NOVEMBER 2004

LESSONS FOR THE FUTURE

# Meeting the Climate Change Challenge
# Sustaining Livelihoods

United Nations Development Programme

Global Environment Facility

## Contents



## United Nations Development Programme (UNDP)

UNDP is the UN's global development network, advocating for change and connecting countries to knowledge, experience and resources to help people build a better life. We are on the ground in 166 countries, working with them on their own solutions to global and national development challenges. As they develop local capacity, they draw on the people of UNDP and our wide range of partners.

World leaders have pledged to achieve the Millennium Development Goals, including the overarching goal of cutting poverty in half by 2015. UNDP's network links and coordinates global and national efforts to reach these Goals. Our focus is helping countries build and share solutions to the challenges of:

- Democratic Governance
- Poverty Reduction
- Crisis Prevention and Recovery
- Energy and Environment
- Information and Communications Technology
- HIV/AIDS

UNDP helps developing countries attract and use aid effectively. In all our activities, we encourage the protection of human rights and the empowerment of women.

## Global Environment Facility (GEF)

The Global Environment Facility (GEF) was established to forge international cooperation and finance actions to address four critical threats to the global environment: biodiversity loss, climate change, degradation of international waters and ozone depletion. Launched in 1991 as an experimental facility, the GEF was restructured after the 1992 Earth Summit in Rio de Janeiro. The facility that emerged after restructuring was more strategic, effective, transparent and participatory. During its first decade, GEF allocated US$4.5 billion in grants, supplemented by more than $14.5 billion in additional financing, for more than 1,300 projects in 140 developing countries and transitional economies, as well as more than 5,000 projects in 73 countries that participate in the GEF Small Grants Programme, managed by UNDP. In 2002, donors pledged $3 billion to finance projects from 2002 to 2006.

In addition to its original mandate, the May 2003 GEF Council approved two new focal areas. The GEF now provides financial assistance for the mitigation and prevention of land degradation and persistent organic pollutants. GEF-funded projects are implemented through the following development agencies: UNDP, UNEP and the World Bank. The GEF also benefits from having the following executing agencies: African Development Bank, Asian Development Bank, European Bank for Reconstruction and Development, Food and Agricultural Organization, Inter-American Development Bank, International Fund for Agricultural Development and the United Nations Industrial Development Organization.

## The UNDP-GEF Team

The Global Environment Facility team of the United Nations Development Programme (UNDP-GEF) is headquartered in New York. UNDP-GEF has six regional coordination units located in Malaysia, Slovakia, Lebanon, Mexico, Senegal and South Africa. Working with other international organizations, bilateral development agencies, national institutions, non-governmental organizations, private sector entities and academic institutions, the UNDP-GEF team supports the development of projects and oversees a mature portfolio of projects in all six GEF focal areas of biodiversity, climate change, international waters, land degradation, persistent organic pollutants and ozone depleting substance phase-out (the latter minimally). The cumulative UNDP-GEF portfolio is valued at $1.8 billion in core grants, with approximately $3 billion raised in additional co-financing. On behalf of the GEF partnership, UNDP-GEF also manages its two corporate programmes, the GEF Small Grants Programme and the GEF National Dialogue Initiative.

# Meeting the Climate Change Challenge Sustaining Livelihoods

Drill thousands of metres into an Arctic ice cap, uncover the long-buried remains of ancient forests, or study the chemical makeup of tiny oceanic animals and you get a glimpse of the earth's climatic past and, quite possibly, its tumultuous future.

For well over a decade, scientists from around the world working with the Intergovernmental Panel on Climate Change (IPCC) have pored over evidence from the deepest ocean trenches to the loftiest reaches of the stratosphere to reach one conclusion: the world's climate is changing, and human beings are largely responsible. The burning of fossil fuels, which releases greenhouse gases such as carbon dioxide and methane, the unsustainable destruction of carbon-rich forests, and the use of heat-trapping aerosols are the main culprits behind a phenomenon that could lead to unprecedented climatic changes in the coming decades.

The expected repercussions of climate change – including rising sea waters, more frequent and intense storms, the extinction of species, worsening droughts and crop failures – will affect every nation on earth. Historically, developed countries have released the vast majority of greenhouse gases, but they are also the best positioned financially to reduce those emissions. Developing countries and countries in transition, however, will bear the brunt of any change in climate patterns, and their people will suffer the most from them. In an effort to address the threats posed by climate change, 178 nations came together at the Rio Earth Summit in 1992 to adopt the United Nations Framework Convention on Climate Change.

Even before the convention on climate change entered into force in March 1994, UNDP-GEF had a leading role in working with countries to reduce greenhouse gas emissions while promoting climate-friendly development policies. Through 153 projects currently under way in 119 countries, UNDP-GEF is expanding the use of renewable energy technology, fostering markets for energy-efficient lighting, appliances and transport, and protecting forests and other ecosystems that absorb carbon dioxide and other greenhouse gases.

Humanity is at a critical stage in its efforts to combat climate change. Decisions made today will have a lasting impact on future generations. UNDP-GEF's approach to addressing

**The amount of carbon dioxide has increased by more than 30 per cent since pre-industrial times and is still increasing at an unprecedented rate of on average 0.4 per cent per year, mainly due to the combustion of fossil fuels and deforestation.**

*Source: Climate Change 2001: The Scientific Basis* (IPCC, 2001)

## UNDP-GEF's climate change portfolio

- 153 national and regional projects are taking place in 119 countries.
- Through UNDP, the GEF has provided over $550 million in financial grants to date.
- UNDP partners at the community, national and international level have invested an additional $1.49 billion.

## What are greenhouse gases?

When sunlight strikes the earth's surface, some of it is reflected back into space as infrared radiation (heat). So-called greenhouse gases absorb this infrared radiation and trap the heat in the earth's atmosphere. This warming has major implications, since even a one-degree rise in temperature can cause dramatic variations in the earth's climate. Gases that exhibit these greenhouse properties – for example, water vapour, carbon dioxide, methane and nitrous oxide – occur in nature, but human activities such as the burning of fossil fuels (primarily coal, petroleum crude oil and natural gas) account for the production of considerable additional emissions of carbon dioxide, methane and nitrous oxide.

## Addressing a global threat: The convention on climate change

The United Nations Framework Convention on Climate Change was the first global treaty aimed at mobilizing the international community against this global threat. Its ultimate objective is to "achieve stabilization of…greenhouse gases at levels that would prevent…interference with the climate system."

The 189 Parties that have ratified the convention agreed, among other things, to produce national communications analysing their greenhouse gas emissions and highlighting actions they are taking to implement the convention.

These national reports as well as updated news and information regarding the convention are available at: http://unfccc.int/index.html

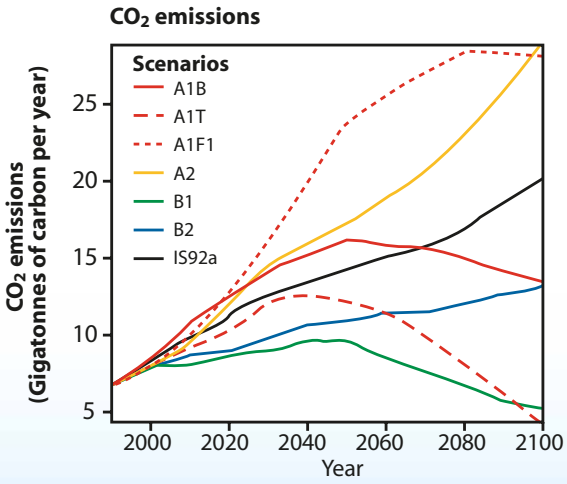
climate change centres on five strategic priorities that will maximize its investments in promoting sound alternatives to current trends. Those priorities are:

- Transforming market policies to promote energy efficient products and processes;
- Increasing access to local sources of financing for renewable energy and energy efficiency;
- Promoting power-sector policy frameworks to support renewable energy and energy efficiency;
- Renewable energy for poverty alleviation;
- Catalysing shifts in modes of urban transport and the use of 'clean' vehicles and fuel technologies.

