

ANALYSIS OF THE GERMAN FEDERAL GOVERNMENT'S DRAFT ENERGY CONCEPT

POTENTIALS THWARTED BY NUCLEAR POWER AND COAL

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Contents

1	Executive Summary.....	4
2	Life-span extensions for nuclear power plants	6
3	Objectives of the energy concept.....	9
3.1	Ambitiousness of the targets.....	9
3.2	Binding force of the targets	10
3.3	Comparison with other studies and scenarios.....	10
3.4	Expected electricity mix	12
4	Electricity supply in the energy concept.....	13
4.1	The expansion of renewable energies.....	13
4.1.1	Wind energy	13
4.1.2	Biomass	14
4.2	Co-Generation	14
4.3	Carbon Capture and Storage (CCS).....	15
5	Increase in energy productivity.....	16
5.1	Energy efficiency in the field of electricity	16
5.2	Energy efficiency and public procurement.....	17
5.3	"Modernisation campaign buildings"	18
6	Transport.....	21
7	Efficient power grid infrastructure and integration of renewable energies	22
7.1	Expansion and transformation of the grid infrastructure	23
7.2	Market integration of renewable energies and generation according to demand	24
7.3	Expansion of storage capacities.....	24
7.4	Environmental impact and acceptance	25
8	Energy supply in the European context	27

1 Executive Summary

The German government has presented the draft of its energy concept.¹ It is marked by a striking contradiction: life-span extensions for nuclear power plants massively impede investments in renewable energies, the revenues from written-off nuclear power plants further strengthen the market power of the large electricity supply companies. On the other hand, the federal government has announced far-reaching objectives for the expansion of renewable energies, for energy efficiency and the required extension of the power grids, as well as instruments designed to bring about the breakthrough into the regenerative era. It tries to bridge the contradiction by announcing that the operators of nuclear power plants to a certain extent shall contribute to financing the new start into the direction of energy efficiency and renewable energies.

In view of the traditional large energy utilities' financially strengthened role, it is doubtful whether this approach will be successful. It is difficult to see how massive investments in energy efficiency (in the electricity sector) and in the expansion of renewable energies can be reconciled with their interests, as long as they negatively affect their profits; and following the life-span extensions, this is the case more than ever. Besides, it is doubtful whether and how the announced measures will be implemented. Hans-Peter Keitel, president of the Federation of German Industry (BDI) has already mobilised against guidelines for the energetic modernisation of buildings and electricity saving: "We will in the near term explain to the government what is feasible. There will certainly be some rework done in the parliamentary process."² Previous experience does not suggest that the ministries and parliamentary groups concerned will coherently pull together – towards the renewable era. Last not least, it remains unclear whether the measures announced in the energy concept, if they are implemented, will be sufficient to reach the targets, the self-imposed ones or the necessary ones which partly go even further.

Table 1: Targets in the energy concept (all figures in percent)

	2020	2030	2040	2050
change in GHG emissions compared to 1990	-40	-55	-70	-80
share of RE in gross final energy		30	45	60
share of RE in gross electricity consumption	35	50	65	80
change in primary energy use compared to. 2008	-20			-50
change in electricity consumption compared to 2008	-10			-25
change in final energy use in transport sector compared to 2005	-10			-40

Table 1 gives an overview of these objectives. Further objectives have been established as follows:

- Energy productivity shall increase by 2.1% per year on average.
- The ratio of energetic refurbishment of buildings shall be doubled from presently less than 1% annually to 2% of the total building stock.

¹ Neun Punkte für eine umweltschonende, zuverlässige und bezahlbare Energieversorgung. draft BMWi/BMU of 7 September 2010.
<http://www.bmwi.de/BMWi/Navigation/Service/publikationen,did=357316.html>

² Hans-Peter Keitel (Interview), "Mit Umweltminister Röttgen war nicht zu reden", SZ, 13.09.2010, p. 18,

The reduction of primary energy use by 50% and electricity consumption by 25% are very ambitious targets. This also applies to the announcement to reduce final energy demand in the transport sector by 40% by 2050. The announced long-term reduction targets for greenhouse gas emissions (80%) on the other hand are not sufficient to contribute to a worldwide course which limits global warming to less than two degrees with adequate probability. To this end, greenhouse gas emissions would have to be reduced by 95%. The expansion targets for renewable energies (80% by 2050) likewise do not go as far as the objective announced e.g. by the German Minister for the Environment, Dr. Norbert Röttgen, i.e. to transform energy supply to 100 percent renewable energies.

The targets are not binding, but shall be subject to a monitoring process in intervals of three years. Much more investment security would be ensured by summarising the targets and measures in a climate protection law.

Especially with regard to the energetic refurbishment of buildings, and expansion of both offshore wind energy and electricity power grid, the German government has presented remarkable packages of measures. The initiative for an energy efficiency fund likewise has potential.

The intended expansion of biomass utilisation could cause considerable conflicts with international food security. Besides, the German government has not seized the opportunity to couple its announcement of life-span extensions with an abolition of old inefficient coal-fired power plants with and a stop for new coal-fired power plants.

The energy efficiency package underestimates the need for regulatory measures. The transport sector fortunately aims at energy efficiency, but otherwise strongly focuses on electric mobility. The potentials of expanding railway traffic on the other hand are completely left unconsidered. In the interesting package regarding expansion of the power grid, the aspect of creating social acceptance remains underexposed.

On the whole, many of the government's announcements are too vague to allow at this stage for an assessment of whether the measures are suitable to achieve the objectives which the Federal Government has set itself. No doubt: There is a time slot ahead of us during which fundamental decisions for the decades ahead until the politically important date 2050 will be taken.

2 Life-span extensions for nuclear power plants

The federal government has planned to grant life-span extensions for nuclear power plants of 12 years on average to the large energy supply companies (8 years extension for older plants and 14 years for plants built as from 1980, due to arithmetic tricks the average will rather be 13 years)³. It thus considerably strengthened the market power of the large energy companies and significantly thwarted investments in energy efficiency and renewable energies. Municipal utilities that trusted in the nuclear power consensus and made investments in the last few years do not only feel bilked out of the revenues from these investments; they also announced to put on ice umpteen billions of planned investments in mainly (but not only) climate-sound new power plants.⁴

The postponement of the phase-out conserves existing structures and hampers competition, which is declared important in another chapter of the concept⁵, as well as the transition to a more decentralised⁶ energy system. At the present stage, the last nuclear power plants will be switched off around 2040. During the last few weeks, the Federal Minister for the Environment, Dr. Röttgen, repeatedly and rightly emphasised: When we have 40% renewable energies, we do not need nuclear power any more.⁷ According to the projections made by the federal government, this will be the case shortly after 2020. By then at the very latest nuclear power will increasingly become a structural obstacle for the further expansion of renewable energies. The energy concept likewise emphasises the relevance of a flexible power supply infrastructure⁸, in order to facilitate the integration of renewable energies. The life-span extension for nuclear power plants however hampers and postpones the required re-structuring.

