

Why Subnational Actors Matter: The Role of *Länder* and Municipalities in the German Energy Transition

Philipp Schönberger and Danyel Reiche

INTRODUCTION

Findings from climate science have been indicating dangerous effects of global warming for decades, with an increasing clarity.¹ Moreover, the resources of natural gas and oil as well as uranium are declining and could be depleted by the end of the twenty-first century.² At the same time, many observers perceive the concentration of remaining fossil resources in politically unstable regions such as the Middle East and Russia as a severe risk to the security of energy supply in Europe. According to many actors involved, these developments make it necessary to initiate a major technological change toward energy saving, energy efficiency, and renewable energy.³

From a technology perspective, this kind of change is possible. Respective concepts and action plans have been proposed time and again.⁴ However, none of these ideas has been implemented on a larger scale so far. Taking

P. Schönberger (✉)

EnergyEffizienz GmbH, Gaußstraße 29a, 68623 Lampertheim, Germany

D. Reiche

Department of Political Studies and Public Administration (PSPA) American University of Beirut Beirut 1107-2020, Lebanon

the multi-level system of governance into account, two of the most important questions in this policy field are as follows: What are the policy options to promote the energy transition at each level of governance? What factors can influence the furthering of the transition to renewable energy through these options? In this chapter, these questions are analyzed for the *Länder* and municipal levels of governance in Germany.

This chapter refers to several theoretical approaches. In particular, concepts of ecological modernization, capacity building, and conditions for environmental policy success are applied to the *Länder* and municipal levels of governance.⁵ Moreover, the chapter follows certain foundations of policy research such as the policy cycle and Paul Sabatier's advocacy-coalition approach.⁶ Finally, path dependence concepts as well as more recent research on multi-level and local governance are included.⁷

We will begin by outlining the history of the term *Energiewende* (energy transition) in the German energy policy context. We will also look at the status quo of the energy transition from the perspective of German *Länder* and municipalities. We will then describe the changing political framework conditions for *Länder* and municipalities before presenting the opportunities and instruments that German *Länder* and municipalities can use to promote the energy transition. A number of practical examples illustrate these policy options. The section is based on an extensive review and analysis of scientific literature as well as other documents.

In the last section, we analyze the conditions that influence the degree to which the *Länder* and municipalities promote the furthering of the renewable transition comparative to national averages. Based on Jänicke's categorization, potential conditions are divided into problem-related, political-institutional, economic, informational-cognitive, and actor-related factors. The empirical basis for the *Länder* level consists in a secondary analysis of case studies undertaken by Mez et al.⁸ For the municipal level, data from Philipp Schönberger's dissertation project are included.⁹ We conclude with an assessment of the future role of *Länder* and municipalities in the German energy transition.

GERMAN "ENERGIEWENDE" AT THE *LÄNDER* AND MUNICIPAL LEVELS

German states have significantly contributed to Germany's energy transition. However, the *Länder* have not fared equally well. For example, as Fig. 2.1 shows, the shares of primary energy consumption accounted for by renewable energy range from 9 percent (Berlin) to 26.5 percent (Mecklenburg-Vorpommern).

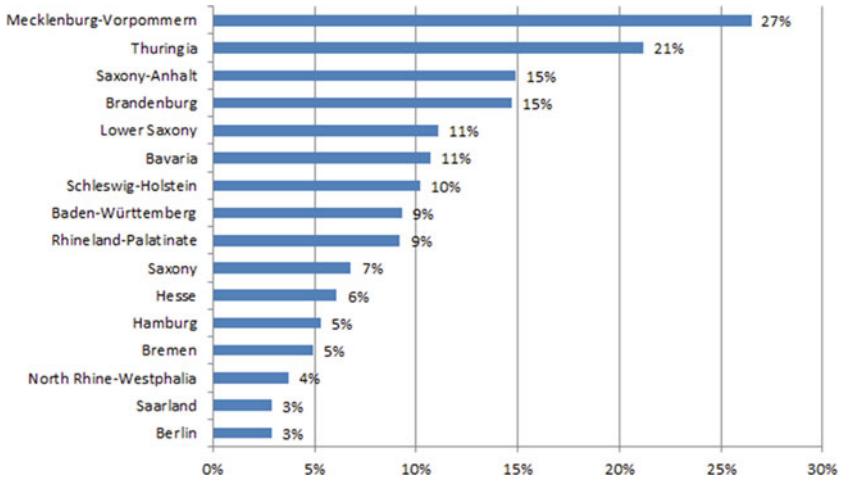


Fig. 2.1 Shares of primary energy consumption accounted for by renewable energy – German *Länder*. *Source:* Agentur für Erneuerbare Energien (AEE), Bundesländer in der Übersicht, (2014), accessed October 10, 2014, <http://www.foederal-erneuerbar.de>.

Comparing municipalities instead of *Länder*, the differences are even bigger. There are front-runner districts that—at least in the electricity sector—have already achieved calculated renewable energy shares of more than 100 percent, compared with local renewable electricity production and local consumption (Fig. 2.2).

When interpreting these data, we should recall that the geographical potential for renewable energy use differs considerably between German *Länder*, and even more between municipalities. For example, it is a lot easier to achieve a high share of wind energy for the *Länder* in the coastal regions. Thus, explaining the degree to which various *Länder* and municipalities have achieved a transition to renewables in relation to national averages and in relation to one another requires a more in-depth analysis.

CHANGING FRAMEWORK CONDITIONS FOR *LÄNDER* AND MUNICIPAL ENERGY POLITICS

For the past 30 years, the role of German *Länder* and municipalities in the country's energy politics has been significant. As explained in article 74 of the German *Grundgesetz* (constitution), energy supply is a field with

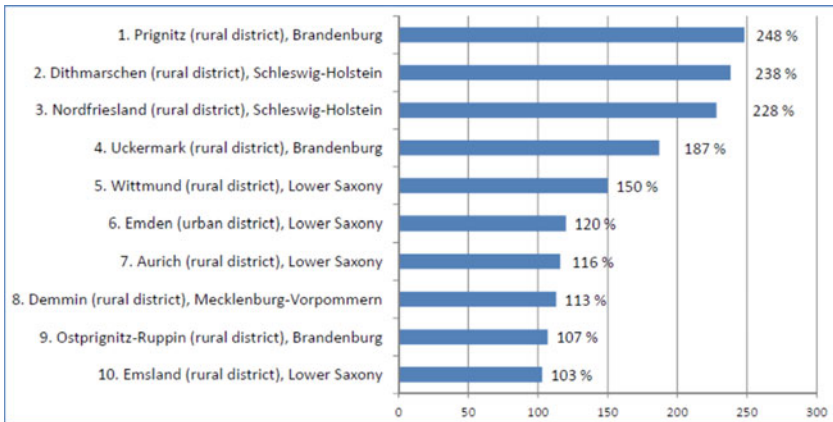


Fig. 2.2 Ratio between local renewable electricity production and local electricity consumption—top ten German districts (*Source:* Agentur für Erneuerbare Energien, DGS = Deutsche Gesellschaft für Sonnenenergie).

competing legislation. Both federal and *Länder* parliaments are entitled to pass laws in this area. For a long time, the federal level did not make full use of this option, which is why the *Länder* and municipalities played a crucial role in the promotion of renewable energy in the 1980s.¹⁰ Some *Länder* and municipalities even set up financial promotion schemes for renewable energy and energy-saving measures, for example, feed-in tariffs for solar and wind.¹¹ Moreover, local and regional energy companies had supply monopolies in their respective territories, enabling their municipal owners to set energy prices.

Liberalization processes in the 1990s, induced by the European Union (EU) and put into national law by the *Energiewirtschaftsgesetz* (Energy Industry Act), abolished these monopolies. More recently, the EU created further important framework conditions, such as the introduction of the Emissions Trading Scheme, the Renewable Energy Directive, and the Energy Efficiency Directive. Altogether, the influence of the EU on the energy sector has rapidly increased within the past 20 years (see Chapter 5 on EU in this volume). At the same time, federal policies to promote renewable energy in all energy sectors (i.e. electricity, heat, fuels) were implemented in Germany (see Chapter 4 by Stefes in this volume). However, the increasing importance of the federal and EU levels of governance did not erase the influence of *Länder* and

municipalities. Subnational actors still maintain a number of decisive energy policy options.

OPPORTUNITIES FOR LÄNDER AND MUNICIPAL ENERGY TRANSITION GOVERNANCE

The opportunities and instruments of *Länder* and municipal renewable energy policy (not only, but also, in Germany) can be divided into five distinct governance modes: (1) overarching measures, (2) consumer behavior of the *Länder* and municipal administrations, (3) regulation and planning, (4) provision of energy, public transport, and housing, and (5) support and information.¹² These five categories refer to different levels of action (Fig. 2.3). First, overarching measures (e.g. target-setting and *Länder*/local energy concepts) can be distinguished from individual, concrete instruments to promote renewable energy. The latter can be divided into instruments concerning the *Länder*/municipal administration itself

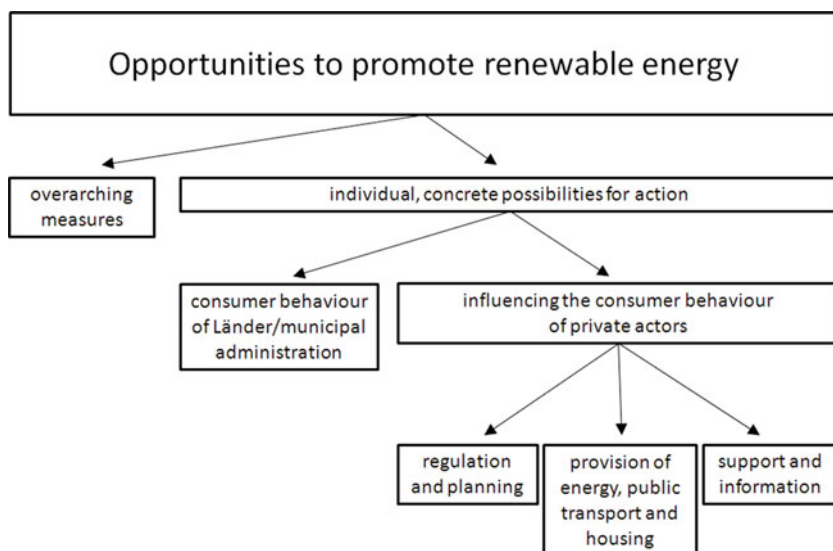


Fig. 2.3 Overview of *Länder* and municipal opportunities to promote renewable energy (Source: Adapted from Schönberger (2013), Alber and Kern (2008), Kern et al. (2005), and IEA (2009))

as an energy consumer, and instruments aiming to influence the consumer behavior of private actors. Finally, there are three ways for *Länder* and municipalities to influence private actors: regulation and planning; provision of energy, transport, and housing; and support and information.