The following sections highlight various manifestations of activities in these areas.

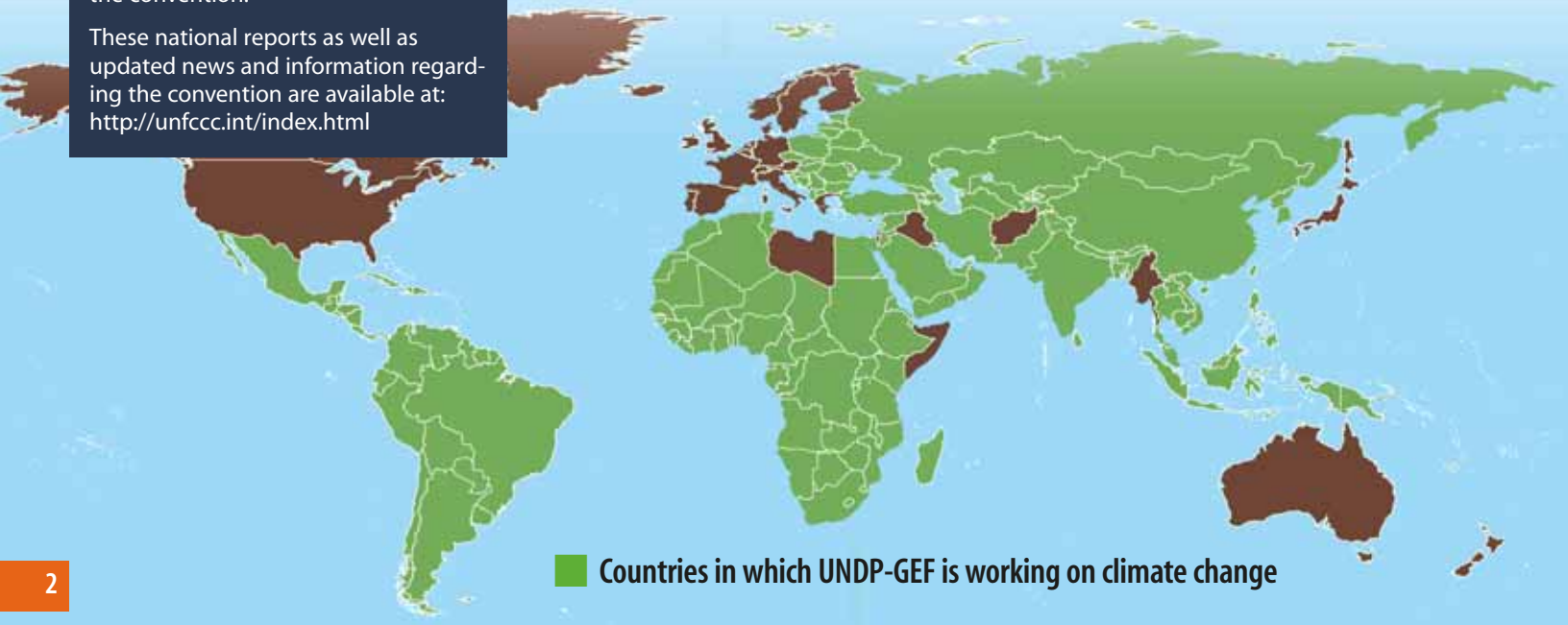
## Global climate change in the twenty-first century

**Scenarios** present specific conditions and serve to illustrate the direction of potential future climate change impacts and social and economic policies. This chart shows projected changes in carbon dioxide ($CO_2$) emissions based on standard scenarios.




A1: A world of rapid economic growth and rapid introductions of new and more efficient technologies
A1 B (balanced)
A1 FI (fossil intensive)
A1 T (non fossil)
A2: A very heterogeneous world with an emphasis on family values and local traditions
B1: A world of "dematerialization" and introduction of clean technologies
B2: A world with an emphasis on local solutions to economic and environmental sustainability
IS92a "business as usual" scenario (1992)

*Source:* Presentation by Ulrich Cubasch CLA, WGI (IPCC, 2001).



Countries in which UNDP-GEF is working on climate change

# Transforming Market Policies to Promote Energy Efficiency

In a world with rising standards of living, improving energy efficiency is a low-cost means to reducing long-lived greenhouse gas emissions. Establishing and enforcing energy-efficient building codes, promoting the adoption of more efficient lighting and household appliances, and supporting labelling efforts that enable consumers to make more informed choices can result in major reductions in greenhouse gas emissions. Energy-efficient refrigerators, for example, often use less than half the electricity needed by traditional models. Compact fluorescent light-bulbs can provide an equal amount of light while using a fraction of the energy of an incandescent bulb.

Promoting the adoption of energy-efficient products and processes, however, often requires changes in national legislation, awareness-raising among the general public, private sector, and government, and cooperative relationships with manufacturers in order to succeed. UNDP-GEF projects foster such actions by assisting countries in shaping their national energy strategies to promote greater efficiency.

**China**, the world's leading producer of lighting products, can have a powerful impact on regional and global markets. UNDP-GEF is working with Chinese manufacturers to increase the use of energy-efficient lighting, with the goal of reducing the energy used on lighting by 10 per cent relative to a constant baseline. This requires improving Chinese lighting technology, increasing consumer awareness of efficient lighting products, and helping to establish a vibrant, self-sustaining market for energy-efficient lighting products.

Since the project began in 2001, sales of highly efficient compact fluorescent bulbs have shown remarkable growth. Sales volume has increased 10 per cent, sales value is up 6.5 per cent and the number of local manufacturers of energy-efficient lamp units has nearly doubled. Perhaps most important, however, is that the more efficient lamps and lighting systems are increasingly replacing the use of traditional and less efficient incandescent bulbs.

In **Cuba** and China, this approach means working with the domestic refrigerator industry to design and market more efficient models to consumers. In **Lebanon**, it means strengthening building standards that enhance energy efficiency; and in the **Czech Republic**, strengthening building standards while also disseminating knowledge and best practices in the design of energy-efficient buildings. Projects in **Kenya** and **Malaysia** have engaged with specific sectors of the economy to improve industrial efficiency.

Many of these efforts are highlighted in this report. What they have in common is their focus on developing skills at the local and national level to shift markets towards products and processes that promote energy efficiency and, ultimately, to help protect the global climate.

## Up close: New buildings reduce energy usage by one third

Reducing greenhouse gas emissions in the **Czech Republic** by supporting energy-efficient buildings is the aim of the $500,000 UNDP-GEF effort begun in 1999.

Working with local teams of experts, the project helped expand national capacity to develop, design and construct homes that consume 30 per cent less energy than comparably priced buildings.

By partnering with architects, builders and policy makers, the project's ultimate goal is to raise awareness about the potential of energy-efficient buildings and to foster the spread of related techniques throughout the country.

To date, 77 professionals have been involved in the design and construction of new energy-efficient buildings; 500 professionals and 250 students have been trained in design and construction; two multi-apartment buildings have been built, and six single-family homes are under construction.