The investment retardant however has an effect on the construction of new coal-fired power plants as well. It can be assumed that there will be much less dynamic than planned before. The federal government could therefore seize the opportunity to announce a moratorium for the construction of new coal-fired power plants; this step would be pointing the way in terms of climate policy and would not intervene in the market to a relevant extent. This is necessary to achieve the climate objectives.⁹

³"In the overall picture, effective life-time expansions are approximately 1 year longer than the a.m. nominal values; the said effects lead to a longer extension for old nuclear power plants than for the younger ones." Felix Chr. Matthes (Öko-Institut), Updated analysis of the model for life-span extensions for German nuclear power plants negotiated on 5 September 2010, <http://www.oeko.de/oekodoc/1066/2010-112-de.pdf>

⁴ Stadtwerke befürchten Milliardenverlust (07.09.2010) in: <http://www.spiegel.de/politik/deutschland/0,1518,716093,00.html>

⁵ p.16 of the energy concept

⁶ *ibid.* p. 19

⁷"Today, we have a share 16 percent of renewable energy in electricity generation, and 23 percent nuclear energy. The moment the renewables account for 40 percent, i.e. 23 plus 16, nuclear energy is replaced." "We want to replace nuclear energy", *Süddeutsche Zeitung*, 06.02.2010; http://www.bmu.de/presse/artikel_und_interviews/doc/45613.php

⁸ Energy concept, p. 16

⁹ "It must be part of the energy concept not to authorise the construction of new coal-fired power plants. Otherwise, the objective to generating some 80% of the electricity from renewable energies by 2050, while at the same time extending life-spans for nuclear power plants cannot be achieved", http://www.saarbruecker-zeitung.de/aufmacher/berliner_buero/Atomenergie-Atom-ENergie-Kraftwerk-Claudia-Kemfert;art182516,3412543

In particular, it must be feared that in view of the excess supply in the grid caused by the continued operation of nuclear power plants while at the same time there is a dynamic expansion of renewable energies, the next strategic step taken by the energy supply industry will be to topple the priority rule for renewable electricity established in the Renewable Energy Law. The decision to extend the life-span has cemented the energy supply companies' interest in this direction, since additional renewable energies in the grid limit the profits from written-off nuclear power plants. A toppling of the priority rule would be a fundamental attack on a speedy transformation towards a regenerative era. It must be feared that they will contrast the production costs per KWh from written-off nuclear power plants with the costs for non-written-off renewable energies which are based on production costs and feed-in tariffs, and use this comparison to deduct an economic necessity to turn away from the feed-in priority for renewable energies.

Besides this, another technical argument can be expected: The fact that with life-span extensions on the one hand the inflexible nuclear power plants continue to feed in electricity for an extended period, and on the other hand the introduction of a market bonus¹⁰ in the Renewable Energy Law aims at an improved market integration of wind and solar energy may in this combination prove to be a pitfall. Though a market premium can be a useful incentive to feed renewable energy into the grid when it is actually needed, but in view of the life-span extensions it presents a gateway for the demand to switch off renewable energies at short notice as soon as there is an excess supply in the grid, given that nuclear power plants are too inflexible to be throttled and powered at short notice.

The fact that the governing coalition announces in its energy concept to maintain the basic structure of the Renewable Energy Law, i.e. priority for renewable energies and secured feed-in tariffs, is welcome against this background. Whether this promise will be kept will be a key issue in the further discussion. It will have to be neatly observed what is meant by the announcement to stronger adjust the Renewable Energy Law to the market, and that the further expansion of renewable energies shall be "market-driven" (p. 8) to a greater extent.

It has to be expected that the energy utilities will now act even more massively against the implementation of the objectives to significantly reduce electricity demand, as laid down in the energy concept, since this would considerably reduce the profitability of their electricity business. (On the electricity stock exchange the most expensive power plants determine the price – these in effect then have to be switched on less often.)

In its energy concept, the federal government tries to counteract this overall dynamics by announcing that part of the revenues (46%, according to recent calculations by Ökoinstitut¹¹) will be paid into a fund which shall be (besides revenues from emissions trading) the major financial source for the otherwise rather ambitious energy concept. In view of the energy suppliers' massively replenished "war chest", their interests and the life-span extension which thwarts investments, it is more than questionable whether this will come true. If the life-span extensions prove to thwart investments as feared, the logic of the energy concept that life-span extensions give time for the transformation towards a more flexible power infrastructure, turns out to be wrong.

¹⁰ Energy concept, p. 8

¹¹ Felix Chr. Matthes (Öko-Institut), Updated evaluation of the model for life-span extensions for German nuclear power plants negotiated on 5 September 2010, p.3, <http://www.oeko.de/oekodoc/1066/2010-112-de.pdf>

Thus the issues of nuclear phase-out, renunciation of the construction of new coal-fired power plants, and the utilisation of easily adjustable gas-fired power plants remain on the agenda – the much trumpeted entrance into the regenerative era could otherwise fail. It is obvious that the present opposition parties will use this argumentation to contest the postponement decision both legally and after the following elections, if parliamentary majorities allow for it. This is not what investment security looks like.

The attempt to turn the dynamics into a positive direction is further aggravated by the fact that the structural problem of counter-productive subsidies is not tackled. Even despite empty coffers, this problem is approached only very cautiously (air traffic tax, fuel element tax). According to a recent study commissioned by the Federal Environmental Agency (UBA)¹², the federal government in 2008 alone has made available some 48 billion Euros in subsidies which are harmful in terms of environment and health - this is more than twelve times the amount provided for environmental subsidies. The analysis by UBA comes to the conclusion that environmentally harmful subsidies in Germany have risen, at least between 2006 and 2008, by 15% (!). The sectors that profited most were energy supply and use (increase in subsidies from 11.6 to 17.7 billion Euros) as well as traffic (increase from 19.6 to 23.1 billion Euros). If this potential was used, it could facilitate a fair competition for energy efficiency and renewable energies on the one hand, and make a contribution to solving the budget crisis on the other.

The energy concept envisages numerous of the required measures for the transformation and expansion of the power grid. The life-span extensions, however, also in this respect threaten to conserve existing structures. Since a less ambitious expansion can be expected from the part of the nuclear power companies, the necessity to speedily expand the grid will be tempered. This, however, is indispensable for the transformation of the energy supply system towards a generally more decentralised electricity market which ensures complete integration of renewable energies.

In its energy concept, the German government calls the ambitious plans for grid expansion into question by insufficiently considering the necessity to generate acceptance of this objective. A purely technocratic approach will predictably provoke a lot of protest and objections.

¹² UBA, Umweltschädliche Subventionen in Deutschland – Update for 2008, Berlin, 2010, <http://www.umweltdaten.de/publikationen/fpdf-l/3780.pdf>.

3 Objectives of the energy concept

In its energy concept, the German government has united central envisaged developments of climate, energy and transport policy into a set of objectives to be achieved by 2050. It establishes objectives for GHG reductions, for the share of renewable energies both in gross final energy use and in gross electricity consumption, for the reduction of primary energy use and electricity consumption, as well as for final energy use in the transport sector by 2050 – often with intermediate targets for 2020, 2030 and 2040 (see table 1 on page 4).

