



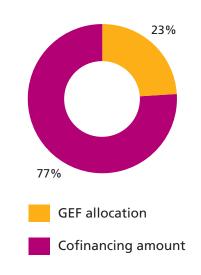
ABOUT THE GLOBAL ENVIRONMENT FACILITY (GEF)

The GEF unites 176 member governments—in partnership with international institutions, non-governmental organizations (NGOs), and the private sector—to address global environmental issues while supporting national sustainable development initiatives. It is a catalyst that drives actions to improve the global environment.

The GEF mobilizes international cooperation, helping to move the world toward sustainable development. It links local and global environmental challenges. In just 13 years, it has evolved into an effective and transparent entity with a solid track record of getting results. Today, the GEF is the largest funder of projects to improve the global environment. The GEF has allocated \$5 billion, supplemented by more than \$16 billion in cofinancing, for more than 1,500 projects in 140 developing countries and countries with economies in transition.

At the heart of the GEF's work are its three Implementing Agencies—the U.N. Development Programme (UNDP), the U.N. Environment Programme (UNEP), and the World Bank—which share the credit for the GEF's measurable onthe-ground achievements. The GEF's Executing

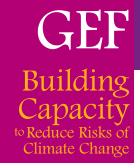
THE LEVERAGING EFFECT OF GEF SUPPORT



Agencies also contribute to the GEF's impact: the U.N. Food and Agriculture Organization (FAO), the U.N. Industrial Development Organization (UNIDO), the African Development Bank (AfDB), the Asian Development Bank (ADB), the European Bank for Reconstruction and Development (EBRD), the Inter-American Development Bank (IDB), and the International Fund for Agricultural Development (IFAD).

FOR MORE INFORMATION

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EXPANDING RENEWABLE ENERGY IN BANGLADESH

Providing power without intensifying the effects of climate change is a priority for the people of Bangladesh, who know all too well what rising seas and more frequent storms can do to their coastal nation. The Government of Bangladesh has established a goal of providing electrical power to all its citizens. Renewable energy is a key component of the initiative, and Bangladesh has already made impressive gains in reaching the 85 percent of the country's population that lives in rural areas.

However, in many rural areas, people live too far from the main electrical grids to make connections reliable or affordable. Without access, these families are forced to rely on more expensive—and nonrenewable—energy options such as kerosene or batteries. Even with 400,000 new households gaining access to electricity every year, it could take another 40 years for all the people of Bangladesh to have power.

To help speed that process, the GEF is undertaking an ambitious effort with the Government of Bangladesh, the World Bank, and Bangladesh's Infrastructure Development Company Limited (IDCOL) to greatly increase the spread of off-grid, renewable energy technologies, such as solar home systems. The goal of the Renewable Energy and Rural Electrification project is to reduce barriers to the use of these climate-friendly energy systems, expand their reach to an additional 50,000 households by 2008, and put the country on a firm footing to grow the market for renewables even further. The project is building capacity for renewable energy through work in these key areas: access to financing; business skills; training and technical skills; institutional capacity; and consumer awareness.

IMPROVING ACCESS TO FINANCING AND BUILDING BUSINESS SKILLS

The renewable energy project cooperates with and builds on the tremendous efforts of such organizations as Grameen Shakti, a subsidiary of the Grameen Bank, and the Bangladesh Rural Advancement Committee, the country's largest nongovernmental organization (NGO). Both are active partners in a program managed by IDCOL that has installed more than 25,000 solar home systems in the two years since the GEF project began.

The project works by combining a GEF grant with a line of credit to microfinance institutions and NGOs to purchase solar home systems. Those organizations, in turn, provide small loans to individual consumers and village cooperatives interested in purchasing such systems. By shifting a portion of their monthly energy budget away from kerosene and batteries, families can afford modest investments in more reliable 20–40 watt solar home systems. That's enough to provide lighting at night, help pump clean water, or keep critical medicines cold.

Payback periods on the loans vary from one to three years, and past experience has shown that even the poorest households make very reliable partners. To date, the vast majority of IDCOL's partner organizations are reporting a better than 98 percent return rate on loan installments.

