

The End of Energiewende, really?

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The distinguished German economist Heiner Flassbeck¹ has denounced important elements of the Energiewende². Energiewende is commonly known as the German government's multi-decade effort to transition to a low-carbon, renewable-based energy economy. The transition has four main objectives: increasing the share of renewables to at least 80% in electricity and 60% for total energy consumption, reducing greenhouse gas emissions by 80-95% (basis: 1990) by 2050, phasing out nuclear energy by 2022, and increasing energy efficiency significantly. Public participation in energy policy discussions and profit sharing are also encouraged by the government³.

Flassbeck affirms that a recent period of particularly low solar and wind activity for power production shows that Germany will never be able to rely on renewable energy, in spite of how much new capacity will be built in the future. He assures that an Energiewende relying primarily on solar and wind energy is not going to work in the long term; and that nuclear power and fossil fuels can not be ignored while people are told that electricity supplies will remain the same. Data collected by Agora Energiewende on power generation and demand in Germany from last December do not display encouraging results. At 3 pm on the 12th, for example, the total power demand was 69.0 GW, of which just 0.7 GW was provided by solar

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² Energy Post. (2017, January 10). 'The End of the Energiewende?' [WWW document] URL <http://energypost.eu/end-energiewende/> (visited 2017, February 13)

³ Christian Von Hirschhausen, 'The German "Energiewende" - An Introduction' *Economics of Energy & Environmental Policy*, 3.2, (2014), pp. 1-12

energy, 1.0 by onshore wind power and 0.4 by offshore power⁴. Flassbeck says that there is no need to be a scientist to realize the futility of this⁵.

In the assumption that today's solar and wind energy could be tripled by 2030, almost all required energy will be provided by these two sources under normal weather conditions. Flassbeck notes that this is an exceedingly optimistic scenario since current policy is slowing down the increase of renewable energy sources. Nevertheless, assuming that in 2030 there will be similar winter conditions to December 2016 and three times the number of solar panels and wind turbines (assuming current technologies), wind and solar power would then fulfill just 20% of the requirement⁶ if the demand does not grow. Flassbeck believes the opposite is what can be expected because of the increased generation due to electrically powered cars. Moreover, the saving of that much energy depends on the price of fossil energy to rise radically and the political compensation for the new distribution effects, both to be unlikely according to Flassbeck. With no nuclear power, at least 50 GW of power consumption⁷, and an enormously network of solar panels and wind turbines; Flassbeck states other means will be used such as coal, oil and gas. Flassbeck predicts Germany will end up with a catastrophic result 30 years after the start of the Energiewende. He hasn't been able to find Energiewende advocates who are willing to explain the aforementioned inconsistencies⁸. Thus, this article intends to do so.

I'd like to note that I do not agree with Flassbeck's conclusions at all and shortly I'll explain why. First of all, it's important to highlight that the Energiewende is not a sudden policy change; its trajectory began more than two decades ago. The institutional foundation of the Germany's energy transition has been established since 1990 with the introduction of a feed-in-tariff model for renewable energy sources. In subsequent years, rapidly introduced reforms and policy measures reinforced this model, thus paving the way towards a

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sustainable energy future. Hence, the Energiewende is the outcome of gradual, but intricately linked and coordinated policy changes⁹.

As mentioned above, the Energiewende aims to move to a renewable-based energy economy. That does not mean a solar-and-wind-energy-only-based economy, as Flassbeck was implying. There are other types of renewable energies such as: hydropower, geothermal, biomass, biofuels, tidal power, and hydrogen. Fortunately, within the EU, Germany is the leading biogas market. In 2015, almost two-thirds of EU's biogas plants were installed in Germany¹⁰. The country is the biggest producer of wood and, and wood is a great source of bioenergy; approximately, 40% of Germany timber production is used as a source of energy¹¹. Studies have shown that the share of bioenergy can be increased in the next few decades. Biomass is expected to make up nearly two-thirds of Germany's renewable energy consumption by 2020. Additionally, biogas is a crucial way of storing energy seasonally¹², in this way, Flassbeck is not going to have to worry about December 2016 winter conditions anymore. Furthermore, other storage options are being discussed such as: underground compressed air in natural caverns, pumped storage, flywheels and batteries. The Fraunhofer Institute for Solar Energy Systems indicates that the amount of storage needed is not correlated to the share of fluctuating renewable power by itself, but rather to the combination of fluctuating renewables and inflexible baseload power. Namely, the need for power storage can be reduced by decreasing baseload generation capacity, mainly lignite and nuclear plants¹³.

