Incongruence of superior goals and energy efficiency funding programs

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Abstract

Purpose / Context – Political topics like energy efficiency and climate protection are en vogue. There are manifold funding programmes, but since these are bound to the goals of the respective programmes, the implemented projects do not adequately consider integrative aspects. It is necessary to analyse the purpose of those funding programs and to bring them in correlation with higher goals of urban development.

Methodology / Approach –In the case of 'Bottrop Innovation City', 5 depth-interviews were conducted to provide initial impressions of the modernization of municipal structures

Results –Some of the assessed municipalities show elaborative strategies to develop promising energy efficiency projects, all of which with a grand amount of funding resources.

Key Findings / Implications – Political top topics have influence on the urban development for centuries.

Originality – Germany as a model for energy efficiency strategies has a vast funding scheme which does not exist in other countries. Therefore, it is necessary to analyse the organisation and to develop guidelines for an even better and more sustainable funding scheme. Funding schemes affect city development and have impacts on the housing and the neighbourhood. It is necessary to understand which impacts a funding scheme has, to review the aims of programs with the superior goals and to give guidance for a better use of the respective funding scheme.
Other countries could learn from those strategies and could adapt to certain degree to establish a similar funding scheme. Additionally, municipalities could be supported in their strategies for sustainable city development, be it with or without funding resources.

Keywords - Energy efficiency- funding scheme- Incongruence

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1. Introduction

1.1 Literature Review

In the last decades, changes in climate have caused impacts on natural and human systems all over the wold. 'Impacts are due to observed climate change, irrespective of its cause, indicating the sensitivity of natural and human systems to changing climate' (IPCC, 2015). In the future, there must be effective measures and strategies to reduce climate change (Federal Government, 2008).

One of the big strategies and a shared policy goal of many governments around the world is to increase energy efficiency. The advantages of efficient use of energy are well known and flatter investments in energy infrastructure and lower fossil fuel dependency (IEA, 2008). In former times, there were different strategies to reduce the impacts of climate change and to increase energy efficiency. One of the most popular agreement was initiated by the UN is the conference, the 'Agenda 21' held in Rio in 1992. 179 governments agreed to limit their emissions of greenhouse gases. The following years have seen far reaching changes and response to climate change (Green Alliance, 2014). One important agreement is the Kyoto Protocol from 1997 (UNFCCC, 2011). In the year 2015, there was the United Nation Conference on Climate Change in Paris where 196 countries confirmed to devote themselves to more sustainability and to work on the energy efficiency goals and to reduce their greenhouse gas emissions (Green Alliance, 2014). All governments agreed on the long-term goal of keeping the increase in global average temperature to **well below 2°C** above pre-industrial levels. The aim was to limit the increase to **1.5°C**, since this would significantly reduce risks and the impacts of climate change (UN, 2015).

There are many holistic strategies like the C40 Cities Climate Leadership Group who aim to reduce greenhouse gas emissions in the world´s megacities. The group consists of 83 members around the world (C40, 2015). To date, there are many studies and documents which deal with climate change and city development. One example is the study 'City of tomorrow' which deals with the challenges and visions on how cities should look like in future (EU, 2011). Furthermore, there is the Intergovernmental Panel on Climate Change, which published its Fifth Assessment Report in 2014, summarising the work of thousands of scientists across the world. The 2013 report the IPCC was the first to put the total amount of carbon in numbers that could be emitted while simultaneously keeping the 2°C target (IPCC, 2015). Today, city development cannot be planned without considering climate change and its impacts. Even on the big conferences like the United Nations Conference on Housing and Sustainable Urban Development Habitat III in Quito, Ecuador 10/2016 the New Urban Agenda (NUA) document is going to be resolved, which will provide guidelines and recommendations for sustainable urban development within the next two decades (Cities Alliance, 2015). Up to today, many cities have become members of national and transnational city networks, like the C40 Cities as mentioned before (Kern, 2008).

In fact, global climate change affects local governments in three different ways. First, a high portion of greenhouse gas (GHG) emissions is generated in cities. Second, the effects of global climate change have a direct impact on cities, which need to adapt to the changing situation. Third, linkages and synergies between sustainable development and climate policy become most obvious at the local level.

