Sustainable Cities and Society 38 (2018) 205–218

Contents lists available at ScienceDirect

Sustainable Cities and Society

journal homepage: www.elsevier.com/locate/scs

The application of municipal renewable energy policies at community level in Denmark: A taxonomy of implementation challenges

Jens-Phillip Petersen

Technical University of Denmark, Department of Civil Engineering (ICIEE), Kgs. Lyngby, Denmark

ARTICLE INFO

Keywords:
Renewable energy policy
Municipal energy strategies
Community energy
Local communities

ABSTRACT

The implementation of national renewable energy targets requires policies at the local level. Communities are considered as key arenas of transforming policies into actions, where technical configurations intersect with socioeconomic interests. Local governments put great efforts into developing and applying energy strategies. Although many frontrunner projects are well-documented, insufficient attention is paid to the average-performing municipalities that are challenged in linking technical energy scenarios with socioeconomic realities. The following implementation gap between national policy and local practice leads to a non-attainment of national energy targets. This paper analyses the Strategic Energy Plans (SEP) of 17 Danish municipalities based on their development, scope, and inclusion of local communities. As a synopsis, the main technical, physical, organizational and socioeconomic challenges for local energy policy implementation were illustrated. Internal organization, lacking municipal capacities, combined with the complexity of communities leads to procedural deficits in strategy production. The resulting neglect of socioeconomics and other community peculiarities by technology-driven strategies impede strategy implementation. As a consequence, a community-oriented taxonomy of implementation challenges is introduced. This approach might help to improve the scope of SEPs, ensure a local anchoring of energy strategies, and raise awareness for challenges already present during strategy production to facilitate strategy implementation.

1. Introduction

1.1. Problem statement

In light of the potential consequences of climate change, the transformation of energy systems from fossil fuels to renewable energies constitutes one of the biggest challenges for governments worldwide. After committing to the Paris Agreement, governments pursue the reduction of greenhouse gas emissions through the implementation of national energy policies (UNFCCC Secretariat, 2015). However, implementation of national energy policies requires local action. First, cities are responsible for roughly two-thirds of global primary energy consumption; thus, they play a key role in transforming the energy systems. Second, local governments have the ability to balance national policies with local interests (Amin, 2004). Third, spatial planning in most European countries is steered by municipalities that have strong governance capacities at their disposal to shape the built environment. Hence, municipalities directly and indirectly influence physical manifestations of energy policies (e.g., Fitzgerald & Lenhart, 2016; Smedby & Quitzau, 2016).

In practice, a gap between energy policy ambitions and implemented solutions in the built environment can be observed (Vergragt, Akenji, & Dewick, 2014). National energy efficiency targets are adapted to municipal documents but are seldom implemented in their entirety in the built environment. Local communities are a major arena for the implementation of energy targets, where abstract strategies are transformed into actions that lead to actual socio-technical configurations.

Municipalities' implementation struggles can be attributed to different factors. In the end, they are a result of the degree of urban complexity coinciding with institutional complexity at the community level. The complexity of energy target implementation has been characterized several times as 'wicked' (Cajot, Peter, Bahu, Koch, & Maréchal, 2015). The reference to Rittel's & Webbers' concept of 'wicked problems' from 1973 illustrates that implementing energy targets at the community level is not just another governance challenge, but requires strategic, systematic, and continuous actions.

Recent studies on municipal energy plans and their relation to communities focus prevailingly on citizen involvement, empowerment of local communities, communication, and mobilization strategies (van der Schoor & Scholtens, 2015). Hence, grass-roots innovations, rare bottom-up community initiatives and first-movers dominate the current

E-mail address: jepete@byg.dtu.dk.

https://doi.org/10.1016/j.scs.2017.12.029
Received 31 August 2017; Received in revised form 29 November 2017; Accepted 23 December 2017
Available online 03 January 2018

literature, whereas the average-performing community is rarely discussed. Despite the eligibility of these studies, inactive communities are the norm. To reach national energy targets, a stronger emphasis on the average-performing municipality and its communities is necessary.

The Danish strategic energy plans (SEP, a form of municipal energy strategies) exemplify this dilemma in a nutshell: while some Danish municipalities are recognized internationally as role models for energy transformation, the majority of the municipalities struggle with the realization of their targets, despite having the same national institutional boundary conditions. The specific local preconditions that enabled these examples are just not reproducible in other settings (van der Schoor & Scholtens, 2015). The passionate, proactive local citizens on the island of Samsø, the long-lasting public-private partnerships in Sonderborg or the strong economy of Copenhagen are unique among municipalities in Denmark (Radzi, 2009).

Nonetheless, these examples provide important lessons. But it makes sense to look at the challenges that 'ordinary' municipalities deal with when implementing energy strategies in the built environment. Therefore, it is necessary to assess how municipal energy strategies integrate the local community level, as SEPs are the most local energy planning documents in Denmark.

