CASE STUDY 8: PHILIPPINES – GRID-CONNECTED SOLAR PV – HYDRO HYBRID DEMONSTRATION

Barriers	Lack of project development experience for grid-connected PV technology
Instrument	Contingent project development grants
Application	Loan converting to a grant after 5 years of successful operation
Amount	US$4 million

PROJECT BACKGROUND AND OBJECTIVES

The CEPALCO Distributed Generation PV Power Plant project involved building a 1MWp solar PV plant on the island of Mindanao in the Philippines. The grid connected PV plant is located 5km from a business park on an urban fringe, which provides a local load centre. The plant is designed to provide power during daytime peak hours and to be operated in conjunction with a 7MW run-of-river hydro plant. By combining the two plants the project is able to achieve full dispatchability. The plant began operation in 2004.

The objective was to demonstrate the technical and operational feasibility of a grid-connected PV plant in a developing country and to demonstrate its operation in conjunction with a hydro plant. The convertible loan structure was intended to create incentives toward achieving the demonstration objectives of the project.

INSTRUMENTS USED

The project received a US$4 million convertible loan from GEF (administered by IFC) with the remaining portion of financing (US$1.8 million) coming from the utility (CEPALCO). The convertible debt provided debt financing through which the debt was forgiven in return for successful operation and the sharing of information.

INSTITUTIONAL ARRANGEMENTS

IFC acted as the executing agency for the GEF funds to be disbursed to CEPALCO for this project on behalf of the World Bank as the GEF's Trustee and one of its three Implementing Agencies. The GEF loan was made directly with CEPALCO without an intermediary on-lending mechanism.

Under the terms of its agreement with the IFC, CEPALCO operates the plant and provides data on performance, O&M, and power output, as well as CEPALCO's custom load and the cost and availability of other power suppliers. The GEF loan can convert to a grant after five years of operation if specific conditions are met.

OUTCOMES

At the time when the project was conceived it was expected that solar PV panel prices would fall in the future. In that case, projects of this type were expected to become viable without subsidisation (which was provided through the GEF grant) and this project would have served to reduce the first-of-a-kind barrier to wider implementation.

From the start of its commercial operations on September 26, 2004, the PV plant has exported to CEPALCO a total of 4,169,100 kWh or an average of 1,389,700 annually, which is 10% higher than the expected annual energy generation of 1,261,400 kWh. At its current generating capacity, the PV plant supplies the equivalent requirement of no less than 900 CEPALCO residential customers.

Further reading:

CEPALCO website – click here

IFC, Selling Solar: Lessons From more than a Decade of IFC's Experience, 2007 – click here

USAID, Philippine Utility-scale Photovoltaic Case Study, 2009 – click here