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The German energy U-turn will not succeed unless energy research changes course

By Matthias Ruchser,
German Development Institute /
Deutsches Institut für Entwicklungspolitik (DIE)

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Bonn, 13 June 2011. What seemed unthinkable before 11 March 2011 has become possible since the super-MCA at Fukushima: the simultaneous, early shutdown of the seven oldest German nuclear power stations. With other nuclear power stations offline at the end of May for periodic safety checks or the repair of technical faults, only four of 17 nuclear reactors were in operation in Germany, producing less than 5.5 GW of electricity – yet without the country's competitiveness being jeopardised.

The debate on extending the operational life span of German nuclear power stations is over. Only last year the federal government took this extension through the *Bundestag* and – despite constitutional reservations – the *Bundesrat* as part of an energy concept that was meant to endure until 2050. But the Fukushima accident led the cabinet to make a U-turn on energy on 6 June 2011.

The decisions taken by the government on energy and research policy in recent years are now coming home to roost: after taking office in 2009, the new government undertook major reallocations in the energy research budget. For example, it greatly increased the resources earmarked for nuclear energy and fusion research, which had already been raised by the Grand Coalition. While expenditure on nuclear energy research already amounted to EUR 186 million in 2008, the government increased the budget further to EUR 232.2 million by 2010. To this must be added EUR 251.6 million for the disposal of nuclear facilities and further millions for institutional and project-related research. Expenditure on nuclear fusion research rose from EUR 119.4 million in 2008 to EUR 143 million in 2010. But even these sums were not enough for substantial progress to be made in this field. Germany is also participating in the ITER project, in which an experimental fusion reactor is being constructed in France at a cost which had tripled to EUR 15 billion even before building work began.

Having decided to change its energy policy, can Germany afford to continue throwing tax billions at nuclear fusion, which even after several decades of research has yet to feed a single kilowatt hour of electricity into the public grid? Renewable energy sources, which received far less in research grants over the same period, are now meeting 17 per cent of German electricity demand. And for several decades the researchers involved in fusion have been telling us the same story: nuclear fusion will not be available for at least another 30 to 40 years. Thus, if research funds are to be found for sustainable energy technologies with a future, Germany will have to abandon nuclear fusion research.

Just as the change of energy policy will result in there being winners and losers in the energy industry (falling share prices and corporate profits and fewer jobs in the conventional energy sector – rising share prices and corporate profits and more jobs in the renewable energy sector), there will be changes in the energy research scene, which will include adverse effects on existing jobs. As Germany will be abandoning nuclear energy within ten years, nuclear energy research has no future here. Instead, it should be reduced to solving the problems associated with the disposal of nuclear facilities, nuclear safety and the final storage of nuclear waste.

In contrast, Leopoldina, the German Academy of Sciences, argues that in the long term energy research should cover a wide spectrum of subjects and the whole range of basic research, even if it does not form part of the current mainstream. This argument also extends to nuclear fusion research; interestingly, Leopoldina was still referring to nuclear fusion as a regenerative energy in 2009. A nuclear-free Germany which, according to the renewable energy industry, is likely to meet 100 per cent of electricity demand from "genuine" renewable energy sources by 2050 will not need nuclear fusion or, therefore, nuclear fusion re-

search. If there is really to be a change of energy policy, there must also be a change of course in energy research. Or, as the German Advisory Council on Global Change (*Wissenschaftlicher Beirat der Bundesregierung Globale Umweltveränderungen* – WBGU) puts it in its most recent Flagship Report, we need a "A Social Contract for Sustainability".

And this especially as, after the 2009 decline in energy demand and greenhouse gas emissions in the wake of the financial crisis the International Energy Agency estimates that greenhouse gas emissions due to energy consumption reached an all-time high in 2010. In its latest *Global Energy Review* oil giant BP reports that China has now taken the USA's place as the world's largest energy consumer. In 2010 alone China's economic growth caused an 11 per cent increase in its energy requirements.

Against the background of these current trends Germany is enjoying major competitive advantages as an exporter. While most sectors of industry experienced an economic slump during the financial crisis, the growth in renewable energy sources, with nearly 80 GW of new capacities added in 2009, was not slowed down. According to REN21's *Global Status Report 2010*, renewables

accounted for nearly 20 per cent of annual global power production in 2009. Since 2008, more renewable energy capacity than conventional power capacity has been installed in both the United States and Europe. The developing and emerging countries in particular are experiencing high growth rates. Germany and China are the top two investors in renewable energy sources. In the past five years Germany's development bank, KfW, for example, has spent EUR 3 billion, or 21 per cent, of its financial cooperation funds on eco-friendly and sustainable energy supply in developing countries.

The Sixth German Energy Research Programme now gives the federal government a chance to make Germany the international innovation champion in increasing energy efficiency and expanding renewable energy sources and electricity grids by changing the core areas of research. Those who argue – like the Federal Chancellor in her government statement last week – that a reappraisal of the risks associated with nuclear power in the light of the events at Fukushima indicates the need to abandon nuclear energy must take the next step and focus energy research on energy efficiency, renewable energy sources, energy storage and transmission networks.



Matthias Ruchser
German Development Institute /
Deutsches Institut für Entwicklungspolitik (DIE)