

Scaling Up Energy Efficiency in Buildings in the Western Balkans

Establishing and Operationalizing an Energy Efficiency Revolving Fund

Guidance Note

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Abbreviations and Acronyms

General

CG	credit guarantee
DH	district heating
DSM	demand-side management
ECA	Europe and Central Asia
ECS	Energy Community Secretariat
EE	energy efficiency
EEO	energy efficiency obligation
EERF	energy efficiency revolving fund
ESMAP	Energy Sector Management Assistance Program
ESCO	energy service company
ESA	energy service agreement
ESP	energy service provider
ESPC	energy savings performance contract
EU	European Union
FI	financial institution
GEF	Global Environment Fund
GFA	guarantee facility agreement
GHG	greenhouse gases
GWh	gigawatt-hour
HOA	homeowner association
IFC	International Finance Corporation
IFI	international finance institution
kgoe	kilograms of oil equivalent
kWh	kilowatt-hour
MWh	megawatt-hour
M&V	measurement and verification
MB	management board
MOF	Ministry of Finance
mtoe	million tons of oil equivalent
NEEAP	National Energy Efficiency Action Plan
NPV	net present value
PIU	project implementation unit
PPP	public-private partnership
RE	renewable energy
TA	technical assistance
tCO ₂ e	tons of CO ₂ equivalent
TRV	thermostatic radiator valves

Regional

The Western Balkan region comprises Albania, Bosnia and Herzegovina, Kosovo, the former Yugoslav Republic of Macedonia, Montenegro, and Serbia:

AB	Albania
BiH	Bosnia and Herzegovina
KOS	Kosovo
MK	FYR Macedonia
MNE	Montenegro
SER	Serbia

Executive Summary

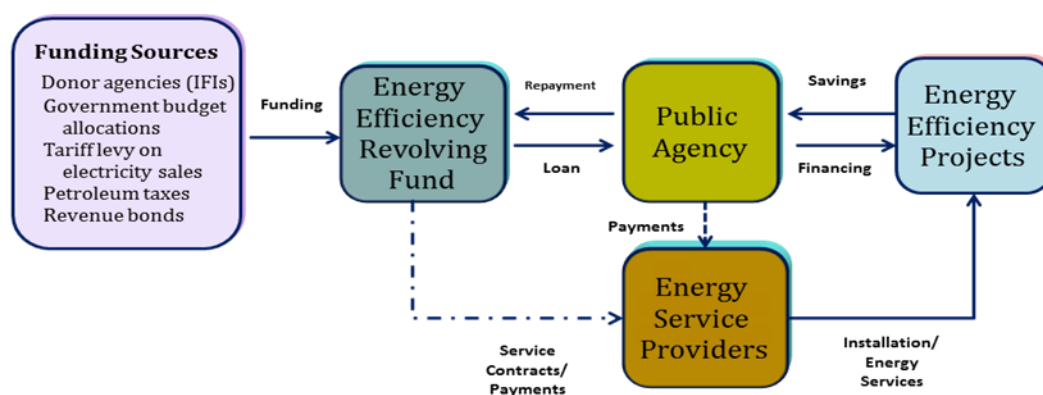
An energy efficiency revolving fund (EERF) is a viable option for scaling up energy efficiency (EE) financing in the public sector in the Western Balkans. Under a typical EERF targeting the public sector, loans are provided to public agencies to cover the initial investment costs of EE projects; some of the resulting savings are then used to repay the EERF until the original investment is recovered, plus interest and service charges. The repayments can then be used to finance additional projects, thereby allowing the capital to revolve creating a sustainable financing mechanism.

Since both the borrower and lender are publicly owned, such funds may often offer lower-cost financing with longer tenors (repayment periods) and less-stringent security requirements than typical commercial loans. Because EE projects have positive financial rates of return, capturing these cost savings and reusing them for new investments creates a more efficient use of public funds than typical budget- or grant-funded approaches. This can help demonstrate the commercial viability of EE investments and provide credit histories for public agencies, paving the way for future commercial financing.

This guidance note is intended for government decision makers interested in establishing such EE revolving funds.¹ It defines the typical structure of such funds, conditions under which they can be useful and effective, ways they can address some of the financing barriers, and implementation options. The note also provides examples, case studies, and lessons learned, and a "road map" for establishing such funds.

The typical structure of an EERF is illustrated in Figure ES1.

Figure ES1. Typical Structure of an EERF



An EERF is generally capitalized from a range of sources, such as concessional loan or grant funds from donor agencies, government budget allocations, special tariffs or levies on electricity sales, petroleum taxes, revenue bonds, , environmental charges or other sources. The fund then provides financing to public agencies to finance EE investments in public sector buildings and other facilities, such as street lighting. The agencies can then use the accrued energy cost savings to repay the principal and interest on the debt. The installation and other services for project implementation would generally be provided by independent energy service providers (ESPs).

The establishment of an EERF generally requires the development of a legal framework comprising national legislation as well as supporting secondary legislation or regulations that will

¹ There are many different types of EE funds, some of which provide budget- or donor-supported grants and incentives to EE projects or specific financial assistance to EE programs. However, this guidance note focuses only on EE revolving funds that finance EE projects and are repaid from the energy savings to allow the fund to revolve in a sustainable manner.

define the structure of the EERF. Options include creating the fund under an existing ministry, energy agency, or development bank; creating a new legal entity (independent corporation or new statutory agency); not-for-profit entity; or establishing a public-private partnership (PPP).

The fund structure should also define the management and governance. This includes oversight arrangements; selection of the fund manager or management team; and monitoring, evaluation, and reporting procedures.

An EERF should be designed to serve the needs of all public agencies. Therefore, in addition to debt financing (i.e., loans) for EE projects, the EERF may have other financing options, or “windows,” that may include energy service agreements, risk guarantees, grants, and budget capture; this guidance note presents a summary of these options.

The EERF should also provide technical assistance to public agencies and ESPs, and may provide procurement and implementation services that will transfer some of the implementation risk to ESPs and facilitate the development of an energy services market. The guidance note summarizes how an EERF can overcome the barriers to scaling up EE in the public sector and provides a step-by-step approach to operationalizing such a fund.

The key lessons learned from international experience (including the four case studies presented in Annexes A–D) are as follows:

- There are six main prerequisite conditions: (i) government commitment to improving EE in public facilities; (ii) cost-effective opportunities for improving EE; (iii) an existing demand for financing EE projects; (iv) lack of available financing for EE projects; (v) existence of a mechanism to repay the fund from the achieved savings; and (vi) energy payment discipline with cost-reflective, consumption-based billing among public end users.
- An EE revolving fund is best established as an independent organization governed by a government-appointed board of governors or board of trustees comprising both public sector and private sector members.
- When selecting a fund manager—which may be an individual or an organization but is called the “fund manager” in either case—options include an independent, newly created organization; an existing non-independent public agency; a national development bank; a utility; or another public enterprise.
- To be sustainable, the EERF may require one or more accessible funding sources to ensure recapitalization over time.

The major steps involved in establishing an EERF are summarized in Figure ES2.

Figure ES2 – Major Steps in Establishing an EERF



1. Purpose of this Guidance Note

In the Western Balkans, improving energy efficiency (EE) in buildings has been identified as a key priority, because it can contribute to efficient economic growth while providing one of the lowest-cost measures for reducing greenhouse gas (GHG) emissions (World Bank 2013a). While the potential for EE is quite large, the actual implementation has been far short of potential due to a number of barriers, of which financing barriers are among the most important. In the public sector, these barriers arise because internal funds are limited and the incomplete state of fiscal decentralization has left many municipalities with a limited borrowing capacity, limited ability to secure loans, and a lack of borrowing history. Also, public agencies have a number of restrictive procedures, such as budgeting and procurement, and often lack the capacity to identify and implement EE projects.

Although the countries of the Western Balkans are gradually improving relevant policy frameworks, completing fiscal decentralization, and developing municipal credit markets, one viable option identified for scaling up EE financing in the public sector in the near-term is the establishment of an EE revolving fund in each country. Such funds can (i) finance public sector EE projects without the typical collateral requirements and with longer tenors and (ii) allow public agencies to repay loans from energy cost savings. This in turn will help demonstrate the commercial viability of EE investments—while providing credit histories for public agencies and paving the way for expanded commercial financing options in future years.

This guidance note is intended for government decision makers interested in establishing such EE revolving funds.² It defines the typical structure of such funds, conditions under which they can be useful and effective, ways they can address some of the financing barriers, and implementation options. The note also provides examples, case studies, and lessons learned, and a "road map" for establishing such funds.

2. Why Energy Efficiency Revolving Funds?

Public Building EE Market in the Western Balkans

Buildings in the Western Balkans represent about half of the total energy consumed in the region, and estimated energy savings in buildings range between 20 and 40 percent, with the highest potential expected in the public sector (35–40 percent). The 2012 regional market assessment commissioned by the Energy Community Secretariat (ECS) concluded that potential annual energy savings amount to about €462 million or 7,940 GWh (ECS 2012). A substantial portion of this amount is in the public sector: although the study did not estimate energy savings for the entire public sector, it identified annual energy savings in schools and hospitals to be €35.4 million or 515.4 GWh (see Table 1).

Table 1 – Projected Energy Savings in Schools and Hospitals in the Western Balkans

Country	Potential Energy Savings		Investment Needed	Average Payback
	GWh/year	Million €/year	Million €	Years
Albania	53.7	5.1	33.3	6.5
Bosnia & Herzegovina	69.8	4.5	32.4	7.2
Kosovo	79.3	4.3	23.3	5.4
FYR Macedonia	36.8	3.2	18.8	5.3

² There are many different types of EE funds, some of which provide budget- or donor-supported grants and incentives to EE projects or specific financial assistance to EE programs. However, this guidance note focuses only on EE revolving funds that finance EE projects and are repaid from the energy savings to allow the fund to revolve in a sustainable manner.

