

Polyrational strategies for sustainable energetic development of space – the example of Leipzig

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1 ABSTRACT

The project “The sun is rising in the east – energy efficient city of Leipzig” is a joint project funded by the German federal Ministry of Education and Research (BMBF). Main objective of the project is to develop an innovative concept for the future procedure of developing Leipzig as an energy efficient city. Therefore the concept contains “energetic-spatial” topics (in the sense of a combination of both strategies) against the background of demographic change.

As a first step this concept will be developed in the urban district “Leipzig east”. This is a quarter of the so called Wilhelminian style. It suffers from a shrinking population and changes in the population structure. In spite of perennial reconstruction measures the area is suffering from a backlog in reconstruction. Therefore it is necessary to go on with the urban regeneration. Generally, potentials to integrate energetic needs can be found, but on the other hand it is difficult to realize them because of the socioeconomic structure. Therefore reducing energy is not the only objective. To find sustainable solutions it is essential to include socioeconomic demands and restrictions: Not the best technical solution can be realized but a solution which also considers social and cultural aspects and which can be financed at least.

Within the project, “energy” will represent a benchmark for the evaluation of the technical dimension of the “city system”, as well as an object for the planning process in the political dimension of that system. For the first time, strategies to handle with the spatial consequences of demographic change and strategies of mitigation will be combined in this project. The results of the concept will be integrated into the strategic district plan for Leipzig east. Leipzig thereby shall become a role model of urban reconstruction in Germany and in Europe.

2 MAIN OBJECTIVE OF THIS ARTICLE

The dynamic changes currently taking place in society and space call for a rapid response. Therefore, research needs to highlight alternative approaches to achieve sustainable solutions. Concerning sustainability of spatial development which includes energy efficiency it is necessary to create new strategic and action plans which basically have to be developed by local actors.

Main objective of this article is to emphasize that a modern urban energy concept should integrate several dimensions, especially it is necessary to combine the two policy fields of energy and of space. For that it is obligatory to develop an integrative and cooperative governing process. Following this objective, “energy” should be seen as a new object of spatial governing process. It is essential to find a sustainable answer which integrates also the demand side into the strategy and action plan to develop urban energy concepts. On the whole, the article refers to the question of urban policy.

3 EXAMPLE OF LEIPZIG

At first it is necessary to give a short impression of the city of Leipzig to understand the challenges and the background for preparing a sustainable energy concept. Leipzig is a big city in East Germany. In 1989, not only a political transformation has begun but also social, economic, cultural and ecological transformation processes. Looking back to more than 20 years of these different forms of transformation it has to be emphasized that the city – its physical and its societal structure – has changed in an enormous way and that this transformation processes are still going on (Doehler-Behzadi, Lütke Daldrup 2004). A lot of problems could be solved – but not all. The unemployment rate is very high. The population has decreased from 1989 until the late 1990s because of migration to the suburban areas of Leipzig or to West Germany. Although the current height seems to be stable or even to increase again the density is much lower than in the early 1990ies. Concerning the spatial structure, the city has to cope with waste land and with apartment vacancies. This has got impacts for society, space and for the effectiveness of the technical and other infrastructure.

Leipzig has got a specific local situation with energy related challenges. That is why on the one hand there are also specific challenges for sustainable forms of energy policy. But on the other hand the transformation process in Leipzig has got a lot of similarities to other cities in Central and Eastern Europe. That is why it is useful to share experiences with each other and also to use methods and results of existing projects. But it is always necessary to find out if they are exactly transferable or if a modification is required.

To cope with these spatially related problems in East Germany it was not possible just to adapt the traditional understanding of a policy of space which had been developed in West Germany but to develop new forms, with new content and new instruments (cf. Oswalt 2005). On the whole, sustainable urban development has to follow two approaches to cope with these dynamic changes: At first it has to implement different sectors in an integrative way which influence the spatial structure (cf. Leipzig Charter 2007). Then, because of this integrated approach it also has to be organized in a cooperative way (cf. Healey 1995) – as the power to analyze, to plan and to change spatial structures does not only belong to the public sector. Different actors can be identified:

- Government of State
- Local authorities
- Public utilities
- Owner of building
- Inhabitant
- Users
- Consumers

These different actors have got different rationalities, different perspectives and also different opportunities to implement their objectives. Especially if the existing city (the “built city”) should be transformed – and this is the main task in the future – it is obligatory to have a development together with private actors. An urban energy concept should be a part of a superior strategy of urban development. Therefore it should be discussed if and how an energy concept also could follow these two approaches.

