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Consequences of the German Energy Revolution for Local Democracy. Some Considerations

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Introduction

In my paper I will present some considerations about possible **democratic innovations refers to the fundamental changes in the German energy policy**. The problems of climate change and energy supply are just one example of the so-called wicked problems of modern states and societies. Solutions of this kind of problems are very difficult to achieve. This is not a German phenomenon, but occur in all Western industrialized countries. However, because of the way of a dramatic energy revolution, which Germany joined in 2000, exacerbated in 2011, the corresponding processes in Germany have expired quicker than in other European countries.

Germany has undergone a profound **change in its energy policy** in June 2011. The federal government decided in the wake of the nuclear disaster in Japan to change fundamentally the path in energy policy and supply. Germany would like to lower its CO₂ emissions by 40 % versus 1990 by the year 2020 and by at least 80 % by 2050. Nuclear power is to be phased out by 2022 at the latest. The share of renewables in final energy consumption is to be boosted from 12 % (2011) to at least 18 % in 2020 and 60 % in 2050.¹ In the case of electricity, the share of renewables in gross power consumption is to be increased from 20 % (2011) to at least 35 % in 2020 and 80 % in 2050. Energy efficiency levels in Germany are lifted substantially. Primary energy consumption is to be reduced by 50 % (vis-à-vis 2008) by 2050, while power consumption shall cut back by 25 %

Germany's *Energiewende* based on a **grand democratic consensus**. This far-reaching consensus is manifest by fundamental decisions of the federal Parliament, the Parliament of the federal states and many local councils.

The energy turnaround will require transformations on the micro and macro level. It is at the same time a top down and a bottom up project. Local authorities are both **object** of this new energy policy (changed aims, instruments and regulatory framework for energy policy) as well as **subject** (as an independent actor especially in the implementation of the *Energiewende* and for setting local standards for renewable energy) within the framework of their local autonomy. They hope to benefit from this development with some expected political, economic and social advantages. A strong decentralisation bias is typical for the German energy revolution. Frankly it can be determined that the energy transition offers the German municipalities a unique opportunity to revitalize their local community and for mobilizing the inhabitants for supporting this community significantly.

This decision has changed fundamentally the parameters for local sustainable energy policy in Germany. The local authorities had to provide a new design of its energy policy and its

¹ The German energy revolution aims first to a sustainable energy supply in the sectors of electricity, heat and mobility with renewable energy. These include wind power, solar power (thermal, photovoltaic), ocean energy, bioenergy (including landfill gas and sewage gas), hydro and geothermal energy.

implementation with respect to the various challenges. In the next chapter is analysed, how municipalities try to take advantage of this “window of opportunity” for a fundamental change in its organization of energy supply, by re-municipalisation of the local energy supplier.

First results are of the energy turnaround visible. The energy revolution in Germany is connected with fundamental challenges for public administration and the coordination of different administrative levels. It is a **fundamental political project**, a great **economic project** for the future of Germany as an economic player, an important **social project** by creating new jobs and reducing energy poverty, and finally an important **democracy project** too.

In this paper, I will concentrate on three current **examples of democratic innovations** in the course of the energy turnaround are the local initiatives for energy self-sufficient municipalities, Bioenergy villages and energy cooperatives. I will show what development these projects have taken in the last years as part of the energy revolution in Germany and how this could lead to democratic innovation.

1 Energy Self-Sufficient Municipalities

Based on the long-term decentralization trend of energy supply in Germany in the last 20 years developed a movement to establish **energy self-sufficient municipalities**², in which the local energy consumers exclusively use locally available energy sources and do not need external energy supplies.³ Basis is always appropriate policy decision of the municipal council after a public debate.

Energy self-sufficient municipalities are **contributing** a lot to the German Energiewende. More than 120 of the 11.000 German municipalities have committed to reaching 100 % renewable energy in the next years. More than 50 of them have already reaches the goal by early 2012. For two examples of best practice, see Box 1.

² For these municipalities different terms are used (Energy autonomous municipalities, self-sufficiency municipalities, energy independent municipalities etc.), which are in this paper all used interchangeably.

³ The concept of energy independence is controversial. It is based either on the local energy balance or on certain energy sources as well. One hundred percent self-sufficiency of municipalities is in Germany in fact not possible.

