

'Baseload is Poison' and 5 Other Lessons from Germany's Energy Transition*

Baseload power is not the answer to the variability of renewable energy, a German energy official said Friday, and energy storage may not be the answer either. Germany has achieved moments in its *Energiewende*, or Energy Transition, in which renewables met 100 percent of demand without the aid of baseload power or batteries, said Thorsten Herdan, a director general for energy policy at the German Federal Ministry for Economic Affairs and Energy. Germany was able to do that, he argued, because of its system's flexibility.

1. Flexibility Trumps Baseload

"What we need for this fluctuating renewable energy in the electricity mix is not baseload. Baseload is poison for our electricity transition in Germany," Herdan said in a briefing at the Dirksen Senate Office Building in Washington, D.C. "What you need is flexibility, because the sun is shining and then you have PV production, wind is blowing and you have wind production. So it's not according to demand, it's according to weather conditions, which means they are there in any case and then you need to have flexibility to fill the gap."

2. Flexibility Trumps Storage

Herdan appeared in a briefing on Germany's Energy Transition hosted by the Environmental and Energy Study Institute. Asked whether an energy transition like Germany's will increase the demand for energy storage, Herdan said, "I don't know whether the demand for storage will increase. What I know is the demand for flexibility will increase, will increase dramatically... and if storage proves to be the cheapest flexibility, and the market chooses storage, then of course storage will increase. "It's always coming down to flexibility. That's what we need and storage is one sort of that."

3. Flexibility Can Be Geographic

Energy storage is not necessarily the cheapest form of flexibility. Germany is building transmission lines into Norway so the two countries can exchange electricity between Germany's northern wind farms and Norway's 937 hydropower stations.

4. Markets Should Be Transparent

To manage flexibility, electricity providers need real-time information about electricity production and demand, Herdan said, and that information should also include the price for the various forms of flexibility.

"All you have to do is create a market, an electricity market, where prices tell the truth," he said.

5. Flexibility Provides Reliability

Germany moved from almost no renewable energy in the 1990s to 37 percent today—its single largest block of power, almost all of it generated from wind and solar photovoltaic. Anxieties about a loss of grid reliability have not materialized, Herdan said:

"The grid is extremely stable. We have grid disruption in a year of about 12 minutes. So, 12 minutes a year is effectively nothing," he said, citing Germany's average duration of electric supply disruption.

6. Powerful Price Signals Help

Germany has more than 100 Gigawatts of renewable capacity, more than enough to meet a demand that fluctuates between 40 and 85GW. One day in May, renewables were meeting 100 percent of demand, Herdan said, and the price of electricity dropped below zero.

"At the time the renewables were at 100 percent, the price went down and it was negative, so we had a negative price, and what we say is, fine, there is nothing bad in negative prices because that very clearly tells the other generators how to behave," he said. "That forced the generators, specifically the coal generators, to change their behavior, shut them down or reduce them or whatever is possible."

Herdan cautioned that Germany's example is not a model for every country. Germany has decided not to use nuclear power, for example, and few countries share that commitment.