



International
Energy Agency

Joint Public-Private Approaches for Energy Efficiency Finance

*Policies to scale-up
private sector investment*

*Policy
Pathway*



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Energy Agency

The IEA Policy Pathway series

Policy Pathway publications provide details on how to implement specific recommendations drawn from the IEA 25 Energy Efficiency Policy Recommendations. Based on direct experience, published research, expert workshops and best-practice country case studies, the series aims to provide guidance to all countries on the essential steps and milestones in implementing specific energy efficiency policies.

This Policy Pathway presents the critical elements of joint public-private approaches to accelerating and scaling up private investment in energy efficiency. It focuses on the lessons learned from country experiences with three mechanisms – dedicated credit lines, risk guarantees, and energy performance service contracts.

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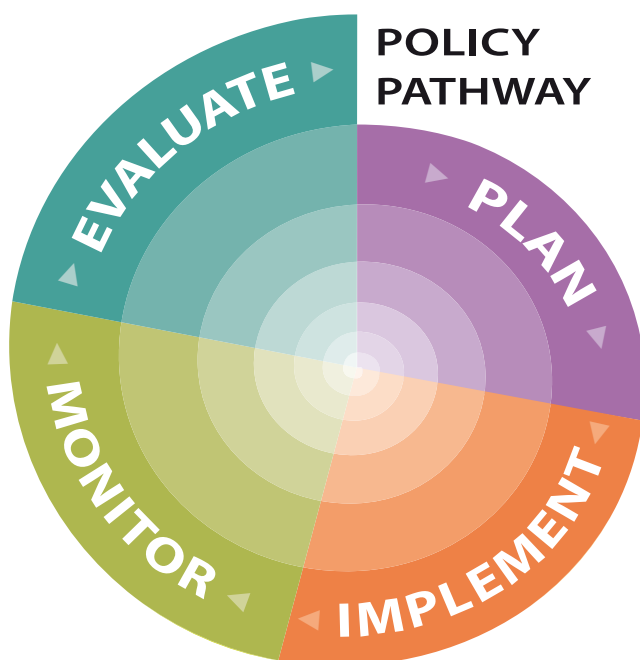
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The Policy Pathways series is designed for policy makers at all levels of government and other relevant stakeholders who seek practical ways to develop, support, monitor or modify energy efficiency policies in their home country and abroad. The Pathways can also provide insight into the types of policies best adapted to the specific policy context(s) of different countries, so that each country derives the maximum benefit from energy efficiency improvements.

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The IEA carries out a comprehensive programme of energy co-operation among 28 advanced economies, each of which is obliged to hold oil stocks equivalent to 90 days of its net imports. The Agency aims to:

- Secure member countries' access to reliable and ample supplies of all forms of energy; in particular, through maintaining effective emergency response capabilities in case of oil supply disruptions.
- Promote sustainable energy policies that spur economic growth and environmental protection in a global context – particularly in terms of reducing greenhouse-gas emissions that contribute to climate change.
- Improve transparency of international markets through collection and analysis of energy data.
- Support global collaboration on energy technology to secure future energy supplies and mitigate their environmental impact, including through improved energy efficiency and development and deployment of low-carbon technologies.
- Find solutions to global energy challenges through engagement and dialogue with non-member countries, industry, international organisations and other stakeholders.

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Executive summary

The Policy Pathway series is designed to guide government policy makers and other relevant stakeholders on the essential steps in implementing policies from the 25 IEA Energy Efficiency Recommendations. Lack of finance is a key barrier to investment in energy efficiency and therefore one of the IEA recommendations stipulates that *“governments should facilitate private investment in energy efficiency”* (IEA, 2011). This policy pathway describes a particular aspect of this recommendation, namely, the use of joint public-private approaches, known as public-private partnerships (PPPs) in this report, to encourage and promote private-sector investment in energy efficiency (EE) projects.

PPPs are mechanisms that use public policies, regulations or financing to leverage private-sector financing for EE projects.

Defining characteristics of PPPs for financing energy efficiency include:

- a contractual relationship (or less formal agreement) between a public entity and a private organisation;
- allocation of risks between the public and private partners, consistent with their willingness and ability to mitigate risks, to encourage the private partner to mobilise financing;
- mobilisation of increased financing for EE; and
- payments to the private sector for delivering services to the public sector.

This report describes three PPP mechanisms:

- **Dedicated Credit Lines:** credit lines established by a public entity (such as a government agency and/or donor organisation) to enable financing of EE projects by a private-sector organisation (bank or financial institution).
- **Risk-Sharing Facilities:** partial risk or partial credit guarantee programmes established by a public entity (such as a government agency and/or donor organisation) to reduce the risk of EE project financing to the private sector (by sharing the risk through a guarantee mechanism), thereby enabling increased private-sector lending to EE projects.
- **Energy Saving Performance Contracts (ESPCs):** public-sector initiatives, in the form of legislation or regulation, established by one or more government agencies to facilitate the implementation by energy service companies (ESCOs) of performance-based contracts using private-sector financing.

The rationale for the use of PPPs for EE financing is as follows: the public sector can develop policy and regulatory instruments to overcome the barriers and facilitate the scaling-up of investments in EE projects, but project development and commercial financing are necessary to sustain the scaling up of EE investments. The active participation of commercial banks and financial institutions is needed for the long-term growth and development of the market for delivering EE financing and implementation services. PPP mechanisms can be used to obtain such leveraging of commercial financing.

Based on international experience in the development and implementation of PPPs for financing EE projects, this report describes the three PPP models and includes case studies that demonstrate how the models have been put into practice to generate financing.

The use of a PPP structure for energy efficiency financing depends on a number of important characteristics including:

- the country context;
- the legislative and regulatory conditions;
- the existing energy services delivery infrastructure; and
- the maturity of the financial markets.

The three PPP approaches discussed in this report are applicable in different market environments. They represent different degrees of public and private financing approaches.

Dedicated credit lines involve a greater degree of public-sector financing in that the government or donor agency provides funding to the private partners (local financial institutions [LFIs]). These credit lines are, therefore, most applicable when the commercial financial market is less mature and LFIs are not undertaking much financing of EE projects, due to lack of knowledge and understanding of the characteristics and benefits of EE projects and/or limited liquidity.

In the case of **risk-sharing facilities**, the public sector provides a lesser amount of financing, focusing more on the risk guaranty provided. This characteristic makes them suitable when the commercial financing market is somewhat more mature, and LFIs are willing to consider financing EE but are concerned about the potential risks of such projects. The risk guarantees provided by the public partner help overcome this high risk perception and encourage the LFIs to undertake financing of EE projects.



In the case of **energy saving performance contracts**, the public sector provides no direct financing but creates the enabling legislative and regulatory frameworks and facilitates the negotiation of performance contracts between public agencies and ESCOs that lead to financing from the private sector. They are appropriate in a mature commercial financing market, where LFIs have both the liquidity and the understanding and willingness for EE project financing.


This publication proposes a policy pathway that supports the development, implementation, and financing of PPPs comprising ten critical steps in the following four stages.

- **Plan:** policy makers begin the PPP process by identifying the market segment where EE needs to be improved, choosing among the different public-sector intervention approaches available, and structuring an agreement between the public and private partners.
- **Implement:** although the private-sector partner takes the lead in implementation of the PPP mechanism, the public partner needs to define the implementation steps and manage the implementation process, making adjustments as necessary to meet objectives and respond to market changes.

- **Monitor:** monitoring the PPP process involves managing the contract to ensure delivery of services (including authorising payments and maintaining records) and assessing performance relative to the standards defined in the PPP agreement.
- **Evaluate:** an independent third-party organisation evaluates the PPP design and implementation to assess its success in meeting objectives, factors affecting performance, and key lessons learned.

Countries around the world have accumulated considerable experience with PPPs for energy efficiency financing, as described in the main body of this report and in the case studies. Government policy makers interested in developing PPP mechanisms in their own countries can learn much from this experience. This report points out, however, that to be effective in addressing the financing barriers to energy efficiency, PPPs must be adapted and customised to local legislative, regulatory, institutional, financial and energy services market conditions.

Table ES1 provides a checklist of the ten critical steps in a policy pathway for an EE finance public-private partnership.

Table  Policy pathway action checklist for PPPs

		DONE
PLAN	1 Identify priority market segments	<input type="radio"/>
	2 Select PPP approach and key elements	<input type="radio"/>
	3 Develop PPP agreement	<input type="radio"/>
IMPLEMENT	4 Identify major implementation steps	<input type="radio"/>
	5 Manage implementation process	<input type="radio"/>
MONITOR	6 Manage contract	<input type="radio"/>
	7 Manage performance	<input type="radio"/>
EVALUATE	8 Evaluate PPP design	<input type="radio"/>
	9 Evaluate PPP implementation	<input type="radio"/>
	10 Summarise findings and recommendations	<input type="radio"/>

Source: compiled by authors.

Introduction

Governments in most countries face challenges with respect to the sustainable development of their energy systems. These challenges include:

- ensuring adequate supplies of energy in the long term to support economic development;
- improving security of their energy supplies to reduce dependence on foreign energy sources;
- providing a healthy, unpolluted environment for their populations; and
- contributing to global climate change mitigation.

An important goal in meeting these challenges is to transition from a fossil-fuels-based economy to a less carbon-energy-intensive economy. The IEA *Energy Technology Perspectives 2010* estimates that the investment required to halve the greenhouse gas emissions by 2050 is USD 46 trillion higher than the baseline scenario over the period 2010 to 2035 (IEA, 2010a). The reduction of energy consumption through improved energy efficiency (EE) represents a key strategy in these efforts, because EE provides the most cost-effective solution in the short to medium term for reducing energy demand/supply gap, enhancing energy security, and mitigating local and global environmental impacts. Many countries are introducing ambitious energy-saving targets. For example, the European Union's 2020 strategy for climate and energy, known as the "20-20-20" target, includes a reduction in EU greenhouse gas emissions of at least 20% below 1990 levels; a 20% contribution of renewable energy resources, and a 20% reduction in primary energy use compared with projected levels, to be achieved by improving EE (EU, 2010).

The IEA developed policy recommendations to advance global EE efforts aimed at achieving 20% reductions in global CO₂ emissions by 2030. These recommendations call for action in seven priority areas: cross-sector activity, buildings, appliances, lighting, transport, industry and power utilities (IEA, 2008). The IEA's goals were to support countries in saving large quantities of energy at low cost, address existing market imperfections or barriers, address significant gaps in existing policy and encourage widespread EE implementation.

These recommendations have been updated in 2011 and endorsed by IEA Ministers (IEA, 2011). The IEA estimates that if implemented globally without delay, the proposed actions could cumulatively save around 7.6 Gt of CO₂/year or 82 EJ/year by 2030.

The fourth of these recommendations addresses the finance barrier to EE investments, and stipulates that

Governments should facilitate private investment in energy efficiency by supporting energy efficiency capacity building, standardised measurement and verification protocols, private lending and energy efficiency technology research, development and deployment.

Measures should include:

- *energy efficiency knowledge generation and dissemination and reliable technical assistance on energy efficiency opportunities in all sectors through networks or energy advisory services;*
- *education and training programs to ensure that all sectors have access to the skilled labour force necessary to effectively improve energy efficiency;*
- *development of measurement and verification protocols to ensure consistency in methodology, overcome uncertainties in quantifying the benefits of energy efficiency investments, and stimulate increased private-sector involvement;*
- *collaboration with private financial institutions to develop public-private partnerships and other frameworks that facilitate energy efficiency financing; and*
- *broad financial and collaborative support for research, development and deployment.*

The IEA has recognised the importance of overcoming barriers to financing EE, and has undertaken studies of risk mitigation and the need for financing networks (IEA, 2010b). The recommendation (part (d)) cited above was the basis for the development of this policy pathway on public-private partnerships for EE finance as a part of IEA's continuing engagement on EE financing issues.

Barriers to energy efficiency finance

Introduction

One of the most significant barriers to the global implementation of ... proven EE technologies is the lack of commercially-viable financing. The problem is not a lack of funds, but a lack of access to available funds at local financial institutions (LFIs), caused by 'disconnect' between current lending practices at LFIs and needs of energy efficiency projects.

*Thomas K. Dreessen, Vice-chair,
Efficiency Valuation Organization*

Many recent studies have identified the various barriers to large-scale implementation of EE in IEA and developing countries (IEA, 2010c; Singh *et al.*, 2010; Limaye, 2009; Taylor *et al.*, 2008). In general, these barriers can be classified into four broad categories:

- policy and regulatory barriers;
- barriers related to energy end users (both public and private sectors);
- barriers related to providers of energy-using equipment and energy services; and
- financing barriers.

Even when the first three barriers have been overcome, financing barriers arise because energy users are generally unwilling to invest their own funds in EE projects; they have many of what they consider to be higher-priority investment options for their funds. Most energy users, including large industrial firms, small and medium enterprises (SMEs), commercial sector energy users, and public agencies, therefore, seek external financing for their EE projects. However, banks and financial institutions (referred to herein as local financial institutions or LFIs) are generally reluctant to provide loans even for highly profitable EE projects because of their lack of knowledge and understanding, and their perception of high risk with respect to EE projects.

Among the potential EE investors and EE-supporting industry, SMEs are affected much more by the “disconnect” between the financing needs and the lending practices of LFIs than large industrial firms with substantial balance sheets that can borrow funds with fewer restrictions. Because a substantial portion of EE potential is in SMEs, mechanisms must be developed to “scale up” lending to SMEs for the implementation of EE projects on a national and international level. Even large companies, however, are often unwilling to take on additional debt for financing EE projects because of the potential effect on their borrowing capacity for other types of investments. EE investments may sometimes fundamentally change industrial processes with potential risks to the enterprise if the equipment or process does not work as well as expected or excessive downtime occurs. For this reason, the CEO may be looking for a higher IRR from projects to compensate for risks.



