

# Market Power in the Capacity Market? The Case of Ireland

EPRG Working Paper 1712

Cambridge Working Paper in Economics 1727

**Juha Teirilä**

Increasing amounts of intermittent electricity generation from renewable sources (wind and solar plants) means less run-time, lower prices, and thus, less revenues for conventional generators. This may cause some conventional generators to exit the market. During those hours when the sun is not shining and the wind is not blowing their capacity might still be needed to meet all the demand for electricity. This capacity adequacy problem is a real threat for the reliability of electricity supply in countries where solar and wind constitute a large share of electricity supply. Another factor that may exacerbate this problem is a price cap which is set in the electricity market to protect consumers from market power and high prices. The cap is often set so low that generating units which are running very rarely cannot cover their costs. One solution to this problem is a capacity market where generators are paid for the capacity they provide, whether it is used or not. Capacity markets have been established in several European countries lately.

For historical reasons it is common that there are only few dominant firms in the electricity market. Thus, these markets are vulnerable to market power as the dominant firms may gain significantly by increasing electricity prices without reductions in demand. When a capacity market is introduced beside of an electricity market, there have been concerns that the amount of market power potentially exercised by dominant firms is multiplied making electricity very costly for end-users. At the moment, this concern is particularly topical in the republic of Ireland since there is currently one dominant firm in the Irish electricity market which owns a large share of total generating capacity. Also, the electricity market in Ireland is currently ongoing a redesign process where the existing capacity remuneration mechanism is replaced with a less regulated capacity market enabling possibly the exercise of more market power.

This study examines whether the concerns on the potential abuse of market power in the new capacity market in Ireland are relevant. First, a simulation model is developed which incorporates both an electricity market and a capacity market. The

model is then applied for the Irish electricity market. The main research questions explored are: can the dominant firm exercise market power in the new Irish capacity market, if so, how would it do that, what would be the consequences for end-users, and what would be the best ways to mitigate market power? The challenge in modelling is to develop a realistic model which is still computationally solvable. The electricity and capacity markets are multi-unit auctions which are typically complex to model because of a large number of possible equilibrium strategies. Furthermore, the two markets are highly interconnected: profits and profit-maximizing behaviour in one market depend on profits and profit-maximizing behaviour in the other market. This makes the modelling inevitably complicated.

We find that the concerns on the abuse of market power in the future Irish capacity market are justified. The dominant firm can gain a lot by gaming in the capacity market. Its main strategy would be to withhold part of its generating capacity in the capacity auction to increase the market clearing price for its winning generating units. Moreover, there is no simple way to mitigate market power without increasing regulation, which is the opposite of what the new market design is aiming to achieve.

The main contributions of the study is not just to examine thoroughly what might happen in the future Irish capacity market, but also developing a model that combines a capacity market and an electricity market in such a way which can be used in quantitative empirical applications. Even though the main results are specific for the Irish market they suggest possible consequences which can be expected in combined electricity and capacity markets in other countries or areas.

Contact [juha.teirila@oulu.fi](mailto:juha.teirila@oulu.fi)  
Publication July 2017  
Financial Support Fortum Foundation, Academy of Finland