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IENE Comment

Blackout

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On Monday, around noon, the Iberian Peninsula blacked out. Everyday life ground to a halt, including several hospitals, which, although they had backup generators, did not have backup water supply. As some of us know from bitter experience, once the power's out, so's the water because the water reaches us mostly courtesy of electrically-powered pumps. When the power goes down, the water goes down.

Trains stopped. Planes were grounded. Ice cream melted in the vats. Worst of all, people got stuck in hair salons with unfinished haircuts. One might say, if one is dramatically inclined, that Spain and Portugal got a taste of the Apocalypse in an electrified world.

What actually happened, per Reuters: "A massive blackout that hit most of the Iberian Peninsula on Monday was due to a sudden, large drop in power supply that caused the grid interconnection between Spain and France to trip, according to Spanish grid operator REE.

The network lost 15 gigawatts of electricity generation in five seconds at around 1033 GMT, the Energy Ministry said on Monday evening, without explaining the reason for the loss."

Almost 24 hours later, the cause is still unclear, at least according to official statements. On Monday, Portugal's grid operator said it was Spain's fault, of sorts, attributing the blackout to "a rare atmospheric phenomenon" called "induced atmospheric vibration", which it described as, per the above-linked BBC live coverage stream as follows: "due to extreme temperature variations in the interior of Spain, there were anomalous oscillations in the very high voltage lines (400 KV), a phenomenon known as 'induced atmospheric vibration'."

Now, let's see. It's late April in Europe. Mornings, at least here, in Bulgaria, are rather cool but by 10 am the sun has spoken and the air has warmed. How much of an extreme temperature change could occur in a such a sudden manner, in late morning, as to cause the loss of 15 GW of power generation in 5 seconds? I don't know. Neither do the authorities, it seems, and neither do the grid operators. But we all know what's going to happen, right? They'll grab the "rare atmospheric phenomenon" and run with it, blaming the blackout on climate change and using it as argument to build even more solar in this sunniest part of Europe.

Speaking of, here's what friend and fellow resistance member David Blackmon wrote yesterday: April 16, 2025: Spain Runs 100% on Renewable Power. April 28: Blackouts. And

here's what Bloomberg wrote around the same time Reuters first reported the blackout. The universe does love irony: European Power Prices Drop Far Below Zero as Solar Output Surges. The story focuses on this last weekend when electricity prices in Belgium, for instance, dropped to an amazing -266 euro per MWh. So, Europe got a lot of sun over the weekend, panels produced a lot of electricity but sadly, people did not rush to use that electricity. That's a bummer but there appears to be an even bigger bummer. It's called inertia.

Energy consultant Kathryn Porter was the first to mention it, at least on my timeline: "Spain has been worrying about grid stability due to low inertia particularly at lunchtime. Low inertia makes the grid less stable and it becomes harder for system operators to respond to grid faults leading to cascading blackouts. Unless this is a terrorist attack of some sort I'd say low inertia was a factor in the extent of the outage," she wrote on X. But Kathryn Porter is no fan of wind and solar. She's from the Dark Side. Let's hear it from someone greener.

Javier Blas of Bloomberg had this to say about the state of his native Spain's grid: "Before the outage hit, Spain was running its grid with very little dispatchable spinning generation, and therefore no much inertia. Solar PV/thermal + wind: ~78% Nuclear: 11.5% Co-generation: 5% Gas-fired: ~3% (less than 1GW) Snapshot at 12.30pm local time (outage was 12.35pm)"

Then I came across this paper from 2020: Future low-inertia power systems: Requirements, issues, and solutions - A review. You would never believe what the paper says so I'll quote straight from it.

Quote 1: "Photovoltaic (PV) arrays require power electronic dc–ac inverters to integrate with the grid and do not offer an inertial response to a grid, and wind turbines need variable frequency ac – dc – ac converters, which decouple the wind turbine inertia from the grid."

What's an inertial response? The ability of power generators to respond to imbalances between supply and demand for electricity in the blink of an eye if not less. Coal, gas, and nuclear can do it. Wind and solar can't. Honestly, it's complicated enough to get the wind and solar electricity into the grid as it is, let alone rely on them to respond to fluctuations in demand.

Quote 2: "The reduced inertia in the power system leads to **an increase in the rate of change of frequency (ROCOF) and frequency deviations in a very short time,** under power imbalances that substantially affect the frequency stability of the system." I just randomly bolded a section of that sentence with no ulterior motives whatsoever.

Meredith Angwin warned about this in her masterpiece "Shorting the Grid". She also wrote an article with the gist of it. Robert Bryce reported there's a pretty good chance it was solar

that tripped the Iberian grids. John Kemp also detailed the problems — and the importance of inertia. But I guarantee you the authorities, the grid operators, and anyone in an official capacity will blame climate change. The truth is simply way too inconvenient.

Others warned about it, too. In this piece from 2021, I related reports of one smaller-scale blackout that highlighted the problem but, of course, no one heeded the warnings. Here's one final quote, if you can't be bothered to read the whole thing:

"Utilities know about the problem. "It is not a question about if a blackout in some European regions will happen, it is only a question of when it will happen," Stefan Zach, head of communication at Austrian utility EVN, told Bloomberg. "A blackout might happen even in countries with high standards in electricity grid security.""

P.S. Wind and solar also suck during grid restart after a blackout. And the restart itself seems to be such a complicated affair the fact that electrical people managed to restore most of it so (relatively) fast is a monumental accomplishment.

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