Especially the building sector contributes to up to 30% to the global annual greenhouse gas emissions and consumes up to 40% of all energy. In total, the building sector has the most potential for delivering significant and cost-effective GHG emission reductions (UNEEP SBCI: 2009). All in all, it is important that all climate protection and energy efficiency measures have to be implemented on the local level in a way that has long lasting effects on the development, particularly with regard to the high potential of the building sector.

1.1.1 German Energy Transition

An important step towards meeting these prior mentioned climate goals is the 'Energiewende, Germany's energy transition policy, which was launched to support the objectives set out in the Energy Concept in 2010 (BMUB, 2014).

According to the German Federal Government, CO_2-emissions are to be reduced by 40% until the year 2020 (Federal Government 2008). Furthermore, the electricity supply is to consist to at least an 80% share of renewable energies by 2050. Another goal is to reduce energy consumption by 10% till 2020 and by 25% till 2050 compared to the 2008 baseline (Umweltbundesamt, 2010). Especially the present building stock shows significant potentials for actions as these have high energy consumption rates, which make up to about 40 % of the total energy consumption in Germany (Federal Government, 2008). However, the remediation rate of buildings stagnates at approximately 1 % per year. Because of this, the potential in the building sector should be activated more strongly in the future (BMWI, 2014).

1.1.2 German Funding Scheme

Funding problems can in general be regarded as one of the most serious barriers impending the efforts to implement energy transition policies on local level. In most OECD countries, climate change policy remains a voluntary task of local governments that have limited mandatory responsibilities in this regard. A major issue for implementing related policies is lack of funding, since these compete with other demands that often appear to be more important from the perspective of policy makers and citizens.

Furthermore, cities normally only have limited opportunities to generate funding for climate protection measures (Kern, 2008). To put efficiency saving measures into practice nonetheless, the (German) government developed financial funding programs. The aim of this support is twofold. First, municipalities are supposed to have a better chance to increase the amount of energy efficiency projects on local level as they get significant financial support from the government. Second, this approach contributes to the implementation of energy-efficient measures on the local level more easily and with a longer lasting effect. Of course these aims are regulated in different laws like in the town and country planning code (BauGB, 2015) and for the Energy Saving Directive in the EnEV (Energieeinsparverordnung) which sets out building standards, and by state laws.

The German administration system is divided in three levels: federal government, state government and the local municipalities. The state authority is not exercised directly by the people; they delegate it to elected, representative or parliamentary bodies (Katz, 2002). In comparison to other countries the municipalities in Germany have the local self-government (GG § 28). The municipalities have the right to manage all affairs on local levels within the limits set by law. However, certain functions are executed by the municipalities on behalf of the federal state governments (Badura, 2003). Nonetheless, the municipalauthoritative power can be used in very creative ways, even to generate funding for the implementation of their climate protection policy (Kern, 2008).

For example, there are different programs from the EU to the state government which are offered the municipality to implement certain measures at the local level andit is a grand effort for them to apply for a suitable program. This is the reason why energy efficiency and climate change projects and their measures in Germany are highly promoted. Not only projects with concepts and the implementation is promoted but also the position of a reconstruction manager who has the task to implement the measures (BMUB, 2015). With a successful application for a funding program every municipality has to pay a certain amount to the funding organisation. This -contribution depends on the funding program and is often between 5-10 % of the total funding amount. However, some of the municipalities in the western part of Germany, like in the Ruhr Area, have a precarious budgetary (Bertelsmann Stiftung, 2007). Because of this reason the funding organisations have

special conditions for municipalities with a precarious budgetary, which for instance are not obliged to contribute with their otherwise compulsory financial share of the total funding sum.

1.1.3 Planning Australia:
In comparison to the German planning system, the Australian federal system is organized differently. The Australian Federal Government has considerably more financial power than the states. On the local level however, municipal governments have by far less financial resources than in Germany (Ahuri 2015: 12). But in both countries it is the consensus that all local government planning schemes and policies are required to be consistent with State Government planning objectives and requirements (State of Western Australia 2014: 4).

Australia's federal system of governance is different to the German, since only one governmental planning law exists. The Australian government structure consists of the nationwide Australian Government, the six states and two territories, all of which have own urban planning laws and procedures, resulting in separate systems of planning and land use management. Consequently, there is no single urban planning system for Australia – rather, there are a number of planning systems that operate largely independently of each other along state based lines (Williams 2007).