BUILDING INSTITUTIONAL CAPACITY

Fully developing the infrastructure for renewables in Bangladesh requires more than just putting solar systems on the market. The project also works to remove the barriers to more widespread use of renewable systems and builds the skills of its partner organizations. The project provides a package of interventions to support Bangladeshi institutions in overcoming major market barriers. These institutions include rural electricity cooperatives, community-based organizations, NGOs, microfinance institutions, and private-sector groups.

A key institution is the Rural Electrification Board, which functions as a quasi-regulator and financial manager of the rural electricity program. The project supports the institutional development of the Rural Electrification Board by providing technical assistance for financial restructuring, monitoring and evaluation, and environmental safeguards.

The renewable energy project is also expanding the number of NGOs engaged in providing energy services. One of the project's new partners is Upakulio Biddutayan O Mohila Unnayan Samity (UBOMUS), a women's cooperative based in a very remote area of the Barisal District. UBOMUS is one of five new partner organizations that have joined in this effort since the GEF project began.

IMPROVING TECHNICAL SKILLS AND PROVIDING TRAINING

Two important aspects of the project's capacity building are improving the managerial skills of grassroots organizations involved in providing renewable energy services and increasing the number of technicians trained to install and repair solar home systems. Thanks to project support, IDCOL has developed a well-regarded database to monitor the program's progress and verify the

technical performance of the solar home systems. Five general inspectors, two technical inspectors, and 40 local schoolteachers are part of a verification team that examines the systems before and after installation.

PROMOTING CONSUMER AWARENESS

The renewable energy project is helping the private sector, NGOs, and microfinance institutions expand the solar energy program and establish it on a commercial and sustainable basis. Recognizing the importance of an informed public, the project is increasing awareness among consumers and suppliers about the benefits and the correct use of solar home systems.

LOOKING TO THE FUTURE

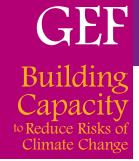
Because solar home systems may not be as efficient in some areas of the country, the project is also developing pilot renewable energy programs: two wind energy projects, two microhydro projects, and two biomass projects. These efforts will be critical to providing Bangladesh with the diversity of clean power sources it needs to bring the benefits of electricity to all of its 140 million citizens.

PROJECT BENEFITS

On a global scale, this project is expected to displace nearly 260,000 tons of carbon dioxide over the next 15 years, primarily by reducing kerosene use. But the most critical impacts will take place at the local level, in the form of improved health, more reliable water supplies, and greater opportunities to improve livelihoods and promote truly sustainable development.

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HELPING COUNTRIES CONDUCT NATIONAL CAPACITY SELF-ASSESSMENTS

Since the Rio Earth Summit in 1992, the global community has reached agreement on an unprecedented number of environmental treaties, including the Convention on Biological Diversity, the U.N. Framework Convention on Climate Change, and the Convention to Combat Desertification. At the center of these Conventions is the recognition that individual countries must address global environmental and development challenges in light of their own national priorities and circumstances.

This ethos of a coordinated response suited to national circumstances is at the heart of the Global Environment Facility's (GEF) National Capacity Self-Assessment (NCSA) initiative. NCSAs are flexible and powerful tools for helping countries identify and analyze their national priorities and needs for capacity development in the context of the major environmental conventions.

To date, the GEF has contributed \$23.4 million to help more than 100 countries assess their environmental governance and capacity needs through NCSAs. In Africa, 30 NCSAs are in progress; in Asia, 25; in Eastern Europe and Central Asia, 26; and in Latin America, 26.

Under an NCSA, a country takes the lead in determining how best to mobilize, allocate, and use the resources needed to implement the conventions. But, more importantly, NCSAs help a



wide range of stakeholders—policymakers, researchers, nongovernmental organizations, the private sector, and community leaders—focus on how they can best contribute to their nation's sustainable development.

- In Armenia, Bulgaria, and Latvia, NCSAs have helped bring together the Ministries of Agriculture, Energy, and Environment to cooperate—for the first time—on joint proposals to improve the environment and strengthen national development.
- In **Moldova**, a previous national effort to create a poverty reduction strategy contributed directly to the objectives of the NCSA, helping bridge global and national agendas, while the Ministry of Ecology and Natural Resources gained experience in working with the Clean Development Mechanism of the Climate Change Convention.
- In **Morocco**, the NCSA is using the promotion of rural tourism—which requires coordination among national and local officials, the private sector, and community leaders—as one model for the type of coopera-

tion needed to make sustainable development a reality.

