Good Governance of the Energiewende in Germany: wishful thinking or manageable?

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Germany has decided to phase out nuclear power and increase the share of renewable energy for electricity production to 80 % by 2050. The energy system transformation, the Energiewende, also aims to improve energy efficiency in the industry and buildings sector as well as to direct the transportation sector towards sustainability. The transition of the whole energy sector in an industrialized country like Germany is a complex issue which affects many sectors, interests of companies, citizens and residents, as well as politicians. The governance of the Energiewende in Germany can currently be described as very fragmented, not well structured, and heavily influenced by different lobbying groups and coalitions. Good governance should comprise clear long-term goals, a distinct allocation of responsibilities to one institution, more and better participation processes, and full transparency as well as better cooperation. Good governance can lead to much more efficient and effective progress of the Energiewende.

Energy Transition in Germany: the Energiewende

The German term "Energiewende" is about to become an international synonym for a major energy system transformation. Germany intends to change its overall energy system by shutting down all nuclear power plants by 2022 and reducing greenhouse gas emissions by at least 80% by 2050 (BMWi and BMU 2012: 15f). The contribution of renewables to the total power production in Germany will be increased to 35% by 2020 and 80% by 2050 and their contribution to the total final energy consumption will rise to 18% by 2020 and 60% by 2050. Energy efficiency improvement is central to reach these goals. The federal government in Germany has set ambitious targets like a 40% reduction of energy demand in transport or an 80% reduction of primary energy consumption in heating by 2050. The Energiewende is therefore a fundamental transformation of the energy system in one of the world's leading industrial economies.

Originally, the intention to transform the energy system towards more renewable energy came up in the environmental movement of the 70s, creating a first short alternative energy boom in California (cf. Hockenos 2013). At that time the German Öko-Institut was the first to assess the energy transformation potentials in Germany. This idea was strongly supported by non-governmental organizations (NGOs) like the WWF, Greenpeace, BUND, and the new political party the Greens, especially with regard to a fast nuclear phase-out and a steep increase of renewable energy. They can be seen as the first advocates of the energy transition, the Energiewende, in Germany. The political breakthrough for renewables came in 1991 with the Electricity Feed-in Law (StrEG) which was a first initiative of the conservative party, the CSU (Christian Social Union), in cooperation with the Green Party, gaining cross-party support in parliament (cf. Berchem 2006). Soon the law proved more effective than expected, increasing the share of renewable energy - though the association of electricity producers filed a complaint concerning market distortion in front of the EU Commission, without success.

Later, the socialist-green government (SPD and Greens) created the Renewable Energy Act (EEG) in 2000 that guaranteed feed-in for renewable energy and guaranteed prices for 20 years (cf. Ydersbond 2012: 33). Furthermore, in the 2000s the social-democrat-green government decided to phase-out nuclear power by 2022 (Sitte and Glatzel 2002). However, in 2010 this decision was revoked by the conservative-liberal government. In their Energy Concept they confirmed the transition to a low-carbon economy, but they announced a longer use of nuclear energy as a so-called bridge technology (cf. BMWi and BMU 2010). But already in 2011 this turnaround has been taken back in light of the Fukushima disaster and massive public protest. Since then all major German parties have committed to the massive energy system transformation that is known as the Energiewende. This means the creation of a non-nuclear low-carbon economy that is highly energy efficient and primarily fueled by renewable energy. The political commitment to do so created a strong

global media response and since then the term "Energiewende" has become a worldwide synonym for Germany and its progressive energy policy (cf. Hockenos 2013).

Germany has made significant progress towards becoming a low-carbon industrial economy. From an electricity share of about 3% renewables in 1990, the share of renewable power has increased to more than 22% today - constituting approximately 11% of the total energy demand (IEA 2013: 111). By the end of 2010, private citizens, largely through energy cooperatives, owned 40% of the country's total of 53 GW installed renewable energy capacity. In addition, farmers owned 11% and project developers 14% (Buchan 2012: 10). Nevertheless, the German electricity market is still dominated by four big electricity producers (Eon, Vattenfall, RWE and EnBW) that account for almost 80% of the German electricity consumption (Buchan 2012: 9). Until recently they also owned the respective transmission system in their territories. After strong interventions from the European Commission for competition, they have been urged to sell their transmission system so that basically four new grid owners are responsible for the grid expansion.

The Energiewende is often presented as Germany's big gamble (Buchan 2012). Criticism is not primarily based on concerns about insufficient renewable energy production, the lack of innovative new technologies or the creation of a large decentralized energy grid. Instead, the major obstacle is focusing on the governance of this massive long-term project. The term "governance" stands for the complexity and interdependency that characterizes today's world. Public matters require cooperation and coordination of various public and private actors instead of hierarchical top-down decisions (cf. Grande 2012). In this context good governance is sometimes referred to as "an effective, efficient, and reliable set of legitimate institutions and actors engaged in a process of dealing with a matter of public concern" (Anheier 2013: 13). The Energiewende in Germany comprises diverse political levels and jurisdictions as well as various interest groups, cooperatives and alliances. Without clear rules, assignment of tasks and responsibilities, without a clear regulation and monitoring, without stringent governance, the whole project can and will fail. The energy transition process itself faces several challenges. These include important aspects like an adequate grid expansion for renewable energy, load management and intelligent distribution grids, as well as effective storage so as to manage volatilities as well as globally competitive and socially inclusive energy prices. Unforeseen global developments like the massive increase of shale gas, low coal prices or the currently quasi inactive EU emission trading scheme further challenges the governance process. All the above-stated challenges require adequate governance responses. However, this has proven complicated in light of global, European, federal, state and municipal levels of governance and the resulting lack of transparency, the lack of clear accountability and legitimate actors, and the resulting lack of efficiency and effectiveness.

