

# COMMUNITY ENERGY MANAGEMENT SYSTEM BASED ON THE CONCEPT OF *PUBLIC GOVERNANCE*

## Abstract

In the dissertation, an attempt was made to develop a model of the community energy management system based on *Public Governance*, which is one of the public management concepts. The main goal of the study was to evaluate the current energy management system at the municipal level in Poland based on the efficiency criteria, and to propose an alternative concept of such a system based on the experiences of other countries. The alternative model was developed on the basis of Danish experience, whose competence in participatory energy management can be considered as a good example for other countries.

According to the assumption accepted and justified in the empirical part of dissertation, energy systems operating in European countries significantly influence the process of energy management in local government units. Therefore, energy management systems on the municipal level operate more efficiently in countries in which the central energy systems are more efficient. On the other hand, the measurement of the efficiency of an energy management system using national data reflects the efficiency of such systems on the municipal level.

To evaluate the efficiency of the energy management system in Poland and to identify the benchmarks, the multidimensional statistical analysis (including linear ordering and hierarchical agglomerative clustering) was employed. The study was based on data characterizing the energy management systems of 17 European countries in 2005, 2010 and 2014. The empirical analysis indicated relatively low multidimensional efficiency of the energy management system in Poland, including a municipal level. The hierarchical agglomerative clustering as a method of distance (similarity) evaluation for multidimensional objects, supplemented by a qualitative analysis of the best energy management systems, allowed the identification of a benchmark (Denmark). On the basis of Danish experience a model of the community energy management system for Poland was developed. The search for the benchmarks characterized by the high efficiency of community energy management systems was based on both quantitative as well as qualitative approach. The research allowed to draw the conclusion that the most efficient approach in developing local energy management systems is, next to the professional energy planning, the use of social capital building methods, which is embodied in the concept of *Public Governance*. The model proposed can serve for planning of a community energy management system, its implementation, control and monitoring of its implementation and operation, and finally, corrective actions to improve the system.