**For more information on China's Greenlights project, visit: http://www.cn-greenlights.gov.cn.**

**In Cuba, the Energy Savings Programme determined the need to replace 1,400,000 defective home refrigerator joints throughout the country. With this measure, consumption of electric energy can be reduced by between 20 and 30 per cent, and the life of the equipment is also extended.**

*Source:* Initial National Communication to UNFCCC, Cuba

## Measuring the impact: Cuba leads region in production of energy-efficient refrigerators

**Country:** Cuba

**Implementing agency:** UNDP

**Executing agency:** Ministry for Foreign Investment and Economic Cooperation

**Partners:** Ministry of Steel and Mechanical Industry and Electronics, Central University Marta Abreu, Technical Institute General Lázaro Cardenas, Ministry of Science, Technology and the Environment

**GEF financing:** $0.75 million

**Co-financing:** $6.9 million

**Total financing:** $7.7 million

**Projected greenhouse gas reductions:** 1.52 million tonnes of carbon dioxide by 2015

## Measuring the impact: China boosts efficiency of manufactured refrigerators by over 60 per cent

**Country:** China

**Implementing agency:** UNDP

**Executing agency:** State Environmental Protection Administration

**Partners:** United Nations Department for Economic and Social Affairs, State Administration for Light Industry

**GEF financing:** $9.6 million

**Co-financing:** $31.3 million

**Total financing:** $40.9 million

**Projected greenhouse gas reductions:** 100 million tonnes of carbon dioxide over 15 years

# Keeping cool: Producing energy-efficient refrigerators in Cuba and China

Cold appliances like refrigerators and freezers account for at least 2 per cent of the world's emissions of carbon dioxide. China, as the single largest refrigerator market in the world, is a key contributor to the problem – and the solution. On average, Chinese refrigerators are relatively inefficient, currently consuming 60 per cent more energy per litre of volume than a comparable European model. Therefore, a tremendous opportunity exists to significantly decrease both the energy required and the resulting emissions. And, because refrigerators can be used for so many years, introducing more energy-efficient models into the market can pay dividends for decades to come.

This was the objective of a UNDP-GEF project in **Cuba** called *Producing Energy-Efficient Refrigerators Without the Use of Ozone-Depleting Substances*. Analyzing the work done in China first (see below), amongst other research, the project, which started in May 2000, worked with the country's sole refrigerator manufacturer, the Industria Nacional Productora de Utensilios Domésticos, to produce a new type of refrigerant compressor that reduces electricity consumption. To do so, designers combined the compressor with more efficient insulation – produced without the use of ozone-depleting substances – resulting in a refrigerator that uses 470 kilowatt-hours less each year than previous versions, a significant energy savings. Today, Cuba manufactures refrigerators that are more energy efficient than most appliances marketed in the region or imported into Cuba.

Since the project's completion in 2003, an estimated 20,000 new-model refrigerators have been introduced in Cuba, and 430,000 more are expected to be produced over the next 15 years. Over that same period, more than 1.5 million tonnes of carbon dioxide will have been saved as a direct result of these investments. As a result, to date, usage of approximately 65,000 tonnes of carbon dioxide has already been avoided.

In **China**, a similar effort was undertaken but the stakes were even higher. By 1997, refrigerators accounted for nearly half of all residential electricity consumption, and demand for household refrigeration was growing rapidly. Continuing growth in refrigerator use and China's dependence on high sulphur coal for electricity generation led to substantial increases in both sulphur dioxide and carbon dioxide emissions, while contributing to worsening local air pollution and associated human health problems. Pulmonary disease, for example, which is closely linked to air pollution caused by burning coal, kills more adults in China that any other cause.

UNDP-GEF's efforts to provide technical assistance and incentives to Chinese refrigerator manufacturers to produce more energy-efficient models yielded immediate benefits. From 1999 to 2002, through a project called *Barrier Removal for the Widespread Commercialization of Energy-Efficient CFC-free Refrigerators,* more than 28 participating manufacturers achieved substantial efficiency gains. These averaged about 71 per cent in 1999, and 60 per cent or better in the subsequent three years. The production and sale of highly efficient refrigerators (those that consume less than 40 per cent the energy of a standard model) increased from less than 1,000 units in 1999 to nearly 330,000 units in 2002. Moreover, the research and development capacity acquired by manufacturers through project-sponsored seminars and technical training programmes has enhanced their competitive strength both at home and abroad. In addition, the project was influential in shaping China's policy on energy efficiency by providing the expertise needed to establish an effective system of efficiency standards.

# Engaging small- and medium-sized enterprises in Kenya

Small- and medium-sized enterprises usually make up the bulk of a nation's economy. In **Kenya**, the rising cost of energy, coupled with growing concerns for environmental conservation, increased the interest of the business community in efforts to reduce production costs through energy efficiency. Yet while many businesses wanted to reduce their energy consumption, a major barrier was lack of information and knowledge about effective energy management strategies and alternatives.

UNDP-GEF's *Industrial Energy Efficiency Project* for Kenya works with energy service companies as well as small- and medium-sized manufacturers and service industries to reduce overall carbon dioxide emissions through improved energy efficiency.

Project activities are broken down into a four-stage process:

- **Capacity-building and awareness-raising**. Specialized training courses on energy management have been conducted for energy plant operators and auditors. In addition, in 2002, the project helped start an industrial energy-efficiency network to promote best practices through newsletters, reports, organized training courses and energy audits. The network operates through a variety of industrial and service sectors, including textiles, tea, leather and dairy.
- **Overcoming financial barriers**. Training in financial issues helps participants to develop bankable energy-efficiency projects. In addition, a guidebook for investors interested in energy efficiency has been produced and cooperative work with engineers and entrepreneurs is under way to create viable energy service companies.
- **Demonstration projects**. New technical and financial mechanisms for energy-efficiency projects are currently being designed to help showcase the benefits of this approach. In 2003, for example, seven energy-efficiency projects were identified and implemented in three industries, with expected energy savings averaging 22 per cent per year.
- **Institutional strengthening and sustainability**. The project is collaborating with the Kenya Association of Manufacturers to ensure that energy efficiency is institutionalized as a cornerstone of Kenya's future economic development.

To take just one example, at Cirio Del Monte Kenya Ltd., an energy audit supported by the project identified nearly $185,000 in potential savings through upgrades and efficiency measures, most of which would pay for themselves in less than two years.

