission and wind farm take place separately, creating additional coordination efforts. However, when development and operation of the offshore transmission asset are bundled in the hands of the offshore wind farm developer, coordination improves.

Second, the market design affects competition. When regulation requires a competitive tender to determine the development and operation of the offshore transmission asset, all bidders are in direct competition. Alternatively, in a monopolistic market environment, only the local TSO is obliged to ensure development and operation of the offshore transmission asset.

Our study examines two comparable countries with contrary regulatory approaches. Therefore, we calculate the cost of offshore transmission assets in Germany and the United Kingdom. Germany follows a monopolistic approach, in which development and operation of the wind farm and the transmission asset are separated. By contrast, the UK follows a competitive and largely integrated approach.

We collected a new data set using cost information from national authorities, TSOs, and other sources of offshore transmission assets built so far. We find that German offshore transmission assets are significantly more expensive. This result is robust even after considering differences in distance, technology choice, capacity utilization, environmental regulation, and financing conditions. The cost difference is not explained by a higher security of supply in Germany. The cost in Germany are further amplified by the offshore liability levy, a financial compensation scheme paid by the TSO to the wind farm operators for delayed commissioning of transmission assets. We argue that the cost difference between offshore transmission assets in the UK and Germany primarily measures the cost impact of the different regulatory approaches.

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