Review of financing barriers

Financing EE may not appear to be much different than financing other types of investments such as facility or business expansion or modernisation, new product development, or sales and marketing. Certain characteristics of EE projects, however, are unique and negatively influence their attractiveness to LFI as candidates for lending. These characteristics can be grouped under five major types of financing barriers (Limaye, 2011) (Figure 1).

- 1 Availability of funds for investing in EE projects.** EE projects reduce energy costs over time, thereby improving the “bottom line” of enterprises, but they do not increase the “top line”.¹ As a result, it can be difficult for corporate or government executives and managers, as well as bankers and other members of the financial community, to clearly perceive the long-term benefits.
- 2 Information, awareness and communication.** LFI generally are not familiar with EE technologies and erroneously perceive EE projects as more complex than their traditional lending, and as initiatives that require expertise, effort and cost to identify and implement. A knowledge gap exists between the organizations developing and implementing EE projects and the beneficiaries (project hosts) and bankers in LFI.
- 3 Project development and transaction costs.** The average size of an EE project is small relative to typical LFI loans, thereby making EE projects less attractive to bankers. They are often fragmented, with high transaction costs, and fall below the minimum value that many banks are willing to consider. EE projects typically have a higher proportion of “soft costs” (project design and development) than traditional LFI loans, and therefore a lower proportion of securitisable assets. Aggregators who could create scaled bankable opportunities are often lacking.

These factors make such projects difficult to finance using a project financing approach from the LFI perspective.²

- 4 Risk assessment and management.** In many cases, the assets financed have little or no residual value, because EE is often in effect an integrated engineering project with energy savings not guaranteed, which makes the assets unusable as collateral against a bank loan. Although the EE industry has developed measurement and verification (M and V) protocols for EE projects, the knowledge and information about these procedures and protocols are not widespread, particularly among bankers. Also, an insufficient number of trained professionals are available to implement the M and V standards and protocols. Different countries adopt different guidelines regarding M and V. Also different engineering companies develop and use their own proprietary models for M and V. As a result, bankers often do not trust the estimated benefits from EE projects, because they are technical in nature and derived from non-transparent and non-standardised models. This also makes it very difficult to appraise EE projects.
- 5 Lack of capacity.** Significant capacity limitations exist with respect to project developers and energy services companies (ESCOs), project hosts (energy users), and LFI loan officers and risk managers.

These barriers create a mismatch between the current lending practices of LFI and the financing needs of EE projects, making EE lending discouragingly difficult. LFI typically provide asset-based lending³ rather than project financing and limit the debt amount to 70%-80% of marketable asset value.

1 The “top line” refers to gross revenues of the enterprise, while the “bottom line” is the net profit.

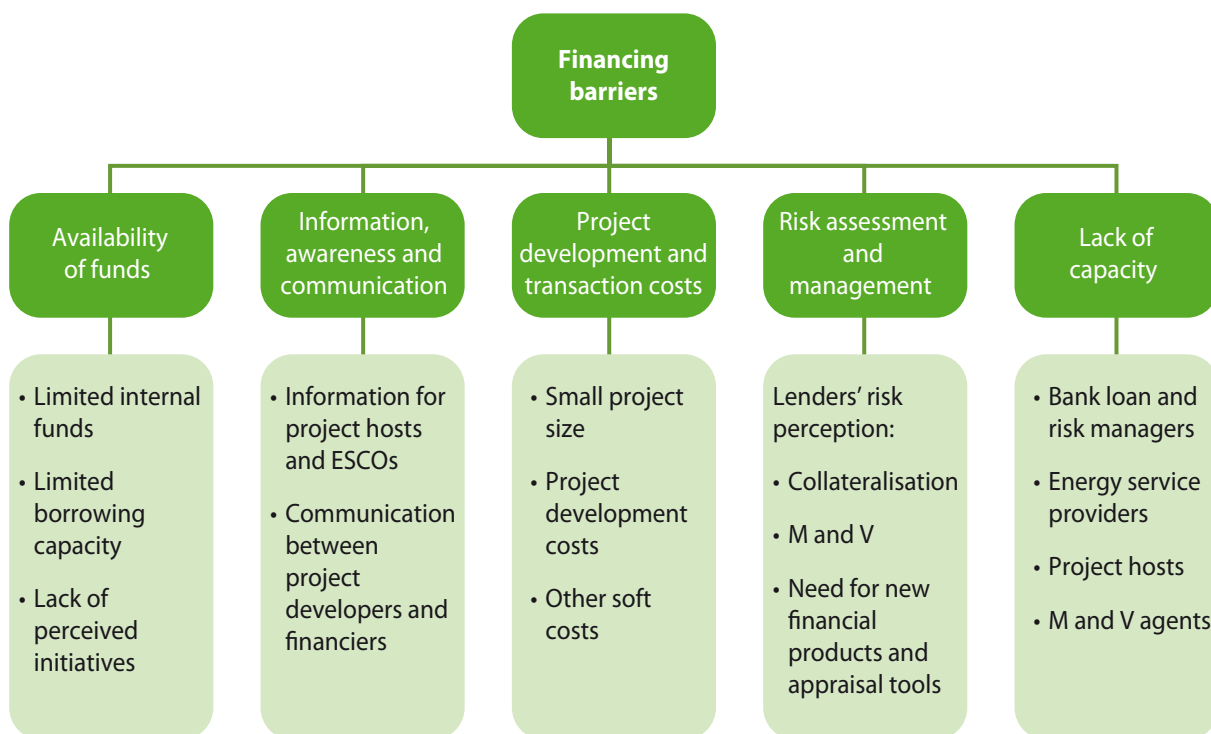
2 Project financing refers to loans that are secured by the project assets or cash flows alone, not by the balance sheet of the enterprise.

3 Asset-based lending generally requires the balance sheet or other assets (such as real estate) as collateral.

LFIs also do not normally finance projects based on the “cash flow” resulting from the energy savings. Typically they are not familiar with the unique characteristics of EE projects and have limited internal capacity to properly appraise the risks and benefits of EE projects. LFIs also do not usually recognise the potentially large business opportunity in EE lending and, therefore, do not have the management commitment or the organisational structure to finance EE projects on a large scale.



Figure 1 Classification of EE financing barriers



Source: Limaye, 2011.

Overcoming the barriers.....

The development of approaches to overcome these financing barriers can deliver immense benefits from the implementation of EE projects, such as expanded markets worth billions of euros for LFI, increased competitiveness of economies, and significant CO₂ emission reductions. Businesses and industrial enterprises (small, medium and large) will benefit from reduction in their energy bills, leading to increased profitability. So will households, giving them more money to spend elsewhere.

When companies are unable to procure loans for implementation of EE projects, they have the alternatives of either financing these projects with their own equity or putting them on hold. Because EE usually has a low priority on the agenda of top management in most industrial enterprises, superseded by other issues and options, most EE projects are not realised. Certain government programmes, such as promoting EE through subsidies and incentives, can temporarily drive the market forward, but the effects are rarely sustainable, because subsidies are not long term. Stability is key to creating markets.

Many other barriers to successful EE implementation exist, but lack of financing is one of the biggest

obstacles to the development of this market. Some governments and international financial institutions (IFIs) realised this many years ago, and have been designing programmes and instruments to mobilise private-sector financing for EE through LFIs.

Along with other tools for market regulation, policy makers have become more and more aware of the potential and flexibility that joint public-private approaches, or PPP mechanisms, can provide, especially when applied to EE financing. In recent years, PPPs have been used increasingly and with great success to attract private financing to the EE investments.



What are public-private partnerships in energy efficiency finance?

Introduction

The IEA report *Energy Efficiency Governance* (IEA, 2010c) pointed out the importance of engaging the private sector in implementing EE policy and programmes. That study defined the concept of public-private partnerships as “*voluntary efforts in which government and the private sector collaborate to analyse public policy problems and jointly implement solutions. Public-private partnerships work most effectively when they focus on a specific issue or problem (i.e. are programmatic), involve broad engagement with private-sector entities, and include some form of co-financing on technology or concept development or demonstration*” (IEA, 2010c).

In this report we have defined public-private partnerships for EE finance as **mechanisms that use public policies, regulations or financing to leverage private-sector financing for EE projects**.

Key characteristics of PPPs for EE financing include:

- contractual relationship (or agreement) between a public entity and a private organisation;
- allocation of risk between the public and private partners consistent with their willingness and ability to mitigate risks, in order to encourage the private partner to mobilise financing;
- mobilisation of increased project financing for EE; and
- payments to the private sector for delivering services to the public sector.

PPP context

Generally, a PPP is a government service or private business venture that is funded and operated through a partnership of government and one or more private-sector companies. The concept of PPPs has been popular since the early 1990s, and many different PPP models exist (EIB, 2010).

The *European PPP Report* (DLA Piper, 2009) states that “the range of structures used for PPPs varies widely: in some countries, the concept of a PPP equates only to a concession where the services provided under the concession are paid for by the public. In others, PPPs can include every type of outsourcing and joint venture between the public and private sectors.”

PPPs generally involve a contract between a public agency and a private party, in which the private party provides a public service or project and assumes substantial financial, technical and operational risk in the project. In some types of PPP, the cost of using the service is borne exclusively by the users of the service, not by the taxpayer. In other types, capital investment is made by the private sector based on a contract with a government agency to provide agreed services. In this case, the cost of providing the service is either borne wholly or in part by the government (Partnerships BC, 2003).

In addition to public contracts and concessions, this legal form is best suited for large operations in which the payment of public service cannot be ensured by users. The structure has the advantage of promoting rapid implementation of projects without burdening public finances and can provide better value for money for the public sector. It allows the state or local authorities to involve a private enterprise in both the financing and management of a public service. Generally, the public sector is responsible for monitoring and evaluation of quality, while the private sector is responsible for project implementation and service delivery.

The introduction of PPPs in the European Union has been driven by Maastricht criteria (Maastricht, 2011), which prohibit a debt greater than 60% of national gross domestic product (GDP). Several countries, such as the United Kingdom, France, Italy, Portugal and Sweden, have established the legal framework for the implementation of a PPP, both nationally and in the context of cross-border projects.

PPPs related to energy efficiency

The vast majority of PPPs are in infrastructure projects. In recent years, however, PPP structures have been used increasingly in EE implementation and finance.

As improvement of EE has become a priority of governments, the public sector has become increasingly aware of the specific barriers related to development, financing and implementation of EE projects.⁴ Many EE projects have negative costs over the lifetime of the project, but the government may not have the ability to invest and tie up large amounts of public funding for projects with long pay-back profiles. The partnering of the government with local financial institutions (LFIs)⁵ and energy services companies (ESCOs) enables the structuring of PPPs to deliver market-oriented instruments that target specific EE market barriers, without the need for direct government subsidy programmes. It also allows governments to achieve their EE targets with only a fraction of the public funding that would otherwise be required, with the private sector taking on both the financial and performance risks.

Practice shows that specific PPP legislation is not crucial for the structuring and implementing PPPs, particularly those in EE finance. The partners may be able to work around the gaps in the local legislation and structure the form and nature of their partnership in PPP contracts (Ablaza, 2011).

Types of PPPs discussed in this report

This Policy Pathway discusses three PPP mechanisms for EE financing⁶:

- **Dedicated credit lines:** credit lines established by a public entity (such as a government agency and/or donor organization) to enable financing of EE projects by a private-sector organization (bank or financial institution). Generally, the private-sector bank or financial institution provides additional financing (co-financing) for the EE projects.
- **Risk-sharing facilities:** partial risk or partial credit guarantee programmes established by a public entity (such as a government agency and/or donor organization) to reduce the risk of EE project financing to the private sector (by sharing the risk through a guarantee mechanism), thereby enabling increased private-sector lending to EE projects.
- **Energy Saving Performance Contracts (ESPCs):** public-sector initiatives, in the form of legislation or regulation, established by one or more government agencies to facilitate the implementation by ESCOs of energy performance-based contracts for improving EE in the public sector using private-sector financing.⁷

These three types of PPPs are designed to address different financing barriers.

Dedicated credit lines utilise government, international financial institutions (IFIs) or donor agency funds to leverage an increase in lending by LFIs for EE projects. They address the issue of insufficient (or non-existent) lending to EE projects due to the LFIs' lack of knowledge and understanding of the characteristics and benefits of such projects. By providing funds to the LFIs (generally at a low interest rate), the public partner gives an incentive to the private-sector LFIs to on-lend funds for EE projects. Because the on-lending is at a higher interest rate (most of the World Bank credit lines are on-lent at market rates), the LFI can earn a profit on the loan transactions. The agreement between the public and private partners generally requires the LFI to co-finance the loans, thereby leveraging and increasing the amount of financing available (see, for example, the World Bank, 2008).

4 Singh et al., 2010.

5 LFIs include banks and other financial institutions.

6 Other types of public-private approaches also exist, such as local government or public utility financing private EE investment, and there is growing interest in finding new approaches. We have selected the three main forms of PPPs that have been in wider use and where we can draw from experiences and lessons already learned, however these are not the only PPP approaches possible.

7 In some cases, the public sector can borrow from a publicly-owned financial institution.

Risk-sharing facilities address the perception of LFI that EE projects are more risky than their conventional lending. Such a perception of high risk prevents the LFI from large-scale commercial financing of EE projects. Under the risk-sharing facility, the public agency provides a partial guarantee that covers a portion of the loss due to loan defaults. By sharing the risk, the public partner reduces the risk to the private-sector LFI, thereby motivating the LFI to increase its lending to EE projects (Mostert, 2010).

