



American Institute for
Contemporary German Studies
JOHNS HOPKINS UNIVERSITY

(<http://www.aicgs.org>)

The Nuclear Power Endgame in Germany

Author: R. Andreas Kraemer

Author: R. Andreas Kraemer (<http://www.aicgs.org/by-author/r-andreas-kraemer/>)

Germany is where the endgame of nuclear power began. In June and July 2011, the conservative and pro-business German government and parliament began composing legislation to switch off all nuclear power plants by the end of 2022; the process is likely to be concluded by 8 July. In the final days and hours of the legislative process, as if in a frenzy, all sides did their utmost to shape the details of ending nuclear power in the heartland of Europe. Polls indicated that 85 percent or more of Germans wanted nuclear power to be phased out as soon as possible and within a decade at the latest. The final battles in national policymaking pitted those with clear vision of a clean energy future and rational energy policies against those who are invested in outdated energy supply technologies and fear for their place in a future energy economy they cannot themselves imagine.

The short history starts in the 1950s, when Germany was swept along in the illusion that nuclear power would be a safe source of energy and fountain of peace and prosperity. Germany became a founding member of the Euratom Treaty, Europe's quasi-constitutional commitment to subsidize nuclear power, signed in March 1957, the year of the nuclear catastrophes in Windscale, UK, and the Mayak reactor, near Kyshtym in the Soviet Union.

In the 1970s, local opposition to a planned reactor in Wyl, in the southwestern state of Baden-Württemberg bordering on Switzerland, not only stopped construction but also provided the nucleus for an increasingly knowledgeable, organized, and influential anti-nuclear environmental movement. Germany's first Green Party Minister-President, Winfried Kretschmann, runs the state today, and the movement has gone into business developing renewable energies to displace nuclear and fossil energy.

While the tragedy at the Three Mile Island reactor in Harrisburg, PA, had an impact on the industry in the U.S., the Soviet catastrophe in Chernobyl, Ukraine, focused German minds again on the need to invest in "anything but nuclear." To this day, radioactive pollution levels caused by Chernobyl are such that berries and mushrooms collected and venison and wild boars shot in parts of Germany are unsafe to eat.

Where would the U.S. be today in its shift from fossil and nuclear energy to 100 percent renewable energy from the sun, water, wind, the oceans, the earth, plants, and waste, if 20 years ago influential, land-owning Republicans owning hydropower dams in the Rocky Mountains had obtained a federal law mandating power utilities to buy renewable electricity from them at stable rates? The German Power Feed-in Law (Stromeinspeisegesetz) of 1990 does just that, and it is the achievement of an early alliance of conservative and progressive green forces. It accelerated the green shift in German power generation in a way that an “American Independent Power Act” might have done at the time.

Building on multi-partisan support and the experience with wind power in the U.S. and Denmark, inventors, businessmen, land-owners, and small investors developed the German renewable energy industry we know today. In a nation of circa 80 million people, it currently generates 16.8 percent of power, employs about 370,000 workers at various skill levels throughout the land including in rural areas, and in 2010 invested 27 billion Euros (\$38 billion) in new plants. The industry’s dependable growth helped Germany weather the economic crisis of 2008 and 2009 better than other nations.

It would be wrong to multiply figures by four to estimate what might now have been in the U.S. because the contiguous 48 States have a much higher potential for all kinds of renewable energy. The legend of German wind maps ending where U.S. maps begin exemplifies the difference between becalmed Germany and the gusty coasts, shores, ridges, and plains of the U.S.

Conservative forecasts of future developments in Germany indicate that 35 percent renewable power is achievable by 2020, 50 percent by 2030, and 80 percent by 2050. These percentages would be achievable essentially without demand response or measures to stimulate demand flexibility. More ambitious but still entirely possible scenarios show that 100 percent renewable power can be reached by 2050, possibly even earlier if the shift to electric mobility accelerates and provides massive additional storage capacity to even out variations in power supply and demand.

The debate about the future of nuclear power in Germany appeared settled when in 1999 and 2000 the red-green federal government consisting of the Social Democratic and the Green parties negotiated a phase-out of nuclear power with the industry and upgraded the Stromeinspeisegesetz to become the Renewable Energy Act (Erneuerbare-Energien-Gesetz or EEG), the much-copied law providing priority access to the grid for power from renewable sources, and stable rate support.

