



# Global Environment Facility

September 6, 2000

Dear Council Member:

The World Bank, as the Implementing Agency for the project, *Philippines: CEPALCO Solar Photovoltaic Demonstration Project*, has submitted the attached proposed project document for CEO endorsement prior to final approval of the project document in accordance with World Bank procedures.

The Secretariat has reviewed the project document. It is consistent with the proposal approved by the Council in May 1999 and the proposed project remains consistent with the Instrument and GEF policies and procedures. The attached explanation prepared by the World Bank satisfactorily details how Council's comments and those of the STAP reviewer have been addressed. I am, therefore, endorsing the project document.

We have today posted the proposed project document on the GEF website at [www.gefweb.org](http://www.gefweb.org). If you do not have access to the Web, you may request the local field office of UNDP or the World Bank to download the document for you. Alternatively, you may request a copy of the document from the Secretariat. If you make such a request, please confirm for us your current mailing address.

Sincerely,

cc: Alternates, Implementing Agencies, STAP

# OFFICE MEMORANDUM

**DATE:** August 15, 2000

**TO:** Mr. Mohamed El-Ashry, CEO/Chairman, GEF

**FROM:** Lars Vidaeus, GEF Executive Coordinator 

**EXTENSION:** 34188

**SUBJECT:** *Philippines: CEPALCO Solar Photovoltaic Demonstration Project*  
**Final Council Review/CEO Endorsement**

1. Please find the electronic attachment of the Project Document for the above-mentioned project for review by Secretariat staff, prior to your final endorsement. The project was endorsed by the GEF Council in May 1999. This final GEF document reflects the project's further development and appraisal by the International Finance Corporation. The project is designed as a full-sized, operational demonstration of the pioneering PV-Hydro Conjunctive Use Initiative, which is being supported by the GEF and the German Government and designed to develop, in time, a large commercial market for grid-connected PV-generating plants throughout the world.

2. The project document is fully consistent with the objectives and scope of the proposal as endorsed by Council as part of the May 1999 work program and reflects comments made during work program endorsement by GEFSEC, STAP and Council members as follows:

In response to suggestions made by the STAP reviewer, it can now be confirmed that the project will be situated in a single location and not be spread among numerous individual rooftop installations. The location selected is adjacent to the city of Cagayan de Oro. The project will be fully integrated into an existing 13.8 kV distribution feeder, thereby creating distributive generation benefits by delaying the need for substation expansion. It will only be some 30 km. distant from the conjunctive use hydro project, which is connected to the same subtransmission feeder system.

The maximum daily output of the 1 MW PV power plant will be about 3.6 MWh per day. The storage capacity of the Bubunawan hydro plant is equivalent to 7 MWh. Hence, the hydro project can comfortably "store" the equivalent water "saved" by the PV plant's output, making it available for those periods in which sunshine is not available.

With respect to replicability, the nominal 360,000 MW of existing hydro power plants in developing countries should be able, in time, to yield the estimated target of the PV-Hydro Conjunctive Use Initiative of 4,000 MW. It is projected that this level of demand would help to expand the worldwide market for PV cells to entice the PV manufacturing industry to build the required new, more cost-efficient PV module and balance of system

manufacturing facilities needed to bring PV generating costs down to competitive, commercial levels.

In response to comments made by the German Council member, a copy of the study terms of reference for the parallel, GEF-supported PV-Hydro Conjunctive Use Initiative is available as reference document No. 5. These terms of reference clearly link the project to the larger, worldwide PV development objectives of the PV-Hydro Initiative.

The Council member from France questioned the utility of installing a modest-sized 1 MW PV generating plant in a developing country. She rightly states that most of the technical issues of incorporating PV generating plants into network power systems have already been solved by previous installations in developed countries. However, none of the existing 1 MW and larger, grid-connected installations in developed countries have been built for the purpose of conjunctive use with existing hydro facilities. It is this feature which allows the conversion of low-value, interruptible PV supplies into firm peakload energy. In this respect, the CEPALCO Project will be the first practical demonstration of this operating mode anywhere in the world.

It is readily apparent that, at present, there are more cost-effective technologies available to supply peakload energy to power systems. However, the purpose of the CEPALCO Project is not to compete head-on with alternative generating technologies on the basis of cost-efficiency, but to demonstrate that PV can be used as an effective and technically reliable source of such power, in anticipation of a future market large enough to bring PV supply prices into line with the costs of alternatives.

The Council member from Switzerland questioned the rationale for installing a grid-connected PV generating plant in a developing country, rather than doing it first in a developed country. However, there already exist some 15 to 20 grid-connected PV power plants of 1 MW and up, all of them in developed countries. Technically, all of them operate satisfactorily (see reference document No. 3). However, none of them operate in conjunction with a fully integrated hydroplant. Opportunities for such combined operations are far more numerous in developing than in developed countries because the former have many water-constrained hydro plants. Developing countries in the tropical and sub-tropical zones also have by far the most intense solar insolation. This high insolation directly and positively affects the net output and hence, the economic viability of PV power plants. Therefore, the PV-hydro combined types of plants are uniquely suited for developing countries.

Also in response to another Swiss comment, detailed simulations of the optimized PV-Hydro combined operations have now been included in the project appraisal document.

The Council member from Switzerland questioned the location of the project. Cagayan de Oro has been chosen for the project because the area is served by one of the more forward-looking and efficient private power utilities in the world, with a strong commitment to promote the use of renewable energy. Such a commitment by the owners and management of the plant, plus high technical competence of staff, are considered to be important assets for successfully operating a full-scale demonstration plant that can

serve as a model for developing country utilities around the world. Cagayan de Oro is a well-developed, thriving provincial city in the Philippines with a strong industrial base that has an excellent deep harbor and is served by three different airlines. Based on these criteria, it is not a "remote area."

Responding to another issue raised by the representative of Switzerland, it can be confirmed that extensive simulations and modelling of different PV price scenarios to establish the price competitiveness of PV form an integral part of the PV-Hydro Conjunctive Use Initiative which is underway now (see Reference 5).

3. Please let me know if you require any additional information to complete your review of the project document. We look forward to receiving your endorsement of the project to be able to proceed with project implementation. Many thanks.

#### Attachments

cc: Messrs./Mmes. K. King, A. Miller, F. Rittner, M. Sanio, E. Martinot, GEF PROGRAM COORDINATION (GEFSEC); A. Raczynski, M. Riddle, L. Boorstin, D. Younger, C. Breslin, V. Widge, V. Talvadkar, S. Sethi, P. Cook; M. Sharma, R. Khanna, D. Aryal (ENV); ENVGC ISC, Regional Files