Both dedicated credit lines and risk-sharing facilities also include technical assistance and capacity building for the LFIs to increase their knowledge and understanding of EE projects, create greater interest on their part to increase lending to such projects, and help them identify and manage project risks and opportunities.

ESPCs address a number of barriers related to implementation of EE projects in the public sector.

Under the ESPC concept, energy services companies (ESCOs) or other types of energy service providers provide a broad range of services, including providing or arranging commercial financing, to public agencies, industries, housing associations etc. under a performance-based agreement, in which guarantees are provided for the energy savings achieved. In the context of PPPs, ESPCs are involved in implementation of EE in the public sector. The public agency makes payments to the ESCO only upon the satisfaction of the guarantees, thereby eliminating much of the technical and performance risk from the agency (Singh *et al.*, 2010).

Table 1 identifies features of these three types of PPPs relative to how they comply with the PPP characteristics identified above. These three types of PPPs are not mutually exclusive, and combinations may be used. For example, a dedicated credit line or a risk-sharing facility may be combined with policies and regulatory initiatives to facilitate ESPCs.

Table 1 PPP mechanisms in the policy pathway

Type of PPP	Brief Description	PPP Features			
		Agreement between public and private entities	Allocation of risk between partners	Mobilization of private sector financing	Payment to private sector for providing services
Dedicated credit lines	Mechanism under which governments or donors provide low-interest loans to LFIs to encourage them to offer sub-loans to implementers of EE projects	Loan agreement between partners	Project financing risk shared between partners	Private partner generally provides co-financing	LFI earns fee by on-lending funds at higher interest
Risk-sharing facilities	Mechanism where governments or multilateral banks offer guarantee product to absorb some EE project risks and encourage involvement of LFIs in EE financing by reducing their risk	Guarantee Facility Agreement (GFA)	Public partner absorbs some financial risk	Risk reduction mobilises additional private-sector financing	LFI earns interest on additional loans mobilized
Energy saving performance contracts (ESPCs)	ESCO enters into term agreement with public agency to provide services, with payments contingent on demonstrated performance	Energy Services Agreement (ESA)	Performance risk generally borne by ESCO	ESCOs mobilize private-sector financing	Performance-based payment to ESCO

Source: Compiled by authors.

The application of a PPP structure for EE financing depends on a number of important characteristics including the country context, the legislative and regulatory conditions, the existing energy services delivery infrastructure, and the maturity of the commercial financial market

The PPP approaches discussed in this report are applicable in different market environments. They also represent different degrees of public and private financing approaches (Figure 2). Dedicated credit lines involve a greater degree of public-sector financing in that the government, IFI, or donor agency provides funding to the private partners (LFIs). In the case of risk-sharing facilities, the public sector provides a lesser amount of financing, focusing more on the risk guaranty provided. In the case of ESPCs, the public sector provides no direct financing, but creates the enabling legislative and regulatory frameworks and facilitates the negotiation of performance contracts between public agencies and ESCOs that lead to financing from the private sector.



Dedicated credit lines are most applicable when the commercial financial market is less mature and LFIs are not undertaking much financing of EE projects, due to lack of knowledge and understanding of the characteristics and benefits of EE projects and/or limited liquidity. Risk-sharing programmes are useful when the commercial financing market is somewhat more mature, and LFIs are willing to consider financing EE but are concerned about the potential risks of such projects. The risk guarantees provided by the public partner help overcome this perception of high risk and encourage the LFIs to undertake financing of EE projects. With a mature commercial financing market, where LFIs have both the liquidity and the understanding and willingness to consider EE project financing, the ESPC mechanism can be useful for scaling up the LFI financing.

Dedicated credit lines

Introduction

A dedicated credit line for EE mobilises commercial financing from LFIs for EE projects by providing funds to the institutions, which they can then on-lend to project developers or implementers. Such a credit line is effective in overcoming the issues related to insufficient availability of funds for EE projects.

Objectives

Governments, IFIs, or governments in cooperation with IFIs provide dedicated credit lines to one or more participating LFIs. The credit line is intended to increase the motivation of the participating LFI in financing EE projects. The dedicated credit line achieves this by providing funds at a low-interest rate and allowing the LFI to on-lend them at a higher interest rate.

The credit line generally also includes technical assistance to the participating LFIs to enhance technical capacity of the LFIs. This is key to scaling up EE lending; strengthen the participating bank's capacity in identifying investment opportunities and project risks and managing them; and assist the participating bank in establishing a new business in EE and other low-carbon-energy lending (Blyth and Savage, 2011).

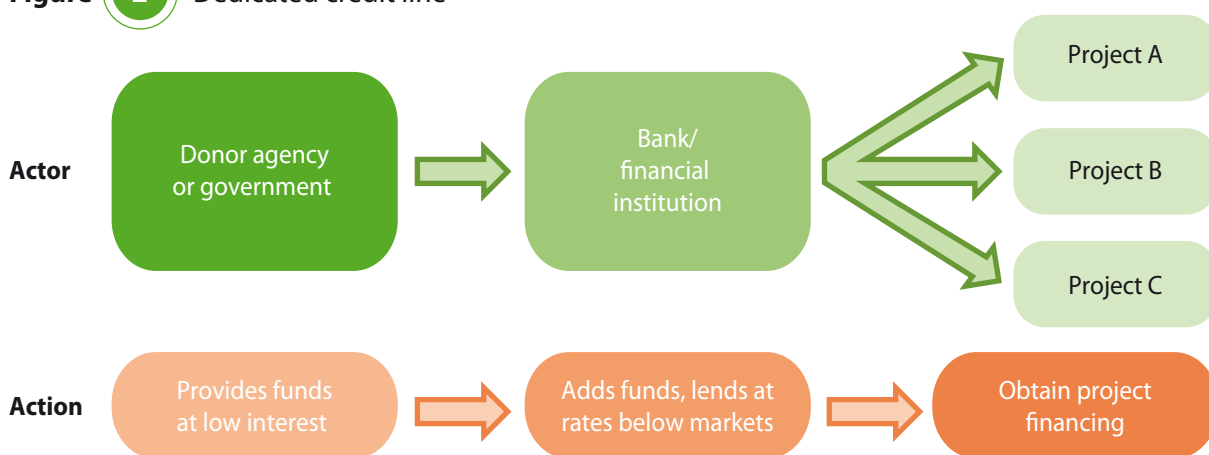
Structure

In a dedicated credit line, a public partner provides a credit line at low interest to private partners (one or more LFIs) (Figure 2). The agreement between the public and private partners identifies the types of projects eligible for financing with the credit line. The agreement also specifies the requirements for the LFIs to co-finance the projects to increase the total size of the loan fund available.

The LFI generally charges a fee for loan processing and may charge market rates for its funds, but the total interest cost to the LFI for financing projects is generally lower than the market interest rate due to the availability of the low-interest funds from the public partner. The LFI, therefore, may be able to provide loans for EE projects at a lower-than-market interest rate. Some dedicated credit lines, however, require LFIs to on-lend the funds at market interest rates to avoid any possible market distortions.

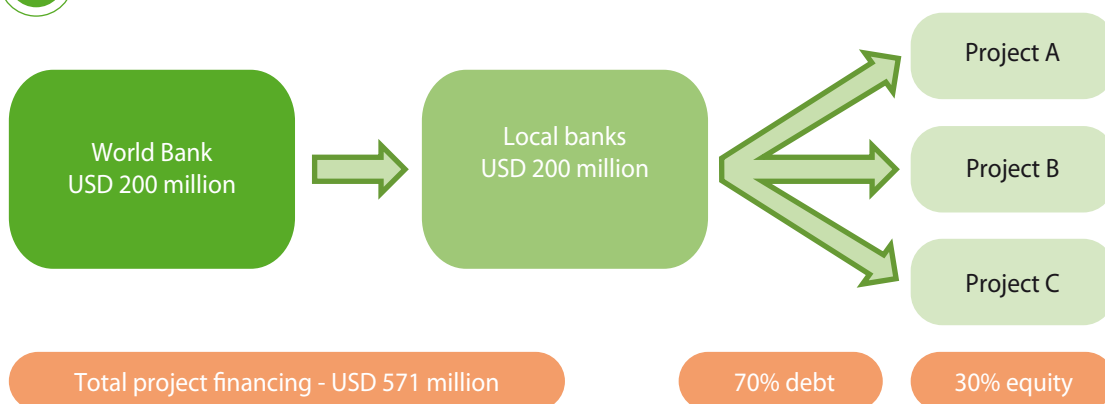
In the case of the China Energy Efficiency Financing programme (CHEEF) where the banks match the donor/government funds on a 1:1 basis and require a 30% equity investment for each project, the public partner is able to obtain a leverage ratio of about 286% in terms of the funds provided to the total investment in EE projects (Figure 3).

Figure 2 Dedicated credit line



Source: Limaye, 2011.

Figure 3 China Energy Efficiency Financing Programme



Source: Limaye, 2011.

Examples

Examples include:

- the China Energy Efficiency Financing programme (CHEEF);
- the Thailand Energy Efficiency Revolving Fund; and
- the KfW Credit Line to the Small Industries Development Bank of India (SIDBI) for EE projects in SMEs (KfW and SIDBI, 2010).

China Energy Efficiency Financing Programme (CHEEF)

The World Bank initiated the China Energy Efficiency Financing Programme (The World Bank, 2008) to encourage Chinese banks to provide EE project loans. The line of credit was structured as a financial intermediary lending operation with a sovereign guarantee provided by the government of the People's Republic of China (Ministry of Finance). In the programme's first phase (called CHEEF I), the World Bank provided USD 100 million each to two participating LFI, Exim Bank and Huaxia Bank (Figure 3). The banks matched the World Bank funds on a 1:1 basis to increase the total size of the loan portfolio.

In the programme's second phase (CHEEF II), the World Bank worked with Minsheng Bank as the participating LFI.

Thailand Energy Efficiency Revolving Fund

The Royal Thai Government (RTG) established the Thailand Energy Efficiency Revolving Fund (EERF) to stimulate and leverage commercial financing for EE projects, and help commercial banks develop streamlined procedures for project appraisal and loan disbursement. The fund provides capital to Thai banks to fund EE projects, and the banks provide low-interest loans to EE projects in industries and buildings. It represents a working partnership between the RTG and 11 commercial banks.



The source of the funds provided by the Royal Thai Government is the original fund created under Thailand's Energy Conservation Promotion Act (Kingdom of Thailand, 1992; Sajjakulnukit, 2008; Sinsukprasert, 2010). The Department of Alternative Energy Development and Efficiency (DEDE) manages this fund, called the ENCON Fund.

Phase I of the EERF was launched in 2003 as a three-year programme and has been renewed for two additional three-year terms. By April 2010, the EERF had financed 335 EE projects and 112 renewable energy projects. The total investment in these projects was USD 453 million, and the estimated annual energy cost savings were USD 154 million, providing an average payback of about three years.

See also Case Study 1 in the annex of this report.

Indian KfW SME Credit Line

The Kreditanstalt für Wiederaufbau Bankengruppe (KfW) of Germany has provided a dedicated credit line of EUR 50 million to the Small Industries Development Bank of India (SIDBI) to finance EE projects in micro, small and medium enterprises (MSMEs) in India (KfW and SIDBI, 2010). The credit line provides SIDBI the capacity to encourage MSMEs to undertake energy-saving investments in plant and machinery and production processes. KfW has also provided a technical assistance component to support SIDBI in identifying key target MSME clusters, setting up the credit lines, providing technical support, and conducting awareness campaigns in MSME clusters throughout India. The programme's overall objective is to reduce greenhouse gas (GHG) emissions.

Specifically, the programme seeks to:

- increase investments of MSME in EE;
- increase the contribution of MSME to ecologically sustainable economic development; and
- broaden the financial instruments of SIDBI.

A part of the credit line funds is channelled by SIDBI through private- and public-sector “partner lending institutions” (Apex-model). Another part is disbursed by SIDBI directly to MSME clients.

A key requirement of this dedicated line of credit is that each project should achieve a minimum level of energy savings and GHG emission reductions.

KfW and SIDBI have agreed that at least 25 tons of GHG emission reductions should be reached for every INR 1 million (about USD 22 500) invested.

As part of its drive to be a market leader in EE financing in India, SIDBI is increasingly institutionalising its knowledge in EE lending, e.g. by setting up an “energy efficiency cell” within the organisation.

The three examples of dedicated credit lines profiled in this section illustrate the range of possible features and commitment of funding (Table 2).

Table 2 Three dedicated credit lines for EE

<i>Feature</i>	<i>China CHEEF I</i>	<i>Thailand EERF</i>	<i>India KfW/SIDBI</i>
Public partner	<i>World Bank</i>	<i>Govt. of Thailand ENCON Fund</i>	<i>KfW Bank</i>
Local financial Institution (LFI)	<i>Exim Bank and Huaxia Bank</i>	<i>11 commercial banks in Thailand</i>	<i>SIDBI, private and public partner lending institutions</i>
Amount of credit line	<i>USD 100 million to each bank</i>	<i>USD 192 million</i>	<i>EUR 50 million</i>
Co-funding from banks	<i>Minimum USD 100 million each</i>	<i>Varies by bank</i>	<i>None required</i>
Sectors targeted	<i>Medium and large industries and ESCOs</i>	<i>Industrial and commercial energy users and ESCOs</i>	<i>MSMEs</i>
% Debt financing	<i>70%</i>	<i>Maximum 70%</i>	<i>70%</i>
Maximum loan size	<i>USD 17.5 million</i>	<i>USD 1.4 million</i>	<i>Borrowers must be defined as SME according to Indian regulation, no additional limit on loan size</i>

Source: Compiled by authors.

