OPERATIONAL PROGRAM NUMBER 5
REMOVAL OF BARRIERS TO ENERGY EFFICIENCY AND ENERGY CONSERVATION

5.1 The United Nations Framework Convention on Climate Change (UNFCCC) seeks to stabilize atmospheric greenhouse gas concentrations at levels that would prevent dangerous anthropogenic interference with global climate. The Operational Strategy of the GEF puts initial emphasis, among others, on three Operational Programs that address long-term program priorities of the Convention to mitigate climate change. The first of these deals with the removal of barriers to energy conservation and energy efficiency, as many studies have suggested that institutional, economic, and social barriers delay or inhibit the realization of the large energy saving potential in many sectors and regions.

GUIDANCE

5.2 At its first meeting, the Conference of the Parties (CoP) of the UNFCCC asked the GEF, as the interim operating entity of the financial mechanism...

> ...to adopt a mixed strategy wherein projects will be selected with a double set of program priorities as described in paragraph 9(c) of the [GEF] report, that is, if they meet either one of the long-term program priorities or one of the short-term program priorities.

5.3 The CoP also provided the following initial guidance that the GEF, as the interim operating entity of the financial mechanism, should support agreed activities in Parties not included in Annex I to the Convention[1] that:

(a) are country driven and in conformity with, and supportive of, national development priorities;

(b) are consistent with and supportive of internationally agreed programs of action for sustainable development;

(c) transfer technology that is environmentally sound and adapted to suit local conditions;

(d) are sustainable and lead to wider application;

(e) are cost-effective;

[1] When the GEF provides assistance outside the Convention's financial mechanism, it will ensure that such assistance is also fully consistent with the guidance provided by the CoP.

(f) strive to leverage other funds; and

(g) mitigate climate change.

PROGRAM OBJECTIVE

5.4 The objective of this Operational Program is to reduce the risk of climate change by reducing net greenhouse gas emissions from anthropogenic sources and by protecting and enhancing removal of such gases by sinks. This objective will be achieved by removing barriers to large-scale application, implementation, and dissemination of least-economic cost energy-efficient technologies (whether commercially established or recently developed); and by promoting more efficient energy use. There is high potential for energy efficiency measures in all stages of fuel-cycles -- production, transport, and use -- and for energy conservation measures on both the supply side and the demand side.

5.5 To date, the commercially viable application of these measures has been slower than desirable from the perspective of mitigating climate change. It also has been considerably slower than might be expected based upon a *prima facie* evaluation of relative costs. This lag in their adoption is frequently attributed to the existence of barriers of many types -- any of which can prevent seemingly profitable market transactions from taking place.

5.6 This Operational Program shares with Operational Program Number 6 its design and the programmatic objective of removing barriers to market-oriented transactions. Both of these programs are intended to lay the foundation for increased public and private sector investments that also result in mitigating potential climate change.

5.7 The programmatic benefits will result from the combined effects of the continuous and sustainable implementation of "win-win" measures following the removal of barriers. These programmatic benefits can be estimated by reductions in greenhouse gas emissions either directly (as compared to what they would have been) in tons of carbon-equivalent emissions averted or indirectly from changes in energy intensities or inter-fuel substitutions in specified sub-sectors. Programmatic benefits also can result from structured learning from projects implemented. The effectiveness of this learning is estimated by more qualitative performance indicators.

5.8 Meeting the overall programmatic objective depends, however, on two key assumptions, which concern **scope** and **replication**. The first assumption is that successful outcomes will be achieved in many of the various major market applications

for energy efficiency and conservation measures. The following are major market applications (with specific examples of measures in parentheses):

(a) electricity production and distribution (load analysis, better maintenance and instrumentation, boiler and turbine improvements);

(b) industrial energy consumption (efficient drives, motors, and improved systems configurations);

(c) manufacturing processes in energy-intensive industries (basic materials processing);

(d) effective use of energy intensive materials;

(e) combined heat and power technologies;

(f) coal production, transport, storage, and use (best practice applications);

(g) manufacture of more energy-efficient equipment (refrigerators, industrial motors, and lighting systems);

(h) energy for rural and agro-processing industries;

(i) passive heating and cooling (building regulations and designs);

(j) commercial buildings (more efficient lighting and space conditioning); and

(k) district heating and cooling (insulation, weatherization, boiler tuning, and controls).