NCSA PUBLICATIONS

To assist countries interested in NCSA support, the GEF and its partners have created two publications, which are available on the GEF website (www.theGEF.org):

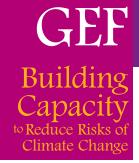
- A Guide for Self-Assessment of Country Capacity Needs for Global Environmental Management.
- Operational Guidelines for the Expedited Funding of National Self-Assessments of Capacity Building Needs.

LOOKING TO THE FUTURE

The partnerships established and the skills developed as a result of NCSAs lay the foundation for future efforts to address a range of global environmental and developmental issues. As one participant in Georgia said, NCSAs "are not only about an assessment or an action plan, but about changing the mind-sets, approaches, and attitudes that are so crucial for global environmental management."

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STRENGTHENING COUNTRY CAPACITY

For the Global Environment Facility (GEF), capacity building is first and foremost about providing people, institutions, and developing countries with the tools and training to make choices about the environment that help reduce poverty and promote sustainable livelihoods. Nearly all of the 1,500 projects that the GEF supports include a capacity-building component. In the climate change focal area, GEF projects help provide enabling environments for the sustainable and economic use of renewable energies and energy-efficient technologies, build the necessary capacity to sustain them, and demonstrate the useful applications of these energy sources.

To these ends, GEF projects work with the host countries to raise awareness, increase local capacity, and train technicians. The GEF calls upon the host government to support sustainable energy systems on a political level by providing the necessary frameworks—everything from a country's general investment climate to the legal conditions for access to the central grid to the existence of technical standards, import tariffs, and zoning regulations. Based on its 13-year experience in the climate change area, the GEF focuses on a balanced combination of policy frameworks, technical knowledge, and business skills.

The following climate change projects illustrate how the GEF is helping countries build their capacity in the areas of technology, education, training, public awareness, and institutional and financial arrangements, among others, along with improving enabling environments.



Many of these projects include a number of aspects for building capacity and promoting enabling environments.

ENHANCING INSTITUTIONAL CAPACITY AND ENABLING ENVIRONMENTS

The Galapagos Islands are famous for rare species of fauna, including the giant tortoise for which they are named. As a result of the Galapagos' uniqueness, several donors have already provided substantial support for renewable energy installations on four islands. A GEF project is working on both the national and local levels to build the capacity to support these installations.

On the national level, the GEF project is helping to reform the regulatory framework. These reforms include provisions that allow the costs of the renewable energy systems to be adequately recovered so that replacements and operational costs can be funded from the system itself, rather than depending on renewed donor support. On the local level, the project is helping to

adapt ownership structures and arrangements to the context of each island to ensure that the renewable energy equipment is optimally used and maintained.

In Tunisia, a GEF-supported project is working with the government to provide an enabling policy environment and smart incentives for investments into 100 megawatts of wind generation capacity. The newly created policy framework will serve to attract other investments in wind generation.

PROMOTING TECHNOLOGY TRANSFER

The Fuel Cells Financing Initiative, a global GEF program, is using structured learning and technology transfer to introduce stationary fuel cells. Fuel cells can produce electricity at higher conversion efficiencies than most other currently tested technologies. The initiative, through its structured capacity-building and technology transfer approach, is a unique attempt to bridge technological gaps between developed and developing countries.

IMPROVING LOCAL TECHNICAL CAPACITY AND EDUCATING CONSUMERS

Through a GEF project in Botswana, the Government of Botswana is testing a large-scale solar photovoltaic-based strategy to provide 88 villages with electricity. More than 5,000 house-holds will be given access to clean lighting, and more than 1,000 households will receive a more extensive supply of electric power from a solar home system. This project seeks to bolster the process of rural electrification with a combination of interventions that improve local technical capacities, political framework conditions, and access to financing, as well as educating consumers on renewable energy.