In the following paper, the governmental structure of the Energiewende and how it is influenced by civil society organizations and private actors will be examined. Building on this, based on the advocacy coalition framework, the two main actor coalitions will be portrayed in detail (cf. Sabatier and Jenkins-Smith 1999). Attitudes and positions of different actors as well as their interests and capabilities are shown. Thereon, current governance obstacles, as well as how the different political parties aim to solve them in case they win the upcoming national elections in autumn 2013, will be discussed. In summary, the key governance problems will be highlighted and some future scenarios for the development of the Energiewende will be depicted.

The government structure

The Energiewende in Germany needs to be reflected against the energy and climate change policies of the European Union. The European Union's Third Energy Package in 2007 called for more competition in the electricity and gas markets (cf. European Commission 2013). In 2009 the Lisbon treaty assigned clear energy-related jurisdictions to the EU by giving it the mandate to create framework conditions for a single European energy market and the task to coordinate the cross-border expansion of the electricity grids (cf. BMWI 2013b). The non-binding Directive on Electricity Production from Renewable Energy Sources in 2001 (2001/77/EC) and its binding successor - the Renewables Directive (2009/28/EC) - have the aim to increase the share of renewable energy of electricity production. Also in 2009 EU countries agreed to the so-called 20-20-20 targets with a 20% reduction of greenhouse gases, a 20% increase of energy efficiency, and a share of 20% renewables in the total energy demand by 2020. Furthermore, the Energy roadmap 2050 depicts scenarios for the

achievement of an 85-90% reduction of greenhouse gas emissions by 2050 compared to the level of 1990 (BMWi 2013b). The European Emission Trading Scheme (ETS) has been established to reduce greenhouse gas emissions in Europe where energy and industry companies trade emissions certificates. As there has been an over-allocation of certificates, the carbon price has dramatically declined.

The EU´s energy and climate chance policy decisions have a strong impact on national energy policy decisions. On the one hand this indicates a European consensus to strive for a low-carbon economy, and on the other hand it suggests increasing interference by EU level actors when Germany aims to realize its overall more ambitious national targets.

On the federal level in Germany, the most important actors are the Federal Ministry of Economics and Technologies (BMWi) and the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU). Their jurisdictions comprise the most important pillars of the Energiewende. The BMWi - currently headed by the market-friendly liberal party (FDP) - is responsible for the reliable supply of energy, energy efficiency and the energy grid. In this context the related Federal Network Agency is supposed to monitor and coordinate the expansion of the electricity grid and the Federal Cartel Office should serve as a guardian of fair competition in the rather oligopolistic German electricity market. Jointly, both organizations are supposed to monitor the German electricity market. The Federal Office of Economics and Export Control (Bafa) is a superior federal authority subordinate to the BMWi. With regard to energy it is responsible for various support schemes for energy efficiency and conventional as well as renewable power. Bafa conducts some of these programs for other ministries like the BMU (cf. Bafa 2013). The German Energy Agency (Dena) is another important organization related to the BMWi. The public-private company is not part of the BMWi, but the BMWi is heading its supervisory council and therefore it is the ministry with the closest affiliation to Dena.[1] Its task is to provide expertise and awareness that supports the development of markets for energy efficiency and renewable energies. On the one side this means that Dena prepares studies on the grid expansion (so called Dena Netzstudie I and II); on the other side it means that Dena is active in projects like the German export initiative for renewable energies (cf. Exportinitiative 2013).

The Federal Ministry for Environment and Nuclear Safety (BMU) - currently headed by the conservative party (CDU/CSU) - is responsible for renewable energies (apart from bioenergy), environmental protection, and nuclear safety. These jurisdictions can create important overlaps with the BMWi - for example, the grid expansion needs to be closely monitored with the expansion of renewable energy. The BMU assigned environmental protection to the Federal Environmental Agency (UBA), which is subsequently responsible for tasks like the European emissions trading system (ETS) in Germany. The German Renewable Energy Agency is another affiliated organization. Even though it is not headed by the BMU it gets support from the BMU as well as from the Federal Ministry for Food, Agriculture and Consumer Protection (BMELV) and various renewable energy companies and organizations. Its mission is the promotion of the renewables. Thus, although it does not conduct independent studies, there is some jurisdictional overlap with Dena.

Besides these two ministries, some other Federal ministries have relevant jurisdictions related to the energy system transformation. The Federal Ministry of Transport, Building and Urban Development (BMVBS) is responsible for energy efficiency improvement in buildings, low carbon means of transportation, and sustainable city development. In addition to this, its Federal Office for Shipping and Hydrography is responsible for the authorization of off-shore wind parks. The Federal Ministry of Food, Agriculture and Consumer Protection (BMELV) has the mandate for bioenergy and consumer protection with regard to energy. Furthermore, the Federal Ministry of Education and Research (BMBF) engages in research in energy efficiency, energy storage and renewables, just as the BMWi, the BMU and the BMVBS are doing. The Federal Ministry of Finance (BMF) decides about taxation of energy and it controls the KfW Bank (Kreditanstalt für Wiederaufbau), which finances various activities in the field of renewable energy projects and energy efficiency improvement, especially of houses by insulation. Altogether, six federal ministries have relevant jurisdictions concerning the Energiewende with the BMWi and BMU standing out as the most dominant actors. As energy efficiency improvement is a central cornerstone of the Energiewende project, the Ministry of Transport, Building and Urban Development should also have a prominent role.

[1] Overall, 50% is owned by the federal government, 26% by the state-owned KfW Bank, and 8% each by the Allianz SE, Deutsche Bank and the DZ Bank (Dena 2013).

