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Article

"Continued and broad-based support for research and development of power storage needed": Seven questions to Wolf-Peter Schill

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Dr. Wolf-Peter Schill, Research Associate in the Department of Energy, Transportation, Environment at DIW Berlin

SEVEN QUESTIONS TO WOLF-PETER SCHILL

»Continued and Broad-Based Support for Research and Development of Power Storage Needed«

1. Dr. Schill, how important is power storage for Germany's energy transition? In the course of the energy transition, fluctuating renewable energy is expanded significantly. The power generation capacities of renewables vary according to the weather, time of day, and season. Electricity storage facilities can help offset these temporary fluctuations and bring power generation in line with demand. They can also compensate for deviations from generation forecasts within a very short period of time.
2. To what extent are we already dependent on power storage? We currently have a good six gigawatts of installed pumped hydro storage capacity in Germany and an additional three gigawatts abroad which are directly connected to Germany's transmission grid. At present, there is no shortage of storage and, also in the immediate future, power storage facilities will not create any congestion for the energy transition. Obviously, however, power storage will become increasingly important if we continue to expand the share of electricity generated from renewables and move toward complete reliance on renewable energy sources.
3. From what stage of the expansion of renewables does creating additional storage capacity become unavoidable? This cannot really be answered in general terms. Storage requirements heavily depend on the context. They are not only contingent on the share of renewable energy but also on the cost development of the various types of storage. Requirements also depend on the overall system, particularly the availability and cost of other flexibility options.
4. What other options are available to increase the flexibility of the power system? There are a variety of other flexibility options which can perform the same or at least a very similar function to power storage. These include

shifting electric load to certain hours of the day, more flexible power generation using biomass or natural gas, for example, and also flexible electricity consumption in other sectors. The latter is also known as "power-to-X," which means that electricity flows from the grid to other areas of use, such as the transport or heating sectors.

5. Which of these flexibility options are the most efficient? A cost-effective system will always provide different options. A number of studies strongly suggest that a wider interconnection enabling European exchange of electricity is a very cost-effective option. This option essentially has two effects. First, it results in a blending of demand and feed-in profiles of renewable energy sources in the different countries, creating smoother profiles on the whole. Second, it can be linked in with other existing flexibility options such as hydro storage in the Alps region. International balancing of electricity would definitely play an important role in achieving a cost-effective mix but we should not rely exclusively on this option.
6. What are the different types of power storage and which of these are worth considering for Germany? Germany has already developed substantial capacity of pumped hydro storage technology, which has been established for many years, and could further expand this capacity in the future. To meet the demand for short-term storage, different battery technologies could play an important role. For long-term storage, power-to-gas with subsequent reconversion might prove to be a promising option.
7. How should policy-makers pave the way for future power storage? First, policies should pave the way for fair competition with regard to power storage and other flexibility options. This includes non-discriminatory access to all relevant segments of the electricity market, particularly operating reserves. Second, we need continued and broad-based support for research, development and demonstration of different storage technologies.

Interview by Erich Wittenberg



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