INTRODUCING INNOVATIVE FINANCIAL AND INSTITUTIONAL STRUCTURES

A GEF project in Cuba will introduce innovative financial and institutional structures to enhance local manufacturing capacity, encourage private investments, and support sustainable markets for renewable energy technologies. The project will establish commercial business models for renewable technologies and provide modern energy services on the island.

SUPPORTING COMMUNICATION ACTIVITIES

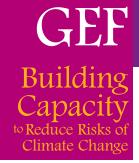
Working with 130 countries, the GEF's National Communications Program for Climate Change will contribute directly to education, public awareness, and a policy-enabling environment in the area of climate change. National project activities include stakeholder consultations to formulate the national work plans, technical assessments, workshops, and monitoring and evaluation using capacity indicators and benchmarks. Global support program activities include providing technical backstopping to national teams, creating training workshops, establishing knowledge networks, and disseminating information and lessons learned.

BUILDING TRAINING CAPACITY

A GEF project in Eritrea aims to transform the market for wind energy. The project will help install and operate a wind park connected to the grid, as well as eight decentralized stand-alone and hybrid wind systems in rural villages. More importantly, the project will strengthen the country's capacity in terms of personnel, know-how, government institutions and authorities, and private companies with regard to the use of wind energy. Training is a key component of this effort.

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PROMOTING ENERGY-EFFICIENT LIGHTING IN POLAND

In 1995, you had to visit 10 Polish homes to find a compact fluorescent lamp (CFL). By 1998, one in three Polish homes had one. Today, 50 percent of households use CFLs. How did this dramatic change come about? The Poland Efficient Lighting Project (PELP), which is financed by the GEF, is responsible for the transformation.

Before PELP, the Polish market for CFLs was hindered by two major problems: the lack of consumer awareness of CFLs and their benefits and the cost of the lamps, which were 30 times more expensive than ordinary incandescent lamps. PELP targeted both of these problems, using public education and manufacturer-level price buy-downs to increase demand and lower the price of CFLs. PELP is an excellent example of how the GEF builds capacity on many levels, using various tools. PELP used consumer education (which increased public awareness of the benefits of CFLs) and manufacturers' rebates (which expanded the domestic market for CFLs).

CONSUMER EDUCATION

Consumer education was key to the success of PELP and to the widespread adoption of CFLs in homes throughout Poland. PELP launched a vibrant advertising campaign that dramatically increased public awareness. The PELP logo was promoted as a symbol through which consumers could identify high-quality, energy-efficient products. PELP held seminars for professional lighting designers, which inspired a Polish university to include energy efficiency in its lighting design curriculum. PELP also ran an energy-efficiency education program, endorsed by the Polish Ministry of Education, that reached more than 1,000 participants at 250 schools.



MANUFACTURERS' REBATES

One barrier to the widespread adoption of CFL was the "first-cost barrier." Although economical in the long run, a CFL required an upfront investment of as much as \$15; at the time, an incandescent bulb cost about 40 cents. The GEF's contribution was to remove this barrier by providing investments from outside Poland.

PELP was notable for the skillful way it used incentives. The incentives were administered through manufacturers and linked directly to the manufacturer's price, instead of to the retail price as is usually done. Manufacturers stated that this reduction was one of the key ways in which PELP influenced the adoption of CFLs over incandescent bulbs. In addition, manufacturers had to engage in competition to be part of the program, which led to pledges of more manufacturers' discounts. The PELP approach added considerable leverage to the GEF's inputs, generating substantial direct investments by manufacturers, wholesalers, retailers, and consumers.

PRIVATE SECTOR

The private sector played a prominent role in PELP by managing the project and acting as the principal channel of delivery. This was a pioneering approach for the GEF—PELP was one of the first GEF projects to work directly through the private sector.

BENEFITS

A primary goal of the project was to reduce emissions of carbon dioxide and other greenhouse gases. Using CFLs rather than traditional incandescent bulbs leads to lower energy consumption. The project has saved an estimated 2,320 gigawatt-hours, which translates in the Polish context into a reduction of 2.8 million tons of CO₂ emissions. It has also led to a reduction in pollution from coal mining and electricity generation.

