

Schönberger, Philipp

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Municipalities as key actors of German renewable energy governance: An analysis of opportunities, obstacles, and multi-level influences

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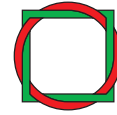
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Wuppertal Institut
für Klima, Umwelt, Energie
GmbH

Philipp Schönberger

Municipalities as Key Actors of German Renewable Energy Governance

An Analysis of Opportunities, Obstacles,
and Multi-Level Influences

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Döppersberg 19
42103 Wuppertal

Author:**Philipp Schönberger**

Research Group “Energy, Transport and Climate Policy”

E-mail: philipp.schoenberger@wupperinst.org

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Abstract

In recent years, policies to promote renewable energy have become increasingly popular among municipalities in different parts of the world. This article examines the case of Germany. It argues that municipalities, compared to other state and private actors, already have the potential to play a key role in German renewable energy governance. Although both private actors and the European Union have gained importance in the past 20 years, German municipalities still play a crucial role and can apply five distinct and important modes of governance in the field of renewable energy policy. In this regard, the notion of a general development towards a ‘cooperating and ensuring state’, which increasingly delegates its tasks and thus becomes less important, cannot be confirmed in the field of municipal renewable energy governance in Germany.

Zusammenfassung

Seit einigen Jahren ist in verschiedenen Weltgegenden eine zunehmende Verbreitung kommunaler Ansätze zum Ausbau erneuerbarer Energien zu verzeichnen. Der vorliegende Artikel widmet sich deutschen Kommunen und argumentiert, dass diese im Vergleich zu anderen staatlichen Ebenen und privaten Akteuren das Potenzial haben, eine Schlüsselrolle bei der Energiewende in Deutschland zu spielen. Obwohl private Akteure ebenso wie die Europäische Union in den letzten 20 Jahren an Bedeutung gewonnen haben, spielen Kommunen hier weiterhin eine wichtige Rolle und können im Politikfeld erneuerbare Energien fünf bedeutsame und voneinander abgrenzbare Governance-Modi anwenden. Die weit verbreitete These einer stetigen Entwicklung hin zum so genannten Kooperations- und Gewährleistungsstaat, der seine Aufgaben zunehmend an Private delegiert und an Bedeutung verliert, kann im Bereich kommunaler Erneuerbare-Energien-Politik daher nicht bestätigt werden.

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1. Introduction

In recent years, numerous municipalities¹ in different parts of the world have taken measures to increase the share of renewable energy in their territories. Some even strive for a completely renewable energy supply. They do so for different reasons, such as climate protection, the strengthening of the regional economy and job creation (cf. Schüle/Scheck 2012: 3).

This article analyses whether municipalities have the potential to play a key role in German renewable energy governance. The term ‘key role’ is used in this article to describe that a certain actor plays a very important (although not necessarily the most important) role, compared to other actors involved. Thus, municipalities can be considered as key actors in renewable energy governance if their role is a very important one compared to higher political levels and private actors.

The relationship between German municipalities and higher political levels as well as private actors has been influenced by several developments that have taken place within the European Union (EU) during the past 20 years. For example, the EU level of governance has gained importance within the multi-level political system, and some of the decisions at EU level have had direct impact on the municipal level. Moreover, municipal decision structures have changed in Germany. The influence of both private companies and citizens has increased, many municipal companies have been privatised, and local administrations have been re-organised to become more efficient. Another issue that has been debated since the 1990s is the financial crisis of many German municipalities. It has often been stated that the municipalities’ scope of action was extremely limited by their budgetary position.

Consequently, this article investigates how the municipal role in German renewable energy governance is affected by these developments regarding (1) higher political levels, (2) private actors and (3) municipal budget crisis. On this basis, the article aims to find out (4) whether, on the whole, municipalities can be classified as key actors of renewable energy governance in Germany.

¹ In this article, the term *municipality* is used to refer to cities, towns and villages as well as to rural and urban districts.

2. Literature review and methodology

Opportunities and obstacles for renewable energy policy have been examined by a number of studies. However, most of these studies concentrate on the international, supranational (EU) and national levels of governance (cf. e.g. Schreurs/Tiberghien 2007, Oberthür/Ott 2000, Aminov 2008, Hirschl 2008, Reiche 2004 and 2005). Moreover, there have been studies focusing on the regional (Länder) level in Germany (Mez et al. 2007, Diekmann et al. 2010).

On the contrary, studies about municipalities and energy predominantly concentrated on technical and economical potentials, rather than on policy options (cf. e.g. Siemens AG 2009, Wuppertal Institute 2008a). According to Schreurs, “there has still been relatively little systematic research into local climate change policies and politics” (2008: 346).

There are a few exceptions, however, i.e. studies examining municipal climate and energy policy, both in Germany and world-wide. For the German context, Kern et al. (2005; see also Alber/Kern 2008 and Kern/Bulkeley 2009) depict the options for municipal climate policy, studying three cities in greater detail. Additionally, Hennicke et al. (1999) examine success factors of municipal climate protection processes. However, renewable energy plays a rather small role in both of these studies, the main focus lies on energy saving.

Two relevant international studies were published in 2009. The International Energy Agency (IEA) and the Renewable Energy Policy Network (REN21) both give an overview of options for renewable energy policy that exist in most countries around the world (cf. IEA 2009, Martinot et al. 2009). These studies deliver case summaries for 13 respectively 30 cities and towns. However, they necessarily remain rather superficial and broad, since they cover municipalities in different countries with very different societal, political and legislative frameworks.

This article will draw on these studies in the following sections, but it will set a clear focus on German municipalities and renewable energy. This way, the article analyses a more specific topic than the studies mentioned above, thus contributing to fill a research gap in environmental policy literature.

Besides literature on renewable energy policy, there have been intensive debates about multi-level/local governance and municipalities, which are also highly relevant for this article. Drawing on these debates, *section 3* presents an analytical framework for investigating the role of German municipalities in a multi-level governance system and proposes the relevant analytical questions that are the basis of examining a distinct policy field like municipal renewable energy policy. *Section 4* describes opportunities and instruments of municipal renewable energy policy in Germany, also taking

obstacles into account. Finally, *section 5* addresses the general questions from section 3 with regard to municipal renewable energy policy.

This article is based on a review and analysis of scientific literature², legal documents, publications from energy-related institutions and media coverage (German newspapers and journals, such as *Neue Energie*, *Solarzeitalter*, *Spiegel Online* and *Zeitung für kommunale Wirtschaft*).

² With regard to scientific literature, sources from three different research disciplines have been reviewed for this paper. First, political science literature about governance as well as municipal, energy and climate politics and policy. Second, jurisprudential literature that deals with individual possibilities of municipal renewable energy policy and discusses the interpretation of relevant legal norms. Third, applied research studies and guidelines published by national, sub- and international organisations as well as research institutes. Whereas the paper as a whole takes up a political science perspective, the results of jurisprudential and applied research are also incorporated as far as they include further or more detailed findings.

3. The role of German municipalities in a multi-level governance system

In political science, two prevailing trends relevant for municipalities are debated under the headings of local governance and multi-level governance³. First, the relationships between different political levels have partly changed. Second, the influence of private actors has increased significantly⁴. This section describes these developments and examines their relevance for municipal renewable energy policy.

3.1 Relationships between different political levels

The political framework set at higher levels is crucial for the municipal scope of action. During the past decades, relationships between different political levels have partly changed. This has affected both the national framework in Germany and the interdependencies between all political levels, including EU and global levels.

State and development within the nation state

As in many other countries, German municipalities are traditionally dependent on higher political levels. Municipalities can even be regarded as “local outpost of the state administration” (Naßmacher/Naßmacher 2007: 31). Since federal and Länder governments have no comprehensive net of separate administrative agencies, they employ municipal administrations for implementing certain tasks (e.g. fire protection, building control).

However, today Article 28 para 1 of the German Basic Law (Grundgesetz) guarantees public representation at municipal level by a body that is not chosen by the Länder government, but instead locally chosen through general, direct, free, equal, and secret elections. Furthermore, municipalities have “the right to regulate all local affairs on their own responsibility, within the limits prescribed by the laws” (guarantee of self-

³ Some (local as well as multi-level) governance approaches advocate an increasing role of private actors, since they regard this as leading to higher effectiveness and legitimacy. In contrast to such normative approaches, local and multi-level governance are used as empirical and analytical approaches in this article (for the distinction between the different perspectives of governance approaches, see Hirschl 2008: 48, Holtkamp 2007). Moreover, the term *governance* – broadly interpreted – is understood in this article to include all arrangements of public and private decision makers, whereas narrow interpretations only include cooperative forms of decision-making (cf. Wolf 2008: 226). Whereas first multi-level governance research was related to developments at EU level, Benz (2004) shows that the concept can be applied to multi-level systems of different kinds.

⁴ These two developments are by no means independent of each other. As the following section will make clear, e.g. the role of private actors is strengthened by the increasing importance of the EU decision making process as well as by some individual EU policies. Nevertheless, for the sake of clarity the two developments are described separately here.

government, Art. 28 para 2 Grundgesetz). This guarantee of self-government leads to considerable room for manoeuvre in Germany, whereas in other countries, e.g. in the United Kingdom, municipalities are much more legally restricted by central government (cf. Bulkeley/Kern 2006: 2238 f.).

Nonetheless, the scope of this guarantee is a matter of interpretation. It has been argued that in constitutional reality virtually all political tasks of municipalities are decided by federal or state legislators. Thus, municipalities are said to have administrative rather than political tasks, i.e., they are implementing decisions made at higher policy levels (cf. Naßmacher/Naßmacher 2007: 22). However, one has to differentiate between original municipal tasks and tasks for which federal and state governments employ the municipal administrative agencies. Original municipal tasks can be divided into voluntary (e.g. library, theatre) and compulsory tasks (e.g. urban land-use planning, road construction). The difference between compulsory municipal tasks and state tasks implemented by municipal administrative agencies is that the Länder only exert legal supervision of the former, but legal *and technical* supervision of the latter (cf. *ibid.*: 112 ff., Kern et al. 2005: 5, Bulkeley/Kern 2006: 2238).