Concerning energy related projects there are several initiatives in Leipzig. Not only public authorities have begun to develop strategies and actions plans like preparing an application for the European Energy Award or finding strategies for adaptation processes in Leipzig Region against the background of climate change. Also some private groups discuss and realize interesting solutions in this subject. For example there are two districts which have not been refurbished on the whole until this moment, the owners and the inhabitants of the buildings have now initiated bottom up plans to develop their district. The possibilities of energetic improvement are discussed together with a lot of other demands and objectives.

But although energy is already a topic in the perception of several actors an integrated and cooperative solution is still missed. That is why a project consortium has applied for a research project in Leipzig which should develop an integrative urban energy concept. In the following chapter this project is described.

4 RESEARCH PROJECT “ENERGY EFFICIENT CITY OF LEIPZIG”

The project “The sun is rising in the east – energy efficient city of Leipzig” is a joint project funded by the German federal Ministry of Education and Research (BMBF) (www.energiemetropole-leipzig.de). Main objective of the project is to develop an innovative concept for the future procedure of developing Leipzig as an energy efficient city. Therefore the concept contains “energetic-spatial” topics (in the sense of a combination of both strategies) against the background of demographic change.

As a first step this concept will be developed in the urban district “Leipzig east”. This is a quarter of the so called Wilhelminian style. It suffers from a shrinking population and changes in the population structure. In spite of perennial reconstruction measures the area is suffering from a backlog in reconstruction. Therefore it is necessary to go on with the urban regeneration. Generally, potentials to integrate energetic needs can be found, but on the other hand it is difficult to realize them because of the socioeconomic structure.

The joint project is split up into different working packages “energy space”, “actors”, “software” and “service engineering”. In every working package other objectives are more important so that it is possible to

analyze the city from different perspectives as system of energy, a spatial system or a system of users. As results of the project, an energy-spatial concept will be developed, an energy-spatial consensus will be concluded, a computer-assisted communication platform will be prepared and a service engineering will be introduced.

All results should serve the main objective of the project to identify strategies of highly reducing the energy demand in the east of Leipzig and should show potentials for energetic optimization, increase public awareness and lead to new forward-looking businesses. Based on an evaluation of the current energetic structure, the concept will show strategies and actions to save energy consumption. But reducing energy is not the only objective. To find sustainable solutions it is essential to include socioeconomic demands and restrictions: Not the best technical solution can be realized but a solution which also considers social and cultural aspects and which can be financed at least.

To find out what the perceptions of the different groups and actors in the inner-city are, existing superior (political and societal) and individual strategies are analyzed and optimized. Thereby, a decentralization of technical infrastructures is discussed although the dominance of the existing district heating network in the east of Leipzig has to be accepted.

Within the project, “energy” represents a benchmark for the evaluation of the technical dimension of the “city system”, as well as an object for the planning process in the political dimension of that system. For the first time, strategies to handle with the spatial consequences of demographic change and strategies of mitigation are combined in this project. The results of the concept will be integrated into the strategic district plan for Leipzig east. Leipzig thereby shall become a role model of urban reconstruction in Germany and in Europe.

The first part of the project has got a time period only of twelve months; it has started in June of 2009 and will go on until June of 2010. Within this period it is only possible to develop a concept for the future. The second part of the project for which we have to apply again will focus on the implementation of the concept. Only three to five of the current 15 projects will be funded in the next period which will take five years at a maximum. But even if we will not be funded the project will have been successful because already now it is possible to discuss the challenges and solutions of a spatial-energetic urban development in Leipzig and to sensibly people and organizations for this topic.

Four project partners are mainly involved in the project:

- Fraunhofer Center for Central and Eastern Europe (MOEZ) (coordination)
- City of Leipzig (department for business development)
- University of Leipzig, Institute for applied Informatics (InfAI) e. V.
- University of Leipzig, Department for urban development and construction management (ISB)

The research project has got some advantages for the municipality of Leipzig. The concept contributes to a sustainable urban development. It also connects strategies and actions of spatial with an energy policy and it is strengthening the profile of energetic and spatial policy. Furthermore, solutions to overcome two crises – “climate crisis” and “socioeconomic crisis” – will be shown. Finally an integrative and cooperative concept for the district of “Leipziger Osten” (east of Leipzig) concerning spatial and energetic dimensions will be developed which combines objectives of urban regeneration and needs of technical infrastructure.

At the municipal authorities the project is assigned to the department for business development. But this is only for formal purposes. In fact, a lot of departments (e. g. planning, environment) are involved. Additionally, there is an exchange with several public and private actors, so called “dialogue partners”, for example housing companies and public utilities. In this dialogue a new “energetic truth” as a part of sustainability will be discussed.