5.9 The second key assumption is that a successful market application in one country will be replicated widely in other countries where the same market applications have significant GHG-reduction potential. Therefore, to the degree possible, the GEF would support the type of barrier-removal mechanisms that are transferable to other countries and would assist with such dissemination of learning and experience.

EXPECTED OUTCOMES

5.10 A successful outcome is one where particular least-cost, win-win energy efficiency and energy conservation measures have become financially sustainable in a recipient country market.

5.11 The indicators of overall financial sustainability for energy efficiency and conservation measures will depend on the sub-sector and the barrier-removal measure. One indicator could be "market share for energy efficient equipment," and it may be possible to estimate the programmatic cost-effectiveness of GEF measures by the *increase* in market share resulting from each unit of GEF resources expended.

5.12 One key assumption for getting the desired outcome is that the sum total of the outputs of the various GEF projects and other specific activities will be sufficient to open and sustain the market for particular energy efficiency and conservation measures. In any given market, all the major barriers must be removed for energy conservation and efficiency to be realized on a sustainable basis. The associated risks to cost-effectiveness of GEF operations are the following:

(a) Identified barriers are not removed but only surmounted temporarily. To address this risk, the project proposal would attest the sustainability of "win-win" projects after GEF support has ended, including demonstrations that appropriate cost recovery mechanisms would be established and mainstream financing facilitated. Moreover, projects should take an approach that stresses continuity of institutional capacities developed;

(b) Only some of barriers are removed. Achieving program objectives requires removal of several interrelated key barriers. Development assistance experience clearly shows that technology demonstrations by themselves are not sustainable. Provision of hardware alone, while useful for reducing perceived or real uncertainties, will not create the necessary incentives or cost-recovery mechanisms. Hardware should only be provided where technology demonstrations can achieve clear benefits, such as reduced uncertainties over costs, performance, and market acceptance. Demonstrations can help in resolution of institutional issues associated with a new technology, and with the development of a maintenance and service infrastructure. Production capability, access to financing, stakeholder partnerships, information channels, marketing and distribution systems, and institutional capacities are all part of a properly functioning market;

(c) Some of the measures identified as barrier removal activities may not in fact be barrier-removal activities. Minimizing the third risk would require more careful scrutiny of the project proposals by the technical reviewers, STAP, and the GEF Secretariat; and

(d) When a demonstration project is executed for a specific business enterprise, conditions for competition may be distorted between this particular enterprise and other enterprises in the same industry. This risk can be minimized by a sufficiently broad specification of the technology and an open bidding process for procurement.

5.13 A major risk to sustaining outcomes, one that is inherent in all of GEF's long-term Operational Programs in climate change, is a fall in international prices of fossil fuels that reduces the economic potential for the supported measures.

PROJECT OUTPUTS

5.14 The output of a GEF-supported project in this Operational Program will be the removal of a barrier to a particular type of energy conservation or efficiency measures in a given recipient country market. Some barriers are generic and common to all measures and some will be specific to the sub-sector and application. Some examples of generic barriers and measures to remove them are shown below in Table 1. Not all barriers will be equally important in any given setting, nor will the removal of all of them incur the incremental cost financing that GEF provides.

5.15 The indicators of barrier removal are at the project level and depend on the barrier being removed. For example, a survey may be needed to show that the requisite skills have been transferred, movement in prices relative to economic costs may need to be tracked, or information on measures of credit availability may need to be collected.

GEF ACTIVITIES

5.16 GEF activities in this Operational Program will remove identified barriers in a specific market. Some of the more important barriers and mechanisms for their removal are shown in Table 1. In order to increase the cost-effectiveness of GEF operations, country-driven opportunities in each of the market applications listed in paragraph 7 will be initially emphasized where:

(a) national communications and or other sources provide information about country priorities and about opportunities in, and barriers to, energy efficiency and conservation;

(b) conducive sectoral policies increase the likelihood of sustainability of win-win projects and the wider replicability of barrier removal activities; and

(c) most significant potential for cost-effective opportunities exists.

5.17 GEF assistance will provide more sustainable benefits in those markets where severe energy price and other distortions do not tilt the playing field against energy efficiency and conservation. A macroeconomic and policy environment that allows and encourages fair competition is desirable for removing barriers.

