

MORE INFORMATION, LOWER COSTS A NEW ELECTRICITY MARKET MECHANISM

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CONTEXT AND BACKGROUND

Secure, reliable electricity is an important input good in any economy. Electricity cannot be easily or economically stored, and so the electricity demand at any given moment in time must be matched instantaneously by the electricity generation. This means there must be sufficient electricity generation capacity, such as coal units, gas units, oil units or wind turbines, to satisfy the total demand for electricity at each point in time, including times of very high demand. In order to ensure the availability of sufficient electric power plants, electricity markets often include a mechanism called a capacity payment, which incentivises electricity generators to invest in electricity generation capacity.

However, in order to ensure reliable electricity supply, it is not sufficient to ensure there are enough power plants physically on the system. Those power plants must be available to generate electricity when required. In the case of renewable generation, such as wind and solar, their ability to generate at any given moment in time is dependent on the weather. In the case of fossil fuelled power plants, they cannot generate if they are on scheduled outage, e.g. for routine maintenance, or if they are unavailable due to a technical fault.

Therefore, from the consumer's point of view, more reliable generators, which are more likely to be available to generate at each point in time, are more valuable, and should consequently attract a higher proportion of the capacity payment. However, in order to allocate a higher proportion of revenues to the most reliable generators, the regulator must know in advance how truly reliable each generator is.

¹ This Bulletin summarises the findings from: Devine, M.T. and Lynch, M.Á., "Inducing truthful revelation of generator reliability", *Energy Economics* (2017), Available online: <http://dx.doi.org/10.1016/j.eneco.2017.03.017>

CONTRIBUTION OF RESEARCH

This piece of research designs a new mechanism for allocating the capacity payment amongst generators according to how reliable each generator is. The mechanism is designed such that, instead of trying to estimate the true reliability of each generator (which is the current practice), the regulator simply calls on generators to declare their reliability in advance. The generators are then penalised if they do not provide electricity according to their declared reliability. The mechanism is designed such that the firms are incentivised to truthfully declare their reliability.

The results indicate that the inclusion of this mechanism in a capacity payment causes firms to increase the reliability of their generation capacity, by refurbishing their units to make them more reliable. This benefits the consumer by reducing the probability of blackouts or brownouts. Furthermore, the mechanism brings about a reduction in electricity prices, which further benefits the consumer. Using data from the Irish system from 2010, we estimate that the reduction in electricity prices would be 5%. A final unquantified benefit to the consumer is the benefit of the information on reliability that has been provided by the generation firms. The fact that the firms provide this information on reliability eliminates the requirement of the regulator to allocate resources to the discovery of this information.

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