Further objectives have been established as follows:

- Energy productivity shall increase by 2.1% per year on average.
- The ratio of energetic refurbishment of buildings shall be doubled from presently less than 1% annually to 2% of the total building stock.

With this, the federal government sets the bar against which the implementation of its energy concept has to be measured in future.

3.1 *Ambitiousness of the targets*

The federal government has established the long-term target for the reduction of greenhouse gas emissions at minus 80 percent as compared to 1990. At best, this target will be sufficient to contribute to limiting global warming to 2 up to 2.4 degrees with a probability of 50%. The emerging economies consider an 80 percent target for the industrialised countries as insufficient as this would mean that still in 2050 they will cause significantly higher per capita emissions. The EU therefore deems a reduction by 80 to 95% necessary by 2050, and the Federal Minister for the Environment, Dr. Röttgen, likewise repeatedly made similar statements. In the coalition agreement, it reads "at least 80%"¹³, i.e. there was no upper limit. The energy scenarios developed for the energy concept (minus 85%) and further scenarios showed that targets up to 95% would be achievable¹⁴. Nonetheless the federal government established a reduction target of merely 80 percent.

The federal government could not bring itself to adopt a 100 or 95 percent target for renewable energies in gross electricity consumption by 2050, although a growing number of studies show that this is definitely possible. By stating that solar electricity from North-African countries could make a contribution to future energy supply in Europe by 2050, it opened a backdoor though. A study recently published by the German environmental council SRU¹⁵ shows that this could fill the gap between 80 and 100 percent. The German government should therefore consider including the 100 percent target into the announced amendment to the Renewable Energy Law. The reduction of

¹³ Coalition treaty, CDU, CSU and FDP, 17. legislative period, p. 18, <http://www.cdu.de/doc/pdfc/091024-koalitionsvertrag-cducsu-fdp.pdf>

¹⁴ see table 2 below

¹⁵ SRU, Aktuelle Stellungnahme Nr. 15: 100% erneuerbare Stromversorgung bis 2050: klimaverträglich, sicher, bezahlbar, http://www.umweltrat.de/cae/servlet/contentblob/1001596/publicationFile/95428/2010_05_Stellung_15_erneuerbareStromversorgung.pdf

primary energy use by 50% and electricity consumption by 25% are very ambitious targets on the other hand. This also applies to the announcement to reduce final energy demand in the transport sector by 40% by 2050. The increase in the energetic refurbishment rate for old buildings likewise is ambitious. With regard to the increase in energy productivity, an even larger percentage is considered achievable in various scenarios (see below).

The German government has confirmed the target of reducing GHG emissions by 40 percent by 2020, as compared to 1990. The economic crisis made it easier to reach this target so that the package of measures adopted by now probably will lead to a reduction by 32%. There is still a need for the German government to adopt measures designed to fill the gap. It is not possible to determine to which extent the measures now announced can contribute to this end, since most of them are not concrete enough to estimate the impact of respective political measures. Besides, it cannot be foreseen which of the measures will actually be implemented, since major conflicts around many of them can be expected between various ministries and in parliament.

3.2 Binding force of the targets

The federal government has not dared to make a large step towards serious implementation by announcing that the agreed targets shall be laid down in a comprehensive climate law. It rather states not to "envisage a precision landing", since "this could not be reconciled with the expectable manifold economic and technical developments. It is the development path in general and in the individual sector which provides information on whether the targets are achieved in the course of the actual development."

It is decisive for investment readiness that political signals are long, loud and legal. The federal government has presented respective long-term objectives. But it did not announce them loudly and perceivable for everyone. And it avoids to make them legally binding. This noncommittal objective alone is insufficient as a counter-signal for investors as compared to the signal of life-span extension that points into the other direction. The targets and corresponding measures should be fixed in a comprehensive climate protection law. _At least, the German government did not limit itself to announce targets. It had announced to determine in intervals of three years on the basis of a scientifically sound monitoring "whether actual progress is achieved within the development path described above, and in how far there is need for action." This monitoring shall take into consideration aspects of cost effectiveness and cost efficiency. Moreover it shall identify existing obstacles and changes in the general conditions and, if necessary, present additional measures that may be required. If this announcement is meant seriously can be judged by the fact whether the first monitoring will still take place during the present election period, i.e. whether the federal government dares to be judged by first results in the election year.

Such a monitoring for the entire climate and energy policy as announced for the energy concept should be established in a climate law, and should provide for the participation of parliament, science and civil society.

3.3 Comparison with other studies and scenarios

A comparison of different scenarios can be helpful to classify the decisions regarding life-span extensions and targets contained in the energy concept. It shows that there are

serious scenarios which illustrate how even more ambitious climate targets could be achieved without life-span extensions (table 2).

Table 2: Figures, data, facts of the energy concept as compared to other studies¹⁶

Name	Energy concept of the federal government ¹⁷	Scenarios for the energy concept ¹⁸	Federal Ministry for the Environment: Guiding scenario 2009 ¹⁹	WWF Model Germany: Climate protection until 2050 ²⁰	Greenpeace: Climate protection: Plan B 2050 ²¹
Reduction of CO₂ emissions by 2050	at least 80 % (no exact specification of GHG)	85 % (all GHG)	79,50 % (only CO ₂)	Innovation scenario: 87 % (all GHG) "Model Germany": 95 % (all GHG)	90 % (all GHG)
Energy productivity	2.1 %/a	2.5 %/a	3 %/a by 2020	2.6 %/a	3 %/a by 2020
Modernisation rate of buildings by 2050	2 %/a	1.5 %/a to 2 %/a	approx. 2.25 %	approx. 2 %/a	approx. 2 %/a
Phase-out of nuclear energy (year)	approx. 2040, 8 years life-span extension for older plants and 14 years for plants built as from 1980	between 2027 and 2051	approx. 2023	approx. 2023	2015
percentage of renewable energies in electricity consumption (2050)	approx. 80%	approx. 80%	84%	innovation scenario without CCS: 97.5% innovation scenario with CCS: 78.6%	100%
primary energy demand in 2050 compared to 1990	-50%	-50%	-43%	-58%	-66%

¹⁶ Adapted table according to: Burck et al. (2010) Welche Energie-Zukunft ist möglich? www.germanwatch.org/klima/nes.htm

¹⁷ Neun Punkte für eine umweltschonende, zuverlässige und bezahlbare Energieversorgung. Entwurf BMWi/BMU vom 7. September 2010.

¹⁸ BMWi (Hrsg.) (2020): Energieszenarien für ein Energiekonzept der Bundesregierung. Download under: <http://www.bmwi.de/BMWi/Redaktion/PDF/Publikationen/Studien/studie-energieszenarien-fuer-ein-energiekonzept,property=pdf,bereich=bmwi,sprache=de,rwb=true.pdf>

¹⁹ BMU (Hrsg.) (2009): Langfristszenarien und Strategien für den Ausbau erneuerbarer Energien in Deutschland unter Berücksichtigung der europäischen und globalen Entwicklung. Leitszenario 2009, Berlin.

