

## Electricity Storage: From technology to market solution

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### Introduction by Marc Van den Bosch, general manager FEBEG

Welcome ladies and gentlemen to this event dedicated to electricity storage.

In the beginning of the week we were doubting whether to go on with the event or to postpone it. I think we took the right decision not only because we saw that yesterday afternoon the alarm level was reduced yesterday to level 3 but of course with presence of you all today.

As a result of the alarm level this week, our foreign speakers will join us by video conference. But let's consider this as part of the digitization where the sector is going through.

Storage is a hot item! If you would not be convinced yet ... just take a look at recent media coverage on the topic. The Belgian media mainly pay attention to battery technology and pumped hydro storage. And this is not a surprise. Experts say that these two technologies will be the most important storage technologies in the near future. Of course, pumped hydro is not a new technology and is already implemented on a large scale throughout Europe. In Norway, for example, the total storage capacity is 85 TWh which is more or less equal to the total Belgian electricity consumption). Batteries are also known for quite a long time, but the search for the cheap, light and efficient battery is still ongoing. To this end, the importance of cost reduction by economies of scale is not to be underestimated: see, for example, the planned Gigafactory of Tesla in Nevada.

But, let's have a look at the situation closer to home. In Belgium, storage technologies, can or will be part of the future, and with this event, we wish to explore and discuss the way forward.

This afternoon, we will not focus too much on the technical aspects and challenges of storage. Storage technology is a very large scientific and technological subject, on which we could spend several days. But this is not the objective of this event. Market parties – producers and suppliers – as we are, our main interest lies in the implementation of storage solutions in a Belgian context. Of course, exactly the specific technical characteristics of the different technologies will be determining factors for their application. Crucial characteristics are for example, the power of the storage option (from a few kW to even GW), the charging and discharging time (over a few seconds or minutes up to days and weeks), the reaction speed and the energy density.

Where could electricity storage technologies be applied? First of all, a storage facility can be installed nearby an energy producer, most probably a renewable energy producer (*show first part of slide*). Storage facilities can also be directly connected to the grid without having a link with a particular generation or consumption site. Finally, storage can be at the consumers' side, connected to the grid. In the particular case of a prosumer, the storage appliance will mainly charge power from own production units such as PV.

Where and when storage will actually develop is not clear, but this will for sure highly depend on taxes, tariffs and support policies as they differ significantly between these 3 types of applications and have a major impact on the viability of the different business cases.

Let's illustrate the impact of policy with the business case of a prosumer: in Belgium almost all prosumers have net energy metering ... which implies that the supplier is in fact offering a virtual battery over the year by uptaking surplus production in summer and supplying extra and more expensive power to the prosumer in winter time! Off course, the business case for batteries for the prosumer will be negative because the supplier is now bearing the cost.

Storage can deliver different services, for both regulated as non-regulated parties. But we should be aware that other technologies might be able to deliver these same services as well. We strongly believe in innovation and

optimization driven by competition; we're convinced that market functioning will result in the economic most efficient solution to a given problem. That's exactly why a level playing field between technologies is so crucial. Markets will value storage in competition with other technologies, and will deliver the most economical solution. Storage should therefore be a commercial activity in the liberalized market, like generation, the delivery of system services or the supply business are.

Electric vehicles, under the form of a battery electric vehicle or a plug-in hybrid electric vehicle, have a somewhat special place in the debate on storage. First of all an EV is a simple consumer of electricity. But when EV's start to communicate and interact in an intelligent way with the grid, the concept of vehicle-to-grid is coming into play. Our key note speaker, prof. Van Mierlo will address this topic later on.

Also on our program today are the presentations of some of the FEBEG members who will share with us some insights on their current activities, ranging from research to demonstration and commercial storage projects, both for own use or oriented to different kind of customers. At the end of the afternoon, we will have a debate between some main stakeholders. But first of all ..., we're very pleased that the Flemish minister of Energy has accepted our invitation to give us an update on her views and on the upcoming initiatives with respect to this important topic. Please welcome Mrs. Annemie Turtelboom. We have in this a premiere. Minister Turtelboom is the first regional minister to speech at a FEBEG event.

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- Power: can reach from a few kW (e.g. in end user applications like residential PV) to MW (large scale generation plants) up to hundreds of MW or even GW for centralised bulk energy storage devices.

- Time: storage may perform charge or discharge functions over a few seconds or minutes (e.g. for grid services like frequency stabilisation), minutes to a few hours (smoothing or time shift of renewable generation), up to days and weeks (balancing long term fluctuations in generation and consumption). Multiplying power by time delivers the capacity or energy content of the storage.