Montenegro*	7.1	0.7	5.6	7.6
Serbia	268.7	17.6	114.8	6.5
Total	515.4	35.4	226.2	6.4

* Estimated.
 Source: ECS (2012).

Challenges and Barriers to Improving EE in Public Buildings

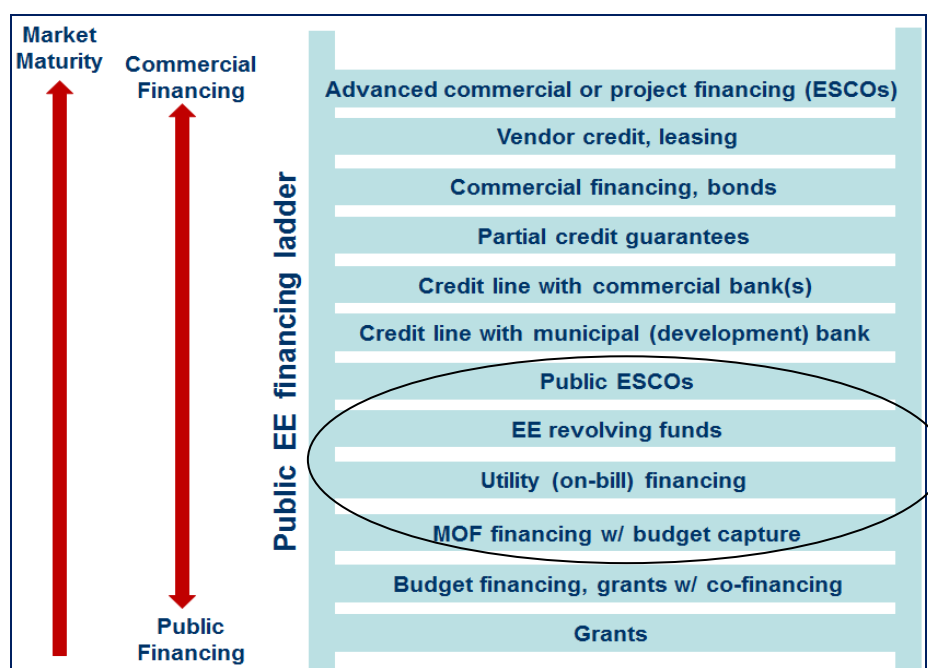
As earlier efforts in this World Bank project (World Bank 2013a) have shown, implementation of EE projects in public facilities in the Western Balkans faces many key challenges and barriers, including:

- Limited number of creditworthy municipalities and borrowing capacity;
- Restrictive budgeting and procurement regulations;
- Low energy tariffs;
- Norm-based billing systems for heating;
- Relatively high interest rates charged by commercial banks;
- Small project sizes, leading to high project development and transaction costs;
- Lack of development of energy service providers and performance-based contracting; and
- Low existing comfort levels.

Financing Options for Scaling Up EE in Public Buildings

Global experience with financing of public sector EE projects demonstrates a number of potential financing mechanisms, as illustrated in the “financing ladder” in Figure 1.

Figure 1 – Public EE Financing Options Ladder



Source: World Bank (2013a).

Table 2 presents a comparison of the four options circled in Figure 1.³

³ A more detailed comparison of all of the options listed in Figure 1 appears in World Bank (2013a).

Table 2 – Comparison of Financing Options for Public Sector EE Projects

Option	Description	Market conditions	Examples	Pros	Cons
MOF financing with budget capture	Budget financing to public agencies/municipalities, with repayment through reduced future budgetary outlays	<ul style="list-style-type: none"> Underdeveloped public/ municipal credit markets Limited equity among public agencies High commercial bank lending rates and low tenors Availability of budgetary space for MOF financing 	Belarus, FYR Macedonia (MSIP), Hungary, Kosovo, Lithuania	Builds market capacity, relatively easy to implement, can directly finance municipalities that are not able to borrow, could allow funds to revolve (if MOF reinvests reflows), no repayment risks	Requires MOF to allocate substantial budget for financing, sustainability relies on MOF PIU, scale relies on PIU and borrower capacities, reducing future budget provisions can be complex
Utility (on-bill) financing	Utility borrows and finances EE investments in public clients; recovers investments through customers' utility bills	<ul style="list-style-type: none"> Requires regulations for utility participation Strong financial position and financial management of utilities Payment discipline among public clients, adequate energy pricing and billing practices 	Brazil, China, India, Mexico, Sri Lanka, Tunisia, United States, Vietnam	Streamlined repayments, lower repayment risk if risk of utility disconnection, builds off of utility relationships and services, can be done on a sustainable and scalable basis	Requires changes in utility regulations and billing systems, creates potential for monopolistic behaviors, financing competes with local banks, may be easier for power utilities than heating ones
EE revolving funds	Independent, publicly-owned entity provides financing for EE to public clients; repayments based on estimated energy cost savings	<ul style="list-style-type: none"> Underdeveloped public/ municipal credit market Access to public budget or IFI loans/grants to capitalize fund Credible and proactive fund manager can be recruited Public agencies able to enter into multiyear obligations and retain energy cost savings 	Armenia, Bulgaria, India, FYR Macedonia (proposed), Romania, Serbia (proposed), Uruguay	Builds market capacity, can directly finance municipalities that are not able to borrow, can better leverage funds by pooling, greater potential for bundling of projects and development of simple ESCOs, centralized implementation and procurement can lower costs, can recover operating costs through fees	Recovering operating costs in early years is difficult, using private fund manager to oversee public funds may not be politically desirable, heavy reliance on good fund manager, need mechanisms to help ensure public client repayment, fund can act monopolistic
Public ESCO	Publicly owned company that provides financing for EE projects with public entities, with repayments based on energy cost savings	<ul style="list-style-type: none"> Underdeveloped public/ municipal credit market No local, active, capable ESCOs Rigid public procurement rules make ESCO hiring difficult Credible public entity exists with demonstrated capacity to subcontract/manage subprojects 	Armenia, China, Croatia, Poland, Ukraine, United States, Uruguay	Builds ESCO market capacity through subcontracting, helps address public procurement and financing issues, centralized implementation and procurement can lower costs, greater potential for bundling of projects and development of simple ESCOs models	Public ESCO can be monopolistic and may be subject to public sector bureaucracies (procurement, staffing, budgeting), appropriate exit strategy may be needed if private ESCO/ESPs enter the market, public ESCO requires access to long-term financing

Note: ESCO = energy service company. MOF = Ministry of Finance. MSIP = Municipal Services Improvement Project (FYR Macedonia).

Source: Prepared by authors based on information from World Bank (2013a and 2014a).

3. What are EE Revolving Funds?

A financing mechanism that has received increasing acceptance in both developed and developing countries is the special-purpose “revolving” fund established by a national or state government for financing EE projects. There is a wide range of such EE revolving funds (EERF). In some countries, international financial institutions (IFIs) such as the World Bank or Kreditanstalt für Wiederaufbau (KfW) have established them to help finance public sector projects. In other countries, national or local governments have established funds that provide grants or subsidies to public EE projects. In the U.K., the city of London has established a £100 million revolving fund (with funding from European Regional Development Fund and London Green Fund) to finance public and private sector EE projects.⁴ In the United States, electricity regulators at the state level have used a tariff surcharge called the “public benefit charge” (PBC) that is partly used to provide revolving funds (as well as grants and incentives) for EE projects (Limaye 2010).

This guidance note does not address funds that provide budget- or donor-supported grants and incentives, or other grant-like financial assistance, to EE projects. Rather, it addresses funds that are designed to be sustainable through the recovery of principal and interest from the clients.

EERFs can be established by national, state, or local governments to provide long-term financing for public sector EE investments while also creating centers of expertise. Under a typical EERF targeting the public sector, the EERF provides loans to public agencies to cover the initial investment costs of EE projects; some of the resulting energy savings are then used to repay the EERF until the original investment, plus interest and any fees or service charges, is recovered. The repayments can then be used to finance additional projects, thereby allowing the capital to “revolve.” Since both the borrower and lender are publicly owned, such funds may often offer lower-cost financing with longer tenors and less-stringent security requirements than commercial loans. And because EE projects have positive financial rates of return, capturing these cost savings and reusing them for new investments creates a more sustainable program than typical budget- or grant-funded approaches.

Moreover, these revolving funds can help demonstrate the commercial feasibility and viability of EE projects, provide a credit history for the public agencies borrowing the funds, and help build capacity among service providers such as auditors, installers, construction management firms, and energy service companies (ESCOs). Thus, the revolving fund can help lay the groundwork for increased commercial financing as the market evolves.

