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THE EFFECTIVE HYDROPOWER POTENTIAL OF THE MSZANKA RIVER IN
SOUTH POLAND – THE COURSE OF ESTIMATION

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The resources of power engineering raw materials are limited. The energy generating in conventional power plants is connected with emission of many pollutants to the environment. For these reasons, the technologies based on renewable sources are currently strongly promoted. Producing energy from these kind of sources brings no pollutants so is usually called “clean or green energy”. Energy of water, or to be more precise energy of rivers, is one of the types of renewable sources that are being developed from many centuries in many countries on the Earth.

The aim of the paper was to calculate the actual (called “effective”) hydropower potential based on the identification of real possibilities of small hydro power plants realization. The term “effective potential” was proposed in previous articles with explanation of the sense and course of action. The quantitative assessment of the hydropower potential is most often restricted to present value of theoretical, technical and economic potential. In practice there is a lot of procedural regulations that could block erection of a hydropower plant, even in the conditions when its execution would be possible technically and economically. Execution only of these installations is especially important within sustainable development idea. The “effective potential” allows estimation of production of energy from the given river with the method closest to the real possibilities of execution of new hydropower plants. Authors believe that the term could be in common use.

As an example river Mszanka in South Poland was chosen. The course of estimation was shown in Polish conditions of law, procedures and environmental barriers. The comparison of estimated values of effective potential was done with theoretical and technical potential. The paper shows basic information on the Mszanka River in accordance to hydropower possibility and characteristic of the flows. Stationary observations of water level and flows on the Mszanka river are conducted by the Institute of Meteorology and Water Management – National Research Institute. There is an one measurement gauge post operating within the national surface observation network along the Mszanka river. The paper consists of a computational part containing calculations of theoretical potential, technical potential and “effective” potential. The location of potential new small hydropower plants was proposed in places of possible energy use and was checked for possible limitations in Poland conditions. Finally, the results of calculations were compared. The results of the analysis shows that only about few percent of the theoretical potential could be realize in the real conditions of existing law and environmental limitations.

The Mszanka river in southern Poland has been selected as the example, but the course of the analysis seems to be universal for investments in other countries where procedures may be differ significantly. The resulting “effective potential” provides the actual view on the hydropower generation capacity of the analysed river.