Germans have been aware that intermittent solar and wind power are incompatible with baseload power for years. To complement renewables, dispatchable power plants that can ramp up and down quickly are needed. In order to pay for such reserve generating capacity, the power market will need to be redesigned which is why Germany is talking about a capacity market and a strategic power reserve. The winter reserve is expected to be

⁹ Christoph H. Stefes, 'Energiewende: Critical Junctures and Path Dependencies Since 1990', in Friedbert W. Rüb (ed.), *Rapide Politikwechsel in der Bundesrepublik. Zeitschrift für Politik (ZfP) Sonderband* (Baden-Baden: Nomos, 2014)

¹⁰ Craig Morris, Martin Pehnt, *Energy Transition: The German Energiewende*, (Berlin: Heinrich Böll Stiftung, 2016)

¹¹ Ibid

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expanded from 2.5 to 4 GW¹⁴. The winter reserve comprises power plants that are needed in emergency cases, generally when power demand peaks during the winter. These plants receive compensation for their standby services but can not sell power otherwise¹⁵. This serve as another answer to Flassbeck's winter uncertainty.

Germany also has geothermal resources. The first geothermal power plant went into operation in 2003. As well, permits have already been granted for an additional 20 offshore wind farms within Germany's Exclusive Economic Zone in the North Sea along with three in the Baltic. Offshore wind farms provide more reliability since the wind on the open sea is more constant¹⁶. Other good reasons for Flassbeck to stop worrying about low wind activity periods.

In regards with nuclear phasing out, Germany can easily replace its nuclear capacity with electricity from renewables, power from natural gas turbines, lower consumption, demand management and the rest, in the meantime, with conventional power plants. Germans consider nuclear energy is unnecessarily risky, very expensive and no compatible with renewable energies¹⁷. On March 11, 2011, following a 9 magnitude earthquake, a 15-metre tsunami disabled the power supply and cooling of three Fukushima Daiichi reactors in Japan, causing a nuclear accident. The reactors were proved safe from earthquakes, but not tsunamis. There have been no deaths or cases of radiation, but over 100,000 people were evacuated from their homes and 1,000 died from maintaining the evacuation beyond a week¹⁸. In Berlin, around 90,000 people took the streets to protest against nuclear power¹⁹. On March 14, of the same year, the closure of Germany's seven oldest nuclear plants was announced and this would be followed by phasing out nuclear entirely by 2022²⁰. Eleven EU member states do not rely on nuclear power and the majority of them have committed themselves to phase it out²¹.

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¹⁸ World Nuclear Association. (2017, January). 'Fukushima Accident' [WWW document] URL <http://www.world-nuclear.org/information-library/safety-and-security/safety-of-plants/fukushima-accident.aspx> (visited 2017, February 16)

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²¹ Erik Gawel, Sebastian Strunz, Paul Lehman, *The German Energiewende under attack: Is there an irrational Sonderweg?*, UFZ-Diskussionspapiere, No.15/2012

Flassbeck claims fossil fuels can not be ignored, but they actually can and they will be. In 2014, electricity production from hard coal and lignite went down by more than 6% in Germany²². Firms are trying to shut down capacity. Since Fukushima, no coal plant has been added to the utilities system. Renewables are already competing with fossil fuels in many countries. Renewables are only seen more expensive because some costs of fossil and nuclear energy are passed on as taxes and other external costs are not considered. The cost of renewables will continue to drop whilst the cost of fossil and nuclear power will continue with a clear long-term upward trend, contrary to Flassbeck's expectations. Discussions on how miners, workers and communities can benefit from shutting down the coal mines and coal plans are underway. Renewables create more jobs than the fossil and nuclear sectors; in fact Germany already has twice as many people employed in the renewables sector than in all other energy sectors combined. The coal phase out begins with or without a policy after the nuclear phase out just because there will be nothing left for renewables to offset in power supply. Fraunhofer IWES calculated the net cost of the Energiewende up to 2050 and found that the expenses would be less than without a transition²³.

