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New Study: Renewable Energy can replace abandoned Nuclear Energy in Germany

by Rolf Hug
14.12.2006

The dispute about whether or not to abandon nuclear energy continues. German Federal Chancellor Merkel emphasised at an energy summit that the German government wants to continue abandoning nuclear energy but several minister-presidents of the Christian Democratic Union/Christian Social Union supported and continue to support longer lifespans of German nuclear power plants, e.g. Hessian Minister-President Roland Koch, who even mentioned new plants. This was echoed by the Federal Association of the German Industry and the German Federation of Chambers of Trade and Industry. German Minister of Environmental Affairs Sigmar Gabriel (Social Democratic Party), however, repeatedly pointed out that his party would not simply waive the nuclear consensus. The chairperson of the Hessian Social Democrats Andrea Ypsilanti recently presented an exemplary study that sketched the possibility of Hessen becoming a nuclear power-free zone, where the entire nuclear power capacities are replaced by renewable energies.



Hessian nuclear power plant Biblis; 5 megawatt solar power plant in Bürstadt (Hessen) – 1 700 of such solar power plants can fully replace the nuclear energy produced in Biblis. Photos: BMU
Copyright: H.-G. Oed; Tauber Solar.

In a study titled “New energy for a nuclear power-free Hessen” an expert calculates the feasibility of a German and Hessian energy turning point, the very same expert who



already advised Californian Governor Arnold Schwarzenegger on the most ambitious solar programme in the world: the chairperson of the World Council for Renewable Energy and Alternative Nobel Prize Winner, Dr Hermann Scheer.

Secure, decentralised and climatically neutral power supply – without nuclear power plants

Political, legal, economic and technical aspects were investigated by Hermann Scheer, Prof. Dr.-Ing. Klaus Traube, lawyer Fabio Longo and scientific contributor Heiko Stubner. In their study the doctor of economic and social studies, Hermann Scheer and his co-authors show that and how a turning point in the German and Hessian energy world can be achieved and they convincingly contradict prejudices held against the potential of renewable energies. The Solar Report summarises the pertinent results of the study and sketches the suggested road to a replacement of nuclear energy with autonomous, decentralised supply of renewable energies.

Extended lifespan for Biblis as a symbol of a nuclear energy renaissance?

The German federal state Hessen is currently one of the most prominent stages of the worldwide battle of the nuclear lobby for a renaissance of nuclear energy production. The application by RWE Power for the continued use of the oldest German nuclear reactor Biblis A is viewed by the Social Democrats, the Greens and environmental associations as a breach of the nuclear consensus that the former red-green federal government entered into with the operators of nuclear power plants and that provides for the stepwise abandonment of nuclear power production throughout Germany until 2021.

Exemplary turning point in Hessen: renewable energies instead of nuclear power

After RWE Power submitted an application to the German Federal Ministry of Environmental Affairs on 26.09.2006 for consent for the transfer of power capacities to Block A of the Biblis nuclear power plant, the Hessian chairperson of the Social Democratic Party, Andrea Ypsilanti announced an energy programme for the federal state which envisaged the full demand to be covered with renewable energies. "It was high time that politics should now come to realise through this application for extension that the monopoly in energy supply can no longer be trusted", Ypsilanti stated. With her courageous step Ypsilanti astonished the at Wiesbaden, the capital of her federal state – especially since it had been merely the two nuclear reactor blocks in Biblis that had thus far received blows from the Social Democrats. Their discontinuation had always been demanded offensively. But where power should come from after Biblis taken off the grid had always been discussed secretly, because citizens are becoming increasingly sceptical of climatic killers coal and gas as replacements for nuclear power – even more so after the latest movie by the former US Vice-President Al Gore on the dangers of climatic changes.

The Christian Democrats who hold the absolute majority and Minister-President Koch intentionally scratch in this open wound and rejoice in the contradictions in which many a Social Democrat entangles himself when it comes to debating energy issues. The goals of climatic conservation and abandoning nuclear power cannot be achieved by simply erecting new coal and gas power plants. And it is this very point of weakness anticipated by the Christian Democrats which the Social Democratic Chairman in the parliament of the federal state of Hessen, Jürgen Walter, offers his opponents.

In May he declared cryptically that the Social Democrats should attack the green party on the issue of "New Jobs through Renewable Energies". When in September SMA Technologie AG with its head office in Niestetal was awarded the "Entrepreneur of the Year 2006" award, he linked his congratulations to the board of directors with a political message that is hard to understand in Niestetal: that coal and gas would have to continue to cover the basic energy need of Hessen ... the solar company located in northern Hessen is

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already the international leader in network and regulator technology with which the basic energy need of entire municipalities can be met by renewable energies. The municipality of Alheim in the northern Hessian valley of Fulda opted for this alternative: in 2010 already the approx. 5 000 residents are to be supplied by 80 % with ecologically friendly power from renewable energies, mainly gained from solar parks and new bio-gas modular electricity and heat generators. This route is viewed by the Social Democratic Chairperson of the state of Hessen Andrea Ypsilanti as an example for the whole of Hessen and she is unanimously supported by her party.



