STUDY AND DEVELOPMENT OF THE TECHNOLOGIES OF RENEWABLE ENERGY AND SMART GRIDS FOR IMPLEMENTATION IN THE REPUBLIC OF KAZAKHSTAN

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INTRODUCTION.

Besides traditional energy sources, Kazakhstan has a huge potential for development of renewable energy. The research and development of autonomous energy systems and smart micro grids, which can operate independently or interact with the traditional power grid using renewable energy and energy efficient technologies, is the mainstream research area in the world and can be very effective for use in our country.

MATERIALS AND METHODS.

We have applied the method of control with power filters [1].

RESULTS AND DISCUSSION.

We have established and put into operation an autonomous smart house which can satisfy the needs of an average person (Fig. 1); designed and implemented control system for the integration of renewable energy sources into the University main electricity grid, and an automatic braking system for existing wind turbines with nominal power of 2, 5 and 5 kW [2-4].

Figure 1. The autonomous smart house at Nazarbayev University.

CONCLUSIONS.

The results presented confirm the feasibility of the use of renewable energy sources in the environmental and weather conditions of Kazakhstan; they open new challenges and directions for further research in the area of energy-converting devices, integration into the main electricity grid, and data acquisition systems for renewable energy sources.

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