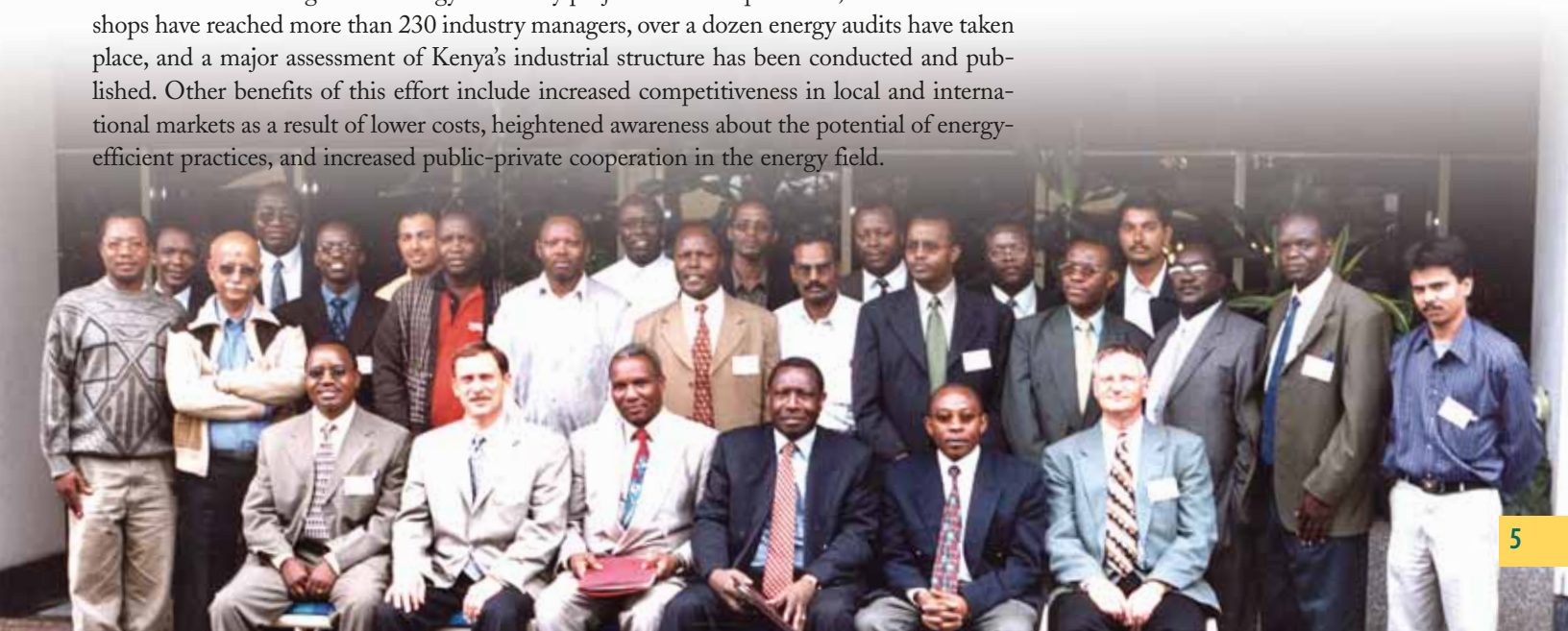
Overall, the project has already fostered more than $1 million in investments in energy-efficiency efforts by Kenyan businesses, with average payback periods on investments of just over one year. A 2003 survey of 37 industries involved in the project has shown savings of 10-20 per cent of energy costs, and a reduction in carbon dioxide emissions totalling 8,100 tonnes. An investor's guide to energy-efficiency projects has been produced, awareness workshops have reached more than 230 industry managers, over a dozen energy audits have taken place, and a major assessment of Kenya's industrial structure has been conducted and published. Other benefits of this effort include increased competitiveness in local and international markets as a result of lower costs, heightened awareness about the potential of energy-efficient practices, and increased public-private cooperation in the energy field.

## Up close: Tightening energy standards for new construction

In **Lebanon**, where heating during the winter months and cooling during the summer is essential, inefficiency in the building sector takes a heavy economic and environmental toll. A major opportunity exists to improve efficiency standards since the construction industry is expected to undertake over $40 billion in investments during the period from 2000 to 2020.

In an attempt to capitalize on these investments, a $500,000 UNDP-GEF project, which started in 2000, brought together the Government of Lebanon and the Lebanese Order of Engineers and Architects. Their joint efforts are focused on removing barriers to the formulation, adoption, dissemination and application of thermal building standards. A draft 'Thermal Standard for Buildings in Lebanon' has been put forward that, if implemented, will result in reductions of up to 43 per cent on space heating and cooling energy needs in buildings. The project is also working to develop economic incentives and policies to help private developers overcome any additional initial costs associated with energy-efficient buildings, while working with the government to develop a thermal building code. Over a 20-year horizon, and assuming a steady building construction growth rate, an estimated 1 million tonnes of carbon dioxide will be avoided as a result.

**More information about this project in Kenya can be found at http://www.kam.co.ke.**



# Increasing Access to Local Sources of Financing

UNDP-GEF works as a catalyst for change, helping developing countries and economies in transition to strengthen their own skill base and introduce climate-friendly technologies. Ultimately, however, moving from successful demonstration projects to the widespread use of renewable energy technologies requires the full participation of local financial institutions. Without that support, businesses and entrepreneurs will not get the steady, long-term financing they need to make renewable technology and energy efficiency more profitable on a broad scale.

More than a decade after the signing of the UN Framework Convention on Climate Change, which raised the profile of this global concern, financial barriers remain one of the biggest impediments to the adoption of renewable energy technology and increased energy efficiency. To overcome these hurdles, UNDP-GEF works closely with local financial markets and institutions, focusing particularly on capacity development and lowering start-up costs for businesses. It also provides technical assistance to help create the business and regulatory environment that makes energy efficiency and renewable energy investments profitable, while decreasing their perceived risks.

UNDP-GEF support for risk-sharing instruments, such as partial risk guarantees, combined with commitments from other co-financiers, can increase awareness and support for financing renewable energy projects in the local financial community. Throughout the UNDP-GEF climate change portfolio, local partners include energy service companies, non-governmental organizations, and microcredit lenders and savings groups. Beneficiaries range from small- and medium-sized enterprises, homeowners, consumers, rural communities and local governmental authorities such as village councils. In Eastern Europe, for example, UNDP-GEF is implementing projects in **Bulgaria**, the **Ukraine**, **Latvia** and **Poland** that are increasing lending by commercial banks for municipal energy efficiency, setting up municipal energy service companies or establishing relevant public-private partnerships.

In Asia, energy is often imported from overseas. But an innovative new effort using the husks of rice – a primary staple – for energy could become a powerful tool for achieving greater energy independence, reducing greenhouse gas emissions and improving the local environment. Along with experiences drawn from earlier biomass initiatives, that is the philosophy behind the *Removing Barriers to Biomass Power Generation and Co-generation* project in Thailand, which is supporting the operation of two new power projects in Surin and Yala provinces.

## Measuring the impact: Biomass energy off to a promising start in Thailand

**Implementing agency:** UNDP

**Executing agency:** Thailand Ministry of Energy

**Partners:** Danish Cooperation for Environment and Development, Industrial Finance Corporation of Thailand

**GEF financing:** $6.8 million

**Co-financing:** $117.6 million

**Total financing:** $124.4 million

**Projected greenhouse gas reductions:** 1.5 million tonnes of carbon dioxide by the end of 2007

**A substantial amount of biomass (e.g., charcoal, wood, paddy husk and bagasse) is still consumed as fuel for households, commercial establishments and industry. Some 15 million tonnes of bagasse, 10 million tonnes of fuelwood, and 6 million tonnes of charcoal were estimated to have been used in 1994.**

*Source:* Initial National Communication to UNFCCC, Thailand

The Roi-Et Green Power Plant, based in Surin, is supported with $1 million in risk guarantees from UNDP-GEF. The plant uses 260 tonnes of rice husks a day to produce nearly10 megawatts of energy, sufficient to power 20,000 households. Without the risk guarantees provided by UNDP-GEF, the power plant would not have received the financing it needed to begin operations.

An immediate impact of the project has been increasing support for biomass-based energy systems. Financiers involved in the Roi-Et Power Plant have already begun providing support for other plants using rice husks, independent of UNDP-GEF funding. This is a promising start to an effort to make this technology far more common in Thailand and throughout the region.

