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Original research article

Of transitions and models: Community engagement, democracy, and empowerment in the Austrian energy transition

Nadejda Komendantova[a,b,*], Monika Riegler[a], Sonata Neumueller[a]

[a] International Institute for Applied Systems Analysis (IIASA), Austria
[b] ETH Zurich, Switzerland

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ABSTRACT

Energy transition towards a greater share of renewable energy sources and even energy independence based on local generation is ongoing in several regions of Austria. The Climate and Energy Model (CEM) regions are the major vehicles of this transition, which also assumes that investment into renewable energy sources will create socio-economic benefits for local economies. However, recent experience of such CEM regions as Güssing shows the need of holistic assessment of the transition process, including elements of participatory governance such as existing possibilities for inhabitants to engage into decision-making processes regarding energy transition in their community. The results of this paper are based on case studies of three CEMs: Freistadt, Ebreichsdorf and Baden. The data are also collected with the help of in-depth qualitative interviews with key stakeholders in the region and are analyzed based on the concept framework of the ladder of Arnstein. The results show typical level and forms of inhabitants' engagement into decision-making processes in three CEMs.

1. Introduction

Energy transition in Austria became a goal of political process on the way to energy security and climate change mitigation. Renewable energy sources (RES) and energy security are regarded by policy makers as major options to reach the goals of energy transition towards a greater independence from green house gas intensive fossil fuels imports. This goal is currently being implemented at the regional level through climate and energy model (CEM) regions [1]. Besides goals of energy security and climate change mitigation there is an expectation on socio-economic drivers for development of the CEM regions from investment into RES and energy efficiency.

Austrian policy-makers are hoping that the CEM process will be a driver for energy transition in the regions. But if we look at the term "transition" in its originally understanding, namely, beyond the political understanding of energy transition, the term means the following: "transformation process in which society changes in a fundamental way over a generation or more" [2]. Indeed, if we speak about transition in a societal and not in a political understanding, this means a social change, which follows the deployment of new technology. Patt points out that technological innovation has to be at the core of energy transition and that policies need to support new technologies quickly and directly [3]. New technology is a driver of energy transition and the transformation of so complex socio-technical system as energy system requires institutional changes, also to support technological innovation. As energy transition, according to Geels, requires a large-scale shift from one technology to another one, it requires not only technological changes, but also changes in culture, in markets and regulations as well as in industrial networks and infrastructure [4].

The CEM Güssing is a well-known example where deployment of RES was regarded as a driver for transition of the energy system of the region. With the help of subsidies several RES projects were deployed. In a decade, the region reached its goal, namely generation of energy supply, which was sufficient to cover regional energy demand, creation of employment in RES sector and induced impacts on regional economy in the form of several small and medium enterprises deployed in the region. Originally Güssing was regarded as a poorly developed and structurally weak region, which changed with energy transition. It was claimed that the success of this transition was based on the cycle economy when financial flows, which were originally needed to cover energy imports, remained within regional economy [5]. The CEM Güssing became an internationally recognized example of energy transition, which was replicated not only within Austria but also abroad.

However, the fact that CEM Güssing experienced energy transition in a societal and not a political sense of the word is questionable. Even based on the deployment of new technology, such as RES, it was still a top-down governance model implemented with the help of subsidies

* Corresponding author at: International Institute for Applied Systems Analysis (IIASA), Austria.
E-mail address: komendan@iiasa.ac.at (N. Komendantova).

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and driven by a couple of policy and RES private sector stakeholders. The fact that Güssing was implemented without significant support from inhabitants manifested itself in the year 2013 when the mayor of Güssing, who was the leader of RES transition, was defeated at the local elections. In fact, the CEM was jeopardised by the withdrawn of subsidies for the operation of biomass facility and the mayor lost support among inhabitants of his region when it became clear that the municipality was heavily in debt.[1] The Austrian government reacted on the experience of Güssing and a new program on engagement of inhabitants of CEM was developed. The so-called "flagship projects" program had such goals as to improve awareness about the need of energy transition and to provide opportunities for inhabitants to engage into the decision-making processes. However, as the program is existing only during the last couple of years, the evidence about successfulness of this program in terms of involving inhabitants into energy transition is limited.

The example of the CEM Güssing shows the need of a holistic approach towards such complex process as energy transition. Such approach can be based on analysis of socio-economical factors and available technological innovations but also it can include an understanding of human factors, such as acceptance and willingness to participate in energy transition. Also further research is needed on adaptation of the existing institutional structure to reflect the needed for energy transition societal changes. Even though the number of scientific works on so-called "soft factors" of energy transition, such as human behavior and institutional framework, is growing, at the time when this research was conducted, according to Sovacool only 3% of all cited by Scopus scientific works were looking beyond economic and technical factors [6].

