CHALLENGES TO MAKE HEATING RENEWABLE: EMPIRICAL RESULTS FROM SIX EUROPEAN CASE STUDIES

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Overview

The EU climate and energy package, enacted in legislation in 2008, sets a target for a 20 % share of renewable energy sources (RES) on final energy demand for the European Union until 2020. That target as well as greenhouse gas (GHG) emission reduction and energy efficiency targets were translated into binding national objectives. The EU project progRESsHEAT aims at assisting policy makers at the local, regional, national and EU-level in developing integrated, effective and efficient policy strategies to achieve a fast and strong penetration of renewable and efficient heating and cooling systems.

In different countries and regions various potentials and barriers for using renewable technologies for heating can be identified. Barriers and preliminary recommended policies are presented based on empirical results of the EU progRESsHEAT project for six target countries across Europe: Ansfelden in Austria, Litoměřice in Czech Republic, Helsingør in Denmark, Herten in Germany, Matosinhos in Portugal and Brașov in Romania.

Methods

In order to identify barriers for the implementation of renewable energy or alternative technologies as combined heat and power several steps were undertaken. First a literature review was done in order to describe the current research results. Three types of barriers for implementing renewable heating and cooling technologies (financial-economic, institutional-structural/market oriented and perceptual-behavioural) were classified into supply-side barriers and demand-side barriers (Doble und Bullard 2008a, 2008b; Reddy 2013):

- **Supply-side barriers**: inhibitive factors for the *implementation* of renewable heating and cooling (RES-H/C) technologies.
- **Demand-side barriers**: inhibitive factors for the *use* of renewable heating and cooling (RES-H/C) technologies offered by the supply side (either resulting in them using an alternative non-renewable fuel or in deciding not to replace existing heating equipment entirely).

Working together with stakeholders is crucial in order to overcome the depicted barriers. For that reason a stakeholder analysis based on literature (among others Reddy 2013) was made identifying the most relevant stakeholders to be authorities (national/regional/local), final energy consumers (businesses/households), energy suppliers, technology suppliers (local professionals, producers of technologies) and others (finance corporations and insurance companies, energy agencies and energy advisors, action groups, media as well as research and development institutes).

Drawing on this base from literature the barriers and stakeholders in the case studies were identified. For this reason project documents and information material from the municipalities had been analysed. In addition qualitative interviews were conducted with local stakeholders using an interview guideline. In order to gather more reliable information on a broader basis at the local level, a quantitative survey was conducted in each case study. The purpose has been to obtain information on what hinders and what fosters the use of RES heating and cooling technologies. The topics and target groups of the surveys were developed together with the scientific and local partners. The surveys were conducted in the period from June 2016 to January 2017 with different issues and target groups (households, companies and technology designers and installers) depending on the research question most relevant for each case study. Whenever possible, information from the interviews ans the surveys was crosschecked against publicly available data and against the evaluation of the scientific team of this project.

Empirical Results

As empirical results show (Chassein et al. 2017a; Chassein et al. 2017b), the most relevant barriers regarding the use of renewable energy for heating and cooling across almost all case study cities are financial constraints for investing in renewable energies (all case studies), lack of awareness about renewable energy options (AT, CZ, DE, PT, RO) and lack of information and demonstration sites (CZ, DE, PT, RO) that could otherwise serve as best practice examples. Other problems are an insufficient grid due to several reasons (CZ, DE, RO) and concerns due to cultural or historical issues (PT, RO). The depicted barriers may exist in all case study cities to some extent but they do not have high relevance for all cities.

It is necessary to have a mix of policy instruments (command-and-control instruments, incentive regulation instruments and knowledge building instruments) for the successful deployment of renewable energy for heating and cooling. The instruments can address either the supply side (several diverse stakeholders) or demand side (consumers). Another significant factor is the involvement of all relevant stakeholders (energy supplier, professionals, administration, political leaders and end users) as described in more details by Chassein et al. (2017a; 2017b). Policy measures available in the case study cities address these barriers at different degrees. This has been evaluated in individual fact sheets for each case study according to criteria based on several documents and empirical results (from Holländer et al. 2016, individual fact sheets not published).

In order to enhance the use of renewable energy for heating and cooling, a combination of framework conditions and activities is required (so called success factors). In every case study analysed several success factors were identified that can serve as a role model for other cities. Examples for success factors are: a round table which regularly discusses energy topics and a forum for enterprises (Litoměřice), various courses for energy advisers, professionals and representatives of municipalities provided by the Energy Academy of the Oberösterreichische Energiesparverband (Ansfelden), several “demonstration districts” (Herten), introduction of a new business model (Helsingør), construction regulations imposing the installation of solar thermal systems in new constructions (Matosinhos), monitoring and evaluation of public buildings (Brașov).

Conclusions

The barriers and their priority differ considerably between case studies due to differences in context factors. In some countries the progress of renewable heat utilisation is more advanced than in others. Despite that differences success factors and motivated stakeholders can be found in every case study.

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