"In order to ensure independent regulatory policies in the interest of consumer protection, climate and resource protection as well as long-term energy supply from local renewable energies, we need the regulatory power of the state and not a shaky consensus policy," says Andrea Ypsilanti.

Photos: Solarserver

The Hessian Chairperson of the Social Democratic Party, Andrea Ypsilanti, presenting the study together with the holder of the Alternative Nobel Prize and President of Eurosolar, Dr Hermann Scheer.

48 TWh/a less nuclear power - 49 TWh/a increase from renewable energies

The study "New energy for a nuclear power-free Hessen" is the basis for the ambitious target of an energy turning point in the federal state, where the percentage of nuclear power in the overall power production is just below 60 % and is thus representative for the whole of Germany. "By 2013 we will be able to respond to the decommissioning of nuclear power stations producing 48 terawatt hours per year (TWh/a) with an increase of renewable energies amounting to 49 TWh/a," the study says on the development of renewable energies in Germany. The only condition being that the speed of introducing plants for the utilisation of renewable energies as documented since 2001 continues. In addition, a speedy expansion of co-generation plants would provide the possibility of closing down and at the same time reducing gas emissions of fossil power stations that negatively influence climatic conditions.

Conflict on either decommissioning or extending the lifespan of the Biblis reactors

The Christian Democratic government of the federal state and Minister-President Roland Koch are driving the Hessian energy policy into the nuclear trap, the authors of the study emphasise. They hinder the expansion of renewable energies through a policy of refusal and blockade, especially with regard to wind power. At the same time arguments are put forward, claiming that an extension of the lifespan of Biblis A and B cannot be avoided. However, it is absolutely possible to decommission the nuclear power stations Biblis A and B by 2008 and/or 2012 without new large-scale fossil power stations based on coal and gas having to be built as replacements. The electricity capacity shortfall resulting from the abandonment of nuclear power in Hessen could be compensated with an increase of only renewable energies, state Hermann Scheer and his co-authors.



Large power station, decentralised energy production in the biological energy village Jühnde (Lower Saxony; German Solar Award 2005). Photos: BMU; Bioenergiedorf Jühnde

A new way to cover energy needs in Germany and Hessen In their study Scheer and his co-authors consider the effects of decommissioning nuclear power stations throughout Germany, not on an annual basis, but for the medium-term. In terms of the nuclear law (including the transfer of remaining power potentials from Mülheim-Kärlich) 7 nuclear power stations are to be decommissioned by the end of 2013. The exact decommissioning dates can only be estimated, since they depend on future power generation of the respective nuclear power stations and thus on their technically based availability that cannot be quantified in advance, explains Professor Dr.-Ing. Klaus Traube, former director of the Bremer Energieinstitut. The study assumes that the future average generation of every nuclear power station will be similar to the average generation in the years 2000 to 2005. On this basis the following decommissioning dates were calculated:

| Nuclear power station | Net performance MW | Residual power capacity from 31.7.06 TWh | Average annual generation TWh | Decommissioning month/year |
|-----------------------|--------------------|--|-------------------------------|----------------------------|
| Biblis A | 1167 | 14,87 | 6,88 | 8/2008 |
| Neckarwestheim 1 | 785 | 17,7 | 6,03 | 3/2009 |
| Brunsbüttel | 771 | 16,26 | 4,70 | 11/2009 |
| Isar 1 | 878 | 34,16 | 6,75 | 8/2011 |
| Biblis B | 1240 | 47,48 ¹ | 8,22 | 1/2012 |
| Philippsburg 1 | 890 | 38,71 | 6,49 | 7/2012 |
| Unterweser | 1345 | 56,81 | 9,15 | 9/2012 |

¹ Residual power capacity from 31.7.06 26,03 TWh + 21,45 TWh transfer from Mülheim Kärlich

Source: Dr Hermann Scheer et. al: "NEUE ENERGIE FÜR EIN ATOMSTROMFREIES HESSEN"

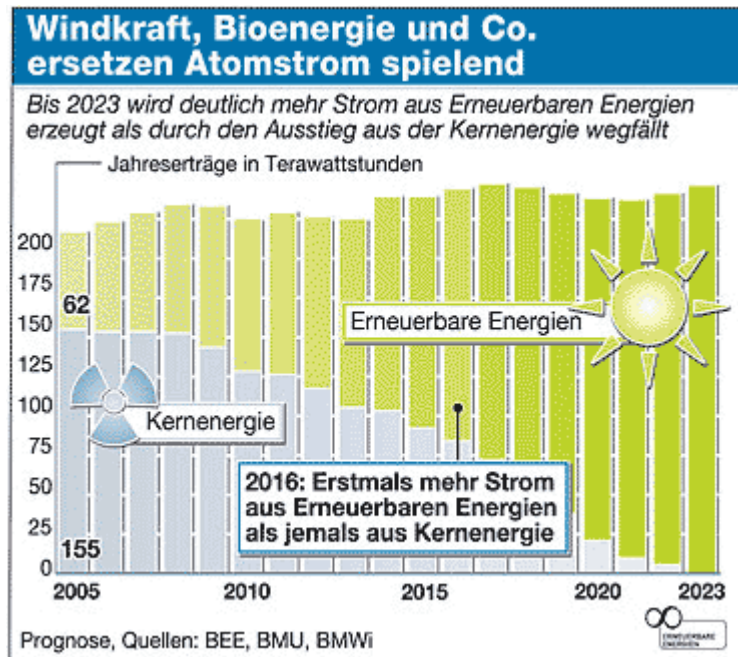
The reduced power generation can be covered by the following alternative methods according to the study: the reduction of energy consumption, additional power generation from renewable energies, additional power generation in highly efficient co-generation plants as well as additional power generation in conventional fossile power plants.

