Planning of Installation and Demand Side Management of a Pico Hydro Power Plant
in a Rural Area

Small hydro-power installation in a rural community paves the way to economic
development and positive environmental impact of the area. Kuromori Pico Hydro
ower Plant (PHPP), a demo-project of 1st Center of Excellence (COE) program of
Tokyo University of Agriculture and Technology (TUAT), is capable of generating
continuous power of about 515 W. Here, installation of a PHPP in a rural area and its
output evaluation is discussed in this study. Different methods are applied to
investigate the proper site of installation by field survey. In the future, this type of
small source can be increased to some numbers which is possible to be connected
with one another working as a micro grid system to supply electricity independently
according to the necessary demand. To optimize the plant generation, a proper load
management is necessary. The objective of the study is to develop a low cost Pico
hydropower and to examine its feasibility in actual field. It is supposed that a barrier
of small hydropower is the investment cost. Even very small hydropower of 0.6 kW
costs 4 million yen in an example (including the cost of application side). In other
words, the unit cost is approximately as high as 7 million yen/kW. It is incredibly
high compare with that of conventional co-generation power plants. In order to
make a Pico hydropower an alternative, the plant must be designed in an
appropriate way for very small scale. It is the aim of this paper to allocate and
schedule properly the load or demand using the concept of Demand Side
management (DSM). Ways and means of utilizing energy from a dummy load will
also be dealt in this study to maximize the usefulness of the generated power from
the plant.
کلمات کلیدی:
Decentralized Power Generation, Pico Hydro Power Plant, Micro Grid, Demand Side Management, and Electronic Load Controller.

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