5.18 The activities would be coordinated with past[2], ongoing, and prospective work of the Implementing Agencies (in both their GEF and non-GEF capacities) and others to avoid duplication and ensure cost-effectiveness. Project designs and activities should:

(a) incorporate and build upon all past activities, including past GEF projects;

(b) be mainstreamed with existing Implementing Agency programs; and

(c) be coordinated with existing and anticipated bilateral and multilateral technical assistance, targeted research, and investment.

5.19 Table 1 shows several generic barrier-removal measures. Each of these measures require a different mix of the following standard GEF modalities:

(a) targeted research (e.g., adaptation to local conditions);

(b) capacity building (e.g., financial evaluation);

(c) institutional strengthening (e.g., regulatory framework);

(d) investments (e.g., demonstration projects); and

(e) training (e.g., to operate, maintain demonstration sites).

[2] In particular, UNDP / World Bank ESMAP studies have been conducted for a large array of countries and sectors.

TABLE 1: EXAMPLES OF GENERIC BARRIERS TO ENERGY CONSERVATION AND EFFICIENCY AND OF MEASURES TO OVERCOME THEM.

GENERIC BARRIER	MEASURES TO REMOVE BARRIERS
Lack of information	Information centers and services; Appliance labeling, consumer information
Lack of trained personnel or technical or managerial expertise	Training programs (e.g., integrated resource planning; analyzing non-traditional projects)
Below long-run marginal cost pricing and other price distortions	Instituting supportive legal, regulatory and policy changes
Regulatory biases or absence	Standards
High transaction costs	Market development and commercialization; Demand-side management programs; Energy service companies
High initial capital costs or Lack of access to credit	Innovative financing mechanisms
High user discount rates	Energy service companies
Mismatch of the incidence of investment costs and energy savings	Institutional matching of costs and benefits; Energy service companies
Higher perceived risks of the more-efficient technology	Technology research, adaptation, and demonstration; and/or performance contracting.

5.20 Each GEF project proposal will show how the above activities would be coordinated and demonstrate the following:

(a) assess the economic scope for energy conservation and energy-efficient technologies and programs whose implementation is blocked by barriers;

(b) estimate the contribution of the project to reducing greenhouse gases;

(c) identify all key barriers, particularly energy pricing distortions;

(d) propose specific measures to remove barriers, specify priorities for those barriers that will be removed with GEF financing, and estimate their costs;

(e) demonstrate the sustainability of "win-win" projects after GEF support has ended, including demonstrations of appropriate cost recovery; and

(f) determine how programmatic benefits will be monitored and evaluated.

5.21 One assumption is that these activities are appropriately designed, carried out, and sufficient to remove barriers as an output. The success of the effectiveness of these activities would be monitored by performance indicators appropriate to that activity. Another key assumption is that financing can effectively be used to remove barriers. Despite some experience gained by Implementing Agencies from barrier removal activities in the Pilot Phase, assistance for barrier removal is a newly emphasized endeavor for the GEF and comes with the risk associated with any new endeavor. This risk will be minimized through structured learning from experience.

PUBLIC INVOLVEMENT

5.22 One of ten basic operational principles of the GEF is that its projects provide for consultation with, and participation as appropriate of, the beneficiaries and affected groups of people. User participation, therefore, is envisaged for all projects. In many instances, the direct participants in projects in this Operational Program will be industries and parastatal organizations. In projects dealing with energy efficiency in rural areas, public participation of affected beneficiaries will not only be appropriate, but also essential for the success of the project. The GEF Council approved a paper on *Public Involvement in GEF-Financed Projects* that defines policies for information dissemination, consultation, and stakeholder participation in projects funded by the GEF.

RESOURCES

5.23 GEF activities in this Operational Program are expected to take place over about 10 years, although the outcomes will have to be monitored for up to 20 years. The GEF's role is in removing barriers to the widespread dissemination of least-cost energy-efficient technologies and practices. While the GEF is available to meet the incremental costs of removing these barriers, other financiers are expected to meet the costs of energy efficiency programs once the barriers have been removed and the markets for energy efficiency and conservation are open. The required GEF resources for this Operational Program are estimated to be in the range of US $ 50-100 million per year

for the next 5 to 10 years, but further work will be undertaken on the longer term resource requirements.