Box 1 Best Practice Energy Self-Sufficiency: Schönaufeldheim

One of the pioneers of energy self-sufficiency in Germany includes the town of **Schönaufeldheim**, which is located in Baden-Württemberg in southern Germany (2.321 inhabitants). After the nuclear disaster at Chernobyl in 1986, a group of volunteers who wanted to realize actively developed an ecological energy supply, started a citizen's initiative. In 1996 after a successful referendum, it took over the acquisition of the local power grid. In this referendum, the city was committed to a renewable energy generation. Since 2009, the Electricity EWS Schönaufeldheim eG, is operating as registered cooperative, in the meantime not only local, but nationwide.⁴

Another example of energy self-sufficiency in Eastern Germany is the village of **Feldheim** (today part of the municipality Treuenbrietzen) in the federal state of Brandenburg. This municipality with 135 inhabitants is still energy independent and owns a wind farm with 43 wind turbines. The success of this project is due to the partnership between the municipality Treuenbrietzen, the residents of the municipal district Feldheim and the project developer Energy GmbH. The individually connected households be powered independently via its own separate distribution networks of electricity and heat from "outside our own front door" located renewable energy systems (wind energy and biogas).

Sources: Own compilation on the basis of publicly available information

In all energy self-sufficiency projects, so far implemented successfully, **citizen's participation was a key requirement**. Citizens' initiatives were often the first point of contact and provided identification for interested persons, companies and organizations. They set the topic on the local policy agenda, develop models for planning processes and influence subsequent local energy policy decisions. Finally, they form actor's networks to achieve collective objectives in local energy policy.

Crucial to a successful citizen's participation was in particular the optimal **project area's size**, which makes a large-scale networking possible and forms a larger sphere of influence. Under these circumstances, more *know how* could be generated, smaller projects could be bundled and potential donors could easier to be find.

There are today three **different groups of municipalities** in the policy field "energy independence": Municipalities with subsidized "lighthouse projects", financially strong municipalities with mostly successful projects and financially weak municipalities with many failed projects:

⁴ See <http://www.ews-schoenau.de/>.

- **"Lighthouse projects"** for energy self-sufficiency of municipalities, which are mostly, funded by the EU or the federal resp. the federal state government. Therefore, there is a high willingness of citizens to participate in these projects and a high level of acceptance of these activities. However, these projects are not sustainable because of no permanent flow funding.
- **Financial strong municipalities** can bear the financial burden which especially initially are occurring or the risk itself or together with its citizens.⁵ You are also able to develop the appropriate management structures for steering the energy self-sufficiency local activities. This goes especially for municipalities in suburbia and in the South and West of Germany.
- Financially, **financial weak municipalities** are more or less overwhelmed with the task of developing an energy self-sufficient municipality. This is especially true for the financial burdens or risks that initially on the community and its citizens but also more for the generation of the necessary expertise to develop and implement energy self-sufficient projects. This goes especially for municipalities in rural areas in the North and East of Germany.

However, the diverse possibilities of inter-municipal cooperation are hitherto been used very little.

The pursuit of energy self-sufficiency is also associated with **risks**. For instance, if individual municipalities declare for themselves the goal of regional energy autarky or seek to generate 100 % of their electricity from regional renewables, this may result in renewable power plant capacities being built on sites that are actually not suitable or over dimensioned. Note though that the latter mainly represents a problem insofar as the grids for long-distance transmission are not yet available.

⁵ This will only work if the citizens have the financial resources and are willing to use them. Thus, the financial burden (internal portion) of the citizens and homeowners reaches, for example, in bioenergy villages per household at € 5,000 to € 10,000.

2 Bioenergy Villages

In recent years, however, the idea of Bioenergiedörfer (bioenergy villages), seems to have captured the public imagination in Germany. The first officially recognized bioenergy village in Germany was Jühnde in the state of Lower Saxony, which is still a best practice case. (See Box 2)

Box 2 Best Practice Bioenergy Village: Jühnde

In 2005, a cooperative within this village of 780 inhabitants and 450 cows built a biogas production facility fuelled by silage plants and manure. The gas from this plant is burned in a communally owned cogeneration plant that provides electricity and heat to buildings in the village. Eventually a wood chip-fired boiler was added to the district heating system to provide supplemental heat. In 2014, the town produces over twice as much electricity as it consumes. The citizens are now participating in an electro-mobility pilot project that is exploring ways to use the excess power to serve local transportation needs. The examples of Jühnde and other early adopters of the bioenergy village concept have encouraged municipalities throughout Germany to pursue similar strategies.