2. Research Problem

Germany and its municipalities meet the requirements to realize projects on local levels, which could serve as a pilot worldwide. But this support system has the disadvantage that the municipalities are dependent on public funding. For the implementation of large projects municipalities try to access different forms of funding, for instance funding provided by the EU, which is also a common approach for institutions on state level.

In the past years and even today there are many projects related to the topics of energy efficiency and climate protection. For municipalities with precarious budgetary it is difficult to implement projects which push the city development forward or which solve essential problems of the city without any funding money. Because of this reason they develop a holistic strategy which fits to many funding programs. These days there a lot of programs which deals with energy efficiency or climate protections and because of this the municipality develops strategies which match to these ‘en vogue’ topics. These projects will ultimately be congruent with the goals of support programs, but do not solve the original problems of the city, like ‘goal-30-ha’ of the Federal government. This goal is a political intention and should lead to a reduction of the daily growth of area for settlement and transport from 100 ha today to 30 ha by 2020 (Malburg-Graf et al, 2007).

To sum it up, the intention of the developed strategy to acquire the highest funding possible to enable the solution of a city’s initial issue within one major project. Therefore, superior goals like sustainability, quality of life and climate adaptation are not considered in the specific project as it should be. First, the projects fulfil the aims of the support programs but it is not confirmed that they have to fulfil the goals of the superior goals. Last, there are funded projects which are internally consistent, concerning the city development however these are not the best solution in terms of sustainability.

Because of the precarious budgetary situation of the cities in the Ruhr-Area in Germany, it is difficult to create projects that contribute to urban development relevant projects. Through the funding scheme however, it is possible to develop projects with a specific aim orientation like energy efficiency or climate protection.

Current topics like energy efficiency or climate protection are promoted through different political levels. These topics are in the foreground of the political agenda and because of this, there are manifold funding programs related to these topics. It is moot point whether or not projects imple-

mented through these funding schemes are the best sustainable solution for urban planning. Normally, large-scale projects could only be realized given sufficient funding. It seems as if the content of projects is mainly determined by the aims of the funding program. Other important topics like goal-30-ha are not promoted in the same way as climate protection or energy efficiency. Hence, it could be more difficult to develop projects which solve these problems.

The aim of this study is to highlight the importance of municipalities for the building sector and to underline the influence of both on the energy transition debate. Therefore, the planning process and the decision-making process of the case study Bottrop will be analysed Problems, obstacles, and impulses will be identified. In this way dependencies of municipalities on funding programs and their limited capacities to implement urban development projects without funding will be clarified. Through the case study, analysis incongruences between city development goals and the implemented projects will be analysed.

3. The case

One of the major energy efficiency projects in Germany is 'Innovation City' in Bottrop, which was created due to a call launched by the industry association Initativkreis Ruhr (IR). This pilot-project tries to implement several energy efficiency subprojects since 2010. The transformation through active public-private partnerships and an engaged citizenry into a living laboratory can be observed (ICLEI 2014).

The main aim is to reduce the CO_2 emission by 50 % until 2020 and to create a sustainable, low-carbon city by reshaping existing housing, transport and energy 'regimes"'. For this purpose, numerous individual projects together with practice partners and industry covering the sectors of urban planning, housing, industry, tertiary buildings and transport were implemented in the last years (Huber 2013). Furthermore, the transition process in Bottrop is an effort of steered transformation between public and private institutions, an unprecedented experiment in Germany and maybe even worldwide (Huber 2013).

The beginning of Bottrop`s transition started in 1990s when the city administration adopted its first energy conversation measures. Some involved city departments continuously developed competences for energy efficiency, which cumulated in the application process for the Innovation City project in 2010. At the same time private actors started pioneering renewable energy projects (Huber 2013).

The Innovation City Ruhr has become a model for the renewal of the entire Ruhr Area, but also to other industrial cities worldwide. The main idea of the project was to transform seven districts in the heart of the city with more than 14,000 buildings and 70,000 inhabitants into a role model of energy efficiency. The city became a living laboratory for urban redevelopment, sustainable energy and climate change mitigation. Under the slogan 'InnovationCity Ruhr', the Initiative Group launched a campaign to find a pilot city to conduct comprehensive urban development, with the final objective of replicating the pilot's successful projects across the Ruhr region (ICLEI 2014).
After the successful application as Innovation City Ruhr, the organisation IC Management GmbH was founded. This organisation takes care about the aims of the innovation system and develops new ideas for the implementation (Huber 2013).