1.2. Aim of the study

This study assesses a broad spectrum of municipal energy strategies by means of SEPs from Denmark. The strategic documents are examined as they represent the intrinsic municipal strategies. In analyzing strategy development, scope, and their embeddedness in the institutional context, we can illustrate to what extent SEPs contribute to the energy target implementation. In combination with an understanding of what challenges practitioners face in their effort to implement the strategies, we can draw lessons on the suitability of municipal energy strategies to trigger the actions necessary to implement the energy targets in the built environment.

While previous studies examined the integration of climate change into local governance in forerunner municipalities (Wejs, 2014), or the content of Danish climate action plans from a quantitative perspective (Damsø, Kjær, & Budde Christensen, 2016), we emphasize the procedural aspects of strategies. In analyzing emerging actions and exposing where actual implementation is challenged when the strategy meets reality in communities, we focus on the qualitative aspects of strategies. Hence, the objective of this paper is to identify implementation challenges for municipal energy strategies down to community level, and to systematize these challenges according to their reasoning and origin. This could contribute to an increased understanding of how to improve municipal energy strategies so that the gap between energy policy ambitions and implemented solutions in the built environment can be reduced or even closed. The central research questions are:

- How are Danish municipal energy strategies developed, what is their scope and how are local communities represented in key considerations of the strategies?
- What implications do differing procedural factors have for strategy implementation and what challenges occur throughout the implementation process for municipalities?
- How can implementation challenges of energy strategies be framed to improve our understanding of what factors to consider when designing municipal energy strategies?

Theoretically, this paper provides a local, community-oriented classification of implementation challenges for energy strategies, based on the assumption that public actors take a key role in facilitating energy transition processes. Through the subdivision of implementation challenges based on spatial and in the sectoral origin their interdependency is demonstrated, which might have a practical relevance to enhance Danish SEPs. The study does not pretend to evaluate the Danish SEP program as a whole. Rather, the study systematically points out difficulties in municipalities' work with energy strategies under the given institutional boundary conditions.

Centering the community – hence, taking a socio-spatial perspective with the focus on challenges of energy strategy implementation – instead of looking at barriers for singular technologies, legislation or economics, adds a perspective to the academic discussion that many practitioners face. This perspective is only insufficiently covered in the existing literature. But the challenges practitioners face in their persistent struggles to implement energy targets are cross-disciplinary and focus on a single community at a time that has its own distinct challenges.

In Section 2, we frame the concept of municipal energy strategies inspired by strategic planning literature, and develop a relational definition of communities for energy planning that build the theoretical framework for the analysis of the municipal energy strategies and their integration of local communities. Section 3 describes the research methodology, whereas Section 4 gives a brief overview about the SEP program. Section 5 presents the results of the SEP analysis and municipality assessment. The results are analyzed and discussed in Section 6, as challenges are grouped according to their genesis using institutional theory to explain procedural issues and in a second step, they are associated to their origins. Section 7 concludes the paper.

2. Municipal energy strategies in communities: towards a relational understanding of communities and implementation challenges

This section explains theoretical concepts used to build up a theoretical framework to analyze municipal energy strategies. The framework forms the basis for a taxonomy of implementation challenges for energy strategies at the community level.

2.1. From strategies to municipal energy strategies

Several municipalities have in the past years formulated energy strategies to coordinate policies that should promote the implementation of energy targets. Implementation of renewable energy targets is still far from straightforward – energy strategies remain in many cases rather a promise than that they become reality (Bulkeley & Betsill, 2005). While 'strategy' by practitioners is often understood as a document that outlines future actions to reach a desired goal, the term has to be understood in a broader sense: In short, strategies are the systematic organization of collective actions around goals (Bryson, 2011). But strategies encompass an interactive process, where knowledgeable actors ('planners') involve a multitude of other actors, to produce a document to frame considerations of the earlier process. This interaction means that spatial strategies are both a product and a process, understood as a complex human interaction. This process is ongoing from strategy production, over the framing document, up to the retention or implementation of its key considerations through time (Healey & Hilier, 2009). These key considerations are a basis for the collective action to occur, as described by Bryson (2011).

Hence, strategy is not only a plan or a document, it is a pattern. It is often misunderstood as plan, because planners are 'mesmerized by the myth of control' (Mintzberg, 2007), which should get falsified by our day-to-day experiences. Real-world strategies are usually found in between those deliberate plans and emergent developments that can be assorted to the plan. In consequence, parts of the deliberate plan stay unrealized and are replaced by emergent strategy elements. Hence, real-world strategies produce both intended and unintended outcomes (Mintzberg, Ahlstrand, & Lampel, 1998). Strategies, if seen as human interactions, are a capacity to link actors with divergent interests, goals, and working procedures to realize certain goals (Daamen, 2010).

Acknowledging this capacity is of high importance, if we look at the complexity of communities in conjunction with changing roles of public