GEF

Global Action on Renewable Energy

Global Environment Facility

SUPPORTING NEW RENEWABLE ENERGY TECHNOLOGIES

As the chief provider of funding for renewable energy projects in developing countries, the Global Environment Facility (GEF) is having a significant effect on accelerating the development of such energy. A major focus of the GEF's renewable energy portfolio is reducing long-term technology costs through demonstration and commercialization. Since its inception, the GEF has supported the dissemination of new technologies for renewable energy. The GEF strategy rests on the assumption that investments and follow-up can reduce the costs of renewable energy technologies and enable them to become competitive with conventional fossil-fuel-based technologies.

BIOMASS INTEGRATED GASIFICATION

With 170 million energy users across 8.5 million square kilometers and a strong technical and scientific base, Brazil is well-positioned to pioneer renewable energy technologies in partnership with the GEF.

A biomass energy technology project, one of the first endeavors of the GEF, began with the goal of demonstrating the commercial viability of a high technology process for cogeneration of heat and power: biomass integrated gasification/gas turbine technology. In Brazil, this technology can convert sugarcane biomass residues into electricity much more efficiently than can traditional technologies. The power can then be used within the sugar plant and also fed into the grid.

During the 1990s, the venture resolved a wide range of important economic, financial and engineering issues. Now a public–private consortium is working towards building a plant in southeast Brazil at a sugarcane processing factory. Because the Brazilian sugar industry is so large, this technology offers the potential for a large reduction in greenhouse gas emissions. In addition, sugar producers can decrease their operating costs by using the industrial waste more efficiently.

CONCENTRATING SOLAR POWER

In 1996, the GEF's Scientific and Technical Advisory Panel recommended high-temperature solar-thermal power technology as one of the renewable energy technologies with the potential for significant cost reduction and high use in countries with sunny climates. Concentrating solar power is the most cost-effective way to convert solar radiation into electricity. Such efficiency was proven operationally in California in the mid-1980s; research and development programs continue in Europe and the United States.

The Mathania Solar Thermal Power Plant project in India was the first to enter the GEF work program in 1996 as part of a larger strategy for introducing this technology. The GEF is financing the incremental costs of construction and operation of a grid-connected, 140-megawatt (MW) solar-thermal fossil-fuel hybrid power plant in Rajasthan. The plant incorporates a parabolic trough solar-thermal field of about 35–40 MW and will demonstrate the operational viability of solar-trough technology. The GEF is developing similar projects in Mexico, the Arab Republic of Egypt, and Morocco.

MARKET AGGREGATION

Because many of the new technologies and applications are plagued by similar problems, such as the small number of stakeholders involved and a high degree of risk and uncertainty, the GEF is exploring innovative ways to support those new technologies. For example, the EMPower project, initiated by the GEF, is a novel partnership between the renewable energy supply industry and the users and utility companies that constitute the demand for the technologies. The global project will offer a forum for discussing and aggregating future demand and supply. Having global demand and supply interests communicate their respective plans in a common forum is expected to reduce transaction costs, speed up project development, reduce investment risks, and eventually lead to lower prices.

The technologies on which this initiative will focus are both concentrated solar power and large-scale solar photovoltaic (PV) applications. EMPower will develop market aggregation tools and initiate a market forum for solar electric technologies.

LARGE GRID-CONNECTED SOLAR PHOTOVOLTAIC PROJECTS

A successful example of an innovative PV project can be found in the Philippines. CEPALCO, the third-largest electric distribution utility company in the country, considered increasing its generation of fossil fuels to meet growing demand. Instead, a $4 million GEF grant has helped structure a ground-breaking PV project that will enhance the capacity of CEPALCO's existing hydro facility. PV panels with a total capacity of 1 MW will be operated in conjunction with the pumpstorage facility in Bubanawan. The hydro project will serve as an effective storage facility for the power produced in off-peak hours by the PV system, so that the hybrid will become fully dispatchable. The project is unique in several ways:

- It will be the largest grid-connected PV installation in the developing world.
- It will demonstrate the conjunctive use of hydro and PV resources, effectively increasing the capacity of the hydro unit and making PV power dispatchable and reliable.
- It will have an innovative project finance structure, wherein the loan can convert to a grant.

BUILDING INTEGRATED PHOTOVOLTAIC APPLICATIONS

The GEF is promoting national innovations for advanced renewable energy. In Malaysia, a GEF-supported project is investigating different strategies for Building Integrated PV (BIPV) applications. With PV technology integrated into their design and construction, an office building, hotel, residence, or other building could produce its own electricity as well as sell any excess energy back to the grid.

The Malaysia project aims to promote local manufacturing of BIPV systems, support the development of enabling policies to encourage the use of BIPV technology, and promote different applications of BIPV systems throughout the country. To produce those systems, the project is bringing together a variety of stakeholders, including representatives from industry and government.

FOR MORE INFORMATION

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