²⁰ WWF (Hrsg.) (2009): Modell Deutschland Klimaschutz bis 2050. Vom Ziel her denken, Berlin, Basel.

²¹ Greenpeace (Hrsg.) (2009): Klimaschutz: Plan B 2050, Langfassung, Hamburg.

3.4 Expected electricity mix

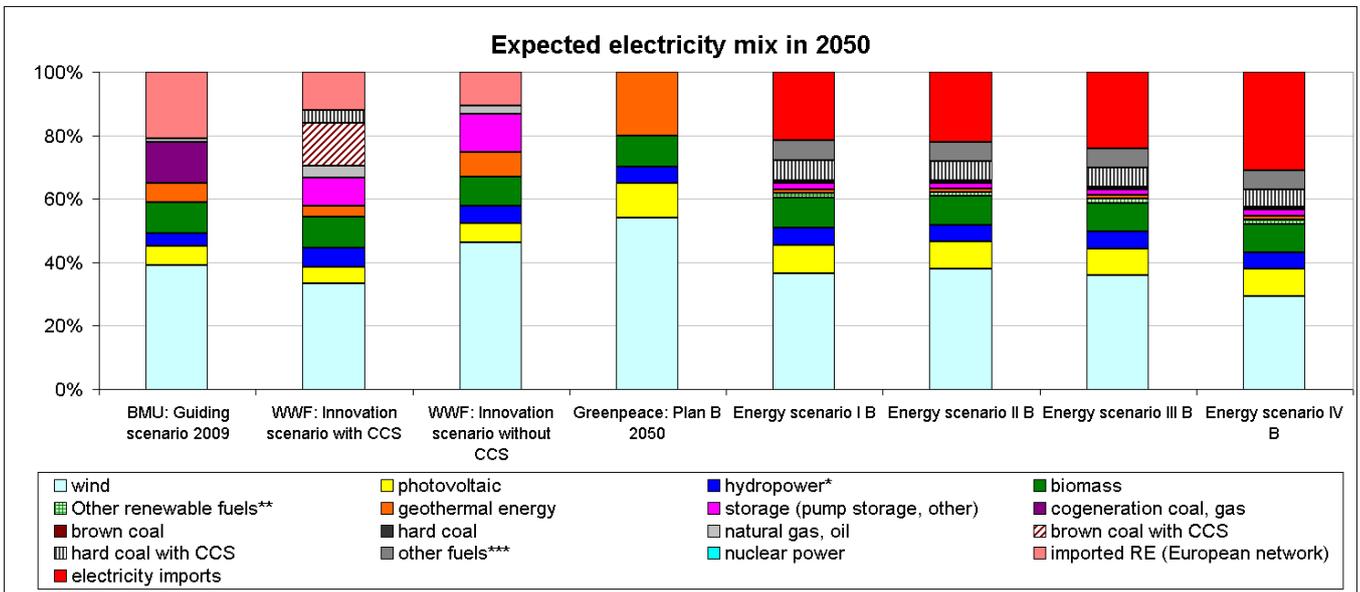


Figure 1: Electricity mix of the scenarios and studies listed in table 1

Some remarks on the electricity mix in the scenarios that serve as a basis for the energy concept:

In all scenarios, wind energy plays the decisive role for a massive expansion of renewable energies – both onshore and offshore.

In view of the data on cost effectiveness, the high percentage of hard coal and the complete phase-out of brown coal surprises in the scenarios. While the latter is welcome from the point of view of climate policy, it does not seem likely under the present general conditions. Besides written-off nuclear power plants, brown coal is the second relatively stable profit centre for electricity supply companies.

The scenarios do not include electricity imports from Northern Africa. These, however, might replace the remaining 20% of fossil power, if it is not considered possible to achieve the same with renewable energies from Germany. For Europe, this is shown in the "Roadmap 2050" study published by the European Climate Foundation²²..

²² ECF, Roadmap 2050, 2010; <http://www.roadmap2050.eu/>

4 Electricity supply in the energy concept

The Renewable Energy Law is the main driver for the expansion of renewable energies in Germany. Meanwhile this law has become a model worldwide. Therefore, announcements to transform the Renewable Energy Law have to be assessed very ambivalently. On the one hand it is obvious that a renewable energy law should provide incentives to feed in electricity when it is actually needed. The nearer the percentage of renewable energies reaches 40% and then 50%, the more urgent such a reform becomes. It will not help to conserve existing structures in this case. On the other hand, it is also clear that many actors want to use the necessary reform of the instrument to break its dynamics. In this respect, the German government's approach is problematic, e.g. regarding the introduction of quantity control (p. 8) for the promotion of photovoltaic in the Renewable Energy Law. Such a regulation could lead to the establishment of quota systems which have proved little promising for the expansion of renewable energies, e.g. in Great Britain. Long-term investment security and feed-in priority are central elements that may not be lost. The formulations in the energy concept are not concrete enough to ponder opportunities and risks of the planned reform.

4.1 *The expansion of renewable energies*

The concept for the expansion of renewable energies above all refers to wind and biomass. It is regrettable that the energy concept does not include details regarding solar heat, solar energy or geothermal energy. Regarding solar energy, it basically contains a self-praise for stronger degression.²³ Geothermal energy is mentioned only in connection with utilisation conflicts regarding CCS.²⁴

4.1.1 Wind energy

The considered measures for the promotion of offshore wind energy have the potential to considerably accelerate their expansion. Up to now, progress off the German coast has been relatively slow; only a single wind park in Germany has been put into operation – for testing purposes. A much more dynamic development takes place in other European countries.

Especially the idea to prolong granted approvals only if companies have actually realised their plans²⁵ is an important step to avoid delays in the expansion of offshore wind energy. Presently, numerous approvals have been granted which have not been followed by any implementation activities on the part of the applicants. A reform of licensing procedures can stop this grab of wind park areas by assigning the areas in question to other interested parties after a certain time of inactivity. In order to achieve an accelerated use of offshore potentials, the validity period of licences will be decisive in a future detailed regulation. If validity periods are too long, the positive approach will be impaired in its effectiveness. At the same time, the regulation will have to be applied to existing licences which are not followed by realisation activities. In order to avoid a new market-dominating generation model by the energy utilities, it should be examined whether loans from the announced special programme "offshore wind energy" can mainly be granted to

²³ Energy concept p. 8

²⁴ *ibid.* p. 18

²⁵ *ibid.* p. 9

other investors. As a consequence of the life-span extensions, the large electricity suppliers at least do not lack money to invest.

The envisaged re-structuring of feed-in tariffs for offshore wind energy with increased initial subsidies coupled with reduced subsidy periods²⁶ can prove to be a useful measure to accelerate the expansion, as long as wind energy is not excluded from the system of feed-in tariffs established in the Renewable Energy Law. Besides, it has to be ensured that the amendment to the feed-in tariffs does not result in reductions of the overall volume of subsidies.