Beyond these formal powers and responsibilities, the state of a municipality's financial affairs determines its possibilities for political action. In this respect, room for manoeuvre of many municipalities has become more and more limited since the 1990s (cf. Holtkamp 2007: 367). One main reason for this is the tendency of federal and Länder governments to assign the municipalities new tasks without financing them. A recent example is the planned expansion of daycare provision for children under three years of age (cf. Naßmacher/Naßmacher 2007: 183 ff.). Additionally, problems within the municipalities' budgetary positions have been substantially exacerbated by the recent global economic crisis since 2008. As a consequence, in 2010 the municipal budget deficit increased by more than 40 per cent compared to 2009, from seven billion to ten billion Euros (cf. Deutscher Städtetag 2011).

In view of the current financial situation of most German municipalities, it is often stated that their rather broad formal self-government rights, e.g. compared to British municipalities, are de facto irrelevant (cf. Holtkamp 2007: 367, Bulkeley/Kern 2006: 2255).

Interactions between different political levels

Developments at supranational levels, too, have an impact on municipalities. The increased influence of EU and global level governance is of at least twofold importance. First, it leads to cooperative modes of decision making and to the formation of policy-related networks, since there is no central government authorised to make hierarchical decisions at EU and global level. Partly, these networks include actors from different political levels (multi-level networks). Municipalities participate in these networks

either directly or via transnational city networks⁵. Hereby, new possibilities can evolve to influence decision processes directly, without including the nation state (cf. Hooghe/Marks 1996: 73, Hirschl 2008: 54). Second, EU policies have significant impact on national and subnational policy-making. For example, the liberalisation of energy markets strongly influenced the municipal scope of action by eliminating local supply monopolies – including those of municipal energy companies (see section 4.4).

3.2 The increasing influence of private actors

According to many political scientific analyses, private actors (i.e. citizens, non-governmental organisations and business companies) have begun to play an increasingly important role in political processes during the past decades. It is said that – at all political levels and in many policy fields – the *intervening state* has been replaced or at least supplemented by a *cooperative and ensuring state*: Whereas formerly state intervention, regulation and hierarchical modes of governance were dominating, networks and cooperative decisions have become more important. Whereas previously the state carried out a great variety of tasks, it now delegates many tasks to private actors and only ensures that they will be fulfilled (cf. Mayntz 2008: 44, 47, Wolf 2008: 227). Some developments in this direction can also be observed at the municipal level. These trends are discussed under the headings of economisation and participation (cf. Bogumil/Holtkamp 2006: 80).

Economisation

Two trends at the municipal level can be attributed to economisation. These are the introduction of the so-called New Steering Model and tendencies towards the privatisation of formerly public bodies.

The *New Steering Model* (NSM) aims to introduce a number of management elements practiced in business companies into the management of public administrations. In this way, municipal administrations are supposed to become more efficient and service-oriented (cf. Bulkeley/Kern 2006: 2241). Moreover, the New Public Management concept, which was the basis for the development of NSM, intends to examine critically if all tasks carried out by the state are necessary. However, this aspect, which might have led to a significant shift of tasks from state to private actors, did not play a relevant role for the reform discussions in German municipalities. Instead, the implementation of NSM in municipalities was limited to measures of internal administrative modernisation. Since the measures placed particular emphasis on the needs of and services for citizens and companies, one can argue that private actors have been strengthened by the reforms (cf. Bogumil/Holtkamp 2006: 93).

⁵ One prominent example for a transnational city network is Eurocities (cf. Niederhafner 2008). Moreover, there are also thematically oriented city networks (for energy and climate protection city networks, see section 4.1).

There are tendencies towards *privatisation* of municipal property concerning the supply and/or disposal of electricity, gas, heat, public transport, water, waste and housing. The main reasons for privatisation are EU provisions (see section 4.4), ideological considerations and budgetary deficits. In many cases, municipalities do not choose a full-fledged privatisation model, but rather a transformation into private-law companies that are still municipality-owned. Nevertheless, both ways lead to a decrease of municipal influence, whereas the private sector is strengthened. At the same time, new institutional arrangements and governance structures have emerged. Before privatisations took place, the responsible departments in charge of the above mentioned tasks belonged to the hierarchy of the municipal administration. Now new actors such as managing directors, executive boards, advisory and supervisory boards (depending on the organisational form of the privatised company/services) meet municipal representatives at eye level. Accordingly, municipal targets (e.g. the reduction of CO₂ emissions) can only be pursued by cooperation, not only by hierarchical orders anymore (cf. *ibid.*: 93 ff., Bolay 2006: 12 ff.).

Participation

A number of developments have strengthened the trend towards more public participation in governance, such as the introduction of more direct democratic elements and of civic participation processes. In many German states (Länder), direct democratic elements have been strengthened in the 1990s insofar as mayors are now directly elected by the inhabitants of the respective municipality, and political questions can be decided by citizens' initiatives and referenda.

Additionally, civic participation has become more common, e.g. in local Agenda 21 processes, where citizens and organisations take part in informal, cooperative discussions. Moreover, in recent years there has been a debate how acceptance for political projects can be improved by more public participation. The most prominent example was the so-called Stuttgart 21 railway project: After massive protests and demonstrations, finally the renewal of Stuttgart Central Station was nevertheless approved by a referendum. New forms of participatory governance have been created at federal, Länder and municipal level. They include very different projects, such as energy and climate protection plans or participatory municipal budgets (cf. e.g. Ministerium für Klimaschutz Nordrhein-Westfalen 2012, Stadt Köln 2011).

Overall, the municipal trends towards economisation and participation lead to a weakening of the role of local parliaments and to a strengthening of the role of companies and citizens. The development of the mayors' role is rather ambiguous. On the one hand, their position is strengthened by being directly elected. On the other hand, scope for action is reduced as a consequence of privatisations and possible citizens' initiatives and referenda (cf. Bogumil/Holtkamp 2006: 124).

3.3 Conclusions for the analysis of municipal renewable energy policy

One advantage of the local and multi-level governance perspective is the fact that it allows an analytical view on multi-level systems considering the empirical complexity of the co-existence of state, economic, societal, and supranational actors. Likewise, the interaction of these bodies across different political levels relevant for a certain policy field is taken into account (cf. Hirschl 2008: 53).

This analytical model refers to general political trends and can be applied to different policy fields. On its basis, municipal opportunities and instruments to promote renewable energy are described and analysed in the remainder of the article. Several questions can be derived from sections 3.1 and 3.2:

1. *Relationships between different political levels:* How do policies devised at higher political levels affect municipal renewable energy policy? How important are multi-level policy networks?
2. *The role of private actors:* To what extent is the tendency towards economisation and increased public participation affecting the political options to promote renewable energy at municipal level? Can we observe a ‘cooperative and ensuring state’ that involves private actors in decision processes, delegates many tasks and renounces regulatory measures as far as possible?
3. *Municipal budget crisis:* What role does the grave budgetary situation of many municipalities play in their renewable energy policy?
4. *Overarching question:* Are municipalities just one of many actors within the multi-level governance network, or do they, compared to other actors, play a key role in renewable energy politics?

In order to answer these questions, section 4 will describe opportunities and instruments of municipal renewable energy policy, already taking account of the role of other political levels, private actors and financial restrictions. Subsequently, section 5 will explicitly address the questions above.

4. Five modes of municipal renewable energy governance in Germany

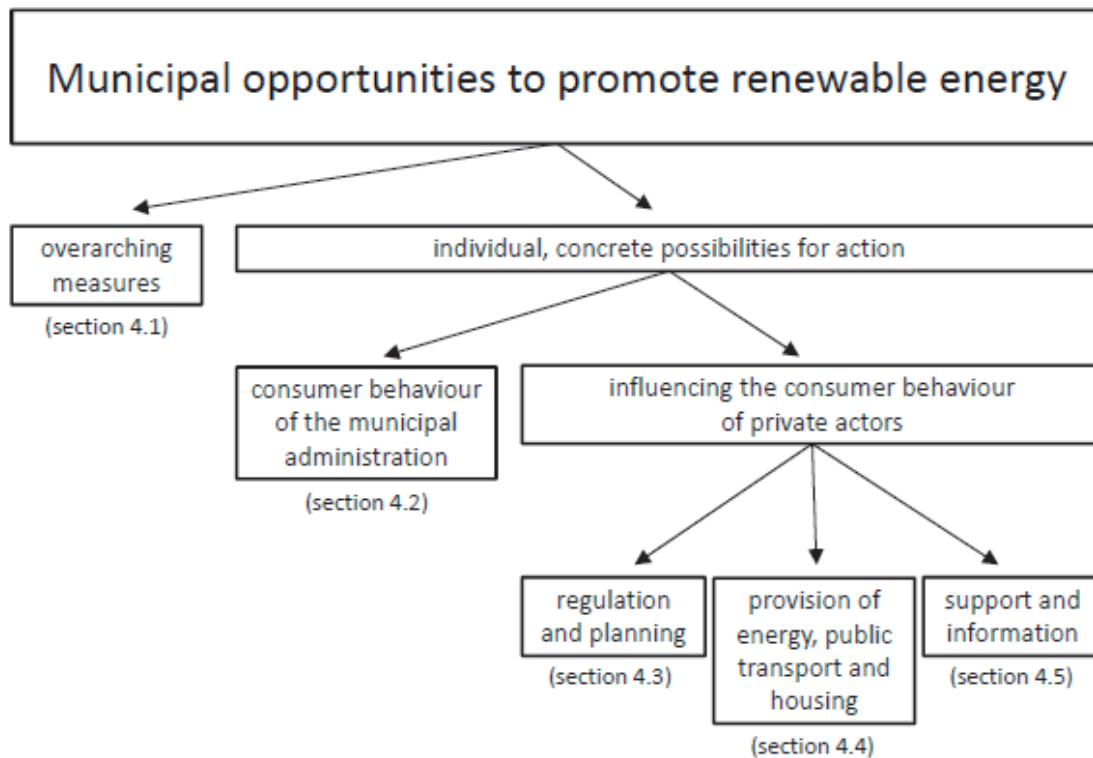
The opportunities and instruments of municipal renewable energy policy (not only, but also in Germany) can be divided into five distinct governance modes⁶ (cf. Schüle/Scheck 2011: 3 f., Alber/Kern 2008: 5 ff., IEA 2009: 95 ff.):

- overarching measures
- consumer behavior of the municipal administration
- regulation and planning
- provision of energy, public transport and housing: municipality as business actor
- support and information

These five categories refer to different levels of action (Figure 1). First, overarching measures, e.g. target-setting, local energy concepts and joining an energy-related city network, can be distinguished from individual, concrete instruments to promote renewable energy. The latter can be divided into instruments concerning the municipal administration itself as an energy consumer and instruments aiming to influence the consumer behaviour of private actors. Finally, there are three ways for the municipality to influence private actors: regulation/planning, provision of energy/transport/housing and support/information.

