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PERSPECTIVES OF SMALL-SCALE HYDROPOWER ENGINEERING IN UKRAINE

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Abstract – Every country takes care of energy independence and security by using different energy sources and remarkably increasing electricity production by renewable energy sources. Ukraine is not an exception, especially when the energy infrastructure is significantly damaged during the war and there is a lack of capacities in the energy system. Because of this, the Government of Ukraine is planning a number of measures to launch systems of domestic mini-power plants. Ukraine has favourable conditions for developing the network of small-scale hydropower plants. While the hydropower potential of the largest Ukrainian rivers is used, the potential of small rivers is used only partially. The small-scale hydropower plants were built during the last century very actively. In 1912 the first small-scale hydropower plant was built. From 1923 to 1960, there were 956 hydropower plants with different capacities from a few kW to a few MW. However, at the end of the 1980s, the interest in small hydro decreased because of the construction of the large hydropower plants in the river Dniester and Dnipro, heat and nuclear power plants. Only 49 plants were in operation. Since 1995 the interest in small hydro has increased again. Nowadays, there are about 150 hydropower plants in operation. The paper examines the past and present state of small hydropower plants and perspectives on their development in the future, both by building new or reconstructing existing power plants. The list of hydropower plants with a short description of possible reconstruction is given. Moreover, the way of reducing the negative influence of hydropower plants on the environment is studied. Taking into account the energy issues in Ukraine, the possibilities of off-grid operation of hydropower plants are considered. The importance of energy security was evident from the issues that Ukraine is recently facing. Building new and reconstructing old small-scale hydropower plants will help to ensure the energy security of other types of electricity generation.

Keywords – *Energy security; environmental impact; hydropower potential; renewable energy sources (RES); small hydropower plants (SHPPs)*

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