Germany's Energy Revolution ('Energiewende') is working

Nuclear phaseout made the renewable energy revolution possible

The Renewable Energy Act powers the renewable revolution

- Germany's Renewable Energy Act of 2000, amended several times since, was created to guarantee reliable investment conditions for producers of renewable energy and to ensure that the phaseout of nuclear power was replaced by renewable energy and not fossil fuels. This has enabled a continued growth in the renewable energy share of power consumption with some of the most generous subsidies for producers of solar and wind power – guaranteed prices or feed-in tariffs.

The German anti-nuclear movement enabled the green energy revolution

- The early rise of the German anti-nuclear movement in the 1970s – strengthened further after the direct experience of the radioactive fallout from the 1986 Chornobyl nuclear disaster – opened the way for the climate movement and the growing influence of the Green Party. This made it possible to introduce renewables, rather than rely on coal, as the alternative to nuclear power.

The nuclear phaseout cleared the way for the renewable boom

- Not building any new reactors as of 1990 and deciding gradually to close down the existing plants in 2000 opened the way for the renewable energy revolution. German power consumers would not so easily have accepted paying billions of euros to support new renewable technology, if there had not also been huge support for a nuclear phaseout.

Closing nuclear plants did not cause increased CO2 emissions

- From 2000 to 2014, renewables substituted for falling nuclear production and continue to do so. In fact, thanks to the surge of renewables enabled by the Energiewende, Germany cut its reliance on coal, despite a decision to phase out nuclear power. Solar and wind prices today are often lower than existing fossil fuel power. And as nuclear power more than halved, coal's contribution also fell and gas's did not rise. Renewables more than doubled.

Germany's greenhouse gas emissions remain on a downward trajectory

- Germany's greenhouse gas emissions have fallen 40.8% between 1990 and 2020 but went up slightly in year-on-year comparison on nine occasions, mostly when the country was going through a period of recovery after an economic crisis. In the energy sector, emissions have fallen by 53% since 1990 while the reduction has been less in other sectors, especially in transport.

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German electricity rates are higher but electric bills aren't

- Despite the fact that German consumers pay one of the highest electricity rates in Europe, German households pay about the same on their electricity bills as consumers in other industrialized countries as they are comparably more efficient and consume less electricity. For example, while Germans pay almost three times more per kilowatt hour of electricity than Americans, residential electricity use per capita in the United States is almost three times higher than in Germany.

Nuclear France imports electricity; Germany is a net exporter

- The French nuclear monopoly, and the country's reliance on electric heat, means it has to import power in winter, often from Germany. Its nuclear supply cannot meet demand but at the same time has stifled growth in renewable energy. The spikes in Germany's coal output have been driven by a favorable export market, not by domestic demand.

Renewable surcharges ended up benefitting everyone

- The German surcharge on electricity rates helped scale up and support domestic and global emerging renewable energy companies, many of them German. This helped lower the cost of the technology and, in the end, everyone benefitted, including German workers.

The renewable trajectory has remained on track despite setbacks

- When the Energiewende was legislated in 2000, the renewable share of the German power consumption market was just 6 percent. Wind, solar and other renewables covered 54% of Germany's power consumption in early 2022. Meanwhile, electricity sector emissions have been cut by half since 1990. Although previous legislation reduced subsidies for renewable energy, the current expansion plan will again support the industry and revise the new target for renewables to an 80% electricity share by 2030.

Germany's coal use declined despite the nuclear phaseout

- Germany has now committed to phasing out coal power by 2038 at the latest, and possibly as early as 2030, which would make the net zero target of 2045 achievable. Since 2000, when the nuclear phaseout began, the share of coal power in Germany's electricity generation has fallen from 43 percent in 2011 (when 7 nuclear plants went offline) to 23.4 percent in 2020. No large new coal plants have been planned or built since 2007.

Germany will ramp up renewables, not return to nuclear

- Over the long-term, Germany will ramp up renewables rather than reopen nuclear plants; will not keep its last three reactors running indefinitely; and will certainly not build new reactors. Goals include 115 gigawatts of installed onshore wind capacity and a total capacity of 215 GW of solar PV installations by 2030. Offshore wind capacity is to reach 70 GW by 2045.

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Renewables can stabilize, not jeopardize, the grid

- Offshore wind energy in Germany is now being used to stabilize the country's electricity system in case of grid fluctuations. Offshore wind turbines are among the most reliable renewable power technologies and have become economically competitive system stabilizers, previously the domain of conventional power plants.

Germany is preparing for the obsolescence of baseload

- Demand-side management, the expansion of grid infrastructure (including smart grid solutions) and, in the long-term, expanded storage capacities, are all being developed in Germany to replace conventional reliance on the "baseload" electricity provided by old-style large thermo-electric power plants such as nuclear and coal.

Germany's carbon struggles are in the transport sector

- The country's goal to achieve a 100% fossil-free economy is slowed by Germany's love affair with the car, an area entirely unrelated to – and uninfluenced by – a nuclear shutdown. The decarbonization of German vehicles is the next and most immediate challenge.

Renewables allow for collective ownership

- Much renewable capacity in Germany is deployed in a highly decentralized patchwork of small-scale facilities, a large share of which are owned by households, farmers and energy cooperatives, compared to a low percentage owned by utilities. This collective, small-scale ownership – and profit – significantly boosts public support for the Energiewende.

Renewables are a far bigger employer than nuclear

- By 2015, the German renewable energy industry supported 330,000 jobs. This number has dropped slightly since but is likely to boom again once the latest legislation re-stimulates the industry. Manufacturing production has performed better in Germany than in other large European countries (and better than in the US). Unemployment remains lower than in other European countries. The Energiewende has not harmed Germany industry.

These Talking Points are drawn from a number of sources but especially from research by **Kerstine Appunn**, *Clean Energy Wire;* **Nikos Tsafos**, *Center for Strategic and International Studies; and* **Ben Weale**r, *formerly with the Berlin Institute of Technology. References available upon request.*

Beyond Nuclear

7304 Carroll Avenue, #182
Takoma Park. MD 20912
Tel: 301.270.2209
info@beyondnuclear.org
BeyondNuclear.org
BeyondNuclearInternational.org

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