



*UNDP Regional Bureau
for Europe and the CIS*

How-to Guide on Local Financing for Energy Efficiency

2005



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Foreword

The countries of Eastern Europe and the Commonwealth of Independent States (CIS) do not use energy efficiently, a problem they inherited from the socialist era. Using energy inefficiently leads to a misallocation of resources, low competitiveness and environmental degradation. In order to overcome these challenges, countries need to identify new sources of financing for energy-efficient technologies, which most former socialist states have not yet been able to do.

There is some good news, however. The transition process has fostered new financial institutions and business models that can accommodate sustainable sources of funding, attract financial and technical expertise, and guarantee risks, thus making investments in energy efficiency more commercially attractive and affordable.

The purpose of this 'How to Guide' is to help potential project developers understand energy efficiency financing, identify funding sources, and develop projects that can be co-financed by the Global Environmental

Facility (GEF) or other investors. It is based on the hands-on experience and 'lessons learned' in the field of energy financing that the United Nations Development Programme (UNDP) has accumulated over the last decade while implementing its GEF-funded climate-change portfolio in Eastern Europe and the CIS. UNDP experience in the region has shown that the process of structuring financing can cause serious delays in project implementation. On the other hand, even low-income countries in the region have used creative thinking to identify local sources of financing. The task of identifying financing is not impossible, and maximizing the potential for success is worth learning from others who have been through the process.

I would like to thank UNDP's Bratislava Regional Centre, UNDP country offices and the UNDP/GEF project teams, who all cooperated to produce this manual.

Vladimir Litvak
RBEC Energy and Environment Practice Manager

How-to Guide on Local Financing for Energy Efficiency

Welcome to the How-to Guide on Local Financing for Energy Efficiency!

The goal of this guide is to help potential project developers and country offices to understand energy efficiency financing, to identify sources of financing, and to develop projects that can be co-financed by the Global Environmental Facility (GEF) or other funders and/or investors.

This guide can be used in two ways:

- 1) If you are new to the subject, you can read the guide from beginning to end to gain an overview of financing mechanisms for energy projects in Eastern Europe and the Commonwealth of Independent States (CIS).
- 2) If you are familiar with the issues but have specific questions (e.g. on a certain type of financing mechanism or stage in the project development process), you can simply check the relevant topic or topics. Even if you have worked on UNDP-GEF energy projects before, you may wish to check the Design Checklist to see how things may have changed due to recent developments at the GEF.

This guide is designed as a hands-on document, and your comments and feedback can make it more responsive and helpful. We look forward to hearing from you.

-The RBEC Energy and Environment Team-

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¹ On-line version can be accessed at http://europeandcis.undp.org/?wspc=HowToGuide_EE_Financing

List of Acronyms

ADB	Asian Development Bank	Jl	Joint Implementation
CDM	Clean Development Mechanism	KfW	German Bank for Reconstruction and Development
CIDA	Canadian International Development Agency	KM	Knowledge Management
CIS	Commonwealth of Independent States	MSP	Medium-sized project (less than \$1 million)
CFL	Compact-fluorescent light	NEFCO	Nordic Environment Finance Corporation
CPD	Country Programme Document	NEX	National Execution modality
DFID	UK Department for International Development	OP	Operational Programme
DHC	District Heating Company	PDF	Project Development Facility
EBRD	European Bank for Reconstruction and Development	PELP	Poland Efficient Lighting Project
EE	Energy efficiency	PIR	Project Implementation Review
EPC	Energy Performance Contract	RBEC	Regional Bureau for Europe and the CIS
ESCO	Energy Service Company	RF	Revolving Fund for Biofuel, Belarus
FP	Full-sized project (more than \$1 million)	Tce	Ton carbon equivalent
GEF	Global Environmental Facility	TPF	Third-party financing
GHG	Greenhouse gas	UNDP	United Nations Development Programme
HEEP	Hungary Energy Efficiency Programme	UNDP CO	UNDP Country Office
IAPSO	Inter-Agency Procurement Services Office	UNECE	United Nations Economic Commission for Europe
IBRD	International Bank for Reconstruction and Development	UNEP	United Nations Environmental Programme
IFC	International Financial Corporation	UNFCCC	United Nations Framework Convention on Climate Change
IFI	International Financial Institution	UNOPS	United Nations Office for Project Services
IPCC	Intergovernmental Panel on Climate Change	USAID	United States Agency for International Development

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1 Overview

Why Knowledge Management for Financing Energy Projects?

UNDP has over 10 years of experience in energy project financing in Europe and the CIS. While there are many documents and 'lessons learned' that individuals and country offices have acquired, it is difficult to take advantage of all of the country office (CO) experience in this area without some guide to the information.

Because UNDP CO environmental focal points may be the only environmental experts in their offices, it can be difficult to gather information about projects, forcing focal points to 'reinvent the wheel'.

Likewise, for CO staff who are new to UNDP, there are a number of points in the project development process that are very important to UNDP and its operating procedures but may be completely unfamiliar to those who have built their careers in other organizations.

Knowledge management is seen as the key to making UNDP a more efficient and effective organization, and the potential regional benefits of this strategy are large. Communities of practice; i.e., groups of professional peers working on shared problems and solutions, are one solution to this problem.

However, for those who would like a reference document that synthesizes the lessons learned, explains major

issues, and provides materials for further follow-up and learning, 'knowledge products' are also important.

The UNDP global KM strategy mentions a large number of potential knowledge products, and RBEC programme officers can already draw upon the following documents:

- Action-Reflection Notes for five RBEC energy projects (see the References section of the Guide)
- Lessons Learned Notes for two topics: heat sector projects and capacity building in RBEC energy projects (see the References page of the Guide)
- This regional How-to Guide for financing energy projects
- A UNDP-GEF global programming kit for local financing (expected 2005/2006)

Note that all of this information forms a pyramid, with specific project information at the base capped by increasingly general analysis that covers more projects and a broader region. This How-to guide draws upon the other knowledge products that are available, and it will also feed its regional experiences and lessons into the global programming kit.

For more information on the scope of a How-to Guide, see the official guidelines. For more information on knowledge management, visit the **Knowledge Management Helpdesk** (see the References section of the Guide).

2 Introduction – Defining Local Financing

2.1 A Definition—What the GEF Says

Local financing, as it is interpreted by the Global Environmental Facility (see Text Box 2-1), is simply seen as financing for projects that comes from local markets and institutions or from public sources of financing. The term local in this context can be interpreted to mean ‘originating in the host country’, although many of these financing products can also be found at the ‘local’ level in the sense that they are ‘primarily serving the needs of a particular, limited district’, (Webster’s *New Collegiate Dictionary*), e.g. at the municipal or district level.

Text Box 2-1: Definition of GEF Strategic Priority 2

GEF Strategic Priority 2 (SP 2) ‘Experience from the GEF portfolio suggests that in a large number of countries, the local financial market has sufficient size, capacity and liquidity to provide capital for investment in (near) commercial energy efficient equipment, energy conservation or renewable energy technologies for modern energy services. However, consumers and investors have limited access to local financial institutions due to perceptions of risk for the lender, high transactions cost, lack of institutional infrastructure, or lack of awareness regarding technologies and their technical and financial performance. Supporting financial intermediaries like NGOs, microcredit lenders, savings groups, or Energy Service Companies (ESCOs), and providing risk-sharing instruments to financial players (e.g., credit risk guarantees and other contingent finance instruments) can be very cost-effective ways of addressing this barrier. Microcredit to rural households, commercial loan guarantees for ESCOs, revolving funds, and local business finance have all been successfully demonstrated in completed GEF projects. With the focus on *local* financial markets and institutions, such

projects have a higher likelihood of sustainability and replication.’ Source: GEF Strategic Business Planning: Directions and Targets. 2003

Project developers and the CO focal points who work with them usually face the following challenge: How to identify and finalize local sources of financing for proposed projects? This guide is designed to give both groups the resources to take on this challenge even in countries where the overall financial situation is not encouraging.

2.2 The Regional Perspective

The GEF language on ‘village councils’, ‘savings groups’, etc. makes it clear that in a global approach to local financing, the authors of the strategy have developing countries in mind. On the other hand, Energy Service Companies (ESCOs) and certain types of contingent financing may be more relevant to countries where capital markets are more robust. While RBEC countries vary widely in terms of capital markets development, most fall in between the two visions for SP2 that are described by the GEF. Therefore, it is especially important in this region to focus on lessons learned in the region when considering programming and the development and management of a project portfolio.

More than a decade of UNDP experience in the region has shown that identifying and ‘structuring’ financing can be the single biggest source of delay in project approval and project implementation. At the same time, however, even low-income countries in the region have used creative thinking to identify local sources of financing. The task of finding financing is not impossible, but it helps to learn from others who have been through the process on how to maximize the potential for success.

3 Primer

3.1 Energy Efficiency

Energy efficiency is a very simple principle: use less energy by using it more effectively and reducing waste. However, it has many positive and far-reaching implications both in environment and economic development.

TERMINOLOGY

Experts in the field prefer to use the term '*efficiency*' (commonly translated as '*effective use*' in many regional languages) rather than '*conservation*', which was popular during the 1970s and 1980s, because conservation implies sacrificing something. In many cases, reducing the amount of energy that is wasted can save money and also improve energy services. The term '*energy savings*' is also used regularly and covers essentially the same areas as energy efficiency.

The literature often refers to '*supply-side efficiency*' and '*demand-side efficiency*'. Supply-side efficiency refers to energy savings that are captured where energy is supplied, such as a boiler house or a transmission system. Demand-side efficiency refers to savings that are captured where energy is used (also known as '*end-use efficiency*'), such as electric heaters and refrigerators.

RBEC: A UNIQUE REGION FOR ENERGY EFFICIENCY

The Director of the Russian Centre for Energy Efficiency, Igor Bashmakov, once referred to Russia and other economies in transition as the '*Saudi Arabia*' of energy efficiency. By this he meant that the potential for '*exploiting*' the energy that is currently being wasted is enormous.

When speaking about energy efficiency, RBEC differs from the other GEF regions in two important ways. First, many of its countries have a history of heavy industrialization and high levels of per-capita fuel consumption, primarily in industry. Energy waste is also high. Second, heating is a critical human security issue. The climate in many RBEC countries is such that reliable and affordable heating is quite literally a matter of life and death.

ENVIRONMENTAL SIGNIFICANCE

The main environmental benefits in energy efficiency projects occur because when energy efficiency improves, the use of fossil fuel decreases. At a local level, emissions of SO₂, NO_x, ash, particulates, and other pollutants in the air also decrease, and the results can actually be visible to residents.

At the **global level**, benefits include reduced greenhouse gas emissions. When an energy efficiency project reduces the amount of fossil fuel (such as coal, gas, or mazut) used, CO₂ is also reduced.

NOTE: GEF specifically focuses on global benefits because of its mission to address global environmental issues. This area is the most important to them. Other donors may be more interested in local benefits.

ECONOMIC SIGNIFICANCE

The economic significance of energy efficiency projects varies, but it is often reflected in municipal expenditures: the single largest expenditure of many cities in the colder parts of the RBEC region is the heating sector. Energy saving then translates into lower heating bills for families or for the city that is heating schools, hospitals and other public buildings. In countries where heat costs are subsidized by the government, the financial burden on government also decreases. Savings in that area can translate into money available for education, health care and other municipal services.

Energy efficiency at a national level can also provide significant benefits. For oil and gas producing countries in RBEC, fuel that is not consumed domestically can be sold on the international market at world prices. For RBEC countries dependent on fuel imports, energy efficiency reduces the amount of money spent on imports and improves national security by reducing dependence on imported fuel.

STRATEGIC SIGNIFICANCE

Energy efficiency has formed an important part of the GEF priorities from its early days, as it was seen as a means of addressing a global environmental issue

(climate change) in a cost-effective way. This position is explained in detail in the GEF description of Operational Programme 5 (GEF Operational Programme 5. Removal of Barriers to Energy Efficiency and Energy Conservation – see References).

With the introduction of Strategic Priorities, there is still an important role for energy efficiency as a part of SP 2 (see description of SP 2 in Text Box 2-1), which focuses on accessing local sources of financing for energy services.

On a broader level, the environmental sustainability of energy efficiency measures supports Millennium Development Goal 7: Ensure Environmental Sustainability. Use of fossil fuels means exploiting a finite resource. Thus reducing dependence upon such fuels is a sustainable measure.

ADDITIONAL BENEFITS AND ADVANTAGES

A strong point of energy efficiency projects is that most of them call for proven technologies that have been on the market for many years. Very basic equipment such as meters and controls, insulation for pipes, and radiator reflectors can generate substantial benefits. In other cases, savings can be generated through behaviour change, such as the use of compact-fluorescent light bulbs, or CFLs (see for example the summary of the IFC/GEF Poland Efficient Lighting Project). The techniques used by energy efficiency projects have other side benefits. For example, industrial improvements can also save water, and heating projects can dramatically increase the comfort for people in their homes or in schools and hospitals.