If Flassbeck is concerned about lights going out, he can unwind. Germany just reached a new reliability record in 2015 (around 12 minutes of power outages per year) ²⁴ and has remained stable since. Other countries that are going renewable, such as Spain and Italy, have seen enhanced grid reliability as they increase renewable energies. Smart grids will also help tailor power demand to the available renewable power supply²⁵. Plus, some back up capacity is contracted with neighboring countries like Austria and Switzerland²⁶.

Furthermore, Flassbeck can not make calculations for the future assuming current technologies. Wind turbines are 50 times more powerful today than 20 years ago²⁷. One can expect that this tendency is going to be followed by all renewable energies technologies.

Likewise, on the contrary to Flassbeck's belief, power demand can decrease as energy efficiency is one of the main objectives of the Energiewende²⁸. In order to achieve this, many

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actions and policies are underway. In the case of buildings, the investments in efficiency may offset consumption over decades. For this, Germany has implemented a Market Incentive Program, which provides funds for renewable heat systems (solar thermal collectors, modern biomass heaters, and efficient heat pumps). The government's Strategy for the Efficiency of Buildings announced further activities to support large solar thermal installations. Important to call to mind that heat demand is particularly important since it accounts nearly 40% of German energy consumption²⁹.

The share of renewable electricity in Germany went from 6% to nearly 25% in only 10 years³⁰. Germany surpassed 25% of electricity consumption from renewables in 2013³¹. Estimates suggest the country will surpass 40% by 2020³². A scenario study by the Federal Ministry of the Environment estimates that renewables would make up 85% of Germany's power supply by 2050³³. Germany has even benefited economically from its leadership in going renewable. The country created the world's largest domestic solar PV market. For other countries, investing in renewables is going to be much cheaper since the costs are lower. Moreover, a survey made in 2015 found out that 93% of Germans agreed that the Energiewende was important or very important to the country's development³⁴.

Gawel et al argue about why some liberal economists make drastic critiques on renewable support policies. According to them, economists ignore externalities in the market price, hence they don't make enough effort in getting the prices right neglecting some of their core principles. Then, economists take individual preferences and normative ends as given. All of this could be because of deep skepticism regarding large-scale government interventions and belief in market merits. Also, some liberal economists seem to confuse their twofold role as citizens and scientists. They should differentiate their own preferences from analytically obtained results. Gawel et al asseverate the Energiewende is ambitious and challenging, thus it needs to be governed in an effective way. Consequently, economic

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observation is necessary but alarmists warning about economic catastrophes (like Flassbeck) are surely misleading³⁵.

Craig Morris, one of the greatest advocates of the Energiewende, took a look to Flassbeck's insight and he replied and explained everything very well. In summary, he says the solution to Flassbeck's statement is flexibility options such as: all power plants that can ramp, demand that can react and storage; in that order. He also adds: 'The problem with his [Flassbeck's] analysis is that he acts as though there are no solutions – indeed, as though no one had even looked for any'³⁶.

The economic power has shifted towards the advocates of the Energiewende. Trade associations of the renewable energy sector employ numerous well-educated professionals who have built tight networks to ecological think tanks, state officials and members of political parties. Furthermore, many industries and banks are heavily invested in renewable energies. The anti-renewable energy group has weakened and lost important allies³⁷. Cost analyses have suggested that the Energiewende is an investment with high returns³⁸. It is very unlikely that Germany will reverse this course³⁹, just 'the losers will continue to mobilize against it [Energiewende]'⁴⁰.

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³⁶ Energy Transition (2017, January 23). 'The end of the Energiewende is back' [WWW document] URL <https://energytransition.org/2017/01/the-end-of-the-energiewende-is-back/> (visited 2017, February 17)

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³⁹ Supra note 10

⁴⁰ Supra note 9

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