The following analysis outlines concrete options aligned to each of these five categories, and considers to what extent they depend on the political framework of higher policy levels. The analysis focuses on opportunities to promote renewable energy in all sectors (power, heat, mobility), all of which can be influenced by measures from different categories. The opportunities and instruments are illustrated by examples from German municipalities, as far as such examples exist in the literature reviewed for this article.

⁶ This classification differs in several points from the one commonly used in environmental policy debates. The latter distinguishes between regulation and planning, financial incentives, cooperation and information (cf. Jänicke et al. 1999: 100). This common classification does not include the options of municipalities to participate in market processes, both as energy consumer and as supplier. Additionally, a category *overarching measures* is missing, since local renewable energy targets and concepts as well as joining a city network do not fit in any of the other categories. Furthermore, fiscal instruments play only a minor role in municipal energy policy, since, on the one hand, energy taxes have not been established at local level up to now, and, on the other hand, few municipalities can afford comprehensive financial promotion schemes. For this reason, fiscal instruments and further supporting and information measures are summed up by a single category *support and information*.

Figure 1: Overview of municipal opportunities to promote renewable energy

Sources: adapted from Alber/Kern 2008, Kern et al. 2005 and IEA 2009

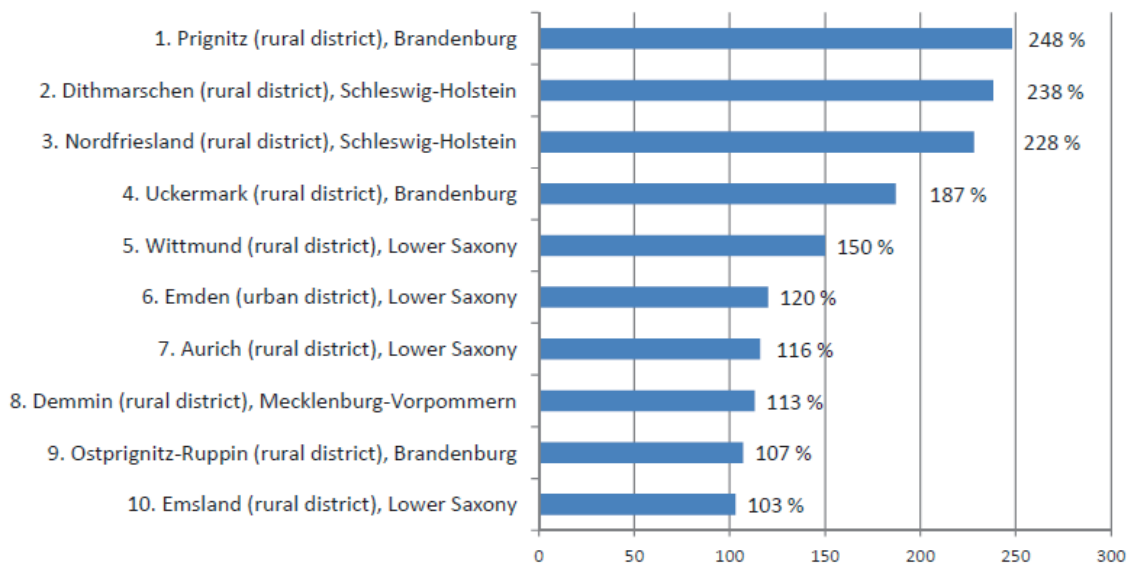
4.1 Overarching measures

This section deals with four overarching measures to promote renewable energy. These are: targets concerning the local share of renewable energy or the reduction of greenhouse gas emissions, local energy and climate action plans, cooperation with other municipalities, and the personnel institutionalisation of renewable energy and climate protection within the municipal administration.

Most municipalities planning activities in the field of renewable energy set a certain *quantitative target* (cf. IEA 2009: 99). According to the German Advisory Council on the Environment, targets can improve long-term orientation and help to create a reliable environment for investors (cf. SRU 2004: 18). Some of these targets refer to a future share of renewable energy within the local energy mix. The target of a 100 per cent renewable energy share has become more and more 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. Up to now, there are more than 120 German municipalities and regions striving for an entirely renewable energy supply (cf. IdE 2012). Some of them try to reach this aim in a long-term perspective, e.g. until 2030 or 2050, whereas others refer to shorter periods of time. Taking only power and heat into account, there are a few, small municipalities that have

already reached the self-sufficiency target (cf. Hawlitzki 2010). Comparing locally produced to locally consumed quantities of electricity, even some bigger municipalities have reached or exceeded a 100 per cent renewable energy share in the power sector (see Figure 2). Some of these local targets are based on national or European targets, others are based on data from local energy and climate action plans.

Figure 2: Rural / urban districts (Landkreise / kreisfreie Städte) with the highest renewable electricity shares (October 2012)



Source: DGS 2012a

In recent years, *local energy and climate action plans* have become more and more popular among German municipalities. These concepts usually contain a CO₂ balance sheet, an estimate of local renewable energy and energy saving potential, and concrete policy recommendations. They are more and more supplemented by a strategic long-term perspective (e.g. until 2050, cf. Landeshauptstadt Düsseldorf 2011). Moreover, the existence of an energy action plan can be important when it comes to concrete regulation, e.g. as explanation that a certain encroachment upon property rights is not an arbitrary act, but necessary for the implementation of the municipality's conception of future urban development (cf. Schmidt 2006: 1357 f., see also section 4.3). 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, which also includes the financing of additional administrative personnel for the municipalities (cf. Difu 2011).

As a further overarching measure, *cooperation with other municipalities* is becoming increasingly important. Cooperation with neighbouring municipalities is often reasonable, e.g. for establishing energy-related advisory agencies or defining priority

areas for wind power (cf. Alber/Kern 2008: 16, Rauschelbach 2009: 17). Furthermore, transnational climate protection networks have gained importance since the 1990s⁷.

The *institutionalisation of renewable energy and climate protection within the municipal administration* is important to make sure that agreed measures are implemented properly. Kern et al. (2005: 9) recommend establishing both a central, coordinating climate protection unit and decentralised responsibilities within individual departments⁸.

From a legal perspective, all overarching measures described above are unproblematic, since municipalities are authorised to implement them by virtue of the constitutional guarantee of self-government (cf. Longo/Altrock 2008: 33). In contrast, legal barriers and problems emerge in relation to some concrete individual measures for promoting renewable energy, which are dealt with in section 4.2 to 4.5.

4.2 Consumer behaviour of the municipal administration

Like every consumer, the municipal administration can take measures to reduce its energy use and to meet its energy needs with renewable energy. Moreover, the municipality can apply ecological criteria for its procurement. Therefore, it is in the position to act as a model in these areas. By doing so, the municipality can take climate-protecting measures without consideration of and influence to private actors (for possibilities to influence the energy consumption of private actors, see sections 4.3 to 4.5 below). Although only about five per cent of the entire German energy demand can be directly influenced by municipalities (cf. Bulkeley/Kern 2006: 2245), municipal administrations belong to the largest consumers within their territories (cf. Barth et al. 2005: 6 f.). Additionally, acting as a model can serve to legitimise climate protection measures concerning other actors (cf. Kern et al. 2005: 29).

⁷ Main reasons for joining such a transnational network are, on the one hand, to exchange information and good-practice examples and, on the other hand, lobbying, especially within EU institutions, since their legislative action is often relevant for climate protection at municipal level. The biggest networks are the Climate Alliance, Energie-Cités, Cities for Climate Protection and the Covenant of Mayors, which was initiated by the EU Commission (cf. Kern/Bulkeley 2009: 314 ff.). By joining one of these networks, a municipality commits not only to pay a membership fee, but also to reduce local greenhouse gas emissions more rapidly than stipulated in European and national targets. As Kern et al. (2005: 59) point out, the membership fees can be outbalanced by third-party project funds which are generated with the help of the networks. For this reason, the city of Heidelberg can afford to be a member of all four climate protection networks mentioned above.

⁸ According to Kern et al. (2005: 40), in order to ensure that also 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 (cf. *ibid.*).

In order to cover their *electricity* demand with renewable energy, municipalities can purchase green power for public buildings – either from municipal energy companies (see below, section 4.4) or from an external supplier. Heidelberg und Hamburg are examples of cities that have purchased green power for a considerable time. In the case of Heidelberg, the city council decided in 2001 that 25 per cent of the municipal buildings' electricity demand must be covered by green power. Electricity is provided by the municipal energy company Stadtwerke Heidelberg, taking an extra charge for green power and investing the extra revenue in new renewable energy plants. Until 2011, four photovoltaic systems (PV) and one biogas plant were financed this way. CO₂ emissions were reduced by 4400 tons per year (cf. Stadt Heidelberg 2011, Kern et al. 2005: 54 f.). In the case of Hamburg, municipal buildings have been supplied with a 10 per cent share of green power since 2002. In 2011, this share has been expanded. Now 100 per cent of the electricity demand of municipal buildings, local public transport and several municipal companies is covered by green power. The required electricity is produced in German hydro power plants and Danish wind parks. The city government states that this step should set an example with regard to the reduction of CO₂ emissions. Nevertheless, the measure is contentious, since RWE is the supplier of the hydro power. RWE is one of Germany's biggest energy companies, which also operates nuclear and coal power plants (cf. Knödler 2011, Kern et al. 2005: 29).

Furthermore, electricity demand can be covered directly by using cogeneration units or photovoltaic systems on municipal roofs. However, given the current legislative framework of the Renewable Energy Act (as of 1 January 2012), the more profitable option is feeding at least a certain share of the PV-generated power into the electricity grid. Using 100 per cent of PV electricity in the building where it is produced is no economic solution because storage costs are too high (cf. Reichmuth et al. 2011: 173 ff., Rentzing 2010: 86).

