

Microgrid calculation with the multi-criteria decision analysis

Olha Shulyma, *PhD Student*; Vira Shendryk, *PhD, Associate Professor*
Sumy State University, Sumy

The process of energy management requires several judgments of different fields. So the best solution is the using the multi-criteria decision analysis (MCDA) in creating Decision Support System (DSS).

The main goal of this work is to define the state of the knowledge in the field of the using in MCDA order to improve calculation of the renewable energy for electricity generation in microgrid.

The method NAIADE helped to find a compromise solution in the fuzzy decision-making environment [1]. The approach proposed the using of the five alternatives, wind turbines are used to initially determine the power and the quantity. In [2] is described an approach to building DSS that uses software HOMER, as a way of calculating and determining the best design MicroGrid. The using of an integrated system is proposed, that uses solar and wind energy are calculated every hour. According to [3] is constructed a system of distributed energy management in buildings in real time Capo Vado (Liguria Region), which allows to determine the optimal flow of energy in the building and is characterized by a combination of renewable resources.

It can be concluded that there are many the disparate approaches of MCDA. Next step is aimed to create system, which can count technical parameters of devices, give recommendations for their optimal combination and also simulate operation of the grid.

1. T.V. Ramachandra (2009). RIEP: Regional integrated energy plan. *Renew Sustain Energy Rev*, 13(2), 285–317.
2. M. Muslih, Y. Abdellatif (2011). Hybrid Micro-Power Energy Station; Design and Optimization by Using HOMER Modeling Software. *Proceedings of the 2011 international conference on Modeling, Simulation & Visualization methods*, 183.
3. H. Dagdougui, R. Minciardi, A. Ouammi, M. Robba, R. Sacile (2010). A dynamic optimization model for smart micro-grid: integration of a mix of renewable resources for a green building. *Proceedings of International Congress on Environmental Modelling and Software*.