In addition to this, the governance of the Energiewende becomes more complex due to Germany´s federalism. Germany's sixteen states (Bundesländer) have an important autonomy when it comes to state support schemes, regulations for construction, renewable energy heating and land-use planning. As all Länder have their own agenda, they make varying use of their political instruments and can thus cause inconsistencies with the federal goals for the Energiewende. For instance, the southern states of Baden-Württemberg and Bayern want to increase their self-supply with renewable energy. At the same time many northern states like Brandenburg, Schleswig-Holstein or Mecklenburg-Vorpommern would like to benefit from their good conditions for wind energy and supply the more industrialized southern states with renewable energy (cf. Diekmann 2012: 12). If both continued it would create significant over-capacities (cf. Meiritz et al. 2012). Such conflicting interests constrain a coherent national concept for the Energiewende. However, recently the Länder government agreed to improve cooperation and to transfer more planning competencies to the federal level (cf. Krohn 2013).

The municipalities constitute the final political governance level. They are very interested in supporting the Energiewende, but often their practical capabilities are limited by budget constraints and jurisdictions (cf. Schönberger 2012: 17). Many municipalities though have created local climate and energy concepts. Depending on the exact jurisdictions, the municipalities can make use of political instruments like building codes and set guidelines for energy efficiency, heating and warm water supply. They can also provide counseling and information as well as create local support schemes. In addition to this they have the mandate for land-use planning and thus the power to authorize renewable energy projects or grid expansions as long as their decisions do not conflict with regional development plans. Municipalities also have significant impact with their management and procurement decisions in areas like energy efficiency, public transport or public housing. After a period of privatization over the last few years there is an increasing tendency for the remunicipalization of local grids or utilities (cf. Buchan 2012: 12) which is driven on the one hand by citizen initiatives and on the other hand by local governments themselves. In the case of municipally-owned public utility companies, the local authorities can steer the local grid development in favour of renewables, invest returns into new renewable energy projects, and they can even become an electricity provider. Finally, municipalities try to increase their political weight and attractiveness as an eco-friendly business location by creating regional coalitions or joining national networks like the federal initiative 100% Renewable Energy Regions.

From government to governance – private sector and civil society

From an institutional perspective Germany can be described as a coordinated market economy (cf. Hall and Soskice 2001). In such a country, political actors strive for unanimous policy decisions in accordance with the main stakeholder groups. Thus, there is a strong preference for dialogues, strategic concessions and trade-offs, allowing different actor groups and coalitions to influence policy decisions. In the Energiewende two fundamentally different energy systems oppose each other, creating two very different advocacy coalitions that constrain unanimity (cf. Dagger 2009). For a long time Germany's energy system has been based on large coal and nuclear power plants in order to assure a steady and cost-efficient base load power supply. This energy system was built with massive infrastructure investments creating path dependence. Since the liberalization of the market in the late 1990s this costly infrastructure is controlled by a very profitable and powerful oligopoly. The ambitious renewable energy targets of 60% renewables energy and 80% electricity by 2050 (BMWi and BMU 2012:16) undermine the profitability of this oligopoly. Hence, the so-called conventional energy coalition - especially this oligopoly - wants to maintain the status quo and slow down the Energiewende, while the beneficiaries of the upcoming system - the sustainable energy coalition - try to accelerate the energy system transformation. Accordingly, both coalitions have a large interest to influence policy decisions in their favour. This means firstly that they try to set the agenda for energy policy, secondly that they lobby at legislative veto points, and thirdly that they constrain the implementation of policies.

Agenda-setting is a multi-actor process with the intention to direct the public attention to a certain topic and to frame it. For instance, this can be done through large scale media campaigns, studies, or critical expert statements that highlight their own positions and obscure others. Successful agenda-setting can push a government to act and narrow down the available policy options with the dominant lines of argument.

Following this process, or going hand in hand with it, comes the lobbying at veto points. Germany provides various veto points that assure political stability, but increase decision-making costs and reduce transparency (cf. Saalfeld 2003). The most important veto point is definitely the parliament (Bundestag). Most of its legislation is issued by the government, which most of the time is a coalition of political parties. Accordingly, lobbyism concentrates on the governing coalition. To maintain the status quo and prevent new legislation it is a fruitful strategy to divide the coalition in order to avoid majorities. This possibility makes it more difficult to change or amend legislation than to maintain it, as a majority of parliamentarians has to be convinced of changes. In order to convince the parliamentarians, the numerous lobby groups provide convenient arguments and information, seek private conversations, organize various forms of events, and try to build political pressure. Another important veto point for federal legislation is the Bundesrat (the Federal Council of the sixteen Länder), but only in cases that affect the states' finances. This, however, is often a controversial legal debate as the discussions prior to the EEG reform illustrated (cf. Bannas 2013).

The implementation of policies can also be influenced by different interest groups by public and informal pressure or by lawsuits. Prominent examples of this are the various citizen initiatives that are directed against projects like new coal power plants, electricity grids, or wind farms (cf. Althaus 2012).

The conventional energy coalition

There are different actor coalitions with different interests. The conventional energy coalition is driven by the aim to maintain the status quo of the energy system. On the political level it nowadays comprises the already mentioned BMWi - headed by a market-friendly party - as well as political parties the FDP and parts of the CDU/CSU and also a very small part of the social party (SPD). Its main support comes from the private sector. This means an especially large part of the big four energy producers, the transmission system operators (TSOs), the energy intensive industries, as well as their aligned organizations. All these actors benefit largely from the current system, either because they own the current infrastructure or because they fear financial losses, increasing costs and costly projects by the change of the system. Officially, they support the Energiewende, but they neither invest in the Energiewende nor support it. On the contrary: they argue that it should be slowed-down as the necessary technologies are still immature and the Energiewende is poorly conceived, making it too costly.