In order to cover the municipality's *heat* demand with renewable energy, solar thermal, biomass and near-surface geothermal plants come into consideration. Each of these technologies can be used either as individual plants or in combination with a local heating network. In contrast to the electricity sector, the majority of buildings in Germany are supplied by individual heat plants today. Nevertheless, the expansion of local heating networks can be an opportunity to realise an efficient use of renewable heat (cf. Klinski/Longo 2006: 28 f.).

As far as motorised *transport* can neither be avoided nor replaced by walking or cycling, biofuels and renewable power can be utilised. This applies to cars, trucks and motor-supported bicycles⁹. Since switching to renewable transport will not challenge

⁹ Electric bicycles (pedelecs) show a comparatively low energy demand of about 1 kWh (equating to 0.1 litres of oil) per 100 km (cf. DGES 2010).

motorised individual transport, there might be a broad acceptance rather quickly¹⁰ (cf. Alber/Kern 2008: 7).

Further to the direct energy demand, which finds expression in the municipal administration's electricity, heat and fuel costs, so-called *grey energy* plays an important role. Grey energy is the amount of energy needed for the manufacturing and disposal of products and the delivery of services (cf. Kern et al. 2005: 29). Municipalities can commit themselves to prefer products and services on the basis of renewable energy, e.g. products from companies that use green power for their manufacturing processes. Examples for cities that have committed themselves to an ecological procurement are Bremen, Heidelberg, Frankfurt/Main and Stuttgart (cf. *ibid.*: 28, 57, 65, Erdmenger/Winter 2005).

4.3 Regulation and planning

Municipalities can implement regulatory measures especially in relation to buildings and the designation of areas for renewable energy plants. Up to now, the opportunities to integrate climate protection into planning procedures have not been made use of adequately (cf. Kern et al. 2005: 92). This section discusses potential ways that municipalities can use to promote renewable energy.

Building codes

Local building codes can oblige the owner both to use renewable energy (for heating, hot water and power) and to construct the building in an energy efficient manner. Local building codes can either be based on binding land-use plans, urban development contracts or on building law (cf. Kern et al. 2005: 22 ff.). Moreover, municipalities can oblige building owners to connect to and to use district heating networks.

With regard to *binding land-use plans* on the basis of the Federal Building Code (Baugesetzbuch), municipalities can prescribe that the main front of a building must be directed southward, to facilitate the use of solar energy. Likewise, it is undisputed that they can regulate the compactness of the building and the avoidance of shadows. However, there is a need for legal clarification on some crucial points. Especially, it is controversial if the binding land-use plan can prescribe the installation of renewable

¹⁰ Empirical evidence indicates that municipal measures for energy saving are hardly realised in the transport sector (cf. Alber/Kern 2008: 11 f., Kern et al. 2005: 22; Palmer 2009: 46 ff.). The main reason for this seems to be a weak societal acceptance of measures restricting motorised individual transport. It is unlikely that the personnel of municipal administrations has a different attitude in this question. Nevertheless, Palmer (2009: 81 ff.), mayor of the Baden-Wuerttemberg town of Tübingen, shows that the use of bicycles, car sharing and public transport by municipal and administrative leaders can contribute a lot to the acceptance, and also to an increased use, of alternative means of transportation by the rest of the municipal personnel. Thus, it is possible to achieve a certain degree of cognitive and cultural change at least within the administration, which contributes to the municipality's function as a role model in climate protection.

(particularly solar) energy plants exceeding the amount stipulated by federal law¹¹, or whether the respective passage only refers to the creation of constructional requirements for a possible later installation (cf. Klinski/Longo 2006: 9, Söfker 2009: 87). Another controversy deals with the question if regulation regarding thermal insulation (again, beyond the extent stipulated by federal law) is permitted¹².

Urban development contracts can be used to determine both renewable energy and energy efficiency requirements. These contracts require the consent of the building owner, thus limiting their applicability. Municipalities however can make the sale of municipal building ground conditional upon the completion of such a contract (cf. Longo 2010: 305 f., Hug 2003). Similar options exist in the case of hereditary leaseholds (cf. Thiel 2004: 25).

Regulations on the basis of *building law* are highly dependent on regional (i.e. Länder) political framework conditions. In general, municipalities can prescribe the use of renewable energy if the regional building law authorises them to do so. The solar ordinance of the Hessian city of Marburg is the most prominent example for a municipality hindered in its efforts to prescribe the use of renewable heat also for renovated buildings by the Länder government and parliament¹³.

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 (CHP). All regional (Länder) Municipal Codes include this option.

Designation of areas for renewable energy plants and facilities

Municipalities can designate parts of their territories as areas for renewable energy plants. This is especially relevant for wind turbines, since these are regarded as relevant for spatial development (cf. Kern et al. 2005: 24). On the level of urban land-use planning, areas for renewable energy plants can be depicted in the preparatory land-use

¹¹ Since 2009, the federal Renewable Heat Act (Erneuerbare-Energien-Wärmegesetz, EEWärmeG) prescribes that new buildings have to cover a certain percentage of their heating and hot water demand with renewable energy. The building owner can choose between different technological options. For example, in the case of a solar heating system, 15 per cent of the total heat demand have to be covered. In turn, the EEWärmeG partly fulfils the requirements of EU directive 2009/28/EC, which requires member states to prescribe the use of renewable heat in new and comprehensively renovated buildings.

¹² In both cases there are many arguments favouring the permissibility of respective municipal regulations. Nonetheless, legal certainty can only be attained if either federal politics decide to change the Baugesetzbuch in a clarifying way or if municipalities dare to set designations for renewable energies and energy efficiency on the basis of existing law and take the risk of a possible lawsuit (cf. Ecofys 2007: 15, Schmidt 2006: 1361).

¹³ Before the solar ordinance could come into force, it was repealed by the Hessian government on the grounds that Hessian building law did not authorise municipalities to adopt respective ordinances. After the competent administrative court rejected this opinion, the Hessian parliament changed the building law (cf. Stadt Marburg 2010, Coordes 2010, Landesregierung Hessen 2010: 11).

plan¹⁴. However, according to the Federal Building Code and the Regional Planning Act (Raumordnungsgesetz), all urban land-use plans have to be compatible with the regional plan, which is therefore the decisive level for designation proceedings¹⁵. In turn, municipalities participate in the development of the regional plan (principle of countervailing influence, cf. BUND/IDUR 2008: 9 f.).

Municipalities can thus try to influence the designation of priority areas for wind and other renewable energy plants by issuing a respective statement. Up to now, most municipal statements 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 (cf. Gemeinde Rimbach im Odenwald 2009: 5, Carstensen 2010: 37 f.). If neighbouring municipalities do not raise any objections, there are good chances that such requests are approved.

The concentration of wind turbines within priority areas can be determined as a so-called objective of the regional plan. Many regional plans make use of this possibility, since otherwise wind power plants could be constructed nearly everywhere, according to the Federal Building Code (cf. Mez et al. 2007: 62). If a municipality wishes to allow the construction of a wind turbine outside the priority areas of the regional plan, it is necessary to make a request for conducting proceedings to obtain permission to deviate from the planning objective. The same body that has passed the regional plan then decides if the municipality obtains permission to deviate from the planning objective (see also May 2010: 17).

4.4 Provision of energy, public transport and housing: the municipality as business actor

Another possibility to influence the energy use of citizens and companies includes the provision of energy, public transport and housing. German municipalities have been engaged in these areas since the 19th century (cf. Naßmacher/Naßmacher 2007: 36 f.).

The municipality as energy supplier

On the basis of the regional (Länder) Municipal Codes, municipalities can establish energy companies (Stadtwerke) and carry out energy-related economic activities. Thus, municipalities are generally authorised to produce energy from renewable sources (cf.

¹⁴ Additionally, preparatory urban land-use plans and regional plans can include depictions for heat grids and district heating networks (cf. BUND/IDUR: 10).

¹⁵ According to Schüle et al. (2009: 41), preparatory land-use planning can nevertheless make a supporting contribution to depict and permanently safeguard suitable sites for wind energy plants.

Mez et al. 2007: 49). Provisions of the Municipal Codes however differ significantly regarding the limits of municipal economic activities¹⁶.

Additionally, framework conditions for the electricity and gas market were substantially altered in the 1990s by the amendment of the Energy Economy Act (Energiewirtschaftsgesetz) and underlying EU provisions. Striving for liberalised 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 affects municipal budgets and possibilities e.g. to subsidise public transport (cf. Kern et al. 2005: 15 f.).

At the start of the new millennium, shortly after the liberalisation of energy markets, numerous observers identified a trend that many municipal energy companies were sold or at least refrained from energy production. Until 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 (cf. Berlo/Wagner 2011: 236).

However, this empirical evidence from a certain period of time does not allow the conclusion (drawn by Bulkeley/Kern 2006: 2246 and Alber/Kern 2008: 10) that the role of municipalities as providers will continue to become less important in the future. On the contrary, a number of indications point towards a possible rollback, i.e. a renaissance of municipal energy companies. In the past 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 (see Becker/Wassermann 2010, Franken et al. 2009, ZfK 2010, Landeshauptstadt Dresden 2009, Spiegel Online 2009, AEE 2008). Moreover, an increasing number of good practice examples shows the opportunities of 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 – compared to conventional power plants – higher costs, the cities of Munich and Heidelberg have set up funds that are fed by revenues from green power tariffs (cf. Kern et al. 2005: 55, 73). However, the most important framework condition to realise ecological and economic targets at the same time is the Renewable Energy Act (Erneuerbare-Energien-Gesetz, EEG). Through the cost-covering remuneration

¹⁶ 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 (for an overview, see Naßmacher/Naßmacher 2007: 125).

guaranteed by the EEG, investments in renewable power plants become economically feasible (cf. Thomas/Richter 2007: 117). Accordingly, there are a lot of good practice examples for renewable electricity production by municipal energy companies. The following overview of some examples shows the great variety of options in this field:

- In 2009, the municipal energy company of Munich has announced a wide extension of renewable electricity production, aiming to cover the complete demand of the city in 2025. To reach this target, the company has started to invest in wind power plants both onshore and offshore in Wales and Germany, in solar thermal power plants in Spain as well as in PV, geothermal and hydro power plants in Germany. This renewable energy expansion programme requires a planned investment volume of nine billion Euros until 2025 and is regarded to be one of the most ambitious renewable energy projects in the world (cf. Stadtwerke München GmbH 2010, Schlandt 2010).
- Much earlier, and with a much more local focus than in Munich, the municipal energy company of Emden (Lower Saxony) started to invest in wind energy. In 1993, the first wind energy park in Emden was put into service. In the meantime, some of the older turbines have been repowered, i.e. replaced by new turbines, which have an output of up to 7.5 MW. Altogether, the wind power plants owned by the municipal energy company produce about 75,000 MWh electricity per year, which is equivalent to about 20 per cent of the local demand (cf. Stadtwerke Emden 2012, DGS 2012b).
- In Rhineland-Palatinate in the south-west of Germany, the municipal energy companies of Mainz and Trier plan to build pumped-storage power plants. These plants can balance out fluctuations in the power production of PV and wind power. In case of Stadtwerke Trier, the investment volume will be about 300 million Euros, Stadtwerke Mainz is planning to invest 500 to 700 million Euros (cf. Berlo/Wagner 2011: 240).