Until now existing energy generation and transmission architecture was dominated by the traditional top-down governance approach when the decision making process was driven by politicians with the help of educated experts [7]. Such top-down decision-making process is typical for governance of critical infrastructure sectors, such as energy, which are relevant for national security. In contrary, participatory governance is using a more bottom-up, sometimes emergent and informal approach by involving a network of leaders and change agents. Participatory governance, which involves local knowledge, brings views of different stakeholders and is based on compromise solutions challenges the existing energy architecture and might lead to energy transition. Even though participatory governance of energy transition is a relatively new development, according to Linnerooth-Bayer, evidence exists from different kinds of infrastructure deployments that compromise solutions and involvement of local knowledge often helped to improve procedural and outcome justice of decision-making processes [8].

Energy transition requires a broader participation and changes in institutional structure. Involvement of additional stakeholders, including also people on the ground and inhabitants of the affected by transition or infrastructure regions, may be crucial to improve outcomes of decision-making processes. Conventional leaders typically operate within their formal roles at the same time as emerging leaders often operate voluntary and spontaneously and bring additional insight into decision-making processes on interdisciplinary and complex issues, which would require additional skills and approaches. Institutions represent patterns of behavior of all types and actors, which is reproduced and shaped by formal and informal rules and norms [9]. Therefore, energy transition requires a change in the rules and norms in society to implement and to integrate RES into power supply and demand. Participatory governance involves not only a change in decision-making processes at the institutional level but also at the individual level, leading to shifts in behavior of users and adopter of RES technologies [10].

[1] The objective of TERIM project (http://www.uni-graz.at/terim), "Transition Dynamics in Energy Regions: An Integrated Model for Sustainable Policies", was to understand and simulate transformation dynamics in two Austrian energy regions, Weiz-Gleisdorf in Styria and the ökoEnergieland in Burgenland.

In light of existing scientific works on participatory governance, this paper settles the question of how the participatory governance language is implemented in practice in the decision-making processes on energy transition in the Austrian CEM regions. Namely, which elements of participatory governance exist in the CEM process, how inhabitants are involved into decision-making processes and what can we learned from accumulated by CEMs experience.

Therefore, this paper settles the following main research questions: 1) what are the links between openness of decision-making processes and empowerment of inhabitants in the CEM regions?, and 2) how the effects of empowerment or the lack of it can be associated with results concerning transformation of energy systems in the CEM regions?

In the following chapters we are describing the background of the CEM process in Austria as well as the theoretical background on participatory governance. We provide detailed explanation of our methodology and data as well as the description of three cases studied in our research. In the results section we are summarizing our findings and discussing their relevance to existing research and remaining open questions in the discussion section.

2. Background

2.1. Climate and energy model regions in Austria

Austria has a target to reduce its greenhouse gas (GHG) emissions with the help of RES and energy efficiency. The Austria's goal is to increase the share of RES in the gross final energy consumption by up to 34% in 2020 and 78% in 2050 [11]. Besides climate change mitigation, the Austrian government assumes several other benefits in achieving this goal, for example: i) investment into RES as a socioeconomic driver for development; ii) hosting the RES project communities; and iii) achieving energy security through an increased share of locally produced RES and a decreased share of energy imports.

This national-level goal is currently being implemented at the Austrian regional and at local provincial levels. The Austrian Climate and Energy Fund (KLIEN) was established in 2007 to help Austria to achieve its climate and energy policy goals. The main vehicle for implementation is the regional process of CEM [1], which was initiated in 2009 by KLIEN. In 2015 there were 104 CEMs in Austria, covering some 2.5 million inhabitants: around 43% of the Austrian population [12]. The main aim of the CEM concept is to develop RES potentials and to improve energy efficiency in the CEM regions [16]. CEM can be also regarded as a policy intervention at the level of national and local government to stimulate deployment of RES.

Several strategies and plans for deployment of RES existed also before the introduction of the CEM process, but CEM is a first concept which brings together goals of climate change mitigation, energy security and socio-economic development policies at the regional level. In addition to achieving a high share of RES, some CEM regions even plan to become energy independent by 2050, namely, to generate all electricity they require from local RES. Although in its aim for independence from fossil fuels, the CEM initiative is a top-down one, the process also relies on a regional bottom-up approach.

The majority of CEMs are in intermediate or thinly populated areas. They are usually rural and structurally weak regions. The majority of CEMs are in the Eastern part of Austria. An average CEM has energy demand of 29.95 MWh, electricity demand of 6.59 MWh, heating demand of 16.72 MWh, and mobility demand of 9 MWh [13]. Moreover, the average CEM produces 33% of its own heating energy and 25% of its own electricity demand. The populations of the regions themselves vary in size from 1269 to 81,268. Each region should comprise at least two municipalities with a minimum of 3000 and a maximum of 60,000 inhabitants. The regions also vary in terms of the territory they cover, from 150 ha to 60,000 ha. However, an average region is around 40,000 ha [1]. The cluster analysis conducted by Bramreiter et al. [14] grouped CEMs into three clusters: suburban, semi-rural, and rural (Fig. 1).