Overarching Measures

This section deals with three overarching measures to promote renewable energy: (1) energy and climate action plans, including targets concerning the share of renewable energy or the reduction of greenhouse gas emissions, (2) cooperation with other *Länder* and municipalities, and (3) the institutionalization of renewable energy and climate protection within the administration.

The development of *energy and climate protection action plans* is a widely used measure in *Länder* and municipalities. According to the German Advisory Council on the Environment, targets can improve long-term orientation and help to create a reliable environment for investors.¹³ Today, all *Länder* have established action plans or comparable strategies, including quantitative targets.¹⁴ In some *Länder*, there are comprehensive, long-term, and binding targets. For example, the state government of Baden-Württemberg aims for a 50 percent reduction of the energy consumption and an 80 percent renewable energy share until 2050. This way, greenhouse gas emissions are to be reduced by 90 percent.¹⁵ In other cases, the targets only cover certain aspects, such as renewable energy expansion or the electricity sector. Moreover, some targets have been given up or replaced rather soon. In the state of Hesse, for instance, the government set a target in 2005 to achieve 15 percent coverage of final energy consumption through renewable energy until 2015. Four years later, this was replaced by a 20 percent target for 2020.¹⁶

Also at the municipal level, energy and climate action plans have become increasingly popular in recent years. The main driver of this process has been a networking project called “100% Renewable Energy Regions,” funded by the Federal Ministry of the Environment. So far, there are more than 130 German municipalities and regions striving for an entirely renewable energy supply.¹⁷ These action plans usually contain a CO₂ balance sheet, an estimate of local renewable energy and energy-saving potential, and concrete policy recommendations. The popularity of these action plans has been increased not only by greater local willingness to mitigate climate change, but also by a federal support scheme that

also includes the financing of additional administrative personnel for the municipalities.¹⁸

At the *Länder* level, *cooperation with other Länder* is an obvious way to influence national framework conditions for the energy transition via the *Bundesrat* (Federal Council). In particular, some laws at national level require the approval of the *Bundesrat*, for example, the *Bundesregierung* (government) and *Bundestag* (parliament) cannot put through certain legislation against the *Länder*'s vote. Furthermore, the Federal Council itself can initiate legislation. In the past decades, according to Mez et al., the *Länder* have asserted their energy policy interests successfully in many cases.¹⁹ This could also be observed during the decision-making process for the revision of the Renewable Energy Act in 2014.²⁰

At the municipal level, the importance of cooperation with other municipalities is increasing. Cooperation with neighboring municipalities is often well advised, such as for establishing energy-related advisory agencies or defining priority areas for wind power.²¹ Furthermore, transnational climate-protection networks have gained importance since the 1990s.

The *institutionalization of renewable energy and climate protection* within the administration is important to make sure that agreed-upon measures are implemented properly. At the *Länder* level, competence for energy issues is organized very differently within the respective governments. In many cases, both the ministry for economic affairs and the ministry for the environment are involved. Recently, some *Länder* also created ministries for climate protection or energy transition.²² Likewise, at the municipal level, the competence for energy issues is often split between the department for the environment, the building authority, and the mayor's office. Kern et al. recommend establishing both a central, coordinating climate-protection unit and decentralized responsibilities within individual departments.²³

Consumer Behavior of Länder and Municipal Administration

Like every consumer, *Länder* and municipal administrations can take measures to reduce their energy use and to meet their energy needs with renewable energy. By doing so, *Länder* and municipalities can take climate-protection measures without consideration of, and influence from, private actors (for possibilities to influence the energy consumption of private actors, see sections below). Especially, municipal administrations are among the largest consumers within their territories.²⁴ Additionally, acting as a model in these areas, they can serve to legitimize climate-protection

measures concerning other actors.²⁵ For example, in North Rhine-Westphalia, the minister for construction initiated the use of renewable energy in state-owned properties in as early as 1996.²⁶

In order to cover their *electricity* demand with renewable energy, *Länder* and municipalities can purchase green power for public buildings. In the case of Hamburg, municipal buildings have been supplied with a ten percent share of green power since 2002. At present, green power covers 100 percent of the electricity demand of municipal buildings, local public transport, and several municipal companies. The required electricity is produced in German hydropower plants and Danish wind parks. Nevertheless, the measure is contentious, since *Rheinisch-Westfälisches Elektrizitätswerk* (Rhine-Westphalia Electricity; RWE) supplies hydropower. RWE is one of Germany's biggest energy companies, which also operates nuclear and coal power plants.²⁷

Furthermore, electricity demand can be covered directly by using cogeneration units or photovoltaic (PV) systems on administration buildings. However, given the current legislative framework of the Renewable Energy Act, the more profitable option is feeding at least a certain share of the PV-generated power into the electricity grid. Using 100 percent of PV electricity in the building where it is produced is no economic solution because storage costs are too high.²⁸

In order to cover the administration's heat demand with renewable energy, solar thermal, biomass, and near-surface geothermal plants are possibilities. Each of these technologies can be used either as individual plants or in combination with a local heating network. Today, individual heat plants supply heat to the majority of buildings in Germany. Nevertheless, the expansion of local heating networks can be an opportunity to realize an efficient use of renewable heat.²⁹

As far as motorized *transport* can neither be avoided nor replaced by walking or cycling, biofuels and renewable power can be utilized. This applies to cars, trucks, and motor-supported bicycles.³⁰ Since switching to renewable transport will not challenge motorized individual transport, popular support might emerge rather quickly.³¹

Further to the direct energy demand, which finds expression in the administrations of the *Länder* and municipalities electricity, heat, and fuel costs, so-called *gray energy* plays an important role. Gray energy is the amount of energy needed for the manufacturing and disposal of products and the delivery of services.³² *Länder* and municipalities can commit themselves to favor products and services on the basis of renewable energy (e.g. products from companies that use green power for their manufacturing

processes). Cities that have committed themselves to ecological procurement include Bremen, Heidelberg, Frankfurt/Main, and Stuttgart.³³

Regulation and Planning

Länder and municipalities can implement regulatory and planning measures especially in relation to buildings and the designation of areas for renewable energy plants. With regard to buildings, the federal *Erneuerbare-Energien-Wärmegesetz* (Renewable Heat Act) prescribes that new buildings have to cover a certain percentage of their heating and hot water demand with renewable energy via a number of technological options. For example, in the case of a solar heating system, 15 percent of the total heat demand has to be covered. However, the federal law delegates the decision of whether comprehensively renovated buildings also have to use renewable energy to the *Länder* level. Until now, Baden-Württemberg is the only regional state that has put such a law into force. Others have enabled their municipalities to implement their own policies. The solar ordinance of the Hessian city of Marburg is the most prominent example of a municipality hindered in its efforts to prescribe the use of renewable heat also for renovated buildings by the *Länder* government and parliament.³⁴ Moreover, municipal building codes can also be based on binding land-use plans or urban development contracts. However, the opportunities, defined by the Federal Building Code *Baugesetzbuch* (Federal Building Code), are limited, and there is a need for legal clarification on some crucial points.³⁵ Additionally, municipalities can oblige building owners to connect to and use district heating networks, which can be fed with renewable heat (e.g. from combined heat and power plants). All regional (*Länder*) Municipal Codes include this option.

In general, municipalities are allowed to *designate areas for renewable energy plants* within their territory. This is especially relevant for wind turbines, since these are regarded as relevant for spatial development.³⁶ On the level of urban land-use planning, areas for renewable energy plants can be depicted in the preparatory land-use plan.³⁷ However, according to the *Raumordnungsgesetz* (Federal Building Code and the Regional Planning Act), all urban land-use plans have to be compatible with the regional plan, which is, therefore, the decisive level for designation proceedings.³⁸ In turn, municipalities participate in the development of the regional plan.³⁹ Until now, most municipalities have argued against the designation of wind energy areas within their territory. However, it is also possible to request more wind energy areas, as some examples show.⁴⁰

At the *Länder* level, the restrictiveness of guidelines for wind energy areas varies significantly. For example, Bavaria recently introduced a restrictive minimum distance of 2000 meters from residential buildings for modern wind turbines with a height of 200 meters.⁴¹ This will probably stop most wind energy projects planned in the state. The other *Länder* are less restrictive. In Baden-Württemberg, for instance, the required minimum distance is only 700 meters.⁴²

Provision of Energy, Public Transport, and Housing

Another possibility to influence the energy use by citizens and companies includes the provision of energy, public transport, and housing. German municipalities have been engaged in these areas since the nineteenth century, while *Länder* seldom assume responsibility for these provisions.⁴³ In this respect, Baden-Württemberg is an exceptional case, since the state bought a 45 percent share of *Energie Baden-Württemberg* (EnBW), Germany's third largest energy company, in 2010.⁴⁴ Furthermore, the *Länder* own woodland and therefore are involved in the use of forest wood for energy purposes.⁴⁵ Finally, *Länder* laws set important rules for the economic activities of municipal energy companies.

