



How does the German phase-out decision affect Europe and Sweden?

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As a consequence of the events in Fukushima, Chancellor Angela Merkel's government decided in March 2011 to shut down eight of the country's oldest nuclear power stations immediately. This was followed by government and parliamentary decisions to close the remaining nine nuclear power stations by 2022. More details of the German government's decision and its progress through parliament (the Bundestag) may be found in *Gesetzentwurf der Bundesregierung: Entwurf eines Dreizehnten Gesetzes zur Änderung des Atomgesetzes* (see link below).

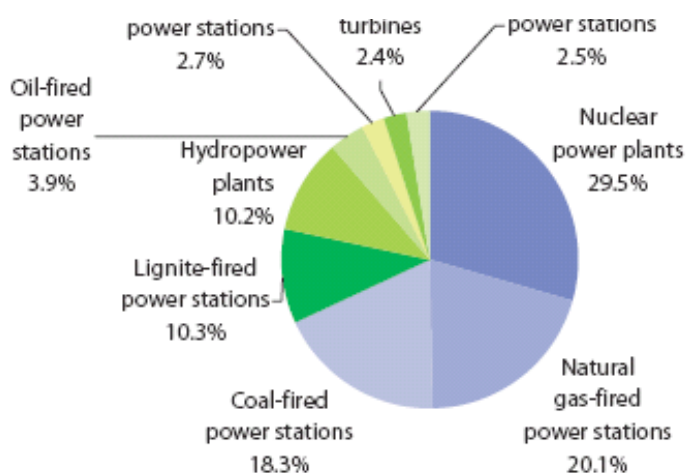
The German decision had been preceded by a wide-ranging discussion in an ethics commission appointed by Angela Merkel, called *Sichere Energieversorgung* ('Secure Energy Supply'), with 17 members representing various German public bodies. The commission's members included Jörg Hacker, chairman of the German National Academy of Sciences Leopoldina. On 28 April a whole-day seminar, broadcast on TV, was held to discuss four different themes in German society. During the session on technology and science, seven people were interviewed, and Sven Kullander, chairman of the Royal Swedish Academy of Sciences' Energy Committee, had been invited to give a European perspective. Two of the images he then presented are reproduced below.

The German Leopoldina Academy very promptly drew up an Ad-hoc statement: *Energy- and research-policy recommendations following the events in Fukushima*, published in June 2011. The coordinator responsible was Professor Ferdi Schüth. This report, which was published online (see link below), is based on an earlier (2009) report from the German Academy of Sciences entitled *Concept for an Integrated Energy Research Programme for Germany*. The former (2011) report found that the proposed rapid transformation of the Germany energy system calls for a profound analysis to examine how the energy supply can be secured without an excessive rise in import dependency. The importance of improving efficiency is emphasised, as is the need for increased research and development. The report also states that it will be necessary, within the brief ten-year period, to build new power stations fired with fossil fuels. The idea is that these stations can temporarily replace the nuclear ones, bridging the gap until a higher proportion of renewable energy sources can come into use.

The Energy Steering Panel (ESP) of the European Academies Science Advisory Council (EASAC) was asked by the German Academy of Sciences to state its opinion on the latter's two reports, whose authors were interviewed at a meeting in Munich on 3 May. ESP's statement is included as appendix 1 to the 2011 report. The ESP is asking for more information about climate problems, the restricted supply of fossil fuels, energy security etc. Moreover, the ESP considers that the European perspective should have been raised, for example concerning Germany's key role in the EU's work on integrated gas and electricity markets and European electricity networks, on the European Strategic Energy Technology Plan (SET) and on the planning of future research programmes.

The EU's energy policy to date has been governed by the Union's climate objectives, and nuclear power has been regarded as a key component for attaining the set targets (Figure 1). If the whole of the EU were to follow the German example of rapidly phasing out nuclear power, the EU's carbon dioxide emissions would rise by 20% compared with the current level, directly contrary to the EU objective of reducing emissions by 20% by 2020.

Figure 1. EU electricity production was 3,374 TWh in 2008. Fossil fuels accounted for 53%, nuclear power for 28% and renewables 19%. [Owing to rounding, the percentages given for the various types of power stations do not add up to 100%.] Source: Eurostat 2008.



