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SCENARIO MODELLING FOR MUNICIPAL ENERGY TRANSITION IN THE BALTIC SEA REGION

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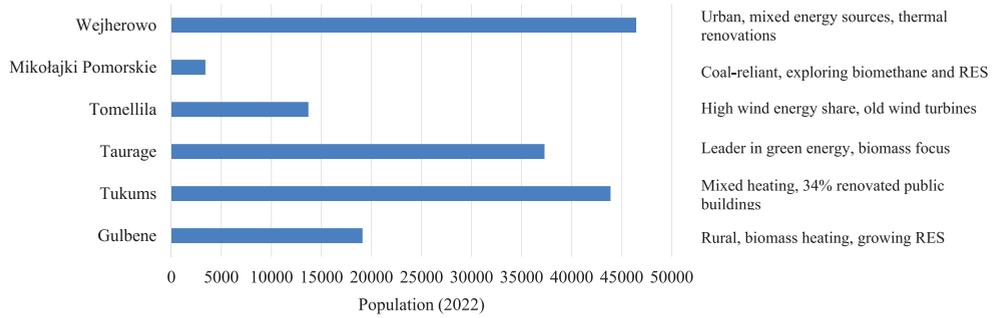
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Abstract – In the context of the EU Green Deal and the Paris Agreement, the transition to renewable energy sources and the deployment of energy storage systems are fundamental for a sustainable and low-emission tomorrow. However, given the diversity of municipalities in terms of resources, infrastructure, and socio-economic conditions at local energy transition level, main actors face numerous challenges related to the implementation of new renewable energy generation projects, lack of capacity to initiate, install, and develop new projects, for which the underlying unifying factor is economic and lack of knowledge/specialists. Hence there is a need for a modelling platform that can model scenarios for the deployment of different energy generation/storage technologies in municipalities, thus saving financial resources and assessing risks and potential before the actual deployment. This research paper is a follow-up to previous publications in which the authors characterized Baltic Sea region municipalities through benchmarking and identified their storage potential and engagement in the energy transition. The focus of this case study, however, is the development of a modelling platform using systems dynamics approach to provide local public authorities support in decision-making for energy system planning. The model was validated and piloted in six municipalities – Tukums, Gulbene, Wejherowo, Tomellila, Mikolajki Pomorskie and Taurage. A scenario modelling approach based on existing municipal parameters was used for piloting. The study reveals the outcomes of different simulated scenarios in each of the municipalities and provides insights and resources to address the challenges of energy storage deployment. The study analyses the potential and means of municipalities to move towards an energy transition, but each municipality is different, and one approach does not fit all. The findings mainly address renewable energy production, storage, costs and emissions. The results of the pilots are a useful tool for municipalities to understand possible actions to reduce emissions, become more sustainable to meet EU targets whilst maintaining a stable and reliable energy supply.

Keywords – *Energy efficiency; energy policy; energy storage; energy sustainability, energy transition; municipality*



Pilot municipalities and their key characteristics

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