In the *heat sector*, municipal energy companies can produce or purchase natural gas from biomass and then sell it to consumers (cf. Thomas/Richter 2007: 119). Moreover, local or district heating networks can be fed with renewable heat. As described in section 4.3, the use of local and district heating can be prescribed by the municipality, since these types of heating have not been liberalised, in contrast to the gas market. Here is an overview of some good practice examples:

- In general, municipal energy companies in Germany show a comparatively high share of combined heat and power (CHP) plants. Examples are the municipal energy companies of Schwäbisch Hall, Oerlinghausen, and Lemgo, all of which operate CHP plants on the basis of biomass and/or natural gas (cf. Berlo/Wagner 2011: 239).
- In Crailsheim (Baden-Wuerttemberg), the municipal energy company is currently constructing a solar thermal local heating system for a new development area. With a size of 10,000 m², it will be the biggest solar thermal plant in Germany and cover about 50 per cent of the heat demand of 2,000 inhabitants. A seasonal reservoir will

be able to store the solar heat also for winter times. The solar local heating system is supposed to avoid 1,000 tons of CO₂ emissions per year (cf. Wuppertal Institute 2008b: 308 f., Stadtwerke Crailsheim 2012).

Regarding *energy efficiency technologies*, the short distance to their customers is a high comparative advantage of municipal energy companies. The following examples show the variety of options:

- 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 (cf. Berlo/Wagner 2011: 238).
- In Wuppertal (North Rhine-Westphalia), the municipal energy company has expanded its energy service activities during the past years. Meanwhile, the company manages the heating, cooling and compressed air systems of more than 400 customers, especially small or medium-sized businesses and the housing industry. This is regarded to be a win-win-solution, since the systems are managed in a more economic way now. The revenue of Wuppertaler Stadtwerke in this business segment has increased to 13 million Euros in 2010 (cf. *ibid.*).
- In March and April 2012, the inhabitants of Kassel (Hesse) had the chance to receive a so-called scrap bonus (Abwrackprämie) of 100 Euros for disposing their old refrigerator and buying an especially energy-efficient new one. The scrap bonus campaign was jointly organised by the city of Kassel and its municipal energy company (cf. Städtische Werke Kassel 2012).

Overall, it can be stated that there are tendencies towards a rollback, a re-municipalisation and a stronger role of municipal energy companies (cf. Becker/Wassermann 2010). As the previous paragraphs have shown, there are numerous possibilities for them to promote energy efficiency and the use of renewable energy. 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 have 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 (cf. Berlo/Wagner 2011: 237).

Most of the good practice examples described above are based on political decisions taken by the municipal parliaments. At the same time, it is also true that in many municipalities the actors are still not aware of the chances lying in the promotion of renewable energy and energy efficiency. Accordingly, there is the danger that these opportunities for municipal companies and climate protection will still not be made use of in the nearer future (cf. *ibid.*: 241, Schlandt 2010).

The municipality as provider of public transport

Many German municipalities founded their own transport companies, running electric trams, subways and/or busses. This portfolio can be supplemented by car sharing. As described in section 4.2, the societal acceptance of measures restricting motorised individual transport is rather weak. Thus, it is essential to develop attractive alternatives, such as a high-quality public transport system (cf. Kern et al. 2005: 22). Operating public transport by renewable energy, biofuels and renewable electricity are options to be considered. Similar to the energy sector, public transport has also been liberalised in the 1990s by EU and federal provisions, which 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 (cf. *ibid.*: 128 f.).

The municipality as provider of housing

By founding housing companies, municipalities can construct energy-saving passive houses, refurbish buildings reaching passive house standard, 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.

4.5 Support and information

Support and information are useful measures for policy areas where municipalities have no regulative authority (cf. Kern et al. 2005: 13). This can include energy consulting services, public relations and educational work, financial incentive programmes, and support/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 and especially the use of combined heat and power technology. Another option is to offer individual mobility concepts without motorised individual transport (cf. *ibid.*: 63). Some municipalities cooperate with the energy consulting services of the consumer protection organisation Verbraucherzentrale (cf. e.g. Stadt Bürstadt 2012, Verbraucherzentrale Bundesverband 2012).

An important task for municipalities are energy-related *public relations and educational work*. This task can be performed by environmental departments, municipal energy companies, energy agencies or adult education centres. 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).

Moreover, municipalities can establish their own *financial incentive and support programmes*. For example, the city of Heidelberg promoted 267 solar thermal installations already in the 1990s (cf. *ibid.*: 17 f., 55). A more recent example for the promotion of solar thermal systems is the municipality of Nalbach (cf. Gemeinde Nalbach 2012: 11). Taking into account the grave situation of many municipal budgets, one solution for the financing of incentive programmes can be funds that are financed by a surcharge on the energy prices of municipal energy companies (cf. Enercity-Fonds proKlima 2010). Additionally, the municipality of Isernhagen has developed an incentive scheme for CO₂-reducing measures in buildings. This scheme is financed by a surcharge on municipal property paid by purchasers not willing to implement energy-saving measures (bonus-malus system, cf. Mez et al. 2007: 73).

Furthermore, municipalities can 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, all of whom contribute a relatively small share of the investment (usually between 100 und 20,000 Euros, cf. Stadtwerke Osnabrück 2010). Partly, these projects are directly organised by municipal energy companies. In the light of the difficult situation of many municipal companies, the involvement of citizens' capital can help to finance investments. 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 (cf. Berlo/Seifried 2008). In the case of solar energy, an important prerequisite for the realisation of citizen-owned plants is the availability of data about suitable roofs (for the generation of such data, cf. e.g. Steinbeis-Transferzentrum 2010). By publishing these data the municipality can trigger private investments. For example, the city of Düsseldorf has published a solar land register on its website. The register maps all buildings within the city and shows whether or not their roofs receive enough solar energy for a PV or solar thermal installation (cf. Landeshauptstadt Düsseldorf 2012). Furthermore, suitable municipal roofs can be leased or made available for free to private investors. The latter is practiced in Munich (cf. Kern et al. 2005: 72 f.).

5. Analysis and conclusion

This last section addresses the questions from section 3, regarding the role of German municipalities in today's multi-level governance system, based on the description of municipal possibilities to promote renewable energy in section 4. This way, insights into the role of municipalities in times of changing relationships between political levels, a stronger role of private actors and budget deficits are to be gained for the field of renewable energy policy.

Relationships between different political levels

On the basis of the governance debate depicted in section 3 and the description of five distinct governance modes in section 4, it can be concluded

1. that German municipalities depend on framework conditions set by higher political levels in many ways, and that the increasing role of the EU is also relevant for municipal renewable energy policy,
2. that there are growing network activities including multi-level networks,
3. that there are also individual municipal responses to policies devised at higher political levels, which can be interpreted as a hint that municipalities might play the role of addressing blind spots in EU, national and regional energy/climate policy.

Hindering framework conditions for municipal renewable energy policy can be identified at all policy levels. At *EU level*, the provisions leading to liberalisation and privatisation processes in the gas and electricity sectors have been major hindering framework conditions, since the supply monopoly of municipal companies was abolished (cf. Kern et al. 2005: 15 f.). At *federal level*, provisions regarding binding land-use plans still notably limit municipalities to prescribe the use of renewable energy in buildings. Likewise, some *Länder policies* have proven to be rather hindering. The example of the Marburg solar ordinance has demonstrated that Länder governments have a considerable potential for playing an obstructive role. Taking into account that a similar solar ordinance was successfully introduced in Barcelona in the year 2000, the German federal and Länder building laws can be classified rather as barriers than as drivers of municipal renewable energy policy (cf. Alber/Kern 2008: 11, Agència d'Energia de Barcelona 2006). Furthermore, some Länder have adopted regional plans restricting the municipal scope to designate wind energy areas within their territories. Finally, municipal codes are considerably restricting the economic activities of municipalities in some Länder (cf. Naßmacher/Naßmacher 2007: 125).

On the other hand, there are also *facilitating framework conditions* at all policy levels. At *EU level*, the directive on renewable energy can be regarded as a facilitating factor. At *federal level*, the constitution guarantees local self-government, which authorises municipalities to become active in all locally relevant areas. This can be regarded as the

most important of all facilitating framework conditions, although the municipal scope of action is considerably limited by federal and Länder financial policies (cf. Holtkamp 2007: 367). Moreover, the federal Renewable Energy Act (EEG) can be categorised as a major facilitating factor, since on its basis municipal energy companies as well as groups of citizens can produce renewable electricity in an economically feasible way (cf. Thomas/Richter 2007: 117). At *Länder level*, some governments leave the designation of wind energy areas to the local level and set rather broad limits for the economic activities of municipalities, enabling them to operate renewable energy plants.