4. Characteristics of EE Revolving Funds

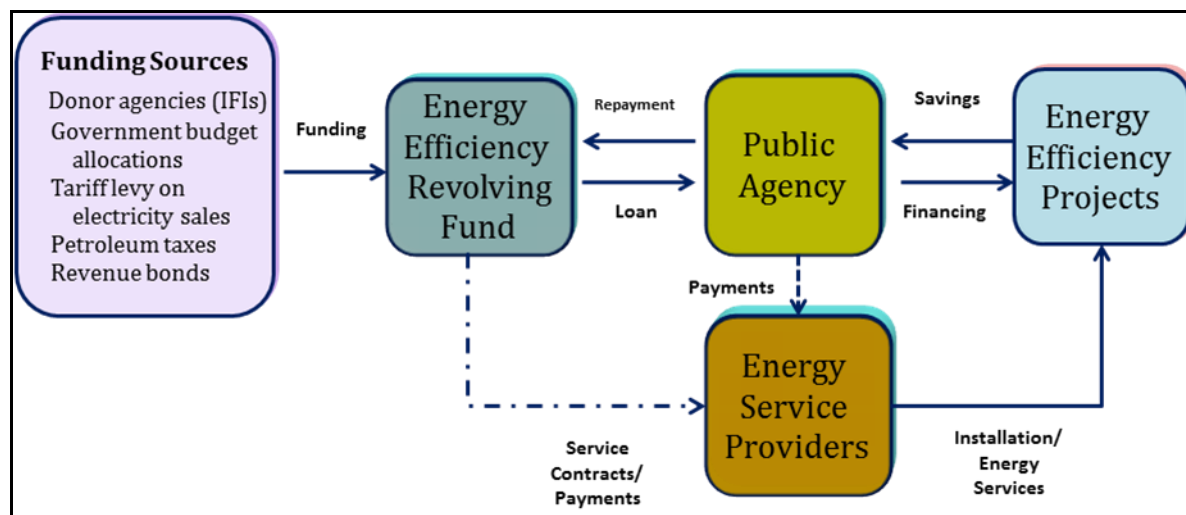
Structure

The typical structure of a revolving fund is illustrated in Figure 2. An EERF is generally capitalized using a range of different sources of financing, such as concessional loan or grant funds from donor agencies, government budget allocations, special tariffs or levies on electricity sales, petroleum taxes, revenue bonds, environmental charges, etc. The Fund then provides financing to public agencies that is then used to finance investments in EE projects. The energy cost savings accruing from the results of the projects can then be used by the public agency to repay the principal and interest on the debt. The installation and other services for project implementation would generally be provided by independent energy service providers (ESPs).⁵ The public agency may pay the ESPs directly for the services provided.

⁴ <http://www.leef.co.uk>.

⁵ Energy service providers may include energy service companies (ESCOs), engineering firms, installers, contactors, construction management firms, or other service providers.

Figure 2 - Typical Structure of an EE Revolving Fund



Source: Prepared by Authors based on World Bank (2013a and 2013b).

The Fund is replenished by the repayments from the public agencies of principal and interest on the investment made. This allows for the funds to revolve. However, since the loan repayment periods may be long (sometimes as long as 7 to 10 years), it may be necessary to plan on periodic replenishments to operate after the initial capital has been deployed. EERFs may have equity bases to help cover some of their start-up and initial operating costs, but need to eventually cover their costs from public sector clients through principal and interest payments and fees.

Legal Framework

The establishment of an EERF will require legislative action. The provision for establishing a fund may be included in the general energy law or an EE law. For example, the Macedonian Energy Law authorizes the establishment of an EE fund that would provide financial support for the public and private sectors to implement the obligations for EE improvement (Macedonia 2011). In Serbia the establishment of an EE fund is authorized in the Law on Energy Efficiency (Serbia 2013).

However, such provisions do not always imply the creation of a new, independent institution that would serve as an EERF administrator. Sometimes, such a provision only implies a line item in the budget (as is the case in Serbia) or funding through an existing entity, such as existing environmental funds (as is the case in Bosnia and Herzegovina and Montenegro, which typically provide grants instead of loans).

Consequently, if the government has decided to establish a new EERF, secondary legislation should specify its legal organization and ownership. Options include creating the fund under an existing ministry, energy agency, or development bank; creating a new legal entity (independent corporation or new statutory agency); not-for-profit entity; or establishing a public-private partnership (PPP).

Fund Management and Governance

The key elements of fund management and governance include the following:

- Oversight arrangements
- Choosing the fund manager
- Monitoring and evaluation
- Reporting

Oversight Arrangements

Although oversight arrangements vary, they typically include all relevant ministries that have some authority over EE, such as those responsible for finance, construction, economy/energy, environment, or urban/regional development. For the Bulgarian Energy Efficiency Fund, or BEEF (see Annex A), oversight is by a management board (MB) appointed by the national government, as further explained in Box 1. Among other examples discussed in the annexes to this note:

- The Renewable Resources and Energy Efficiency (R2E2) Fund in Armenia (Annex B) is governed by a government-appointed board of trustees and comprises representatives from the government, private sector, NGOs and academia;
- The Romanian Energy Efficiency Fund (*Fondul Român pentru Eficiența Energiei*, or FREE) (Annex C) is governed by a government-appointed board of administration consisting of seven members, of whom five are private sector representatives; and
- Salix Finance in the U.K. (Annex D) has a three-person board, of whose members two are from the private sector.

Most of these governance arrangements are similar in terms of featuring representation from both the public and private sectors.

Box 1 – Composition of the BEEF Management Board

The Management Board is the primary governance body responsible for overall strategic management in compliance with its stated objectives and principles of operations. The board consists of nine members:

- A representative of the Ministry of Economy, Energy and Tourism, designated by the Minister of Economy, Energy and Tourism and acting as chairman;
- A representative of the Ministry of Regional Development and Public Works, designated by the Minister;
- A representative of the Ministry of Environment and Waters, designated by the Minister;
- The Executive Director of the Sustainable Energy Development Agency;
- Five representatives elected by the General Donors' Assembly, as follows:
 - A representative of non-government organizations, the activities of which are focused on reducing the risk of global climate changes;
 - Two experts with higher economic education with experience in funding of projects in the area of power generation;
 - An expert in the field of EE with higher engineering education;
 - An expert in the field of renewable sources with higher engineering education;

The MB sessions are convened every month, on formal invitation by the chairman.

Source: <http://www.bgeef.com/display.aspx?page=structure>.

The main functions of the oversight bodies include setting the investment strategy and policy of the fund, hiring the fund management team, establishing the overall criteria for selecting projects, approving the annual business plans and budgets formulated by the management team, preparing and submitting an annual financial report to the government, and assuring that the fund is operating in compliance with national EE strategy and plans.

Choosing the Fund Manager

Reviews of international experience with EE funds (Limaye 2010; Limaye and Patankar 2011) have identified a number of options for the choice of a fund manager, including an existing government agency or development bank, a utility, or a special directorate related to municipal services or building management. Alternatively, a new organization may be created to manage the fund—an independent agency, a new statutory authority, a public corporation, or a PPP. Any

of these types of organizations could also hire a fund manager or fund management team under a contract.

In Bulgaria, an independent fund management team was appointed (World Bank 2010a). This team was competitively selected and included a consortium of three firms (Econoler International, EnEffect Consult, and Elena Holding).⁶ In the case of the recently established Armenia R2E2 Fund (World Bank 2012), the government appointed an executive director (ED) and supporting financial and technical staff to manage the fund. The day-to-day activities of FREE are managed by an ED appointed by the board of administration, supported by a small permanent staff and some short-term experts (FREE, n.d.). In addition, the ED engaged a fund manager with professional structured finance and EE expertise to manage the fund's investment portfolio.

A public sector management team (such as in R2E2) is likely be less costly because of public salary caps, but the team may not be fully independent from political influence, and may have less incentive to perform than a private sector management team (such as in Bulgaria) for whom the compensation can be based on performance and incentives and penalties can be based on successes or failures. FREE chose a combination approach: although its main management team is from the public sector, it engages a fund manager with incentives based on performance.

Whatever form the fund manager takes, the fund management team must have expertise in a number of areas, including knowledge and understanding of EE technologies and options; skills in market assessment and pipeline development; capabilities in credit analysis, financial analysis, and project appraisal; and understanding of EE and energy services markets.

Monitoring and Evaluation

The progress of the fund needs to be monitored and evaluated continually. *Monitoring* is the process of routinely gathering information on all aspects of the EERF implementation. Monitoring measures the quality and effect of the implementation process and procedures. The board and management team must supply periodic performance reports, including annual reports, to the funding sources for any EERF (governments and/or donor agencies); the latter may define specific performance indicators and reporting periods (see under “Reporting” below). The fund management team therefore needs to establish a monitoring system that will collect the data needed to assess these indicators. Box 2 presents the performance indicators established by FREE, which were required to be reported to the World Bank on a quarterly basis.

Monitoring

The fund needs to track the technical and financial status of projects. The following are suggested guidelines for doing so:

- The fund should employ a monitoring system that is (i) appropriate for the type and scale of the projects and (ii) able to track both technical progress and financial status.
- The monitoring system should take into account all project stages and components (planning, implementation, outcomes and impacts, replicability, visibility, and so forth).
- Monitoring should include field supervision as appropriate and periodic audits as agreed.
- Periodic progress reports should form the basis for monitoring.
- Use of electronic reporting techniques is desirable.

In addition, a project review committee can help to appraise the progress of the project and to resolve any problems encountered.

⁶The Consortium includes an energy efficiency consultancy (Econoler International), a Foundation (Center for Energy Efficiency EnEffect), and a non-banking financial institution (Elana Holding PLC).

Box 2 – Romanian Energy Efficiency Fund: Performance Indicators

Output Indicators

- Number of projects received by the Fund Manager (by size, type, and client type)
- Number of projects appraised by the Fund Manager (by size, type, and client type)
- Number of the loans approved (by size, client type, and sector)
- Deals under preparation/under appraisal/ submitted to the Investment Committee (IC)
- Total principal, interests and fees received during the quarter
- Number of projects with first disbursement, if in tranches
- Number of projects with second disbursement, in tranches
- Total quarterly operating expenses
- Non-performing loans (by size, repayment schedule, type, and reason for non-compliance with the terms of contract)
- Co-financing, including actual contributions made to the investment projects
- Technical assistance (TA) delivered in terms of amount of time spent and nature of activities
- TA provided per development phases of deals
- Relevant news indicating factors that could affect energy prices and thus attractiveness of energy savings instruments, and any changes in the business environment that could impact project demand.

Process Indicators

- Average time required for deal preparation (by type of investment, client type, and sector)
- Average time elapsed from submission (preparation) to approval by the IC
- Average time elapsed from submission (preparation) to final board approval
- Average time elapsed from approval to conclusion of the loan contract
- Average time elapsed from approval to the first payment, if disbursed in tranches
- Number of projects rejected by the Board (by reason of rejection)
- Number of projects with delays more than 30–60 days in the repayment of the installments/interest rate/commission by, with reason for delay /clarified with the client by the Fund Manager.

Source: FREE (n.d.).