Risk-sharing facilities

Introduction

One of the most important barriers to EE financing by commercial banks and financial institutions is their perception that EE projects are inherently more risky than traditional investments. Risk-sharing facilities address this perception by providing participating LFI with partial risk coverage in extending loans for EE projects. The risk-sharing facility directly facilitates increased financing of EE projects by overcoming the barriers to structuring the transactions and by building the capacity of LFIs to finance EE projects on a commercially sustainable basis.

The most common examples of risk-sharing facilities are publicly-backed partial risk guarantees or partial credit guarantees (Mostert, 2010).

Objectives

Risk-sharing facilities assist EE project implementers by:

- providing access to finance from commercial LFIs;
- reducing the cost of capital by reducing the risk faced by the lender;
- expanding the loan tenor or grace period to match project cash flows; and
- helping create a long-term sustainable market for financing of EE projects.

Generally, risk-sharing facilities provide targeted technical assistance to stimulate deal flow (the rate at which new investment proposals are made to lenders) and uptake of financial products. They support both LFIs in the marketing and delivery of EE financing services, and project developers in the preparation of projects and programmes for investment. The risk-sharing facility leverages commercial financing for EE projects by reducing the risks for LFIs in financing EE projects and by informing and educating the staff of the LFIs through parallel technical assistance programs.

Structure

In the basic structure of a risk-sharing programme, a public agency (government or donor agency) signs a Guarantee Facility Agreement (GFA) with participating LFIs to cover a portion of their potential losses (Figure 4). Under the GFA, the public agency provides a partial guarantee, covering loan loss from default. Although the actual amount or percentage of the loss covered by the guarantee may vary, typically the guarantee is for a 50-50 (*pari passu*) sharing of the losses between the LFI and the public agency. Some GFAs also include a “first-loss” facility that absorbs a high percentage of the losses (up to 100%) up to a specified amount.

Participating LFIs sign agreements with project developers, specifying loan targets and conditions. LFIs are responsible for conducting due diligence and processing the loans, and the project developers repay loans to the LFIs. The public agency may specify certain terms and conditions for the project appraisal. The public agency generally approves each project (or project portfolio) for each LFI. In case of loan default, the guarantee facility covers the specified portion of the loss.

The risk-sharing facility may offer individual project guarantees or portfolio guarantees. In the case of individual project guarantees, the public agency is involved in each individual transaction, appraising the eligibility of the applicant borrower for the guarantee in parallel with the LFI’s due diligence to determine eligibility for a loan. In the case of a portfolio guarantee, the public agency covers all loans by the LFI to a class of borrowers (the portfolio).

The LFI has the responsibility for project appraisal and due diligence, and, therefore, the public agency does not provide a 100% guarantee to cover loan losses. Generally, risk-sharing programmes are designed to provide partial risk guarantee facilities (PRGF).

The three types of partial guarantees are:

- **Pro-rata guarantee:** the loss is shared between the LFI and the public agency according to a pre-specified formula. Typically the percentage share of the public agency is between 50% and 80%.
- **First-loss guarantee:** pays for losses from the first losses incurred until the specified amount of the first-loss facility is exhausted; the lender incurs losses only when the total loan loss exceeds the first-loss guarantee amount. By covering a large share of first losses and defining first losses to be a reasonable proportion of the loan portfolio (usually higher than the estimated default/loss rate), a first loss portfolio guarantee can provide very meaningful risk coverage to the lender.
- **Second-loss guarantee:** pays for losses that exceed the non-guaranteed portion of the loan. The main idea of such a guarantee is to cover incremental losses beyond the LFI's normal loss rate. For example, suppose the LFI has an average loss rate of 1% of its loan portfolio. When asked to move into a new business segment that it perceives to have higher risk (such as EE loans), the LFI would expect the average loss rate to be higher. Because the guarantee is partial, the second loss coverage starts at a percentage loss at or somewhat below 1%.

Examples

Examples include the International Finance Corporation (IFC)/Global Environment Facility (GEF) Commercializing Energy Efficiency Finance (CEEF), the IFC/GEF China Utility Energy Efficiency (CHUEE) Programme, and the World Bank China Energy Conservation II Programme.

IFC/GEF Commercializing Energy Efficiency Finance (CEEF)

One example of successful implementation of a risk-sharing facility was the Commercialising Energy Efficiency Finance (CEEF) Programme offered as a joint programme of the IFC and GEF, with IFC acting as the Executing Agent for the GEF (Danish Management Group, 2010). The CEEF programme was designed to meet the GEF objectives to promote and enhance commercial financing of EE projects, thereby leading to reduction of GHG emissions and creation of a sustainable market in the CEEF countries for EE project development and financing. The programme covered six countries in Eastern and Central Europe (Hungary, Czech Republic, Slovak Republic, Latvia, Lithuania, and Estonia).

Figure 4 Risk-sharing facility



Source: prepared by authors.

The two key tools introduced by CEEF to achieve these objectives were: (i) risk-sharing and risk management through partial credit guarantees provided to LFI for loans to EE projects, and (ii) technical assistance for capacity building within LFIs, ESCOs, project developers, and project hosts.

CEEF provided partial guarantees to share in the credit risk of EE finance transactions, which the partner LFIs would fund with their own resources. The transactions eligible for the programme included capital investments aimed at improving EE in buildings, industrial processes, and other energy end-use applications.

IFC used a 50% *pari passu* risk-sharing structure for CEEF. GEF committed USD 17.25 million to the programme, of which USD 15 million was for the guarantee facility (the remaining USD 2.25 million was used for programme operating costs and for technical assistance).

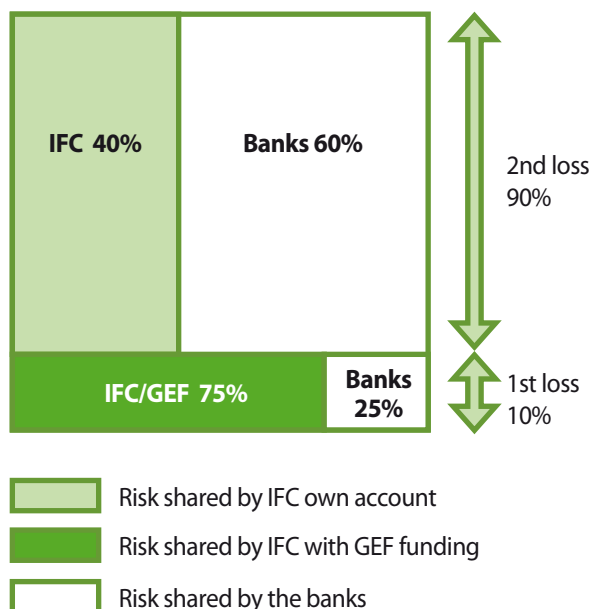
The programme's technical assistance aimed to help identify and prepare projects for investment and build EE and LFI industry capacities in each country. The programme included assistance to participating LFIs to help market their EE finance services, prepare projects for investment, develop new EE finance products, and build their capacities to originate EE project financings. It also included assistance to EE and ESCO businesses for building their corporate capacities and developing EE projects, and targeted EE market promotion activities, generally undertaken in cooperation with other organizations.

Under the CEEF programme, 14 participating LFIs financed 829 projects. The total amount of the guarantees was USD 49.5 million. These projects represent a total investment of approximately USD 208 million. See also Case Study 2 in the annex of this report for more details.

IFC/GEF China Utility Energy Efficiency (CHUEE) Programme

IFC, in cooperation with GEF, initiated the China Utility-Based Energy Efficiency Finance Programme (CHUEE) in June 2006. To implement EE projects in China, CHUEE supported services such as marketing, project development, and equipment financing for energy users in the commercial, industrial, institutional and multi-family residential sectors. CHUEE brought together financial institutions, utility companies, and suppliers of EE equipment to create a new financing model for the promotion of EE (Figure 5). CHUEE cooperated with Chinese commercial banks and offered them a facility whereby IFC shared part of the loss for all loans within the GHG emission reduction portfolio. The programme also provided technical advisory services related to marketing, engineering, project development, and equipment financing services to banks, projects developers, and suppliers of EE and renewable energy products and services.

Figure 5 Initial structure of IFC CHUEE loss risk-sharing facility



Source: the World Bank, 2010c.

In this scheme, IFC provided a “Loss-Sharing Agreement” with partner banks. Losses were defined on a portfolio basis and were defined as 10% of the total original principal amount of the loan portfolio. In the first-generation loss-sharing agreement, IFC shared 75% of the “first losses”. Second losses were defined as all losses after the first losses; these were shared 40/60 between IFC and the bank. IFC also provided technical assistance to the partner banks.

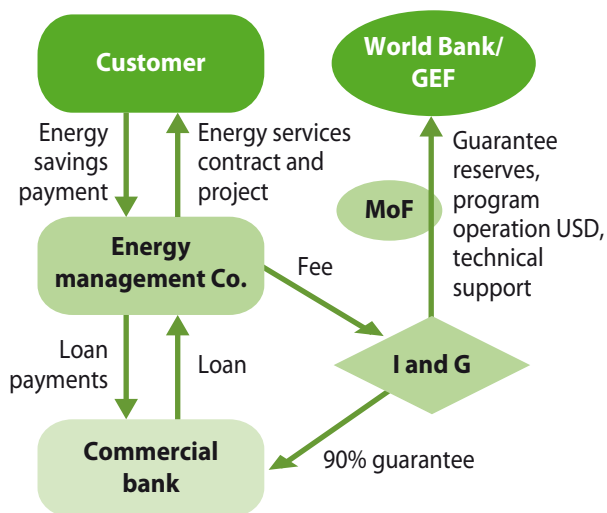
Although the initial IFC model was to work with a utility (Xin’ao Gas), IFC found that a strategic mismatch existed between the utility and the financing partners (the World Bank, 2010c). The gas utility’s customers were primarily smaller customers, and the participating banks preferred to work with large customers only. As a result, IFC worked directly with the banks, without any utility involvement.

World Bank China Energy Conservation II Programme

With funding from the GEF, the World Bank has supported the development of ESCOs in China, as well as related contracting and financial mechanisms under the China Energy Conservation Project. In Phase II of this project, the World Bank established a goal to mobilise local banks to provide ESCOs with debt financing for EE projects. The project used a loan guarantee mechanism, with China National Investment and Guarantee Company Ltd. (I and G), a state-owned national guarantee company, acting as guarantor (the World Bank, 2002).

World Bank/GEF funds were provided through the Ministry of Finance to serve as guarantee reserves and were made available on a formula basis for I and G to pay guarantee claims (Figure 6). With these resources, I and G provided 90% loan guarantees to commercial banks that make loans to ESCOs for qualified EE projects. In addition, the World Bank supported establishment of the Energy Management Company Association of China (EMCA), as an institution to provide support to ESCOs, and as a way to provide technical assistance to newcomers and to represent the emerging industry to the Chinese government and other parties.

Figure 6 Phase II Loan Guarantee Programme



Source: the World Bank, 2002.

The ESCO Loan Guarantee Program helped create a bridge into the world of formal EE financing for many ESCOs. With the backing of USD 16.5 million placed in a special guarantee reserve fund held by the Ministry of Finance, I and G issued loan guarantees totalling approximately USD 52 million from 2004 through April 2008, which provided support for energy performance contracting project investments totalling about USD 90 million. Nearly 40 Chinese ESCOs have received loan guarantees for one or more of their projects. Twelve banks participated in this programme.

The key features of the programme included the following: GEF funds, through the Ministry of Finance, were used for programme operations, technical assistance and guarantee reserves. The World Bank and China’s Ministry of Finance entered into a guarantee programme operations agreement with I and G. I and G marketed, appraised and originated guarantees with ESCOs and banks. The guarantee was a three-party agreement that guaranteed 90% of the bank’s principal. Guarantee fees were paid by the ESCO as borrower.

Table 3 shows a comparison of the three risk-sharing programs.

Table 3 Three risk-sharing programmes

Programme	CEEF	CHUEE	China EC II
Public partner	IFC/GEF	IFC/GEF	World Bank/GEF
Private partners (LFIs)	14 participating banks	Industrial Bank and Bank of Beijing	China National Investment and Guarantee Company (I and G)
Risk sharing (Public/private)	50/50 pari passu	First 10%: 75/25 After 10%: 40/60	90%
First loss reserve	GEF: USD 15 million	None	GEF: USD 22 million
Target markets	Commercial/ industrial firms and ESCOs	Large industries	ESCOs
Total project investments	USD 208 million	USD 512 million	N/A
Total value of guarantees provided	USD 49.5 million	USD 197 million	N/A
Estimated CO₂ reduction	145 700 tons per annum	14 million tons per annum	N/A

Source: compiled by authors.

Energy Saving Performance Contracts (ESPCs)

Introduction

ESPCs have proven to be effective tools in overcoming some of the financing barriers to EE implementation in countries with very mature markets such as the United States, Canada and Germany. In the ESPC approach, the customer engages a commercial service provider to design and implement an EE improvement project with its remuneration connected in one way or another to the performance of the project. Generally some form of performance guarantee (such as, for example, a guarantee of energy savings) is provided by the service provider (IEA, 2010c).

