

4. Hydropower and Other Renewable Energies

Development of New Micro Hydropower Turbine

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There is a huge of available hydropower potential in the water supply system (WSS) that has been abandoned. Each time when we use a water faucet, the power of 10 to 80 watts is dissipated. In fact, this dissipated energy can be converted to useful energy by hydraulic turbine. Presently, there is not suitable turbine to use in WSS. Therefore, the new type turbine is needed to explore. In this study, Positive Displacement Turbine (PDT) is proposed.

The main objective of this study is to develop new turbine that can be used to extract micro hydropower potential of WSS more efficient than the traditional turbine.

In this study, in order to be able to compare the performance characteristics of the new turbine with traditional turbine, one traditional turbine, small impulse turbine, has been tested applying the same test-method as PDT test-method. Moreover, the effect of the different side clearances of PDT to its performance is also investigated.

The model test results showed that PDT has much higher efficiency than traditional turbine and it can hold the high efficiency under the wide range of operation condition. In addition, the efficiency of the turbine has been improved when reducing the side clearance.