Source: Own compilation on the basis of publicly available information

Unfortunately, there is no broadly accepted **definition of the term “bioenergy village”** in Germany. The German Ministry of Food and Agriculture lists the following criteria for bioenergy villages:⁶

- At least 50% of the community’s energy needs (electricity and heat) are supplied by locally produced bioenergy (typically silage plants and/or wood chips);
- Local citizens are actively involved in developing the ideas and making the decisions;
- The biomass used as a resource is owned at least partially by the villagers; it is grown and harvested locally, in a sustainable manner;
- Other renewable energy sources may supplement the generation of power and heat from biomass;
- Energy efficiency and energy conservation measures are regularly considered and implemented;
- Value is created locally, and the benefits extend regionally.

⁶ <http://www.wege-zum-bioenergiedorf.de/bioenergiedoerfer/was-ist-ein-bioenergiedorf/>.

Other definitions are the pillars of electricity production, heat production, energy efficiency and land-use management more focused on the amount of civic engagement.

Under these circumstances, “Bioenergy village” is more or less a general term for many different local concepts and structures to deal with the problem. Therefore, they vary in organizational structure, raw materials used, technology installed, and financing models employed. Since the year 2005, the **trend to establish bioenergy villages** has grown rapidly. As I have described above, determining the precise number of bioenergy villages in Germany is difficult. There are currently about 150 German municipalities are officially registered as bioenergy villages and are located in the phases of “operating and optimizing” or “further development”. Many others are in the phases of initiation, preliminary planning and groundwork, detailed planning and construction.

The establishment of bioenergy villages is a democratic process, aimed to find a local consensus on a new energy policy. It seems to be a good **way to revitalise village structures**, especially in rural areas or areas with population decline. Many villages by help of this instrument have been re-energized and re-capitalized through their own efforts. This is largely than many actors are aware a social issue. The empowerment of the local community, shared by the villagers, is strengthening local identity.

The concept of bioenergy villages is based on some **economic and demographic benefits**. By creating jobs and fostering innovation, bioenergy villages provide opportunities for the rural youth. On the other hand, retirees in these villages are often living on fixed incomes that have been outpaced by increases in the cost of electricity and heat. Stabilizing the cost of utilities is particularly helpful to the elderly and the poor, who spend a relatively high proportion of their income on these necessities.

On the other hand, the use of bioenergy is associated with some **risks and dangers**, which must be attentive to reflect, not to evoke with this type of energy supply any undesirable effects. Thus, an intensive cultivation of land with monocultures may lead to significant dis-acceptance as well as environmental problems in the local community. The use of genetically modified plants and the use of such materials in biogas plants are extremely controversial in Germany. (Ruppert 2010: 80) German bioenergy villages are required to carefully deal with these risks in order not to jeopardize their project.

3 Energy Cooperatives

Bottom up best practice could be found in local energy policy initiatives or the establishment of local energy cooperatives. Over the past few years, energy co-ops have become a **major player in the German energy transition**. They cover everything from power and heat production to grid management, energy marketing, and efficiency. More than 90 percent of them were found in the past five years. The number of energy cooperatives in Germany grows in 2011 about 167, in 2012 about 150 and 2013 about 128. Responsible for the decline is currently especially the federal government plans to reform the Renewable Energy Sources Act, which could greatly slowing effect on the formation of local energy co-operatives. The total number reaches 888 (end 2013). It has more than doubled in the three years since 2010. In Germany, citizens not only put solar on their own roof, but also come together to bundle resources for larger projects,, such as small wind farms, local biomass units, and large solar arrays. Energy cooperatives form of appropriate institution for changing people's behaviour, for example in mobility, food, nutrition and heating habits or the purchase of energy-saving devices.

At the end of 2013, the **Federal Office of Energy Cooperatives** was founded. It is intended to give the energy cooperatives a voice in the nationwide debate about the energy revolution. It strives for a reliable legal framework for energy co-operatives. The office represents 700 energy co-ops with some of 150,000 members. By this way, the energy cooperatives leave the context of local level and start to become a federal state actor.

Especially **small and medium municipalities** without own municipal energy utilities (Stadtwerke) often cannot realize renewable energy projects for financial reasons. They offer the energy cooperative, building together with the administration and citizens a sustainable local supply of energy. Municipalities support can include providing the necessary professional expertise, bringing different interests of the citizens by municipal meetings together and offering the roofs of municipal buildings for photovoltaic plants.