Their most common arguments turn around the possible economic consequences of the Energiewende and its costs. The coalition often claims that the feed-in tariff is not a cost-efficient instrument that allows for increasing shares of renewables. Instead, they call for quota regulations as a cheaper alternative (cf. Hirschl 2008: 402). Furthermore, they criticize the market distortion that the preferential grid access for renewables constitutes, as well as the lack of incentive to optimize productivity in the light of guaranteed payments (cf. Ydersbond 2012: 66). From their perspective the future need for conventional power supply is currently underestimated. Conventional power plants will remain necessary to maintain a secure and steady power supply and to keep energy costs low for consumers and especially for the energy intensive industries which provide numerous jobs. They argue that the current policies create inefficiencies and ask for more cost-efficient measures. For this reason they criticize the currently decentralized investments and call for a European electricity market that allows, for instance, the production of solar power in southern Europe, electricity storage in Scandinavia, and the generation of wind power off-shore. They stress that at present the Energiewende is too costly and hampers German competitiveness (cf. Ydersbond 2012). Finally, they criticize the unreliability of policy decisions, incoherent jurisdictions, and insufficient coordination among the national, state and municipal concepts (cf. Schwägerl 2013).

Conventional power plants (fossil and nuclear) still generate more than three quarters of Germany's electricity (Agentur für Erneuerbare Energien 2013). Eon, RWE, Vattenfall and EnBW account for almost 80% of the total electricity production, but "up to now, the big four have generally played little part in developing renewables in Germany, though they have been more active abroad" (Buchan 2012: 9). This explains their motivation to maintain the status quo, to prolong the lifetime of their conventional power plants and to delay renewables of which they hold less than 7 % (Morris and Pehnt 2012: 27). It further clarifies why they call for a European electricity market. A European market would allow

them to generate renewable energy where they have experience and deem it most cost-efficient. In general this means large and capital intensive projects. For instance, off-shore wind projects like EnBW's Baltic 1 and large solar projects like Andasol in Spain or in North Africa[2]. In such projects their experience with large-scale infrastructure and their ability to mobilize capital pays off and they have a competitive advantage compared to the yet predominantly small renewable energy investors (cf. Morris and Pehnt 2012: 27). With regard to renewables, Grewe (2009: 3) points out that the big utilities might eventually drop their critical position once they have invested more in renewable energy projects.

Additional relevant energy producers are the several hundred Stadtwerke (public utility companies) that generate about 10% of the national power, based primarily on fuels (cf. Buchan 2012: 9). Often they make use of energy-efficient combined head and power plants (CHP) and district heating, but they are rather reluctant when it comes to renewables (ibid.). Nevertheless, there are prominent exceptions like the Stadtwerke Munich that are striving for 100% renewable electricity supply by 2025 (Stadtwerke München 2013). The Stadtwerke also own more than 50% of the low-voltage distribution grids in Germany (Buchan 2012: 9).

The high-voltage transmission system has been the domain of the large utilities for a long time, but in the context of antitrust concerns politicians urged them to sell their companies - Amprion, 50hertz, Tennet TSO and TransnetBW. However, this has been done with limited success. TransnetBW remained a full subsidiary of EnBW and RWE still holds one fourth of Amprion's shares. Only Vattenfall and Eon entirely sold their companies, 50hertz and Tennet TSO, to investors. Thus, the grid is still managed by four private TSOs, despite political debates to create one Federal Network Company (cf. Süddeutsche 2010). As a result of the historic and present ties between grid providers and big four power producers, the grid has been designed in accordance with the needs of the previous power systems owned by the large utilities, and it is not yet prepared for the decentralized renewable energies. The now partially independent TSOs do not directly have a stake in conventional power supply; nevertheless, they have good reasons to prefer the status quo. The massive expansion of the electricity grid requires large investments and it creates complex and long-lasting projects. These might allow for some profits, but they also constitute risks, whereas the status quo allows for steady and reliable returns. Overall, the TSOs are still strongly influenced by their former owners. New grid expansion projects by TSO tend to overestimate needs for long distance grids and conventional power plants (cf. BUND 2012).

The large utilities, the Stadtwerke and the TSOs try to influence policies in their favour using the aforementioned arguments, especially through public campaigns. On the one hand they do so individually and on the other hand they join forces as they did with the German Association for Energy and Water Industries (BDEW). In addition to this they get strong support from the energy intensive industries which highlight the volatility and costs of renewables, the resulting loss of competitiveness for the German industry, and eventually the damaging consequences for employment and tax revenues. This argument is especially put forward by the Association of the Industrial Energy and Power Industry (VIK) as well as the Union of Mining, Chemical and Energy Industry (IG BCE) and the Federation of German Industry (BDI). The BDI alone represents 38 associations with about 100,000 companies and approximately 8 million employees (BDI 2013). The conventional energy coalition also cooperates, somehow under disguise, with the Initiative Neue Soziale Marktwirtschaft (INSM) that tries to stress its impartiality, but is clearly a member of the conventional energy coalition (cf. INSM 2012; Speth 2004). The INSM works as an effective lobbying organization that combines industry-related research and large PR campaigns to spread their positions (ibid.).

The conventional energy coalition with its associations as well as large individual players can thus use its authority and its financial resources to set the agenda, lobby at veto points and constrain the implementation of unwelcome policies. In doing so, they get indirect support from more than a hundred NIMBY-initiatives[3] that target projects like wind farms or grid expansions. The majority of these initiatives is driven by property owners (90%) that are generally satisfied with their material well-being, that are often retired and to a large extent (60%) hold a university degree (Althaus 2012: 104ff). Concerned about the changes in their personal living environment as well as potential losses of property values, the NIMBY-activists get organized and form associations up to the European level like the European Platform Against

[2] Like the so called Desertec project, see Desertec Foundation http://www.desertec.org/de/
[3] NIMBY stands for "not in my backyard". It is a term that refers to the resistance of citizens to large projects in their proximity.