The classic example of this type of project in the region is a technical assistance project that would retrofit a boiler house and insulate pipes in a district heating system, where losses in several RBEC countries reach 20-50 percent of energy generated, such as systems in cities participating in the World Bank's Enterprise Housing Divestiture project, which served as a partner with the UNDP-GEF project in the Russian city of Vladimir.

3.2 Finance

Please note that this is a very brief overview designed for those without a background in finance. This discussion of terminology and financing concepts should be sufficient to become acquainted with the mechanisms and phrases that are often used in project proposals and at project development meetings.

At its most basic level, the field of finance addresses the issue of how to pay for investments. There are essentially two basic ways of obtaining the funding for investment projects: equity and debt. Many projects, particularly in the UNDP-GEF RBEC portfolio, combine both kinds of financing. Older projects also used GEF funding to buy equipment, although this is generally no longer permitted in a project proposal (see Section 4 - Synthesis of Methodologies and Strategic Approaches for Programming).

Equity is simply a share in or a claim on assets or a business. Examples of an equity investment in a project are as follows²:

- The Russian city of Chelyabinsk appropriates money from its annual budget to retrofit a boiler house and install insulation on pipes in its heating system.
- The Czech city of Susice uses two kinds of equity-money from its municipal budget and money from the State Fund for Housing Construction—to construct energy-efficient municipal housing for its residents.
- Union Fenosa, a Spanish utility, buys a majority share in three of the electricity distribution companies in Moldova.
- The European Bank for Reconstruction and Development (EBRD) invests some of its money in an Energy Services Company (ESCO) in Ukraine, UKR-ESCO, and shares in the profits.
- An energy efficiency project in Poland receives money from the sale of the greenhouse gas emissions offsets that it will generate. A buyer purchases the rights to hold and trade the emissions offsets

Debt, in its most simple form, consists of borrowing money. Lenders can be governments (including national funds and export credit agencies), development banks, commercial banks, and—in the case of bonds—whoever may purchase the bonds. Examples of debt in financing projects include the following:

- A school in Northwest Slovakia receives a commercial bank loan to replace its coal-fired burner with a biomass-fired burner and to conduct some efficiency measures, such as replacing windows and putting in insulation.

² Note: not all examples of equity financing listed below are eligible for GEF support

- The Bulgarian municipality of Varna issues bonds (a bond is essentially an IOU or promissory note) to generate the money needed to pay for improvements in the public lighting system.
- A municipality in Slovenia takes a loan from the National Environmental Fund and uses it to convert its district heating system into a biomass-fired system.
- A Dutch company uses an export credit (a loan from the country where the export originates) to partially finance the construction of a biomass-fired boiler in a Latvian city.
- The Government of Georgia takes a 'soft' loan (i.e., a loan with very low interest rates) from KfW, the German Bank for Reconstruction and Development.

Guarantees are an important part of financing because they can make financing more affordable. A loan guarantee, for example, is 'a legal obligation to compensate a lender if a borrower fails to repay a loan' (DFID definition). Commercial creditors, or lenders, base their interest rates (the 'cost' of the money) upon the risk of a project. The riskier the project, the higher the interest rate. When the lender has some type of guarantee, it knows it will be repaid and can lower the interest rate on the loan. The guarantee may be provided in the form of money, political risk insurance, or some type of collateral from the borrower (usually property). Examples include the following:

- The Government of Armenia provides a sovereign guarantee on a loan from the World Bank/IBRD to improve the district heating system in Yerevan. This means that the government guarantees repayment of the loan even if Yerevan cannot make the payments.
- A Bulgarian municipality obtains a commercial bank loan for energy efficiency measures in its heating system backed by a guarantee from the Development Credit Authority, a USAID-funded loan guarantee mechanism.
- A Russian municipality offers several municipal buildings and other facilities as collateral against a loan from a commercial bank.
- A Hungarian municipality takes a loan from a commercial bank for heating system improvements that is guaranteed by a GEF-capitalized fund managed by the International Finance Corporation (IFC).

See the *draft Sustainable Local Financing Advisor Note: Guarantees* for more information on this topic.

Both loans and guarantees can be drawn from a **revolving fund**. This type of fund is similar to a revolving door, in that money paid back from the initial loans (or not used from initial guarantees) revolves and is lent out again (or designated as a guarantee) for additional projects. Both UNDP Russia and UNDP Belarus are using revolving funds to support multiple energy efficiency projects from a single GEF investment (see Sections 6.1 and 6.2 for project case studies from Russia and Belarus). Revolving funds are attractive to UNDP-GEF for several reasons. First, they allow the GEF to get the most from its investment. Instead of providing a few loans, these projects can finance many loans over time. Second, they provide a way of handling GEF financing. Money that is returned from the projects receiving loans from the GEF can be re-invested into additional energy efficiency projects, avoiding discussions with the GEF about how the money returned from the loan or guarantee will be spent.

Note that GEF grants have been used to fund equity investments, debt, and guarantees in projects in the RBEC region.

3.3 Energy Efficiency Finance

Energy efficiency projects are simply a special kind of investment. The investor spends money to make improvements in a facility and then makes money when less energy is used in the future (sometimes referred to as 'negawatts'). For example, a city may decide to spend \$4 million to overhaul its district heating system. The fuel savings from the overhaul will total \$250,000/year. The city can use the savings for part of its loan repayment, and the investment will continue to save the city money after the loan is repaid. The city then needs to decide whether these terms are suitable. Some effective savings measures can have a *pay-back period* of less than two years. Others can have payback periods of 12 years or more. It is important to stress that the financial viability of the investment will depend on many things (ranging from the cost of fuel to the foreign exchange rate), and technologies and savings are only two factors in calculating the *net present value (NPV)* of a proposed energy efficiency investment. For an example of a simple calculation of the payback period, see the case study from Kazakhstan.

There are as many different kinds of energy efficiency financing as there are energy efficiency projects. As the Text Box 3-1 illustrates, even a single type of mechanism can involve different types of investors.

Text Box 3-1: ESCOs from A to Z

Energy efficiency financing, like UNDP, is a world of acronyms. The term ESCO stands for “Energy Service Company.” General definitions usually state that an ESCO designs, finances, and implements energy efficiency projects. An ESCO makes money because the owners of factories or facilities such as schools or hospitals may be using more energy than they should, but they lack the knowledge or money to do anything about it.

The ESCO first identifies potential savings and then signs an **EPC**, or **Energy Performance Contract** (see Text Box 5-1), with the owners (its client). Under the contract, the ESCO agrees to reduce energy use, and the client agrees to pay them a certain amount of the savings from the project. The ESCO then implements the project, recoups its investment (and some profits) from the savings, and the client continues to save energy after the contract has been concluded.

To be called an ESCO, a company must be able to do two things:

- Identify and carry out energy-saving projects
- Finance its investments

The financing component is what makes an ESCO different from a contractor or energy auditor. In most cases, however, the ESCO itself does not have the equity to invest in a series of large energy efficiency projects. Therefore, it needs **TPF**, or **third-party financing** to realize the project. Large equipment vendors may use an ESCO as a means of selling their equipment while keeping risks and debt on the books of the ESCO rather than on the books of the parent company. One example of this would be the Hungarian ESCO Prometheus. Established in the mid-1990s, Prometheus was owned by Generale de Chauffe (France) and used an equity investment from the EBRD. The ESCO completed more than 200 projects in factories, schools, hospitals, and other facilities in Hungary (see the lead article in EBRD’s *Environments in Transition* from Autumn 1997). Development banks and large commercial banks may also finance ESCO projects through **on-lending**, where they lend money to a local bank, which in turn lends it to a project. This is often described as a **line of credit** that the local bank holds with the on-lending bank.

ESCOs are a very good source of financing energy efficiency for their clients, because facilities pay no money up front. However, the ESCO approach relies upon two elements in any country: 1) rule of law; and 2) access to financing. A strong legal environment is necessary to protect the ESCO from the risks it assumes by financing the projects. For example, if a client factory goes bankrupt during the project, the ESCO will not be repaid. Or if a facility changes ownership, the ESCO needs legally-enforceable assurance that its EPC will be valid. Access to financing is important precisely because an ESCO does not have large amounts of capital waiting to be invested. It structures financing for its projects just as any energy efficiency project developer

would. It is no coincidence that GEF ESCO projects underway in the region are primarily located in EU member states (see the project brief for the UNEP/GEF ESCO project underway in the Czech Republic and Slovakia). Several years ago, the IFC proposed a small and medium enterprise project that would attempt to use the ESCO model in Albania, Kosovo, and the former Yugoslav Republic of Macedonia. While the GEF actually approved the concept, the IFC’s board would not approve the project, as it felt the risk was too high.

When the investment environment is difficult, project developers have two options. First they may want to consider a state-owned ESCO, such as UKR-ESCO in Ukraine. UKR-ESCO has equity from the EBRD and other investors. The state-owned model can be complex, and it can take time to attract equity investment, but government involvement can reduce risk, particularly when state-owned facilities are the ‘clients’ of the ESCO, which is described further in a case study from Ukraine (see Section 6.3: **Municipal ESCO in Ukraine**).

Related to state-owned ESCOs, there are also several examples of municipal-owned ESCOs, such as the Krakow (Poland) municipal ESCO or the Rivne (Ukraine) municipal ESCO currently under development as a UNDP-GEF project (Section 6.3). Again, the overall environment for commercial finance will still affect the ability of a national or municipal ESCO to attract the other equity investors it needs to go into business.

The other option in a risky investment climate is to consider the services that you want and try to find a way other than an ESCO to offer them. ESCOs are often proposed to address a lack of trained or certified energy auditors, project developers, financing, and experience with performance contracting. These activities can all fit into technical assistance programmes such as training, outreach and identification of financing.

To summarize: When evaluating a proposal for an ESCO project, your questions should be the same as for any energy efficiency investment project – who will finance the work and how?

BARRIERS TO ENERGY EFFICIENCY PROJECTS IN RBEC

The pressure from the GEF has increased in recent years to offer increasingly “innovative financial mechanisms” and to shift from grant financing to *contingent finance*, in which money may be paid back to an intermediate lender or even the GEF itself.

At the same time, many of the financial barriers to energy efficiency that existed when UNDP-GEF began work in the RBEC region are still present. These include the following:

- A number of the countries in Europe and the CIS do not have a market-based banking sector.

- In countries without a 'hard currency' (e.g. Uzbekistan), lending can be difficult.
- In countries where perceived levels of political risk are high (e.g. Turkmenistan, Belarus), lenders and export credit agencies may be too risk averse to become involved.
- In countries where inflation is relatively high, interest rates may be too high for potential borrowers, even when loan guarantees are available.
- In countries where fiscal decentralization has been slow to take root, cities lack the decision-making authority to allocate resources for efficiency projects
- Currency exchange risk can cause difficulties for projects that are importing equipment. This has happened when a national currency has been devalued (e.g. Russia in 1998) and now, when the dollar, the currency in which GEF grants are denominated, has depreciated significantly.
- Energy subsidies can keep the price of fuel (or competing fuels) low, which translates into very low returns on investments in energy efficiency;
- The price of fuel can be relatively low due to abundant in-country energy resources (e.g. Russia, Kazakhstan, Turkmenistan), which also prevents investment in energy efficiency.

Apart from generic barriers, each particular sector (industry, residential, transport) faces its own obstacles hindering investments in energy efficiency. For example, in the heating sector this may include:

- difficulties for private or semi-private district heating companies in obtaining state or municipal guarantees required by 'soft' loan international providers;
- tariff policy that doesn't permit one to cover full service costs including the investment component;
- unfavourable fiscal and financial policies prohibit re-investment of energy efficiency savings;
- nonexistent or weak tenant associations that are unable to push for investments into the energy efficiency of buildings.

TYPES OF FINANCING IN UNDP-GEF PROJECTS

See Text Box 3-2 on latest trends in financing in the UNDP/GEF projects in Europe and the CIS.

Text Box 3-2: Trends in Financing

While there has been a shift from the GEF-funded technical demonstration of new energy efficient technology to the GEF-capitalized financial mechanism, there are some constants. Nearly all of the projects have co-financed or financed demonstrations with the 'host government' contribution coming from *municipalities* rather than from regional or federal governments.¹ In addition, nearly all of the projects using debt financing rely upon parallel financing from a development bank (most often IBRD). Not surprisingly, UNDP has never been a source of large-scale investment funds or co-financing — this is simply outside of the agency's mission and focus.

The variety of funding options has also multiplied for municipalities. In the early years of its UNDP-GEF project, the City of Gabrovo, Bulgaria, used grants to carry out demonstration projects in a hospital and a school. By 2003, the city was using its revenues to carry out an efficiency project in a municipal building. Other cities used training provided through the project to develop proposals for energy efficiency projects that also used municipal equity, and – in the case of Varna, Bulgaria – municipal debt in the form of bonds.