The service provider can offer a range of services to the customer, such as an energy auditing, project identification and design, equipment procurement, installation and commissioning, measurement and verification (M and V), training, and operations and maintenance (O and M). Generally the service provider also provides or arranges the financing for the EE project (Singh *et al.*, 2010). In this way, private-sector expertise and capital can be deployed, allowing technical risks to be transferred away from the customer, facilitating equipment procurement and offering flexible financing options. More importantly, the project development and implementation can be outsourced to an entity that has the skills and incentives to overcome any short-term barriers and help realise the significant energy efficiency potential.

The role of the public partner in ESPC is twofold: (i) creating the enabling environment through legislative and regulatory changes that facilitates the implementation of ESPC, and (ii) providing the public facilities in which the private sector will implement EE projects using an ESPC (acting as the “client” for the ESPC services).

Although the concept of performance contracting originated with the Energy Supply Contracting, or *Chauffage*, model in France in the 1950s, much of the development of performance contracting occurred in North America during the 1980s and 1990s. Performance contracting has also been successfully implemented in many European countries (such as Germany), as well as in Japan and South Korea (Singh *et al.*, 2010).

The basic features of ESPCs offered by an energy services provider (ESP) or an ESCO are numerous (SRC, 2005). ESPCs can offer a complete EE service, including design, engineering, construction, commissioning, and operation and maintenance (O and M) of the EE measures, as well as training and measurement and verification (M and V) of the resulting energy and cost savings. ESPC services also include providing or arranging financing. Often a link exists between payments to the ESCO and the project performance; customers pay for the energy services from a portion of actual energy cost savings achieved.

ESCOs can be an important institutional mechanism for the delivery of EE investments. In recent years, many established ESCOs have become active, and new ESCOs have been created in developing countries (Motiva, 2005; Bertoldi and Rezessy, 2005). ESCOs strive to develop and implement EE projects for energy users around the globe. Under an ESPC, an ESCO develops, implements and finances (or arranges financing for) an EE project or a renewable energy project (at the end-user level), and uses the stream of income from the cost savings, or the renewable energy produced, to repay the costs of the project, including the costs of the investment (Limaye and Limaye, 2011).



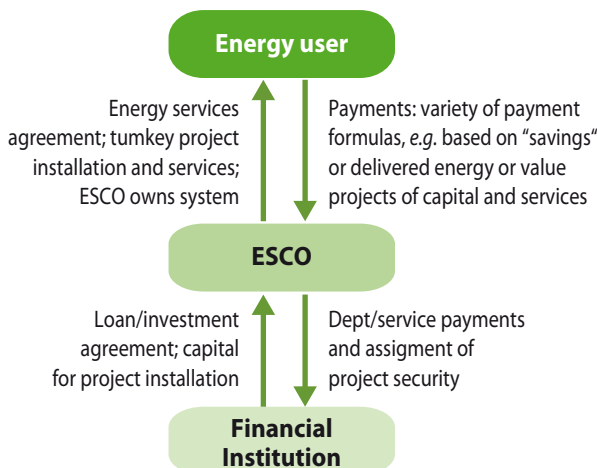
Objectives

The ESPC approach mobilises ESCOs to implement EE projects on a large scale using the performance contracting approach. The public partner creates the enabling environment for an ESPC, including legislative and regulatory changes needed to facilitate performance contracting projects in the public sector. The public sector then partners with one or more ESCOs to implement EE projects in public facilities.

Structure of ESPC business models

The concepts of ESPCs and ESCOs were developed in North America and have been increasingly adopted around the world, including developing countries. Although many different variations exist in the specific approaches to ESPCs, they can generally be characterised as three basic types of agreements: shared savings, guaranteed savings, and Energy Supply Contracting or *Chauffage* (Singh *et al.*, 2010). In all three types of agreements, the ESCO provides a wide range of implementation services and generates energy and cost savings. The differences are in the manner in which the project is financed, payments are made from the host facility to the ESCO, and energy and cost savings are allocated between the ESCO and the host facility.

Figure 7 Shared savings model



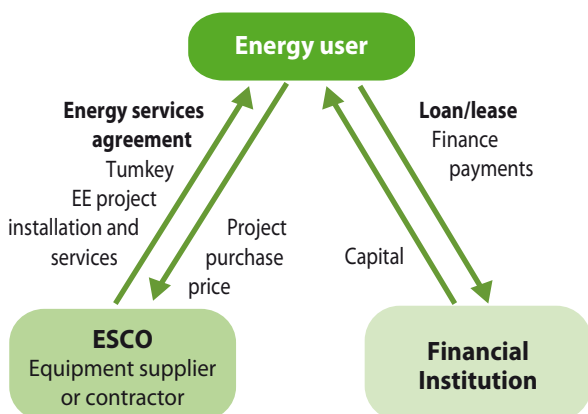
Source: Limaye, 2009.

In the **shared savings** model (Figure 7), the ESCO provides and/or arranges for most or all of the financing needed for project implementation, and assumes the customer credit risk. The ESPC specifies the sharing of the cost savings between the ESCO and the host facility over a period of time. The sharing of the payments is structured such that the ESCO recovers its implementation costs and obtains the looked-for return on its investment within that period.

In a **guaranteed savings** agreement (Figure 8), the customer takes the loan on its own balance sheet. The ESCO guarantees certain performance parameters (such as efficiency, energy savings, cost savings, and/or other performance parameters) in the ESPC, which specifies the methods for M and V, and payments are made once the project performance parameters have been confirmed.

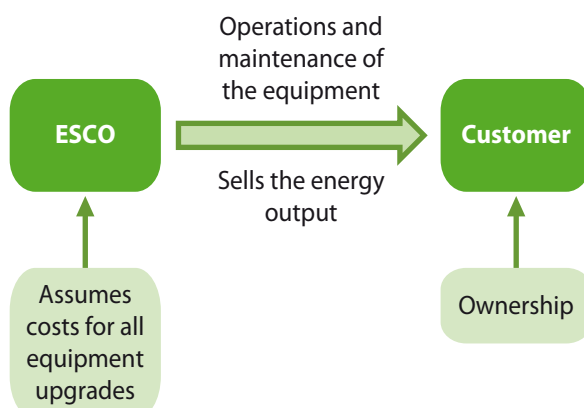
In the **Energy Supply Contracting or Chauffage** model, the ESCO takes over operations and maintenance of the energy-using equipment in the customer's facility and sells the energy output (e.g., steam, heating/cooling, lighting) to the customer at an agreed price (Figure 9). This model represents a form of "outsourcing", where the costs for all equipment upgrades, repairs, etc. are borne by the energy service provider (ESP), but ownership typically remains with the customer. The fee paid by the client under a *chauffage* arrangement is calculated on the basis of its existing energy bill minus a percentage savings (often in the range of 3%-10%), or a fee may be charged per square meter of conditioned space. Thus, under the *chauffage* arrangement, the client is guaranteed an improved level of energy service at a reduced energy bill. Contracts for this type of arrangement tend to be substantially longer than others, ranging from 10 to 30 years.

Figure 8 Guaranteed savings model



Source: Limaye, 2009.

Figure 9 Energy Supply Contracting Model



Source: Singh et al., 2010.

Public and Super ESCOs

In many developing countries, the ESCO industry has yet to be commercially developed to the extent that the ESCOs can engage in ESPC on a large scale. Box 1 defines some of the barriers to ESCOs in developing countries. To overcome such barriers, the concept of a “Public ESCO” has evolved. An example is the HEP ESCO in Croatia (The World Bank, 2010b). The advantages of such a Public ESCO are that it facilitates contracting with other public agencies, helps reduce regulatory issues and the high transaction costs associated with complex public-sector procurements, allows for financing of performance contracts from international donor agencies, and helps concentrate ESPC expertise. However, potential drawbacks of these Public ESCOs are that they may not provide services as efficiently as fully private ESCOs as a result of a lack of competition, and that they may inhibit the growth of the private ESCO industry through a public-sector monopoly.

The concept of a “Super ESCO” has recently evolved as one of the mechanisms for overcoming some of the limitations and barriers hindering the large-scale implementation of EE projects. A Super ESCO is established by the government and functions as an ESCO for the public-sector market (hospitals, schools, municipalities, government buildings, and other public facilities, and even private sector facilities in some cases), and also supports capacity development and project development activities of existing private-sector ESCOs, including helping create new ESCOs, and financing projects (Limaye and Limaye, 2011). The government capitalises the Super ESCO with sufficient funds to undertake ESPC projects and to leverage commercial financing for both the Super ESCO projects and local ESCOs sub-financing. The Super ESCO can also facilitate access to project financing by developing relationships with LFI or IFIs. The Super ESCO may even provide credit or risk guarantees for local ESCO projects, or act as a leasing or financing company to provide local ESCOs and/or customers EE equipment on lease or on benefit-sharing terms.

Box 1

Barriers to ESCOs in developing countries

- Most independent ESCOs have a small capital base and have difficulties accessing project funding from commercial financial institutions (FIs). Once their capital is tied up in a project, they can do no more lending, and therefore a way of recycling capital is needed, such as through bond issuances.
- The concept of project financing for ESCO projects is not commonly accepted by FIs in developing countries.
- EE projects are generally small relative to other investment projects being considered by the FIs, and they also have a relatively large proportion of “soft costs” that cannot be easily collateralised.
- Due to the immaturity of the EE market in developing countries, costs of project development are relatively high, and most small ESCOs find it difficult to finance project development costs.
- The ESCO model is new in developing countries and, due to the limited experience with successful ESCO projects, ESCOs have not yet developed good credibility with energy users.
- The FI’s staff typically has limited knowledge and understanding of EE projects and the ESPC concept. Also, FIs perceive EE projects (incorrectly) as inherently more risky than other investments.

The combination of high project developments costs, limited access to long-term and low-cost project financing, high equity requirements for project financing, and lack of credibility with customers has led to what may be considered a “market failure” with respect to the ESCO industry’s ability to implement EE on a large scale.

Source: adapted by authors from Limaye and Limaye, 2011.

A current example of a Super ESCO is Energy Efficiency Services Limited (EESL), established by the government of India as a public corporation owned by four power-sector public undertakings. It aims to meet the market development and implementation functions of India's National Mission for Enhanced Energy Efficiency (BEE, 2009).

Experience with ESPCs

Over the last 20 years, the ESPC mechanism has been recognised as one of the most promising approaches for public-private partnerships to implement EE measures, particularly in the public sector. Significant results have been achieved with performance contracting in some countries (Table 4).

In the United States, for example, more than 500 ESPC projects have been undertaken and have saved USD 11.7 billion in energy costs.

Case Study 3 in the annex to this report describes the US federal government's performance contracting programme using private utilities as partners. This programme, called the Utility Energy Services Contracting (UESC), involves PPPs between the US government's Federal Energy Management Program (FEMP) and private utilities. FEMP has developed the enabling policies, regulations and procedures as well as provided contract templates to agencies to facilitate contracting with utilities. The utilities perform the ESCO functions, including providing their own financing or leveraging commercial financing.

Table 4 ESPC results in selected countries

Country	Market size	Projects	Results
United States	USD 3.8 billion	500+	Energy savings ~ 30 trillion BTU USD 11.7 billion cost savings
Canada	CAD 320 million	85	20% reduction in energy intensity C\$40 million cost savings
Germany	EUR 200 million	2000 properties	20%-30% reduction in energy costs €30-45 million cost savings
Japan	JPY 10 billion	50	12% reduction in energy intensity
South Korea	KRW 223 billion	1 400	N/A

Source: adapted from Singh *et al.*, 2010.

Why are public-private partnerships important in financing energy efficiency?

PPPs have developed in part due to financial and technical expertise shortages in the public sector, and have demonstrated the ability to harness additional financial resources and operating efficiencies inherent to the private sector. If properly structured, PPPs are an excellent tool for the energy sector, where financing may not take place due to market failures and barriers. PPP mechanisms may enable governments to direct public spending more efficiently and with more precision, without the adverse effects of alternative government programmes such as subsidies or tax waivers.

Public authorities have increasingly worked to improve EE in their respective economies, and access to capital and financing has traditionally been identified as one of the barriers impeding this process. PPPs in EE can help to successfully attract private sector financing.

In many cases, the private sector can provide EE services with higher quality and more efficiently than the public sector alone.

Growing cooperation between the public and private sectors in PPP projects offers a number of advantages, including:

- faster pace of reduction of the energy intensity of the economy;
- reduced costs of EE to the public sector;
- better risk allocation between public and private sectors;
- better incentives to perform; and
- greater commercial value for public sector assets.

The importance of PPPs as a tool for developing EE is based on several elements. PPP structures can transfer benefits of public-sector involvement in the market, without the market distortion effects caused by other government initiatives. The flexible design of PPPs can enable governments to target precisely the use of public funds or direct private financing in areas that would otherwise be of no interest for the private sector.

