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Sweden saw extraordinary high spot prices during last summer, due to difficult power transmission from the north, where most of power generators are located, to the south of the country, where most of the demand is concentrated. According to Swedish PV association Svensk Solenergy, solar-plus-storage offers a quick and scalable solution to avoid expensive and slow grid improvements.

Sweden is currently suffering from energy shortages in its southern regions, which rely on net electricity imports from neighboring countries. This situation is not due to an overall lack of power capacity but to the fact that most of the power generation plants are located in the northern part of the country and that the existing grid infrastructure is not strong enough to transport electricity from the north to the south, where there is the largest power demand, in an effective manner.

According to the Swedish PV association, Svensk Solenergi, solar and batteries may compensate for the sharp imbalances in the electricity system and provide a quick and scalable solution to improve power supply, especially in urban areas. The association cites a report from European engineering consultancy company Sweco which describes how power prices rocketed on the Swedish spot market during the last summer.

“Although both wind and hydropower production in northern Sweden were high, electricity production in southern Sweden was low, which meant that an unusual amount of electricity was produced far from where it was consumed,” the Sweco experts said. According to them, technical challenges such as voltage stability and short-circuit effect forced the electricity transmission system operator, Svenska kraftn?t (Svk), to reduce the transmission capacity which was available on the spot market from northern to southern Sweden.

As a result, the country experienced the largest differences in electricity prices between different regions since it was divided into four electricity areas in 2011. Another undesired effect was that the oil-fired, thermal Karlshamn Power Station had to be activated during the summer. Power reserve is usually procured only in winter. Furthermore, Svk was forced to enter into bilateral agreements with other power producers including the Ringhals 1 nuclear reactor which is owned 70% by Swedish utility Vattenfall and 30% by German energy company Uniper.

According to Sweco, until the end of June, the hourly spot price remained below SEK800/MWh ($95.30) in all electricity areas. During the summer, however, spot prices in southern Sweden exceeded SEK1,000/MWh. June 25 was the day when the spot price exceeded SEK2000/MWh in the SE3 and SE4 electricity areas, which are located in the central and southern parts of Sweden, respectively, while the spot price in SE1 and SE2 areas, both located in the north, was, instead, at exceptionally low levels of around SEK100/MWh.

On June 25, PV was able to cover around 17% of total electricity generation in the SE4 electricity area, which is the southernmost in the country, during the hours when electricity prices were at their highest, in the middle

of the day. The national record for solar so far this year was when it accounted for 3.8% of the country"s total electricity production.

According to Svensk Solenergi, solar combined with storage can help improve power supply during stressful situations in the future. “For 18 hours this summer, the spot price for electricity in southern Sweden was over SEK1/kWh,” the association"s CEO, Anna Werner, said. “Strengthening the electricity grid is important but takes a long time, while solar and batteries are growing rapidly and can therefore be an important, complementary part of the solution.”

The number of newly connected solar PV installations in 2024 in Sweden is back at the same level as in 2022, but far below the record year of 2023, according to new monthly statistics from Svensk Solenergi.