On the basis of the regional (*Länder*) Municipal Codes, municipalities can establish *Stadtwerke* (energy companies) and carry out energy-related economic activities. Thus, municipalities are generally authorized to produce energy from renewable sources.⁴⁶ Provisions of the Municipal Codes, however, differ significantly regarding the limits of municipal economic activities.⁴⁷

Additionally, framework conditions for the electricity and gas market were substantially altered in the 1990s by the amendment of the *Energiewirtschaftsgesetz* (Energy Economy Act) and underlying EU provisions. Striving for liberalized energy markets, local supply monopolies – including the ones of municipal energy companies – have been eliminated. They now have to compete with private energy suppliers, resulting in considerably lower profits, which affect municipal budgets and possibilities (e.g. to subsidize public transport).⁴⁸

At the start of the new millennium, shortly after the liberalization of energy markets, numerous observers identified a trend that many municipal energy companies were sold or at least refrained from energy production. By 2005, the shareholding structure of more than 100 municipal energy companies had changed. In many cases, large private energy companies

had acquired shares in order to ensure sales and to further strengthen their position.⁴⁹

However, this empirical evidence from a certain period does not support the conclusion drawn by some scholars that the role of municipalities as providers will continue to become less important in the future.⁵⁰ On the contrary, a number of indications point toward a possible rollback, a renaissance of municipal energy companies. In the past few years, municipalities have tended to repurchase their energy companies and grids or to found new companies, thereby becoming more independent from the big energy companies again.⁵¹ Moreover, an increasing number of good-practice examples show the opportunities for municipal companies to contribute to the expansion of renewable electricity and renewable heat as well as to energy efficiency.

In the *electricity sector*, municipal energy companies can support the expansion of renewable energy in at least two ways. First, they can purchase green power on the electricity market and then sell it to consumers. Second, municipal energy companies can, where compatible with the respective Municipal Code, install and operate renewable electricity plants or participate in such plants. In order to finance the higher costs (compared to conventional power plants), the cities of Munich and Heidelberg have set up funds that are fed by revenues from green power tariffs.⁵² However, the most important framework condition to realize ecological and economic targets at the same time is the *Erneuerbare-Energien-Gesetz* (Renewable Energy Act; EEG). Through the cost-covering remuneration guaranteed by the EEG, investments in renewable power plants become economically feasible.⁵³ In 2009, the municipal energy company of Munich announced a broad extension of renewable electricity production, aiming to cover the complete demand of the city by 2025. This renewable energy expansion program requires a planned investment volume of nine billion euros by 2025, and is regarded to be one of the most ambitious renewable energy projects in the world.⁵⁴

In the *heat sector*, municipal energy companies can produce or purchase natural gas from biomass and then sell it to consumers.⁵⁵ Moreover, local or district heating networks can be fed with renewable heat. In general, municipal energy companies in Germany show a comparatively high share of combined heat and power (CHP) companies, such as Schwäbisch Hall, Oerlinghausen, and Lemgo, all of which operate CHP plants on the basis of biomass and/or natural gas.⁵⁶ Additionally, in Crailsheim (Baden-Württemberg), the municipal energy company is currently constructing a solar thermal local heating

system for a new development area. With a size of 10,000 square meters, it will be the biggest solar thermal plant in Germany and will cover about 50 percent of the heat demand of 2000 inhabitants. A seasonal reservoir will also be able to store the solar heat for the cold season. The solar local heating system is supposed to avoid 1000 tons of CO₂ emissions per year.⁵⁷

Regarding *energy efficiency technologies*, the short distance to their customers is a high comparative advantage of municipal energy companies. A variety of options exist to promote these technologies. For example, the municipal energy company of Emden offers a so-called heat direct service. Instead of natural gas or another energy source, customers can purchase useful heat. The energy company takes care of all necessary investments and the maintenance of the heating system.⁵⁸ Additionally, the city of Kassel (Hesse) and its municipal energy company introduced an *Abwrackprämie* (“scrap bonus”) in March and April of 2012. Individuals received 100 euros for disposing their old refrigerator and buying an especially energy-efficient new one.⁵⁹

Overall, it can be stated that there are tendencies toward a rollback, a remunicipalization, and a stronger role of municipal energy companies.⁶⁰ Compared to competitors, municipal companies have several advantages. They can exploit synergies between their different business segments, such as energy, waste, water, sewage, and mobility. They are comparatively close to their customers and are in contact with them in the different segments. Furthermore, a strong role of municipal energy companies can lead to effects that might be regarded as politically desirable. They can (1) be helpful to achieve the primacy of politics, (2) contribute to public value (e.g. by improving the situation of municipal budgets), and (3) limit oligopolistic structures and the market power of big energy companies.⁶¹

With regard to public transport, many German municipalities founded mobility companies, running electric trams, subways, and/or buses. This portfolio can be supplemented by car sharing. As described earlier, the societal acceptance of measures restricting motorized individual transport is rather weak. Thus, it is essential to develop attractive alternatives such as a high-quality public transport system.⁶² Operating public transport by renewable energy, biofuels, and renewable electricity are options to be considered. Similar to the energy sector, public transport was also liberalized in the 1990s by EU and federal provisions that aimed to improve market access chances for private companies. In reality, however, running public transport is hardly economically feasible without public subsidies, which are still allowed and only have to be made transparent.⁶³

Finally, by founding *housing companies*, municipalities can construct energy-saving passive houses, refurbish buildings to comply with passive house standards, and use renewable energy as well as combined heat and power technology for the energy supply of buildings. Municipalities can influence such decisions via the members of the housing companies' supervisory boards. The *Länder's* main role in housing policy is to organize financial support schemes.

Support and Information

Support and information includes energy consulting services, public relations and educational work, financial incentive programs, and support and attraction of investment in renewable energy.

Offering *energy consulting services* is an obvious possibility for municipalities because of their closeness to citizens, companies, and disseminators (e.g. private energy consultants, chimney sweepers, construction industry). For example, the city of Frankfurt/Main puts emphasis on energy concepts for buildings, especially the use of combined heat and power technology. Another option is to offer individual mobility concepts without motorized individual transport.⁶⁴ Some municipalities cooperate with the energy consulting services of the consumer protection organization *Verbraucherzentrale*.⁶⁵ Some *Länder* support these developments by establishing regional energy agencies.⁶⁶

Another important task for *Länder* and municipalities is energy-related *public relations and educational work*. Environmental departments, municipal energy companies, energy agencies, or adult education centers can perform this task. This way, municipalities can reach people who do not explicitly ask for energy consulting services. Examples for information campaigns are the federally coordinated *Woche der Sonne* (Week of the Sun) and the locally initiated *Münchener Solartage* (Munich Solar Days). At the *Länder* level, there are ministerial campaigns aiming to promote the energy-efficient refurbishment of buildings and to increase the societal acceptance of renewable energy plants.⁶⁷ Moreover, in Germany, framework curricula for schools are adopted at the *Länder* level and can focus on energy and climate-protection issues in various ways.

Moreover, *Länder* and municipalities can establish their own financial incentive and support programs. Such programs exist in all *Länder*; however, there are considerable differences with regard to the promoted technologies as well as to the actors that can apply for the funding.⁶⁸ For

example, in North Rhine-Westphalia, the “progress.nrw” program and its antecessor “REN program” have promoted the use of renewable energy and energy-saving measures for several decades. Between 1988 and 2006, altogether 640 million euros were granted to private households, companies, municipalities, and public institutions.⁶⁹ A more recent example for the promotion of solar thermal systems is the municipality of Nalbach.⁷⁰ Taking into account the grave situation of many municipal budgets, one solution for the financing of incentive programs can be funds that are financed by a surcharge on the energy prices of municipal energy companies.⁷¹

Finally, many municipalities work with their citizens and businesses as well as with businesses from outside to *attract investment in renewable energy*, using the frameworks that exist at higher levels of government (such as the Renewable Energy Act; EEG). One possibility is to support citizen-owned renewable energy plants, which have become popular during the past years. Wind energy and solar plants are financed by a high number of citizens, each of whom contributes a relatively small share of the investment (usually between 100 and 20,000 euros).⁷² Another positive effect of this model is the inclusion of many citizens in ecological projects. If solar panels are installed on the roofs of school buildings, the projects can also serve educational aims.⁷³ In the case of solar energy, an important prerequisite for the realization of citizen-owned plants is the availability of data about suitable roofs.⁷⁴ By publishing these data the municipality can trigger private investments.

CONDITIONS FOR FURTHERING THE RENEWABLE TRANSITION

In this section, we will examine the question of which factors influence the degree to which federal states and municipalities are able to introduce strategies to further the transition to renewables relative to the national average. A catalogue of potential factors has been compiled in Table 2.1.

Länder Level

The following analysis of the factors that influence the furthering of renewable energy policies at a federal state level makes use of the empirical investigations by Mez et al.—in terms of a secondary analysis—and is partially complemented by more recent developments. The study carried out by Mez et al. looks at the renewable energy policies of the three states,

Table 2.1 Independent variables: factors that can influence the ability of *Länder* and municipalities to implement/further renewable energy policy

Problem-related factors		Renewable energy potential and economic structure Pressure applied by promoters and antagonists of the energy transition/winner–loser balance and regional economic effects
Structural and situative conditions	Political-institutional factors	Party-political majorities in parliament and executive offices/new parties und majority changes Policy mix, path dependence, and environmental policy integration Inclusiveness of the political decision-making process Political framework conditions at higher political levels
	Economic factors	Financial situation of citizens and public budgets/unemployment as a potential competitor for environmental issues in the struggle for political attention, especially in times of recession
	Informational-cognitive factors	Knowledge about public attitude toward renewable energy/long-term experience with renewable energy/recent media headlines Awareness of the actors with regard to their policy options
Actor-related factors		Committed individual persons/advocacy coalitions

Source: Created by the author, based on Schönberger (2014)

namely, Lower Saxony, North Rhine-Westphalia (NRW), and Saxony-Anhalt.⁷⁵ The three states have very different basic conditions in terms of their significance for national energy policy, their primary sources of energy, and their party-political outlook. They, therefore, constitute a broad spectrum of case configurations.