The energetic restructuring of existing buildings is one of the most important measures to reduce CO_2-emissions. The city has a modernization rate of 3 % pa over the last years, which is, in comparison to the German average with 0,9 %, very high (DV 2016: 6). From a scientific point of view, the Bottrop Model City is also a unique testing ground for the exploration of possible pathways to a climate-friendly and energy efficiency urban redevelopment (ICLEI 2014).

For implementation, each program requires an individual funding constellation. Some of the activities are funded within the framework of public research or urban development programs, supported by the EU commission, national, or Land ministries. Others rely on financial means brought in by industrial companies or other external partners (e.g. banks like KfW-Bank) (Huber 2013). In fact, Bottrop had a very successful strategy to use the funding scheme from EU to state government level effectively, because over the last years manifold projects about energy efficiency were implemented. The city administrative of Bottrop successful applied to funding programs of the EU – federal state level and with the slogan 'Blue sky – green city' they found a holistic strategy which fitted to various funding programs.

4. Methodology

In-depth interviews will serve as a qualitative-explorative research approach, since its objectives is to understand the correlation between the support program scheme and superior goals. Furthermore, impulses will be identified. So will be problems and obstacles' during the process to get a better understanding of the entire process flow and to get first results about guiding the project in a specific direction (Marxwell, 2005). In detail 5 stakeholders from the city administration will be interviewed. Most were main stakeholders who played an important role during the planning process. For every interview guideline were employed to ensure comparability. All interview partners were selected by purposeful sampling (Patton, 2009). In average the interviews took between 50 and 120 minutes.

All interviews were recorded and transcribed. For the evaluation qualitative content analysis were used (Mayring, 2005) with the software MAXQDA to sort the important statements and to enable ranking regarding respective importance. Because of the semi-standardized guideline, it was possible for all interview partner to explain important aspects in detail. In the end the material was reviewed, analyzed and interpreted to the research context.

5. Result and Discussion

5.1 Overall Results

So far, the interviews revealed that the project Innovation City can be described as an extensive energy efficiency project which raised a grand funding amount through well elaborated strategies. Over 100 projects were implemented on local level. The conjecture is that the energy efficiency projects are congruent with the funding programs but may however not be the most sustainable solution for the entire city development. To evaluate the impact of the project, it is necessary to analyse the funding constellation in context of the project in detail.

The result of the interviews is, that there are different impulses which pushed the project forward. The first impulse is the funding constellation. Without the considerably high funding amount, it would not have been possible to implement so many projects. This includes the possibility to found the Innovation GmbH. Though this company it was easier to use the network to local companies and to take responsibility over factors like marketing, developing strategies etc. Next to the financial support, there were a lot of entrepreneurial partners who supported the project. During the project process there were different jour-fix events in various constellations with experts, scientists or local companies, which helped to bring to project forward.

Also important is the size of the city of Bottrop, because with 117.000 inhabitants the city administration is manageable and the distance to the public administration is short. There is a close cooperation between public offices and between the public administration and Innovation City GmbH. Another important point is the low fluctuation of staff which is the basis for trustful working atmosphere.

Positive secondary effects are the synergies related to the funding scheme because the ministries request the city of Bottrop to apply for particular funding programs. Bottrop has the chance to formulate its special needs concerning city development and the energy transition debate. The city administration founded a guideline ’11.1 Promotion of energetic renovation’ which is addressed to people who own real estate property in the pilot area (Bottrop, 2014). This guideline was supported by the Federal Land Ministry Of The Land Of North Rhine-Westphalia and will be disseminated to other municipalities. In this case Bottrop was again pilot and could profit from the synergies to the ministry level.

6. Conclusion

In summary, we found evidence for the importance of the funding scheme and the dominance of topics like energy efficiency, which are set on the top of the political agenda. Without those programs it is difficult to implement projects. Particularly the implementation of other city development relevant projects in the city is difficult.

City development is dominated by these themes and the manifold funding programs show which projects can be implemented. Because of the budgetary situation, the Ruhr Cities often do not have a chance to plan something different. In fact, the cities are dependent on financial support, but it is arguable if the projects mentioned above are the most sustainable solution. This paper shows the necessity for a guideline for municipalities to strengthen awareness regarding funding schemes and their impacts on city development.

7. References

Ahuri (Australian Housing and Urban Research Institute) (2015). Spatial disadvantage: Why is Australia different? Melbourne.

