



## Contact

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# Resource use

## Mahagnao Micro-hydro, Philippines

The Mahagnao Micro-hydro Demonstration Project, Philippines, utilised a relatively small existing reservoir to provide off-grid electricity to small, remote communities.

### Overview

The Mahagnao project is located at the west foot of the volcanic range, consisting of Mt. Perker, Mt. Noburas and Mt. Gumdalita in Barangay Mahagnao, Burauen. The power plant is situated half kilometer downstream from the outlet of Mahagnao Lake within the buffer zone of Mahagnao Volcano Natural Park.

The Mahagnao Micro-hydro Demonstration project is unique in that the system can operate as either a run of river or a storage type power station, depending on the demand for power and hydrological conditions at the time. The plant ordinarily operates as a run of river power station, but switches to storage mode when demand for electricity exceeds run of river capacity.

The ability to switch modes of operation is facilitated by the construction of a trench to carry water to the power station intake, rather than the more traditional weir structure across the Lake outlet.

The project aims to demonstrate that off-grid micro-hydro schemes are economically feasible for small remote communities if a simplified maintenance program is adhered to. The scheme was commissioned in 2002 and supplies off-grid electricity to 3 upland barangays comprising a total of approximately 300 households

### Scheme Specifications

#### Dam Name

**Scheme operator**  
Philippine Dept. Energy  
New Energy  
Foundation of Japan

**Size of scheme (MW)**  
0.065

**Country**  
Philippines

**Catchment area**  
3.3 km<sup>2</sup>

**River**  
Awasan

**Effective reservoir capacity**  
Run of river

**Construction years**  
2001-02

**Reservoir size**

### **External Recognition**

2nd Runner-up, 2004 ASEAN Energy Awards, New and Renewable Sources of Energy Category

### **Details**

The Mahagnao Micro Hydro Demonstration project is an excellent example of efficient and effective resource use. The scheme takes advantage of the Awasan River, a relatively small river system within the buffer zone of the Mahagnao Volcano National Park.

The ability to operate the scheme principally as a run-of-river system takes advantage of the natural flows in the river with minimal alteration of downstream flow regimes and reduces the need to create a storage that would inundate significant areas of environmentally sensitive land. However, the creation of a small pondage enables the plant to operate during periods when electricity demand exceeds natural flows.

### **Other aspects**

#### Demonstrated need

Isolation from the electricity grid and the small population inhabiting these barangays prohibited connection to the Philippine national electricity grid. Prior to the installation of this scheme, lack of electricity availability was resulting in a poorer lifestyle for these communities and was limiting the local economy.

#### Local capacity building

The hydropower facility is managed and maintained by the local government, requiring training and up-skilling of local personnel. In addition, access to electricity enables community members to learn to use computers, fiber stripping machinery and other electricity dependent equipment.

### **Further Information**

Source: Hydropower Good Practices Workshop, Annex VIII - Examples for Good Practice Report, Villach, Austria, October 2005. International Energy Agency.

<http://www.eppo.go.th/inter/phil2004/ASEAN-amem22.html>