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SMALL AND MICRO HYDRO

CASE STUDY/INSIGHT

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Though hydropower is in use for over a century, there has been significant growth in mini and micro hydropower in Asia in the past decade. Several country level government programmes, technical assistance and support from donor organizations are the key reasons for the development of mini and micro hydropower generators

The definition of micro, mini and small hydropowers varies from country to country. In general, Pico hydro is a very small-scale power generation up to 10 kW and micro hydro is less than 100 kW capacity. Mini hydro ranges from above 100 kW to less than 10 MW.

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The advantage of small hydropower plant is its cost effectiveness and reliability in providing clean electricity. Small and micro hydropower systems can be installed in rivers or streams with little or no negative environmental impacts and most of the systems do not require a dam.

Micro hydro power generation is a good option for rural electrification and several such plants are in operation in developing countries serving rural communities. The electric power generation potential is proportional to the height (head) of water, flow rate and hydraulic efficiency of the turbine. The efficiency of these hydro plants range from 60-80%. The efficiency of hydro power plants increases with the increase in size.

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In general, the operating life of a hydropower plant is much higher than the conventional power plants. It also requires considerably less labour for operation. There are several equipment suppliers in India and China supplying low cost mini and micro hydroplants. However, life cycle cost should be taken into account before buying the hydropower plant.

Small/Mini-hydropower plants of several MW on the other hand involve considerable investment, which should normally be based on reliable multi-annual water flow measurements and professional feasibility studies. The business model for running such a plant requires formal management and maintenance structures and must also be in line with the rules and regulations for electricity generation and distribution.

Pico-hydropower plants for instance are mostly used at a household level. Because the Pico-hydro technology is low cost and not particularly sophisticated, these plants are normally installed by local craftsmen on the basis of tacit knowledge and without a feasibility study. Most Pico-hydro plants are maintained by household members and thus do not involve electricity fees.