5 “CLIMATE JUSTICE” AND “ENERGETIC TRUTH” IN THE CASCADE OF SUSTAINABILITY

In the Leipzig project it is necessary to define what the impacts of climate change for spatial policy are. Therefore it is also essential to operationalize the normative concept of sustainability. For that two new terms have been defined: “climate justice” and “energetic truth”.

Future strategies and measures of spatial development will increasingly focus on adaptation. Given the macro trends of spatio-structural influences, spatial structures will have to be reorganized: apart from socio-cultural changes in the demand for buildings and areas to live in, the positioning of agglomerations within competition as a result of technological and economic structural transformation, and the way in which fragments and the declining intensity of use in connection with demographic change are dealt with, sustainable spatial development will entail adapting cities and urban regions to the requirements of energy-optimized urban structures and the consequences of climate change (cf. Mörsdorf, Ringel, Strauß 2009).

Materially speaking, this new integrated viewpoint will necessitate reviewing previous models, strategies, aims and measures of spatial development. And in institutional terms, too, the traditional forms of control will have to be examined regarding their suitability in the face of climate change. This includes analyzing the actors and patterns of action as well as the instruments available. A suitable set of instruments for climate change needs to be made available which actors can use to ensure and restore urban development and regulation.

Ultimately, these two areas require a new type of analysis of the forms of transformation which, compared to other spatial-structural challenges, are beset by a considerable lack of clarity. Whereas for example in response to demographic change supply is adapted to changing demand, both demand and supply have to react to the changing conditions brought about by climate change. In addition, forecasts are very unclear and complex. The uncertainty arising from this fuzziness regarding future change is a source of risks – but also of opportunities as innovative solutions become possible (cf. Strauß 2009).

Adopting a holistic interpretation of climate justice of space, measures of mitigation and measures of adaptation need to be combined. In addition, climate justice also ought to take socio-political elements into account. Therefore the term contains:

- The requirement to be suitable for the climate (as environmental justice)
- The socially fair arrangement of these strategies in terms of standards of living and survival capability (as social justice)

In these spaces, innovations are possible with climate justice in a double sense. On the one hand, the haziness of climate projections ultimately leads to an inability to plan space and therefore enables individual innovation, while on the other changing sets of criteria form a breeding-ground for innovations of social justice in regional systems of innovation (cf. Fritsch 2005: 479–480). A climatically suitable spatial innovation system therefore consists of the two mutually dependent foundations ‘knowledge’ and ‘ethics’ (cf. for biotechnology: Koch 2006: 2). The system of innovation contributes to economic improvement and to social and cultural regional development. It hence helps a region as a whole to distinguish itself and to reduce disparities (cf. Schwinges et al. 2001).

A strategic target in future discussions and project dealing with energy consumption, renewable energies as well as climate justice is to publish and to discuss an “energetic truth”. This term can be defined in the following way:

“Accepting and disclosing of current energetic situation and its impact on the future of availability, consumption and costs of energy. The bounded rationality of politics, economy and private persons has to be accepted and alternative polyrational solutions for present ways of acting with all their advantages or disadvantages (costs and limits) have to be shown.” (own definition)

This term implies to enlighten the society about the status quo of energy consumption and the finiteness of fossil fuels as well as telling the truth about perspectives of renewable sources and future energy concepts. The implementation of the energetic truth goes along with the utilization of renewable energy sources, an increase in the efficiency and the adaptation of the current energy infrastructure in combination with the improvement of the physical structure of city as well as the question of decentralization of the main power supply and an energy efficient mobility.

The approach of implementing an “energetic truth” follows the concept of bounded rationality but also emphasizes the need of developing a new polyrationality (Davy 2005, based on Douglas 1992). Therefore it implies two major strategies with the focus on developing new methods of cooperation. The superior strategy sets the focus on the public authority which is in charge of the overall spatial planning process and therefore responsible to secure the welfare of the general public. An innovative connection between general and

sectoral planning is discussed during the process. The superior strategy also includes a dialogue with the public in form of public relations and workshops with the owners and the inhabitants of the district. The individual strategies contain initiatives of private actors which influence spatial development as well as an analysis of institutions and their patterns of acting. These individual strategies are attended by new service concepts like the computer aided service engineering.