As financing has moved away from grants, the varieties of debt have expanded to reflect investment conditions in the host country. For the UNDP-GEF project on biomass energy in the Slovak Republic, where there is some competition among commercial banks for municipal clients, the municipalities joined together to apply for a commercial loan from a Slovak bank. In the biomass energy project in Belarus, facilities will take loans from the federal government, which still oversees most of the economy; and in Ukraine, the local government is supporting the establishment of an ESCO.

Options for equity investment have also expanded. For example, the UNDP-GEF municipal energy efficiency project in Ukraine is currently establishing an ESCO that will provide capital for municipal heating upgrades. The project is starting in Rivne. The municipality contribution in the first phase of the project is more typical of current equity investments in the portfolio: it will use local revenues to purchase energy efficiency equipment and services.

--From UNDP-GEF Heat Sector Portfolio Review (Legro, 2004)

¹ The UNDP-GEF project in the Russian Educational Sector (Ministry of Education) and the Belarus biomass project (State Committee for Energy Saving) are the two notable exceptions.

Table 3-1 lists project financing mechanisms from the RBEC-GEF portfolio in chronological order (grouped by year that the project document was signed). Both renewable energy and energy efficiency projects are included to give a broader sample of the types of financing mechanisms that have been available.

Table 3-1: Financing Mechanisms from the RBEC-GEF Portfolio

Yr.	Project Short Title	Country	Type of Financing Mechanism(s)
,98	Dist. Heating (FP)	Russia	*Grant for equipment *Municipal financing (equity) *IBRD parallel financing (debt/grant)
,98	Municipal EE (FP)	Bulgaria	*Grant for equipment *Municipal financing (equity) *1 Municipal bond (debt)
'99	EE Housing (MSP)	Czech Rep.	*Municipal financing (equity) *Fed. Housing Fund (grant) *Tenants repaid municipal bonds (debt)
'01	Municipal EE (FP)	Hungary	*GEF-capitalized audit fund (partial grant) *IBRD parallel financing (guarantees)
'01	Biomass (MSP)	Latvia	*Grant from bilateral donor for equipment credit *National environmental fund (debt) *Municipal financing (equity)
'01	Biomass (FP)	Slovenia	*GEF equity in Ecofund (equity) *Ecofund loans (debt) *Municipal financing (equity) *State grant for Ecofund projects
'02	District Heating (FP)	Ukraine	*ESCO - to be created (equity) *Municipal financing (equity)
'02	Biomass (MSP)	Poland	*Municipal financing (in-kind equity) *National Environmental Funds (debt/equity)
'02	District Heating (MSP)	Turkmenistan	*Bilateral donor grant (confirm) *Municipal financing (equity) *Government financing (equity)
'02	EE in Schools (MSP)	Russia	*Fed. Funds (grant) *GEF-capitalized loan funds (debt)
'02	EE Project Financing	Romania	*IBRD parallel financing (debt/grant) *Open to private investors (debt or equity)
'03	Biomass	Slovak Rep.	*Local commercial bank loan (debt) *Federal funds (grant)
'03	Biomass	Belarus	*GEF-capitalized revolving loan fund (debt)
'03	Coal Mine Methane	Russia	*GEF co-capitalization of a company
'04	Efficient Motors	Poland	*Equity investment by manufacturers *Grant to manufacturers by GEF *Govt. loans to sites purchasing motors
'04	District Heating	Armenia	*IBRD parallel financing (debt/grant) *bi-lateral donor financing (grant)
'04	Renewable Energy (geothermal/hydro)	Georgia	*KfW parallel financing (debt) *GEF-capitalized loan fund (debt)
'04	Wind Power	Kazakhstan	*GEF equity partially reimburse investment in a wind turbine *Equity investment from the private sector *Power purchase agreement for wind power, tax waivers and land rights from government (grant)
'04	Barriers to EE	Croatia	*IBRD-co-capitalized loan guarantee *GEF contingent grant for audit *GEF-co-capitalized loan guarantee *Other project financing (debt/equity)
,04	Public Lighting	Slovak Rep.	*capital for revolving fund from Slovak commercial bank (equity) *municipal equity and debt (budgetary expenditures and loans from fund)
**	Residential EE	Moldova	*GEF-capitalized audit fund (debt)
**	District Heating	Kazakhstan	*GEF equity for capitalization of ESCO *Municipal investment (equity) for capitalization of ESCO *GEF grant for technical assistance *DH operator investment (equity)
**	District Heating	Uzbekistan	To be determined

4 Synthesis of Methodologies and Strategic Approaches for Programming

4.1 Background

Literally billions of dollars have been spent on technical assistance in Central and Eastern Europe and CIS since development agencies began to operate in the region in the early 1990s. Many of these dollars have supported technical assistance in the field of energy.

EARLY 1990s: PILOT PROJECTS

Many early interventions were based on two key assumptions: 1) energy-intensive industries and the heat and power generation sector were in need of more efficient technologies and operating practices; 2) demonstration projects would convince decision-makers that energy efficiency was a worthwhile investment.

The interventions were very similar in approach:

- A bilateral or multilateral donor would retrofit a facility (e.g. a hospital or a boilerhouse, often in a national or territorial capital) as a 'pilot' project, training some local staff in the process; and a seminar and summary report would be distributed to policymakers.

On the positive side, these projects generated on-site savings and local environmental benefits. In addition, projects achieved substantial reductions in air pollution and in greenhouse gas emissions at a relatively low cost. On the negative side, there was **little or no replication** of pilot projects.³

Ironically, donors were correct in their assumptions about the need for their work. However, most projects had two unspoken assumptions:

- 1) a macro-economic recovery would happen fairly quickly; and
- 2) other 'market' conditions were in place for energy-saving technologies and services. In the first case, many countries continued to face high inflation, which made it extremely difficult to borrow money or import

technologies. Many other countries were reluctant to lift price controls on energy, making it difficult to generate a return on investment even when fuel savings were large. In the second case, project developers came to realize that even when policymakers were convinced that energy efficiency was a good investment, they were not able to invest.

THE MID-1990s: MARKET BARRIERS AND A WIDENING GAP

The reasons that investments in energy efficiency were only a small percentage of the potential for savings were then attributed to 'market barriers'. Hence the introduction of the GEF Operational Programme 5: 'Removal of Barriers to Energy Efficiency and Conservation'. This approach acknowledged that many different kinds of barriers blocked the development of a market for energy efficiency products and services, ranging from lack of information to the high cost of capital (see Table 1 of Operational Programme 5 for a list of 'generic barriers' and the proposed interventions).

At the same time, economic disparities in the region became more apparent. For example, several Central European RBEC countries launched their own internally-funded mechanisms to promote energy efficiency and environmental protection. In Hungary, the German Coal Fund (bilateral assistance) essentially brought down the interest rate for efficiency projects in municipalities. In Poland, the Ecofund (capitalized by the retirement of sovereign debts) supported environmental projects that included energy-related projects. In the Czech Republic, the Clean Air Fund (funded by pollution control fines) sponsored projects that switched heating systems to cleaner-burning natural gas and also supported energy efficiency projects. Several ESCOs began to operate in Central Europe, and a private market for energy efficiency was born.

Elsewhere in the region, these 'models' seemed like wishful thinking. In the Balkans, post-war reconstruction programs meant large inflows of assistance, but they favoured easy-to-contract infrastructure rather than projects that would offer efficiency or environmental sustainability. In Russia, a regional leader in approaches

³ Note: When replication was not an objective, as in the case of Joint Implementation (JI) investments made by Western European investors in the RBEC region, this project design made more sense.

to energy finance, a 1998 monetary crisis set energy efficiency financing back several years. In Ukraine, the persistent practice of barter to pay for energy made financing almost impossible. In Armenia, Azerbaijan, and Georgia, political and economic difficulties led to the shutdown of the countries' largest district heating systems. In Central Asia, heating systems and industrial facilities deteriorated while price controls on fuel and high rates of non-payments by customers deterred investors. See also a case study on energy efficiency financing policy in Belarus in Section 6.5 of the Guide.

4.2 Synthesis of Methodologies

KEY METHODOLOGICAL ISSUES

While the GEF is still in the process of detailing its new strategic priority for local financing, several key concepts are likely to be present in any detailed treatment.

Innovative financing: This term began to appear in GEF communications to its implementing agencies (including UNDP) several years ago. The GEF does not define innovative financing specifically, but the current standard seems to be that the mechanism should be innovative *on a global level*. For example, the IFC/GEF project in Hungary to provide partial credit guarantees in conjunction with a commercial bank for energy efficiency projects is often cited as an example. However, it is important to note that this project uses a financial mechanism that would probably not work outside of Central Europe (the IFC has expanded this GEF project to three other EU member states). The GEF focuses its funding on this type of project because it aims to make a global contribution with limited resources. But this is a potentially sensitive issue for RBEC countries, which can present large yet risky markets.

Co-financing: This is another key issue related to GEF policy where a written explanation can be difficult to obtain. The GEF Secretariat and the Implementing Agencies (including UNDP) have been discussing the issue of how much co-financing should be a part of GEF-funded projects.⁴ Current discussions include what the ratios should be, whether they should be mandatory or suggested, and how 'co-financing' is defined (e.g., parallel lending, similar activities in the host government, etc.). At present, the GEF is suggesting that the overall ratio of co-funding to GEF funding should be 8:1 in the

climate change portfolio as a whole. In other words, there should be \$8 of external funds in the climate change portfolio for every \$1 of GEF funding. While some projects will have levels of co-financing that are higher than that average (e.g., very large World Bank loans), and others will have lower than average levels, this target is important in that it shows much higher expectations on the part of the GEF than in the past.

While specific levels of co-financing may vary, two things are certain: the greater the level of co-financing, the more likely it is that a project will be approved. The GEF is always looking for projects where its funds will play a 'catalytic role'—that is, they will leverage much larger amounts of financing. This approach explains why proposals to pay for loan guarantees or train staff at a loan fund are more attractive than proposals to capitalize a loan fund. It also explains why World Bank GEF project grants are often so much larger than UNDP grants in RBEC: the Bank can offer its associated lending (through the IFC and IBRD) as co-financing for projects. In other words, a \$7 million grant from the GEF may only be 10 percent of the total project financing in a Bank GEF project.

While co-financing expectations are very high at present, the underlying reasoning for them is based on GEF experience to date. Even within the UNDP portfolio, projects that have drawn upon significant co-financing, be it from a participating government or from a donor or IFI, have run with fewer delays in implementation and far fewer delays in start-up. In addition, the availability of financing is a fairly good indicator of sustainability. Projects with very low co-financing ratios may face different obstacles, but all of the obstacles are likely to reduce the chances that the project will continue to generate results after GEF funding ends.

Market transformation: Originally, this term was used for projects involving energy-efficient appliances. For example, the ICF/GEF Poland Efficient Lighting Project (PELP) worked with utilities and lighting manufacturers to make compact fluorescent lamps widely available on the Polish market at an affordable price. In part because of the success of PELP, the concept of market transformation has crept into virtually every project brief presented to the GEF in energy efficiency. In the broadest definition, GEF projects are seen as transforming the market for energy efficiency products and services.

While the frequent use of this term may have diminished its meaning, there is a very important concept underneath. Every successful GEF project must understand the market in which it is going to operate.

⁴ In the past, the unofficial guidelines have been at least 3:1 non-GEF:GEF funding for full projects and at least 1:1 for medium-sized projects.

The lack of market information and market penetration indicators in UNDP-GEF projects in RBEC is a very common cause of delays in project development and results in requests for additional information from the GEF Secretariat. On the other hand, projects that have provided more thorough discussions of their markets (for example, the energy efficiency project in the Russian educational sector and the Belarus biomass project) have been able to move to start-up more quickly – see Sections 6.1 and 6.2 for project examples).

4.3 Synthesis: Current Approaches

DESIGN APPROACH

Project design today must take into account the background of the portfolio and all of the current methodological issues. In addition, project developers and their country office partners should consider another key issue: capacity development.

The RBEC GEF portfolio tells an interesting story. Projects focusing on single pilot investments have not tended to replicate beyond the sites receiving GEF grant money or equipment. This has also been true of the financial mechanisms used in the pilot intervention (restructuring municipal heating companies to change the debt profile, vendor financing, etc.). Projects that have been replicated have focused more on presenting energy efficiency techniques and ideas for financing. For example, Bulgarian cities participating in the GEF-funded Eco-Energy network have used ‘mechanisms’ ranging from funds in their operating budget (Gabrovo) to a municipal bond issue (Varna) to support energy-efficient street lighting. In the Czech Republic, energy efficient building techniques taught to architects are being used in publicly-financed buildings and also in construction for private clients, who utilize commercial financing.

These findings make it clear that while it is important to consider financial mechanisms in detail, one size does not fit all! The same market may rely on several sources of financing. Attention to mechanisms should be balanced by an attention to the need for capacity development for key stakeholders, such as service providers, financiers, and local decision makers.