Evaluation

Evaluation aims to determine whether project objectives set in terms of expected outputs, effects, and impact are being or will be met. Evaluation is an important part of good governance and is needed to test planning assumptions, monitor overall results, compare program performance, fine-tune implementation processes, and incorporate lessons learned into improving the fund's future operations. Combining quantitative data with qualitative information, evaluations are performed at specific times—such as mid-term, interim special studies, at completion, or after completion—in order to compare the fund's achievements relative to expected performance. (Most World Bank funded projects include a mid-term and a final evaluation). Often the evaluation of the fund's performance is conducted by an independent third party.

Measurement and Verification

An important element of both monitoring and evaluation is *measurement and verification* (M&V), which is designed at the project level to:

- Develop baseline characteristics and typical operating conditions;
- Lay out a clear methodology for measuring energy savings that is acceptable to all parties; and
- Develop estimates of the actual energy savings, cost savings, and other performance characteristics of a project.

M&V is an important part of establishing the baseline as well as modifying it as needed if operating conditions change. There are many methodologies and protocols for M&V, ranging from simple methods such as “deemed savings,” where the savings are calculated using stipulated formulas, to detailed metering or simulation modeling (World Bank 2010b). Because the

accuracy and precision of the M&V results is proportional to its cost, and it is desirable to use a pragmatic approach that balances the M&V costs against the required quality of the savings estimates. The most important aspect is that all parties agree to the level of detail of the M&V plans. For public agency projects involving efficient lighting, deemed savings may be adequate. However, in the Western Balkans, where a large portion of the energy use is for heating, simple commissioning tests may be used to determine the amount of energy needed to heat one square meter of floor space by one degree before and after the renovation.

Reporting

Reporting involves providing information to the appropriate organizations (in this case the funding sources) on implementation progress so that timely decisions can be made, if needed, to ensure progress is maintained according to schedule and performance goals. The collected data—both quantitative and qualitative—are provided in periodic reports to assess the status and quality of project activities. For example, R2E2 provides semiannual and annual progress reports to the World Bank.

The fund manager is usually required to prepare periodic reports that cover:

- Financial reporting—a periodic summary (usually monthly) of transactions, receipts, and disbursements by type, cash flows, outstanding balances, and so forth over the reporting period;
- Technical reporting; and
- Annual reports—annual reporting of technical, financial, and administrative results to the Board of Directors or Trustees and to the major stakeholders including the funding sources.

Financing Windows or Products

The EERF should be designed to serve the needs of all public agencies. Some of these agencies may not be creditworthy, or have no borrowing history; others may not have available borrowing capacity; and others may not have the internal capacity to identify, design, and manage the implementation of EE projects. To address some of these issues, the EERF may offer several financing products and “windows,” such as the following:

- Debt financing window
- Energy services window
- Risk guarantee window
- Budget capture
- Grants window
- Forfeiting

Debt Financing Window

For creditworthy municipalities that can borrow and are able to identify, design, and implement projects, the fund can offer debt financing. One of the advantages of an EERF is that—unlike commercial financing, which may require an equity contribution from the borrower—the EERF may provide up to 100 percent debt financing. Also, the fund may not require the type of collateral typically requested by commercial borrowers because the public agencies may not be legally able to pledge public assets. Instead, the EERF could implement other payment security mechanisms, such as:

- Establishing an escrow account into which the public agency pays funds equal to the baseline energy bills. The EERF then pays the reduced energy bills from this escrow account and uses the remaining funds to repay the principal and interest on the invested funds. Thus, if the public agency does not keep up payments, the EERF has the option to not pay the energy bills, creating a risk of energy supply disruption;

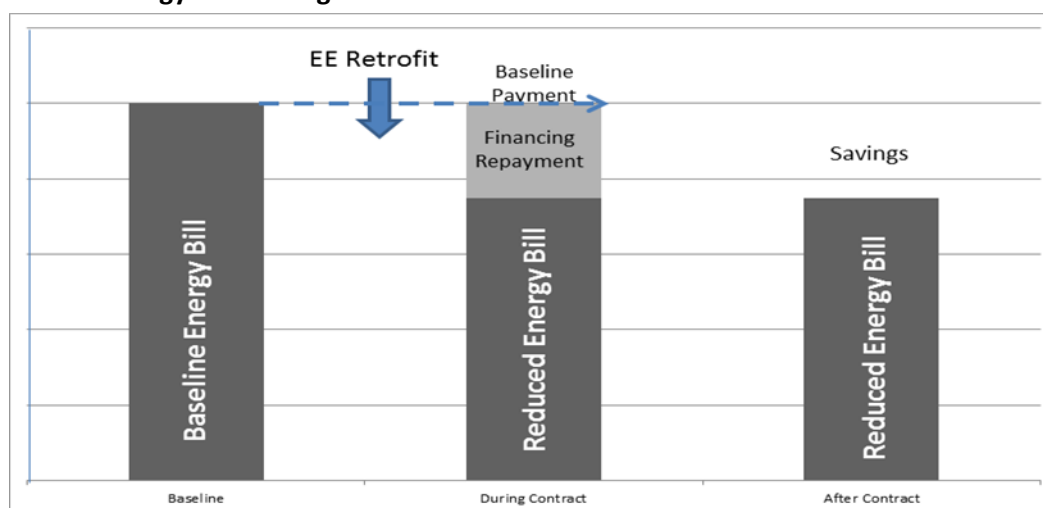
- Pledging future tax collections, revenues, or transfers that will be received from the Ministry of Finance (MOF) or other sources; and/or
- Obtaining guarantees from MOF to back up the loan repayment.

The tenor (repayment period) of the loan will be based on (i) the type of project and (ii) the anticipated cash flows resulting from the energy cost savings; usually the repayment period will be structured in such a way that the loan repayments are less than the energy cost savings. Often, EERF tenors can be longer than typical commercial bank loans. In some cases, EERFs are used in concert with bank loans, through co-financing schemes, to involve banking partners in the EE business.

Energy Services Window

For municipalities that lack the capacity to borrow funds or to effectively implement EE projects, an energy services agreement (ESA) can offer a full package of services to identify, finance, implement, and monitor EE projects. The public agency is usually required to pay some or all of its baseline energy bill into an EERF-established escrow account to cover the investment cost and associated fees during the contract period. Figure 3 illustrates the basic concept of a public agency’s cash flows under the ESA, with payments equal to its baseline energy bill during the contract period.

Figure 3 - The Energy Services Agreement Model



Source: Adapted by authors from World Bank (2013a).

For example, let us assume that the monthly energy bill for the public agency prior to the EE project implementation is €10,000. The ESA will specify this as the baseline amount, and the public agency will agree to pay this amount each month into an escrow account for the duration of the ESA, which is assumed to be five years. The EERF will then make the EE project investment (assumed in this example to be €150,000). This investment will reduce the energy costs by 30 percent, to €7,000 per month. During the five-year ESA period, the agency will pay into the escrow account (i) its monthly energy bill of €7,000 and (ii) the remaining €3,000 per month, thus allowing the fund to recover its investment (plus interest and fees). Following the five-year period, the agency will be able to retain its energy cost savings and its overall energy bill will fall to the assumed €7,000.

In some cases, the contract duration is fixed; in other cases, the contract can be terminated after an agreed number of payments have been made to the EERF—thereby offering a greater incentive for the agency to save more energy. Either way, one of the main advantages of Energy Services Window model is that the ESA payments generally do not count as public debt, allowing public entities that are not allowed to borrow, or municipalities that do not have sufficient debt capacity, to implement EE measures. In this way, the model also helps public agencies to use

their limited budget/debt space for higher-priority investments while still being able to implement EE. In addition, the repayments to the EERF and energy payments are bundled together, providing some added leverage to the EERF to cut off the energy supply should the public agency default on its ESA repayment obligations.

Risk Guarantee Window

The EERF may also use a risk-sharing mechanism by providing credit or risk guarantees to commercial banks and other financial institutions (FIs) in order to leverage commercial financing for EE projects. Risk-sharing programs are designed primarily to address the common perception of lenders that EE projects are inherently more risky than traditional investments (a major financing barrier), or to allow them to lend to marginally creditworthy clients with very attractive EE investment opportunities. They provide commercial banks/FIs with a partial coverage of the risk involved in extending loans for EE projects. The risk-sharing facility generally includes a subordinated recovery guarantee⁷ and may also have a “first-loss reserve”⁸ that may be used to absorb up to a specified amount of losses before the risk sharing occurs.

The Bulgaria EE Fund provides three types of guarantees: (i) a credit guarantee covering up to 80 percent of the credit value to secure loans for EE projects, with individual guarantee commitments not to exceed Lev 800,000 (about \$500,000); (ii) an uncollateralized guarantee to a portfolio of receivables of energy service companies (ESCOs) for their energy performance contracts (EPCs), covering the first 5 percent of the delayed payments of the portfolio covered; and (iii) a residential portfolio guarantee covering the first 5 percent of defaults within the portfolio of projects.⁹

Budget Capture

The budget capture option may be used when the public agency receives dedicated funds from the MOF or another government agency to pay its energy bills. In such cases, after the EERF invests in EE projects implemented by the public agency, the government (i) reduces its budgetary outlays to that public agency by an amount equivalent to the amount of energy cost savings (thereby “capturing” the savings) and (ii) redirects these funds to the EERF. This would require that the government agrees to provide the same amount to the public agency for energy bill payments in subsequent years.

Grants Window

If an independent, sustainable financing source is available, an EERF may also offer a grant window. For example, if a government (through special taxes, levies, or surcharges, for example) or a donor agency commits to funding the EERF for a given number of years, a portion of the funding may be used for grants to public agencies to improve the economics of the EE project from the public agency perspective.

⁷ In a *subordinated recovery guarantee*, the guarantor ranks behind other lenders in the recovery of the guarantee funds it pays out in case the borrower defaults on the loan. This allows lenders to offer better loan terms, such as lower interest rates or longer tenors. A subordination provision may be useful, for example, when interest rates are high due to higher perceived risk, or if a new technology with limited operational experience is being deployed.