The impact of PELP extended to the Polish economy. PELP provided a significant market for the country's CFL manufacturers. Sales of CFLs grew from 600,000 units in 1994 to 1.6 million units in 1997. By the end of PELP in 1998, the retail price of CFLs in Poland had decreased by 34 percent. Polish CFL market experts and manufacturers agree that the PELP CFL subsidy and promotion campaign were largely responsible for this dramatic price decrease. Moreover, this innovative program generated total retail price reductions worth \$7.2 million, nearly three times the GEF's initial funding.

SUSTAINABILITY

One of PELP's most important results is the sustainability of the project's benefits: Three years after the project officially ended, CFL prices have

not returned to their previous high levels. In fact, prices for the most frequently sold CFLs have fallen from 38 zloty (about \$12) to 25 zloty (about \$8), a decrease of about 33 percent.

In early 1998, during the first buying season after the project, manufacturers joined in a cooperative advertising campaign, with a small advertising grant from the GEF. This time there were no GEF price incentives, but manufacturers voluntarily reduced their prices during the three-and-a-half-month campaign. An additional 430,000 CFLs bearing the PELP logo were sold during this period.

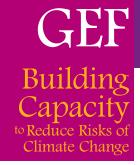
As further evidence of sustainability, positive media reports on CFLs continue. CFLs today are sold in a larger number—and a greater variety—of shops than before the project. On the demand side, fully 97 percent of all CFL purchasers have said that they will replace any burned-out CFLs with other CFLs rather than return to incandescent bulbs.

REPLICATION

Another mark of the project's success is that it is being replicated through a GEF project called the Efficient Lighting Initiative (ELI), with activities reminiscent of PELP. The influence of PELP has spread worldwide and the ELI is taking place on four continents: Africa, America, Asia, and Europe. Countries participating in the initiative—Argentina, Peru, South Africa, the Czech Republic, Hungary, Latvia, and the Philippines—are employing many of the tools used by PELP, including the PELP logo, in the hope of repeating PELP's success.

FOR MORE INFORMATION

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BUILDING THE PHILIPPINES' CAPACITY FOR GRID-CONNECTED SOLAR POWER

The Cagayan Electric Power and Light Company, or CEPALCO as it is generally called, had considered increasing its generation of fossil fuels to meet the Philippines' growing demand for energy. Instead, CEPALCO, the third largest electric distribution utility in the Philippines, is supplying energy through a GEF solar photovoltaic (PV) project. This ground-breaking project combines hydro- and photovoltaic-based power for homes, schools, hospitals, offices, and other users.

The key to this demonstration project is its strong emphasis on education and capacity building. The project is improving CEPALCO's technical competence in electricity generation from renewable sources and providing valuable know-how in the development and operation of clean energy distributed electricity generation. On the national level, it is strengthening the Philippines' capacity for solar power. On the international level, it is supporting the development of a global market for solar PV technology.

THE PROJECT

The CEPALCO project is a first of its kind: the largest grid-connected PV installation in the developing world.

The one-megawatt grid-connected solar PV power plant operates on the island of Mindanao. The PV plant works in conjunction with the recently built seven-megawatt hydroelectric power plant. The hydro plant operates as a load follower, varying its output inversely with that of the PV plant. The saved water is stored in the hydro plant's reservoir, to be used when PV

output is not available. The PV installation is designed to meet peak power needs during the daytime and allow the dam—which has insufficient water flow to run 24 hours a day—to store capacity for nighttime use. Because this hybrid project combines hydro and PV power, it is fully dispatchable. To avoid transmission and distribution losses, the PV plant was constructed just five kilometers southeast of the business district of Cagayan de Oro, which is located within CEPALCO's distribution system.

BENEFITS

The PV plant is expected to generate more than a million kilowatt-hours of clean electricity annually. This amount of electricity will displace about 1,500 barrels of fuel oil per year, reducing carbon dioxide emissions by about 800 metric tons per year. The project will not only have global environmental benefits, it will also benefit the local environment by reducing the emission of diesel generation, which would otherwise be used. Using clean technology helps to provide a clean environment for the local population.

INNOVATIVE FINANCING

The project is innovative not only in its design but in its financial structure. The GEF is financing a loan that can convert to a grant after five years of operation if specific conditions are met. This financing structure should promote timely execution and operation of the project.

