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Europe faces an unusual problem: ultra-cheap energy

The continent is failing to adapt to a renewables boom

PHOTOGRAPH: REUTERS

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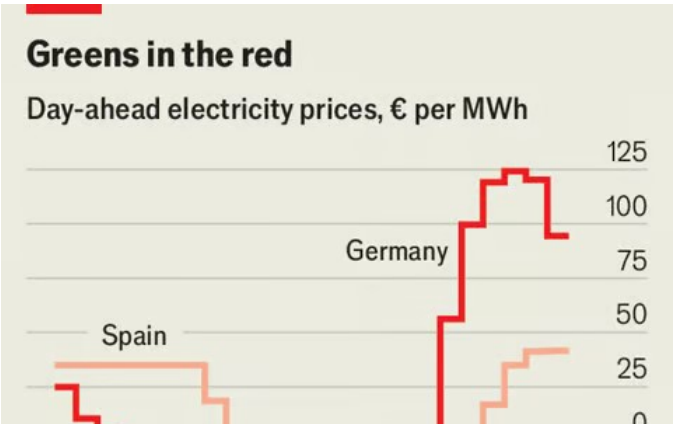
OWING TO THE rapid spread of solar power, Spanish energy is increasingly cheap. Between 11am and 7pm, the sunniest hours in a sunny country, prices often loiter near zero on wholesale markets (see chart). Even in Germany, which by no reasonable definition is a sunny country, but which has plenty of wind, wholesale prices were negative in 301 of the 8,760 tradable hours last year.

As solar panels and wind farms take over Europe, the question facing the continent's policymakers is what to do with all the power they produce. Ultra-low—and indeed negative—prices suggest that it is not being put to good use at present, reflecting failures in both infrastructure and regulation. There are three main ways that firms and regulators could establish a more efficient market: sending energy to areas where there is no surplus, shifting demand to hours when energy is plentiful, and storing energy as electricity, fuel or heat.



The need to make such shifts will only become more pressing. Europe's renewables boom is bigger than elsewhere in the rich world. Last year the continent installed roughly twice as much fresh capacity as America, with 56 gigawatts (GW) of new solar power

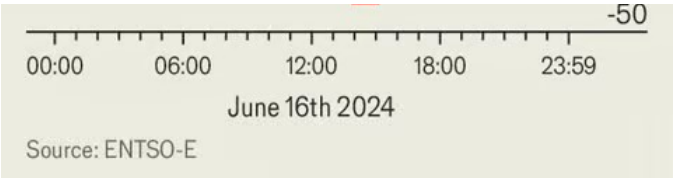


CHART: THE ECONOMIST

the latest figures suggest will be exceeded this year. By 2030, 43% of the EU's total energy consumption will have to come from renewables, according to the latest rules, up from 23% in 2022.

Sending energy to places without surpluses would require a better connected grid. ENTSO-E, a club of European grid operators, estimates that improved international links would ensure that 42 terawatt-hours a year of otherwise wasted electricity would be put to use in 2040. That is more than Denmark's current annual consumption. According to Bruegel, a think-tank, such a grid would also need 20-30% less storage and backup capacity.

The problem is that grid extensions take time and meet local opposition. As a result, energy firms have resorted to putting them underground, which raises costs. Extensions also prompt arguments. When a connection is established, the market with lower electricity prices will inevitably export power to the one with higher prices. Even if both sides benefit from the transaction overall, on one side the beneficiary may be electricity producers and on the other side it may be consumers, with the other group losing out in both places. On June 18th Sweden cancelled the Hansa PowerBridge, a 700-megawatt connection to Germany, over fears it would raise electricity prices for domestic consumers.

The next option for policymakers is to shift demand. This does not mean persuading everyone to take showers during their lunch breaks, when the sun is at its brightest. Instead, the idea is to move flexible sources of demand, such as electric-vehicle (EV) charging and district-heating buffers, into hours of abundant energy. Doing so requires smart meters that measure not only how much energy is used, but also when it is used, and which thus allow prices to vary accordingly. So far, however, countries are making slow progress installing these devices. Although almost everyone has a smart meter in Spain, hardly anyone does in Germany.

ready to transform surplus electricity into heat for as many as 20,000 households. It must pay full monthly network charges, even if it is employed only briefly, which makes it too costly to switch on most of the time. As a consequence, it often sits idle, even as local wind turbines are turned off to prevent the grid from overloading. Meanwhile, consumers face similar problems. They tend to pay network charges at fixed rates, regardless of when energy is taken from the grid. The EU is pushing member states and markets in a more flexible direction, but upgrading regulations, pricing methods and grid technology takes time.

Could better storage solve the problem? In Vantaa, Finland, the local energy company is about to dig a hole the size of 440 Olympic swimming pools into the bedrock beneath the town. This will be filled with water heated to 140°C, which will store 90 gigawatt-hours of heat, an amount sufficient to keep the town toasty for a year. Other firms are making greater use of batteries for shorter-term storage. Unfortunately, such schemes are once again hindered by existing energy-market structures. When it comes to things such as congestion management and frequency control, markets are typically built on the expectation that backup capacity will arrive from conventional gas-fired plants. “The efficient use of surplus electricity is not considered and not encouraged in Europe,” sighs Julian Jansen of Fluence, which makes energy-storage products.

With better incentives, policymakers would also be able to bring household batteries into play. Jochen Schwill of Spot My Energy, a startup, reckons that a German home with batteries might receive €600 ($650) a year if it was able to store energy for the grid. EVs could also play a part. They are, in essence, two devices in one: a car and a battery. Octopus, a British energy provider, recently rolled out a tariff that offers free charging if the firm can decide when the car charges and sometimes feed energy from its battery into the grid. Used more widely, such tariffs would both help soak up surplus energy and by cutting costs make EVs a more attractive purchase.

May the “capture rate” of German solar panels—the share of the average daily energy price that they earned—dropped to 50%, down from 80% three years earlier, according to calculations by Julien Jomaux, an energy consultant. Ultra-cheap power is something to be celebrated. But as Europe is now discovering, it can be tough to exploit. ■

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