Onshore wind energy should be strengthened both through re-powering (i.e. replacement of old plants by new, more efficient ones) and through a speedy designation of new areas.²⁷ Onshore wind energy has a considerable economic potential in its contribution to an increase in renewable electricity generation. Improvements in the designation of new areas therefore are laudable. In contrast to offshore expansion plans, this area, however, is not prioritised.

4.1.2 Biomass

The generation of electricity from biomass accounts for a high percentage in the energy scenarios the energy concept is based on. The federal government announces the intention to make increased use of both domestic and imported biomass.²⁸

The present state of global biomass use already shows that it comes into growing conflict with food security. This basic conflict cannot be solved by certification of biomass. There are considerable potentials for biomass that are not in conflict with food security, but already today rather thoughtless activities can be observed. Therefore the extremely far-reaching expansion plans are highly alarming.

It must also be avoided that production areas for certified biomass supersede other production areas and thus indirectly contribute to deforestation. Especially here it would be useful to create incentives to feed electricity in when it is needed.

4.2 Co-Generation

The German government has stated that with regard to power plants, emissions trading is the central element to achieve the climate targets. Supplementary instruments, such as the promotion of cogeneration, shall be revised to determine their additional use and additional costs.

In the field of industrial cogeneration, there are still considerable potentials which are not sufficiently tapped by emissions trading alone. As far as the building sector is concerned, it should be examined where exactly subsidies make sense, considering the objective of an overall refurbishment of old buildings and increased use of regenerative heat. This analysis, however, should be carried out completely impartially.

²⁶ *ibid.* p. 9

²⁷ *ibid.* p. 9f.

²⁸ *ibid.* p. 10f.

4.3 Carbon Capture and Storage (CCS)

The German government does not address the issue of a system conflict between coal-fired power plants (with or without CCS) and an electricity mix with 80% renewable energies which is expected by many observers.

It announces however some important decisions for the CCS concept. Thus, it makes clear that subsidies for CCS compatible plants will only be granted if inefficient emission-intensive older plants are shut down to the same extent.²⁹

The acknowledgment that CCS shall above all be tested as an option for energy-intensive industrial sectors with high process-related CO₂ emissions (e.g. steel, lime, cement, chemical industry, refineries) is likewise important. Fossil power plants range in the second place.³⁰

In this sense it is announced to implement storage projects in the field of coal-fired power plants for industrial CO₂ emissions in addition to the two known CCS demonstration plants (in the framework of the EU guideline). .

An obligation to upgrade recently or presently built coal-fired power plants with CCS technology is not mentioned. This could lead to a serious conflict with the long-term climate objectives announced in the energy concept.

It is welcome that in contrast to the previous CCS draft bill, the energy concept now states a time target (2012) for a detailed analysis of storage potentials in Germany on the basis of which a storage register shall be elaborated. Moreover it is announced to scientifically examine and clarify in a joint concept the future demand of alternative and competing utilisations – e.g. use of geothermal energy, or storage of CO₂, natural gas, compressed air, hydrogen, and waste.³¹

In view of the manifold problems with CCS (costs, open questions, acceptance) it is positive that the government announces to also examine the utilisation of CO₂ as raw material.

²⁹ Energy concept p. 16 f.

³⁰ *ibid.*

³¹ *ibid.* p. 18

5 Increase in energy productivity

It is positive that the German government basically agreed to a complete set of necessary measures in the field of energy efficiency. Numerous of the measures now announced the Federal Ministry for the Environment could not get through during the negotiations for an integrated energy and climate programme adopted by the grand coalition in 2008/2009. The announced doubling of efficiency progress could help to make use of the huge potential for cost reductions. Measures in the building sector, which has a particularly huge efficiency potential, shall be initiated with ambition.³² In many issues, such as the exact modalities of the announced energy efficiency fund³³ or the introduction of ambitious energy efficiency standards³⁴, the German government remains too vague to allow for an assessment of effects.

Up to now German policy in the field of energy efficiency in general is characterised by a multitude of laws, regulations and policies which are coordinated only to a limited extent, and by increased influence of European legislation. In order to better adjust the central instruments for an increase in energy productivity, and to develop an overall strategy, it is of utmost necessity to better coordinate policies and to bundle competencies. Along with the announced efficiency fund, there should be an energy efficiency law (on the basis of European legislation), flanked by tax measures.

5.1 Energy efficiency in the field of electricity

The German government rightly calls the realisation of energy efficiency potentials in the field of electricity a key issue for sustainable energy and climate policy. The energy concept contains ambitious targets and a corresponding catalogue of measures. Far-reaching guidelines consist in an increase in energy productivity by 2.1% per year, a reduction of electricity consumption by 10% until 2020 and by 25% by 2050, as well as a reduction of primary energy consumption by 20% by 2020 and by 50% by 2050³⁵. However, it has not been mentioned that these targets shall be embedded in an energy efficiency law as prescribed by European law, or that respective EU directives shall be nationally implemented.

In times of the grand coalition, the introduction of an energy efficiency funds equipped with 500 million Euros per year as well as a compulsory energy management³⁶ for companies did not yet find general consensus and thus were not included in the integrated energy and climate programme. Efficiency and effectiveness of the fund will depend on its practical implementation.

The design of the energy efficiency fund remains open.³⁷

- The fund should synchronise policies in the field of energy efficiency in Germany,
- develop and evaluate efficiency programmes and measures,

³² Energy concept p. 5

³³ *ibid.* p. 14

³⁴ *ibid.* p. 26

³⁵ *ibid.* p. 5

³⁶ *ibid.* p. 13f.

³⁷ *ibid.* p. 14f.

- and coordinate financing, information, counselling and management, as well as ensure conjunction with existing programmes, such as the programme implemented by the KfW development bank.

Central elements moreover should be:

- a market incentive programme for efficient energy use in private households
- targeted promotion of and energy-saving advice especially for low-income households

The monitoring should also examine whether the fund should be increased. In our estimate, some two billion Euros would be required.³⁸

A breakthrough consists in the obligation to introduce energy management systems for companies that are exempted from eco-tax.³⁹

It is interesting that the German government wants to promote a pilot programme on soft certificates. Many of the announcements of such "soft measures", such as the start of an "Initiative Energy Efficiency", are still very vague and therefore hardly quantifiable with regard to achievement of the targets.⁴⁰

The German government could not reach consensus regarding the introduction of top runner programmes⁴¹, e.g. for electrical devices. It states its intention to stand up for "the further development especially of European product standards according to the eco design guideline, corresponding to an advanced state of the art". This, however, does not generate the dynamics that could be achieved if top runners automatically set the new standard. In this respect, it will be necessary to wait for the Federal Council to take the initiative, as has already been announced by the State of Hamburg.⁴²

It is recommended to bundle many of the announced funding measures – including the target of increasing energy productivity (by 2% annually) in an energy efficiency law. This law could also regulate the implementation of the respective EU directives, e.g. with regard to efficiency standards or the prohibition of stand-by circuits. Up to now, the energy concept does not refer to such an energy efficiency law.

