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IENE Comment

Negative Electricity Prices: the EU's Big Energy Headache

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*By Irina Slav**

It is spring again in Europe, winds are abundant and so is sunshine. Wind and solar installations are generating a lot of electricity. As a result, negative electricity prices are back and they are back for an extended series of frequent visits, likely breaking another record this year.

As a taste of things to come as the weather gets sunnier and windier, last Monday Germany saw intraday electricity prices of a negative 323.96 euro per MWh in the afternoon as wind power covered 80% of the country's load—on a market that was already oversupplied because solar had kicked in as well. The negative prices came despite "massive" curtailment, meaning the German electricity market was oversupplied despite many wind and solar installations being ordered to switch off to balance the grid.

It gets even worse for generators operating weather-dependent capacity, however. Negative prices on the intraday market are only part of the equation. The other part comprises so-called imbalance fees that generators must pay when they are producing too much electricity compared to their contracted amount with the grid operator. On Easter Monday, German imbalance fees reached 4,631.99 a megawatt-hour.

The problem with negative electricity prices in Europe is not new but it was studiously ignored until it could no longer be ignored. The first alarm bells began ringing three years ago as grid operators were forced to contend with massive new capacity whose output depended on the weather and could swing wildly in a matter of hours.

According to reports from 2025, in 2024 there were 8,645 voltage surges in Europe, per data from ENTSO-E, the EU grid operators' association. The figure represents a 2,000% increase from 2015, when there were 34 surges. Of course, the most famous voltage surge came after that data, in April, in Spain and Portugal. The cure: curtailment and more gas generation. The problem with that cure: wind and solar operators lose money again. For now, that problem remains unsolvable, though not for lack of trying.

In February this year, media reported that EU leaders were planning to meet in March to discuss what could be done to prevent negative electricity prices, which soured investment sentiment about new wind and solar additions.

Needless to say, by March, EU leaders had much bigger energy problems as the war between the U.S. and Israel, and Iran threatened oil and gas supply security. Unsurprisingly, what the EU leadership decided to do about that crisis was to campaign for even more wind and solar—despite the return of negative prices and despite the exorbitant imbalance costs that the operators of existing installations.

The inherent paradox of the idea that replacing baseload generation with wind and solar would lead to lower energy prices for consumers therefore stands in stark relief in Europe. It is true that wind and solar electricity can be cheap – so cheap, in fact, that its producers need to pay instead of getting paid for supplying it. Yet this is a problem for these producers, because they are business enterprises, not nonprofits. Subsidies cannot help cover all the imbalance costs and curtailment costs they are incurring due to the sheer amount of capacity that needs to be balanced or curtailed. Raising subsidies would mean raising the total cost of wind and solar even higher, and it is already high, when backup generation costs are factored in.

There is, of course, the option of a battery storage capacity buildout. However, the fact this buildout has yet to materialize suggests costs are a problematic for battery storage as well. It is true the cost of storage capacity has fallen significantly. Yet it is still too high to make a massive buildout economic from all perspectives, including that of electricity consumers.

For a case study in how the transition actually works on a large scale, we need look no further than China. Celebrated as the ultimate world champion in wind, solar, and battery storage, China recently had to raise its maximum curtailment threshold to 10% from 5% because at 5% maximum curtailment wind and solar generators had to pay higher imbalance costs—so they grew reluctant to expand capacity. Battery storage could not help remedy the situation.

Europe is having a problem with its energy security and building even more wind and solar capacity will not solve this problem for the above reasons plus the additional problem of grid upgrade needs that would cost billions of euro at a time when most

European economies are already struggling and about to struggle even more as oil and gas prices on international markets soar. Yet letting markets cap new additions of wind and solar might be a start to the solution of that problem. At the very least, it will prevent the further increase in negative price occurrences and lighten operators' imbalance cost load.

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