

The role of Battery energy storage in the new energy market design

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After the publication of the Energy Union Strategy¹ and the Communication on New Energy Market Design², the European Commission is about to propose in 2016 a package of legislative measures that could reshape the way European energy market works. In this package, battery energy storage (BES) might finally see recognized its importance and its potential to empower citizens to take an active role in the energy transition, increase the necessary flexibility, favoring the deployment of renewables and the stability of the grid.

To fully deploy renewables

and untap their potential to ensure a stable and secure energy supply, Europe needs to work to overcome the limits of renewables. Renewables are not a constant source of energy, and depend on unstable weather conditions. So far, the integration of renewables into the electricity grid has posed important challenges in terms of stability and continuous availability, and with the growth of the share of renewables these challenges will become more and more relevant.

Batteries can solve these problems storing energy from on-peak renewable energy and discharging it when it is more needed on central, de-central and off-grid situations. Moreover, batteries can also offer grid services like voltage control and frequency regulation, maintaining grid stability, offering flexibility services and security of supply. All four batteries technologies - lead, lithium, nickel, sodium - can provide distinctive and important functions to grid operators and have potential for significant further technological and economic improvement.

The consultation process on new market design and the debate on the Energy Union are thus important steps for the creation of a more balanced EU energy market. It is fundamental to take into account the contribution offered by new technologies

such as battery energy storage, removing legislative barriers and creating the correct incentives to modernize the energy market.

One of the key provisions of the new energy market design might be electricity prices reflecting scarcity. This would represent an important market signal for demand-response, smart appliances (including electric vehicles) and storage solutions like batteries. Flexible electricity prices would stimulate energy efficient and smart solutions, now hampered by regulated prices. Besides, it will be important that electricity prices will reflect transmission costs: storage solutions could be used for transmission congestion relief, deferring expensive investments and extending the life of the existing transmission infrastructures. Transmission costs integrated in the final cost of electricity would allow a fair market selection of the most efficient solution.

A general problem of storage in the current energy market is the lack of an agreed definition of energy storage at EU level. On the practical level, this has two direct consequences: first of all, since most of the EU countries consider storage as a generation facility, it is not clear if Transmission and Distribution System Operators (TSOs and DSOs) are allowed to own storage facilities. This



uncertainty is clearly a formidable barrier for investments of TSOs and DSOs, the actors that could use storage to better balance and stabilize the grid. Defining energy storage as a separate asset would improve market conditions for take-up of market technologies, and should work towards enabling utilities to own and operate those technologies within their asset portfolio.

Additionally, energy storage is today often defined as generating facility, but in some cases storage systems are also treated as end consumers, resulting in double fee imposition. Direct additional taxation on energy stored for self-consumption should also be avoided, as it represents a strong dis-incentive to the deployment of energy storage.

A proper, well-functioning balancing market should also be a key element of the new energy market design. One of the problems faced by storage is the insufficient or non-existing reward of ancillary services such as frequency regulation and voltage control, an important part of the business case for storage. It will be fundamental for the European Commission to promote a regulatory framework

able to include rewards for grid services and the overall capacity of energy storage to stabilize quality and supply for renewables generation. The balancing market should also allow the participation of small and individual producers or aggregators, as well as of any other actor in the energy market. An appropriate regulatory framework for aggregators is also needed to allow their participation to the market.

Overall, it will be of capital importance to remove unnecessary barriers to tools ensuring the proper integration of renewables. For instance, curtailment of renewable energy is simply energy waste. Curtailment of renewable energy should always be avoided where and when possible. Storage systems can substantially reduce curtailment rates absorbing renewable energy when needed. Grid constraints naturally preventing renewable energy from having priority of dispatch could be addressed through the deployment of BES.

The new energy system will see the presence of new actors, the deployment of distributed generation and increasing production of instable renewable

energy. Designing a legislative and regulatory system able to properly address these challenges will not be an easy task for the Commission. Nevertheless, it will be fundamental to take advantage of existing tools and systems able to facilitate the transition to the new energy system. In this context, batteries are part of the solution and will play an important role in the European energy system if the barriers to their deployment will be removed. ●

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