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Germany's Energiewende: What Have We Learned So Far?

By [John Mathews](#) | Tuesday, March 12, 2013

Within the next decade, Germany will have shifted from a coal- and nuclear-powered economy to a thriving, decentralized system with power from renewable sources. This transformation, writes John Mathews, will not only make a real reduction in global carbon emissions. It is leading to a democratization of economic power that is unprecedented in the industrial world.

Japan's Fukushima nuclear disaster struck on March 11, 2011. While Japan was still clearing away the rubble, Germany got busy reshaping its entire energy system.

Germany's energy transformation has led to a democratization of economic power unprecedented in the industrial world.

Within a month, Chancellor Angela Merkel had reversed an earlier decision to slowly phase out nuclear power. And in June 2011, the German parliament voted to abolish nuclear power altogether.

This marked the beginning of the most fundamental transformation in energy infrastructure unleashed by any advanced industrial economy — what is called, in German, the *Energiewende* ("energy transition").

Nuclear power is now a dead issue in Germany, as far as the country's future is concerned. Even so, generation of nuclear power still accounted for 16% of total German electricity in 2012. However, the share is falling (down from 17.2% in 2011) and will continue to fall.

Seven reactors were shut down immediately as a result of Chancellor Merkel's announcement. No new reactors are to be brought on stream, and all existing reactors will have been completely phased out within ten years.

Following the U-turn on this issue by Merkel and her Christian Democratic party, there is no longer any political support for reviving the nuclear industry in Germany.

As nuclear's share of power falls, new renewables are being ramped up at a tremendous pace. Generation of solar photovoltaic electricity increased by 48%, to 27.6 terawatt hours in 2012, while wind power held steady at 46 terawatt hours, accounting for 11.9% of all electricity.

Other renewables (biomass and hydro) also increased, meaning that total renewables rose to 21.9% of total electricity generated in 2012. The proportion of renewables in capacity additions for 2012 is much higher, indicating that renewables will be taking more and more of the load.

It is notable that Germany's promotion of renewables has moved on from market expansion policies (like [feed-in tariffs](#)) to industry promotion policies — taking a leaf out of China's book.

German pride in being the largest wind power and solar power market in the world (until recently) moderated as it became clear that China, with its promotion of the green industries, was benefiting from Germany's market expansion. Now Germany is focusing on building its renewable industries for both domestic reasons and as a platform for exports.

Nevertheless, such a radical reshaping of the energy sector does not come without some hiccups. One of these is that the interim (or "bridging") power arrangements have involved marginally more coal being burned. Brown coal — lignite — increased a full percentage point to 25.6% of German electric power generation in 2012 and black coal rose 0.6 percentage points to 19.1%.

Coal thus now accounts for 44.7% of Germany's electricity generation. But it is destined to fall quickly as the renewables are ramped up, and fewer new coal-fired power stations are envisaged.

Meanwhile, natural gas has been forced out of the German (and mostly European) electricity market because of high prices, and because there has been no "fracking" revolution (as yet) in Europe.

To claim that the *Energiewende* means simply that [more coal is being burned](#) — and hence more carbon emitted — is to miss the point that fossil fuels are marked for elimination.

Germany's has undertaken a dramatic upgrade of its national power grid, which will enable it to accommodate higher and higher levels of fluctuating (renewable) power sources. Official estimates are that €20 billion will need to be invested in upgrading the grid over the course of the next decade.

The German plans are for three major north-south connections to be built first, consisting of 380-kV high-voltage lines. Installing and equipping the smart grid is the huge new growth opportunity in Germany.

Market reforms

Perhaps the most significant aspect of the *Energiewende* (and of the years leading up to it) is the almost complete destruction of Germany's erstwhile power generation oligopoly. Over many years, four large firms had dominated it — E.ON, RWE, EnBW and Sweden's Vattenfall.

Germany and China are the two nations that are farthest along in building a new energy system based largely on renewables.

By 2010, these four once-mighty firms accounted for only 6.5% of electricity generated in Germany — with their role being supplanted by hundreds of local co-op, municipal and small-scale producers that have sprung into existence. This is a democratization of economic power unprecedented in the industrial world.

So there is no doubting the scale of the changes unleashed by the *Energiewende* and their long-term impact. Within the next decade, Germany will have shifted from a coal- and nuclear-powered industrial economy with four large, centralized power producers to a thriving, decentralized system generating power from

renewable sources all over the country.

Elections in September 2013 will provide an interim scorecard as to how well Germany's energy transition is faring politically.

All of this is managed through a modernized and IT-enhanced smart grid. No central energy "czar" required.

Of course, there are critics — and not just from interests aligned with the former oligopolistic power producers and the coal/nuclear interests. There is fierce debate over

- whether the costs of the transition can be justified,
- whether the feed-in tariff system has run its course, and
- whether a predominantly renewables-driven energy system will be up to powering a modern industrial economy.

This is a healthy debate, of course — it could hardly be a revolution without such a debate.

Some neoclassical economists are reaching for unprecedented hyperbole as they denounce the whole enterprise. They call the transformation the beginnings of an authoritarian dictatorship in Germany (because the feed-in tariffs are imposed by the federal government).

Others argue there will be a "costs tsunami" — thus seeking to reverse the Fukushima disaster symbolism away from nuclear power and towards renewables. But opinion polling in Germany shows a public unmoved by such rhetorical flights. Germany's federal elections in September 2013 will provide an interim scorecard as to how well the *Energiewende* is faring politically.

Leaving behind the USA?

The single most arresting issue is the contrast between Germany and China — the two industrial nations that are farthest along in building a new energy system based largely on renewables — and the United States.

Germany and China have both made forceful and determined commitments to the new energy systems — while maintaining and then phasing out their existing commitments to a "black" energy economy. Both see the upgrading of power grids as the key to accommodating higher and higher levels of renewables in the electric power mix.

And both are encouraging a swarm of new entrepreneurial ventures into the power generation space, making it more competitive and vibrant than any power system before it.

Meanwhile, the United States — the supposed global champion of entrepreneurship — is mired in political infighting and a sincere lack of both vision and determination.

China, by contrast, is enlisting its state-owned banks to make the needed investments and allocations of credit. Provincial and local administrations compete fiercely to attract new green energy industries.

The cleaning of the industrial

Germany is accomplishing the same result without any central planning or energy "supremo" — but with comparable local and state-level competitive promotion of the new industries with their job-creation potential.

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economy was always going to be a state-mandated industry-policy driven strategy.

The closest that Germany has had to an energy leader would be [the late Hermann Scheer](#) — champion of solar and father of the feed-in tariff — and Germany's protagonist in advancing renewables in the [energy "clash of civilizations."](#)

The new green growth strategies emerging in China and Germany will prove to be far more effective at lowering carbon emissions than the Kyoto Protocol with its nominal carbon reductions. And this is as it should be: The cleaning of the industrial economy was always going to be a state-mandated industry-policy driven strategy.



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