Windfarms. These NIMBY-initiatives are not necessarily in opposition to the Energiewende, but they disagree with related measures. Their actions delay or prevent processes like the grid expansion, wind farms or pumped hydro storage projects. The conventional energy coalition benefits from NIMBY phenomenon in order to maintain the status quo. However, similar resistance and protests occur more often also with regard to new coal power plants or nuclear waste disposal.

Finally, the conventional energy coalition is very active in its efforts to provide studies that support their position. Such studies are either produced by the companies and associations themselves or they are given to external - supposedly more objective - organizations like the RWI research institute or Dena. Many of these studies are criticized for their methods and assumptions (cf. BUND 2012, WWF 2010, Frese 2012).

The sustainable energy coalition

The sustainable energy coalition comprises new market actors, some parties and politicians, as well as environmental groups. Strong political support for a progressive Energiewende comes primarily from political parties the Greens, large parts of the SPD, the Left, and parts of the CDU/CSU. The private sector advocates comprise companies benefiting from new market developments. These are especially the numerous renewable energy companies and their associations which are united in the German Renewable Energy Federation (BEE), but also the German Engineering Association (VDMA) as representative of the renewable energy manufacturers. Finally, various environmental groups and citizen initiatives advocate a fast Energiewende (cf. Hirschl 2008; Ydersbond 2012).

The sustainable energy coalition argues that the current costs of the Energiewende have to be seen as long-term investments that will pay off in the light of rising energy prices and decreasing costs for renewable energy equipment (cf. Gawel, Strunz, Lehmann 2012). Furthermore, they underline that today's prices for conventional energy neglect the large external costs from environmental damages or nuclear waste. If these costs would be included in current balances, renewable energy costs would already be competitive. They also stress the massive subsidies for nuclear, coal and large parts of other fossil fuels that have created the present and path dependency. Accordingly, they call for equal support to transform energy systems towards renewable energy (ibid.). In their view this justifies the additional costs of the EEG which they defend as the "most efficient and least costly way of developing renewable energy production" (Ydersbond 2012: 66). More market-based approaches are rejected as too costly, too inefficient and being too slow to increase the share of renewables. They also argue that it would create energy production "far away from the people" (ibid.). In response to concerns about the costs and volatility of renewables and their effect on the competitiveness of energy intensive industries, the sustainable energy coalition emphasizes the large positive employment effects of the growing renewable energy industry. They state that the renewable energy sector already employed about 387,000 people in 2011 and is likely to employ about 600,000 by 2020 (Morris and Pehnt 2012:68f). In addition to this they highlight that concerns about the volatility of renewables are not appropriate given that the German electricity grid is still the most reliable in Europe (ibid.) and base-load supply can be guaranteed with flexible technologies like a better load management, increased bioenergy, gas turbines and ever-improving energy storage facilities (cf. Ydersbond 2012: 66; Morris and Pehnt 2012).

The feed-in tariff concept led to an increased acceptance of renewable energy in a decentralized bottom up process spearheaded by diverse civil society initiatives. The various initiatives have merged their impact in associations like the German Association for Wind Energy (BWE) or the German Solar Industry Association (BSW). In addition to such technology specific associations, already in 1991 the German Association for Renewable Energies (BEE) was formed. Today it serves as an umbrella organization for 25 more specific renewable energy associations with a total of 30,000 member companies and individuals (BEE 2013). The German Engineering Association (VDMA) is another important supporter of the sustainable energy coalition. The VDMA represents a total of 3,100 member companies with sales of nearly €200 billion and 947,000 employees in 2011 (VDMA 2013). Due to the success of renewables, today the VDMA includes a large number of small and medium enterprises (SMEs) that are active in the production of renewable energy equipment and therefore require the VDMA to represent their interests. The VDMA is also a member of the BDI which

demonstrates conflicting interests even within the conventional energy coalition (cf. Ydersbond 2012: 60). There are various other associations that support the Energiewende: for instance, the German Farmer's Association because of the promotion of bioenergy, or the IG Metall that highlights the jobs in the new industry (cf. Ydersbond 2012, Hirschl 2008, IG Metall 2013).

Civil society and its various environmental organizations constitute one important backbone of the bottom-up Energiewende project. In Germany the renewable energy movement enjoys much credibility and support in society. A 2012 survey by TNS Infratest indicated that 70% of the respondents considered the stronger expansion of renewables very important and another 24% at least important (Agentur für Erneuerbare Energien 2012). The sustainable energy coalition makes large efforts to maintain this overwhelming support for renewables as a powerful way to legitimate progressive Energiewende policies. The various non-governmental environmental and civil society organizations like WWF, Greenpeace, BUND, DUH or Germanwatch play an important role in nourishing the support. In doing so, they make use of various forms of events, public statements, studies and campaigns, and most importantly they cooperate among themselves to spread their views. One significant example of this is the so-called Klima-Allianz that comprises 110 organizations with about 10 million members ranging from churches, development organizations, environmental organizations, trade unions, consumer protection organizations, youth associations and other groupings to promote sustainable development (Althaus 2012: 109). In addition, there are energy specific private initiatives like the European Association for Renewable Energy or the Friends of Solar Energy Association (Solarförderverein Deutschland) (cf. Grewe 2009: 9).