COUNTRY PROGRAMMING APPROACH

Few areas may have changed more in the past decade than the role of the CO in GEF project development. While the CO has always officially served as the point

of submission for GEF project concepts, project development was fairly centralized in the beginning. Often, project developers initially contacted UNDP Headquarters with ideas or proposals. With time, COs moved away from a ‘GEF/Gender/HIV/AIDS’ staff member to a designated GEF/environmental focal point, increasing the capacity of COs to identify and screen proposals. At the same time, Country Dialogue Workshops and missions by UNDP-GEF regional experts (who were gradually out-posted to Bratislava), increased the number of proposals coming to COs.

Ideally, the project development process should be proactive; i.e., the CO should decide in advance what kinds of projects would fit well with its work in the country. The current buzzword for this is ‘mainstreaming’, but this is essentially common sense. GEF project ideas and the portfolio should reflect the intersection of three sets: CO programming, country energy/environment issues, and GEF eligibility criteria.

While this type of thinking may seem obvious, many project opportunities are often overlooked. Examples of potential projects follow:

- *Rural development*: This area is a priority for several RBEC countries both for governments and for CO programming. Rural initiatives have been successfully linked with GEF energy financing projects in other regions (although primarily in renewable energy).
- *Small and Medium Enterprise development*: Energy efficiency provides an effective way for manufacturers to cut costs, and it can be financed more easily as part of an overall package for process improvements.
- *Water*: Water supply and wastewater treatment is often the second most energy-intensive process in a municipality after heating. Efficiency measures can reduce energy use, costs, and water losses, which can be important in countries where water quality and/or scarcity is an issue.
- *Capacity 21*: This initiative developed the capacity of municipalities to focus on sustainable development and could theoretically serve as a means of delivering information on energy efficiency to municipalities.
- *Area-Based Reconstruction*: Post-conflict programs that re-build infrastructure are not only a high priority for participating governments and COs; they are also an opportunity to install efficient equipment and designs...and a chance to avoid having to go back and make efficiency improvements several years later.

In reality, only one or two RBEC project ideas fall into these categories. In addition, these categories are only suggested. The list of relevant projects is actually much larger. Additional suggestions on project planning are provided under **Project Identification** in the Design Checklist section of this guide.

A final argument in favour of pro-active planning: the types of proposals that can emerge from this discussion may not be eligible for GEF financing, but if they reflect national priorities, they may be strong candidates for the UNDP Thematic Trust Fund, bilateral donors, or other multilateral donors, such as the EU.

5 Design Checklist

The project design process is a juggling act at times. You must constantly think about the type of intervention that will be most successful, but you also have to keep in mind the following:

1) **GEF Operating Procedures:** These include the format of the project proposals to the GEF (the project brief), deadlines for submission and responses to the review process, letters of endorsement from the national GEF focal point, and participation in the annual Project Implementation Review (PIR) process. Even UNDP veterans will find that GEF adds another layer of requirements that have changed over time. The GEF website (www.thegef.org) provides some basic guidance; however, regional staff in Bratislava will have the most current and detailed information.

2) **UNDP Operating Procedures:** These include the establishment of a Project Steering Committee, the appointment of a project manager, approval procedures for the project execution arrangements, the delegation of authority (DOA) process, and (often) support in procuring equipment, hiring international consultants, and conducting audits. If you are familiar with environmental issues but new to UNDP, the Programming Manual (particularly the chapters on executing arrangements and budgeting) and your colleagues can be valuable sources of information.

3) **Government Operating Procedures:** This area has caused numerous delays in GEF projects in the region. Past examples have included the need for a special approval procedure for capital designated for lending (Slovenia) to mandatory approval of all environmental technical assistance projects by a committee at the Ministry of Environment (Slovakia). The stronger your contacts in the government, the sooner you can find out about these requirements, start the necessary paperwork, and avoid problems later in the process.

4) **Other Operating Procedures:** Any other project partners who are contributing financially to the project will have their own set of approval procedures. Commercial banks and development banks require board approval for their loans, and they require a due diligence process that can take many months. Other bi-

lateral donors may require approval by a high-level civil servant or confirmation that there will be funding in the aid agency's budget for the project. Private investors such as ESCOs require the approval of the company's leadership. In other words, GEF approval is not sufficient to launch a project.

5.1 Project Identification

The Current Programming Approach information in Section 4 of this guide provides some basic information on how to identify promising areas for projects using a pro-active approach. To be realistic, however, no programme officer has unlimited amounts of time to conduct in-depth analysis of the current local situation. However, a pro-active approach does not require much time. Even a morning should be sufficient for doing an 'opportunity survey'.

THE ONE-MORNING OPPORTUNITY SURVEY:

- Read the most recent version of the Country Programme Document. You have an instant list of priorities. Don't limit your reading to the 'Environment' Section (if there is one!). Keep yourself open to possibilities.
- Pull up a copy of the basic energy information on your country (Energy Information Administration's of the US Environmental Protection Agency country information sheets are an excellent place to start - see References section). What kinds of fuel are consumed? Where is most fuel consumed? National Energy Strategies (where they exist and if they are fairly recent) are good sources of project ideas.
- Use the Internet (or Annual Reports, if there are some in the office) to look at a current list of lending by development banks, such as the German KfW, or the multilateral development banks EBRD, IBRD and ADB. These lists can also provide quick answers about current priorities for spending in energy and environment, as governments have already agreed to the terms and conditions of the loans. Again, don't limit your search to the "energy and environment"

loans. Transportation, municipal infrastructure, business development, and other areas all have strong potential links to energy efficiency initiatives. Also, look in financial newspapers and news from local and foreign chambers of commerce for information on private investors in your country.

- Finally, re-read the paragraph on Strategic Priority 2 in the Introduction - Defining Local Financing section of this guide (Text Box 2-1). Think about how these GEF priorities might link with the other trends you've seen in your survey.

These suggested activities will probably generate several ideas that can be pursued further. In addition, most CO focal points occasionally receive proposals from potential project developers who have heard about the GEF and consulted the website. With either type of proposal, there are three questions to keep in mind when considering whether it would be a strong competitor for limited GEF funds.

1. **Is there a "market"?** Is the project proposing to fill a real need? What is the potential size of the market (for efficient appliances, for public lighting, for energy audits, for loan guarantees)? To what extent could the project be replicated in the proposing country and in the region? For example, if you have only a few

centralized heating systems, and they are all losing money, a heating efficiency finance project is not going to be viable.

2. **Is there a client?** Who is going to purchase these services? Apartment owners may not be interested in purchasing energy efficiency equipment if the payback period is several years (or they may simply not have enough money). State enterprises that do not pay market cost for fuel may not see a need to improve their efficiency. Municipalities may not want a loan guarantee if the loan itself is too expensive. On the other hand, do not overlook local and national governments as a client. The less privatized the economy, the stronger the incentive the government has to reduce operating costs in industry (as it is paying for the subsidies).
3. **Is there a project champion?** Who is going to visit stakeholders, serve as an advocate for the project to the government, and provide expertise and willingness to stay with the project during the long development and approval process? Strong, professional partners will make your life as a CO focal point much easier.

If the idea seems to have a market, a client, and a champion, the next step is to determine whether it is

Table 5-1: Eligibility of financing mechanisms under GEF policy framework

Type of Mechanism	Is it eligible?	Why or why not?
<i>Interest rate buy-down.</i> What it is: A donor contributes money to pay the cost of several percentage points on a loan. The market rate may be 9 percent, for example, but the fund covers 4 percent, leaving borrowers with a loan at 5 percent. Example: German Coal Fund EE project in Hungary.	No	While these projects are successful at stimulating lending for energy efficiency, the GEF does not see them as sustainable. When the money is spent, the programme ends.
<i>Capitalization of a revolving fund.</i> What it is: Money is provided for lending on energy efficiency projects and is then paid back into the fund for additional loans. Example: World Bank's Romania Energy Efficiency Fund	Possibly	GEF would not approve a proposal to donate 100 percent of the capital. It would probably fund a project where capital was provided by other sources and GEF funds paid for support and training services (see Country Case Studies).
<i>Capitalization of a loan guarantee fund.</i> What it is: GEF capital is used to partially guarantee loans made by local commercial banks. Example: HEECP	Probably	This is seen as a promising area of activity, and UNDP is in the process of producing a guidance note on loan guarantees.
<i>Carbon finance:</i> Equity investments or loans for a project or projects that will also receive JI or CDM credits Example: IFC Carbon Finance Facility ⁵	Possibly	GEF funds, which are Overseas Development Assistance, are not supposed to be mixed with carbon credits, which governments buy as they would any other commodity. However, the GEF is discussing cases where a GEF loan fund would lend to a project that also generated credits... discussion is ongoing.

⁵ <http://www.ifc.org/ifcext/enviro.nsf/Content/CarbonFinance>

eligible for GEF support. **Eligibility** for local financing projects will be discussed thoroughly in an upcoming (2005/2006) UNDP-GEF guidance note. This guide can only provide a brief introduction to the subject. In addition, this may be the one area where other projects under implementation cannot be useful – the GEF Council would not approve the financing terms of some of the older projects were they proposed today.

Even after the guidance note is published, it is always a good idea to contact the UNDP regional experts in Bratislava to ask about eligibility. As sample cases from Table 5-1 indicate, eligibility is not often a black-and-white question.

5.2 Project Development

LESSONS LEARNED—FINANCING AND FINANCIAL MECHANISMS

Many ‘lessons learned’ are already available from the Lessons Learned section of project PIRs and from the Action-Reflection Notes and Lessons Learned Notes listed in the References section of this guide. In addition, the following ‘lessons learned’ in project financing may save you time and effort during the development process.

Start financing negotiations early. Regardless of the financial mechanism or mechanisms that will be used in the proposed project, informal discussions with potential lenders, be they commercial banks or government loan programs, should start as early as possible. It may also be worth talking to several commercial banks, as UNDP-GEF projects have found that the bank that finances the project is often different from the bank that appeared to be the most likely candidate during the development process.

Research the loan market before proposing a guarantee. If the project proposes a loan guarantee fund, check interest rates and lending activities to your proposed beneficiaries. If interest rates are high, guarantee funds cannot create a market. Donor roundtable discussions can also be a good place to discuss this issue. If other donors have been involved in guarantee proposals in the past (IFC and USAID have regional guarantee programs), you can learn from their experiences. If neither agency is promoting guarantees in your country, it is worth asking why.

Capitalization is important. Research the necessary level of capitalization (i.e., how much money will be available to borrowers) very carefully before proposing a

loan or loan guarantee fund. If the level of capitalization is small, there may not be enough capital being paid back into the fund for it to ‘revolve’; i.e., to support additional, similar projects. Commercial bankers can play an important role in providing information of this sort for your market.

Just as the amount of capital available is important, the timing of payments may also be important. As the Hungary case study shows (Section 6. 6), project beneficiaries may have special requirements, such as a need to be reimbursed up front for certain work, or a limit on the amount of debt that they can have at any given time. Thorough market research and strong, early communication with project stakeholders can identify these needs and build them into project mechanisms (also see the Action- Reflection Note on building a network of sites in Bulgaria).

Consider loan terms carefully. Remember that the maximum lifetime of a UNDP project is seven years. Typical RBEC GEF projects are designed for three to four years (although most take longer than their projected lifetime). Payback periods on energy efficiency projects can range from less than one year to more than 15 years. Make sure that the project developers can demonstrate: 1) how the money in the loan or guarantee fund will “revolve”; 2) what the volume of lending will be by the end of the UNDP-GEF project; and 3) what will happen to the remaining capital at the end of the project.

Think through ‘structuring financing’. Experience from UNDP-GEF capacity building activities in the region has shown a gap between developing what are often called ‘bankable’ investment proposals and actually getting them financed. You can increase the chances of obtaining financing in several ways. First, the project can use project developers who will benefit from the implementation (as opposed to a contractor who is paid only to write the proposal, regardless of whether it is financed). Second, the project can offer more than one type of financing (remember the Bulgarian example, with bonds and more modest city projects) and training in several types of financing arrangements. Third, the project developers can speak early and often with potential lenders. In one RBEC project, early discussions with the EBRD revealed that they were not willing to accept municipal property as collateral in that country. This information meant that the project team did not waste time on developing that financing scenario.

In addition, it should be noted that there are two types of projects when it comes to ‘structuring financing’.

One type of projects has a single mechanism that is defined before the project (as in the UNDP-GEF Georgia Renewable Energy Project) or during the project (as in the UNDP/GEF Hungary Audit fund or UNDP/GEF Poland efficient motors fund). In the other type of project, structuring financing is an ongoing activity, focusing on a series of smaller investment projects to be developed (as in the UNDP/GEF Romania Energy Efficiency project).

Energy Performance Contracting, or the contract signed by a company providing energy efficiency services and financing, is another area where the more specific the agreements are, the more likely the chance of success (see Text Box 5-1).