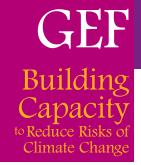
POTENTIAL FOR REPLICATION

The GEF hopes the CEPALCO project—a first of its kind in design, technology, and financial structure—will spur similar projects throughout the

world. The project has enormous potential for replication. If the large-scale introduction of this technology helps to substantially reduce the costs of PV systems, as expected, worldwide applications are likely to result. There exist some 360,000 megawatts of potentially suitable hydro plants in developing countries that could benefit from combined hydro-PV projects.

FOR MORE INFORMATION

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INCREASING URUGUAY'S CAPACITY TO SUPPORT THE UNFCCC

Developing countries that are parties to the UN Framework Convention on Climate Change (UNFCCC) have made commitments to produce national communications that analyze national greenhouse gas emissions, assess the country's vulnerability to climate change, and highlight actions the country is taking or would like to take to fully implement the UNFCCC. And these national communications have an added advantage: they build a country's capacity to report to the convention and raise awareness of climate change issues.

With assistance from the GEF, Uruguay was one of the first countries to complete its First National Communication, submitting it to the UNFCCC in Kyoto in 1997. The First National Communication included an inventory of the country's greenhouse gas emissions.

In May 2004 Uruguay submitted its Second National Communication. As with the First National Communication, Uruguay received financial support from the GEF to prepare it. The Second National Communication contains information related to the National Inventory of Greenhouse Emissions for 2000, options for mitigation and adaptation to climate change, and additional information relevant to achieving the UNFCCC goals. The communication recommends strengthening both public and private sector participation in the management of actions and measures to respond to climate change.

Uruguay has used its national communications to increase capacity in a number of areas, working with government ministries, municipal governments, the private sector, nongovernmental organizations (NGOs), and others.

- Communications and Awareness. When a national survey showed that the country's population was unaware of climate change issues, the government supported a massive effort to raise public awareness. The Ministry of Education and Culture was engaged to ensure a strong focus on primary, secondary, and technical schools. The Uruguayan Network of Environmental NGOs held workshops for the general public on climate change and depletion of the ozone layer. Government leaders increasingly engaged the media on climate change and other critical environmental concerns.
- **Training.** When the government realized that its technical skills for assessing climate impacts needed strengthening, it undertook a broad training program. The program included a regional workshop on vulnerability and adaptation to climate change, a national workshop on greenhouse gas mitigation in the energy and agricultural sectors, and a technical training program for managers in the public and private sectors on the benefits of addressing climate change issues.
- Monitoring Efforts. To help fill information gaps, Uruguay has become more involved in international efforts to monitor climate change. The country established a national network of environmental, climatic, and meteorological observation posts under the direction of the National Meteorological Directorate. The directorate has used information from the network to develop and update a national data bank on climate and environment that, in turn, provides data to the Inter-

American Institute for Global Change Research and global data centers.

MOVING FORWARD

As Uruguay presses forward on a Third National Communication, it is working to address the priorities highlighted in its latest report to the UNFCCC: minimizing greenhouse gas emissions in the transport sector; promoting energy-efficient investments; and preparing management plans that address the threat climate change poses to coastal areas, water resources, and agriculture. A number of GEF projects in Uruguay are supporting these priorities.

With GEF assistance, the Programme of General Measures for Mitigation and Adaptation to Climate Change is evaluating the financial and socio-economic impacts of measures for mitigation of greenhouse gas emissions and adaptation to climate change.

One GEF project aims to demonstrate that methane gas can be recovered from a landfill and used to generate electricity. As a result of this project, carbon dioxide emitted into the atmosphere will be reduced by an estimated 470,000 tons over a 15-year period. This reduction would achieve both national and global environmental benefits and would help meet national economic and social goals.

The GEF recently approved a \$21 million energy project that seeks to expand consumer demand for energy-efficient goods and services and ensure adequate supplies of these goods and services to meet increased needs. The project will work to increase efficient energy use by building capacity and know-how on cost-effective energy conservation options, strengthening the technical and financial capacity of energy service companies, creating access to financing, building legal frameworks, and promoting investment financing.

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