A second power plant, that uses the same technology and is located in the southern Yala Province, is due to come online in 2005 with 9.9 megawatts of electricity. Particulate emissions for both plants are expected to be far below national standards, and the dependence on a renewable resource like rice means that net greenhouse gas emissions will be far lower than those from a similarly sized coal power plant.

Altogether, the project has helped spawn seven biomass-based power plants in Thailand, has produced to date a total of 130 megawatts of energy, and potentially already displaced a cumulative total of 646,000 tonnes of harmful emissions a year.

## Promoting biomass power in Slovenia

In **Slovenia**, woody biomass is one of the most abundant renewable energy resources, yet the national market for biomass energy has remained relatively small. UNDP-GEF is promoting the increased use of this alternative energy source in Slovenia in part to help the country achieve its stated goals of reducing greenhouse gas emissions by 8 per cent from 2008 to 2012.

With $2.5 million in financing from UNDP-GEF, a Biomass Energy Fund was established in May 2003 through a project called *Removing Barriers to Increased Use of Biomass Energy in Slovenia*. Combined with support from the Government and the Environmental

Development Fund of Slovenia, the new Fund has begun providing financing to municipal utilities and private companies that have committed themselves to supporting biomass district heating projects. In June 2004, for instance, work began on two wood-chip boilers in the municipality of Vransko that will provide 3.8 megawatts of energy, enough to heat 110 homes. A contract signed to build another plant in Kocevje is helping extend the local district heating network to more than 6,000 people. More than 30 additional projects are under consideration by the Fund.

To receive financing from the Biomass Energy Fund, at least half of the total investment in initiatives must come from other sources. The current financing approach has generally involved a 25 per cent equity funding contribution from the Fund, a 25 per cent contribution from private or municipality investors, and 50 per cent from alternative sources, which may include financing from the Environmental Development Fund. The goal of the Biomass Energy Fund is a 3 to 5 year pay-back period. This will ensure that new investment projects will be able to access support in the coming years and that the long-term impact of the Fund and of the UNDP-GEF project will continue to grow.

Unlike fossil fuels, which take millions of years to form, biomass can be replaced in a short period of time. It is considered a clean, renewable energy resource if it is harvested in a sustainable manner.

### Measuring the impact: Wood chips provide heat for city dwellers in Slovenia

**Implementing agency:** UNDP

**Executing agency:** Ministry of Environment, Spatial Planning and Energy

**Partners:** Government of Slovenia, Environmental Development Fund of Slovenia, Municipalities

**GEF financing:** $4.3 million

**Co-financing:** $7.9 million

**Total funding:** $12.2 million

**Projected greenhouse gas reductions:** 900,000 tonnes of carbon dioxide by 2010

For more information, visit: www.aure.si

### What is biomass energy?

Biomass is non-fossil organic matter that can be used as a source of energy. It includes vegetation and trees grown on land or in water as well as waste products. These include municipal solid waste and sewage, animal manure, forestry and agricultural residues, and certain types of industrial wastes. An important source of biomass comes from forests and woody crops – woody biomass – when these are converted into solid, liquid or gaseous fuels to provide energy for domestic, commercial or industrial use.

Unlike fossil fuels, which take millions of years to form, biomass can be replaced in a short period of time. It is considered a clean, renewable energy resource if it is harvested in a sustainable manner.

## Up close: Harnessing wind power

With its vast unimpeded steppes, few countries are better positioned to expand their use of wind energy than **Kazakhstan**. In 2004, UNDP-GEF began a $2.6 million project to promote the development of a private wind energy market in that country. By collaborating with the national government and the private sector, which is providing more than $4.5 million in co-financing, the project has four main objectives:

- Assist the government in formulating a national policy on the development of wind energy, including the creation of financial incentives for renewable power development;
- Strengthen national capacity – in both the government and the private sector – to develop and obtain financing for wind energy projects;
- Facilitate the construction of the country's first 5-megawatt 'wind farm' (located in a mountainous area with natural wind tunnels) to demonstrate the feasibility of wind power projects and to increase awareness and support for them;
- Provide lessons and experiences that can be applied to other renewable energy projects in Kazakhstan and other countries.

**Implementing agency:** UNDP

**Executing agency:** Ministry of Energy and Mineral Resources

**GEF financing:** $2.6 million

**Co-financing:** $0.16 million (Government), $4.6 million (private sector)

**Total funding:** $7.3 million

**Kazakhstan possesses significant potential for wind energy development. According to research work, nine regions were identified in Kazakhstan as most suitable for development of wind energy. The carbon dioxide emission reduction potential of this measure is estimated to be from 0.7 to 3.1 million tonnes.**

*Source:* Initial National Communication to UNFCCC, Kazakhstan

# Fostering Supportive Policies

Access to electricity – whether in a home, a new business, a health clinic or school – can change lives overnight. Many renewable energy projects, such as solar home systems, are designed for rural populations removed from central electricity grids. Others, however, require access to grids in order to be financially viable. Accessing those grids in a fair and competitive way is a challenge in many countries.

Moreover, there will be more and more reliance on large-scale grid-connected renewable energy. To substantially increase its share in the energy supply mix, national and regional energy sector policies and legislation need to be changed, and regulations assuring equal (competitive) access introduced and enforced. Facilitating competitive access to the grid for wind, biomass, geothermal and small hydro producers is a key component of UNDP-GEF's newest strategic priority in the climate change arena.

In the **Russian Federation**, a $3 million *Capacity-Building to Reduce Key Barriers to Energy Efficiency in Russian Residential Buildings and Heat Supply* project, supported by UNDP-GEF, is working to improve the energy efficiency of buildings in the city of Vladimir. Partnering with the Federal Agency for Science and Innovation and the Ministry of Education and Science, the project is:

- Developing a system for consumption-based metering and billing to create an incentive for families and energy companies to invest in energy efficiency.
- Undertaking studies to highlight the feasibility of developing autonomous heating supplies, such as gas-fired boilers located in individual residential buildings. This is an alternative to networked heat supplied by pumping hot water through pipes from a power-and-heat plant or a district boiler. Such a shift would, however, require changes in policies, standards and regulations.
- Working with maintenance companies and municipal energy managers to improve the financial and technical analysis of proposed energy efficiency investment projects.

Methods for calculating the amount of heat actually consumed by municipalities were developed, along with guidelines for introducing autonomous boilers and determining tariffs for their use. Local regulations were also worked out, with the potential for replicating them throughout the Russian Federation.

In **Mexico**, a new $4.7 million UNDP-GEF project expects to reduce national carbon dioxide emissions by 4 million tonnes per year by promoting the development of a commercial wind energy market with an installed capacity of 2000 megawatts by 2015. Succeeding in this effort will require education campaigns for government officials, hands-on technical training for engineers, and pre-feasibility studies of the country's most promising wind energy sites. The project will share experiences with a similar effort being launched in **Kazakhstan** (see box).

In addition, fostering policies that promote energy efficiency can help overcome traditional barriers – such as limited access to electricity by rural or urban populations – which have prevented the broader penetration of renewables in national markets.

# Renewable Energy for Poverty Alleviation

For rural communities beyond the reach of central power grids, renewable energy sources offer the potential to support both income generation as well as essential social services. The adoption of renewable energy not only provides global greenhouse gas benefits, but also contributes to clean development and sustainable livelihoods.

While much of the UNDP-GEF portfolio has focused on electricity for quality of life improvements – home lighting being just one example – productive uses of renewable energy include water pumping for irrigation and drinking water, agricultural processing, and lighting for health centres and educational institutions. As a result, this strategic priority has significant potential for direct poverty alleviation in addition to its global environmental benefits.