Text Box 5-1: Energy Performance Contracting

Energy Performance Contracting is a contract signed between ESCO, the company providing energy services, and its client. While GEF projects are not likely to involve UNDP directly in the actual negotiation of Energy Performance Contracts, projects with other donors may use them. As a report for the European Commission (EVA 2000) points out, each contract should include very specific information about the parties involved, the services that will be provided, the guarantee provided (as in the level of energy reductions that will be achieved), the project duration, and how payments will be structured (EVA, 2000: p. 118-9). Several sources of information can help you if you need to review a contract in the context of a project. First, Annex II of the report cited above provides details on the types of material that should be covered in a contract (EVA, 2000: pp.117-139).

Second, there is an organization that supports the **International Measurement and Verification Protocol**, which is designed to promote standardized measurements for measuring and verifying energy savings: especially important for the guarantee section of the contract.

Finally, the **Berlin Energy Agency** hosts a clearinghouse on energy contracting that is designed to standardize performance contracting and make contracts easier to negotiate and understand (See References).

Financing is a means, not an end. Don't propose a mechanism just because it seems 'innovative'. Think about what the components of these mechanisms do and what problems they are designed to address. For example, if interest rates and political risk is high in your country, proposing an ESCO will be innovative... but also unlikely to succeed. Think about what ESCOs

do that you need - is it the auditing? The contracting? The third-party financing? Perhaps these components can be addressed through specific activities that are more appropriate for a new market. You may find that you have a good project that is simply not the right fit for GEF funding...at which point, it is time to turn to other donors. Or you may find that the activities you are proposing fit the guidelines for local financing and face a greater chance of success.

Independent advice can be extremely helpful in evaluating proposals with financial mechanisms. While the Project Steering Committee may include representatives from government or academia who may be able to comment on the mechanisms, it may also be useful to contact a professional in the field of finance. This is one area where the regional office may be able to make a specific recommendation. In addition, in countries where the IFC is working, their staff may be able to serve as a source of expertise or may be able to recommend an independent professional. For other countries, the EBRD or ADB may be able to make a recommendation. In all cases, if you know that a project will involve a financial mechanism, try to identify some funding to pay an independent expert, and pay close attention to his or her terms of reference (e.g., if you need a report evaluating the mechanism, request it in the contract).

OTHER LESSONS LEARNED

Focus on a network of sites rather than a single 'pilot'.

Municipalities can change quickly due to elections or other events. Small and medium enterprises may also change in the course of a few financial quarters. Finding at least two or three sites for initial capacity development work or testing a financial mechanism increases the chances of success. One UNDP-GEF project successfully used an application process for interested cities, and identified candidates that were willing to commit time and some scarce municipal resources to the project. Even when only one city will receive a particular intervention, a network can also help to spread techniques quickly (see the Action-Reflection Note on the Eco-Energy Network in Bulgaria).

Consider the role of private sector partners. While UNDP uses the term 'public-private partnerships' frequently, it is difficult to imagine a project that would not include private sector participation. At the minimum, private vendors provide energy efficiency equipment or training for in-country experts. Commercial banks can provide private sector finance, and in some cases, private

companies will own and operate an energy producing facility for a city (such as the example in Moldova mentioned in the Primer section). Special considerations when a private sector company is providing substantial co-financing are mentioned in the **Action-Reflection Note for a biomass project in Latvia**.

Use your own professional network even when you contract out hiring. When hiring experts and consultants, do not rely upon UNOPS or IAPSO to find the people you need. This does not mean you should not use their services. In fact, UNOPS and IAPSO are very well suited to the hiring process and can protect you from pressure from the government when it comes to hiring and tendering decisions. However, their standard procedure involves circulating the terms of reference to their in-house database of 'interested companies'. Unfortunately, many of the most suitable consultants and companies in energy efficiency may not be on these lists - they have plenty of business and simply may not have heard of either organization, particularly if they work mainly in the private sector. In addition, while both agencies have a strong database of contractors working in traditional development services (e.g., logistics), they don't often work on energy efficiency finance. You can dramatically increase your chances of success in finding the right person or company for your project by requesting a copy of the announcement and then using your regional team in Bratislava and the SURF-ENV mailing list and other non-UNDP mailing lists (e.g., www.devjobs.net) to target specialized professionals who would have interest and expertise in the project area. You can then sit back and let UNOPS and IAPSO compile a short list and assist you in other ways. This approach also reduces the chances that you will have to re-advertise for positions, a step that costs time and money.

Research is an ongoing process. Ideas for interventions that may work well in an energy efficiency project are constantly appearing, and it is worth consulting the information sources in the References section of this guide about new projects and programmes. Within UNDP, pay special attention to the Small Grants Programme climate grants, the Thematic Trust Fund grants, the Energy and Women projects, and the GEF investment projects in other regions.

Clarify the executing arrangements for the project as early as possible. Unclear executing arrangements can become a huge source of delays. Already halfway through a PDF it is possible to get a sense of whether the executing agency is the right one to continue with the

project. Early discussion about the arrangements can also allow time to acquaint the potential National Project Director and his/her staff with the project and obtain the necessary signatures on the project document. Note that an assessment of capacity and tender procedures are necessary for NGO execution.

Think carefully about foreign exchange risk over the life of the project. This point is particularly important for GEF projects, because cost increases following the approval of the project brief are not permitted. When the GEF project portfolio began in RBEC, the biggest currency risks were local. For example, the UNDP-GEF project in the city of Vladimir suffered delays due to the 1998 rouble devaluation, which increased the cost of imported equipment by more than a third in the face of a fixed budget. A more recent problem relates to the falling value of the dollar against European currencies, because GEF grants are denominated in dollars, and the amount of dollars disbursed to a project is determined when the brief is approved.

To give an example of how this change in rates can cause problems, assume that a project in the Czech Republic budgeted 20,000 CZK per month for 36 months of the project for a project expert's salary. If the project brief were submitted in 2000, when \$1 = 42 CZK, the brief would, in effect, be requesting 720,000 CZK, or \$17,000. However, if the project started only in 2004, when the exchange rate had fallen to 24 CZK, a 20,000 CZK salary would actually be worth \$30,000. If the project has allocated \$17,000, it will not be able to pay the stated salary in local currency! Changes in exchange rates in this direction also create problems for purchasing local equipment.

While one project (a World Bank – GEF project) has petitioned the GEF Secretariat for an additional grant to cover exchange rate losses, it does not appear likely that the GEF will allow this to become a precedent. In the meantime, risk can be minimized by taking the following four steps: 1) Look to outside sources for information about possible exchange rate trends over the entire project lifetime (including extra years for possible delays). 2) Consider risk scenarios that involve both falling value of local currency and falling value of the dollar in discussing project risk, as they will affect the project in different ways. 3) Budget conservatively and be very aware of the currency in which cost estimates and co-financing are denominated. 4) Always include the date the exchange rates were calculated in a footnote in a project brief or project document.

5.3 Finalizing the Project for Submission

Finalizing the project for submission to the GEF can be surprisingly labour-intensive. One of the ways to minimize the work that will have to be done as the project proposal nears completion is to go through the project brief and make sure that it contains the elements listed in Table 5-2. While there are a number of other required sections, these sections are most likely to require additional research or information from the project team before UNDP HQ submits the project to the GEF Secretariat.

Finally, you can take several steps to reduce delays related to obtaining the necessary **supporting documentation** from sources of co-financing. As soon as the project identifies the co-funders, determine what kind of letter you will need from them in support of the project. Again, the team in Bratislava should be able to help you with this issue, and they should also be able to provide you with guidance as to how to label other

sources of financing (i.e., are they co-financing or parallel financing).

In addition to the mandatory endorsement letter from the GEF Operational Focal Point, a simple letter from a ministry official at a ministry funding parallel activities may be sufficient. Private investors may need to provide an expression of interest, or they may be asked to provide a more binding letter of commitment.

The dollar value of in-kind financing should be estimated, and the assumptions used in calculating it should also be available for review. It would also be useful to discuss (even at this early stage) what types of supporting documentation will be required for the project document to be approved and signed (for example, a Memorandum of Understanding between the government and a participating bilateral donor may be necessary). If documentation will require approval at the ministerial or parliamentary level, the process can be put into motion, saving time when the final project document has to be prepared.

Table 5-2: Key UNDP/GEF Project Components

Project Component	Example of "Good Practice" in a UNDP-GEF Project Brief
A clear, understandable explanation of the amount and type of energy currently being used, an estimate of the amount of energy that will be saved during the project, and an explanation of how the energy will be saved (by technology or activity).	Ukraine: Municipal ESCO FP
A clear explanation of the cost of the efficiency measures and the financial savings that they will generate. This should include assumptions about the exchange rate, credit terms (if applicable), and any other information used to calculate the Net Present Value of the proposed investments.	Ukraine: Municipal ESCO FP
A clear explanation of how the proposed financial mechanism will work, including a scenario with loans and repayments.	Belarus: Biomass Energy FP Russia: Energy Efficiency in the Educational Sector MSP
A thorough estimate of climate benefits of the project, including the estimated reduction in greenhouse gases and local pollutants and the assumptions used in all calculations (i.e. whether they were IPCC emission factors, and if not, how they were calculated).	Ukraine Municipal ESCO FP
A logistical framework (Logframe) that states clear indicators, specific benchmarks, and provides a timeframe for measuring results.	Hungary: Municipal Efficiency FP

6 Country Case Studies

6.1 GEF Revolving Funds in Russia⁶

PROJECT CONTEXT AND FINANCING FRAMEWORK

The project has been in progress since 2003 with the Russian Ministry of Education and Science. The overall objective of the project is to contribute to the abatement of greenhouse gas emissions by improving the energy efficiency of Russian educational facilities. There is a great potential to save energy in Russian educational facilities. However, ownership of the educational facilities (municipal schools and federal universities) and unresolved regulatory issues have become major barriers to attracting private investments for energy efficiency projects.

The UNDP/GEF project finances low-cost measures to conserve energy, including sealing windows and doors, installing heat exchangers and thermostats, and other measures to be decided based on the energy audit. It also considers measures like repartitioning interiors to make use of school buildings more efficient. The following types of measures can be financed:

- Weatherization measures to reduce heat loss and improve occupants' comfort. The menu of weatherization measures includes weather-stripping around windows and doors and external caulking to seal joints;
- Heat supply related measures to improve control of the indoor temperature in relation to outdoor conditions and the feedback from thermostats/indoor sensors. The system controls the heat delivered to the space, preventing overheating and reducing the heat energy supplied during unoccupied periods. The measures involve installation of heat exchangers, circulation pumps, cut-off valves, filters and control systems to regulate indoor temperatures;

- Electricity saving measures, including retrofits of outdated electrical equipment, energy saving lamps and timers;
- Hot water reducing measures, including control systems to regulate hot water temperature, retrofits of water saving leak-free taps, etc.; and,
- The installation of heat meters to verify the performance of the measures selected in reducing heat energy consumption.

The project finances these essential (but low-cost) repairs for a number of pilot schools and universities in the form of conditional grants. The group represents about 1 percent of all schools in the pilot regions - the Republic of Karelia, Murmansk, Arkhangelsk and Tver Oblasts. The energy efficiency measures carried out at the pilot schools are typical low-cost measures with an investment of approximately \$50,000, or less, for a 5,000-6,000 square-metre building. The investment is expected to bring about energy savings of 20 to 25 percent with a three- to six-year payback period. Preliminary estimations indicate an annual saving for the demonstration programme of about 7,500,000 kWh, leading to a reduction of CO₂ emissions by approximately 3,000 tons annually, or 9,000 tons over the project period. Typical investment lifetime of the suggested measures is 20 years. Thus the investments' total impact can be estimated at 60,000 tons of mitigated CO₂ emissions. Local governments contribute at least 50 percent of the cost of repairs and retrofits. Demonstration projects in schools are co-financed by the Nordic Environment Finance Corporation (NEFCO) through conditional grants to municipalities.

To complement the efficiency improvements, the student population and community will be encouraged to contribute in kind to more cosmetic interior and exterior improvements, like new wallpaper and painting, which will enhance the physical learning environment. The energy efficiency measures in the buildings of federal educational institutions are co-funded with GEF grants, by the Ministry of Education, the region (Oblast/Republic) and the university. Each participating municipality and university was requested to set up a

⁶ The full title of the project under discussion is "Cost effective energy efficiency measures in the Russian educational sector" (RUS/02/G35 - 00014622)

revolving fund, ESCO or a similar financial mechanism. The grant money will be paid back to the revolving facility and made available for new energy efficiency projects in the same municipality or university.

