

# 10 Cases of **TECHNOLOGY TRANSFER**

June 2000



*HIGHLIGHTS FROM GEF'S CLIMATE PORTFOLIO*

*“Developing countries are important theaters for innovation... What can be done at this time to steer their growth and development in directions that will make the best use of modern, cleaner technologies, ‘leapfrogging’ costly and polluting solutions adopted decades ago? This will require a special type of technology transfer.”*

— Professor José Goldemberg,  
University of São Paulo, Brazil



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## Ten Cases of Technology Transfer Global Environment Facility June 2000

The Global Environment Facility (GEF) is the leading multilateral entity promoting energy efficiency and renewable energy technologies in developing countries and industrialized nations transitioning to market economies.

As the financial mechanism of the U.N. Framework Convention on Climate Change, GEF has allocated more than \$1 billion to more than 240 climate change projects, matched by more than \$5 billion in co-financing. Co-financing comes from governments, other donor agencies, regional development banks, the private sector (including non-governmental organizations), and the three GEF project implementing agencies: the United Nations Development Program, the United Nations Environment Program, and the World Bank.

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***“Shell entered the Sri Lanka market as a result of the World Bank/GEF project for off-grid solar power.”***

*— representative of Shell  
International Renewables in Sri Lanka*

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Energy efficiency and renewable energy programs are designed to open doors for promising new technologies by removing barriers, cutting implementation costs, and reducing long-term technology costs. A new program addresses sustainable transport. Programs are designed to build sustainable markets, strengthen capacities, leverage financing from public and private sources, and facilitate technology transfer.

From 1991 to mid-2000 the GEF approved grants totaling \$852 million for 82 energy efficiency and renewable-energy projects in 49 countries. Ten examples:

### ***Wind Power in India***

In India, World Bank/GEF support for wind power occurred in parallel with explosive market growth during the mid-1990s fuelled by favorable investment tax policies. By 1998, almost 1,000 MW of wind capacity had been installed in India and dozens of domestic wind turbine manufacturers had emerged, many with foreign partners. During the 1990s, a World Bank/GEF project directly financed 41 MW of wind turbine installations in India. The project strengthened the capabilities of the India Renewable Energy Development Agency (IREDA) to promote and finance private sector investments, and more than 270 MW of wind projects were financed through IREDA. The project also helped to raise awareness among investors and banking institutions of the viability of wind power technology. As a result of the project and the generally favorable market conditions, many financial institutions decided to offer financing for wind farms, which was a key project goal.

### ***Wind Power in China***

Under a World Bank/GEF wind and solar photovoltaic project, four new domestic wind power companies will construct 190 MW of wind farms and enter into commercial power-purchase agreements with utilities. These investments will

about CFLs and the number of households with CFLs almost doubled, from 11.5% to 19.6% of all households.

### ***Energy-efficient Building Technologies in West Africa***

A UNDP/GEF project in Côte d'Ivoire and Senegal strengthens capabilities to design and construct more efficient buildings, drawing upon international experience and technologies for efficient buildings. The project helps finalize an existing energy efficiency code for air-conditioned buildings and helps implement the code; the project consults with affected parties, tests the application of the code to several building projects, trains construction operators to understand and apply the code, and introduces the code into building permit procedures. In addition to the energy efficiency code, the project drafts a thermal comfort code for

buildings without air conditioning and assists with its implementation. One representative building from each country is being audited and retrofitted, with an emphasis on air conditioning and lighting.

### ***Decentralized Wind Power in Mauritania***

A UNDP/GEF project installed demonstration wind-electric systems for rural electrification in 19 villages with 900 households. Beyond direct installations, the project piloted sustainable service delivery models (with cooperatives), trained local technicians, promoted consumer awareness, and developed financing and institutional capability for further development of small wind-electric systems. A second phase, extending the experience to 100 villages, has started with financing from the French government.

## ***What is Technology Transfer?***

Definitions of technology transfer differ widely in common usage and even among scholars. In the narrowest sense, technology transfer means simply transfer of equipment from one place to another, whether purchased (direct sales) or donated (i.e., through development assistance). This definition is usually unsatisfactory. Most would agree that a more compelling definition is that technology transfer means that local capabilities to understand, develop, produce, and use technologies are enhanced. This definition includes, for example, manufacturing joint ventures, technology licensing, joint research pro-

grams, university programs, personnel exchanges and training, service personnel and infrastructure, consumer understanding, policy-maker familiarity, and so on. Going even further, one could say that technology transfer means anything that facilitates the adoption, adaptation, diffusion, and dissemination of new technologies within a given country. Almost all GEF projects provide some forms of capacity strengthening, know-how, market facilitation, and other technology-related elements that fall under these definitions.

### ***For Further Information***

“Renewable energy markets and the Global Environment Facility,” *Financial Times Renewable Energy Report* no. 12 (February 2000), pp.18-22.

*Promoting Energy Efficiency and Renewable Energy: GEF Climate Change Projects and Impacts*, Eric Martinot and Omar McDoom (Washington, DC: Global Environment Facility, 2000.) (Available at [www.gefweb.org](http://www.gefweb.org))

**The Global Environment Facility** is a multilateral financial mechanism that assists developing countries and countries with economies in transition to protect the global environment in four areas: biodiversity, climate change, international waters, and ozone layer depletion. GEF has funded more than 650 projects in 140 countries, committing close to \$3 billion in grants and raising an additional \$8 billion in co-finance. These projects are implemented by the United Nations Development Program, the United Nations Environment Program, and the World Bank on behalf of the GEF.

For further information, see the Operational Report on GEF Programs (December 1999).

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