5.2 Energy efficiency and public procurement

The energy concept mentions the obligation to ensure energy-efficient public procurement and announces to legally embody this obligation.⁴³

The success of this intention will depend on the details of its implementation – the vague and unclear formulation leaves much room for interpretation.

As to the background: The public authorities (federal, state and municipal) place annual orders to the amount of some 360 billion Euros.⁴⁴ They thus possess a decisive market power and in fact are the only customer in some product categories (buses, public

³⁸ *ibid.* p.14

³⁹ *ibid.* p. 13

⁴⁰ Energy concept p. 12f.

⁴¹ Such a programme declares consumption of the most efficient appliances as standard for the sector

⁴² Energy concept p. 37

⁴³ *ibid.* p. 12

⁴⁴ Mc Kinsey & Company, Inc. (2008): Potenziale der öffentlichen Beschaffung für ökologische Industriepolitik und Klimaschutz

transport). The direct climate relevance of public procurement is obvious. At the same time, this market power offers the opportunity to induce industry to develop climate-friendly and energy-efficient new products by setting clear specifications and targets, and thereby produce an effect even beyond public procurement.

Since the public procurement law was reformed last year, energy efficiency or other climate-relevant factors can be included in public calls for tender. Though this is only a discretionary provision and does not oblige the procurer to take energy efficiency or life cycle costing into account, it has eliminated legal uncertainty and thwarted arguments against so-called "external criteria".

It is necessary to adopt a national strategy for climate-friendly public procurement, as the EU demands from all member countries since 2003. It would have to re-structure the highly fragmented procurement practice and ensure coherence of actual procurement practices with national climate protection targets by establishing a national service point and clear targets.

In contrast to what is suggested in the energy concept, the federal government has no superior legislative powers that could bind states and municipalities. It is, however, indispensable as overall coordinator and role model.

5.3 "Modernisation campaign buildings"

By stating that energetic modernisation of buildings is a key to modernising energy supply, and by demanding a "modernisation campaign for buildings" the German government rightly attaches to this sector a central role with regard to sustainable climate and energy policy.⁴⁵ The "sleeping giant of climate protection" actually deserves this role. Though the building sector accounts for 40% of energy consumption in Germany and is responsible for a considerable part of GHG emissions, it only came into political focus in the last two years, i.e. with the climate protection package adopted by the grand coalition.

The German government presents ambitious targets by announcing a doubling of the modernisation rate to 2% annually, a reduction of heat requirements by 20% until 2020 and by 80% until 2050, a significant increase in the share of renewable energies for heating purposes, and an almost climate-neutral stock of buildings by 2050. Moreover, it announces a comprehensive set of measures to achieve these targets. Only when these vague announcements have been concretised, it will be possible to assess whether the measures are suitable to actually achieve the pronounced targets.

The studies relevant for this area⁴⁶ consider a regulatory framework (above all legal provisions for energy standards in buildings and for the use of renewable energies), flanked by an increased refurbishment rate and quality through improved state subsidy and amendments to the rent law, to be the central strategic approach to achieve ambitious targets.

The German government acknowledges that both the Energy Conservation Regulations and the Renewable Energies Heat Act will have to be further developed (p. 26) in order to achieve the desired effect with regard to the existing buildings. A first important step would be to apply to existing buildings the obligation to use renewable energies, as laid

⁴⁵ Energy concept p. 26ff.

⁴⁶ WWF (2009): Modell Deutschland Klimaschutz bis 2050. Vom Ziel her denken, Berlin.

down in the Renewable Energies Heat Act.⁴⁷ At the same time the German government estimates "that the application of regulatory provisions to existing buildings is limited, especially with regard to the owners' economic burden". It therefore sees the necessity of a new strategic approach at the core of which "the demanded modernisation requirements are defined on a long-term basis in the interest of the owners so that they can take them into consideration in their investment plans."⁴⁸ This would mean that each house owner will soon – i.e. with the amendment of the Energy Conservation Regulations in 2012 – know when in the decades to come he will have to energetically modernise his building.⁴⁹

The amendment shall introduce the standard of "zero emission" for all buildings by 2050 on the basis of key figures for primary energy consumption. The modernisation road map begins in 2020 and gradually leads to the target level by 2050.

The study "Model D - Climate protection 2050" proposes the following milestones for such a step-by-step plan:

- 60 kWh/m² in 2020 and 40 kWh/m² in 2030 should be established as standards for energy-efficient renovations.
- By this, the specific final energy consumption of all buildings should be reduced by more than half between 2005 and 2030, and by some 90% until 2050.

The German government's concept does not specify on which level it sees the "moderate standard" in 2020 which is supposed to ensure that in a first phase only the energetically worst buildings are affected.⁵⁰ The owners can choose between insulation measures, improvement of installations or use of renewable energies.

In order to ensure modernisation rates of at least 2% per year and a efficiency of refurbishments of 90% in the long run, it is necessary to continue, accelerate and amend the respective funding programmes. In fact, the German government has announced a significant improvement in funding the refurbishment of old buildings.⁵¹ (In the medium term, an evaluation of previous and planned subsidy structure should lead to an improved adjustment of different funding instruments.)

The proven CO₂ building sanitation programme shall be provided with much better funding – it remains open what this means. This measure comes as a surprise, given that the programme recently has been cut by one third. According to the study "Model D – Climate protection 2050" it would be necessary to increase the building sanitation programme by 500 million Euros per year. The comprehensive catalogue of measures in the building sector could be financed e.g. by cancelling subsidies that are harmful to the environment (see above).

The German government furthermore has announced to continue the market incentive programme to promote the use of renewable energies on a high level with additional funding of 200 million Euros per year.⁵²

⁴⁷ It has to be assumed that BMU and BMWi support different positions on this issue.

⁴⁸ Energy concept p. 26 f.

⁴⁹ *ibid.* p. 27

⁵⁰ *ibid.*

⁵¹ *ibid.*

⁵² *ibid.* p. 27

Tax incentives to promote building sanitations have proved to be particularly effective in the past. The federal government therefore wants to consider the re-introduction of a special amortisation corresponding to the old § 82a income tax by-law.⁵³

The "new strategic approach" (p. 26) may not be played off against regulatory approaches. A lack in implementing and monitoring government regulations is one of the reasons for slow progress in sanitation and the new construction of numerous sub-standard buildings. A lack of control threatens to frustrate an implementation of the targets announced for the building sector. Except for giving incentives, the German government obviously does not want to become active in this field, and it has to be assumed that only some of the people concerned will respond to these incentives.

The federal government furthermore announces to expand the possibilities of energy contracting in order to promote an efficient realisation of saving potentials especially in the field of rented apartments, and therefore wants to create a uniform framework for heat supply contracting⁵⁴. These announcements to support contracting are in sharp contrast to the present draft of the secondary budget laws which withdraw from the contracting business tax relieves which have been in force for more than ten years and thus obstruct the development of a market for energy services which has just begun.