Over the decades and layer by layer, technologies and the industrial base for a great energy transformation were built up, driven not only by misgivings about nuclear power but later also concern about climate change. Today, the positive vision is one of a smart power grid, with a mixture of large and small distributed renewable power plants, load-based tariffs stimulating

demand response, and dynamically efficient feed-in from dispatchable generators and combined heat-and-power plants, with electricity stored in car batteries connected to the grid as well as in pump storage behind hydropower dams.

It is dawning on the German public that the co-transformation of the power and transport systems – where the large aggregate capacity of car batteries compensates for the predictable variations in wind power – will be easier and cheaper than separate reforms of each sector on its own. The price of electric cars made from light material is likely to come down even faster than that of solar panels, and within a few years could fall well below the cost of current cars based on oil and steel, which need high maintenance. Indeed, concerns are emerging that the new individual mobility with electric cars will be so much cheaper that the shrinkage of the after-sale service and maintenance industry, and the business closures and job losses to be expected, may happen quite quickly and might turn out politically difficult to manage. However, Germany is suffering from a skill shortage in a number of sectors and regions, so the economy as a whole would benefit from such a development, as it would free up highly skilled technicians that are needed in other sectors, including renewable energy and the smart grid.

Contrast this with the history of outright and hidden subsidies for the nuclear industry: In research, development, and training; through cheap loans and loan guarantees for investment; government support for managing the fuel cycle and storing nuclear waste; and by society and future generations bearing the legacy costs and the catastrophic risks of nuclear technology. The economic case for nuclear power is dismal, as studies show in Germany as well as the U.S. or the United Kingdom. Were all of these costs reflected in the price of nuclear power, not one plant would run; the cost of insurance for the catastrophic losses alone would ensure that even existing nuclear power plants would be taken off the grid.

In addition, there is also a security policy price for nuclear power. The misnamed Non-Proliferation Treaty provides a civilian veil for military nuclear weapons programs. The link from nuclear power to the proliferation of nuclear technology and materials to rogue states and potentially non-state terrorist groups is not new, but with recent events for instance in Pakistan, North Korea, or Iran it is attracting renewed attention.

Given these facts and arguments, it is not surprising that not only the German public is opposed to nuclear power – over the years, opposition rarely fell below 70 percent in opinion polls. Most business-owners and managers in Germany's Mittelstand, the often family-owned small and medium-sized businesses that are the backbone of the economy and technology development, not only share in the dislike of nuclear power but also in the mistrust of monopoly powers that the four big operators of nuclear power plants enjoy. A clear majority of government employees with academic degrees is solidly against nuclear power. The current German federal government also misread elite opinion when it unnecessarily extended the running time of existing nuclear plants in September 2010.

A member of the ruling conservative coalition, Josef Göppel, said when he voted against the party line that the extension of nuclear power carried the seed for the electoral demise of the ruling parties, notably his Christian Social Union in Bavaria, and the Christian Democrats in the rest of Germany. After Fukushima, his comment seems prescient, but even before the accident, the public anger and elite opposition to nuclear power was high.

The tragic accident in Fukushima merely provided the starting gun for the fight to end nuclear power that is currently underway in Germany. Given the continued need for subsidies, the need for secrecy and the lack of transparency, the treatment of critics and victims of nuclear power, and its accidents in Germany and abroad, it is entirely rational for German voters, taxpayers, and utility customers to demand a phase-out of nuclear power, and to switch to suppliers of renewable power in the thousands every week.

The forces opposing the great energy shift in Germany, the die-hard protagonists of nuclear power, are diminishing in number but still large in voice, finance, influence, and access to political power. They are motivated partly by economic interests, for a number of them benefit from the subsidies going their way, but partly also by a fear of the future energy supply structure they cannot or do not want to comprehend. The digital generations born after the Internet may have no difficulty envisioning a marriage of the power grid with modern communication and signal-processing technologies to produce a self-stabilizing grid with distributed generation and storage, and demand response able to cope with the variations of renewable supply and demand. Older folks and mentally conservative people may fear innovations and change they do not understand, but they will find themselves on the wrong side of history.

