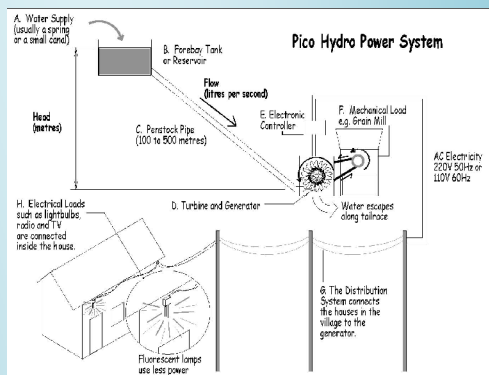


PICO HYDRO FOR OFF GRID ELECTRIFICATION



WHAT IS PICO HYDRO

Pico hydro is the term used in hydro electric power. It's utilizing the height difference (Head) of flowing water (Flow) to run the hydraulic turbines that coupled with electric generator producing electricity. The pico refers to the size of electric power produced, it's in the range of few hundred watt up to 5 kW.



Pico hydro can be used for powering the small village with 20-50 houses, villa, hotel, cottage, temporary camp or public facilities in the remote area. It's also can be combined with existing power supply from the grid, diesel or other renewable energy resources to reduce the electricity bill.

ADVANTAGES

Pico hydro has many advantages comparing to other type of energy utilization. It's much cheaper comparing to photovoltaic and wind power system with the same power output. It's generated AC electricity thus no need of storage battery, inverter and can be used directly for electric appliances.

The compact and robust size of equipments make it easy in transportation and installation even to very remote area, no need large workmanship and special equipments to install. It can be built and installed by the villagers and technician under guidance of the expert.

Pico hydro can utilize the small stream on the private property, irrigation canal or even water supply system. The ideal drop of height is around 15 meters, even though the site with lower drops below 10 meters still also feasible. The higher the drops mean that smaller water are required to generate the same power as well as the size of pipes and turbine are also smaller, thus less expensive.



In many cases no need special permission to build it especially for village electrification and private property. It's from renewable resource therefore expected to reduce the carbon emission from fossil fuel use.



The key benefit of pico hydro is operational and maintenance cost. The operational cost is nearly zero, since no need to buy fuel or special material to operate it. An operator is required to start/stop the plant as well as maintain the water availability. No need special maintenance of equipments besides greasing of turbines and cleaning the trash on the water ways. The simple equipments and widely available spare parts make it easy in repair in case of damage.



THE MAIN SPECIFICATION:

Head range	:	8 – 30 meter
Flow range	:	25 – 150 l/s
Power	:	1 – 5 kW
Piping	:	4 – 8 inch

TURBINE

Type	:	Cross flow
Runner diameter	:	100 mm & 130 mm
Width of runner	:	30 – 120 mm
Transmission	:	Pulley with V belt
Material	:	Mild steel

GENERATOR

Type	:	Synchronous with brushes
Phase	:	1 phase
Voltage	:	120/220 Volt
Frequency	:	50 Hz
Power	:	3 kW or 5 kW

CONTROLLER

Type	:	Electronic load controller (ELC)
Phase	:	1 phase
Voltage	:	220 Volt
Frequency	:	50 Hz
Power	:	3 kW or 5 kW
Dummy load	:	Tubular air heater



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