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The Transition Problem No One Saw Coming

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*By Irina Slav**

The European Union has a target of 750 GW in solar power by 2030 under its Solar Strategy. Most members of the bloc are working hard to hit that target—and by doing this, they are dooming it to failure.

That coming failure is a side effect of solar power capacity growth that would stump future growth unless addressed. Said effect is, of course, negative electricity prices due to a massive imbalance between supply of electricity from solar installations and demand for electricity. Solar systems peak in terms of output around midday, which happens to be trough demand time. As a result, generators are forced to pay to grid operators to take their electricity.

Negative electricity prices have become an increasingly frequent occurrence in the EU, with specialized media reporting as early as April that such prices were being witnessed in nearly all EU member states, including solar power champions Spain and Portugal where there had previously been no incidence of negative prices.

The problem could have been foreseen. It is, after all, basic economics that the more excess supply of a commodity there is on the market, the lower its price would fall, until eventually it drops below zero because supply has become uncontrollable. Yet no one seems to have given the possibility of excess supply any thought—even as climate advocates and green MEPs argued in favour of solar power buildout as a way of making all electricity cheaper.

This is where the second problem comes in. Because negative electricity prices hurt solar power generators and discourage further investments in capacity, governments would need to step up their subsidy support for the sector, which usually takes the form of guaranteed minimum prices for solar electricity. And these minimum prices tend to make all electricity costlier for the end consumer as every EU citizen has already noticed with monthly bills rising in unison with solar generation capacity—as the latter leads to excess output when no one needs it.

The negative price conundrum could reach catastrophic proportions before too long and by catastrophic here I mean proportions that would effectively sap future development of utility-scale solar and even some rooftop solar. Any solar installations aimed at generating profits for their owners by selling the electricity to the grid are in jeopardy and so are the EU's solar targets. On the other hand, the installations put up to save money by reducing a household's dependence on the grid and grid prices would likely continue growing.

Essentially, this means that the market would sort out what solar is viable and what isn't. The problem is this sorting out would reveal most solar as unviable in a market environment—and that would be completely unacceptable for the target-setters in Brussels. One cannot help but wonder if the people who set the targets based them on any realistic expectations or they simply liked the number 750 followed by GW and put it there as target, completely ignoring market mechanisms that even the most transition-minded government cannot override.

The solution to the problem put out by advocates is battery storage. It is the ultimate solution to the whole intermittency problem that both solar and wind have—and in both cases it is a solution in theory only. For years battery storages has been touted as the Holy Grail of the energy transition, and for years battery storage has proven to only be a workable solution in an extremely limited capacity.

This is clear enough from the fact that negative electricity prices exist at all on the EU market and that they are becoming more and more frequent. If battery storage worked and could be built out as quickly and as cheaply as advertised, it would already be part of the energy landscape. The reason it isn't is that battery storage is, quite simply, expensive to build at the scale it would be needed to eliminate the risk of negative electricity prices. And this is without factoring in the fire hazard aspect.

The transition narrative promised cheap, abundant, and reliable energy. The only part of the statement where there is some truth is with regard to abundance. Indeed, solar power output is abundant over certain periods during the day. However, since those periods happen to be the hours of least demand, this abundance has no significance—except for the generators whose profits evaporate as they are forced to pay grid operators to take in their supply—or flip the switch on their installations to save some money.

It is an unsustainable situation and battery storage will not fix it, even if suddenly all European governments find the money to build out enough battery arrays to cover their solar storage needs. That's because in addition to its high cost, battery storage also takes up space—and so does solar. The energy density of both solar and batteries is another issue that is not being talks about but should be.

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