One of the major constraints which hamper increased refurbishments rates consists in obstacles in the rent law (landlord-tenant dilemma). The German government announces to "amend (it) in a balanced way and make it more investment-friendly to promote energetic sanitations" in order to realise the energy efficiency potential.⁵⁵ Since the announcement remains vague, it cannot be discerned whether the landlord-tenant dilemma will be seriously tackled.

It should be considered to unite in an overall law various laws which, according to the German government, shall be amended anyway – such as the Energy Conservation Regulations and the Renewable Energies Heat Act, improved implementation and monitoring by the federal and the state governments, the abolition of night storage heaters etc.

⁵³ *ibid.* p. 28

⁵⁴ *ibid.*

⁵⁵ *ibid.*

6 Transport

In the field of passenger transport, the energy concept conserves existing structures. It proceeds from the assumption that the market share of motorised private transport will remain stable at 80 percent until 2050.⁵⁶ It does not reckon with demographic aspects and looming shortages (crude oil, agro fuels) which point into another direction.

Thus it loses sight of potentials, such as those of local railway traffic. An implementation of the "Germany tact", which aims at doubling (!) the demand for local railway traffic during the next few years, as laid down in the coalition agreement, is not mentioned at all.

Unlike in the energy sector, there is no orientation towards forward-looking concepts – such as e.g. the combination of electric mobility with railway traffic: e.g. a concept which links electric mobility for local traffic up to a range of 50 km to intersections which allow changes to public railway traffic.

According to the concept, there will be a million electric cars by 2020, and five million by 2030 (out of 50 million cars at present). The concept does not present a roadmap for the transition from passenger cars with combustion engine to electric vehicles.

It is welcome that in 2011 the federal government will present a Labelling Regulation for electric vehicles operated with addition renewable energies.⁵⁷ A more stringent coupling of electric mobility with renewable energies however would be appropriate.

The targets for final energy use in the transport sector as compared to 2005 (2020: -10%, 2050: - 40%) are interesting, as is the statement to reduce specific emissions to 35 g CO₂ per car by 2040.⁵⁸ The non-quantified announcement to aim at "ambitious limits for all vehicle classes", however, is of little significance.

No future-oriented concept has been presented with regard to goods traffic which accounts for almost 10 percent of emissions in Germany. This is an alarming omission given that huge growth rates can be expected in Germany as a transit country, and that some of the capacities are already used to the limit. An appropriate reaction to the risk of considerable price jumps for crude oil is likewise missing.

⁵⁶ Energy concept p. 29 ff.

⁵⁷ *ibid.*

⁵⁸ *ibid.*

7 Efficient power grid infrastructure and integration of renewable energies

The transformation and expansion of the electricity power grid will play a central role with regard to the transition into the regenerative era. At the moment, the grid is the bottleneck on this way. Therefore, the grid expansion will have to meet three targets:

1. Acceleration of the grid infrastructure expansion including a consistent orientation towards 100% supply of renewable energies
2. Triad of expansion and transformation of grids and storages facilities, market integration of renewable energies and generation according to customer demands
3. Speedy implementation without curtailing the rights of the affected population or compromising nature conservation and the protection of species.

In this regard, the energy concept mainly contains a far-reaching conception and a number of good approaches (e.g. in the field of "accelerated grid expansion" for an improved grid fee regulation).

Since the target of having 100% renewable energies by 2050 is missing, however, the signals of what, where and how to expand are getting more diffuse. From our point of view, the lack of a 100% target in some respects leads to the wrong conclusions regarding the target plan 2050.

Unfortunately, the principle "grid expansion: optimisation before reinforcement before expansion" (deducted from the Renewable Energy Law (EEG § 14) and the Energy Management Act) which is of utmost importance to social acceptance, has not been further substantiated in the concept.

The European dimension has mostly been taken into consideration, and German programmes have been linked to European requirements (integrated Europe-wide grid, overlay grid etc.). However, it should have been concretised how Germany will constructively participate in processes taking place on the European level (e.g. harmonisation of grid codes, funding for the expansion of grid connectors etc.). .

It has been omitted to bind the Federal Network Agency in its capacity as regulatory authority to the objectives of the Renewable Energy Law. Up to now it is responsible for increases in efficiency gains in monopoly structures – in future it will also be responsible for the approval of costs related to the transformation of the grid.

The paragraph on "social acceptance"⁵⁹ indicates that the authors of the paper have only recently started dealing with the issue; it is merely mentioned (using at least some of the right keywords). A convincing strategy to ensure social acceptance, however, is indispensable to achieve the transformation and expansion of the grid on time.

As far as the issues of market integration and generation according to demand are concerned, it is recognisable that the federal government plans to flexibly adjust access to the electricity markets to the requirements of renewable energies. (It must be emphasised,

⁵⁹ Energy concept p. 39

however, that this is one of the central points where the priority rule for renewable energies can be attacked – see above.)

At least, the German government has announced its willingness to "politically flank" initiatives undertaken by large-scale industry to import renewable energies (e.g. Desertec) – without a corresponding roadmap, though. Important is the political confession that the importation of solar energy from Northern Africa can play a role in European energy supply in a perspective up to 2050 (p. 38), and the CSP technology⁶⁰ is explicitly mentioned as an important technology in this respect. The focus on solar technology in this case is too narrow though, leaving out the huge offshore wind potentials in Northern Africa and the balancing effect of North-African wind currents as compared to Northern European wind potentials.

7.1 Expansion and transformation of the grid infrastructure

The following positive aspects can be stated in this regard:

- The concept addresses the triad of expansion of the grids and storage facilities, market integration of renewable energies, as well as generation according to demand.
- The idea of a super smart grid⁶¹ is reflected in the concept, since it emphasises in principle the need for expansion of both large production sites located far away from consumer centres (wind offshore), and decentralised production plants, as well as Germany's importance for an integrated European electricity system (p. 19). According to the federal government, it is necessary to plan an overlay grid (i.e. low-loss electricity transport via HVCD transmission technology mainly over north-south routes) which has to be incorporated in an integrated European electricity grid.
- The federal government intends to develop a "concept for a nationwide strategic planning of a target grid 2050" (p. 19) that shall address the following issues: further development of the existing grid, planning of an overlay grid and potential pilot routes, North Sea grid and cluster connection for offshore energy, as well as the integration of the German grid in the European network.
- Focus on "accelerated grid expansion" – the German government intends to enter into a dialogue with grid operators and states and to jointly develop concepts to master the challenges (p. 20). (comment see under 'acceptance')
- Development of a coherent German-wide grid expansion plan agreed between all operators which shall be laid down in the amendment to the Energy Industry Act for the implementation of the Third Internal Market Package in 2011. On the basis of this plan, the federal government wants to submit a federal network plan. The only drawback is the missing link to the target plan 2050.
- Some concrete proposals to improve and accelerate the planning and authorisation practice, harmonisation between the states (federal/state working group to develop

⁶⁰ Concentrated Solar Power

⁶¹ the Super Smart Grid combines two complementary approaches, i.e. large-scale spacious electricity supply from renewable sources and intelligent grids for decentralised renewable energies, demand control and virtual power plants

master plan guidelines for the plan approval procedure regarding the construction of power lines etc.).