Increasing network activities can be observed both within and between municipalities. Within municipalities, administrations form internal working groups and external working groups including administrative and party representatives as well as citizens, non-governmental organisations and business companies. On the other hand, there is also inter-municipal cooperation with neighbouring municipalities and in transnational city networks (cf. Alber/Kern 2008: 16). Cooperation with neighbouring municipalities can facilitate the integration of energy aspects in cities and their surroundings. For example, according to recent studies (e.g. Schüle/Scheck 2011: 12 f.), surrounding regions will have to provide bigger cities with renewable energy in the future. Furthermore, you can observe individual *municipal responses to framework conditions set by higher levels*, partly filling gaps or blind spots in energy and climate policy at these levels. There are examples for gap-filling municipal activities in all governance modes described above:

- *Governance mode 1 / overarching measures:* Municipal energy concepts and targets for CO₂ reduction or future renewable energy shares can be regarded as a necessary local specification in order to reach EU and national targets (cf. IEA 2009: 99, Martinot et al. 2009: 23 f., 29).
- *Governance mode 2 / consumer behavior of the municipal administration:* Municipal administrations are responsible for a significant share of the German energy consumption, since about five per cent of the entire German energy demand is related to municipal buildings and vehicles (cf. Bulkeley/Kern 2006: 2245). As long as higher levels of governance do not prescribe sufficiently strict standards for the CO₂ balance of buildings and motorised transport, municipalities can use their role as energy consumer to act as a role model for private consumers, pointing out possibilities for emission reductions.
- *Governance mode 3 / regulation and planning:* Some municipalities – such as Marburg with its solar ordinance – go beyond federal energy-related provisions for building owners by implementing own regulations. Municipal planning and municipal participation in regional planning procedures, e.g. for wind energy locations, can integrate local interests and concerns into the decision process, which is crucial for the societal acceptance of renewable energy plants.
- *Governance mode 4 / provision of energy, public transport and housing:* Electricity and heat production by municipal energy companies can be interpreted as filling a gap left by higher political levels, because public energy companies do not exist at

these levels. The same applies to local public transport and housing activities. Moreover, municipal energy companies might develop to become a strong decentral component within the current centralistic and fossil-fuel-based energy system in Germany.

- *Governance mode 5 / support and information:* Many municipalities offer energy consulting services, informing – among other things – on federal and regional promotional schemes. This can be regarded as division of tasks between federal/regional and municipal levels, whereby the municipal level is predestined for consulting services due to its proximity to citizens and companies. At the same time, some municipalities have introduced own financial promotional schemes as a supplement to regional and national programmes.

The role of private actors

There are several developments leading to a stronger role for private actors (citizens, non-governmental organisations, business companies) in municipal renewable energy policy:

- First, liberalisation of the electricity and gas market has also abolished municipal monopolies and has led to a competition between municipal and private companies. Public transport is also subject to liberalisation (cf. Kern et al. 2005: 15 f., 128 f.).
- Second, due to lower profits of municipal energy companies it is increasingly important to include citizens' capital in order to realise investments in wind parks or solar plants.
- Third, citizens, non-governmental organisations and companies are nowadays integrated into processes like Local Agenda 21 groups and energy-related working groups. On the other hand, the introduction of referenda, the direct election of mayors and the New Steering Model had obviously no significant impact on municipal renewable energy politics so far.

Although private actors are playing a larger role, it is rather doubtful if municipal renewable energy policy and politics can be taken as evidence for the development towards a *cooperative and ensuring state*. This thesis is put forward by Kern et al. (2005: 93), who argue that municipalities increasingly restrict themselves to a coordinating and promoting role in climate policy, preferring soft instruments such as information, support and voluntary commitments. In turn, regulatory measures and energy provision are said to play an ever-decreasing role (see also Bulkeley/Kern 2006: 2246, Alber/Kern 2008: 10).

This thesis cannot be confirmed, since the real development in the past years has shown a much more complex picture. As described and illustrated by many examples in section 4.4, municipal energy companies seem to be regaining importance, including activities in renewable energy production and energy efficiency. Moreover, in the past years municipalities tend to repurchase their energy companies and grids or to found new companies. Thus, it seems that the decrease of the municipal role as provider has

stopped and turned into a rollback, a renaissance of municipal energy companies (Berlo/Wagner 2011: 237, Becker/Wassermann 2010).

In relation to regulatory measures, it is true that they have not been used adequately up to now. However, planning procedures already play a decisive role for the use of wind energy. And solar-related provisions for buildings have at least been increasingly discussed in the past years (cf. Longo 2010, Söfker 2009, Ecofys 2007, Stadt Marburg 2010).

Municipal budget crisis

An important challenge for many municipalities is maintaining fulfilment of tasks despite their increasingly grave budgetary position (cf. Holtkamp 2007: 367). With regard to renewable energy policy, one has to consider that not all measures described in section 4 are associated with costs for municipalities. First, setting renewable energy or emissions reduction targets is for free, but gives orientation for citizens and companies regarding the planned municipal development. Second, in their role as energy providers, municipalities can contribute to the expansion of renewable energy and even make moderate profits at the same time.

On the other hand, institutionalising renewable energy within the municipal administration, developing regulatory/planning measures and offering information and advisory services cause personnel costs. Moreover, the development of an energy and climate protection concept, financial incentive programmes and the use of renewable energy in municipal buildings/vehicles will lead to additional costs.

These costs might be outweighed by beneficial effects for the economy and local tax revenues (e.g. designation of wind energy areas triggering private investments). Additionally, costs for all measures mentioned above are rather moderate compared to other larger municipal projects. Nevertheless, in times of a budgetary crisis in many municipalities, even these measures need to be financed. A number of respective approaches is described in section 4. One possibility is to include citizens' capital in order to realise investments in wind energy or solar plants. Cooperation with neighbouring municipalities can reduce costs, e.g. for the establishment of energy consulting services. Concerning the sale of municipal building ground, a bonus-malus system can set a financial incentive to use renewable energy. Additionally, municipalities can apply for EU and federal funding, whereby the integration in transnational city networks has proven helpful.

A further possibility to finance renewable energy policy is additional, cost-saving climate protection measures. For example, the energy-saving renovation of municipal buildings can be profitable. Moreover, many municipalities have not introduced parking space management or city tolls yet, which can be regarded as subsidies for motorised individual transport. Finally, the partial replacement of municipal vehicles with motorised bicycles might also reveal cost-saving potential (cf. Palmer 2009: 81 ff.).

Conclusion: Municipalities as key actors of renewable energy governance

As defined in the introduction, municipalities can be called key actors of renewable energy governance if they play a very important role, compared to other state and private actors in this policy field. On the basis of the previous sections, it is now possible to answer this central question of the article.

When analysing the *relationships between different political levels*, it becomes clear that municipalities are largely dependent on higher political levels, since the latter set the legislative framework within which the former can act. This is traditionally the case with the Länder and federal levels. Furthermore, the EU level of governance has gained importance during the past 20 years, which has partly reduced the options of municipal policies and politics.

Nonetheless, municipalities can still apply five distinct governance modes to promote renewable energy: overarching measures, municipal administration's behaviour as an energy consumer, regulation/planning, the provision of energy, public transport and housing, and support/information. As shown above at the beginning of section 5, the application of each of these municipal governance modes can address gaps or blind spots of EU, national and regional energy/climate policy. Thereby, municipalities can make use of their comparative advantages: They are closer to their citizens, companies and other local organisations. Moreover, municipalities have the possibility to integrate different energy-related aspects and policy fields, such as renewable energy use, energy efficiency, climate protection, transport, land use, and business development. In order to achieve the integration of these aspects, inter-municipal cooperation between cities and their surrounding regions also plays an important role. Finally, municipalities can also establish links between mitigation, adaptation and resource efficiency (cf. Schüle/Scheck 2011: 12).

Looking at the *relationship between municipalities and private actors*, the former seem to play a more important role. This is due to two reasons:

- First, municipalities can – just as private actors – participate in market activities, both as consumers, making voluntary commitments, and as providers, making ecologically sound offers. However, municipalities can play a key role compared to private actors, since municipal administrations usually belong to the largest consumers within their territories, and municipal providers only have moderate profit expectations, which facilitates investments in renewable energy and energy efficiency. Moreover, municipal energy companies can play a crucial role as decentral component within the current centralistic and fossil-fuel-based German energy system.
- Second, municipalities fulfill several tasks which can hardly be delegated to private actors. This mainly applies to regulatory measures, but also to coordinating measures such as setting targets, initiating working groups and energy concepts, and attracting investment in renewable energy.

Furthermore, as the previous section has shown, most municipal instruments to expand renewable energy are not eliminated by the *grave budgetary crisis* of many German municipalities. This means that even in times of a global economic crisis with dramatic consequences for municipal budgets, measures to expand renewable energy are possible. To some extent, these measures can even show positive budgetary effects.

Finally, which conclusions can be drawn from the results of this article? Compared to both higher political levels and private actors, municipalities have the potential to play a very important role in the expansion of renewable energy. Thus, you can conclude that municipalities are not just one of many actors within the multi-level governance system, but, compared to other actors, have the *potential to play a key role in German renewable energy governance*.

In *relation to the scholarly literature on governance, municipalities and renewable energy policy*, the contributions of this article are twofold:

- First, concerning the governance debate, on the one hand, the thesis of a general development towards a ‘cooperating and ensuring state’, which increasingly delegates its tasks and thus becomes less important, cannot be confirmed in the area of municipal renewable energy governance. On the other hand, it has been confirmed that there is a growing interdependency between political levels as well as a growing influence of private actors in this policy area, too.
- Second, the article contributes to *literature on renewable energy policy*. It contributes to fill a research gap regarding renewable energy policy at the municipal level. It was shown that the municipal level of governance has the potential to play an important role within the system of renewable energy governance.

Future research should investigate to what extent and under which conditions this potential is actually used by German municipalities¹⁷. Knowledge about such success conditions seems to be important, since the observation that actors in many municipalities do not make use of their possibilities and chances is not only true for municipal energy companies (cf. Berlo/Wagner 2011: 241), but for all modes of municipal renewable energy governance.

¹⁷ The author of this paper examines good practice examples and the success conditions of municipal renewable energy governance in his dissertation project at Wuppertal Institute / Freie Universität Berlin, which is supposed to be completed in 2013.