What might be the international consequences of Germany ending nuclear power? Other nations are also pulling back or at least taking the time for a rethink. The Swiss government aims for a slow phase-out, but political dynamics may hasten the end. In a referendum in mid June 2011, the Italian electorate voted overwhelmingly to end the Italian Prime Minister Silvio Berlusconi's nuclear ambitions, with a majority of about 95 percent and on a record turn-out of circa 55 percent. Other EU countries, such as Sweden, may well follow. In fact, a majority of EU Member States will soon have no nuclear power or a clear phase-out policy, and nuclear power is increasingly blocked and on the way out around the world, from Peru to Thailand, from Bangladesh to U.S. utilities.

Japan is reducing, perhaps ending, nuclear power also, because of the earthquake that crippled Fukushima and the risk of future earthquakes. As nuclear power plants come up for periodical inspections and re-licensing every 13 months, regulators in Japan are often ordering a halt of operations, forcing utilities in Japan to invest in quick-to-build gas-fired power plants. The Japanese race to gas is a challenge in the short run, but Japan will then have a good proportion of responsive gas power to run alongside variable renewable generators. Japan already has a high number of electric hybrid cars with batteries that can help stabilize the grid.

Germany finds itself in a competitive innovation race with Japan as both nations will test and extend the capacity, flexibility, reliability, and resilience of their power grids. More sophisticated smart-grid energy management systems will be developed for high-voltage transmission, low-voltage distribution, and anything in between. Germany and hopefully Japan will most likely demonstrate practical ways to achieve the shift to fully renewable energy supplies as well as show the economic development opportunities associated with that transition. The example will strengthen those who argue for nuclear phase-out in other nations, and erode the arguments of those still clinging to nuclear power.

Germany, being the largest net contributor to the EU budget, pays the largest share in the funds of Euratom and thus subsidizes nuclear power in other EU states. That is unlikely to continue for long into the future. German industry, fearing competitive disadvantages when other EU Member States continue to receive aid for nuclear power, might ask for anti-state-aid disciplines to be applied. These disciplines are meant to avoid distortions to competition in the European market, and can be applied beyond the EU to neighboring states participating in the European Internal Market generally or just in the area of grid-bound energies, namely electricity and gas.

Think about it: How will future German governments explain to their voters and electricity customers that Germany is phasing out nuclear power but at the same time contributing German taxpayers' money to subsidize the nuclear power industry in other EU Member States? How will German industry react when subsidies and privileges in other neighboring countries lower the competitive position of German businesses? Expect the pressure to grow for Germany to leave the Euratom Treaty, or, as that is unlikely to succeed, to work towards the treaty's repeal.

There has been an inconclusive debate about whether or not the nuclear phase out in Germany should be enshrined in the nation's constitution, its Basic Law. This debate ran out of steam, perhaps because changing the constitution and thus putting an end to a decade-long grand societal conflict was regarded as a symbolic move, not fitting for a time when concrete, actionable decisions were needed to shape the future. Perhaps the debate will pick up again as Germans realize that their domestic nuclear phase-out marks the start of a constitutional debate over the Euratom Treaty in the European Union. Germany's hand would be greatly strengthened by a clear, constitutional commitment to correct the historical mistake of investing in nuclear power technology.

There are international treaties and institutions governing the proliferation of civilian nuclear technology while hoping to avoid the proliferation of nuclear weapons capability. A public admission that nuclear power is not economically feasible and even after 60 years of development still relies on subsidies, and that it is so risky that adequate third-party liability insurance for damages cannot be obtained other than in the form of government assistance, would destroy any remaining legitimacy of these treaties and institutions.

That would increase pressure to change the remit and statutes of the International Atomic Energy Agency (IAEA), perhaps even call to disband it after it lost so much of its credibility in recent years. The context for reviewing the Non-Proliferation Treaty is likely to change as well. With the civilian economic veil removed from the nuclear weapons programs, controls on the export and trade of nuclear technologies and materials, and inspections of nuclear sites anywhere in the world might soon be strengthened. The IAEA, imbued with a pro-proliferation culture, is not a suitable institution to assist countries in phasing out nuclear power.

Economics, risk assessments, security policy considerations as well as general principles of good government all tell us that nuclear power must be ended as soon as possible. Germany will show how and how fast the shift to renewable energy can be achieved, and thereby how soon the nuclear endgame can be reached.

R. Andreas Kraemer is Director & CEO of the Ecologic Institute in Berlin and co-author of AICGS Policy Report 31.

A version of this essay originally appeared in The San Francisco Chronicle, and in the June 30, 2011, AICGS Advisor.