- In part very detailed ideas to improve the regulatory framework for the grid expansion: revision of the grid fee regulation - the objective is an improved acknowledgement of costs for the grid extension, inclusion of north-south routes in the requirement plan (amendment to the Power Line Expansion Law), create incentives to invest in the expansion of the overlay grid.

The following aspects, however, are rated as negative:

- The energy concept deals with the expansion of the grid, but not with the necessity to transform it. Just as important is the development of technical solutions to optimise and enhance the grids. In the opinion of Germanwatch, the legislator will have to concretise the principle "grid expansion: optimisation before enhancement before expansion" established in the Renewable Energy Law.
- The federal government remains vague in explaining how to achieve the objective of "accelerated grid expansion", it only announces to review "economic incentives and planning instruments" (p. 19).

7.2 Market integration of renewable energies and generation according to demand

- In principle, the federal government recognises the need to regulate electricity markets much more flexible in future in order to bring renewable energies onto the market and to install a flexible load management (p. 23). The proposals to introduce an optional market premium and to further develop the compensation mechanism regulation therefore point into the right direction, but will have to be concretised in the amendment to the Renewable Energy Law. The devil is in the detail – this may not lead to questioning the priority rule for renewable electricity.
- Very important is the announcement to facilitate the participation of renewable energies in regulation and balancing energy markets by lowering the existing access barriers (pre-announcement of regulation energy four weeks in advance) (p. 23).
- Interesting: improved conditions for effective load management (alleviation of access conditions for electricity-intensive industries in the regulation and balancing energy markets)
- The challenge to adjust electricity generation, grid routes, storage and consumption to the energy markets' constantly changing requirements has been recognised. On the whole, the proposals regarding load management and generation according to demand are positive and partly very concrete (p. 21).

7.3 Expansion of storage capacities

- The German government acknowledges the important role of storage facilities to facilitate integration of renewable energies in the power grid (p. 24). Most of the proposals (development of German potentials, use and integration of foreign potentials in Norway and in the Alps, research on new storage technologies) point into the right direction. (As far as biomass is concerned, the general criticism regarding its unbridled expansion has to be taken into consideration.) Moreover, the

proposals have to be further concretised (e.g. investment incentives for storage capacities for both decentralised and central plants, analogous to the Renewable Energy Law).

7.4 Environmental impact and acceptance

- The energy concept mentions a basic precondition for regional acceptance of grid expansion, i.e. improved planning on the basis of coherent German-wide grid expansion plans (p. 20), this, however, has to be concretised: An optimised grid planning requires grid concepts for all levels (extra-high, medium and low voltage) which are coordinated with the states and in harmony with European grid expansion plans. They have to be based on the politically established expansion plans for renewable energies and must be published.
- The energy concept reveals that politics begins to assume their responsibility for the expansion of the grid, given that these are projects of public interest ("a task for economy and politics for society as a whole", p. 39). Early involvement of all actors concerned, as well as transparency of data and information have likewise been identified as important steps.
- This shall be brought about by an internet platform and an internet-based dialogue forum for citizens (p. 39), as well as an information campaign (p. 20). These are necessary first steps, but not enough. It clearly shows that the federal government has not yet understood the dimensions of social acceptance.
- Just one example: The German government plans a dialogue with the "most important stakeholders" (p. 21) under the auspices of the Federal Ministry of Economics, but names only grid operators and states. Environmental associations or local actors from regions concerned are not considered as actors with a relevant interest. Nor is it enough to involve only the Federal Ministry of Economics; a dialogue jointly organised by the ministries for economics and environment would be more productive.

What is missing in the energy concept with regard to acceptance?

- In order to achieve regional acceptance it is important to provide information regarding the need for expansion at an early stage, to ensure transparency, and to offer possibilities to participate in the planning. These should be subject to the same criteria or planning guidelines throughout the country.
- In the opinion of Germanwatch, interference should be minimised through various, also technical measures as far as possible. In concrete terms, this means:
 - Application of distance regulations prescribed by law and valid throughout the country;
 - Application of the bundling principle, but respecting binding national distance regulations between line routes and residential areas (development plan)) and for new building projects;
 - Coupling the building of new routes with optimised landscaping; e.g. dismantling of 110kV lines which means relief to some regions / residential areas;

- Reduction of magnetic fields by optimising allocation of phases and system as well as use of power poles with a corresponding effect potential;
- Development of financial or other suitable compensation measures for municipalities and counties which could be significantly limited in their development potentials by the transmission and distribution grids;
- Establishment of new sector-specific compensation rules (revision of § 45 Energy Management Act, if necessary sector-specific adaptation of state compensation laws and a limitation of the easements to the technical and economic lifetime);

8 Energy supply in the European context

The demand to establish an integrated European-wide grid is reflected in the energy concept.

It deals rather exhaustively with the requirements and challenges of trans-border electricity transport (very large distances, expansion of European-wide interconnector capacities, as well as improved energy trade between neighbouring states in order to optimise the geographic spread of renewable energy generation), especially with political measure, but is not concrete.

- Positive aspects are the announced initiative to plan an integrated European grid, as well as the development of common technical grid standard (p. 35), besides the EU Commission as most important actor, progressive member states are likewise needed to push these political objectives.
- In order to avoid bottlenecks in the grid, the federal government plans to intensify its cooperation with France and the Benelux countries. Stronger integration of the Eastern European energy markets is another objectives that is reflected in the planned EU infrastructure package (p. 35).
- "The German government, with participation of the companies, will enter into talks with Norway and the Alpine countries in order to achieve long-term cooperation with the European partner countries in the field of electricity supply, in particular with regard to building up and using storage capacities." (p. 35)
- With regard to the expansion of an integrated European grid, it is planned to actively accompany and check the EU infrastructure package. Where a "market-driven grid expansion" alone is not sufficient, the federal government intends to work towards an improved EU legal framework (especially with regard to improved access to funding sources for companies, expansion of grid connectors), p. 35. Further concrete proposals regarding both innovative funding models for pilot projects of European relevance or with new technologies would be helpful, just as proposals on how to ensure investment and yield security for private investors.

At first sight, the considerations regarding the **marketing of green electricity and electricity labelling** seem to be useful (improved guideline for renewable energies: no double-marketing for CO₂-free electricity, improved consumer information on origin and electricity mix), p. 37.

Germanwatch

Following the motto "Observing, Analysing, Acting", Germanwatch has been actively promoting North-South equity and the preservation of livelihoods since 1991. In doing so, we focus on the politics and economics of the North with their worldwide consequences. The situation of marginalised people in the South is the starting point of our work. Together with our members and supporters as well as with other actors in civil society we intend to represent a strong lobby for sustainable development. We endeavour to approach our aims by advocating fair trade relations, responsible financial markets, compliance with human rights, and the prevention of dangerous climate change.

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