References

- AEE – Agentur für erneuerbare Energien (2008): Unabhängig dank Netzzrückkauf – Wolfhagen ist „Energie-Kommune“ des Monats September. <http://www.unendlich-viel-energie.de/detailansicht/browse/3/article/247/unabhaengig-dank-netzrueckkauf-wolfhagen-ist-energie-kommune-des-monats-september.html> (retrieved 6.6.2010)
- Agència d’Energia de Barcelona (2006): Barcelona Solar Thermal Ordinance. http://www.barcelonaenergia.cat/document/OST_new_explanation_eng.pdf (retrieved 28.7.2010)
- Alber, Gotelind / Kern, Kristine (2008): Governing Climate Change in Cities: Modes of Urban Climate Governance in Multi-level Systems. <http://www.oecd.org/dataoecd/22/7/41449602.pdf> (retrieved 28.2.2010)
- Aminov, Davlatbek (2008): International Politics on Global Climate Change: Problems and Perspectives. In: Schönberger, Philipp / Klose, Stefan M. / Heitmann, Christian (ed.): Energie, Klima & Politik. Gesellschaftliche Herausforderung des 21. Jahrhunderts. Berlin, pp. 169–177
- Barth, Regine et al. (2005): Die nachhaltige öffentliche Beschaffung in der politischen Diskussion. In: Barth, Regine / Erdmenger, Christoph / Günther, Edeltraud (ed.): Umweltfreundliche öffentliche Beschaffung. Innovationspotenziale, Hemmnisse, Strategien. Heidelberg, pp. 1–11
- Becker, Sven / Wassermann, Andreas (2010): Wende rückwärts. In: Der Spiegel no. 44, pp. 41–44
- Benz, Arthur (2004): Multilevel Governance: Governance in Mehrebenensystemen. In: Benz, Arthur (ed.): Governance – Regieren in komplexen Regelsystemen. Wiesbaden, pp. 125–146
- Berlo, Kurt / Seifried, Dieter (2008): Bürger-Contracting – Photovoltaikanlagen und Effizienzmaßnahmen im Doppelpack. In: Solarzeitalter 4/2008, pp. 48–52
- Berlo, Kurt / Wagner, Oliver (2011): Zukunftsperspektiven kommunaler Energiewirtschaft. In: RaumPlanung 158/159, pp. 236–242
- Bogumil, Jörg / Holtkamp, Lars (2006): Kommunalpolitik und Kommunalverwaltung. Eine policy-orientierte Einführung. Wiesbaden
- Bolay, Sebastian (2006): Strategische Kommunalpolitik zur Nutzung erneuerbarer Energieträger (SKEP) – Arbeitspapier Nr. 4: Steuerung in Kommunen. Implikationen für eine strategische Energiepolitik. Berlin/Potsdam
- Bulkeley, Harriet / Kern, Kristine (2006): Local Government and the Governing of Climate Change in Germany and the UK. In: Urban Studies 43, pp. 2237–2259
- BUND/IDUR (2008): Klimaschutz in der kommunalen Planung. Stuttgart / Frankfurt am Main
- Carstensen, Peter Harry (2010): Unser Ideal ist der Bürgerwindpark. In: Neue Energie 4/2010, pp. 36–38
- Coordes, Gesa (2010): Kommt Solarpflicht doch? <http://www.hna.de/nachrichten/hessen/kommt-solarpflicht-doch-795371.html> (retrieved 13.6.2010)

- Deutscher Städtetag (2011): Neuer finanzieller Tiefpunkt für die Kommunen – 2011 keine Erholung in Sicht – Lichtblick bei der Gewerbesteuer. Press release, 14.2.2011. <http://www.staedtetag.de/10/pressecke/pressediens/artikel/2011/02/14/00767/index.html> (retrieved 13.3.2011)
- DGES – Deutsche Gesellschaft für elektrische Straßenfahrzeuge (2010): Fahrzeuge: Elektrisch unterstützte Fahrräder. <http://www.dges.de/alternative-antriebe/fahrzeugbeispiele/elektrisch-unterstuetzte-fahrraeder.html> (retrieved 13.3.2010)
- DGS – Deutsche Gesellschaft für Sonnenenergie (2012a): Die Karte der erneuerbaren Energien. Top 10 der Städte und Landkreise. www.energymap.info (retrieved 16.12.2012)
- DGS – Deutsche Gesellschaft für Sonnenenergie (2012b): Stadt Emden. <http://www.energymap.info/energieregionen/DE/105/116/178/603.html> (retrieved 6.5.2012)
- Diekmann, Jochen / Groba, Felix / Vogel-Sperl, Antje / Püttner, Andreas / van Mark, Kerstin / Mayer, Jörg / Ziller, Undine (2010): Bundesländer-Vergleichsstudie mit Analyse der Erfolgsfaktoren für den Ausbau der Erneuerbaren Energien 2010. Endbericht. Berlin/ Stuttgart
- Difu – Deutsches Institut für Urbanistik (2011): BMU-Förderprogramm. <http://www.kommunaler-klimaschutz.de/bmu-f%C3%B6rderprogramm> (retrieved 31.3.2011)
- Ecofys (2007): Energieeffizienz und Solarenergienutzung in der Bauleitplanung. Zusammenfassung und Thesen zum Rechts- und Fachgutachten. Frankfurt am Main
- Enercity-Fonds proKlima (2010): Struktur. <http://www.proklima-hannover.de/Struktur.31.0.html> (retrieved 27.6.2010)
- Erdmenger, Christoph / Winter, Michaela (2005): Umweltfreundliche Beschaffung in der Praxis – Erfahrungen der Stadt Stuttgart. In: Barth, Regine / Erdmenger, Christoph / Günther, Edeltraud (ed.): Umweltfreundliche öffentliche Beschaffung. Innovationspotenziale, Hemmnisse, Strategien. Heidelberg, pp. 33–43
- Eurosolar (2010): 4. EUROSOLAR-Konferenz "Stadtwerke mit Erneuerbaren Energien". http://www.eurosolar.de/de/index.php?option=com_content&task=view&id=1291&Itemid=336 (retrieved 6.6.2010)
- Franken, Marcus / Weinhold, Nicole / Wiedemann, Karsten / Janzing, Bernward (2009): Dinos raus! Wie Kommunen das Energiegeschäft zurückerobern. In: Neue Energie 10/2009, pp. 20–42
- Gemeinde Nalbach (2012): Null-Emissions-Gemeinde Nalbach. Nutzung erneuerbarer Energien. http://www.fg-umwelt.de/assets/files/NKI/Fachtagung/Woerner_GemeindeNalbach_Fachtagung.pdf (retrieved 12.5.2012)
- Gemeinde Rimbach im Odenwald (2009): Niederschrift über die 7. öffentliche Sitzung der Gemeindevertretung. http://ratsinfo.rimbach-odw.de/bi/to0040.php?__ksinr=82&toselect=1597 (retrieved 29.5.2010)
- Hawlitzi, Philipp (2010): Der Trend zu 100 Prozent. In: Solarzeitalter 1/2010, pp. 41–42
- Hennicke, Peter / Jochem, Eberhard / Prose, Friedemann (1999): Mobilisierungs- und Umsetzungskonzepte für verstärkte kommunale Energiespar- und Klimaschutzaktivitäten. Karlsruhe
- Hirschl, Bernd (2008): Erneuerbare Energien-Politik. Eine Multi-Level Policy-Analyse mit Fokus auf den deutschen Strommarkt. Wiesbaden
- Holtkamp, Lars (2007): Local Governance. In: Benz, Arthur / Lütz, Susanne / Schimank, Uwe / Simonis, Georg (ed.): Handbuch Governance. Wiesbaden, pp. 366–377

- Hooghe, Liesbet / Marks, Gary (1996): "Europe with the regions": Channels of Regional Representation in the European Union. In: *The Journal of Federalism* 26/1, pp. 73–91
- Hug, Rolf (2003): Fördern und fordern: Hessische Stadt Vellmar verwirklicht neues städtebauliches Solarkonzept. <http://www.solarserver.de/solarmagazin/anlagemai2003.html> (retrieved 15.2.2010)
- IdE – Institut für dezentrale Energietechnologien (2012): 100ee erneuerbare energien region. [http://www.100-ee.de/index.php?id=61&tx_ttnews\[tt_news\]=317&tx_ttnews\[backPid\]=203&cHash=8eb437442a](http://www.100-ee.de/index.php?id=61&tx_ttnews[tt_news]=317&tx_ttnews[backPid]=203&cHash=8eb437442a) (retrieved 24.4.2012)
- IEA – International Energy Agency (2009): *Cities, Towns & Renewable Energy. Yes In My Front Yard*. Paris
- Jänicke, Martin / Kunig, Philip / Stitzel, Michael (1999): *Umweltpolitik*. Bonn
- Kern, Kristine / Bulkeley, Harriet (2009): Cities, Europeanization and Multi-level Governance: Governing Climate Change through Transnational Municipal Networks. In: *Journal of Common Market Studies*, Vol. 47, No. 2, S. 309–332
- Kern, Kristine / Niederhafner, Stefan / Rechlin, Sandra / Wagner, Jost (2005): *Kommunaler Klimaschutz in Deutschland – Handlungsoptionen, Entwicklung und Perspektiven*. WZB Discussion Paper. <http://bibliothek.wz-berlin.de/pdf/2005/iv05-101.pdf> (retrieved 20.2.2010)
- Klinski, Stefan / Longo, Fabio (2006): *Strategische Kommunalpolitik zur Nutzung erneuerbarer Energieträger (SKEP) – Arbeitspapier Nr. 6: Rechtliche Rahmenbedingungen kommunaler Strategien für den Ausbau der Nutzung erneuerbarer Energien*. Berlin
- Knödler, Gernot (2011): Hamburg setzt auf Ökostrom. <http://www.taz.de/!64666> (retrieved 26.4.2012)
- Landeshauptstadt Dresden (2009): Dresden startet den Rückkauf der Stadtwerke DREWAG. Pressemitteilung vom 12.10.2009. http://www.dresden.de/de/02/035/01/2009/10/pm_055.php (retrieved 6.6.2010)
- Landeshauptstadt Düsseldorf (2012): Solarkataster. <http://www.duesseldorf.de/umweltamt/klimaschutz/solarkataster/index.shtml> (retrieved 30.4.2012)
- Landeshauptstadt Düsseldorf (2011): *Technologiematrix Deutschland. Informationsvorlage*. <http://www.duesseldorf.de/ratsinfo/duesseldorf/45827/Vm9ybGFnZW5kb2t1bWVudF8ob2VmZmVudGxpY2gp/14/n/153748.doc;jsessionid=9190BC3E69A571AA1CE97887C2467088> (retrieved 24.4.2012)
- Landesregierung Hessen (2010): Gesetzesentwurf der Landesregierung für ein Gesetz zur Änderung der Hessischen Bauordnung und des Hessischen Energiegesetzes. <http://starweb.hessen.de/cache/DRS/18/3/02523.pdf> (retrieved 27.6.2010)
- Longo, Fabio (2010): *Neue örtliche Energieversorgung als kommunale Aufgabe. Solarisierungen zwischen gemeindlicher Selbstverwaltung und globalem Klima- und Ressourcenschutz*. Baden-Baden
- Longo, Fabio / Altrock, Martin (2008): *Gutachterliche Äußerung: Rechtliche Rahmenbedingungen für eine Energieversorgung auf der Basis erneuerbarer Energien in kommunaler Verantwortung*. Berlin
- Martinot, Eric / Zimmermann, Monika / van Staden, Maryke / Yamashita, Noriaki (2009): *Global Status Report on Local Renewable Energy Policies*. http://www.ren21.net/pdf/REN21_LRE2009_Jun12.pdf (retrieved 17.6.2010)
- May, Hanne (2010): Entdecke die Möglichkeiten. In: *Neue Energie* 4/2010, pp. 16–17