In **Bolivia**, for instance, the $8.2 million *Rural Electrification with Renewable Energies* project is using solar photovoltaic systems and micro-hydroelectric plants to electrify more than 3,400 rural homes and jump-start longer-term support for renewable energy systems in rural areas. Funding from UNDP-GEF and the Government of Bolivia is channelled through rural microcredit institutions, which evaluate and qualify potential credit clients and pay supplier companies on behalf of the beneficiaries. This innovative financing mechanism is proving so successful that the government is adopting it in other areas of rural development, such as the financing of tractors for small-scale farmers. The proposed elimination of import duties on photovoltaic panels is also being enacted by the government. With a reduction in the rate now being applied to these panels of over 40 per cent, this is opening the way for a potential market transformation.

A similar electrification project is also under way in **Chile**, where nearly a quarter of the rural population lacks access to electricity. There, more than 9,000 households, schools and health care centres, among others, are being targeted in a $6.1 million effort to expand the use of photovoltaic, hydropower and hybrid projects.

In **Uganda**, where hydroelectricity has been one of the few renewable energy resources put to use, a heavy dependence on conventional fossil fuels has required substantial capital investments, increasing the country's debt burden. Establishing a foundation for the sustainable use of photovoltaic systems in rural areas is one way of both reducing that burden and expanding access to power in remote areas. As in Bolivia and Chile, the UNDP-GEF *Uganda Photovoltaic Pilot Project for Rural Electrification* worked with micro-lenders, in this case with additional help from the newly established Uganda Renewable Energy Association. As a result, more than 2,000 photovoltaic systems were established in Uganda between 1998 and 2002. The Association, which successfully lobbied for the elimination of taxes on photovoltaic panels, is seeking to build on this pilot effort. Towards that end, and in collaboration with UNDP-GEF, the Association helped develop national standards for the installation of photovoltaic systems and components. Training provided under the project, both for technicians and for Association officials developing bankable business plans, has ensured that technical capacity is no longer a constraint in the development of a private sector photovoltaic industry in Uganda.

# Rural Guatemalan communities organize around renewable energy

Projects are designed to leave a legacy. Without this focus on replicability, a limited number of projects scattered around the world would never have the broad global impact that UNDP-GEF was created to foster.

The positive ripple effects of a single project can be seen in a $380,000 investment by UNDP-GEF in **Guatemala**. Starting in July 2000, the *Renewable Energy Based Small Enterprise Development in the Quiché Region of Guatemala* project partnered with Fundación Solar, a local non-governmental organization in the El Quiché region, where communities were often poorly organized and had little access to reliable electricity.

A full year of community discussions, analysis, negotiations and capacity-building led to a decision to build and service a series of small hydro and photovoltaic systems for three rural towns. The communities involved helped transport and construct the equipment needed for the systems while also agreeing to set aside a modest amount of financing each month to address maintenance and replacement concerns.

By the time UNDP-GEF financing ended two years later, the project's accomplishments included:

- A 110 kilowatt micro-hydroelectric plant installed in the village of Chel;
- More than 80 solar photovoltaic systems installed in two remote communities;
- Seven refrigeration systems powered by photovoltaic energy established in seven remote communities. This provided cold storage for vaccines and basic lighting for health centres.

The project's lengthy preparation phase paid off in terms of local support and the creation of a vibrant local industry to service the newly installed systems. Roads throughout the region have been improved, local capacity is growing in administration and finance as a result of the micro-lending aspects of the project, and communities are better organized, not just in terms of this project, but also in relation to their dealings with local and national government. All of these results are in addition to the 50,000 tonnes of carbon dioxide that will be avoided over a 20-year period.

# Promoting Sustainable Transport

Greenhouse gas emissions related to transport are rising faster than those in any other sector. Moreover, emissions from transport in developing countries are expected to exceed those of developed countries by 2010. Without a dramatic shift in current trends, the global growth of motor vehicle use may overwhelm any efficiency gains from new fuels and technologies. Unfortunately, the transportation sector is also the area where the least amount of progress has been made over the last decade in addressing cost-effective greenhouse gas reductions.


Improving a population's mobility and access to transport can have positive repercussions on social welfare by stimulating trade and improving access to jobs, health services and education. Achieving this enhanced mobility through private vehicles, however, can involve high infrastructure costs, worsening air pollution and chronic traffic.

Experience has shown that there is no single magical solution to the challenges of sustainable transport facing developing countries. The cities that have made progress have done so by using a variety of approaches: traffic control, shifts in modes of urban transport to well-managed public transit, support for non-motorized transit, vehicle regulation and the use of new technologies. Countries and cities must decide how to best meet their mobility needs while acknowledging that concerted action will be required over the long run.

UNDP-GEF's focus in this area is on ground transportation, with a two-pronged strategy for reducing greenhouse gas emissions. The first approach emphasizes cutting-edge technology that can increase mobility and decrease emissions, including the commercialization of fuel-cell bus technology.

The second approach is geared to non-technological solutions that facilitate the shift to public transit. This includes rapid-transit bus systems, increased bicycle use and the creation of pedestrian zones, and the introduction of other measures, such as management of traffic demand and land-use planning.

## Measuring the impact: Cycling up 100 per cent in Gdansk, Poland

**Implementing agency:** UNDP

**Executing agency:** Ministry of Environment

**Partners:** Gdansk Municipality, Polish Ecological Club, 11 non-governmental organizations

**GEF financing:** $1 million

**Co-financing:** $1.65 million

**Total financing:** $ 2.6 million

**Projected greenhouse gas reductions:** 250,000 tonnes carbon dioxide over ten years

For more information, visit: http://www.rowery.org.pl/bicycles.htm

# Encouraging cycling in Gdansk

Motorized transport is the fastest growing source of carbon dioxide emissions in **Poland** and a primary source of urban air pollution. Increasing prosperity has led to more private cars, worsening traffic congestion and higher emissions of local air pollutants and greenhouse gases.

To help remedy this problem, the people of Gdansk expressed an interest in making greater use of bicycles, particularly for commuting to work. A major problem, however, was that the existing infrastructure in that city did not allow for bicycle safety, even in places where the topography and settlement patterns were conducive to it.

Research conducted by UNDP-GEF's *Gdansk Cycling Project* confirmed that the main barrier to cycling there was the lack of bicycle paths and other infrastructure, along with measures to reduce traffic speed, such as speed bumps and strict speed limits. Through the project, a core network of cycling facilities is being constructed. A public outreach and information campaign is also being carried out by NGOs to spread the technology and encourage cycling in other Polish cities.

The project, developed by the Municipality of Gdansk and a local organization, the Polish Ecological Club, is being used as a model to encourage cycling throughout the country. To date, the number of people routinely using bicycles in Gdansk increased by 100 per cent, and 12 kilometres of bicycle paths are completed or under construction, with another 20 kilometres planned. Up to 60 per cent of the city population participates in ride-share or other programmes to promote reduced traffic congestion and greenhouse gas emissions, resulting in local and global environmental benefits.

# Demonstrating the potential of fuel-cell buses

Widespread use of fuel-cell vehicles, which produce water as their only major emission, could yield major reductions in air pollutants and result in significantly higher fuel efficiency as compared to conventional vehicles. Although fuel cells are technically proven, they are not yet economically competitive in many commercial applications. Nevertheless, early investments in this technology can reduce its costs to a commercially competitive level within 7 to 15 years.