In 2008, the total German electricity supply was 637 TWh, of which nuclear power made up 140 TWh or 22% (Figure 2). According to a press release of 4 April 2011 (see link below) from the German Association of Energy and Water Industries (BDEW), the immediate shutdown of the eight reactors meant that an export surplus of 70–150 GWh/day in the first half of March gave way to an import surplus of 50 GWh/day, being mainly electricity from France and the Czech Republic. In the longer term, production from conventional power stations will probably also rise. German carbon emissions are thus expected to increase as a result of the rapid phase-out of nuclear power.

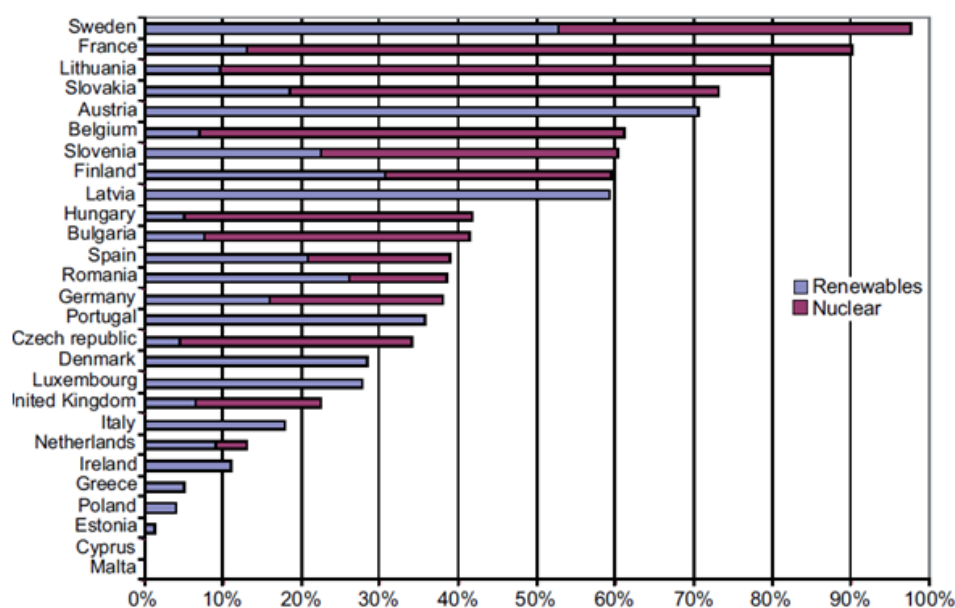


Figure 2. Carbon-free electricity production in the EU in 2008. Germany's carbon-free electricity production accounted for 38%, of which 22% derived from nuclear power. Source: Eurostat 2008.



The growing proportion of wind power probably means that there will be more interest in using Nordic hydropower to adjust the scale of German wind power and in importing fossil-free Nordic electricity into Germany.

Since 2005, the Energy Committee at the Royal Swedish Academy of Sciences has dealt with energy issues, with the emphasis on scientific and technical aspects. Its work has included drawing up scenarios for the energy situation for Sweden and the world in 2050 (see link below). The guiding aim of this work has been to cut use of fossil fuels to permit fulfilment of the EU's objective of limiting global climate change to 2 degrees Celsius. These scenarios rest on the assumption that nuclear power will be extended between now and 2050. Whether the objective is achievable largely depends on political developments in the wake of the meltdowns in Fukushima.

One closely related question of great interest to Sweden is how the European electricity supply, 28% of which is currently derived from nuclear power, could be secured after the German decision earlier this year to close its nuclear power stations. Have the events in Germany and Japan changed the experts' view of our future energy supply?

Links

Energy Committee of the Royal Swedish Academy of Sciences

<http://kva.se/energy>

Gesetzentwurf der Bundesregierung:

Entwurf eines Dreizehnten Gesetzes zur Änderung des Atomgesetzes

<http://dipbt.bundestag.de/dip21/btd/17/062/1706246.pdf>

Ad-hoc statement: Energy- and research-policy recommendations following the events in Fukushima

http://www.bmbf.de/pubRD/Leopoldina-Statement_EnergyPolicy_EnergyResearch_June_2011.pdf

Press release: BDEW analysis for March 2011: Development of electricity generation and exchanges

[http://www.bdew.de/internet.nsf/id/EN_20110404-PI-Development-of-electricity-generation-and-exchanges/\\$file/110404%20Entwicklung%20Stromerzeugung%20und%20Stromtausch_englisch%20ok.pdf](http://www.bdew.de/internet.nsf/id/EN_20110404-PI-Development-of-electricity-generation-and-exchanges/$file/110404%20Entwicklung%20Stromerzeugung%20und%20Stromtausch_englisch%20ok.pdf)



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