As depicted in Fig. 2.1, Lower Saxony and Saxony-Anhalt can be seen as farther along in implementing renewables, with renewable energy shares of primary energy consumption at 11 and 15 percent, respectively, both exceeding the national percentage of renewable energy sources of nine percent in the year of reference. In contrast, with a renewable energy share of four percent, North Rhine-Westphalia is below the national average and can therefore be classified as comparatively less far along in the energy transition.

The empirical material from these three case studies is presented systematically using the described categorization of the factors in Fig. 2.4. Unless stated otherwise, the source of all empirical data is the study by Mez et al.⁷⁶

Problem-Related Factors

The case studies confirm the significance of geographic factors. For example, Lower Saxony has a geographic advantage for the use of wind energy (on- and off-shore) and biomass, thanks to characteristic features such as

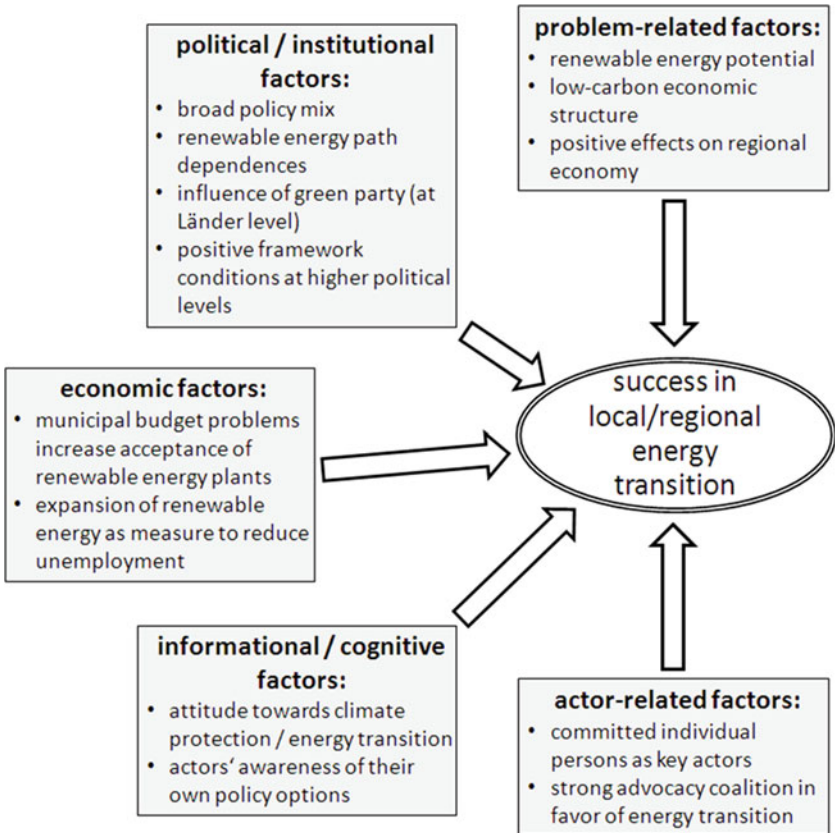


Fig. 2.4 Explanatory factors for furthering the energy transition governance at *Länder* and municipal level (Source: Adapted from Schönberger (2014))

coastal regions and flat lands. In terms of wind energy, Saxony-Anhalt has the benefit of medium-range wind conditions, low population density, and a low proportion of protected landscape and areas of conservation. On the other hand, solar radiation levels are comparatively low. In contrast, the example of North Rhine-Westphalia clearly highlights the significance of economic structure for the implementation of renewable energy policies. Thus, the state displays above-average levels of energy consumption, heavily influenced by the industrial facilities, making it difficult to achieve a high share of energy from renewable sources.

Pressure to act from both supporters and opponents can also be recognized in the *Länder*-level case studies. Particularly in Lower Saxony, many people are employed in the renewable energy sector, especially in economically underdeveloped areas. In contrast, in North Rhine-Westphalia, although there are indeed many people employed in the renewable energy industry, the same is also true of the fossil fuel sector. In addition, there are 86 municipal shareholders, primarily from North Rhine-Westphalia, with shares in RWE, an energy company chiefly concerned with fossil fuels and nuclear energy.⁷⁷ This explains why representatives from the state government in North Rhine-Westphalia repeatedly reveal themselves as champions of the interests of the fossil fuel industry, while also exerting influence over national politics.⁷⁸ This lobbying counteracts efforts to establish commitment to the *Energiewende*.⁷⁹

Political-Institutional Factors

The importance of political-institutional factors can also be seen within the case studies. With regard to party-political influences, the social-democratic/green *Länder* governments in North Rhine-Westphalia and Lower Saxony both demonstrate a considerably more positive attitude toward wind power than the conservative-liberal governments during the time period observed (the 1980s onward).⁸⁰ In all three states, the renewable energy policy mix is comprised of a range of different tools, including energy concepts, state planning, and development programs. However, sometimes measures counteractive to the turnaround in German energy policy are implemented, such as the support of brown coal open face mining (NRW, Saxony-Anhalt), subsidies for coal mines (NRW), and planning-related obstacles for the expansion of wind energy (NRW, Lower Saxony). Furthermore, the state energy agency was abolished in Lower Saxony, thus weakening the state's capacity to act in terms of information and consulting.

All three federal states are also characterized by specific fossil-nuclear policies. In Lower Saxony, this is seen in its four atomic power stations alongside the oil and gas production in the North Sea, which have a major impact on the state budget. In contrast, in both North Rhine-Westphalia and Saxony-Anhalt, coal usage and production play a very influential role.⁸¹ As for policy integration, all states are striving, above all, to unite their policy on renewable energy with economic development and business relocation.

Economic Factors

In all three case studies, the situation of the state budget is a matter of concern. Monstadt and Scheiner point out that, in recent decades, it was repeatedly observed that the economic interests of a state had more of an influence over voting behavior regarding energy- and climate-protection laws in the *Bundesrat* than the respective party-political government configurations.⁸² Economic development and the prosperity of the population are at very different levels in each of the three federal states. As with most other former German Democratic Republic (GDR; East Germany) states, Saxony-Anhalt, in particular, is characterized by a low GDP per capita and a high rate of unemployment. The latter is also true for certain regions in North Rhine-Westphalia. Overall, hope can be seen, on the one hand, that many new jobs will be created in the renewable energy sector in the future, but, on the other hand, there is also the fear that many jobs in the fossil fuel and atomic energy industries will be lost, particularly in NRW. Nevertheless, the EEG, in particular, offers an incentive to all states to support investments in renewable energy sources in their own region because if they do not do so, net financial resources will be allocated to the other federal states within the scope of the EEG reallocation charge. Similar incentives apply for taxpayer-funded subsidies from the federal government.

Informational-Cognitive Factors

The case studies show that criticism of individual renewable energy projects can be found in many different places, especially with regard to projects that are particularly visible, such as wind power facilities. Here, the engagement of citizens' initiatives often converges with critical statements of individual politicians. However, more recent investigations into the public acceptance of energy facilities show a more widespread approval for expanding renewable energy facilities, even in the local area. Even in coal-dependent North Rhine-Westphalia, a survey in 2012 concerning the

construction of wind power facilities in the local region received 63 percent approval from the respondents, significantly higher than that for a new coal-fired power station, which was merely nine percent.⁸³

Actor-Related Factors

The case studies show that at the *Länder* level, individual persons can play a very important role. In Lower Saxony, for example, during the period in question, the State Premier (Christian Democratic Union; CDU) spoke out in favor of wind energy while the environment minister (Free Democratic Party; FDP) spoke out against it; this was detrimental to the investment climate in the state. However, overall, in Lower Saxony, there exists a widespread and dominating advocacy coalition in favor of renewable energy expansion, which can also be explained by looking at the positive effect on the regional economy.

In NRW and Saxony-Anhalt, however, although renewable energy expansion is advocated, this is only done to a limited extent as, at the same time, the continued support and use of coal has been given a higher priority. Although the Green Party and environmental organizations are acting to change this situation, a large coalition composed of individuals representing the Social Democratic Party (SPD), CDU, FDP, energy companies, and trade unions dominate the energy policymaking process. Since the accession of the red-green state government in 2010 in North Rhine-Westphalia, the situation has now shifted in favor of climate protection. With this in mind, the state parliament passed a climate-protection law with ambitious targets for the reductions of greenhouse gas emissions in 2013.⁸⁴ The extent to which this change of position will deliver long-term effects, however, remains to be seen.

Municipal Level

Up-to-date empirical data compiled by one of the authors of this chapter can be used for the analysis of the factors and their influence on municipal renewable energy policies. The empirical data for the municipal level is based on 33 interviews with local experts, non-participant observation of council meetings, as well as the analysis of council documents, scientific literature, media reports, and further documents.⁸⁵

Due to the high number of differences between the three good-practice municipalities chosen, it is therefore possible to analyze a relatively broad spectrum of possible circumstances despite the low number

of actual cases studied. The municipalities differ in terms of federal state, party-political character, unemployment rates, and population density. In addition, completely different regions of Germany are represented in the case selection with Lower Saxony (northwest), Brandenburg (northeast), and Rhineland-Palatinate (southwest).