⁸ In the event of a loan default, a *first-loss reserve* pays for all losses incurred until the maximum first-loss reserve amount is exhausted. The lender incurs losses only if the total loan loss exceeds the first-loss amount. By covering all or a large share of first losses and sizing the definition of first losses to be a reasonable proportion of the loan portfolio (usually higher than the estimated default or loss rate), a first-loss reserve can provide meaningful risk coverage to the lender, but with a low level of total guarantee liability relative to the total size of the portfolio.

⁹ The residential portfolio guarantee was not used. The available funds were committed to the ESCO portfolio guarantees.

However, if a revolving fund is established to operate on a fully commercial basis, it is unlikely that it will provide grant financing—except when such grant financing is available from another source and can be combined with the loan financing provided by the revolving fund. If such funds are made available, it should be made clear that these are limited; failing to do so may create false expectations for more grants, which may undermine the fund’s long-term sustainability.

Forfeiting

A possible service that the EERF can provide or arrange is forfeiting, or the sale of receivables. Forfeiting is useful in situations where an ESP is providing its own equity for project financing. It is a form of transfer of future receivables from one party (the seller – an ESP) to another (the buyer – a financial institution).¹⁰ An example of forfeiting is the Bulgarian ESCO Fund (BEF) established under the Law for Special Investment Companies by the Bulgarian company Enemona. This fund received a loan of €7 million from the European Bank for Reconstruction and Development (EBRD) to buy receivables under the energy saving contracts signed by Enemona.¹¹ The fund allows Enemona to use its capital for further development of projects in both the industrial and public sectors including kindergartens, schools, hospitals, and other municipal buildings.

Other Services

Technical Assistance

An important feature of successful EERFs is the technical assistance (TA) provided. The types of TA may include the following:

- Program marketing to and capacity building of the target public agencies to address the information and knowledge gaps related to EE, build demand for financing, and improve the sustainability of energy savings. Examples of activities include program workshops and flyers, development of a program website, development of successful case studies for broader dissemination, market studies, advertising, and educational programs for schools and other organizations.
- Developing procedures that help public agencies engage ESPs under PPPs such as performance-based contracts; preparing performance-based bidding documents for procurement of various elements of project implementation services; and refining these bidding documents based on the implementation experience to provide standard documents for future use.
- Identifying way to bundle procurements by multiple public entities implementing similar projects, thus reducing transaction costs and equipment costs through bulk purchases. Under some financing arrangements, the EERF can even conduct the preliminary audit, procure the ESP, and monitor the project on behalf of the clients.
- Identification, assessment, and recommendation of changes, if needed, in rules for public accounting, budgeting, and procurement to facilitate the financing of EE projects and procurement of EE services. These may include policy development related to existing public procurement and budgeting rules for EE services, development of alternate financing models for EE in the public sector, and so forth.
- Carrying out capacity building for ESPs and other market actors to enhance their ability (i) to conduct energy audits and (ii) to screen, design, evaluate, appraise, finance, implement, and measure EE investments in the public sector.

¹⁰ The original creditor (the ESP) cedes his claims to future revenues from the project and the new creditor (the FI) gains the right to claim these future receivables from the debtor (the client). The ESP receives a discounted one-time payment from the FI that then allows it to invest in new energy savings performance contract (ESPC) projects.

¹¹ EBRD, Bulgarian ESCO Fund, <http://www.ebrd.com/projects/psd/psd2007/38100.htm>.

- Developing or adapting appropriate methodologies for M&V and providing M&V training to public agency staffs, facility managers and engineers, and private sector ESPs.
- Developing the terms and conditions of the ESAs with public agencies for the ESA option, including establishment of the baseline conditions and identification of the baseline changes that would require an adjustment of the fixed annual payments.
- Training in post-project operations and maintenance.

Procurement of Implementation Services

Under the ESA option, the EERF can engage private energy service providers to provide some implementation services using simple performance-based contracts. This approach can help transfer some of the project implementation risk to the private sector. It can also help build the capacity of the ESPs and facilitate the development of an energy services market.

The EERF can use *output*-based procurement for project implementation services. Traditionally, procurement of services such as auditing, installation, or commissioning is *input*-based, meaning that the contracts and payments to the service providers are time- or delivery-based. *Output*-based contracts, on the other hand, tie contracts and payments to performance and/or results (such as improved equipment efficiency, energy savings, and cost savings). Such contracts require clear definitions of the baseline, performance indicators, and M&V approaches.¹²

Eligibility Criteria

The eligibility criteria used to assess whether public agencies that express interest in the EERF should proceed to the preliminary audit stage may include the following:

A. For debt financing:

- Creditworthiness of the public agency
- Existence of consumption-based payments for heating
- Good energy bill payment discipline
- Existing comfort level of at least 50 percent¹³
- Building in reasonably sound structural shape
- No current or imminent plans for closure/privatization
- Ability to retain cost savings to allow loan repayments¹⁴
- Potential use of commercially available technologies
- Minimum and maximum loan amounts
- Proper project preparation and documentation

B. For energy service agreements:

- Availability of historical energy bill data
- Consumption-based billing and good energy-bill payment discipline
- Building in reasonably sound structural shape
- No plans for closure or for major changes planned in building operations
- Willingness and ability to sign ESA agreement spanning multiple years
- Willingness to work with the fund's payment security mechanism

¹² An excellent discussion of output-based procurement of energy services can be found in World Bank (2010c).

¹³ The "comfort level" in a building is defined as the ratio of the actual energy consumed for providing heating comfort to the amount of energy that would be needed to provide the desired or standard comfort level. If this ratio is small, it is unlikely that the EE project that will be designed to provide the desired comfort level can provide cost savings.

¹⁴ Alternatively, existence of a payment security mechanism that will assure loan repayment.

How Does an EERF Address the Barriers?

An EERF can address some of the important barriers to scaling up EE in the public sector mentioned previously. Table 3 provides a summary.

Table 3 - Addressing the Financing and Implementation Barriers

Barrier	How Addressed
Limited number of creditworthy municipalities and borrowing capacity	Finance projects directly with creditworthy municipalities with borrowing capacity and engage in ESAs with others
Restrictive budgeting and procurement regulations and procedures	Since the fund will most likely be considered a public entity, it can enter into loan agreements or ESAs with public agencies without facing the restrictive regulations/procedures
Low energy tariffs	Provide longer tenor on loans and longer terms for the ESAs to allow public agencies to repay the loans from cost savings
Norm-based billing systems for heating	Install heat meters in the selected buildings and measure consumption before and after implementation of the EE project
Relatively high interest rates charged by commercial banks	Provide lower interest rates than commercial banks and engage in ESAs
Small project sizes, leading to high project development and transaction costs)	Standardize agreements and procedures; aggregate similar projects across public agencies
Lack of development of energy service providers and performance-based contracting	Engage energy service providers in project implementation and develop their capacity for performance-based contracting
Low existing comfort levels	Work only with agencies that meet minimum comfort level standards; provide longer tenor loans and longer term ESAs to assure desired comfort levels and yet allow the public agencies to repay the loans or pay the ESA payments

Source: Prepared by authors.

5. Summary of Key Features

A summary of the key features of EERFs is provided in Table 4. For a more detailed explanation, Annexes A through D provide four relevant case studies.

Table 4 – Summary of Selected EE Revolving Funds

Characteristics	Bulgarian Energy Efficiency Fund	Armenia R2E2 Fund	Romanian Energy Efficiency Fund	Salix Finance (U.K.)
Year Established	2005	2006	2003	2004
Funding Sources	World Bank, GEF, and governments of Austria and Bulgaria	World Bank	GEF	U.K. Department of Energy and Climate Change (DECC)
Fund Objectives	Support the identification, development and financing of viable EE projects, resulting in substantial reduction of GHGs	Decrease GHG emissions by removing barriers to the implementation of EE investments in the public sector	Help energy users adopt modern technologies for the efficient use of energy	Improve public sector EE and reduce GHG emissions
Legal Basis	Established under Energy Efficiency Act of 2004	Law on Energy Efficiency and Renewable Energy	Government Emergency Ordinance	Established by the U.K. Department of Energy and Climate Change (DECC)
Legal Organization	Independent organization	Independent NGO	Independent organization	Independent, publicly funded company
Governance	Management Board with 9 members (4 government, 5 non-government)	Board of Trustees - members include government, private sector, NGOs and academia	Board of Administration with 7 members (2 government, 5 non-government)	Board of Trustees
Fund Management	Private sector fund management team selected competitively	Fund Director, Financial Manager, Investment Coordinator, and TA Coordinator	Executive Director (ED) appointed by Board; Fund Manager manages investment portfolio to	CEO appointed by the Board
Main Components	Debt Financing Facility; Partial Credit Guarantees; and TA	Loans, ESAs, and TA	Debt financing and TA	Provide interest-free capital through Recycling Fund and Energy Efficient Loan Scheme
Typical Projects	Rehabilitation of public buildings	Improvements in individual heating systems	Replacing old energy generation equipment (boilers, CHP, hydro, geothermal)	Insulation
	EE in industrial processes	Rehabilitation of public buildings		LED lighting and controls
	EE Streetlighting	EE improvement in homes and buildings	Modernizing process industry equipment and public lighting	Building energy management systems
	Improvements in heat distribution systems	Heat metering and regulating equipment		Heat recovery systems
	Off-grid renewable energy	Cogeneration		Cogeneration
No. of Projects	81 loans	14 ESAs	20 loans	7,400 loans
Loan/ESA Volume	\$16 million	\$2.4 million	\$11.4 million	£115 million
Lifetime Energy Savings	90,000 toe	32.3 GWh	36,533 toe	N/A
Lifetime GHG Reductions	900,000 tCO ₂ e	7,906 tCO ₂ e	183,237 tCO ₂ e	2.5 million tCO ₂ e

Note: tCO₂e = metric tons of CO₂ equivalent. toe = tons of oil equivalent.