Innovative technologies and further research and development are key for a successful energy transition. Therefore, research institutes in relevant fields like renewable energy, energy efficiency, storage and grid technology etc. are natural allies of the sustainable energy coalition. This means various research institutes like the Fraunhofer Institutes, the Wuppertal Institute or the Helmholtz Association, as well as public universities and private research organizations generate expertise in support of the Energiewende. Some leading research institutes even created their own interest organization - the Renewable Energy Research Association (FVEE) (cf. FVEE 2013) - which indicates their active stand as a member of the sustainable energy coalition. Moreover, the public-private Agency for Renewable Energy promotes the Energiewende and produces core scientific results with a public mandate.

Obstacles to the good governance of the Energiewende

The above-stated government structure and the portrayed advocacy coalitions put severe constraints on the efficient and effective governance of the Energiewende. Various public and private actors advocate their own lines of argument making the entire process very confusing and non-transparent. Prominent examples are the debate about the costs of the different sources of energy or the pretended economic damages of the Energiewende (cf. Kemfert 2013). The confusion about facts and myths hinders clear political decisions and it reduces the public support and therefore the legitimacy of the Energiewende. Moreover, the unclear jurisdictions and, related to this, the lack of accountability, pose important problems to planning and implementation. Projects like the expansion of renewables, the increase of energy efficiency, a European electricity market or the grid expansion affect various levels of governmental processes. They require effective cooperation between public authorities and diverse private actors to be timely and cost-effective. To illustrate the arising governance challenges for the Energiewende, some of the most important governance obstacles will be discussed. The given list of obstacles cannot claim completeness, but it comprises some of the most widely discussed issues over the last few months. Initially the grid expansion and the costs of the Energiewende will be examined to highlight the governance challenges of transparency and accountability as well as the capacity of governmental actors to respond effectively to unforeseen political and economic developments.

The substantial expansion of renewable energies went along with large private investments by citizens that hold more than half of the installed renewable energy capacities (Morris and Pehnt 2012:27). Most of the investments in renewables were made on the local level all over Germany. Contrary to the old centralized energy system with large nuclear and coal power plants, the new system becomes increasingly decentralized and therefore it requires an adapted

electricity grid (ibid.: 23). The four large grid providers as well as political planning failed to do so in a timely manner. A recent study by Gerbaulet et al. (2013) has illustrated that a coherent political plan for grid extension has long been missing and the current updated plan might already be outdated. The activities of the four grid providers seem to be poorly coordinated with regard to the grid expansion and optimization of regional over- and under-capacities. With the increasing share of renewable energy, an adequate adaptation of the grid is necessary. It is one of the major governance challenges that requires common targets, coordinated planning, and clear jurisdictions.

Both coalitions continue to advocate opposing strategies. The conventional energy coalition lobbies for a more centralized grid, while the sustainable energy coalition calls for a decentralized system. In addition to this, coordination has long been constrained by the Länder and municipalities. They are most often responsible for the approval procedures for the grid expansion and potential delays of larger projects with incoherent decisions. This challenge has been comprised in the Act to Accelerate the Expansion of Electricity Networks (NABEG) in 2011. It streamlined approval and transferred more competencies to the federal level accompanied with regular dialogues for the improvement of coordination (cf. BMWi 2011). Nevertheless, planning and implementation remain difficult, for instance due to NIMBY-initiatives and the half-hearted attitude of the four implementing TSOs. Being members of the conventional energy coalition, the four TSOs are hesitant in the development of a decentralized grid (cf. BUND 2012). As only the TSOs have the jurisdiction to implement the grid expansion it is difficult for the sustainable energy coalition to intervene. Their primary option is to lobby at the political level in order to increase political pressure on the TSOs and delaying actors. A good example was the threat of the 16 Länder to nationalize the German electricity grid with the creation of a German Network Company if the TSOs remained hesitant (cf. Handelsblatt 2012).

The intransparent public debate about increasing costs of renewable energy and their components is another important governance challenge. An increasing share of renewable electricity is made responsible to cause massive investments in the grid, even though a recent study shows that it might be overestimated (cf. Gerbaulet et al. 2013). Furthermore, the increase of the EEG surcharge is criticized. From about 2 ct/kWh in 2010 the EEG rose to more than 5ct/kWh in 2013 (BMWi and BMU 2012: 39). In the public debate these costs have been described as a large burden for lower income groups as well as a competitive disadvantage for companies that do not benefit from the existing EEG exemptions (cf. Meiritz et al. 2012). The tenor of the debate is very much in line with the conventional energy coalition's interest to depict the Energiewende as a rushed decision and to demand larger shares of conventional power plants in future scenarios in order to keep the costs of the Energiewende down (cf. BDI 2013).

In response to this the sustainable energy coalition stresses the need for transparency, especially with regard to the costs for energy production. Therefore they call for full cost accounting taking into consideration aspects like the merit order effect, hidden subsidies for conventional energies, and several unforeseen shocks that increased the cost-competitiveness of fossil fuels. Greenpeace Energy and the German Wind Energy Association (2012) - two members of the sustainable energy coalition - conducted a study that highlighted the hidden costs of conventional power and the lower costs of renewables if externalities are taken into account. As a result of their study they claim that the EEG is primarily under attack as it is a transparent policy that is directly paid by the consumer, whereas the larger support for conventional power plants is given mostly through intransparent government subsidies and tax exemptions (cf. Morris and Pehnt 2012:36). Secondly, they highlight the problem of the merit-order effect. With an increased share of renewable energy and non-reduced level of conventional energy, power supply is increasing with stable demand. This over-supply of electricity drives down wholesale prices and therefore reduces the electricity costs for large consumers - which are additionally largely exempted from the EEG surcharge (ibid.). In the meantime the retail prices for private consumers and small businesses remain high so that only "industry is benefiting tremendously from the current market design" (ibid.). The sustainable energy coalition further argues that several unforeseen shocks increased the cost-competitiveness of fossil fuels compared to renewables, despite a significant reduction in costs for renewable energy technologies. Altogether, the debate shows the need for more transparency about all components of prices as well as costs to assure the legitimacy of the Energiewende.