REVOLVING FINANCE MECHANISMS

In order to improve the sustainability and strengthen the replication effect, the target municipalities were required to use the resulting savings to pay back the conditional grant to a revolving fund established to circulate investments for educational sector energy efficiency measures. Existing revolving funds were utilised as much as possible for this purpose. The owner of the building is required to pay back annual savings to the fund until 120 percent of the total investment is paid back. This also includes the economic savings resulting from installation of equipment for heat metering and payments based on real measurement instead of estimates. Altogether this will accumulate capital for new energy efficiency projects in the municipality or in the higher educational institutions. As an output of the project, a standard procedure for revolving mechanisms will be developed for both municipal and higher educational institutions. This will make it easier to establish them and lower their transaction costs.

Comments of UNDP/GEF Regional Coordinator on Climate Change:

This project is still a good project model for countries in a less advanced position than Russia. However, there are two areas that may have to be modified in today's GEF. It is increasingly difficult to use straight grants or subsidies for technology demonstrations or investments. The project developer will need to tailor the project's design to meet the essence of the strategic priority. With Strategic Priority 2 the developer is looking for barriers that prevent the release of investment for energy efficiency, and the GEF is currently encouraging implementing agencies to focus on the financial sector. A typical scenario is that the banking sector has little experience in lending to the energy efficiency sector and thus does not fully understand the risks, and therefore tends to assess the risk too highly. A typical response is that a GEF project could share the risk associated with a loan in the form of a partial guarantee. The expectation is that as the bank gains experience, it can build its understanding of risk in lending to the sector and adjust its risk model and lending conditions.

Revolving Funds are being established or augmented as part of the demonstration programme with GEF and non-GEF funding allocated for energy efficiency demonstration projects in schools and universities.

Various alternatives for revolving financial structures will be tested to accumulate funding from various sources (GEF, bilateral donors, federal and municipal budgets).

The basic principles for establishing the revolving funds include:

1. Maximising incentives for high repayment rates;
2. Selecting projects with high energy-saving potential and low pay-back period (up to five years);
3. Allocating funds on a cost-sharing basis;
4. Transparency and control over financial disbursements by UNDP (during the project implementation period), other donors, the National Executing Agency and regional administrations;
5. Creating incentives for participatory energy-efficiency projects with private sector involvement.

The funds are kept in a separate low-risk deposit account. The economic justification for specific improvements in a particular school depends on its current state of repair, as well as on its original design and building quality. Therefore, the final design of specific measures is selected by conducting a sensitivity analysis of the most promising renovations and measures and choosing the collection of interventions that ensure a satisfactory internal economic rate of return and a short payback period. The payback period criteria have been introduced in order to recognise the risk associated with investments with long-term payoffs and to make the revolving funds operational as quickly as possible. The threshold values include an economic rate of return of more than 10 percent, and an investment-payback period of less than six years. Tradeoffs between the two criteria of competitive economic returns and short payback periods will be taken into consideration.

The project will pilot and assess feasibility of three options for the revolving funds in each pilot area, namely:

- linking the funds to the existing regional/municipal establishments such as investment funds, energy efficiency funds, etc. (eg. Kirovsk, Petrozavodsk);
- creating regional funds with federal/regional administrations (Tver); or
- establishing an independent profit/non-profit facility in partnership with municipal/regional administrations (Apatity ESCO). Capitalization of

the revolving funds established as a municipal budget account was largely co-financed by NEFCO.

Operation and maintenance is crucial for the realisation of the estimated savings. The project developers supervise the implementation and operation of the school demonstration projects, participate in the training of installation foremen to ensure the acceptable quality of installations, a training programme for facility and building managers, and take responsibility for occupant education needed to prevent vandalism. The demonstration projects will be monitored for a year after the installation in order to check if there is a need for follow-up training and supervision for the facility managers. The first projects were implemented in Kirovsk, Apatity, Tver and Petrozavodsk where revolving funds have been established.

Contributed by **Nataly Olofinskaya, UNDP Russia**

6.2 GEF Revolving Fund in Belarus

THE REVOLVING FUND: BRIEF DESCRIPTION

The Revolving Fund for Biofuel (RF) is being established in Belarus in the framework of the UNDP/GEF project **Biomass Energy for Heating and Water Supply in Belarus**. The full-scale launch is envisaged for Year 3 of project implementation.

The establishment of the RF is sponsored by the State Committee for Energy Efficiency under the Council of Ministers of the Republic of Belarus. Despite this, the fund is envisaged as an independent legal entity. The RF will have its own bank accounts, financial and programmatic responsibility and its own obligations, etc. Its mission is to serve as a financial tool for implementing national and international programmes relating to renewable energy and energy efficiency, and for pooling and reallocating the investment resources of the state and international organizations.

The RF will invest with preferential terms, such as a comparatively long payback period (currently five years for the signed loan agreements), grace period (12 - 18 months) and low interest rate - the inflation rate plus 0.5–1 percent. Interest should be no more than half of the average commercial banks' rate in Belarus.

Until fully launched, for the purpose of UNDP/GEF project implementation, the RF acts as a hard currency special bank account within Belinvestenergoberez-

henie company (BIES) – one of the companies of the State Committee on Energy Efficiency. Project staff is recruited to service the RF during the project lifetime.

Within the project, the step-by-step process of RF operation is as follows: the government and UNDP/GEF money are transferred to a BIES special bank account when a demonstration site is deemed ready for implementation of technical measures following a successful financial audit. BIES signs a loan agreement with a demonstration site owner⁷. Upon arrival of UNDP/GEF and Government money into the RF, the transfer is made to the site owner on the basis of the loan agreement. Repayment is done to the RF with no recourse to UNDP/GEF or initial government sources.

The two loans made under the project are interest-free because, according to national legislation, a special National Bank license is required for lending by non-credit institutions. During the course of the project, the RF will obtain the necessary licenses and start charging

Comments of UNDP/GEF Regional Coordinator on Climate Change:

Most of the above commentary applies also to this project. In a GEF eligibility review, the focus of discussion might be on a loan mechanism. Increasingly project developers are being encouraged to look more closely at the reasons why a technology is not being used, and to address these specific issues. Projects normally assume that technologies being promoted are cost effective but, perhaps through lack of experience, there is a poor understanding of the costs and returns than can be expected from a model and technology. For example, a borrower may be worried about the reliability of a technology, or she may not have a secure fuel supply contract. The project development team is encouraged to look for guarantees to cover the equipment's reliability, and perhaps secure a fuel supply contract, possibly by insurance against default. This would reduce the risk to an absolute minimum, and also reduce any need for a loan. The GEF feel that such a project would much more closely represent 'reality', or the commercial world without subsidies. In their view, this provides a more convincing example that a demonstration really can be cost effective, and therefore it is more likely to be replicated.

⁷ Currently two loan agreements are operational: with LLC "Volat-1" for the interest-free loan of \$130,000, and joint-stock company "Mostovdrev" for the interest-free loan of \$400,000 (GEF money, there is a proportionate contribution from the government and site owners). Technical works at the first site have been successfully completed; work at the second demonstration site is in progress.

interest. The loans will be indexed to inflation in order to prevent the risk that current annual inflation levels deplete the value of funds paid back into the fund.

The capital of the RF, which is over \$3 million, is made up of equal grant contributions from the GEF and from the Government of Belarus. It is envisaged that the Committee for Energy Efficiency (the national implementing agency authorized by the government) will continue to contribute to the RF after the end of the project.

During the lifetime of the UNDP/GEF project, the management costs of the RF are covered by the project. Later, its management costs will be covered from interest earned by the RF, as well as from its consultancy services on business planning.

Contributed by **Maxim Vergeichik, UNDP Bulgaria**

6.3 Municipal ESCO in Ukraine

PROJECT OBJECTIVE AND CONTEXT

The UNDP/GEF project '**Climate Change Mitigation in Ukraine through Energy Efficiency in Municipal District Heating**' aims to reduce greenhouse gas emissions through large-scale improvements in energy efficiency in Ukraine's communal heat supply sector. The project consists of two main components: (1) establishment of a municipal energy service company (ESCO) and (2) demonstration of an energy saving programme. The pilot municipality selected, in consultation with the government and executing agent, is the city of Rivne in Ukraine.

The municipal ESCO was created and legally registered in the city of Rivne on 12 November 2003, as a closed joint-stock company with the official name 'ESCO-Rivne'. The shareholders are the oblast administration and the city government. Due to the fact that the oblast administration and city government (municipality) are not legal entities, the ESCO stock owners are DHC 'KomunEnergiya' (controlled by and reporting to the oblast administration), with 50 percent of stock shares and CE 'Misksvitlo' (controlled by and reporting to the Rivne municipality), with 50 percent + 1 stock share. The statutory fund (authorized initial capital) is \$50,000.

LESSON 1: LOCAL PROJECTS SHOULD BE IMPLEMENTED ON THE LOCAL LEVEL TO SECURE THEIR SUCCESS

Activities under the project commenced in October 2002 under the national execution modality (NEX), with

the State Committee for Energy Conservation acting both as the government implementing agency and executing agency. After various consultations and a Tripartite Review Meeting in the middle of the year, the following changes were made:

- The project management was moved to Rivne;
- The oblast administration was designated as the national executing agency and the state committee was relieved of this responsibility;
- As a result, the Project Support Office in Kiev was closed and the Project Implementation Office in Rivne became the only project office.

After moving to Rivne, the 'Climate Change Mitigation in Ukraine through Energy Efficiency in Municipal District Heating' Project met overall support from the Rivne municipal and regional authorities. Rivne Mayor Victor Chaika has continually supported the project. The governor's office also supports the project in many respects because the National Project Director, Vasilii Bertash, is the Rivne Vice-Governor.

One of the ESCO's stakeholders - DHC 'KomunEnergiya' is the leading heat and hot water supplier in Rivne and for many years has been cooperating with the Rivne municipality, thus serving as a link between the private and public sector.

The benefits of moving the project from the national to the local level are:

- Mayor's personal involvement and support;
- Support of the governor's office;
- Sound and fruitful cooperation between the municipality and business (KomunEnergiya).

LESSON 2: INCREASED COMMUNITY MOBILIZATION FOR ENERGY EFFICIENCY

The concept of community involvement in energy efficiency through social mobilization is completely new - not only within the (regional and municipal) partner institutions, but also amongst the project staff.

Maintaining continuous heat and hot water supply is an overwhelming priority for a majority of consumers including industries, institutions and, most importantly, residents - especially during the winter months. However, there was widespread dissatisfaction amongst clients concerning current levels of service provided by KomunEnergiya (the Rivne district heating operator). In particular, residents are

hard pressed to pay heating bills that consume a remarkable 30-50 percent of their average monthly wage. The combined effects of low satisfaction with current service levels and people's low ability to pay complicate the implementation of sustainable energy efficiency measures in Rivne.

Because of this, consumers must increasingly be involved in decision-making processes. Knowledge and awareness should be created amongst beneficiary communities about the immediate impact and the benefits that energy efficiency measures can have - not only on the environment but, more importantly, on businesses and residential consumers.

The UNDP/GEF project, together with ESCO-Rivne, involved local residents and followed community-based approaches to energy efficiency. These activities have several features:

- Collaboration with local apartment owners associations, condominiums and other neighbourhood communities;
- Introduction of an Energy Saving elective course in the secondary schools of Rivne in cooperation with the International School Project for Application of Resources and Energy (SPARE);
- Cooperation with other environment/community-oriented international projects being implemented in Rivne and the Rivne municipality in order to build community support and introduce common projects.

PROJECT ACHIEVEMENTS

- The municipal ESCO was created and registered in the city of Rivne;
- Community-based monitoring of people's energy saving needs was conducted and its results were verified by ESCO-Rivne experts;
- The School Energy Saving project reached an audience of about 20,000 people, urging people to save energy and offering new approaches to energy efficiency; and
- ESCO-Rivne secured three orders to implement energy efficiency projects from apartment owners associations and a school supervisory board.

Contributed by **Sergey Volkov, UNDP Ukraine**

Comments of UNDP/GEF Regional Coordinator on Climate Change:

The two sets of comments above apply also to this project. The ESCO model is valid by the GEF, although under SP 2 the project developer would be expected to look more closely at the financial sector. Secondly, the subsidy for equipment would be looked at more closely with a view to reducing the level of subsidies and partially replacing them with risk mitigation instruments.

6.4 Local and Bilateral Financing for Energy Efficiency in Kazakhstan

PROJECT CONTEXT

The objective of the pilot 'Water Preheating Solar Plant' project was to set up a solar preheating plant by the municipal boiler house in Almaty in order to demonstrate solar technology usage for water heating and the associated reduction in fossil fuel consumption and greenhouse gas (GHG) emissions.

Kazakhstan consumes considerable amounts of heat energy. The heating sector is one of the main consumers of fuel as well as a major emitter of greenhouse gases due to high heat demand and low energy efficiency. Kazakhstan is blessed with solar energy that can replace fossil fuel for heat production. Despite this, solar energy is not utilized to any great extent for energy production. One of the barriers to solar energy is a lack of information and experience in Kazakhstan. The pilot solar project aimed to demonstrate solar technology usage for water heating. The pilot solar project was developed within the UNDP/GEF and the Government of Kazakhstan PDF B project 'Removing Barriers to Energy Efficiency in Municipal Heat and Hot Water Supply', assisting the Government of Kazakhstan in fulfilling its obligations under the UN Framework Convention on Climate Change in GHG emission reduction.