Both strategies – the superior and the individual ones – should follow the principles for a sustainable energy supply (cf. Bundesministerium für Umwelt 2009):

- Guarantee security of energy supplies
- Strengthen economy
- Increase renewable energy
- Realize nuclear power phase-out
- Use coal in an efficient way
- Make power grid efficient
- Consume power more efficiently
- Reduce fossil-fired heating system
- Reduce emissions in traffic system
- Act international

In reality, a lot of objectives and actions follow these principles, but there are also a lot with conflicts to them. And it is important to say that the principles refer to different actors. In the sense of a planning process which includes the elements of integration and cooperation it is necessary to find solutions to reduce the conflicts between these objects. Within this discussion there is also another debate which becomes stronger: the debate about zero emission cities. The debate includes the discussion about the following theses (cf. IWU 2002):

- “Zero” is only a vision
- Zero is not absolutely 0
- The city is surrounded
- Integrated analysis is obligatory
- Recycling management is necessary
- Physical space: impact or result?
- How sustainable is the compact city?
- Polycentric agglomerations have got less traffic
- The only question is about “zero”
- People are catalyzers

In opposite to new towns like Masdar City or Dangton it is not possible to realize zero emission structures in the already built city like Leipzig. But it is necessary to analyse the current energetic structures, to develop scenarios about the future development and to create realistic concepts. Therefore, the project has begun to find and to communicate the energetic truth.

6 METHODS AND DATA COLLECTION OF THE ENERGY CONCEPT

Parallel to the two strategies there are also two possible methods to evaluate a city as an energetic system: top down and bottom up methods. Both methods have got advantages and also disadvantages. After all the project partners have decided to follow a bottom up method (in opposite for example to the methods of the European Energy Award). Again, this bottom up method contains alternative possibilities to analyze the energetic structure – they mainly differ between the basic units: buildings (units of the built city) or consumers (units of the societal city). Concerning, this question the project has decided to mix these two

units because it is necessary to have benchmarks regarding the built but also the societal city. Therefore the following indicators have been chosen:

- Construction year of the building,
- Quality of refurbishment,
- Form and quality of heating system,
- Size,
- Use,
- Owner (esp. private/public),
- Population structure,
- Protection of historic building
- Electricity consumption,
- Modal split and other indicators concerning mobility.

As the project has begun in June 2009 the data collection has not been finished. And it will also not have been finished for every indicator (especially concerning mobility) at the end of the first part of the project (June 2010) because the collection is very difficult. But until the end of the first part of the project we will have created an action plan which includes a set of indicators, first data collection and also the responsible actors and sources of the data.

A lot of problems exist with data collection because in Leipzig there is no central public authority which would be responsible for collecting and publishing or selling relevant data. This is not only a problem of Leipzig but of almost every municipality in Germany. In future it is not probable that this will be changed. That is why different ways to collect data have to be found. As an example we have tried but failed (at least until this moment) to get data from the guild of chimney sweeps. At least it is useful to establish a task force where all relevant public actors take part and share their data.

Another challenge has been to define the border of the site. There are different borders – administrative, statistic, funding, content – which also reflect different data, strategies, authorities. We have taken the borders of the ERDF district (“European Regional Development Fund”) which already exists so that it is possible to combine socio-spatial strategies of EFRE with energy related strategies.

In the research project not the whole city of Leipzig will be analyzed but a part of it. This “pars pro toto” is in some kind more difficult to be analyzed than if whole of the city of Leipzig would have been taken because the results of the site have to be typified to be transferable to other districts of Leipzig and to get overall results for the city.

7 CONCLUSION

The Leipzig project of urban energy concept does not achieve a “high end solution” in the sense of a best energy system. But it achieves a sustainable solution which permits a pareto optimum including socioeconomic demands. This optimum reflects the restrictions of an integrated perspective: A sustainable urban energy concept aims not a technical energy system but a combination of spatial and energetic optima. Its content includes the dimensions of space, actors and – at least – energy. This does not mean worse but better objectives and actions.

The research project of Leipzig is specific on the one hand and has got transferable elements on the other hand. While empirical results have to be explained with the local situation it is possible to use the theoretical concepts of “climate justice” and “energetic truth” as well as the methodology of differing strategies and differing data collection for other cities. Especially it is valuable to discuss about a transfer of connecting spatial and energy policy to create really sustainable urban development.

In the future sustainable urban energy concepts should not be prepared separately but it is necessary to combine spatial solutions against the background of different forms of change like climate or demographic change. It is also necessary to combine spatial and energetic policy to permit integrated perspectives of urban

development. Furthermore it is necessary to realize cooperative forms of governing to achieve a cooperative governing process. These polyrational strategies are a key to sustainable urban development.

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