The example the **best practice in the village** of Großbardorf (See Box 3) is particularly illustrative to begin to understand the positive economic, environmental and social impact these energy cooperatives are having on local communities and the opportunity for a diverse mix of individuals and businesses to work together to supply renewable energy directly to a community.

Box 3 Best Practice Großbardorf

“Großbardorf is a village with 928 inhabitants. Over a period of four years, individual citizens invested and leveraged outside capital totalling approximately \$19 million for the development of photovoltaic roof systems, solar power plants, a biogas plant with a combined heat and power (ChP) unit and a district heating network. As a result of these projects, the village generates four times the electricity needed to power individual businesses and homes. The district heating system meets 50 percent of the heating needs for homes and businesses in the village. Approximately 80 percent of the heat supplied is from the ChP unit at the biogas plant. The village has plans to install a wood heating system to increase the amount of renewable heat supplied to the village. Prior to the installation of the district heating system, the fossil energy heating oil supplied 80 percent of the heat in the village. The renewable heat sources supplied to the village are reducing fossil fuel energy use, ensuring stable prices for home heating and saving businesses money. A new manufacturing facility being constructed near the biogas plant will be connected to the district heating system and will realize a one-time savings of approximately \$100,000 by connecting to the district heating system instead of installing a traditional heating source. All of these different renewable energy ventures also add economic value to the village through local taxes.”

Source: Bilek 2012.

Energy cooperatives can also arise because of **inter-municipal cooperation** from the initiative of several municipalities, which founded a joint company. This shows an example from the Upper Palatinate (See Box 4)

Box 4 Best Practice Upper Palatinate

Under the slogan "From the region - for the region" joined in February 2009 in the Upper Palatinate (Bavaria), ten cities and communities together to switch their energy supply to renewable energy by 2030. The New Energies West eG was found to initiate such projects. In the joint venture, municipalities and municipal enterprises from the region are directly involved. Requirement for membership is at least holding one share, which is fixed at a sum of 5,000 euros. Currently, 16 municipalities are members with 76 shares. Three mayors provide the Management Board, other local representatives acting volunteer with the Supervisory Board.

The citizens of the region are also involved in the NEW. However, they cannot directly join the NEW-cooperation, but they can acquire shares of a second cooperative, the Citizens' Energy Cooperative West eG. This cooperative is a full member of the NEW.

Source: Own compilation on the basis of publicly available information

4 Conclusions

The energy revolution includes for local authorities in Germany and for their citizens many challenges and opportunities. Overall, however, this process can help to strengthen their role in the political-administrative system. By developing innovative concepts, municipalities can thereby demonstrate its ability to act while developing specific local solutions for a fundamental societal project. By this way the local governance networks, which include all stakeholders, will be strengthened. Finally, this may contribute to the strengthening of local democracy.

To the democratic nature of the energy revolution local actors can contribute in different ways:

- The **municipal council** has a special obligation to establish a local consensus on energy concepts and priorities. On this basis, he is responsible for develop and implement a local energy vision or concept. For this purpose, he can use to alternatives of bioenergy village or energy self-sufficient municipalities, referred to in this paper. Of particular importance is the council's decision on the local energy supply by municipal utilities, co-ops or private companies. Finally, the council is responsible for all basic planning decisions, e.g. the municipal land use plan and the construction plan. It therefore plays an important role in local governance energy networks. Overall, this development can strengthen the council's role in local politics.
- The **local civil society** (both individuals as organisations) is playing an important role in agenda setting of energy and climate issues and discussing it. By overcoming the

NIMBY-effect by taking over responsibility for local solutions of an important socio-economic problems of the present state and society. Further role are including the possible decision maker role in local referenda. Finally, during the process citizens are winning the role of energy “prosumers” – simultaneously producers and consumers.

The energy transition is not just a technical challenge. It will also challenge the behaviour of societies and individuals. Germany’s energy transition is a “sufficiency strategy”, focusing on a **cultural transformation of citizen’s live-style to an energy saving**. To organize this process in a democratic way is another challenge of the energy transition.

Finally, I will underline that the municipalities analysed in this paper are **still a vanguard**. Only a few hundred of the 11,000 German municipalities have so far a new local energy policy discussed, decided or implemented. Therefore, it will be an important to enable the other municipalities in future, to develop together with their citizens a new local energy policy.

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