PARTNERS AND ROLES

- **UNDP CO** coordinated the project design, negotiated with partners and monitored project management;
- **Canadian International Development Agency (CIDA)** co-financed procurement of the solar equipment; and
- **District Heating Company (ATKE)** provided an in-kind contribution for assembling, commissioning and operating the solar plant at the boiler house.

Project Budget and Donors:

Project design	\$10,000 (UNDP/GEF);
Solar equipment	\$24,000 (CIDA);
Assembling, commissioning and monitoring of equipment (in-kind)	\$6,000 (ATKE)
TOTAL	\$40,000

PROJECT ACHIEVEMENTS

- The Solar Preheating Plant was installed and commissioned in 2003 at the district heating boiler house of ATKE.
- During the summers of 2003 and 2004 the performance of the system was monitored. The solar plant performed well. Average output of the solar panels was estimated at 765 kWh/sq.m for six months in the summer period. Average annual output of the solar plant was estimated at 193,459 kWh, leading to fuel savings totalling 23,870 m³ of gas and a correspondent CO₂ reduction of 40 tons.
- From an economic point of view, with a gas price of \$7,32/MWh, the annual fuel saving was about \$1,670. Comparing this with the total hardware cost and installation cost (\$16,280), the simple payback period was estimated at 10 years. If, however, the control equipment were simplified and the transportation costs from abroad were taken out of the calculation, the payback period would be about five years and the solar plant investment would be justified.
- An information campaign was conducted in order to raise the awareness of local specialists and the population about the climate change problem, saving energy and the advantages of solar technology. The results of the pilot solar plant project will be disseminated throughout Kazakhstan.

LESSON LEARNED ABOUT STRUCTURING FINANCING FOR THE PROJECT

To structure financing for heating-sector energy efficiency projects in the countries in transition, technical assistance and additional investment from international financing and development organizations should be sought to help improve projects' financial viability.

Contributed by **Gennady Doroshin, UNDP Kazakhstan**

6.5 Financing Energy Efficiency in Belarus

With 10 million people and a heating season of more than six months, Belarus is a European country highly dependent on energy. Since the Soviet times, the country has been highly dependent on Russia for its energy sources. The country is a party to the UNFCCC, but the continuing in-country debate has prevented it from joining the Kyoto Protocol. Nevertheless, Belarus' energy efficiency policy and financing mechanisms are deemed to be producing better results than in many neighbouring states.

In December 2002, the Council of Ministers set a number **energy efficiency targets** for the economy:

- 4.5 percent annual reduction in total energy consumption in the state sector per unit of GDP;
- Seven percent yearly reduction of fuel and energy consumption in the state-owned industrial sector of the economy;
- 600,000 Tce imported fuel substitution by 2005 from local and alternative energy sources.

To meet these targets, the government has developed a series of regulatory, institutional and financial instruments. Priority for energy efficiency is set by a separate act - **the Law of the Republic of Belarus 'On energy saving'**, as well as by a number of important by-laws that, among other things, establish financial preferences for producers of energy from non-conventional sources.

Institutionally, there is a high level body - the **Committee for Energy Efficiency** - reporting directly to the Council of Ministers. Among other things, the Committee is responsible for drafting new laws and regulations on energy efficiency and renewables, and implementing energy efficiency policies and energy efficiency targets. It has a central office with a staff of 37 in the capital, and seven departmental offices, each with 19 staff members; and an engineering centre with a consulting company attached to it. In particular, the Committee is responsible for implementing the government's National Energy Savings Programme, and as such, supervises the work of regional, local government and states enterprises; manages government funds earmarked to catalyze energy efficiency investment; sets and enforces energy consumption targets for different economic sectors and business categories; and has the authority to penalize malfeasants.

On the programmatic level, the government's main drive to foster energy efficiency investment has been through the national **Energy Savings Programmes**. The first National Energy Savings Programme (1996 - 2000) is reported to have saved five million tons of fuel equivalent through measures such as the design and introduction of new energy saving materials and technologies, boiler rehabilitation and replacement and the installation of metering devices. Based on the positive evaluation of the first Programme, the Government has decided to initiate a second phase - the National Programme on Energy Saving and Renewable Energy Utilization for 2001-2005. The technical measures include metering of water and heat consumption in housing, use of non-traditional local sources (e.g. wood waste), and boosting the efficiency of existing energy generation, distribution and consumption.

The government's **energy pricing policy** is adjusted to create incentives for energy savings: all energy tariffs paid by residents, as well as enterprises, contain a component that is pooled into an **Energy Efficiency Fund**⁸ - a pool of resources to finance the national energy savings programmes. In parallel, there is a move to gradual withdrawal from state control over energy prices to allow a free market for energy producers and suppliers, but with continued support for some important social objectives through targeted state subsidies.

The government estimated that an **annual investment of over \$120 million** was required under the Second National Savings Programme in order for it to meet its state sector energy efficiency targets. Apart from the energy efficiency tariff component mentioned above, additional sources of funding for these programmes are fines and penalties (including double-tariffs) for inefficient or excess energy consumption.

While raising funds for energy efficiency investments has been quite successful in recent years, there are issues to be considered on the spending side. Local resources available for energy efficiency financing are significantly underutilized for a number of reasons: lack of skills in producing and advocating good business plans; lack of personnel and corporate incentives for improvements in energy efficiency; lack of institutions such as energy efficiency business centres capable of mediating the

demand and supply of the local energy efficiency capital. Filling these gaps is a subject of a **UNDP-GEF project**. By mid 2005, the partnership of UNDP, the Committee on Energy Efficiency and other local stakeholders, as well as UNECE, is expected to result in a \$4.5 million project (with \$1.4 million requested from the GEF). Through institutional capacity building as a main instrument, the project is expected to catalyze additional local financing of at least \$7-8 million annually, ultimately relieving the planet of an estimated one million tons of GHG over a 15 year period.

Contributed by **Maxim Vergeichik, UNDP Bulgaria**

Comments of UNDP/GEF Regional Coordinator on Climate Change:

Here the GEF has made an exception to the focus of the project. As already discussed, the GEF normally asks project developers to focus on the financial sector. In Belarus the state sector is dominant and the financial sector weak. Because of this, the project development team has looked at ways of more effectively directing state resources to energy efficiency investments. It remains to be seen whether the GEF will make similar exceptions in other countries in a similar position. The Regional Coordinator's advice would be to consult the GEF first before spending time and resources on development.

6.6 Audit Fund in Hungary

PROJECT CONTEXT

The UNDP/GEF-supported 'Public Energy Efficiency Programme: Hungary' is aimed at promoting energy efficiency measures in Hungarian municipalities. Apart from training and awareness-raising activities, the major tool introduced by the project to promote energy-conscious municipal decision-making is the **Audit Fund Programme** which was launched in 2002. Its immediate objective is to reduce barriers to the financing of energy efficiency projects at the municipal level.

With the support of the Audit Fund, municipalities are able to conduct energy audits which show the pattern of municipal energy consumption. Audits allow those users who lack information on the potential of energy efficiency improvements to become aware of this potential. The findings of an audit report serve as guidelines for municipal decision-makers for the design and implementation of a municipal energy

⁸ In 2004 it is estimated that the capitalization of the Extra-Budgetary Energy Efficiency Fund is going to reach \$110 million.

rationalisation strategy. Since 2002 the Audit Fund has supported more than 102 municipal applications for energy audits and feasibility studies from around 500 municipal institutions. This is one of the project's main successes.

DESCRIPTION OF THE FUNDING MECHANISM

Applications are received by the Energy Centre (Hungary). After a preliminary financial and technical evaluation of the applicants and their applications, the information is forwarded to the Energy Efficiency Inter-Departmental Committee for final approval. Once a proposal is approved, applicants have a maximum of six months to conduct the energy audit. The Energy Centre evaluates the audit reports both technically and financially. The main criteria of the evaluation is that the audit has to identify a set of low or no-cost measures and advise municipal decision-makers on energy management.

The audits identify measures to implement that are no- or low-cost actions with a maximum five years of payback time. These are considered to be bankable proposals. Most of the audited municipalities have implemented no-cost actions (consumption monitoring and rationalisation, modification of supplier contracts, adjustment of system availability fees) but did not apply for bank financing. The reason for this is twofold:

1. Interest rates in Hungary are too high;
2. Most of the municipalities are already indebted. Municipalities prefer to apply for grants from the National Energy Efficiency Programme, from the EU Structural Fund (KIOP) or from other sources. This allows them to finance their energy efficiency measures while keeping the municipal budget in balance. The UNDP project provides the information about potential sources of financing through the training, the One-Stop-Shop website and via continuous personal contacts. Nevertheless, success in this process depends upon the success of municipal applications which, in most cases,

is important for implementing energy efficiency measures.

LESSONS LEARNED

The conditions for providing grants are reviewed each year on the basis of previous experiences. In order to increase the conversion rate of audits to investments, further incentives were introduced through the funding scheme. For example, the subsidy can be paid in several instalments and the final instalment is paid only when the municipality documents implementation of audit recommendations.

Although the energy audit and feasibility study provide a basic tool for the planning and implementation of energy efficiency investments, the financial sources are not easily available at the municipal level. Cooperation with the financial sector should be further promoted to achieve a high number of energy efficiency projects.

Contributed by: **Antonia Béres, UNDP/GEF Project Manager, Hungary**

Comments of UNDP/GEF Regional Coordinator on Climate Change:

This project design would still be eligible under today's conditions; however, it would probably also include some mechanism to foster bank lending at reasonable rates, such as a guarantee mechanism, or support to more accurately assess lending risk, for example. In summary, the good part of this project, as far as the GEF is concerned, is that it does not include subsidies.

The bad part is that it does not cover the financial sector, which seems to be a fundamental constraint here (although in fact rates have normalized in Hungary today). Hence, some scheme that will encourage the financial sector to lend at rates at which investors can recover costs within three to five years or so would help to realize investments, rather than just do audits that come to nothing.

Table 6-1: Project Focal Points and Contact Information

Country/Project	Focal Point	E-mail/Web-address
Belarus UNDP/GEF Biomass project	Dmitry Goloubovsky, UNDP Programme Officer	Dmitry.Goloubovsky@undp.org http://un.by/undp
	Vladimir Voitekhovich, UNDP/GEF Project Manager Irina Ananich, Revolving Fund Manager	biomass@un.minsk.by www.bioenergy.by
Belarus UNDP/GEF Energy Efficiency Programme	Dmitry Goloubovsky, UNDP Programme Officer	Dmitry.Goloubovsky@undp.org http://un.by/undp
	Sergei Prokazov, UNDP/GEF Project Manager	energy@un.minsk.by
Hungary UNDP/GEF Public Energy Efficiency Programme	Antonia Béres, UNDP/GEF Project Manager	antonia.beres@energiakozpont.hu www.energycenter.hu
Kazakhstan Water Preheating Solar Plant project UNDP/GEF PDF B	Aida Karazhanova, UNDP Senior Programme Assistant	Aida.karazhanova@undp.org www.undp.kz
	Gennady Doroshin, UNDP/GEF Project Manager	Gennady.doroshin@undp.org
Russia UNDP/GEF Energy Efficiency in the Educational Sector	Nataly Olofinskaya, Environment Programme Officer	Nataly.olofinskaya@undp.org www.undp.ru
	Evgeny Zenutich, Technical Project Manager	nice@k8.innov.ru www.energy-efficiency.ru
Ukraine UNDP/GEF Municipal ESCO Project	Sergey Volkov, UNDP Programme Officer	sergey.volkov@undp.org undp-rivne@ukr.net www.undp.org.ua

7 References

7.1 Ongoing Projects, Completed Projects

A complete list of ongoing projects in the region is available through the UNDP-GEF website: <http://www.undp.org/gef>. Copies of project briefs, project documents, and PIRs for specific projects in the region can be requested by contacting the Energy and Environment team in Bratislava at energy-and-environment-practice-group.sk@undp.org.

7.2 UNDP Websites

UNDP-GEF Website (www.undp.org/gef): In addition to the project search feature, there is also a number of useful monitoring and evaluation guides that can be helpful when completing project briefs. The site also contains UNDP-GEF publications, such as the M&E Note on solar photovoltaics, which includes detailed lessons learned about project financing for GEF energy projects. Finally, the site offers quick links to other GEF implementing agencies and the other global environmental conventions.

