EXPERT SURVEY ON CROSS-BORDER EFFECTS OF CAPACITY MARKETS IN THE US: LESSONS FOR THE EU

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Overview

As some member states of the European Union are implementing capacity markets, important lessons can be learnt from the experience with capacity markets in the United States. In the organized markets, there is approximately 15 years of experience with capacity markets in some markets, while other markets have emphasized energy markets.

There are many issues that US market designers have confronted in creating capacity markets, such as the role of demand response, whether locational constraints should be imposed, how far forward such markets should be run, and whether separate markets should be created for flexible capacity to back up intermittent renewables. An issue of particular interest to the EU concerns inefficiencies might arise when markets with different capacity markets are interconnected. This could lead to sub-optimal performance of the capacity markets and spillover of benefits or costs to neighbouring markets. There is also a risk that capacity markets might distort cross-border trade and reduce market transparency. The above-mentioned effects can be termed as "seams issues" (US) or "cross-border effects" (EU).

In this paper, we present a survey of experts in the design and regulation of US capacity markets. The goal of this survey was to provide insights for and advice to the EU with respect to selecting, designing, implementing and administering capacity markets in a highly interconnected electrical system, based on the experience with capacity markets in the United States. Emphasis was given to cross-border effects that may arise from implementing such mechanisms in interconnected regions.

Methods

In order to aid the understanding of the expert survey outcomes, initially a review of the four capacity markets in the US was conducted. This was followed by development of the survey.

We survey a broad range of electricity sector experts. The survey was conducted anonymously and the respondents included experts from regulation, the industry, consulting and academia. The survey focused on the overall impact of implementing capacity markets and expert advice to the member states of the European Union in relation to capacity markets. The participants were asked 15 open questions on the above-mentioned focus areas in the form of an online questionnaire.

Results

The key issues identified by the respondents were 1) the differing capacity market designs in neighboring capacity markets, 2) the continuous changes in administrative rules, 3) concerns about the exercise of market power, 4) the uncertainty regarding the actual availability during a scarcity event of the generation capacity that has sold capacity credits. The experts contend that the capacity markets have achieved their policy goals with respect to providing the required reserve margin, but in an inefficient way. The introduction of capacity markets has not led to an increase in consumer benefit, according to the respondents. As any benefit from reduction in the price on the electricity market due to higher supply is counteracted by the additional cost from the capacity market. Furthermore, differences in calculating capacity credits could have an impact on capacity market performance.

According to the survey results, cross-border effects are currently not a big concern in the US. However, cross-border effects are considered as a potential concern in the future. Results indicate that permitting imports to participate in the capacity markets would have a positive impact on the importing market.

Many of the respondents advised EU member states against implementing capacity markets. There is a clear preference towards depending on energy-only market to provide price signals for adequate investment. In the event that capacity markets are implemented, the operators should ensure transparent and consistent rules and regulations right from the beginning with minimum modifications once the capacity market has been operationalized. Secondly, it is important to have a consistent definition of capacity product between different regions. Thirdly, the remuneration for capacity market should be linked to the resource's performance during scarcity periods. Finally, the sloping demand curve is highly recommended.

Conclusions

We presented a survey of experts of capacity markets in the United States. The main outcome of the survey was that capacity markets in the United States achieved their goals with respect to reliability, but in an inefficient manner. The key concerns that were expressed were uncertainty regarding the availability of generation resources that clear the capacity market during scarcity hours, a mismatch of capacity auction time frames, exercise of market power and regulatory uncertainty due to changes in market rules. According to the survey results, implementation of capacity markets has not reduced consumer costs. As the additional capacity may bring down the electricity prices but this benefit to the consumer is counteracted by the additional cost from the capacity market.

Cross-border effects are currently not considered as a pressing concern by majority of the respondents, but they do consider them a potential future issue. The result of the survey indicates that as far as possible the EU member states should avoid implementing capacity markets and depend on energy-only markets for providing investment signals. If a capacity market were to be implemented nevertheless, they recommended implementing a sloped demand curve. Moreover, they stressed the importance of consistent and transparent regulation, also with respect to the definition of trade in capacity and electricity between interconnected regions. Lastly, the remuneration of the resources should be linked to their performance during scarcity.