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BOOK OF ABSTRACTS



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Richard Büchele is a research associate at the Energy Economics Group at TU Wien. He holds a degree in electrical and power engineering with focus on energy economics and energy supply. His work focuses on integrated strategic heating and cooling planning and analysis on different regional levels and favourable policy frameworks for renewable heating and cooling options.

Integrated strategic heating and cooling planning on regional level for the case of Brasov

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To reach the climate goals of the COP21 meeting in Paris it is essential to also decarbonise the heating sector. But because heating and cooling cannot be transported over too long distances its issues mainly appear on local and regional level and there is no system-wide solution. In former times there was no planning effort given to heating and cooling supply and the sector developed according to pure economics, availability and preference of technology without taking into account climate targets or long-term issues. To exploit the decarbonisation potential of the heating and cooling sector, integrated methods are needed on how to perform strategic heating and cooling planning on local and regional level. This planning process should include long term targets and the assessment of different heat saving and low carbon heat supply options accompanied by intensive and target-group oriented information campaigns and involvement of all stakeholders in order to ensure the achievement of the desired objectives. For example, district heating (DH) in general is seen as an important technology to decarbonise the heating sector mainly in urban areas. Especially DH needs an integrated planning approach including the development of heat demand into the assessment and to ensure a certain heat density by guaranteeing enough consumers making DH an economic effective solution. In this paper, the method and the results of an integrated strategic heating and cooling planning process performed for the case of Brasov is shown and certain parts of the process will be highlighted.

The method for the integrated strategic heating and cooling planning process presented in this paper is based on the case study of the municipality of Brasov, located in the centre of Romania, and was mainly developed within the Horizon 2020 project progRESsHEAT (Grant agreement no. 646573). The performed steps of the quantitative part within the planning process include: (1) Calculation of costs and potentials for heat savings for different building types. (2) Calculation of costs for heat supply with different individual heating technologies for the different building types. (3) Modelling of the existing district heating system and possible alternative supply portfolios for the future of the district heating system in energyPRO¹ to obtain the

district heating supply costs and the sensitivity of the costs to disconnection or to additional costumers. (4) GIS based analysis to divide the municipality into different types of areas according to the availability of a current district heating network or the feasibility and costs of expanding the network into adjacent areas. (5) For all building types and all areas within the municipality the most economic combination of heat saving level and the supply with district heating or individual technologies is calculated. The results of the assessment show that at least a certain amount of heat savings, if performed when maintenance work is needed anyhow, is cheaper than all assessed heat supply options for all building categories. This applies especially for the old parts of the building stock but also for newer buildings. For the heat supply options chosen in combination with the most economic heat saving, the result is subject to the assumed framework conditions: Depending on energy prices, taxes, interest rates, depreciation times and the buildings characteristics, the cheapest combination with heat savings are natural gas boiler, heat pumps or biomass boiler. All assessed supply technologies have heat generation costs close to each other and their economic viability depends on the framework conditions. Especially the economic efficiency of district heating highly depends on the achieved share of connected customers within the network area. This shows the importance of integrated strategic heating and cooling planning to evaluate the needed framework conditions facilitating the implementation of cost optimal combination of heat savings with renewable and low carbon heating technologies.

¹energyPRO is a modelling software developed by EMD International, <http://www.emd.dk/energypro>