In all three municipalities, an entire bundle of measures are being implemented. At least one measure from each mode of governance is in operation in every municipality. All three sample municipalities demonstrate a higher proportion of energy from renewable sources than the national average in at least one energy sector (power, heat, and/or fuel).

Problem-Related Factors

In each of the three municipalities investigated, there is considerable potential for the use of renewable energy. The potential of wind power plays by far the most important role in terms of quantity. With regard to local energy requirements, comparable data is only available for the electricity sector. Here, per capita consumption is very different in comparison with the national average. The three municipalities, therefore, have very different conditions for achieving a higher share of energy generated from local renewable energy sources. It can be seen that the local potential for using regenerative energy sources, as well as the energy intensity of the local economic structure, clearly plays a relevant role in the question of how a municipality can achieve a higher proportion of local renewable energy sources in its power balance.

In the three sample municipalities, the local expansion of renewable energy infrastructure is accompanied by significant benefits for the regional economy. As the affected shareholders also wish to capitalize on their potential profit and find a way to express this, pressure on local policymakers to act has intensified. In the sample municipalities, a broad spectrum of shareholders profit from an ambitious municipal policy of expanding renewable energy. These actors include facility operators (companies, utilities, and households), manufacturers, installation companies, and employees; farmers who lease their land; and broader sections of the population (incentivized via direct investment or price reductions).

In contrast, generally no one within the municipality loses out financially, since the costs for the local expansion of renewable energy is predominantly covered by national contributions and tax money. Municipal budgets also benefit from lower unemployment levels, income from leases, and charging for route usage and cable routing. Critics and opponents of

individual renewable energy projects in the three sample municipalities have, instead, focused to a greater degree on the conservation of species and the preservation of the landscape. However, they are not usually able to stand up against the strong regional economic arguments within the political process.

Political-Institutional Factors

Party-political changes within municipal councils or in the mayor's office have not led to any changes in renewable energy policy in any of the three sample municipalities. On the contrary, almost universal consensus was seen among local policymakers; as a rule, all decisions were made with a large majority. While this consensus supported the expansion of renewable energy in Emden and Prenzlau without any discernible disruptions, three phases with very different levels of commitment to renewable energy policy can be identified in Alzey-Land. At the same time, these transitions or changes between these phases cannot be linked to changes in majority party, mayor, or the emergence of a new party. In Prenzlau, the consensus regarding the expansion of renewable energy was even supported by three different mayors with three different party-political backgrounds (SPD, Die Linke, and independent).

A renewable energy policy mix that covers all five modes of governance can be found in each of the three sample municipalities, albeit to different extents. Local funding programs for renewable energy projects in Emden and Prenzlau can be classified as economic instruments. However, such economic instruments tend to take a more complementary role. In the three municipalities investigated, the federal policy of economic incentives, in particular the German Renewable Energy Act, was decisive for the quantitative expansion of the renewable energy infrastructure. It can, therefore, be concluded that not every political level necessarily requires its own economic incentives in order to implement its environmental policy.

An integration of renewable energy policy with other political fields can be seen within the sample municipalities to varying degrees, although, in general, this is not very far advanced. In Emden and Prenzlau in particular, strong links can be seen between the expansion of renewable energy on the one hand, and the promotion of trade and industry and job creation caused by the relocation of renewable energy-related business on the other.

An institutionalization of local renewable energy policies is likewise only evident in Emden and Prenzlau. Emden has been particularly

successful at integrating various administrative units within the framework of ongoing internal administrative processes for the European Energy Award. Civil servants who are involved with making decisions relevant to changes in local energy policy now regularly meet to discuss and exchange ideas.

Socio-technical path dependencies are a strong factor of influence in all three cases. The local expansion of renewable energy has led to renewable energy paths being opened in the sample municipalities that have developed a large amount of intrinsic logic and momentum far beyond formal institutional structures. It can, therefore, also be seen that path dependencies are by no means beneficial only for established fossil fuels or nuclear energy (as in North Rhine-Westphalia, France, or Poland), but can also have positive effects in terms of renewable energy expansion.⁸⁶ These socio-technical path dependencies comprise three different dimensions:

- *Technical-economical dimension*: It is clearly economically viable to continue to use previously constructed technical facilities and the corresponding infrastructure, and also to modernize facilities after operations have ceased (repowering). Additionally, powerful economic stakeholders emerge around these facilities and infrastructure, and these continue to defend their interests.
- *Social dimension*: According to the experiences of all three sample municipalities, the population becomes accustomed to the sight of renewable energy facilities, even large wind power stations.
- *Political dimension*: The political stakeholders likewise become accustomed to the once tried and tested procedures and tools, such as land-use planning for wind energy plants or establishing local renewable energy development programs.

Openness regarding local processes to shape public opinion can be considered as another key factor for stimulating responses from opponents, administrative bodies, associations, businesses, and civic participation schemes. A collegial sense of cooperation and a constructive atmosphere were evident in the local councils of all three sample municipalities. The political, administrative, civic, and commercial stakeholders all consistently report transparent information and open procedures in current local municipal politics in which opinions, other than merely those of the majority, are also heard.

Ultimately, the framework conditions at higher political levels are of crucial importance for the implementation of municipal renewable energy policies. In particular, the German Renewable Energy Act, enacted in 2000, constitutes an immensely important foundation for numerous investments from municipal utilities, associations, other enterprises, and private individuals. As is made clear in Emden, the national allocation of finances for energy injection allowances also has a beneficial effect on local renewable energy expansion. In contrast, the *Stromeinspeisungsgesetz* (feed-in tariff; StrEG), which was effective prior to the EEG, placed the Emden municipal utility companies under obligation to pay the feed-in allowances themselves as the local network operator; this inhibited the commitment of city officials. Furthermore, the legislative framework for renewable energy policy in the states of each of the respective sample municipalities can be classified as comparatively positive overall. As early as the 1990s, *Länder*-level spatial planning in Lower Saxony and Rhineland-Palatinate contained specifications for the development of renewable energy sources. Moreover, state-level guidelines for municipal economic activity relating to the energy sector tend to have rather broad-ranging definitions in all three sample municipalities; this is advantageous for the expansion of renewable energy plants operated by municipal companies.

Economic Factors

In terms of economic framework conditions, literature on environmental policy assumes, on the one hand, that a dedicated policy of climate protection requires a positive municipal budgetary situation.⁸⁷ On the other hand, high levels of unemployment are seen as a hindrance to making environmental improvements, and tend to lead to less attention being given to environmental concerns.⁸⁸ Based on the three case studies presented here, these two literature-based hypotheses must be rejected, at least with regard to the issue of local renewable energy expansion:

1. A positive municipal budgetary situation does not appear to be a necessary condition for a dedicated policy of renewable energy expansion. In this manner, the municipal development program for renewable energy, which is still in operation today, was initiated in Emden in the 1990s despite the presence of a budgetary crisis. Furthermore, the municipal energy company established a series of wind energy plants in the municipal area; these facilities generated

negative results until the implementation of the German Renewable Energy Act in 2000. Inversely, in Alzey-Land, it is the less wealthy boroughs that are particularly keen to generate additional income from wind energy. In this case, a more positive municipal budgetary situation could potentially hinder the continued expansion of renewable energy sources.

2. In comparison with national averages, both Emden and Prenzlau consistently have significantly higher levels of unemployment. However, the expansion of renewable energy infrastructure is seen in conjunction with the relocation of renewable energy businesses to the local area, thus being a key pillar of support for the local economy and a means to reduce unemployment levels.

Informational-Cognitive Factors

It is very difficult to measure the long-term collective experience of populations and individual local politicians in matters of energy policy. Admittedly, many of the interviewees stated that they perceived the local population to have a generally positive attitude toward the expansion of renewable energy. The nuclear catastrophes in Chernobyl and Fukushima, as well as the 1992 United Nations Conference in Rio de Janeiro, were all cited in the interviews as factors that consciously affected ways of thinking. In Emden, the assumption of a comparatively high environmental awareness is also supported by the numerous demonstrations held against the use of fossil fuels and nuclear energy (against the transport of nuclear waste, the construction of coal-fired power stations, and the Fukushima disaster). Current media headlines were influential in swaying policy in only one of the three case studies. This was when, shortly after the Fukushima catastrophe in 2011, the Emden town council agreed upon a previously controversial proposal to only use green electricity for all municipal buildings, traffic lights, and businesses.

Furthermore, a necessary condition for the implementation and integration of environmental policy is the awareness of local stakeholders regarding their own room to maneuver.⁸⁹ The broad spectrum of measures being implemented in both Emden and Prenzlau demonstrate a high level of awareness for their scope of action. In addition, the interviews also reveal that there is extensive knowledge of the remaining possible courses of action. However, alongside some other measures in Alzey-Land, there is a strong focus placed on the designation of land for wind energy use, such that other possible courses of action are barely given any attention.

Actor-Related Factors

The constellation of actors differs vastly between the three municipalities investigated. In both Emden and Prenzlau, the respective mayors, municipal utilities, and local renewable energy companies were driving forces behind the turnaround in energy policy, while political parties and the administration both played a predominantly supportive role. These stakeholders all share the deep core belief that (1) climate change represents a threat renewable energy can mitigate, and (2) the development of the local economy and the creation of jobs is to be a main priority. At most, differences between the stakeholders emerge in response to individual questions (secondary aspects)—an example of this is the variety of ways in which different stakeholders assessed specific wind energy projects in Emden. Opponents of expanding renewable energy use cannot be identified in Emden or Prenzlau.