Experience with PPP in EE financing

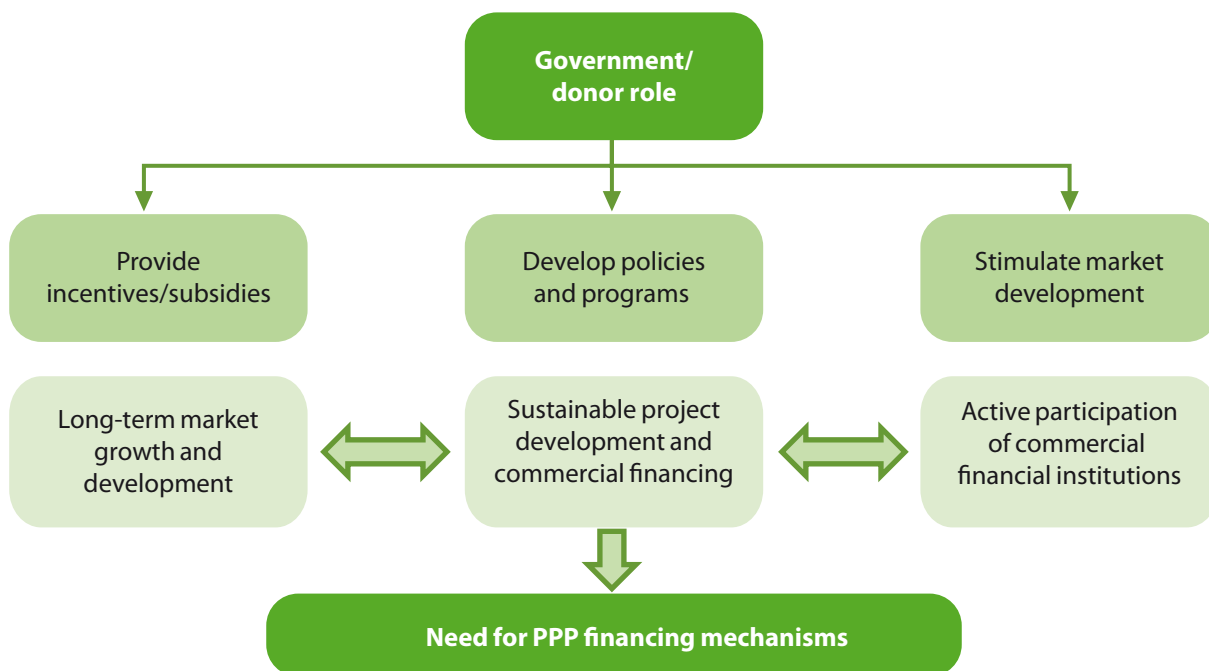
PPP structures successfully address one major barrier to EE implementation: lack of commercially viable financing. The problem is not lack of available funds, but making these funds available for EE projects through LFI. The issue is caused by the discrepancy between the existing lending practices and the nature and needs of EE projects. The PPP structures examined in this report are excellent tools for promoting the involvement of LFI in EE financing. The financing sourced from such PPPs for EE projects is market-driven and, unlike a subsidy programme, does not distort the behaviour of the market.

In recent years, governments and IFIs have increasingly used PPPs for EE financing. Governments, IFIs, and donor agencies have developed and implemented many policy and regulatory instruments to overcome the barriers and facilitate the scaling-up of investments in EE projects.

The approaches used have broadly focused on: (i) developing policies and programmes; (ii) providing incentives and/or subsidies; and (iii) stimulating the development of the market for the delivery of EE services.

Increasingly, policy makers have recognised that, although such public-sector actions can be effective in the short term under certain market conditions, the scaling of EE investments requires the facilitation of sustainable project development and commercial financing approaches. Public-sector initiatives can help towards creating an enabling environment in the short term to promote and facilitate financing of EE projects, but the active participation of commercial banks and financial institutions is necessary for the long-term growth and development of the market for delivering EE financing and implementation services (Limaye, 2011). PPP mechanisms can be utilised to obtain such leveraging of commercial financing (Figure 10).

Figure 10 Public sector vs. market roles in scaling up EE investments



Source: Limaye, 2011.

How do PPP mechanisms generate value?.....

When EE financing and performance risks are the barriers targeted, the three PPP mechanisms discussed in this report, if properly structured, can generate better value for money by:

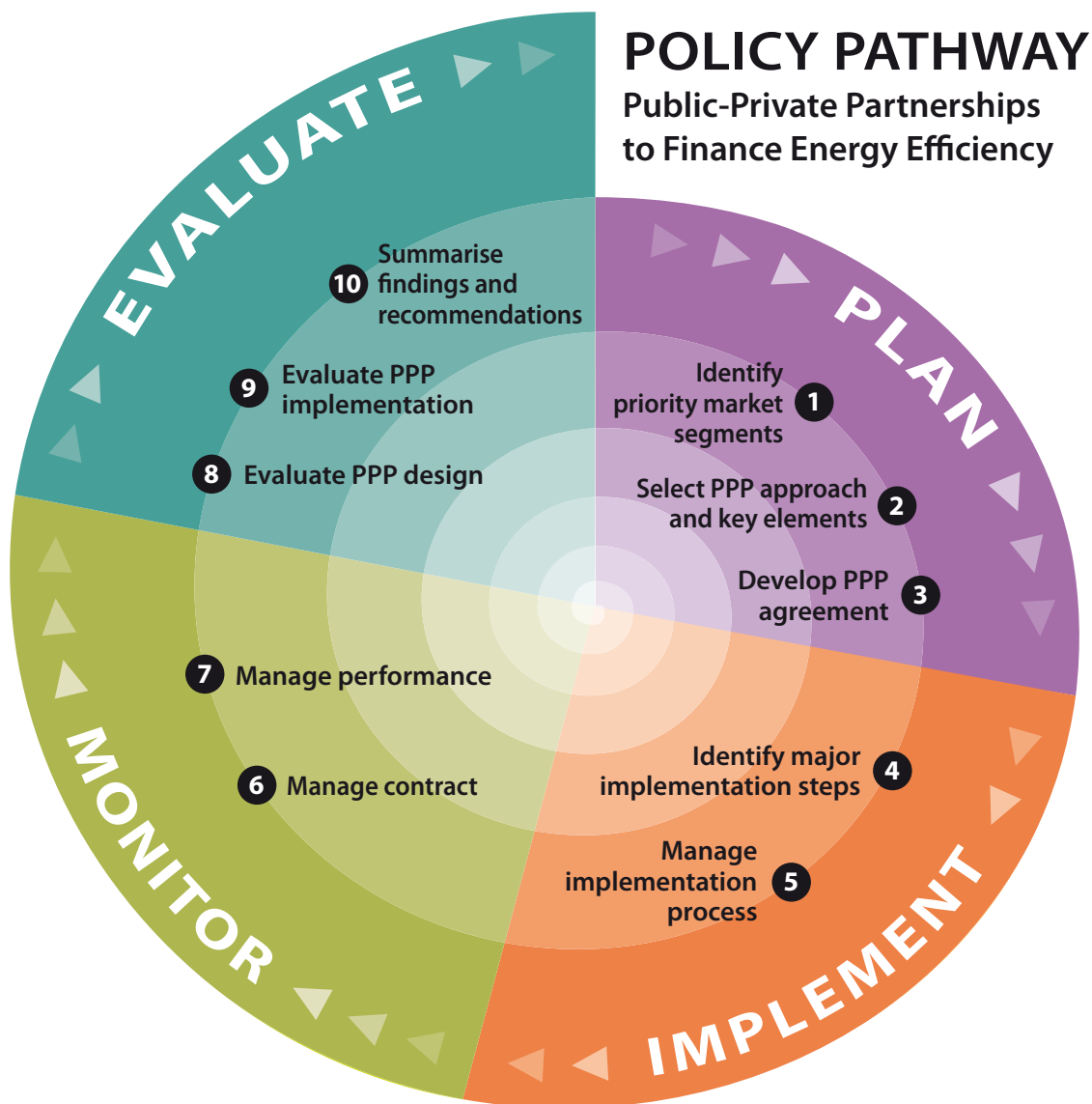
- reducing project life-cycle costs (in the case of third-party financing);
- reducing administration costs (in the case of subsidised rate loans and partial credit guarantees);
- providing better risk allocation (financial risk

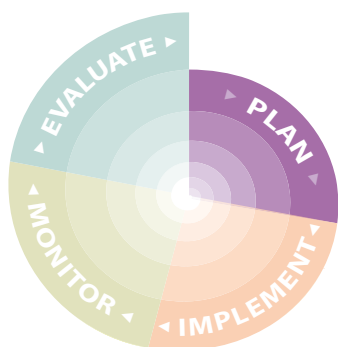
allocated to the bank and technical risk allocated to the ESCO);

- providing faster implementation (private sector may have better capacity to deliver the needed services); and
- providing improved service quality (private sector may have much more rigid quality controls in order to be competitive).

How to design effective PPPs for EE finance: the policy pathway

The policy pathway illustrates the four stages and ten critical elements in delivering PPPs for EE finance.





PLAN

Effective deployment of PPP mechanisms for EE finance requires certain policy and regulatory actions and the design of a suitable delivery structure. Planning is one of the most important phases in the process of developing and implementing PPP mechanisms for EE finance. The policy maker should first assess the suitability of a PPP approach for project implementation. The assessment should take into account a number of factors, as discussed below.

1 Identify priority market segments, and decide on type of market support needed

The first step in the planning process is to define the specific market segment where EE needs to be improved. National energy strategies usually identify the general areas that have to be improved to achieve the country's energy and EE goals. In many cases, however, such strategies are not detailed enough to serve as a basis for the development of a policy instrument to deliver those goals. Governments need to conduct detailed market analyses that build on top of existing strategy documents and pinpoint specific finance-related EE barriers. Stakeholders, *i.e.* LFI's, industry, civil society, should be consulted and involved in this process. The major sub-steps in identifying priority market segments are:

Assess the market situation

The assessment should consider the financing needs of the different sectors of the economy, where EE projects need to be implemented. The analysis needs to identify indicators such as: average EE project size in the targeted market segment, average investment payback times, typical EE technologies used, availabilities and costs of alternative financing mechanisms,

Box 2

Planning for the Bulgarian Energy Efficiency Fund

At the planning stage of the Bulgarian Energy Efficiency Fund, the government of Bulgaria first contracted with a consulting firm to carry out market analysis and design the fund so as to maximise the value for money in comparison to subsidy and incentive programs available at the time. The result was a fund, leveraging close to USD 40 million of Investments at the expense of a USD 3.6 million contribution from the government of Bulgaria, which far exceeded the effect of any subsidy program. The revolving and sustainable nature of the fund ensured that this effect would continue to accumulate in the future.

Source: the World Bank (2010a).

long-term prospects of the market segment, level of development of the EE supporting industry, and market-specific barriers that are currently preventing EE from being implemented.

Identify one or more market segments that can be grouped and targeted with a single policy instrument and also identify common barriers that prevent the development of EE investments in these segments. For example, it would be unwise to have one PPP mechanism targeting financing of large industrial waste-heat-to-energy projects and residential EE projects. These two types of projects employ significantly different technologies and require different implementation, monitoring and evaluation approaches.

Assess the potential impact

The evaluation should review the involvement of the public sector⁸ in these market segments and define the short- and long-term goals that need to be achieved.

⁸ And/or the private sector if the market segment is currently dominated by public sector financing or entities.

Define the type of involvement necessary to overcome these barriers

This involvement may include some or all of the following: capacity building, information dissemination, facilitation of financing, and provision of technical assistance services, etc.

Review the institutional framework

This review involves identifying the possible changes needed to facilitate ESPC and oversee any implementation of changes necessary.

Box 3

Planning for the CHUEE Program

In the case of the China CHUEE program, the government of China first identified a need for support in “developing new private sector initiatives in financing renewable energy and/or energy efficiency”. The International Finance Corporation (IFC) then conducted a two-year research study to identify specific market failures and barriers to EE investments. The study identified three major barriers (an information barrier, a lack of awareness among Chinese commercial banks, and risk aversion in the Chinese banking sector) and the CHUEE program was consequently designed to have three elements tackling these barriers: technical assistance to market players, a loan guarantee mechanism, and outreach and dissemination.

Source: IEG, 2010.

2 Select the PPP approach and key elements

In this next step, the public agency conducts a comparative analysis to choose among the different intervention instruments at its disposal. It compares the costs, benefits and impacts of different alternative programmes vs. a PPP approach for EE financing. This step assesses whether a PPP mechanism is preferable to achieve the public sector's goals.

Crucial to the selection process is whether a PPP will provide more value for money than its alternatives. The major sub-steps in selecting the PPP approach are:

Compare costs and benefits

The comparison includes the full costs and benefits of the public agency acting alone to provide the energy service project vs. the full costs and benefits associated with the mobilisation of private-sector know-how and resources to deliver the same service.

Evaluate suitable PPP mechanisms vs. alternative government programmes

The factors determining value for money will be different, depending on the specific goals of the public sector. This sub-step should consider the potential value of using one of the three specific PPP mechanisms. Final assessment can only be made at the end of the procurement process, when a private-sector partner is selected.

Consider the costs, benefits and limitations of each of these tools


Government interventions that are too weak will not achieve the desired impact on the market; on the other hand, too strong interventions may distort the market and may not be sustainable.

Define the private-sector partner's role

The definition should include the extent of the partner's involvement in developing the PPP agreement. The private sector typically will be interested in any potential financial, as well as non-financial, benefits (e.g. enhanced capacity, more tools such as innovative financing products and analytical spreadsheets and financial models, increased business opportunities, etc.) of this partnership and the value added by the public partner.

Determine the key features of the PPP mechanism

The features should include those most appropriate for delivering EE in a market segment: project design, procurement and construction, financing, ownership, operations and maintenance, marketing, and measurement and verification.