Unforeseeable changes on the international markets relate to the falling prices for CO2 certificates, the shale gas revolution in the USA, and the low costs for coal. The European Emissions Trading System (ETS) has basically collapsed.

The original amount of certificates was too high (cf. Economist 2013) and with the economic downturn following the financial crisis the demand for certificates dropped. Thus, prices for CO2 fell from €20 per ton in 2011 to €5 per ton in early 2013, making fossil power comparably cheap. An EU initiative to reinstate the system by reducing the amount of certificates almost failed in the European Parliament due to national economic interests (ibid.). In addition the so-called shale gas revolution in the USA increased the demand for gas and declined the demand for coal, resulting in decreasing prices for coal (cf. Stevens 2012). With very low CO2 and coal prices, the Energiewende in Germany is in danger as more coal-fired power plants might be constructed. Political actors on the European and/or German level were not able to find coordinated political responses to these shocks and therefore the cost-competitiveness of renewables decreased while CO2 emissions from coal rise again. This inability to act highlights the external vulnerability of the German Energiewende in a globalized and interdependent world.

Another important governance challenge is an effective market design that takes into account the volatility of renewable energy. Longer periods of low sunshine and low wind energy require large back-up capacities of approximately 80 GW (Morris and Pehnt 2012: 23ff.). Therefore flexible sources of energy, a better load management, as well as more storage options are necessary to satisfy the peak energy demand in the absence of sun and wind. Among the renewable energy technologies only pump storage stations and bioenergy can provide this flexible type of energy today. The potential for pump storage stations in Germany is very limited and bioenergy to remain sustainable is estimated to contribute at maximum 10% to the total energy demand for power, heat and transport (ibid.: 18). More storage options are available in Scandinavia. There are, however, not enough grid capacities available yet from Germany to Scandinavia which could be traded. The challenge for the energy system transformation will be to gradually reduce the share of fossil fuel power plants and increase renewable energy components with a better system integration and storage. Gas-fired power plants can easily turn on and off and can therefore be combined with volatile renewable energy. Gas prices in Germany might decrease with falling gas prices on the international market. The conventional energy coalition strongly criticizes this undesirable development and calls for a slow-down of the Energiewende (cf. Energiezukunft 2013) and a stronger integration of the European electricity market to tackle the problem of volatility (cf. CDU/CSU 2013: 47). The sustainable energy coalition rejects the slow-down of the Energiewende and it expresses skepticism about European solutions which could undermine the comparably more progressive German Energiewende targets (cf. Ydersbond 2012). Nevertheless, the sustainable energy coalition agrees that the current market design fails to remunerate the necessary gas power plants. If power plants are only used for a short number of hours a year, the profitability is decreasing. The future market design needs to cover this flexibility and should allow for demand side responses, a more effective load management, and a payment for power capacities necessary as a reserve in peak times. Currently two solutions are being discussed, namely capacity payments and a strategic reserve. Rather progressive voices favour capacity models (cf. Grüne 2013a: 31), whereas actors that are more concerned about the possible costs of such policies advocate something like a strategic reserve (cf. Morris and Pehnt 2012: 27). Thus, despite consent regarding the problem, the debate continues and so far Germany has failed to implement a solution while many other European countries already did (cf. Agora Energiewende 2013: 12). All of these examples demonstrate how important it is to have transparent, effective and participatory governance.

The transition of the whole energy sector in an industrialized country like Germany is a complex issue which affects many sectors, interests of companies, citizens and residents, as well as politicians. Good governance of such a complex transition should comprise the following main components: 1. *Clear definition of mid-term and long-term goals on a federal and state level, which are well defined and regularly monitored.* Because of the dynamics of the process, full flexibility in all areas is always necessary. The overall framework, including fixed long-term goals, should not be changed. 2*. Clear allocation of responsibilities to one institution instead of a division of tasks to many different agents with diverse interests.* If one institution is responsible for the Energiewende, the transformation process can certainly be managed more efficiently. 3. *Transparency.* Unbiased and objective information is essential in all changes of such powerful processes. This information should be provided by the government, neutral media and institutes, and be as broad as possible for all different actors and the mass-market. 4. *Participation.* All relevant agents and actors as well as citizens should be able to participate at all times - not only in concrete energy projects, but should also get the chance to participate actively in relevant processes. Various discussion forums, especially those with citizen involvement, as well as the attempts to clarify jurisdiction and to centralize planning, can serve as important catalyzers for the Energiewende. 5.

Coordination. The complex process encompasses many different actions in all different areas. Comprehensive coordination is obligatory. Good governance which comprises the most important portions of the complex process can lead to much more efficient and effective progress of the Energiewende.

The struggle for good governance – the political parties

In order to improve the governance of the Energiewende, the political actors have made some progress. High level dialogues have been launched, for example the Chancellor meetings and summits. Four times per year the Chancellor meets the Minister Presidents of the Länder, once a year the Chancellor and the Ministers of the BMWi and the BMU meet representatives of business, science and civil society, and about five different regular dialogues exist between actors like the BMWi, the BMU or the Federal Network Agency (cf. Bundesregierung 2013). In addition to this there are annual monitoring and planning reports as well as a more extensive tri-annual progress evaluation (cf. BMWi and BMU 2012). Despite these efforts, the political steering is still not entirely coherent, jurisdictions remain unclear, and processes are ineffective. This is largely due to the various levels of governance and conflicting party strategies. To a certain extent the different parties can be attributed to one of the two major advocacy coalitions. However, certain parties have established their own policy proposals. This results in a variety of possible political scenarios that create uncertainty about the future governance process of the Energiewende. This political uncertainty is best illustrated with the various conflicting party lines in the upcoming federal elections.