Source: Prepared by Authors.

6. Operationalizing an EE Revolving Fund

This section summarizes the major sequential steps involved in setting up and operating an EERF. For each step the options are identified and, where appropriate, the preferred option is identified based on international experience.

- ***Establish the legal framework for the fund.*** This may exist in prior legislation. If not, new legislation may need to be enacted. A key decision is to agree on whether to use an existing entity or establish a new one. The options include creating the fund within an existing ministry, energy agency, or development bank; creating a new legal entity (independent corporation, NGO, or new statutory agency); or establishing a PPP. Most important is a governance structure will incentivize EERF management to perform well while still providing a public service function.
- ***Develop reliable and sustainable funding sources.*** It is important that the EERF be capitalized with sufficient funds from the government, donor agencies, and/or other sources to initiate operations and fund a number of projects. The funding sources may also need to provide additional funding once the initial funds are deployed to ensure that the EERF can continue its operation over the long term.
- ***Define the fund objectives and target markets.*** An EERF cannot be expected to serve all the energy consuming sectors. The government needs to focus the initial activities on a few targeted markets. The public sector, particularly schools and hospitals, represents a good target market for the initial deployment of the fund, because these markets offer high EE potential, lack internal financial resources and/or access to commercial financing, and have very limited capacity to implement EE projects.
- ***Develop the governance structure.*** The governing body is generally a board of trustees (or administrating board) appointed by the government. The preferred approach is to include both government and private sector representatives on the board because the latter provide knowledge and experience while helping to prevent political capture of the EERF, which helps maintain a clear strategy and policy for the fund.
- ***Select and recruit the fund management.*** The governing board will define the fund management options (existing ministry staff, an independent fund management organization, government agency with a fund management consultant, etc.). The preferred option is to engage a professional fund management team (“fund manager”) using a competitive bidding process, because a private sector fund manager (i) brings financial structuring experience that may be very difficult to get from government officials, (ii) can be engaged using a performance-based contract that rewards success and penalizes failure, (iii) provides incentives for performance that can be a great motivator, and (iv) can be terminated and replaced if performance falls substantially short of expectations. However, a private sector fund manager is likely to result in a higher fee structure.
- ***Hire the staff.*** The fund manager will recruit qualified staff to the management team. It is important that the staff have relevant experience in areas such as EE project financing, energy services, investment management, credit and risk assessment, and loan disbursement and recovery. Some of the staff will therefore need to be recruited from the private sector. However, the management and staff must also be responsive to public sector needs and perspectives and the public-benefit role of the fund. For example, when selecting EE projects for implementation, the management team needs to avoid “cream skimming” (picking only the most economically attractive projects) and instead must cater to the needs of a wide range of public agencies and protect the public interest.
- ***Define the major financing products.*** A major focus of the fund will be on debt financing (i.e., loans) to public agencies. However, to serve all public agencies, some of

which may not be creditworthy or have borrowing capacity, the EERF should consider the ESA option as one of the major components. The fund may also consider, depending on the financial markets, the option of credit- or risk-guarantee products.

- **Define TA and other service offerings.** Another very important project component is TA, which is often critical to ensuring high quality deal flow and strong portfolios. For example, the fund may conduct procurement of equipment and services for a bundle of projects (centralized procurement) for a number of agencies to obtain better pricing for equipment and services and reduce administration and transaction costs.
- **Develop and document eligibility criteria.** As discussed in Section 3, the fund should develop and document the eligibility criteria for the various financing windows and products offered.
- **Define the application procedures and prepare related forms.** Based on the eligibility requirements and the major components, appropriate procedures and forms should be prepared. The EERF should also have an operations manual that lays out the principles and implementation rules governing the fund's operations. It provides guidance to all the key participants involved in fund management, project implementation, and results monitoring, thereby providing a common understanding of all operational principles and practice for all stakeholders.
- **Develop a marketing strategy and approach.** This step involves identifying the public agencies for each of the fund components, along with eligibility criteria. Then a marketing strategy and approach should be developed for each target market. This may include collecting energy consumption data and assessing the creditworthiness and borrowing capacity of specific agencies, conducting walk-through audits, and so forth.
- **Develop the project pipeline.** Using the marketing strategy and approach, specific projects shall be identified and a project pipeline established.
- **Subcontract to private ESPs to build their capacity.** The fund manager should develop simple performance-based business models for engaging ESPs in the implementation process. Such models may include equipment leasing, supplier credits, one-year ESP contracts, and so forth.¹⁵ The fund should develop a plan to engage private sector energy service providers in the implementation process of the ESAs. In this effort, the fund should try to develop standardized audit templates, agreements, contracts, and M&V procedures; and also introduce performance-based contracts for energy services. Participation by the ESPs in project implementation will build their capacity for undertaking future energy services projects and contribute to the development of an energy services industry.
- **Develop approaches for project aggregation to reduce transaction costs.** EE projects generally have relatively high project development and transaction costs. In the public sector there may be examples of similar projects across a number of different public agencies (for example, street lighting projects). By aggregating such projects or at least standardizing them, the fund may be able to reduce transaction costs and improve project economics.
- **Develop and document the monitoring, reporting, and evaluation procedures and approaches.** As discussed in Section 3, these are important functions, and the fund management team must develop the monitoring system, define the data sources and databases to be developed, and specify the evaluation procedures and protocols.

¹⁵ These ESP models are described in the *Guidance Note on Energy Services Market Development* (World Bank 2014c).

7. Lessons Learned

This section summarizes the major lessons from the assessment of EE revolving funds.

Prerequisite Market Conditions

The prerequisite market conditions for an EE revolving fund focusing on the public sector are:

- Government commitment to improving EE in public facilities;
- Potential opportunities for improving EE;
- An existing demand for financing EE projects;
- A lack of available financing for EE projects;
- The existence of a mechanism to repay the fund from the achieved savings; and
- Energy payment discipline, with consumption-based billing among public end users.

Fund Organization Structure and Governance

- An EE revolving fund is best established as an independent organization—either a corporation or an NGO.
- The fund governance is usually by a government-appointed board of governors or board of trustees made up of both public sector and private sector members.
- The governing board and the management team need to provide a balance between public interest (since the fund will be targeting public agencies) and private sector perspectives regarding financial structuring of projects, risk assessment, and market development.

Sustainability

For the EERF to be sustainable, it needs one or more reliable and continuing funding sources. Once the fund deploys its initial capital, the replenishment of that capital through loan repayments will take a number of years (sometimes as long as 5 to 7 years or more). The fund thus needs access to financing to enable it to continue operations and finance additional projects.

In Bulgaria, the government demonstrated strong commitment at the project's outset by contributing significant budget funds for setting up BEEF. However, the government's involvement was reduced gradually so that by the end of the project there was a lack of ownership and it did not assist BEEF in its efforts to increase its capital base (World Bank 2010a). Because sustaining political commitment across administrations can be a big challenge, public campaigns—involving local politicians in building commissioning, satisfaction surveys, and so forth—can help build broad support.

Selecting the Fund Manager (and Related Compensation Structure and Incentives)

There are many options for selecting a fund manager. It may be an independent, newly created organization; a professional organization or consortium; an existing, non-independent public agency; a national development bank, utility, or other public enterprise; or a public sector employee dedicated or seconded to the fund. Whatever the choice, it should be competitively selected.

If the fund manager is a public agency (as in Romania; see Annex C), it is likely that the fund will be responsive to the public interest need, but there will be limited incentives to take risks and be innovative. The World Bank (2009) review of FREE's performance concluded that the fund manager contract structure should have included performance incentives rather than employing a standard retainer.

If the fund manager is a private organization or private consortium (as in Bulgaria), the management team is likely to be more expensive but also more innovative and responsive to market needs. However, in smaller countries and markets, it may be difficult to recruit the talent needed for effective fund management and administration.

8. Roadmap for establishing an EE Revolving fund

The major steps in establishing an EE revolving fund are shown in Figure 4.

Figure 4 – Road Map for Establishing a Revolving EE Fund



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Annex A. Case Study: The Bulgarian Energy Efficiency Fund

Introduction

The Bulgarian Energy Efficiency Fund (BEEF)¹⁶—was established under the Energy Efficiency Act of 2004. The fund is designed as a revolving facility to create broad-based, sustainable commercial financing for EE projects. Its main objective is to support the identification, development and financing of viable EE projects, resulting in substantial reduction of greenhouse gases (GHGs). BEEF operates as an independent, not-for-profit organization, managed by a professional fund manager, and income from fees charged to fund clients covers the operating costs and losses from defaults.

Capitalized with \$10 million in GEF funding, BEEF was designed to support the establishment and operation of BEEF as a commercially oriented public-private finance facility. GEF funds were used to provide seed capital for BEEF and cover set-up and operating costs until BEEF reached financial self-sufficiency; and also to partially cover initial costs of EE capacity building. Additional financing was secured from the Bulgarian government (US\$1.8 million) and the Austrian government (US\$2.0 million).

Management and Governance

Three entities manage and govern the fund. The Donors' Assembly consists of representatives of the donors. It convenes at regular sessions every two years and reviews and modifies (as needed) the regulations for the operation and organization of the fund's activities.

The Management Board is responsible for the fund's overall strategic management. Its members—board composition is summarized in Box 1 in Section 3—convene monthly.

The Fund Manager (FM)¹⁷ is responsible for the fund's day-to-day operation. Its objective is to operate the fund as a profit-oriented business that promotes EE investments and helps the development of a sustainable EE market in Bulgaria. The FM selects and applies the appropriate financing tools based on specific project circumstances and overall project portfolio management considerations.

The FM is compensated through a combination of fixed fee (about 30 percent) and a success fee based on the number of signed contracts and project investment volume. Of the success fee, the payment based on the number of signed contracts is about 54 percent; the remainder is based on the project volume.