- *Project design:* in the case of dedicated credit lines and risk-sharing facilities, the project developers (project hosts or ESCOs) carry out the project design. The participating LFI reviews the project design, using in-house or third-party technical consulting services to ensure that the criteria defined by the public partner in the PPP agreement are met. In most cases, the public partner may retain the right to approve the loan disbursement. In ESPC projects, either party may carry out the project design, but the private partner (the ESCO) usually has an active role, because this PPP requires the private partner to provide a number of technical and performance guarantees.
 - *Procurement and construction:* purely financial PPP mechanisms, such as dedicated credit lines and risk-sharing facilities, delegate this responsibility to the project host. The PPP, in many cases, sets the procurement rules for the project beneficiaries. With ESPCs, because the private sector provides an EE service, the private partner (the ESCO) usually handles all the elements that contribute to this service. The public sector only carries out oversight and supervision, but rarely interferes in the implementation process.
 - *Financing:* one of the main objectives of the PPPs is to mobilise private-sector financing. PPPs involving financial structures (credit lines or guarantees) usually aim to leverage as much private-sector financing as possible. In the case of ESPCs, PPPs can be structured in different ways to mobilise commercial financing.
- 
- The public sector can either aim to overcome the limitations of its own budget by getting the ESCO to raise private-sector funds, or if the public agency has appropriate budget authority, it can finance the project directly with commercial LFIs.
- *Ownership:* typically, when EE projects are implemented in the public sector, the public sector retains ownership and control of the assets. When projects are implemented in private-sector entities, the assets can be owned either by the project host, or by the energy services company (in the case of ESCO financing).
 - *Operations and maintenance:* the delegation of the operation and maintenance (O and M) of the project depends on a number of factors, such as type of project, public- or private-sector project host, EE technology implemented, type of PPP instrument used, etc. PPPs that are financial mechanisms focus on the provision of financial services and leave O and M to the project host. In ESPCs, because the ESCO provides performance guarantees, the O and M responsibilities are clearly defined in the project agreement and may either be assumed by the ESCO or appropriate training is provided by the ESCO to the staff of the public agency. In the case of public-sector facilities, the O and M is often kept at the level of the facility, because the facility may be already equipped to realise such tasks and cannot easily reduce its personnel in case of outsourcing.

- **Marketing:** marketing (developing the “deal flow” for the commercial financing) of the PPP is important from the public partner’s perspective, because the objective of the PPP is to increase commercial financing of EE projects. In the case of dedicated credit lines and risk-sharing facilities, the public partner generally makes provisions for publicising the availability of the financing instrument and may also provide technical assistance to potential borrowers. The participating private partners will also conduct marketing campaigns to inform their customers of the availability of the loan facility and its characteristics, terms and conditions. In ESPCs, the private partners (ESCOs) work closely with the public partners to identify public-sector projects and develop the project information (using audits, feasibility studies, etc. that may be co-funded by the public partner) to prepare the projects for commercial financing.
- **Measurement and Verification:** in the case of dedicated credit lines and risk-sharing facilities, the public partner should require the private partner(s) to document the information on each project so that an appropriate assessment can be made of the results of the PPP. The PPP agreement generally specifies the M and V approach that the private partner(s) should use. In most cases, the public partner conducts a post-programme evaluation that includes an assessment of the results of all or selected projects. In the case of ESPCs, M and V is an integral component of every project agreement, because it is needed for confirmation that the guarantees provided by the ESCOs are being satisfied.

Box 4

Private-sector responsibilities in BEEF

In the case of the Bulgarian Energy Efficiency Fund (BEEF), the private sector had full management independence, including autonomy in the day-to-day management of the facility, and a majority on the management board. The state took only the role of strategic supervision with limited control.

Source: the World Bank (2010a).

3 Develop the PPP agreement

The previous steps have already determined whether a PPP is feasible and what form it should take.

The PPP agreement must consider the needs of all parties and how best to achieve delivery. The major sub-steps in developing the PPP agreement are:

Complete the project design

The design will be relative to the PPP structure selected (including technical performance standards, financial assessment to ensure viability, and design of future contract forms). The design should focus on what will be achieved and how. Structuring the right PPP agreement and selecting the right private partner(s) are critical to achieving the desired goals by the public sector. In many cases, only small changes in the PPP structure can result in huge differences in the performance of the mechanism. An example is a comparison between the Bulgarian and Romanian Energy Efficiency Funds (BEEF and FREE) (Table 5). Both funds were designed by the World Bank and were somewhat similar in structure, but they had important differences in their design, which contributed to significant differences in the performance.

Select and design the tendering process

The process includes type of tender process, and procedures for tender, evaluation, negotiation, and contract award. One example of a selection process for private partners is the selection of the private ESCO partners for the US Federal Energy Management Program (FEMP) (Box 5). The following generic selection methods are available for selecting private-sector partner(s), depending on the project parameters and the private-sector role and level of involvement in the PPP:

- **Open public procurement:** where an unlimited number of potential private partners can bid.
- **Limited (two-stage) procurement:** where an open invitation is extended for expression of interest, but only short-listed candidates are invited to submit proposals.

Table 5 Comparison of Bulgarian and Romanian EE funds

Feature	Bulgarian Energy Efficiency Fund	Romanian Energy Efficiency Fund
Board make-up	Seven board members, including four representatives of private sector, with banking, financial and EE background	Seven board members, initially all government officials, with no banking or financing background
Loan committee	Informal loan committee set up by the fund manager	Official loan committee, subordinate to the management board
Share of fund capital disbursed	Over 50% of fund capital disbursed to fund at the start	10% of fund capital disbursed initially
Fund manager expertise	Very strong local expertise in financing and energy efficiency	Very limited local experience
Fund manager contract	Mostly performance based	Mostly fixed remuneration

RESULTS – with quotes from the World Bank Implementation Completion Reports

Level of difficulties faced	<i>“The project was not restructured (except a technical restructuring to reallocate guarantee funds to the loan facility) and was never at risk. The Mid-Term Review carried out in November 2007 favourably assessed project implementation, as well as the initiatives and instruments that had been launched.”</i>	<i>“The project experienced considerable difficulties during the early stages from 2002-04. The Fund Manager (FM) team was strong and had international experience, but the learning curve was steeper than expected for FREE executives, the Board of Administration and investment committee, and turnover of key officials exacerbated these difficulties.”</i>
Time to sign first project	6 months after FM had started work (source FM records)	<i>“The first project was not signed until September 2004, about 18 months after the FM had started work.”</i>
Changes to FM contract	Remained unchanged	<i>“The FM contract was revised in mid-2004, and local specialists were recruited...The new fund manager contract changed the compensation to a lower fixed fee and a higher performance-based remuneration.”</i>
No. of projects financed and leveraged investments	In the first five years of operation, 112 projects financed, leveraging USD 39 million investments	In the first five years of operation, 20 projects financed, leveraging USD 34.9 million

Source: compiled by authors from the World Bank, 2009 and 2010a.

- *Negotiated agreements*: where the public sector negotiates with one or more potential private partners.
- *Competitive dialogue*: in this approach, used in some European countries, the public partner discusses the project with several potential private partners. The interested private partners submit their proposals, and the most attractive offer is selected using a set of pre-determined and pre-specified criteria (Singh *et al.*, 2010).

Define the implementation conditions

The conditions include monitoring and oversight conditions, measurement and verification, and redress and renegotiation. The public partner is responsible for the majority of these activities. The PPP agreement needs to specifically define the terms and conditions related to who will be responsible for these important implementation elements. Generally, the public partner will assume the monitoring and oversight responsibilities, while measurement and verification may be conducted by the private partner or by an independent third party. The public and private partners need to agree on the dispute resolution procedures so that redress and renegotiation can be addressed efficiently and effectively.

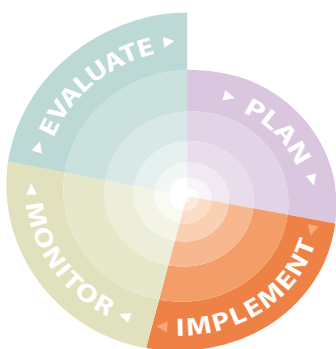
Box 5

Example of procurement process: US Federal Energy Management Program

1. Department of Energy (DOE) representative reviews super-ESPC process and opportunity for a project with agency.
2. Agency issues Notice of Opportunity (NOO) to all 16 pre-qualified ESCOs; interested ESCOs respond.
3. Agency evaluates responses and down-selects to two or more ESCOs.
4. Agency requests additional information, e.g, past performance, case studies.
5. Agency down-selects to one or two or more ESCOs to prepare Preliminary Assessment(s) (PA).
6. Agency evaluates PA or PAs and, on decision to pursue the project, issues Notice of Intent to Award (NOITA) to one ESCO, authorising it to proceed to Investment Grade Audit (IGA) and final proposal.
7. ESCO conducts an IGA and solicits competitive financing offers.
8. ESCO prepares and submits final proposal (based on IGA and financing); throughout the IGA and final proposal preparation period, a continuing dialogue, facilitated by the FEMP Project Facilitator, takes place between the agency and the ESCO.
9. Agency evaluates ESCO's final proposal and negotiates any changes required.
10. Agency prepares Task Order (TO); Department of Energy (DOE) reviews TO for compliance with contract and statute.
11. Agency awards TO to ESCO to begin project.

Source: www1.eere.energy.gov/femp/pdfs/00c_selectionoverviewtemp.pdf

Note: To streamline the selection process, FEMP has awarded pre-competed contracts to 16 ESCOs; Agencies may award TOs against these contracts.



IMPLEMENT

PPP relationships require adjustments to the implementation systems typically associated with traditional loans or grant-financed projects, because the roles and responsibilities of the parties change with increased private-sector involvement. The most important of these changes is the transformation of the public-sector role to a management and regulatory function. Fulfilling this function requires the development of effective regulatory systems and monitoring practices, and may entail a strengthening of national legislative, regulatory and institutional capacities to provide an effective framework for PPPs.

4 Identify major implementation steps

The private partner takes the lead in the implementation of the PPP mechanism, but the public partner needs to define the implementation steps and coordinate them with the private partner. The major implementation sub-steps, which depend on the selected PPP design and the selected private-sector partner, are listed below and explained for each type of PPP in Table 6.

Develop financial products

The public partner should define the specific structure of the financial product. For dedicated credit lines, this structure would involve the terms and conditions of the loans; for risk-sharing facilities, it would be the terms and conditions of the guarantee facility agreement between the public and private partners; and for ESPCs, it would be the nature of the financial agreements.

Define lending process

The public partner needs to define the relevant processes and policies for the implementation of the products of the PPP.

Develop risk assessment and management process

The appropriate allocation of risks between public and private partners is a key feature of the PPP. In this sub-step, the public partner defines how the risks are to be allocated, assessed and managed.

Build capacity of the private partners

Technical assistance for the capacity building of private partners has been a major element of PPPs. The public partner needs to make appropriate provisions for such capacity enhancement.

Develop and implement marketing approach

The public partner needs to cooperate with the private partner to develop and implement a marketing campaign targeted at the sectors addressed by the PPP.

Adjust products and processes to meet market needs

Experience with PPPs indicates that market conditions may necessitate modifications/adjustments to the PPP design and structure. The public partners need to ensure that a feedback mechanism is in place to allow for such adjustments.

Develop and implement M and V procedures

Measurement and verification (M and V) of program results is another very important element of the PPP. The public partner needs to establish the appropriate M and V procedures in collaboration with the private partner.

Table 6 Implementation steps for PPPs

Implementation step	Dedicated credit line	Risk-sharing facility	Energy saving performance contract
Financing products	Create new EE loan product combining public partner funds with private partner funds	Guarantee product offered by public partner; private partners may develop new products for specific target markets	Public and private partners may work with LFI to create new financial products for ESPCs
Lending process	Adjust relevant lending processes and policies of LFI to reflect PPP arrangement with public partner and specified EE lending conditions	Adjust relevant LFI lending processes and policies to reflect PPP arrangement and requirements of guarantee facility agreement	Structure private-sector financing for ESPC (mix of equity and bank financing) procedures with LFIs for different types of ESPCs
Risk assessment and management	Adjust risk management procedures	Adjust risk management procedures	Define appropriate risk allocation between partners
Capacity building	Enhance capacity of risk managers and loan officers as needed for dedicated credit line	Enhance capacity of risk managers and loan officers as needed for guarantee facility agreement	Build capacity of ESCOs to develop “bankable” project proposals for financing by LFIs
Marketing	Carry out marketing campaigns to increase market awareness of potential project developers	Carry out marketing campaign to increase awareness of potential project developers	Publicise and market ESPC concept to public agency managers
Adjusting products and processes	Adjust product/processes as appropriate based on market feedback to streamline implementation	Adjust product/processes as appropriate based on market feedback to streamline implementation	Work with LFIs to adjust products processes to meet market needs of ESPCs
Implementing M and V	Implement project- and program-level evaluation and M and V procedures as required by agreement	Implement project- and programme-level evaluation and M and V procedures as required by agreement	Develop and implement project-specific M and V procedures in collaboration with LFIs

5 *Manage the implementation process*

Although the private sector is responsible for the actual implementation of the PPP mechanism and the delivery of service, the public partner is responsible for managing the implementation process and making adjustments, as needed, if the PPP instrument may be falling short of its objectives or if changes in the market situation require such adjustments.

A good example is the IFC CEEF programme, in which the IFC made programme changes based on information from the field offices regarding the factors influencing successful project implementation. These changes were designed to make the programme operations more flexible and responsive to market needs, so that the programme staff could react more effectively and promptly to market changes, create new products and delivery mechanisms, and develop better relationships with the FIs and other programme stakeholders (Danish Management Group, 2010). These changes were appreciated by the field staff and the stakeholders and led to a large number of additional projects.

The major sub-steps are:

Define and implement procedures for obtaining and assessing feedback from market implementation

As indicated above, the public partner needs to obtain market feedback to ensure that the PPP is functioning as planned and to make the necessary corrections if market conditions so dictate. Such feedback can be obtained from the field implementation unit (to the extent that the public partner has such field presence), or by conducting surveys of a sample of implemented projects.