BauGB (Baugesetzbuch) (2015). in der Fassung der Bekanntmachung vom 23. September 2004 (BGBl. I S. 2414), zuletzt geändert durch Artikel 6 des Gesetzes vom 20.10.2015

Bertelsmann Stiftung (2007). Kommunaler Schuldenreport Nordrhein-Westfalen. Gütersloh

BMUB (Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit) (2014). The German Government´s Climate Action Programme 2020. Cabinet decision of 3. Berlin.

BMUB (Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit) (2015). Energetische Stadtsanierung. Zuschüsse für integrierte Quartierskonzepte und Sanierungsmanager. Berlin

BMWI (Bundesministerium für Wirtschaft und Energie) (2014). Mehr aus Energie machen: Nationaler Aktionsplan für Energieeffizienz. Berlin.

Bottrop (2014). Richtlinie der Stadt Bottrop über die Förderung von Modernisierungs- und Instandsetzungsmaßnahmen nach Nr. 11.1 Förderrichtlinie Stadterneuerung im Stadtumbaugebiet Innenstadt / Innovation City vom 8. April 2014 in der derzeit gültigen Fassung vom 5. Mai 2015.

Cities Alliance (2015). Sustainable Development Goals and Habitat 3: Opportunities for a successful New Urban Agenda. Brussel.

C40 (2015). Climate Action in Megacities 3.0. Networking works, there is no global solution without local action. London

DV (Deutscher Verband für Wohnungswesen, Städtebau und Raumordnung e.V) (2016). Berlin

EU (2011). Cities of tomorrow. Challenges, visions, ways forward. Brussel.

EnEV (Energieeinsparverordnung) vom 24. Juli 2007 (BGBl. I S. 1519), die zuletzt durch Artikel 3 der Verordnung vom 24. Oktober 2015 (BGBl. I S. 1789) geändert worden ist.

Federal Government (2008). German Strategy for Adaptation to Climate Change. Adopted by the German federal cabinet on 17th December 2008. Berlin.

GG (Grundgesetz) (2014). Grundgesetz für die Bundesrepublik Deutschland in der im Bundesgesetzblatt Teil III, Gliederungsnummer 100-1, veröffentlichten bereinigten

Fassung, das zuletzt durch Artikel 1 des Gesetzes vom 23. Dezember 2014 (BGBl. I S. 2438) geändert worden ist"

Huber, Andreas (2013). Composite Case Study. European Institute for Energy (EIFER) Research. Bottrop.

ICLEI (Local Governments for Sustainability) (2014). Bottrop, Germany. InnovationCity Ruhr – Model City Bottrop: revitalizing an industrial region through low-carbon redevelopment and active public-private partnerships.

IEA (International Energy Agency) (2008). Worldwide Trends in Energy Use and Efficiency. Key Insights from IEA Indicator Analysis. Paris.

IPCC (2015). Climate Change 2014. Synthesis Report. Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Geneva

Katz, A. (2002). Staatsrecht: Grundkurs im öffentlichen Recht, Heidelberg.

Kern, K., Alber, G. (2008). Governing Climate Change in Cities: Modes of urban climate Governance in Multi-Level Systems. In: Competitive Cities and Climate Change. OECD Conference Proceedings Milan.

Malburg-Graf et al (2007). Strategies and instruments to limit excessive land use in Germany- a proposal to the German Council for Sustainable Development. Milan

Maxwell, J. A. (2005). Qualitative Research Design: AN interactive Approach. Thousand Oakes: Sage.

Mayring, P. (2005). Qualitative Inhaltsanalyse. Grundformen und Techniken (9th ed.). Weinheim.

State of Western Australia (2014). Introduction to the Western Australian Planning System, Perth.

Umweltbundesamt (2010). 2050: 100 %. Energy target 2050: 100 % renewable electricity supply. Dessau-Roßlau.

UN (United Nations) (2015). Adoption of the Paris Agreement. Proposal by the President. Paris.

UNEEP SBCI (2009). Buildings and climate change. Summery for Decision-Makers. Paris.

UNFCCC (United Nations Framework Convention on Climate Change) (2011). Fact sheet: The Kyoto Protocol.

Williams, P. (2007). Planning and the legislative framework in Thompson, S (Ed) Planning in Australia: An overview of urban and regional planning, Cambridge.