However, in Alzey-Land, there are two distinct advocacy coalitions that are diametrically opposed in terms of their stance on wind energy. Here, the pro-wind energy coalition is firmly established and indicates a similar belief system to the pro-renewable energy coalitions in Emden and Prenzlau. However, secondary aspects splinter the coalition internally. The dominating trend within the coalition advocates a concentration of wind farms governed by regional planning, while the environmental associations *Bund für Umwelt und Naturschutz Deutschland* (BUND; Friends of the Earth) and *Naturschutzbund Deutschland* (Nature and Biodiversity Conservation Union; NABU) want to give bird protection a higher priority. Although these do certainly view certain wind power projects as critical due to their effects on bird protection, they are not against the expansion of wind power in general. Other individual stakeholders place heavy emphasis on the local autonomy of individual communities with respect to location decisions. The anti-wind energy coalition comprises only a few stakeholders, and the core belief of this coalition questions the reality of climate change, and holds that interested parties are heavily exaggerating its potential risks. This inability of opposition coalition groups to form an alliance contributes to the domination of the pro-wind energy coalition in Alzey-Land.

In an overall look at the three case studies, it can also be seen that the local groups of various environmental associations are often seen to be more skeptical opponents of specific local renewable energy projects than would be expected, based on the proactive behavior of the same associations with respect to renewable energy policy at the national level.

This apparent contradiction can be explained by the fact that, at the municipal level, it becomes an issue of a specific location, where, for example, wind energy use may conflict with protection of birds. In this respect, the case studies confirm the conclusions drawn by Reiche regarding this matter.⁹⁰

CONCLUSION

The turnaround on German energy policy to accommodate more renewable energy sources (*Energiewende*) is one of the most important topics on the political agenda in Germany. The potential of *Länder* and municipalities to act in support of this policy turnaround is, to a great extent, dependent on the framework conditions established at national and EU levels. On the other hand, five modes of governance remain available to both *Länder* and municipalities: overarching measures, energy consumption of the public administration, regulation and planning, supply of services, and support and information. The use of each of these modes can act to address blind spots in the energy and climate policies of higher political levels, and to add increased momentum to these policies.⁹¹

By utilizing their existing possible courses of action, state governments and municipal councils can also capitalize on their comparative advantages over other political levels. For example, they are approachable to local citizens, businesses, and other regional organizations. Furthermore, they are also able to integrate different energy-related aspects with other fields of politics, such as the use of energy from renewable sources, energy efficiency, climate protection, transport, land use, and economic development.⁹²

When looking at the relationship between *Länder* and municipalities and private stakeholders, it would seem that—in spite of the increasing importance of non-corporate stakeholders in the last 20 years—the former continue to be assigned the more important function in terms of renewable energy policy. Two points can demonstrate this. First, municipalities in particular—just like private actors—are able to participate in market action, both as environmentally conscious energy consumers and as energy producers and suppliers who place an emphasis on the expansion of renewable energy sources. Second, *Länder* governments and municipal councils fulfill multiple tasks that could scarcely be delegated to private actors, such as regional and urban land-use planning and regulatory appointments, as well as the setting of targets for renewable energy expansion. However, they do not always make full use of

their potential to take action.⁹³ Additionally, problem-related, political, economic, cognitive, and actor-related factors influence the promotion of the transition to renewables.

It can be assumed that both *Länder* and municipalities will continue to play a key role in terms of the future organization of the *Energiewende*. In particular, the construction of further renewable energy facilities and the expansion of energy grids will be necessary as part of the turnaround in German energy policy. In so doing, it is important that *Länder* and municipalities promote acceptance throughout the necessary site-specific planning procedures within the context of state, regional, and urban land use planning. Sub-national stakeholders also play a central role in the renovation of existing buildings. The achievement of these enormous possible energy savings is dependent upon the willingness of millions of decision-makers to invest in renewable energy. As has been shown here, *Länder* and municipalities can boost this willingness to invest by using a number of measures including acting as a model with their own administrative buildings, implementing their own development programs, and providing consultancy services.

NOTES

1. Hans Joachim Schellnhuber, "Manchmal könnte ich schreien," Interview mit Hanns-Bruno Kammertöns und Stephan Lebert, *Die Zeit*, no. 14, (March 26, 2009): 17.
2. Daniel Lübbert and Felix Lange, *Uran als Kernbrennstoff: Vorräte und Reichweite*, (Berlin: Wissenschaftliche Dienste des Deutschen Bundestags, 2006).
3. Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit (BMU), *Beschleunigter Atomausstieg*, (Berlin: Hintergrundinformation, 2009). Peter Henricke and Manfred Fishedick, *Erneuerbare Energien*, (Munich: C.H. Beck, 2007). Jochen Monstadt, *Die Modernisierung der Stromversorgung: Regionale Energie- und Klimapolitik im Liberalisierungs- und Privatisierungsprozess*, (Berlin: VS Verlag für Sozialwissenschaften, 2004), 106ff.
4. Florentin Krause, Harmut Bossel, and Karl-Friedrich Müsler-Reissman, *Energie-Wende: Wachstum und Wohlstand ohne Erdöl und Uran. Ein Alternativ-Bericht des Öko-Instituts*, (Frankfurt/Main: Fischer, 1980). Uwe R. Fritsche, *Das Energiewende-Szenario 2020: Ausstieg aus der Atomenergie, Einstieg in Klimaschutz und nachhaltige Entwicklung*, (Freiburg: Öko-Institut, 1996). Wissenschaftlicher Beirat der Bundesregierung Globale Umweltveränderungen (WBGU), *Welt im Wandel. Energiewende zur*

- Nachhaltigkeit*, (Berlin: Springer, 2003). Hermann Scheer, *Energieautonomie. Eine neue Politik für erneuerbare Energien*, (München: Kunstmann, 2005).
5. Martin Jänicke, "Erfolgsbedingungen von Umweltpolitik," in *Umweltpolitik der Industrieländer. Entwicklung—Bilanz—Erfolgsbedingungen*, ed. Martin Jänicke, (Berlin: Ed. Sigma, 1996), 9–28. Martin Jänicke, Philip Kunig, and Michael Stitzel, *Lern- und Arbeitsbuch Umweltpolitik. Politik, Recht und Management des Umweltschutzes in Staat und Unternehmen*, (Bonn: Dietz, 2000). Danyel Reiche, *Rahmenbedingungen für erneuerbare Energien in Deutschland. Möglichkeiten und Grenzen einer Vorreiterpolitik*, (Frankfurt/Main: Verlag Peter Lang, 2004).
 6. Paul S. Sabatier, "Advocacy-Koalitionen, Policy-Wandel und Policy-Lernen: Eine Alternative zur Phasenheuristik," in *Policy-Analyse. Kritik und Neuorientierung*, ed. Héritier, Adrienne, (Opladen: VS Verlag für Sozialwissenschaften, 1993), 116–48.
 7. Adrienne Windhoff-Héritier, "Die Veränderung von Staatsaufgaben aus politikwissenschaftlich-institutioneller Sicht," in *Staatsaufgaben*, ed. Dieter Grimm, (Baden-Baden: Suhrkamp Verlag, 1994). 75–91. Sonja Blum and Klaus Schubert, *Politikfeldanalyse*, (Weisbaden: VS Verlag für Sozialwissenschaften, 2009). Arthur Benz, "Multilevel Governance; Governance in Mehrebenensystemen," in *Governance—Regieren in komplexen Regelsystemen*, ed. Arthur Benz, (Weisbaden: VS Verlag für Sozialwissenschaften, 2004), 125–46.
 8. Lutz Mez, et al., *Zukünftiger Ausbau erneuerbarer Energieträger unter besonderer Berücksichtigung der Bundesländer. Endbericht für das Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit*, (Berlin: Forschungsstelle Für Umweltpolitik Freie Universität Berlin, 2001), 79ff.
 9. Philipp Schönberger, "Kommunale Politik zum Ausbau erneuerbarer Energien. Handlungsmöglichkeiten, Good-Practice-Beispiele und Erfolgsbedingungen," doctoral dissertation, submitted at Freie Universität Berlin, Department of Political and Social Sciences, Berlin, Germany (2014).
 10. Jochen Monstadt and Stefan Scheiner, "Allocating Greenhouse Gas Emissions in the German Federal System: Regional Interests and Federal Climate Governance," *Energy Policy* (2014), 5, accessed October 14, 2014, doi: <http://dx.doi.org/10.1016/j.enpol.2014.09.001>. Monstadt, *Die Modernisierung der Stromversorgung*. Mez et al., *Zukünftiger Ausbau*, 79ff.
 11. Agentur für Erneuerbare Energien (AEE), "Energie-Kommune: 20 Jahre 'Aachener Modell,'" press release, February 28, 2013, Berlin, Germany. Mez et al., *Zukünftiger Ausbau*.
 12. Ralf Schüle and Hanna Scheck, "Strategic Challenges for Urban Sustainability Transitions. The Case of Germany," *Lexxion: Summer Academy Proceedings 2011*, Berlin, Germany, (2011), 3f. Gotelind Alber and Kristine Kern,

