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Check: No Electrification Without Nuclear



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*By Irina Slav **

The European Commission in July announced plans to turn Europe into the world's first "electro-powered" continent by boosting the share of electricity in final energy demand to 46% from 23% currently. This lofty goal, however, has little chance of success without a substantial increase in nuclear power generation.

The motive for the electrification plan is simple enough: if EU countries produce more of their energy locally, they would need less imports, therefore achieving higher energy security. Since producing oil and gas locally is problematic from a political point of view, and there really isn't any great abundance of these across the EU, electricity is the no-brainer solution—as long as it is affordable and reliable. That's the hard part. That's the part where nuclear comes in.

Since 2015 and the Paris Agreement, the EU's top priority in electrification has been wind and solar — alternative energy sources that are advertised as low-carbon (if we exclude the energy inputs for their equipment production) and cheap (if we exclude grid balancing costs when panels and turbines do not generate). EU governments have doubled and tripled down on wind and solar, while either closing their nuclear reactors or literally neglecting them.

Germany is, of course, the most notorious example of the former approach. With the strongest anti-nuclear lobby in Europe, possibly the world, Germany shut down its last remaining reactors in 2023 to much fanfare from activists. Germany this month had to ask operators of coal and oil-fired power plants to be ready to start generating because the wind died down, as it tends to do in late November. This is perhaps the shortest cautionary tale in the world.

This same Germany that shut down its nuclear reactors seems to have no moral qualms about importing electricity from its neighbour France, which sources as much as 70% of its own electricity from nuclear power plants. However, France has been struggling with nuclear power output due to years and years of bad maintenance, which some critics have attributed to consecutive governments' deliberate shift from nuclear to wind and solar. Indeed, one analyst has pointed out that nuclear generation in France declined more than nuclear generation in Germany between the years of 2011 and 2023. But at least France is not shutting its reactors down.

Nuclear power was really pushed to the side over most of the past decade, but in the last couple of years it has staged a comeback as even the most vehement net-zero advocates, including the International Energy Agency, admitted that net zero would be impossible without nuclear. The reason is simple enough. If an economy is to be electrified, it needs baseload electricity. The only form of emission-free (if we exclude construction), baseload

electricity available is nuclear. Once this admission was made, the tide for nuclear started turning—except in Germany, of course.

Last week, Reuters reported that France's EDF was planning to start work on building six new nuclear reactors to replace some of its aging units. The information has yet to be officially confirmed but if it is, it would mark a big step in the right direction, as long as the EU approves it. In neighbouring Belgium, the Flemish Green party has dropped its opposition to nuclear, after the country's government last year abandoned its nuclear phase-out plans in recognition of the plain facts of physics noted above, namely, baseload and emissions. Hungary and Slovakia are building new reactors to reduce their dependence on energy imports. So is Poland. Nuclear is returning to Europe.

It will take time to boost the share of nuclear generation in the EU's total, of course. Perhaps the major drawback of nuclear energy is that building the power plant takes quite and while and despite everyone's best hopes, small modular reactors have yet to pass the test of the market in terms of both cost and reliability. The first of the new reactors in Europe are scheduled to come online in the late 2030s, which means the energy import dependence will continue for a while yet.

Even so, what many called the nuclear renaissance is underway, and not just in Europe as more and more countries acknowledge the limitations of weather-dependent forms of power generation. Those certainly appear cheaper from a simplistic point of view: put up the panels and watch them generate electricity without you lifting a finger. From a less simplistic point of view, however, electricity needs to be available on an on-demand basis, round the clock, without fluctuations caused by variations in solar irradiation or, in the case of wind turbines, wind speeds.

Gas, coal, and oil can all do that, but there is a price in the form of emissions. Nuclear can do that, too, at the cost of long construction times and the hypothetical risk of a reactor meltdown, made smaller than ever with modern reactor technology.

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