

Managing Uncertainty and Strategy in Offshore Wind Seabed Leasing Auctions

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Extended Abstract

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Abstract Summary

Within the UK, auctions determine access to development opportunities within the offshore wind industry, allocating seabed rights and offtake agreements. These auctions occur infrequently and utilise formats that can change substantively between allocation events. The resulting environment is one in which data on outcomes is sparse and opportunities to test strategies are limited. While uncertainty is commonly incorporated into modelling valuations, translating these uncertain valuations into actions within a specific auction format represents an additional challenge.

Developers who fail to adequately account for uncertainty when translating valuations into actions may submit overly confident or overly cautious bids. This has implications for both the commercial outcomes of developers and the policy objectives of the auction authority.

Whilst there is extensive analytical modelling within the auction theory literature, dominant strategies are rarely identified in applied auction environments. In such settings, the efficacy of individual strategies typically remains contingent on the strategies adopted by competitors. The author could identify no established frameworks that investigate how participants should translate uncertain beliefs into specific actions within the context of offshore wind leasing auctions.

This research seeks to identify auction strategies that remain robust under the significant uncertainty associated with pre-lease project valuations in the offshore wind industry. This

is achieved through the development of a modelling framework that translates uncertain valuations into actions within the format of the UK's Leasing Round 5. The framework integrates a cost model with an agent-based auction model and applies a Monte Carlo simulation to assess how different strategies impact outcomes.

While this research is ongoing, the framework will identify the extent to which different categories of project uncertainty impact auction outcomes, how in-auction strategies balance the risks of overbidding and missed development opportunities, and how pre-lease investigations materially influence auction outcomes.

Presenting Author Biography

Thomas Godfrey-Brown is a final-year EngD researcher in the Industrial Centre for Doctoral Training in Offshore Renewable Energy (IDCORE), a doctoral training programme based at the University of Edinburgh. His research focuses on auction modelling, with particular emphasis on managing uncertainty and developing strategies for participation in offshore wind auctions. His background spans software development, policy, and techno-economic modelling, including previous work in transport systems analysis at Energy Systems Catapult. More recently, he completed a placement with the UK Parliament, reviewing evidence and briefing MPs serving on the Energy Security and Net Zero Committee.