Main Components

BEEF has three main components:

- ***A Loan Financing Facility*** to co-finance bankable EE projects on a commercial lending basis using a Loan Account
- ***Partial Credit Guarantees (PCG)*** to share in the credit risk of EE finance transactions and to improve loan terms for project sponsors
- ***Technical Assistance (TA)*** to finance, on a grant basis, a portion of EE project development, capacity building, information barrier removal, and administration costs

¹⁶ This Fund is now known as the Energy Efficiency and Renewable Sources Fund (EERSF). See <http://www.bgeef.com>.

¹⁷ As indicated earlier, the FM is a Consortium of Econoler International, the Center for Energy Efficiency (EnEffect), and Elana Holding PLC.

Funding

GEF provided grant financing of US\$10 million for (i) providing seed capital for BEEF; (ii) defraying the initial set-up and operating costs until BEEF reached financial self-sufficiency; and (iii) partially defray initial costs of EE capacity building (project development, financial packaging, etc.).

The indicative GEF amount for the loan account was US\$4.0 million, which was expected to trigger investments of US\$16.34 million. The GEF allocation for the technical assistance was US\$1.5 million. Additional funding was provided by the governments of Bulgaria (US\$1.8 million) and Austria (US\$2.0 million).

Projects

BEEF has both technical project development and financial structuring capability and is designed to be flexible in the financial products it offers for the evolving EE finance market. It finances the following types of project:

- Investments in improved EE in industrial processes
- Rehabilitation of industrial, commercial, multifamily residential, single family residential and municipal buildings, health care facilities, schools, universities, and cultural facilities
- Improvements to the heat source and distribution system, including EE street lighting and other energy end-use applications such as off grid renewable energy generation

Eligibility Criteria

The main eligibility criteria for project financing are as follows:

- The project should involve the application of well-proven technology.
- The project cost should range between €15,000 and €1,500,000
- Minimum equity of 10 percent under co-financing and 25 percent for stand-alone financing.
- Payback time of up to five years.
- Required collateral: mortgage, pledges under Special Pledges Act, claims on accounts and commercial contracts, financial risk insurance, bank guarantees, etc.

Implementation Results

By the end of the World Bank project in March 2010,

- The fund had awarded 81 loans (with another 4-5 loans being in the process of final approval). The total loan volume was US\$16 million, and the total investment financed by these loans was US\$24 million.
- The lifetime energy savings from these loans were 0.09 mtoe, and the GHG-savings at 0.9 mtCO₂e.
- The average simple payback period was 4.7 years. The typical loan size was US\$250,000–500,000.

The fund had also:

- Contributed to EE financing for public sector projects in local municipal governments and other public institutions for which commercial banks were unwilling to finance; and
- Contributed, along with a number of other initiatives by EBRD and others, to an increase in the number of ESCOs from 14 to 38 and the number of banks extending loans to EE projects from 2 to 13.

Annex B. Case Study: Armenia Renewable Resources and Energy Efficiency Fund

Introduction

The government of Armenia established the Renewable Resources and Energy Efficiency (R2E2) Fund in 2005, initially as a PIU for a World Bank supported EE/renewable energy (RE) project (World Bank 2012b). It was structured as an independent NGO following the provisions of Armenia's "Law on Energy Efficiency and Renewable Energy" and began operation in 2006. Its local objective is to reduce the energy consumption of social and other public facilities; its global environmental objective is to decrease greenhouse gas emissions by facilitating the implementation of EE investments in the public sector.

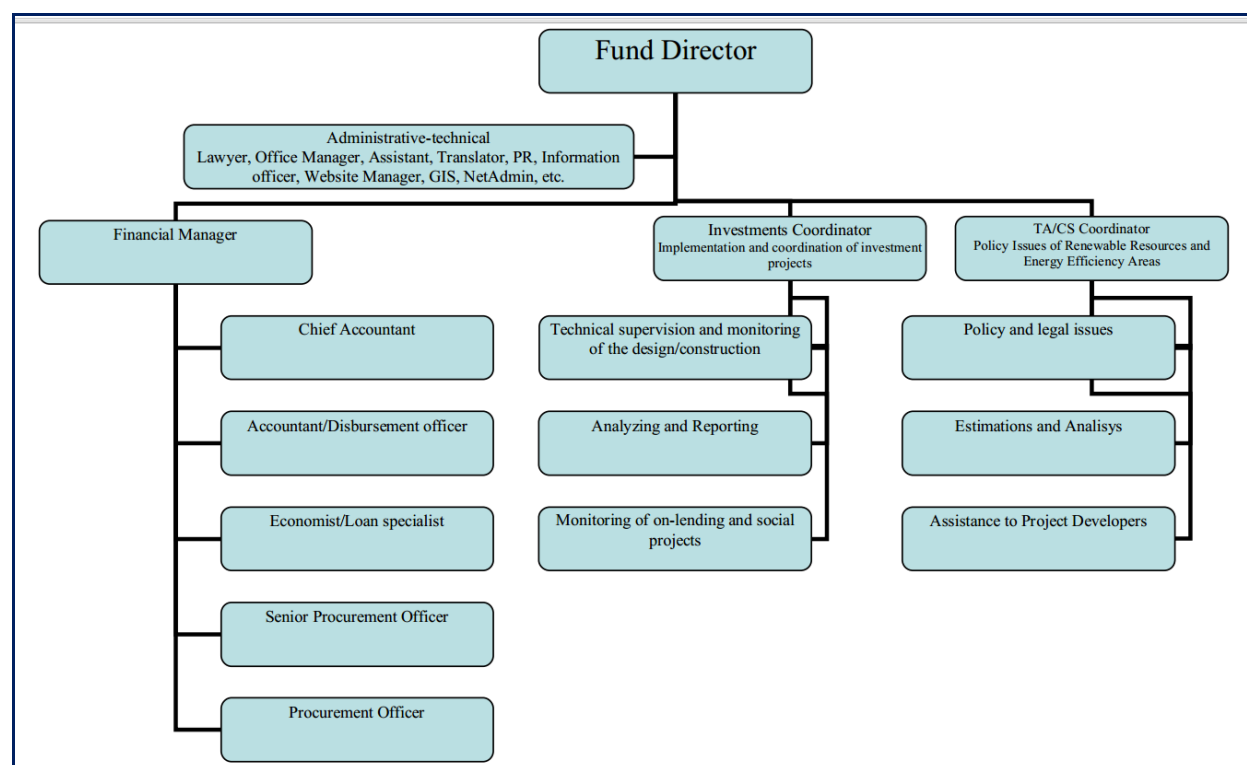
Management and Governance

The primary governing body of the R2E2 Fund is the Board of Trustees, which includes representatives from the government, private sector, NGOs, and academia. The Board is responsible for the overall management of the Fund in accordance with the objectives and operational principles as defined in the Fund Charter. The Board also establishes the strategy and operating rules of the Fund, appoints the top management, and approves the budget and specific investments.

The Fund's day-to-day activities are managed by the Fund Director, who is appointed by the Board. Other key management include the Financial Manager, Investment Coordinator, and Technical Assistance Coordinator.

The organization chart of R2E2 is shown in Figure 5.

Figure 5 – Organization Chart: R2E2 Fund



Source: <http://r2e2.am/en/about-us>.

Main Components

The Fund is currently implementing a World Bank/GEF-supported project that provides EE services in public sector facilities—including EE investments in schools, hospitals, administration buildings, and street lighting—using a revolving fund scheme. The Fund offers two financing products to eligible public entities:

1. For municipalities and public entities with revenue streams independent of the state budget, loans are provided. These loans do count as municipal debt, with fixed repayment obligations to be made within their budget provisions in future years. The amounts of the repayments are designed to allow clients to repay the investment costs and service fees from the estimated energy cost savings.
2. For schools and other public entities that are not legally or budget independent, ESAs are used. Under the ESA, a public entity pays the Fund its baseline energy costs (with adjustments for energy prices, usage, and other factors) over the contract period. The Fund designs the project, hires subcontractors, oversees construction and commissioning, and monitors the project. In this case, the client incurs no debt; the Fund directly pays the energy bills to the utility on the client's behalf, and retains the balance to cover its investment cost and service fee.

R2E2 uses simplified performance contracts to shift some performance risks to private construction firms/contractors and to support the build-up of an ESCO industry in Armenia. Under these contracts, firm selection is based on the net present value of the projects they propose, and a portion of their final payment (around 30 percent) is based on a commissioning test.

Funding

The initial funding is US\$8.7 million for investments in public facilities and US\$1.96 million for TA.

Projects

By January 2014, the Fund had commissioned 19 projects for public clients. The Fund has (i) strengthened its implementation capacity by hiring EE, institutional, and procurement consultants and (ii) initiated a marketing campaign to increase the demand for investment funds from prospective public clients and build the 2014 pipeline.

Eligibility Criteria

The R2E2 Fund addresses financially viable projects in public facilities. The selection criteria are as follows:

- The facility is publicly owned.
- The facility is structurally sound (there is no major structural damage that may jeopardize integral stability of the building).
- There are no plans for closure, downsizing, or privatization of the facility.
- The “comfort level” of the project is more than 50 percent.

A secondary set of eligibility criteria, which will be based on due diligence by the R2E2 Fund, are as follows:

- There should be a minimum of 20 percent energy savings.
- There should be a simple payback period of less than 10 years for EE investments.
- Project investment should be at least US\$50,000 and not more than US\$500,000.
- Borrowers should be in good financial standing and demonstrate payment discipline.

Implementation Results

The total estimated cost of the 19 projects is US\$2.35 million (World Bank 2014b). Assuming a 20-year useful life of the project investments, the estimated lifetime energy savings are 32.3 GWh and GHG reductions are 7,930 tons of CO₂e. Actual energy savings for completed projects varied from 41 to 53 percent, with actual payback periods of six years or less.