Energy efficiency limits growing power consumption

Since the early 90's energy consumption has increased by close to 1 % per annum, according to Scheer; energy policies have thus far hardly attempted to counter-act this trend. Lately, however, energy efficiency has gained importance in Germany and Europe, particularly through the EU energy efficiency directive and the ambitious target of the German coalition government to double energy productivity by 2020 in comparison to 1990. Thus a change in trends can be expected. For their scenario, the authors assume that German energy consumption in 2013 will equal that of 2005.

Planned ecological power production equals nuclear power to be taken from the net

It is the goal of the German Federal Minister of Environmental Affairs to increase power generation from renewable sources from 11 % of the current total German power generation in 2005 to 25 % in 2020. This corresponds to an increase of 1 % per annum of the current power generation of 610 TWh/a. By 2013 this would be 8 % more than in 2005, i.e. 49 TWh. This regenerative energy production would correspond approximately to the 48,42 TWh from nuclear power stations that are to be taken from the net by 2013, including Biblis A and Biblis B.



Wording of diagram: Wind power,

biological energy etc. will easily replace nuclear power. By 2023 significantly more power will be generated from renewable energies than has fallen away through the abandonment of nuclear energy. Annual yields in terawatt hours. Renewable energies; nuclear energy; 2016: for the first time more energy from renewable energies than ever from nuclear energy.

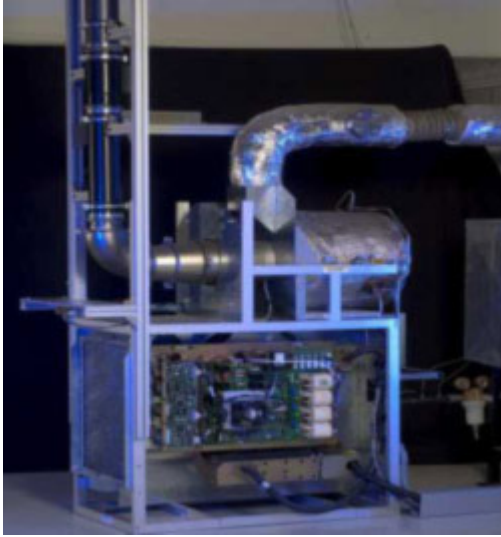
Development of energy production from renewable energies with the simultaneous abandonment of nuclear power. Graphics: Information Campaign Renewable Energies.

More climatically friendly power from co-generation plants

The Red-Green German government decided in 2000 to subsidise the expansion of co-generation through quantity-based legal regulations so that highly efficient co-generation could be doubled by 2010 in comparison to 1998, which would have corresponded to an increase of 50 -60 TWh per annum.

As a result of massive resistance by integrated company groups an extremely restricted subsidisation was done so that the increase would amount to a mere 10 TWh/a, says the study. The German government thus announced an amendment to the co-generation legislation and the authors expect that by 2013 an additional 30 TWh highly-efficient co-generated power will be produced each year, i.e. approx. 5 % of the total German energy production.

Co-generation: micro-gas turbines for bio-gas plants of the Institute for Solar Energy Supply Technology at the University of Kassel (ISET). Photos: ISET



Unrestricted Renewable Energy Law as precondition

"This conservative scenario thus shows that even the expansion of renewable power generation alone would suffice to compensate for the decommissioning of those nuclear power plants that are required to be decommissioned during the next two (regular) legislative periods in terms of the nuclear law," says Hermann Scheer. In addition, by 2013 approx. 5 % of conventional fossile power generation will have been replaced with highly efficient co-generated power, which will lead to a further reduction of CO2 emissions of 20-30 m t per annum.



"It is thus neither necessary nor justifiable to extend the lifespans of nuclear power plants, or to erect new large-scale fossile power plants to replace decommissioned nuclear power plants," Scheer summarises the analyses and forecasts.

Dr Hermann Scheer (Member of the German Parliament) at the inauguration of the Bavaria Solar Park (10 MW). Photo: Powerlight Corporation

The growth rates of renewable energies as stated are all realistic, Scheer emphasises. They merely require the unrestricted continuation of the German Renewable Energies Law (EEG).

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