- “Governing Climate Change in Cities: Modes of Urban Climate Governance in Multi-Level Systems,” Organization for Economic Co-operation and Development (OECD), 5ff, accessed February 28, 2010, <http://www.oecd.org/dataoecd/22/7/41449602.pdf>. International Energy Agency (IEA), “Cities, Towns, & Renewable Energy. Yes In My Front Yard,” (International Energy Agency (IEA)/OECD: Paris, 2009), 95ff.
13. Sachverständigenrat für Umweltfragen (SRU), *Umweltgutachten 2004*, Berlin, Germany (2004), 18.
 14. Jochen Diekmann, et al., *Vergleich der Bundesländer: Analyse der Erfolgsfaktoren für den Ausbau der Erneuerbaren Energien 2012—Indikatoren und Ranking*, (Berlin and Stuttgart: Bundesministerium für Wirtschaft und Energie, 2014), 18ff.
 15. Energiewende Baden-Württemberg, “Unsere Ziele lauten: 50-80-90,” Ministerium für Umwelt, Klima und Energiewirtschaft, (2014), accessed October 10, 2014, <http://www.energiewende.baden-wuerttemberg.de>.
 16. “Grunddaten und Modelle zur Biomassenutzung und zum Biomassepotenzial in Hessen,” Hessisches Ministerium für Umwelt, ländlichen Raum und Verbraucherschutz (HMULV), Wiesbaden, Germany (2005), 1. CDU and FDP Hessen, *Vertrauen. Freiheit. Fortschritt. Hessen startet in das nächste Jahrzehnt. Koalitionsvereinbarung Legislaturperiode 2009–2014*, Wiesbaden, Germany (2009), 74.
 17. Erneuerbare Energie Region (100ee), “Aktueller Überblick über die Regionen im 100ee-Netzwerk,” Institut dezentrale Energietechnologien (IdE) (2013), accessed July 19, 2013, [http://www.100ee.de/index.php?id=61&tx_ttnews\[pointer\]=7&tx_ttnews\[tt_news\]=388&tx_ttnews\[backPid\]=212&cHash=a6f143962e](http://www.100ee.de/index.php?id=61&tx_ttnews[pointer]=7&tx_ttnews[tt_news]=388&tx_ttnews[backPid]=212&cHash=a6f143962e)
 18. Deutsches Institut für Urbanistik (Difu), “BMU-Förderprogramm,” Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit (2011), accessed March 31, 2011, <http://www.kommunaler-klimaschutz.de/bmu-f%C3%B6rderprogramm>.
 19. Mez et al., *Zukünftiger Ausbau*, 168.
 20. Tilman Weber, “EEG-Novelle im Schnellkonsens,” *Das Magazin Erneuerbare Energien* (2014), accessed October 3, 2014, <http://www.erneuerbareenergien.de/eeg-novelle-im-schnellkonsens/150/406/78018>.
 21. Alber and Kern, “Governing Climate Change in Cities,” 16. Uwe Rauschelbach, “Frischer Wind in der Energiedebatte,” *Südhessen Morgen, Ausgabe Lampertheim* (October 29, 2009), 17.
 22. Energiewende Baden-Württemberg, “Unsere Ziele lauten: 50-80-90.” Land Schleswig-Holstein, Ministerium für Energiewende, Landwirtschaft, Umwelt und ländliche Räume (2014), accessed October 3, 2014, <http://www.schleswig-holstein.de/MELUR>. Mez et al., *Zukünftiger Ausbauci*, 164.

23. Kristine Kern, et al., “Kommunaler Klimaschutz in Deutschland—Handlungsoptionen, Entwicklung und Perspektiven,” WZB Discussion Paper (2005), 9, accessed February 20, 2010, <http://bibliothek.wz-berlin.de/pdf/2005/iv05-101.pdf>. According to Kern et al., in order to ensure that even controversial measures are enforced adequately, the climate-protection unit ought to be integrated into another powerful policy unit such as the mayor’s office. Furthermore, the study suggests internal working groups to provide for the coordination of administrative departments and external working groups for cooperation with other actors such as civil society, municipal, and private companies. Such external working groups have been established in virtually all bigger municipalities.
24. Regine Barth, et al., “Die nachhaltige öffentliche Beschaffung in der politischen,” in *Umweltfreundliche öffentliche Beschaffung. Innovationspotenziale, Hemmnisse, Strategien*, ed. Regine Barth, Christoph Erdmenger, and Eledtraud Günther, (Heidelberg: Physica-Verlag, 2005), 6f.
25. Kern et al., “Kommunaler Klimaschutz in Deutschland,” 25.
26. Mez et al., *Zukunfriger Ausbauci*, 171.
27. Gernot Knödler, “Hamburg setzt auf Ökostrom,” *Taz Online* (January 21, 2011), accessed April 26, 2012, <http://www.taz.de/!64666>. Kern et al., “Kommunaler Klimaschutz in Deutschland,” 29.
28. Matthias Reichmuth, et al., *Vorbereitung und Begleitung der Erstellung des Erfahrungsberichts 2011 gemäß § 65 EEG. Vorhaben II c: Solare Strahlungsenergie. Endbericht*, (Leipzig: Leipziger Institut für Energie, 2011), accessed June 27, 2011, http://www.erneuerbareenergien.de/files/pdfs/allgemein/application/pdf/eeg_eb_2011_solare_strahlung.pdf. Sascha Rentzing, “Die Volksbatterie,” *Neue Energie* 4 (2010): 86.
29. Stefan Klinski and Fabio Longo, “Arbeitspapier Nr. 6: Rechtliche Rahmenbedingungen kommunaler Strategien für den Ausbau der Nutzung erneuerbarer Energien,” *Strategische Kommunalpolitik zur Nutzung erneuerbarer Energieträger (SKEP)*, Berlin, Germany (2006), 28f.
30. Deutsche Gesellschaft für elektrische Straßenfahrzeuge (DGES), “Fahrzeuge: Elektrisch unterstützte Fahrräder,” (2010), accessed March 13, 2010, <http://www.dges.de/alternative-antriebe/fahrzeugbeispiele/elektrisch-unterstuetzte-fahrraeder.html>. Electric bicycles (pedelecs) show a comparatively low energy demand of about 1 kWh (equating to 0.1 liters of oil) per 100 kilometers.
31. Alber and Kern, “Governing Climate Change in Cities,” 7.
32. Kern et al., “Kommunaler Klimaschutz in Deutschland,” 29.
33. Kern et al., “Kommunaler Klimaschutz in Deutschland,” 28, 57, 65. Christoph Erdmenger and Michaela Winter, “Umweltfreundliche Beschaffung in der Praxis—Erfahrungen der Stadt Stuttgart,” in *Umweltfreundliche öffentliche Beschaffung. Innovationspotenziale, Hemmnisse, Strategien*, ed.

- Regine Barth, Christoph Erdmenger, and Eledtraud Günther, (Heidelberg: Physica-Verlag, 2005), 33–43.
34. “Marburger Solar-Satzung: Stadt betreibt Klage beim Verwaltungsgericht weiter,” Stadt Marburg (2010), accessed June 27, 2010, <http://www.marburg.de/detail/70999>. Gesa Coordes, “Kommt Solarpflicht doch?” *HNA* (June 7, 2010), accessed June 13, 2010, <http://www.hna.de/nachrichten/hessen/kommt-solarpflicht-doch-795371.html>. Landesregierung Hessen, “Gesetzentwurf der Landesregierung für ein Gesetz zur Änderung der Hessischen Bauordnung und des Hessischen Energiegesetzes,” *Hessischer Landtag* 18, no. 2523 (July 15, 2010): 11. Before the solar ordinance could come into force, it was repealed by the Hessian government on the grounds that Hessian building law did not authorize municipalities to adopt respective ordinances. After the competent administrative court rejected this opinion, the Hessian parliament changed the building law.
 35. Philipp Schönberger, “Municipalities as Key Actors of German Renewable Energy Governance: An Analysis of Opportunities, Obstacles, and Multi-Level Influences,” Wuppertal Paper No. 186 (January 2013), <http://wupperinst.org/publikationen/details/wi/a/s/ad/2056>.
 36. Kern et al., “Kommunaler Klimaschutz in Deutschland,” 24.
 37. *Bund für Umwelt und Naturschutz Deutschland* (BUND) and Information Service Environmental Law (IDUR), “Klimaschutz in der kommunalen Planung: BUND und IDUR geben Leitfaden für Gemeinden heraus,” press release, Stuttgart/Frankfurt/Main, November 5, 2008, 10. Additionally, preparatory urban land-use plans and regional plans can include depictions for heat grids and district heating networks.
 38. Ralf Schüle and Bea Wittger, *Klimaschutz in der integrierten Stadtentwicklung. Handlungsleitfaden für Planerinnen und Planer*, (Düsseldorf: Ministerium für Bauen und Verkehr des Landes Nordrhein-Westfalen, 2009), 41. Preparatory land-use planning can, nevertheless, make a supporting contribution to designate and permanently safeguard suitable sites for wind energy plants.
 39. BUND and IDUR, “Klimaschutz in der kommunalen Planung,” 9f, describes the principle of countervailing influence.
 40. “Niederschrift über die 7. öffentliche Sitzung der Gemeindevertretung,” Gemeinde Rimbach im Odenwald (2009), 5, accessed May 29, 2010, http://ratsinfo.rimbachodw.de/bi/to0040.php?__ksinr=82&toselect=1597. Peter Harry Carstensen, “Unser Ideal ist der Bürgerwindpark,” *Neue Energie* 4 (2010): 37f.
 41. Jörg Staudé, “Bayern nimmt Abstand von Windkraft,” *Klimaretter* (July 2014), accessed October 3, 2014, <http://www.klimaretter.info/politik/nachricht/16751-bayern-nimmt-abstand-von-windkraft>.

