Poland grid stabilization

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Poland is undergoing an ambitious energy transition, aligning with broader European goals to reduce greenhouse gas emissions and substantially increase the share of renewable energy sources (RES) in its national energy mix. A main aspect of this shift involves modernising and expanding its electricity transmission and distribution networks. Over the coming five to ten years, Poland anticipates major advancements in this sector, driven by expected increasing energy demand due to sector coupling and the need to adapt to a rapidly evolving energy landscape.

As renewable energy generation grows, flexible demand side management systems become inevitable. The Alternative Fuels Infrastructure Regulation (AFIR) mandates that EU member states, including Poland, must significantly boost charging station capacity. In Poland, charging capacity is expected to grow from 230 MW currently to over 342 MW by the end of 2025, and to 1,515 MW by 2030. Distribution networks must not only meet rising demand but also ensure a stable energy supply during peak charging periods.

The implementation of smart grid solutions will be a pivotal aspect of developing Poland’s distribution networks from 2025 to 2030. Smart grids facilitate two-way communication between energy suppliers and consumers, enabling more flexible supply and demand management. Real-time monitoring will improve response capabilities to network disruptions, optimise energy flows, and increase RES utilization efficiency.

Furthermore, Poland’s TSO PSE has earmarked PLN 64.3 billion for infrastructure modernisation in its 10-year network development plan spanning from 2025 to 2034 (10YNDP) vestment efforts will need to target not only new infrastructure but also optimisation of existing grids. This approach includes advancing mechanisms for cable pooling, allowing varied renewable energy sources with supplementing production profiles to share network infrastructure. Hybrid RES projects are rapidly emerging in Poland.

Polish grid operator Polskie Sieci Elektroenergetyczne (PSE) has announced its third disconnection of renewable energy capacity this year. This time it has initiated the reduction of 1,201 MW to 1,877 MW of PV in response to oversupply.

"Due to the oversupply of generation in the National Power System and the need to restore the regulatory capabilities of the National Power System, PSE is introducing a non-market reduction in the generation of

photovoltaic sources on March 26, 2024," PSE said in a brief statement this week.

On Tuesday morning of this week, around 10 am, photovoltaics produced and fed 9.7 GWh of electricity into the grid, according to the energy srat.pl portal. This represented around 45% of the total electricity production in the country, making solar the nation"s biggest energy source, followed by coal at around 27%.

In April 2023, PSE disconnected solar for the first time ever, as the nation"s rapidly expanding PV fleet had outpaced grid upgrades. It declared an official threat to grid security due to the oversupply of renewable energy, and ordered solar and wind facilities to disconnect temporarily.

“We need to invest some 500 billion zlotys ($126 billion) in transmission and distribution grids by 2040,” PSE Chief Executive Tomasz Sikorski said at the time, adding that the country needs to time grid upgrades so that they are finalized in sync with the growth of the nation"s renewable fleet.

The problem is that the coal plants are inflexible, but still needed in the evening. The solution is probably batteries. Perhaps more electric vehicles and dynamic pricing so they charge up from 11 till 2.