- Mayntz, Renate (2008): Von der Steuerungstheorie zu Global Governance. In: Schuppert, Gunnar Folke / Zürn, Michael (ed.): Governance in einer sich wandelnden Welt. Politische Vierteljahresschrift, Sonderheft 41, pp. 43–61
- Mez, Lutz et al. (2007): Zukünftiger Ausbau erneuerbarer Energieträger unter besonderer Berücksichtigung der Bundesländer. Endbericht für das Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit. Berlin
- Ministerium für Klimaschutz, Umwelt, Landwirtschaft, Natur- und Verbraucherschutz Nordrhein-Westfalen (2012): Aktiv dabei sein beim Klimaschutzplan. <http://www.klimaschutz.nrw.de/klimaschutzplan-im-dialog/das-dialog-und-beteiligungsverfahren> (retrieved 24.4.2012)
- Naßmacher, Hiltrud / Naßmacher, Karl-Heinz (2007): Kommunalpolitik in Deutschland. Wiesbaden
- Niederhafner, Stefan (2008): Städte als politische Akteure im Mehrebenensystem der EU. Eine vergleichende Untersuchung der pan-europäischen Interessenorganisationen Eurocities und RGRE unter besonderer Berücksichtigung der Länder Deutschland, Frankreich und Großbritannien. http://tuprints.ulb.tu-darmstadt.de/1079/1/Stefan_Niederhafner-Staedte_in_der_EU.pdf (retrieved 11.6.2010)
- Oberthür, Sebastian / Ott, Hermann E. (2000): Das Kyoto-Protokoll. Internationale Klimapolitik für das 21. Jahrhundert. Opladen
- Palmer, Boris (2009): Eine Stadt macht blau. Politik im Klimawandel – das Tübinger Modell. Köln
- Rauschelbach, Uwe (2009): Frischer Wind in der Energiedebatte. In: Südhessen Morgen, Ausgabe Lampertheim, 29.10.2009, p. 17
- Reiche, Danyel (ed., 2005): Handbook of Renewable Energies in the European Union. Frankfurt am Main
- Reiche / Danyel (2004): Rahmenbedingungen für erneuerbare Energien in Deutschland. Möglichkeiten und Grenzen einer Vorreiterpolitik. Frankfurt am Main
- Reichmuth, Matthias et al. (2011): Vorbereitung und Begleitung der Erstellung des Erfahrungsberichts 2011 gemäß § 65 EEG. Vorhaben II c: Solare Strahlungsenergie. Endbericht. http://www.erneuerbare-energien.de/files/pdfs/allgemein/application/pdf/eeg_eb_2011_solare_strahlung.pdf (retrieved 27.6.2011)
- Rentzing, Sascha (2010): Die Volksbatterie. In: Neue Energie 4/2010, pp. 83–86
- Schlandt, Jakob (2010): Die Kleinen auf dem Vormarsch. http://www.fr-online.de/frankfurt_und_hessen/nachrichten/hessen/?em_cnt=2645945&em_loc=1234 (retrieved 16.5.2010)
- Schmidt, Alexander (2006): Klimaschutz in der Bauleitplanung nach dem BauGB 2004. In: Neue Zeitschrift für Verwaltungsrecht 12/2006, pp. 1354–1361
- Schreurs, Miranda A. (2008): From the Bottom Up: Local and Subnational Climate Change Politics. In: The Journal of Environment Development. Vol. 17, No. 4, pp. 343–355
- Schreurs, Miranda A. / Yves Tiberghien (2007): Multi-Level Reinforcement: Explaining European Union Leadership in Climate Change Mitigation. In: Global Environmental Politics, November 2007, pp. 19–46
- Schüle, Ralf / Scheck, Hanna (2012, forthcoming): Strategic Challenges for Urban Sustainability Transitions. *The Case of Germany*. In: Lexxion: Summer Academy Proceedings 2011. Berlin

- Schüle, Ralf / Wittger, Bea / Fox-Kämper, Runrid / Kelberlau, Burkhard (2009): Klimaschutz in der integrierten Stadtentwicklung. Handlungsleitfaden für Planerinnen und Planer. Düsseldorf
- Siemens AG (2009): Sustainable Urban Infrastructure. Ausgabe München – Wege in eine CO₂-freie Zukunft. München
- Söfker, Wilhelm (2009): Bebauungsplan, Energieeinsparverordnung und Erneuerbare-Energien-Wärmegesetz. In: Umwelt- und Planungsrecht (UPR), pp. 81–87
- Spiegel Online (2009): Neues Stadtwerk: Hamburg attackiert Vattenfall mit Öko-Strom. 18.5.2009. <http://www.spiegel.de/wirtschaft/0,1518,625610,00.html> (retrieved 6.6.2010)
- SRU – Sachverständigenrat für Umweltfragen (2004): Umweltgutachten 2004. Berlin
- Stadt Bürstadt (2012): Zuständigkeiten – Energieberatung. <http://www.rathaus-buerstadt.de/html/zustandigkeiten.html> (retrieved 30.4.2012)
- Stadt Heidelberg (2011): Ökostrom – heidelberg energreen. <http://www.heidelberg.de/servlet/PB/menu/1101157/index.html> (retrieved 26.4.2012)
- Stadt Köln (2011): Kölner Bürgerhaushalt. Deine Stadt, Dein Geld. <https://buergerhaushalt.stadt-koeln.de/2012/sites/default/files/downloads/Broschüre%20Bürgerhaushalt%202012.pdf> (retrieved 24.4.2012)
- Stadt Marburg (2010): Marburger Solar-Satzung: Stadt betreibt Klage beim Verwaltungsgericht weiter. <http://www.marburg.de/detail/70999> (retrieved 27.6.2010)
- Städtische Werke Kassel (2012): Abwrackprämie. <http://www.sw-kassel.de/index.php?id=1329> (retrieved 6.5.2012)
- Stadtwerke Crailsheim (2012): Die Kraft der Sonne nutzen. http://www.stw-crailsheim.de/fileadmin/images/web-service/pdfs/Crailsheim_Broschu__re_Einzelseiten_END.pdf?PHPSESSID=c641a2ad4c08e40b4e50445df28ae48a (retrieved 6.5.2012)
- Stadtwerke Emden (2012): Wind: Weitere Informationen. <http://stadtwerke-emden.de/erneuerbare-energien/wind/weitere-informationen.html> (retrieved 5.5.2012)
- Stadtwerke München GmbH (2010): SWM Ausbauoffensive Erneuerbare Energien. Presse-Information. <http://www.swm.de/dokumente/swm/pdf/dok/anlage-ausbauoffensive-projekte.pdf> (retrieved 6.6.2010)
- Stadtwerke Osnabrück (2010): Frischer Wind für mehr Zinsen. Aktuelle Meldung vom 3.5.2010. <http://www.stadtwerke-osnabrueck.de/meldung/artikel/frischer-wind-fuer-mehr-zinsen.html> (retrieved 25.5.2010)
- Steinbeis-Transferzentrum Geoinformation und Landmanagement (2010): Sun-Area – das Solarpotenzial-Dachkataster. www.sun-area.net (retrived 27.6.2010)
- Thiel, Fabian (2004): Das Erbbaurecht – Ein verkanntes Instrument zur Steuerung der kommunalen Flächennutzung. UFZ-Diskussionspapiere. <http://www.ufz.de/data/ufz-disk4-20041361.pdf> (retrieved 1.10.2010)
- Thomas, Stefan / Richter, Nikolaus (2007): Kommunale Energiewirtschaft und moderne Daseinsvorsorge. In: Reutter, Oscar (ed.): Ressourceneffizienz. Der neue Reichtum der Städte. München, pp. 108–120
- Verbraucherzentrale Bundesverband (2012): Energieberatung Bürstadt. <http://www.verbraucherzentrale-energieberatung.de/web/beratungsstelle.html?code=07070&ort=Buerstadt> (retrieved 30.4.2012)

- Wolf, Klaus Dieter (2008): Emerging patterns of global governance: the new interplay between the state, business and civil society. In: Scherer, Andreas Georg / Palazzo, Guido (ed.): Handbook of Research on Global Corporate Citizenship. Cheltenham/UK und Northampton/Massachusetts, pp. 225–248
- Wuppertal Institute for Climate, Environment and Energy (2008a): Perspektiven dezentraler Infrastrukturen im Spannungsfeld von Wettbewerb, Klimaschutz und Qualität. Ansatz und Ergebnisse der Forschungspartnerschaft INFRAFUTUR. Wuppertal
- Wuppertal Institute for Climate, Environment and Energy (2008b): Zukunftsfähiges Deutschland in einer globalisierten Welt. Ein Anstoß zur gesellschaftlichen Debatte. Frankfurt am Main
- ZfK – Zeitung für kommunale Wirtschaft (2010): Halle wieder ohne RWE-Tochter. Tagesticker vom 27.5.2010. <http://www.zfk.de/zfkGips/Gips?Anwendung=MeldungenAnzeigen&Methode=Einzelmeldung&SessionMandant=ZFK&Mandant=ZFK&WebPublisher.NavId=5867&AuswahlRessourceID=116267> (retrieved 6.6.2010)