Depending on the future government, the federal steering of the Energiewende will increasingly represent interests of the conventional or the sustainable energy coalition. However, due to the multi-level government structure of Germany, lower levels of government might still head into different directions and undermine federal decisions. For instance, the currently conservative-liberal (CDU/CSU-FDP) government is confronted with a social-democrat-green (SPD-Green) majority in the Länder and therefore different political positions in the Bundesrat, which can be an important veto point. Nevertheless, the federal government is decisive for the future governance of the Energiewende. Therefore the federal party programs indicate how the governance challenges of the Energiewende will be tackled.

Examining the election programs for the upcoming federal elections in September 2013, the FDP clearly belongs to the conventional energy coalition (cf. FDP 2013). The liberal FDP calls for a fast integration of renewables into the market with a degressive market premium to keep them competitive. The FDP further advocates a European quota model instead of the national EEG, as well as several tax reductions in order to incentivize energy efficiency and to keep electricity costs down. In addition to this they want to unite all competencies for energy in the BMWi and entitle the Federal Network Agency to temporarily stop the feed-in priority of renewables. These ideas are very much in line with the before-stated interests of the conventional energy coalition.

The CDU/CSU is less clear in its program (cf. CDU/CSU 2013). It mentions the market integration of renewables as well as a European electricity market (mainly with regard to the volatility of renewables), but overall the program remains unclear when it comes to concrete policies. The best explanation for this is the broad coalition strategy of the CDU/CSU that does not only aim for the continuity of the liberal-conservative government (cf. Zeit 2013). A possible alternative might be a social-democrat-conservative government with the SPD (grand coalition), although the SPD does officially reject this option (cf. Focus 2013b). Therefore the CDU/CSU cannot advocate a program that is too purely market oriented. For instance, the SPD wants to maintain the EEG and the feed-in guarantee and only stepwise reduce the EEG surcharge contrary to the FDP (cf. SPD 2013). Also the SPD wants to streamline the governance of the Energiewende with the creation of a Federal Energy Ministry, a German Energy Council, and a publicly held German Network Agency (ibid.). Thus, even though the SPD has strong historic ties to the coal industry, the SPD program is very much in line with the sustainable energy coalition and its preferred coalition partner, the Greens (cf. Hirschl 2008: 192ff.; Focus 2013b).
Given the presumably dual strategy, it is no surprise that the CDU/CSU tries to maintain an open position between the conventional and the sustainable energy coalitions to not offend one of the potential coalition partners, but also to appeal to a maximum of voters. This middle position became apparent in the recent conflict about the EEG reform. The CDU/CSU headed BMU defended interests of the sustainable energy coalition to counterbalance the primary economic

reform interests of the FDP headed BMWi (cf. Geyer 2013). However, the BMU later tried to satisfy the needs of the conventional energy coalition by launching a debate about the costs of the EEG (cf. Spiegel 2013).

Finally, the Greens are an important party that could play a role in the next German government. They are a result of the environmental movement in Germany and therefore an important member of the sustainable energy coalition. They advocate the creation of a Ministry for Energy and Environment and overall the continuation of the current political support for the Energiewende with some adjustments to make it more citizen friendly and socially inclusive (cf. Grüne 2013a). Officially, the Greens aim for a coalition with the SPD and exclude the option of a coalition with the CDU/CSU (cf. Focus 2013a). Past coalitions with the CDU/CSU on the state level as well as the political flexibility of the CDU/CSU might eventually allow for a conservative-green coalition. The very left party Die Linke is very much in line with the sustainable energy coalition when it comes to energy policy (cf. Die Linke 2013) although they favour a complete socialization of power producers and grids. A social-democrat-green-left coalition is one final possible option that would support very many ideas of the sustainable energy coalition. This coalition option is officially thus excluded by the Greens as well as the SPD (cf. Grüne 2013b, Focus 2013b).

Different party coalitions would change the governance of the Energiewende into several directions. At first, the conservative-liberal government might continue. Given the political position of the FDP, a continuation would probably result in a slow-down of the Energiewende, less citizen engagement, and increasingly large-scale projects. A second possible scenario is a social-democrat-conservative (grand) coalition. Such a coalition would be more supportive of a decentralized Energiewende as the sustainable energy coalition demands it, but the business wings of the CDU/CSU and SPD would make significant concessions to the industry. Thirdly, a social-democrat-green government might be elected even though it seems less likely according to recent polls (cf. Die Welt 2013). If they were elected - perhaps with support from the Left - their government would be very close to the sustainable energy coalition's interest to promote a decentralized, citizen-driven Energiewende, with less exemption for cost participation for the industry.

Conclusion

The German Energiewende and its governance processes affect numerous government actors, different advocacy coalitions, and various political strategies. In this multi-level, multi-stakeholder and path-dependent German governance structure, the conventional and the sustainable energy coalition continuously strive for prevalence. If the process continues like this the Energiewende necessarily becomes an unreliable incremental process. This enormous project will not become a smooth process as long as the conventional and the sustainable energy coalition maintain their conflicting economic and ideological interests and thereby undermine good governance of the Energiewende. It is vital that both coalitions stick to the agreed long-term and mid-term goals, that the coordination of relevant actors is improved and responsibilities are concentrated on one institution, and finally that the Energiewende becomes more transparent and participative to assure the legitimacy and acceptance of this massive project.

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