To capitalize on this tremendous potential, UNDP-GEF launched a major effort in 2002 to support commercial demonstrations of fuel-cell buses and re-fuelling systems in the largest bus markets of the developing world: **Beijing**, **Cairo**, **Mexico City**, **New Delhi**, **São Paulo** and **Shanghai**. A total of nearly $60 million in GEF financing has been proposed for this effort, with $36 million already approved. Of these markets, activities in China, Brazil and Mexico are already under way.

The first major investments in this global effort have been undertaken in China, where air pollution is a serious problem in most of country's major cities. The primary sources of urban air pollution in China today are coal combustion and vehicle exhaust emissions. The poor environmental performance of vehicles in China is a major contributing factor to local air pollution and greenhouse gas emissions, along with poor traffic management, which contributes to congestion and slow average speeds on roadways. Moreover, the dramatic growth in vehicle use over the coming decades is expected to exacerbate China's urban air pollution problems.

As part of its fuel-cell bus portfolio, the $15.9 million UNDP-GEF *Demonstration for Fuel Cell Bus Commercialization in China* project is catalysing cost-reductions of fuel-cell buses for public transit in Chinese cities. It is stimulating the transfer of technology by supporting demonstrations of fuel-cell buses and their fuelling infrastructures in Beijing and Shanghai.

With considerable support not only from UNDP-GEF and the Chinese Government but from the private sector as well, Shanghai and Beijing have successfully established a management structure for the new enterprise. They have also mobilized local resources, selected routes for fuel-cell bus demonstrations, identified hydrogen sources and conducted technical and managerial training related to project implementation. Shanghai's demonstration buses are expected to arrive in September 2005.

The UNDP-GEF effort has become part of an aggressive programme in China to commercialize fuel-cell buses in China. The interim goal is to put 100 fuel-cell buses into service by the 2008 Beijing Summer Olympics as a way to improve air quality.


## Measuring the impact: China launches aggressive programme to commercialize fuel-cell buses

**Implementing agency:** UNDP

**Executing agency:** Ministry of Science and Technology

**GEF financing:** $5.8 million

**Co-financing:** $10.1 million

**Total financing:** $15.9 million

For more information, visit: http://www.chinafcb.org

# Making Little Go a Long Way: The GEF Small Grants Programme

## Fast facts:

**The GEF Small Grants Programme**

**Grants distributed:** 5,000

**Number of countries:** 73

**Total funding:** $130 million

**Average grant size:** $20,000

**Maximum Grant:** $50,000

More information is available at: http://sgp.undp.org/

In the area of climate change, the GEF Small Grants Programme is providing funding for a wide range of renewable energy solutions that meet community needs. These range from improved efficiency cook stoves to projects promoting solar, micro-hydro, biogas, biofuel, solar photovoltaic and wind energy.

Projects funded under the Small Grants Programme encourage an entrepreneurial approach by building local capacity, raising public awareness of climate change and energy conservation issues, and demonstrating appropriate technologies. The projects may also reduce the cost of suitable technologies for communities by supporting applied and participatory research and development. At 950 projects funded to date, enthusiasm continues to build for the expansion of the programme's climate change portfolio since renewable energy can be the most effective response to the need for electricity in many off-grid area communities, while reducing harmful emissions.

## Devising an energy-efficient kiln for brick making

The Small Grants Programme has consistently shown that improving energy efficiency does not have to require massive new investments in power plants or expensive technology. The $32,000 *Developing a Model of a Vertical Brick Kiln with High Efficiency* project in **Viet Nam** is just one example of the benefits of a modest approach.

Brick making is one of the most important industries in Viet Nam, traditionally carried out by family-run businesses in rural areas. In 1998, there were over 300 brick-making enterprises in the country, of which 200 were privately owned and predominantly small-scale, accounting for about 70 per cent of national brick production.

At the same time, brick production is one of the most environmentally damaging activities in the construction sector. Most brick kilns tend to be highly inefficient, relying on low-quality coal with a high sulphur content. This leads to intense local air pollution and represents a significant national contribution to greenhouse gas emissions.

Working with community leaders, government officials and researchers at the University of Technology, the project studied alternative kiln designs that would have less of an environmental impact while still being affordable by small and rural businesses. Local brick makers were heavily involved in testing different kiln designs, finally settling on a vertical shaft brick kiln.

By the end of 2003, 21 vertical kilns had been installed, six in Hung Yen Province and 15 in Hai Duong Province, with many more in the pipeline. The systems have proven to be up to 50 per cent more efficient in their use of coal than the traditional model – at a fraction of the cost. In addition, the new technology has reduced the incidence of broken bricks, saving both time and money for brick producers. The demonstration of this new technology was so successful, in fact, that the Government of Viet Nam recently issued a decree that all traditional brick kilns in cities must be phased out by 2005 and in rural areas by 2010.

# Fulfilling Convention Mandates

UNDP is a recognized leader in both capacity-building and sustainable development. As a result, developing countries and countries in transition that have signed the UN Framework Convention on Climate Change often request UNDP-GEF assistance in carrying out their responsibilities under the Convention, including the development of relevant strategies, plans or programmes.

One way such targeted assistance is provided is through small-scale funding for specific needs. UNDP-GEF has also begun an effort to help the world's least developed countries respond to the urgent need of adapting to the adverse impacts of climate change. Both of these efforts dovetail with UNDP's traditional role in capacity-building, which is the ultimate basis for establishing effective and sustainable development.

## Meeting reporting requirements

Since 1992, UNDP-GEF has assisted 107 countries in preparing their initial national communications to the UN Framework Convention on Climate Change. By August 2004, 95 of these countries had submitted their national communications.

Through the GEF funded National Communications Support Programme (NCSP), established in 1998, UNDP provided technical assistance to these countries. This 2-year programme created new forums to facilitate consultations among and within countries, promoting a vigorous exchange of information, experience and knowledge on core issues related to climate change. These consultations covered topics such as greenhouse gas emission inventories, mitigation analysis and assessments of a country's vulnerability to climate change. This increased interaction built up technical capacity in these areas and subsequently also led to a number of regional projects in priority areas. More importantly, the NCSP and the initial national communications made many contributions towards advancing climate change issues in national agendas (see box).

Countries are now building on these experiences and results to prepare their second national communications, which are being funded by GEF as required by the convention. While many initial national communications produced comprehensive analyses of countries' potential to reduce greenhouse emissions, the second communications focus more on adaptation to climate change, especially in the most vulnerable areas and sectors. They also aim at increased stakeholder participation, better use of lessons learned, and more efficient and effective preparation and implementation. Furthermore, experts from beneficiary countries are increasingly providing support to other countries, resulting in the cross-fertilization of ideas and greater South-South cooperation.

To support countries in their second national communications, UNDP has established a new National Communications Support Programme. The programme is working to sustain capacity-building efforts through targeted technical assistance, knowledge management, good practice, communications and outreach designed on a country-by-country basis.

## Adapting to climate change

Adapting to climate change is increasingly recognized as a significant step towards the achievement of sustainable development goals. While scientific uncertainty regarding the impact of climate change exists, the scope and magnitude of current climate risks are well known and action is urgently needed.