UNDP Knowledge Management Help Desk:

<http://europeandcis.undp.org>

UNDP Global Energy and Environment Practice

Network (though UNDP Intranet): <http://intra.undp.org/bdp/workspaces/energyenvironment-network>

UNDP Energy and Environment Introduction includes a description of country-level initiatives: <http://www.undp.org/energyandenvironment>

7.3 Knowledge Products and Reference Materials⁹

GEF Operational Programme 5. Removal of Barriers to Energy Efficiency and Energy Conservation. Available on-line:

⁹ These documents can be downloaded through the online version of the How-to guide: http://europeandcis.undp.org/?wspc=HowToGuide_EE_Financing

http://www.undp.org/gef/undp-gef_focal_areas_of_action/sub_climate_change.html

GEF. Strategic Business Planning: Directions and Targets. 2003. Available on-line:

http://www.gefweb.org/Documents/Council_Documents/GEF_C21/C21.Inf.11-_Strategic_Business_Planning.pdf

Action-Reflection Note on the Eco-Energy Network in Bulgaria

Action-Reflection Note for a Biomass project in Latvia

Action-Reflection Note for a Regional project on Greenhouse Gas Inventories

Action-Reflection Note on Energy Efficiency Housing in the Czech Republic

Action-Reflection Note: Developing Capacity to Heat Local Homes Effectively in Russia

Lessons from Capacity Development Activities in a UNDP-GEF Climate Change Project

Lessons from UNDP-GEF Heat Sector Projects

Sustainable Local Financing Advisory Note: *Guarantees* (Draft: UNDP-GEF HQ)

UNDP Guidelines for preparing a How-to Guide

7.4 International Programmes Promoting Energy Efficiency Financing

EBRD project Ukraine Energy Service Company (UKR-ESCO) helped to establish, operate and finance (through an EBRD loan) the first ESCO in Ukraine. More information:

<http://www.ukresco.com>

<http://www.ebrd.com/projects/psd/psd1997/3663.htm>

IFC/GEF Balkans Programme aims at improving the capacity of Balkan private companies to identify and structure investments and/or projects in the

following sectors: energy efficiency, renewable energy, biodiversity conservation, and/or international water pollution prevention. A project brief is available at: http://www.gefweb.org/COUNCIL/GEF_C15/GEF_C15_Inf.13/ConceptPaperBALKANSProgram042000.pdf

IFC/GEF Commercializing Energy Efficiency Finance (CEEF): the programme provides investment for projects in Central European countries (Estonia, Latvia, Lithuania, Slovakia, and the Czech Republic) which improve efficiency of energy use in buildings, municipalities, industrial processes and other energy end-use applications. More information at: <http://www.ifc.org/ceef>

IFC/GEF Hungary Energy Efficiency Co-financing Programme (HEECP 2): the programme's main objective is to build the energy efficiency financing capacity of domestic Hungarian financial intermediaries and facilitate the parallel generation of EE finance projects to utilize this financing capacity. More information at <http://www.ifc.org/ifcext/enviro.nsf/Content/HEECP> http://www.gefweb.org/Outreach/outreach-Publications/Project_factsheet/Hungary-ener-1-cc-wb-eng.pdf

IFC/GEF Poland Efficient Lighting Project (PELP) - one of the first GEF projects working directly through the private sector, was designed to reduce electricity consumption by stimulating the Polish consumer market for efficient lighting products. More information at <http://www.gefweb.org/wprogram/July98/wp/eli6.doc>; <http://www.ifc.org/ifcext/enviro.nsf/Content/Poland>

World Bank's Enterprise Housing Divestiture project (EHDP), Russia: the main goal of the project was to accelerate the divestiture of enterprise housing stock. It helped to mitigate unfavourable financial and managerial consequences of this process for local authorities by promoting effective usage of assets in the housing sector, institutional reforms and resource mobilization. Project website: <http://www.fer.ru/ehdp/english/index.htm>

UNEP/GEF Regional (Czech Republic, Slovakia) Energy Management and Performance Related Energy Savings Scheme (EMPRESS) is aimed at establishing a new type of ESCO – a Monitoring and Targeting Energy Service Company (*M&T ESCO*) - defined as a company that provides both M&T energy management services and the meters, instrumentation, and computer software necessary to undertake an M&T programme at an industrial site. See project brief at:

http://www.gefweb.org/Documents/Council_Documents/GEF_C20/CC_-_Regional_-_EMPRESS.pdf

UNDP-GEF Georgia Renewable Energy Project: the project is aimed, inter alia, on leveraging financial resources for the capitalization of the proposed Renewable Energy Fund so as to sustain renewable energy investments in the country. A project brief can be found at: http://www.gefweb.org/Documents/Council_Documents/GEF_C20/CC_-_Georgia_-_Renewable_Energy.pdf

UNDP/GEF Polish Energy Efficient Motors Programme (PEMP) seeks to remove barriers to the improvement of energy efficiency of electric motors and their operating systems, particularly by promoting market transformation using a financial incentive mechanism. More information at: http://fewe.pl/pemp_pdfb/brief.htm

UNDP-GEF Romania Energy Efficiency project helps project developers to design energy efficiency projects (by supporting feasibility studies, energy audits and financial analysis), and to identify sources of commercial financing, ranging from straight bank loans and equity investments to non-traditional financing methods such as third-party financing. Project website: <http://www.energie.undp.ro/>

World Bank/GEF Romania Energy Efficiency Fund seeks to enable companies in the industrial sector and other energy consumers to adopt and utilize energy efficiency technologies financed under soft commercial conditions: <http://www.free.org.ro/en/fund/thefund.htm>

7.5 Bibliography, Key Readings

Chandler, William. *Energy and Environment in the Transition Economies*. Westview Press, 2000. This is a very useful reference book and an excellent place to start with background reading in this subject. Economic and financing issues are also covered.

Energy Sector Management Assistance Programme (ESMAP) 1999. Energy Service Company (ESCOs) Practitioners Workshop – Summary Report. The report provides a brief sketch of the participants and the ESCOs, findings and lessons learnt from various ESCO business models and recommended actions for the technical assistance programme in support of ESCO development.

Available on-line at <http://www.worldbank.org/html/fpd/esmap/ESCOreport.pdf>

Evans, Meredydd. *An Energy Efficiency Guide for Industrial Plant Managers in Ukraine*. 1999. The title of this publication seems very specific, but the descriptions are very helpful for anyone wanting to learn more about industrial energy efficiency in the Commonwealth of Independent States. Available on-line at <http://www.pnl.gov/aisu/pubs/guide.pdf>

E.V.A., the Austrian Energy Agency, et. al. *TPF of Energy Efficiency in Public Buildings: Pilot Actions and Schemes for Implementation*. Final Report: April 2000. Report for the European Commission, Directorate General for Energy and Transportation (DG TREN). Figures 17 and 18 (Contents of an EPC and Structure and Content of an EPC, respectively) are a useful graphic overview of what can be a complex subject.

International Energy Agency. *Coming in from the Cold -- Improving District Heating Policy in Transition Economies*. 2004. This new publication focuses mainly on policy, but it also discusses the key issues related to financing improvements.

Meyer, Anke and Wolfgang Mostert. *Increasing the efficiency of heating systems in Central and Eastern Europe and the former Soviet Union*. World Bank, 2000. This report remains the single most comprehensive study on technical and economic issues related to district heating in RBEC countries. The report is available on the World Bank website and is available in English and Russian.

Roe, David. *Dynamos and Virgins*. 1984. A relatively old book in this field that still reads like a detective novel. The true story of how a small NGO in California took on a giant electric utility and forced it to think about saving energy instead of building a nuclear energy plant to meet increasing demand.

World Bank GEF Energy Efficiency Portfolio Review and Practitioners' Handbook. 2004. The paper reviews the Bank's GEF EE project portfolio, identifies five key programme models, summarizes key implementation hurdles and lessons learned, and provides recommendations for designing EE financing programs.

Wulfinghoff, Donald R. *Energy Efficiency Manual: for everyone who uses energy, pays for utilities, designs and builds, is interested in energy conservation and the environment*. 2000. A very comprehensive overview of how energy savings measures and financing work.

7.6 Institutions and Websites

Asian Development Bank has a website dedicated to its activities in energy efficiency, renewable energy, and climate change and provides information on several donor-funded initiatives that can support energy projects in Central Asia (e.g., the Dutch Fund-supported PREGA project). Web: <http://www.adb.org/REACH/default.asp>

Bankable Energy Efficiency Projects (BEEP) Project Website. This website provides information on an EU-sponsored project in five RBEC countries to develop and finance energy efficiency projects. BEEP is implemented by the German Energy Agency, DENA. Web: <http://www.save-beep.org/page/index.php?1160>

Canadian Government Foreign Affairs Website on Joint Implementation. Project developers often have questions about carbon financing, and this site provides an excellent quick introduction to the actual regulations that currently 'govern' JI. There is also a link to the agency's counterpart website on the Clean Development Mechanism (CDM): <http://www.dfait-maeci.gc.ca/cdm-ji/joint-en.asp>

ClearingHouse for Energy Contracting is a gateway for information on energy contracting in the countries of Central and Eastern Europe established by the Berlin Energy Agency and the Austrian Energy Agency. Web: <http://www.managenergy.net/products/R361.htm>

Energy Brigades. This programme, which relies on local volunteers to implement energy savings projects in several RBEC countries, is a good example of obtaining good results with a small budget and a creative approach. Web: <http://www.energybrigades.org/international/home.html>

Energy Efficiency Centres in the region with expertise in efficiency policy and projects include: **Eneffect in Bulgaria** (www.eneffect.bg), **SEVen** in the Czech Republic (www.svn.cz), **the Energy Centre** in Hungary (www.energycentre.hu), **CENef** in Russia (www.cenef.ru), **Energy Centre Bratislava** in the Slovak Republic (www.ecb.sk), and **Arena-Eco** in Ukraine (www.arena-eco.kiev.ua).

ESMAP - the UNDP-World Bank Energy Sector Management Assistance Programme. ESMAP has published several studies that can be useful when thinking about efficiency projects, particularly their 2001 study by Anke Meyer on District Heating (see previous section), which deals directly with RBEC countries. Web: <http://www.esmap.org>

European Bank for Reconstruction and Development.

The most recent (November 2004) overview of EBRD's activities in energy efficiency financing is currently available at http://www.eva.ac.at/publ/pdf/20041105_hobson.pdf.

European Council for an Energy Efficient Economy.

This organization sponsors a biennial summer study and lobbies for policies and programmes that will support energy efficiency. While most members are located in Western Europe, there are also RBEC members. Web: <http://www.eceee.org/>

European Union Energy Directorate website on energy efficiency includes information on research and development work. Web: http://europa.eu.int/comm/energy/demand/index_en.htm

EU SAVE programme website includes an archive of past SAVE projects and guidelines for applications. Note that certain SAVE programmes are open to candidate countries as well as member states. Web: http://europa.eu.int/comm/energy/en/pfs_save_en.html

Foundation Joint Implementation Network (JIN). An extremely comprehensive site on JI issues, including a newsletter. Web: <http://jiq.wiwo.nl>

The GEF Secretariat website provides introductory information on the GEF and all official documentation related to its operations. Web: <http://www.thegef.org>

International District Energy Association. This site contains an introduction to district energy (which is essentially district heating plus cooling) and descriptions of how combined heat and power plants and demand-side energy programmes work. IDEA also holds an annual conference and several specialized workshops. Web: <http://www.districtenergy.org>

International Energy Agency (IEA). The site contains information on all IEA programmes in energy efficiency (there are many of them), publications related to energy efficiency, and more general energy and climate-related information. Web: <http://www.iea.org>

International Performance Measurement and Verification Protocol (IPMVP):

<http://www.ipmvp.org> and information on energy efficiency projects in municipalities across RBEC. There are also materials on the site available in Russian. Web: <http://www.munee.org>

Municipal Network of Energy Efficiency. This site provides news

National Association of Energy Service Companies (NAESCO).

Although this is a US-based organization, the website includes a good definition of an ESCO, a directory of their member ESCOs, and an international links page. Web: <http://www.naesco.org>

Regional Network for the Efficient Use of Energy Resources (RENEUER).

This group is a coalition that promotes energy efficiency in Southeastern Europe. Web: <http://www.reneuer.com>

UNECE Energy Efficiency 21 Website.

This site includes a description of the energy efficiency demonstration zones, which were the impetus for the first three RBEC GEF energy efficiency project proposals (in Russia, Bulgaria, and Romania). Web: <http://www.ee-21.net/>

United Nations Framework Convention on Climate Change (UNFCCC) website.

The website includes all national communications from member states, which include priorities for mitigation (and often discuss energy efficiency). Web: <http://unfccc.int>

7.7 Reference Materials

NORESCO provides a good glossary that includes some more technical terms related to energy efficiency financing. Web: http://www.noresco.com/site/content/info_glossary.asp

The **Energy Information Administration of the U.S. Department of Energy** provides country profiles for many RBEC countries that include an overview of basic energy and environmental statistics in a format that is easy to review and use quickly. Web: <http://www.eia.doe.gov/emeu/international/contents.html>

