

## **“Method to quantify the energy droughts of renewable sources based on historical and climate change projections data”**

In recent years, the growing importance of renewable energy sources in the national energy mix has been observed. Wind and photovoltaic generators play a dominant role here. In the future, it is expected that the majority and ultimately all of the energy demand will be covered, inter alia, from the above-mentioned energy sources. Despite many advantages, such as a low impact on the natural environment or a low cost of producing a unit of electricity, these sources are characterized by a very strong variability that depends on weather conditions. These in turn cannot always be predicted with a satisfactory accuracy. Therefore, basing our power system on non-disposable sources raises justified doubts.

The project focuses on the analysis of extreme phenomena understood here as energy droughts. These are periods of prolonged low supply of electricity from wind and/or solar sources. The supply of energy from these sources then relates to the demand for energy in the national or local energy system. The research carried out in the project will be based on historical data and climate change projections in order to develop a unique atlas of the characteristics of extreme renewable sources phenomena in Poland. Based on the new author's metric of classification and description of energy droughts, knowledge about renewable sources in Poland will be supplemented with their thorough analysis from the point of view of the changing nature of their operation. Historical trends of changes in the potential of wind and photovoltaic generation sources will be subject to additional research, along with potential trends in the future based on the climate change projections.