Chart of the Week #2024-47

The German Duck Curve
Evolution of Germany's Mid-Summer Electricity Generation Resource Mix Comparing 2017 and 2024

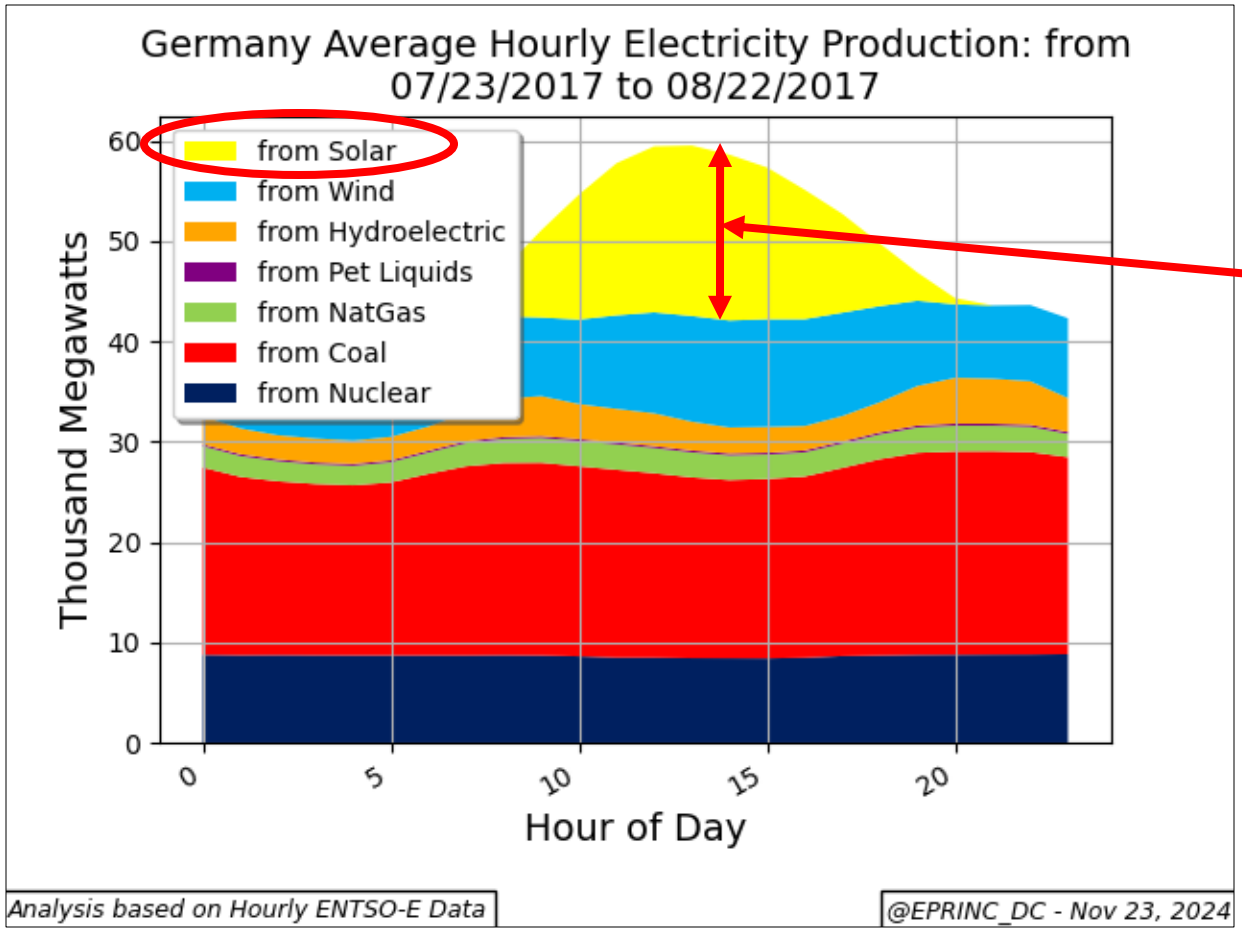
Max Pyziur

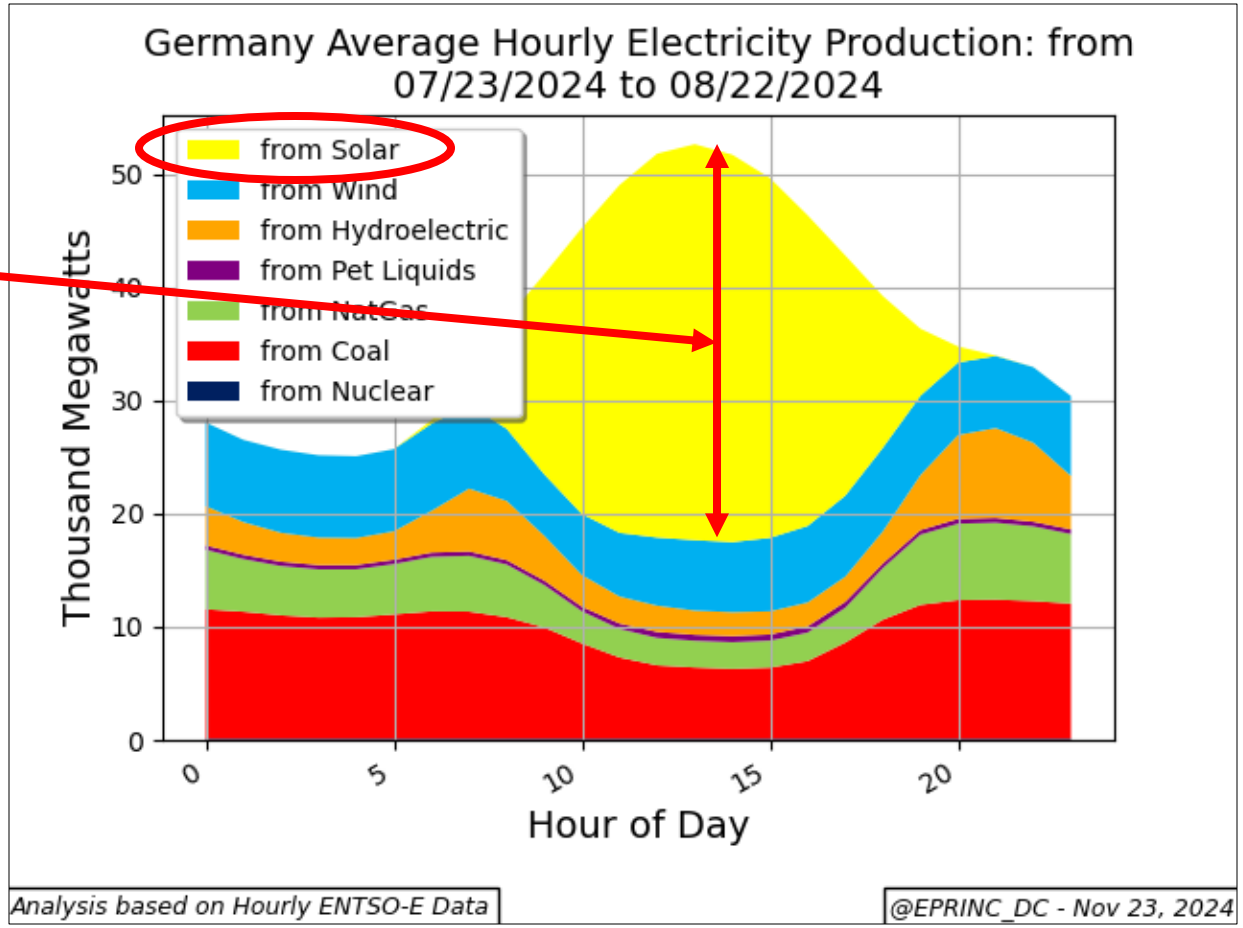
December 4, 2024

Washington, DC

The German Duck Curve
Evolution of Germany's *Mid-Summer* Electricity Generation Resource Mix: Comparing 2017and 2024

Energy Policy Research Foundation





The German Duck Curve
Evolution of Germany's Mid-Summer Electricity Generation Resource Mix: Comparing 2017and 2024

- Increasing reliance on the generation from utility-scale solar photovoltaic systems by state-level and national grids has resulted in a phenomenon known as the "Duck Curve."
- The Duck Curve designation was first noticeable and applied to the phenomenon in California. During peak midday summer generation, a distinctive bulge was graphed by solar electricity production that strongly displaced generation from other sources notably thermal and hydroelectric.
- With the increasing generation of solar electricity in Europe in countries such as Germany, as well as Spain and Italy, the Duck Curve phenomenon can be seen there also.
- In Germany during mid-summer 2024, total power load peaked at 50.5 GWs at noon. Of this, solar provided 11.7 GWs.
- By 8pm, net load declined to 45.3 MWs. Nevertheless, the complete drop off in solar generation in the late afternoon still required additional power from thermal and hydro resources. The total additional power from these resources from noon to 8pm required an average of 5.5 GWs (1.6 GWs from coal, 1.8 GWs from natural gas, and 1.93 from hydroelectric).
- It is important to note that Germany had substantial nuclear-powered capacity. In the summer of 2017, nuclear plants generated 9 GWs of power; in 2024, it was 200 MWs. However, following the April 2011 Fukushima nuclear plant accident, German policymakers, supported by public opinion, resolved to retire Germany's nuclear power plants by 2022. But with increasing unreliability and costliness of Germany's electricity, especially following Russia's 2022 escalation of aggression against Ukraine, policymakers have debated whether to retain some nuclear policy, delaying the shutdown of the last three units operating in Germany.
- This slide deck is available at: https://eprinc.org/chart-of-the-week/
- For more information on this chart, please contact Max Pyziur (maxp@eprinc.org).