Annex C. Case Study: Romanian Energy Efficiency Fund

Introduction

An independent fund providing commercial financing for EE investment projects, the Romanian Energy Efficiency Fund (*Fondul Român pentru Eficiența Energiei*, or FREE) was established under the Government Emergency Ordinance no. 124/2001 regarding the Fund's establishment, organization, and operation. The relevant legal framework was adopted at the end of 2001 and the Fund started operations in June 2003 with a grant of US\$10 million from the GEF, with the World Bank as the grant implementing agency. The main objectives of the Fund are to enable companies in the industrial sector and other energy consumers to adopt and use energy-efficient technologies, financed under commercial criteria by FREE and co-financiers.

Management and Governance

The Fund is governed by a seven-member Board of Administration representing the public and private sector, with one each from the Ministry of Industry and Resources and the Ministry of Water and Environmental Protection, and five representatives of the private sector, of whom at least two are financial experts. The Board has appointed an investment committee comprising several financial experts with training and experience in credit analysis, in order to conduct final reviews of investment proposals.

The Fund's day-to-day activities are managed by the Executive Director (ED) appointed by the Board using a competitive process, with criteria regarding professional training and experience as required by the nature of the Fund's activity and as agreed with the World Bank. The ED is supported by a small permanent staff and short-term personnel and external professionals such as lawyers, auditors, technicians, environmental experts, and other experts. The Finance and Administration function of FREE is ensured by a highly qualified Financial Controller who has the overall responsibility for all financial management functions.

The ED has appointed a Fund Manager to manage the Fund's investment portfolio. The Fund Manager provides professional structured finance experience and EE expertise to develop and finance commercially viable EE investments that can provide sustainable and increasing reductions in GHG emissions in Romania. The FM is responsible for the investment aspects of the Fund and is expected to establish a portfolio of projects that allows the Fund to become self-financing within three or a maximum of four years.

The Fund Manager's compensation includes a base fee plus a performance-based incentive based on the number of new loans and the loan repayment performance, plus a deal origination fee paid by the borrowers. In addition, the Fund Manager received a success fee calculated as a percentage of the increase in the net asset value of the Fund at the end of five years. The organization chart of FREE is shown in Figure 6.

Funding

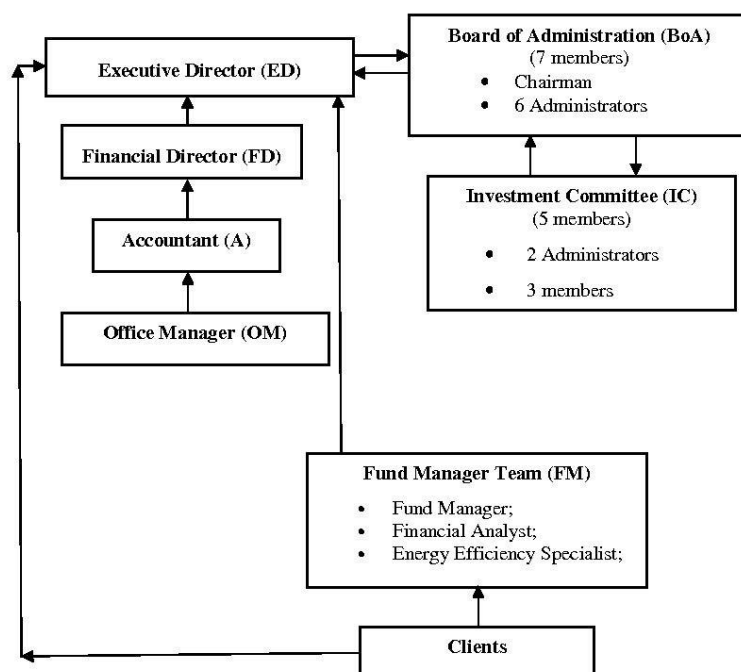
The initial GEF Grant funding for FREE was US\$10 million, of which US\$8 million was for loan financing and \$2 million for technical assistance.

Projects

During the five-year implementation period of the GEF grant, FREE disbursed over US\$9.73 million from the GEF grant, including 100 percent of the US\$8 million GEF allocation for investment financing. FREE also used a part of the repayments in the revolving fund for additional loan commitments. All loans are being repaid punctually, without any late payments or defaults.

Sixteen projects have been completed, of which 12 were in the private sector, representing 83 percent of loan value and 93 percent of overall investment facilitated by FREE; the balance was in the public sector. The major technologies included replacing old energy generation equipment (boilers, combined heat and power [CHP], hydro, geothermal) and modernizing process industry equipment and public lighting (four projects).

Figure 6 – Organization Chart: Romanian Energy Efficiency Fund



Source: http://www.free.org.ro/index.php?option=com_content&task=view&id=109&Itemid=125&lang=en.

Eligibility Criteria

The major project eligibility criteria are as follows:

- Relatively short payback time (generally under three to four years);
- Project investment to be in the range of US\$50,000 to \$800,000;
- At least 50 percent of each project’s benefits must be from energy savings (process or capacity improvements that have ancillary energy savings benefits are not eligible); and
- The technology must be well proven in the proposed application to avoid all technological risk.

The main EE technologies that meet these criteria are burners and boilers, variable-speed drives, condensers for power factor improvement, compressors, controls, and steam traps.

Implementation Results

During the five-year implementation period of the GEF grant, FREE signed 20 loan contracts, of which 18 proceeded to implementation with a commitment of US\$11.4 million from the fund, for a total investment of US\$34.19 million. Three commercial banks offered a total of US\$18.2 million for four large projects.

By the end of 2008, 16 projects had been completed, with an estimated energy savings of 36,533 toe (tons of oil equivalent) from the completed projects. These resulted in annual CO₂e savings of 183,237 tons. The GHG reduction resulting from these 16 completed projects, aggregated over their lifetimes, was estimated to be 2.18 million tons of CO₂e (World Bank 2009).

Annex D. Case Study: Salix Finance

Introduction

Salix Finance Limited was established in 2004 in the U.K. as an independent, publicly funded organization dedicated to providing the public sector with loans for EE projects to reduce their energy consumption and costs by replacing dated, inefficient technologies with modern, energy efficient technologies.¹⁸ Salix Finance operates in England, Scotland, Wales, and Northern Ireland.

Salix is the Fund manager for funds provided by the U.K. Department of Energy and Climate Change (DECC) and delivers 100 percent interest-free capital to the public sector to improve their EE and reduce their carbon emissions. The administrative costs of the organization are paid by DECC.

Management and Governance

Salix Finance is a public limited company owned by the government. The governing body is the Board of Directors, whose chairperson is appointed by the DECC. Two other private sector members are appointed by the chairperson and the company's CEO.

Main Components

There are two types of Salix funding programs available. The first type is the Recycling Fund, which provides long-term interest-free funding to local authorities, emergency services, universities and hospital trusts. These loan funds are managed by the public sector organizations that also provide matching funds. The loans are provided for specific EE projects and are repaid into the fund from the financial savings delivered by the projects. This allows the fund to be continually used for EE projects; hence the term *recycling fund* (this is analogous to the term *revolving fund* used elsewhere in this guidance note). At the same time, the public agencies continue to benefit from the savings that accumulate once the project has been fully repaid.

The second type is the Salix Energy Efficient Loans Scheme. As an example: a school borrows £10,000 to put in new lighting and a new boiler that will save the school £2,000 per annum from reduced gas and electricity usage. For the first five years these savings are used to pay back the interest-free loan. Once the loan is repaid, the continued savings enable the school to use the capital for other budgets, such as the purchase of equipment.

Salix also facilitates knowledge sharing through quarterly regional meetings, technical workshops, and project case studies. There is an extensive knowledge and enthusiasm for EE within the public sector, and enabling the sharing of this knowledge between organizations helps support our clients in delivering long-term, cost-effective savings.

Funding

Salix Finance Ltd is an independent, not-for-profit company funded mainly by the U.K. DECC, with some funding also provided by the Welsh Assembly Government and the Scottish government. Salix also works in partnership with The Higher Education Funding Council for England on its Revolving Green Fund.

Salix was established by the UK Department of Environment, Food and Rural Affairs (DEFRA), the predecessor to DECC, in 2004 to ensure that the public sector in the UK has access to interest free capital loans to increase EE. Since 2004 DECC has provided a total of £148m to Salix for the funding of EE loans and for the funding of its operations.

¹⁸ <http://salixfinance.co.uk>.

Projects

The Recycling Fund of Salix has financed a large number of public sector projects:

- Salix currently has 138 Recycling Fund partner organizations, including local authorities, higher education institutions, emergency services, and the National Health Service (NHS).
- The fund has financed over 7,400 projects collectively worth more than £115 million, and is expected to deliver over £456 million of financial savings and over 2.5 million tons of carbon dioxide over the lifetime of the projects.
- On average, projects have realized a payback of 3.5 years.
- The size of an individual Recycling Fund ranges from £100,000 to £1 million. A typical fund size would be £500,000, with Salix providing £250,000 and the client match-funding the other half.

Eligibility Criteria

Over 120 technology types are supported by the funding programs. These include building energy management systems, cavity wall insulation, combined heat and power systems, evaporative cooling, heat recovery systems, LED lighting, lighting controls, loft insulation, pipe insulation, server virtualization, T5 lighting, and variable speed drives.

Salix funding includes all public sector organizations including schools, higher and further educational institutions, emergency services, hospitals, leisure centers, local authorities, prisons, and the NHS. There has been a focus to commit more resources to increasing EE and driving down energy costs, which Salix aims to address and to assist the public sector in doing.

Implementation Results

The results to date (including both the Recycling Fund and the Energy Efficient Loans) are as follows:

- Number of projects funded: 11,449
- Value of projects funded: £273 million
- Value of lifetime financial savings: £1,019 million
- Lifetime carbon savings: 5,750,877 tons of CO₂