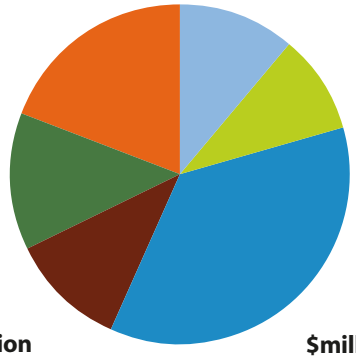
### Contributing through national communications

The NCSP and the initial national communications contributed to bringing climate change issues into national agendas in a number of ways. Specifically by:

- Facilitating the creation and consolidation of national climate change units.
- Strengthening scientific and technical knowledge through the participation of experts, universities and research institutions in training and technical studies.
- Assisting countries in the design of the technical and institutional frameworks required for updating and improving the quality of data on the various areas of climate change.
- Advising countries on integrating global environmental concerns associated with climate change into local development priorities.
- Encouraging countries to develop awareness campaigns for the education system, from primary schools to universities, and the community, including policy makers.

**To sign up as a member of the NCSP list-serv, write to: natcom-l@undp.org.**

## UNDP-GEF climate change portfolio by region (US$)



| Region | $millions |
|---|---|
| Africa | 61.855 |
| Arab States | 53.388 |
| Asia & Pacific | 201.304 |
| Europe & CIS | 61.678 |
| Global | 71.594 |
| Latin America & Caribbean | 106.392 |
| Grand Total | 556.211 |

*Figures are historical – cumulative from July 1991 through June 2004*

## Projected reductions in carbon dioxide ($CO_2$) from 23 UNDP-GEF climate change projects approved between July 2002 and June 2004

**Direct $CO_2$ reduction:** Amount of emissions avoided due to systems or products installed, investments made or energy-efficient products produced with UNDP-GEF support over a project's lifespan: **19.8 million tonnes**

**Direct post-project $CO_2$ reduction:** Amount of emissions avoided due to installations or investments made after a project has ended, through, for example, revolving funds, continued credit guarantees, or re-investments: **10.9 million tonnes**

**Indirect savings (lower boundary):** Amount of emissions avoided as a direct result of a project, during its lifespan, and assuming that it will be replicated: **98.1 million tonnes**

**Indirect savings (upper boundary):** Amount of emissions avoided when the economic potential of a given application in a country or region is taken into account (assuming that the removal of barriers to a cost-effective technology can leverage an entire market)[1]: **157.4 million tonnes**

**Total range:** 123 – 196 million tonnes

UNDP-GEF is currently supporting a portfolio of adaptation projects that focus on health and the environment, agriculture, water resources and the management of climate-related risks. With support from the Swiss, Canadian and Dutch governments, we have also developed an innovative set of guidelines for developing and implementing adaptation strategies, policies and research, called *Adaptation Policy Frameworks for Climate Change: Developing Strategies, Policies and Measures*. The guidelines, to be available in December 2004, motivated by the lack of a clear road map in the rapidly evolving field of adaptation policy-making. At its heart, the guidelines are about practice rather than theory. Their starting point is information that countries already possess on vulnerable systems such as agriculture, water resources, public health and disaster management. What they offer is a flexible approach through which users can clarify their own priority issues and develop responsive adaptation strategies, policies and measures.

## National Adaptation Programmes of Action

National Adaptation Programmes of Action were launched to address the urgent needs of least developed countries in adapting to the adverse impact of climate change. One of the guiding principles of the programme is that countries should use existing information and traditional knowledge; there should be no new studies. The programme is also intended to contribute to broader sustainable development goals in the areas of agriculture, water, health and coastal zone management.

UNDP-GEF is currently implementing national adaptation programmes in 29 countries, emphasizing capacity development and the establishment of an open and transparent process of consultation among relevant institutions. The process is expected to lead to national assessments of vulnerability to climate change, identification of key adaptation measures, and the development and prioritization of proposals to address adaptation needs. The national process includes a public review and revision of the programme document, involving representatives from civil society and the private sector.

## Meeting international obligations: The National Capacity Self-Assessment programme

UNDP participates in and provides support to the National Capacity Self-Assessment programme, funded by the GEF. The programme assists developing countries and economies in transition in assessing their capacity to meet multilateral environmental agreements, including the United Nations Framework Convention for Climate Change, the Convention on Biological Diversity and the United Nations Convention to Combat Land Degradation.

The National Capacity Self-Assessment programme is unique in that it promotes synergy among the three conventions. Through the self-assessment, countries identify capacity gaps and then come up with their own solutions to rectify them. To date, approximately 75 per cent of the resulting activities are implemented by UNDP-GEF.

[1] This potential is then corrected downward in order to reflect what can be achieved in the wake of a project, under its indirect influence. Since some of these achievements might have been made by market forces or government policies at a later time even without a UNDP-GEF intervention, this figure is then multiplied by an assumed GEF causality factor, which indicates to what degree the GEF intervention can reasonably be considered a factor.

## GEF National Dialogue Initiative

The GEF National Dialogue Initiative, launched in 2004, is a joint undertaking of the GEF Secretariat, UNDP, UNEP and the World Bank. It is implemented by UNDP and carried out in close collaboration with UN Member States. Through a targeted, multi-stakeholder dialogue, the initiative aims to strengthen GEF assistance to participating countries by:

- Promoting in-depth understanding of the GEF's strategic directions, policies and procedures;
- Strengthening country coordination and ownership of GEF operations and information-sharing about GEF-funded projects;
- Mainstreaming GEF activities into national planning frameworks and encouraging better coordination at the national level of the GEF focus areas and international agreements, in response to country priorities.

National dialogues sponsored under the programme bring together representatives from governmental and non-governmental institutions, the scientific and academic communities, donor organizations, the private sector, the media, and the GEF Secretariat and its associated agencies. The initiative builds upon lessons from the GEF Country Dialogue Workshops Programme, during which 76 countries and over 5,000 stakeholders participated in 50 national and subregional consultations. For more information, please visit http://www.undp.org/gef/dialogue/index.htm.

## GEF Small Grants Programme

Launched in 1992, the GEF Small Grants Programme supports activities of non-governmental and community-based organizations in 73 developing countries working in areas of GEF concern. The objective of the programme is to foster environment stewardship while helping people generate sustainable livelihoods. Grants provided by the programme average $20,000 per project (though they can reach a maximum limit of $50,000) and are channelled directly through community-based or non-governmental organizations. Decisions concerning the awarding of grants are decentralized, based on the directives of a voluntary National Steering Committee in each participating country. To date, more than 5,000 grants have been awarded worldwide, with many benefiting more than one community. Over 600 partner organizations now provide co-financing and other support to Small Grants Programme activities, including the United Nations Foundation, the European Commission, the governments of Denmark, the Netherlands, Switzerland and the United Kingdom. The programme is implemented by UNDP on behalf of the World Bank and UNEP, and executed by the United Nations Office for Project Services.

## UNDP's Energy and Environment Group

The Energy and Environment Group is part of UNDP's Bureau of Development Policy. It focuses on the central aspects of sustainable development, especially the links between poverty and the environment. The Group offers six services lines, in areas relating to:

- Frameworks and strategies for sustainable development;
- Effective water governance;
- Access to sustainable energy services;
- Sustainable land management;
- Conservation and sustainable use of biodiversity;
- National and sectoral policy and planning to control emissions of ozone depleting substances and persistent organic pollutants.

The Energy and Environment Group also includes UNDP-GEF, the Montreal Protocol Unit and the Nairobi-based Drylands Development Centre. Energy and environment policy advisers are based at UNDP Headquarters in New York and eight regional locations to ensure the highest quality policy advice and services to client countries. In addition, every UNDP country office has at least one environmental focal point and a network of local practitioners that provide a forum for sharing knowledge.

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