42. “Vorsorgeabstand 700 m.,” Landesanstalt für Umwelt, Messungen und Naturschutz Baden-Württemberg (LUBW) (2013), accessed October 3, 2014, <http://www.lubw.de.baden-wuerttemberg.de/servlet/is/230029>.
43. Hiltrud Naßmacher and Karl-Heinz Naßmacher, *Kommunalpolitik in Deutschland*, (Wiesbaden: VS Verlag für Sozialwissenschaften, 2007), 36f.
44. “Die schwäbische Hausfrau wird begeistert sein,” interview mit Stefan Mappus, *Frankfurter Allgemeine Zeitung (FAZ)* (2010), www.faz.net/aktuell/wirtschaft/wirtschaftspolitik/im-gespraech-stefan-mappus-die-.
45. Mez et al., *Zukünftiger Ausbauci*, 187.
46. *Ibid.*, 89.
47. Naßmacher and Naßmacher, *Kommunalpolitik in Deutschland*, 125. Some Länder allow profitable activities if they are justified by a public purpose, do not exceed an appropriate extent, and if this purpose can be fulfilled *as good and efficient* as by private companies. Others are more restrictive and demand that the public purpose can be fulfilled *better and more efficient* than by private companies.
48. Kern et al., “Kommunaler Klimaschutz in Deutschland,” 15f.
49. Kurt Berlo and Oliver Wagner, “Zukunftsperspektiven kommunaler Energiewirtschaft,” *Raum Planung* 158/159 (2011): 236.
50. Harriet Bulkeley and Kristine Kern, “Local Government and the Governing of Climate Change in Germany and the UK,” *Urban Studies* 43 (2006): 2237–59. Alber and Kern, “Governing Climate Change in Cities,” 10.
51. Sven Becker and Andeas Wassermann, “Wende rückwärts,” *Der Spiegel* no. 44 (2010): 41–4. Marcus Franken, Nicole Weinhold, Karsten Wiedemann, and Bernward Janzing, “Dinos raus! Wie Kommunen das Energiegeschäft zurückerobern,” *Neue Energie* 10 (2009): 20–42. “Halle wieder ohne RWE-Tochter. Tagesticker,” *Zeitung für kommunale Wirtschaft (ZfK)* (2010), accessed June 6, 2010, <http://www.zfk.de/zfkGips/Gips?Anwendung=MeldungenAnzeigen&Methode=Einzelmeldung&SessionMandant=ZFK&Mandant=ZFK&WebPublisher.NavId=5867&AuswahlRessourceID=116267>. Landeshauptstadt Dresden, “Dresden startet den Rückkauf der Stadtwerke DREWAG,” press release, October 12, 2009, accessed June 6, 2010, http://www.dresden.de/de/02/035/01/2009/10/pm_055.php. “Neues Stadtwerk: Hamburg attackiert Vattenfall mit Öko-Strom,” *Spiegel Online* (2009), accessed June 6, 2010, <http://www.spiegel.de/wirtschaft/0,1518,625610,00.html>. Agentur für erneuerbare Energien (AEE), “Unabhängig dank Netzzrückkauf—Wolffhagen ist ‘Energie-Kommune’ des Monats September,” (2008), accessed June 6, 2010, <http://www.unendlich-viel-energie.de/de/detailansicht/browse/3/article/247/unabhaengig-dank-netzrueckkauf-wolffhagen-ist-energie-kommune-des-monats-september.html>.
52. Kern et al., “Kommunaler Klimaschutz in Deutschland,” 55, 73.

53. Stefan Thomas and Nikolaus Richter, "Kommunale Energiewirtschaft und moderne Daseinsvorsorge," in *Ressourceneffizienz. Der neue Reichtum der Städte*, ed. Oscar Reutter, (Munich: Oekom Verlag, 2007), 117.
54. Stadtwerke München GmbH, "SWM Ausbauoffensive Erneuerbare Energien," press release, (2013), accessed July 26, 2013, <http://www.swm.de/dms/swm/dokumente/unternehmen/verantwortung/umwelt/erneuerbare-energien/ausbauoffensive-erneuerbare-energien-projekte.pdf>. Jakob Schlandt, "Die Kleinen auf dem Vormarsch," *Frankfurter Rundschau* (May 2010), accessed May 16, 2010, http://www.fronline.de/frankfurt_und_hessen/nachrichten/hessen/?em_cnt=2645945&em_loc=1234.
55. Thomas and Richter, "Kommunale Energiewirtschaft und moderne Daseinsvorsorge," 119.
56. Berlo and Wagner, "Zukunftsperspektiven kommunaler Energiewirtschaft," 239.
57. Wuppertal Institute for Climate, Environment and Energy. *Zukunftsfähiges Deutschland in einer globalisierten Welt. Ein Anstoß zur gesellschaftlichen Debatte*, (Frankfurt/Main: Fischer, 2008), 308f. Stadtwerke Crailsheim, "Die Kraft der Sonne nutzen," (2012), accessed May 6, 2012, http://www.stwcrailsheim.de/fileadmin/images/webservice/pdfs/Crailsheim_Broschu_re_Einzelseiten_END.pdf?PHPSESSID=c641a2ad4c08e40b4e50445df28ae48a.
58. Berlo and Wagner, "Zukunftsperspektiven kommunaler Energiewirtschaft," 238.
59. Städtische Werke Kassel, "Abwrackprämie," (2012), accessed May 6, 2012, <http://www.sw-kassel.de/index.php?id=1329>.
60. Becker and Wasserman, "Wende rückwärts."
61. Berlo and Wagner, "Zukunftsperspektiven kommunaler Energiewirtschaft," 237.
62. Kern et al., "Kommunaler Klimaschutz in Deutschland," 22.
63. *Ibid.*, 128f.
64. *Ibid.*, 63.
65. Stadt Birstadt, "Zuständigkeiten-Energieberatung," (2010), accessed April 30, 2012, <http://www.rathaus-buerstadt.de/html/zustandigkeiten.html>. Verbraucherzentrale Bundesverband, "Verbraucherzentrale Bundesverband," (2012), accessed April 30, 2012, <http://www.verbraucherzentraleenergieberatung.de/web/beratungsstelle.html?code=07070&ort=Buerstadt>.
66. Rheinland-Pfalz Ministerium für Wirtschaft, Klimaschutz, Energie und Landesplanung (2014), accessed November 5, 2014, <http://www.energieagentur.rlp.de/regionalbueros.html>.
67. Mez et al., *Zukünftiger Ausbauci*, 171, 181.
68. Diekmann et al., *Vergleich der Bundesländer*, 25f.

69. Mez et al., *Zukunfriger Ausbauci*, 99.
70. Martin Wörner, “Null-Emissions-Gemeinde Nalbach. Nutzung erneuerbarer Energien,” Gemeinde Nalbach (2012), 11, accessed May 12, 2012, http://www.fgumwelt.de/assets/files/NKI/Fachtagung/Woerner_GemeindeNalbach_Fachtagung.pdf.
71. “Struktur,” Enercity-Fonds proKlima (2010), accessed June 27, 2010, <http://www.proklima-hannover.de/Struktur.31.0.html>.
72. Stadtwerke Osnabrück, “Frischer Wind für mehr Zinsen. Aktuelle Meldung vom 3.5.2010,” (2010), accessed May 25, 2010, <http://www.stadtwerke-osnabrueck.de/meldung/artikel/frischer-wind-fuer-mehr-zinsen.html>.
73. Kurt Berlo and Dieter Siefried, “Bürger-Contracting—Photovoltaikanlagen und Effizienzmaßnahmen im Doppelpack,” *Solarzeitalter* 4 (2008): 48–52.
74. For the generation of such data see, Steinbeis-Transferzentrum, “Geoinformation und Landmanagement,” Sun-Area—das Solarpotenzial-Dachkataster (2010), accessed June 27, 2010, www.sun-area.net.
75. Mez et al., *Zukunfriger Ausbauci*, 79ff.
76. Ibid.
77. “Ein verlässlicher Partner für die kommunalen Aktionäre,” Verband der kommunalen RWE-Aktionäre GmbH (VKA) (2014), accessed October, 14, 2014, <http://www.vka-rwe.de/index.php?id=3615>.
78. Garrelt Duin, “Die Balance halten,” *Handelsblatt* (September 4, 2014): 56.
79. For more on the role of North Rhine-Westphalia and other high-carbon states within German energy policy see Monstadt and Scheiner, “Allocating Greenhouse Gas Emissions.”
80. This corresponds with the findings of Monstadt and Scheiner, “Allocating Greenhouse Gas Emissions,” 4, according to which, after government changes since 2010, red-green state governments operate a significantly more ambitious climate-protection policy than their CDU-led predecessors.
81. For more on this see, Monstadt and Scheiner, “Allocating Greenhouse Gas Emissions.”
82. Monstadt and Scheiner, “Allocating Greenhouse Gas Emissions.”
83. Agentur für Erneuerbare Energien (AEE), *Bundesländer in der Übersicht*, (2014), accessed October 10, 2014, <http://www.foederal-erneuerbar.de>.
84. Ministerium für Klimaschutz, Umwelt, Landwirtschaft, Natur- und Verbraucherschutz Nordrhein-Westfalen (MKULNV), “Klimaschutzgesetz NRW,” (2014), accessed October 14, 2014, <http://www.umwelt.nrw.de/klima/klimaschutzgesetz-nrw>.
85. Schönberger, “Kommunale Politik zum Ausbau erneuerbarer Energien.”
86. Danyel Reiche, *Restriktionen und Erfolgsbedingungen erneuerbarer Energien in Polen*, (Frankfurt/Main: Verlag Peter Lang, 2003), 57ff.
87. Kern et al., “Kommunaler Klimaschutz in Deutschland,” 88.

88. Jänicke, Kunig, and Stitzel, *Lern- und Arbeitsbuch Umweltpolitik*, 88.
89. Peter Hennicke, Eberhard Jochem, and Friedemann Prose, *Mobilisierung- und Umsetzungskonzepte für verstärkte kommunale Energiespar- und Klimaschutzaktivitäten* (Karlsruhe: Fraunhofer Institut ISI, 1999), 15.
90. Reiche, *Rahmenbedingungen für erneuerbare Energien in Deutschland*, 111. Bernd Hirschl, *Erneuerbare Energien-Politik. Eine Multi-Level Policy-Analyse mit Fokus auf den deutschen Strommarkt* (Wiesbaden: VS Verlag für Sozialwissenschaften, 2008), 178f.
91. Schönberger, "Municipalities as Key Actors."
92. Schüle and Scheck, "Strategic Challenges for Urban Sustainability Transitions," 12.
93. Mez et al., *Zukünftiger Ausbauci*, 74.