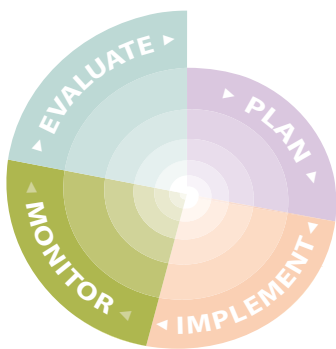
Require private partner to provide periodic reports on progress of implementation

The public partner needs to establish procedures for periodic progress reporting by the private partner on the progress of the PPP implementation. Such periodic reports may be monthly or quarterly in a format that allows the public partner to identify any needed programme modifications or adjustments.

Develop procedures to adjust and refine financial products and delivery mechanisms, as needed

The agreement between the public and private partners needs to have provisions for programme modifications or adjustments, to the extent determined by the market feedback. The public partner should develop the procedures for identifying and implementing such refinements and modifications to the PPP financial products and delivery mechanisms.

The implementation phase is generally less prone to risks if the PPP mechanism has been properly structured and the implementation issues and costs involved have been considered appropriately at the outset. However, the public sector has to manage the private sector's implementation of all elements and features of the PPP mechanism to ensure that they are in accordance with the PPP design and the requirements of the PPP agreement. In cases where the market or other factors demand adjustments in the PPP in the implementation phase, the public sector must take the lead and have the final say in the approval of any such adjustments.



MONITOR

The implementation steps above have outlined the processes for obtaining feedback, monitoring progress, and establishing procedures for modification and refinement of the PPP products and delivery mechanisms. The monitoring step requires that the public partner follows these processes. The two major steps in the monitoring function involve managing the contract and the performance of the private partner in implementing the PPP.

6 Manage Contract

The operation of any PPP for EE finance requires a significant level of proactive management of the interface between the public agency and its private partner to ensure that the service is provided in accordance with the precise requirements set out in the PPP agreement. In a conventional project, project management covers the procedures and organisation needed to take a project through the planning, design, procurement and construction stages before handing it over to operational staff to deliver the service. In a PPP project, the private partner conducts the project management, while the public partner has responsibilities for overall management of the PPP contract.

The overall objective of contract management is to ensure the actual delivery of a service that represents value for money. The major sub-steps in managing the contract are:

Define private partner's project management and reporting responsibilities

The public partner needs to define in the agreement the private partner's specific responsibilities, authority and procedures for the oversight and guidance and the private partner's periodic reporting responsibilities of the PPP progress.

Develop and implement procedures for maintenance of records and reporting to the public partner

The private partner should be required to maintain appropriate detailed records of each project transaction in accordance with the needs of the PPP.

Define approach for management of adjustments and changes

The procedures for making adjustments and modifications were defined in the implementation step. In the monitoring step, the public partner needs to define the specific approach for managing such refinements, including the definition of responsibilities and activities of each partner.

Develop and implement procedures for authorisation of payments

Dedicated credit lines and risk-sharing programs involve payments from the public partner to the private partner. The public partner needs to determine and specify the conditions under which such payments are made and the procedures for verification and authorization of the payments.

Implement the approaches for the discharge of statutory duties associated with reporting to a public agency

Most public agencies have some statutory responsibilities and obligations based on their charter. The PPP needs to define the approaches and procedures that the private partner must adopt to facilitate the public partner in discharging these statutory requirements.

An example is the Global Environment Facility (GEF) Project in Poland, the Krakow Energy Efficiency Project, where a GEF-supported partial credit guarantee mechanism was implemented through the Polish State Bank BGK (Bank Gospodarstwa Krajowego). In addition to monitoring the performance indicators, defined in the project design, contract management also included responsibility for the contract between GEF and BGK and the contract between BGK and partner banks.

In a PPP project that involves a transfer of operating activities to the private sector, contract management extends throughout the term of the contract.

7 *Manage Performance*

Performance management can be part of the contract management function, but in the context of PPPs for EE finance, it needs to be given special focus. Performance management involves monitoring of service delivery and assessment of performance relative to the standards defined in the PPP agreement. Because payment for services is based on the achievement of specific objectives, performance management is a critical matter that determines whether the private partner is in compliance with contract terms and, therefore, whether the amount of payment is due.

The public sector must continually monitor the risks transferred to the private sector, stipulated in the PPP agreement, to ensure no deviation occurs from the PPP design. Areas to be monitored include service, risks, and payment. Service-related elements include scope of service (target clients, technologies and types of projects); quality of service (speed of disbursement and streamlining of approval processes); and coverage of service (target market sectors). Risk-related elements include financial risks (to ensure LFI do not over-collateralise loans, or become too careless if loans are covered by PPP guarantee); and service performance risks (to ensure quality of O and M services in third-party financing).

The major sub-steps in managing performance are:

Develop financial and technical indicators in the PPP design as a basis for reporting and monitoring the performance of the private-sector partner

Such indicators are generally a part of the PPP design and structure and are specified in the PPP agreement. Examples of some indicators include costs per unit energy saved or per ton GHG emissions reduced.

Review the monitoring reports to ensure that performance targets are being met

The public partner needs to establish a process for formal review of the progress reports being provided periodically by the private partner and to define criteria to ensure that performance is on track and, if not, to identify the needed changes in the PPP design and implementation process.

Identify corrective actions needed if market conditions and private partner performance so require

This sub-step involves the actual implementation of the needed adjustments or modifications as determined by review of the private partner's progress reports and the market feedback.

Modify/adjust PPP design and implementation procedures in collaboration with the private partner

Once the corrective actions have been identified in the previous sub-step, the public partner needs to implement the appropriate modifications/adjustments in collaboration with the private partner.

For dedicated credit lines or risk guarantees, one important aspect of ongoing project monitoring is the fact that LFI prefer to disburse larger loans to clients with solid balance sheets. If not monitored, the LFI will be biased toward financing larger EE projects in large companies. In many cases, however, the public partner will be trying to develop EE in small and medium enterprises (SMEs). In such situations, the focus should be to monitor areas where the interests of the public and private partners may not be totally aligned and to make sure that the PPP is delivered in a way that maximises the effect for the public partner. These issues should be already dealt with in the contract; if the public partner considers that a mechanism is needed specifically for SMEs, the contract should provide definitions and restrictions regarding the size of companies and projects.

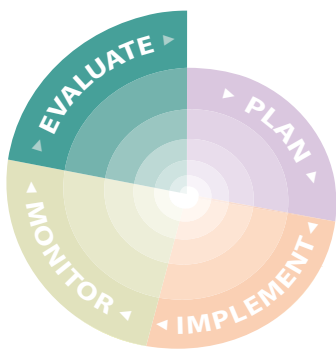
Box 6

China Energy Efficiency Financing Programme

The China Energy Efficiency Programme – Phase I (CHEEF I), which provided a dedicated credit line for EE, resulted in a number of loans provided by Exim Bank (one of the two participating LFIs) exclusively to large industrial customers with strong balance sheets. Recognising that the private partner (Exim Bank) had failed to extend financing to SMEs, ESCOs, and the public sector, the World Bank is now initiating a new programme, CHEEF Phase III, with Exim that includes specific provisions to provide financing to such projects.

Source: the World Bank, 2010d.





EVALUATE

Programme evaluation is an ongoing process, which begins with the start of PPP operations. Evaluation is intended to examine whether the programme objectives have been achieved and, if not, to determine how the programme should be adjusted to do so. It involves an assessment of the entire life cycle of the PPP, including achieved results, deliverables, challenges and issues, and key lessons learned.

8 Evaluate the PPP design

During the planning stage, the design of the PPP structure was based on lessons learned from previous initiatives in this or similar markets. The evaluation stage assesses whether the design turned out to be successful and compares its benefits and shortfalls to alternative structures. The evaluation also considers how the various risks identified in the beginning were mitigated.

An independent organisation generally carries out the evaluation of programme design. The World Bank, for example, has an Independent Evaluation Group (IEG) charged with evaluating the activities of the World Bank's two institutions, the International Bank for Reconstruction and Development (IBRD) and the International Development Association (IDA), as well as the work of the International Finance Corporation (IFC). The Director-General of IEG reports directly to the World Bank Group's Board of Directors. The IEG's goals are to provide an objective assessment of the results of the Bank Group's work and to identify and disseminate lessons learned from experience (IEG, 2011).

The major sub-steps in the evaluation of the PPP design are:

Define the evaluation needs

This sub-step defines why an evaluation needs to be performed and what the public partner needs in the final results of the evaluation.

Identify and document the major evaluation parameters and indicators

The public partner needs to specify the major elements of the evaluation and define the key results that need to be monitored and evaluated.

Define who will conduct the evaluation

The evaluation may be conducted by the public partner, the private partner or an independent third-party evaluator. In major PPP programs, the public partner generally engages a third party to conduct an independent evaluation, which is likely to be more unbiased and credible relative to evaluations conducted by either the public or private partner.

Develop outline of evaluation report

It is very useful to develop an outline of the final report of the evaluation at the beginning of the project implementation. Such an early definition specifies and guides the private partner in collecting and maintaining the needed market and project information and developing the needed recordkeeping procedures.

A typical programme evaluation report includes project definition, project formulation, project implementation, attainment of results, sustainability, recommendations, and lessons learned (Table 7).

Table 7 Typical contents of a programme evaluation

1. Executive summary		
<ul style="list-style-type: none"> Brief description of project Context and purpose of the evaluation Main findings, conclusions, recommendations and lessons learned 		
2. Introduction		
<ul style="list-style-type: none"> Purpose of the evaluation Key issues addressed Methodology of the evaluation Structure of the evaluation 		
3. The project and its development context		
<ul style="list-style-type: none"> Project start and duration Problems that the project seeks to address Immediate and development objectives of the project Main stakeholders Results expected 		
4. Findings and conclusions		
4.1 Project Formulation	4.2 Project Implementation	4.3 Results
<ul style="list-style-type: none"> Conceptualization/Design Country-ownership Stakeholder participation Replication approach Comparative advantage of implementing agency 	<ul style="list-style-type: none"> Implementation approach Monitoring and evaluation Stakeholder participation Financial planning Sustainability Execution and implementation modalities 	<ul style="list-style-type: none"> Attainment of outcomes/ Achievement of objectives Sustainability
5. Recommendations		
<ul style="list-style-type: none"> Corrective actions for the design, implementation, monitoring and evaluation of the project Actions to follow up or reinforce initial benefits from the project Proposals for future directions underlining main objectives 		
6. Lessons learned		
<ul style="list-style-type: none"> Best and worst practices in addressing issues relating to relevance, performance and success 		

Source: GEF, 2005.

9 Evaluate PPP implementation

This step assesses changes in the operating context and how those managing the PPP have responded with changes to the PPP's structure. Often the PPP needs to adjust to market environments, and structural changes are necessary as soon as the PPP is implemented. The evaluation focuses on the drivers for these changes and the response of the PPP in accommodating them.

The major sub-steps in evaluating PPP implementation are:

Identify the major positive and negative factors affecting the implementation

Positive factors may include implementation of favourable legislation and launching of similar or complementary projects in the market leading to a multiplier effect. Negative factors may include competing schemes that slow down the uptake of the PPP products.

Assess how the programme was monitored

Step-by-step monitoring, verification and evaluation are critical for any PPP project. The format, contents and frequency of implementation progress reports are to be agreed by the parties at the contracting stage and included in the Project Implementation Plan.

Assess the adequacy of the data collection and reporting by the private partner

Adequate data collection and reporting are important from the perspective of the public partner to track the progress and results of the PPP and to meet its statutory responsibilities and obligations.

Ensure fiduciary compliance

Compliance needs to cover requirements such as financial management, implementation and operation of a financial information system, procurement of goods and services by the private partner, and regulations imposed by the public partner related to environmental and social standards.

Some of the requirements may include ensuring that project funds are deployed effectively and efficiently for the intended purpose of the PPP. The public partner may require the establishment of a designated pooled account for the public funds and/or a separate ledger account that tracks receipt and use of public funds.

Box 7

Evaluation of Czech Republic Low-Cost/Low Energy Buildings Project

The GEF Terminal Evaluation Review of the Czech Republic Low-Cost/Low-Energy Buildings Project, implemented by the UNDP, demonstrated how small design flaws, such as insufficient technical assistance, or local management of the project, can lead to a deviation from the project objectives during implementation. If the deviation is not recognised until the evaluation process at the end of the project, as in this case, it may be too late to correct such flaws. The evaluation report concluded that:

"... based on all available evidence, the project appears to have some misdirected goals in design and subsequent effectiveness in execution (creation of a financial mechanism to support activities, create a government plan to promote the new LCLE standards). The project was adaptive and marginally effective in attaining some the objectives; and the spreading of the new building standard can at least in part be attributed to the role of this project and its direct and indirect effects. Nevertheless, the project failed to deliver basic deliverables as designed and attribution is hindered due to a lack of evaluative evidence."

Source: GEF, 2005

10 Summarise findings and recommendations

The evaluation phase ends with a report, summarising the findings and the lessons learned. The major sub-steps in summarizing findings and recommendations are:

Review the major findings of the evaluation report

This sub-step consists of a careful review of the findings of the programme evaluation (particularly when conducted by an independent organization).

Document the lessons learned

The evaluation report provides a summary of the lessons learned. The public partner should review and discuss these with the private partner and summarise and document them in a manner that will be useful for future design of similar PPPs.

Define the major recommendations

The recommendations should include potential changes and improvements in the PPP structure for future applications.

An example of a summary of an evaluation of the CHUEE program is provided in Box 8.

Box 8

Evaluation summary of CHUEE Programme

“CHUEE I and II were very heavily focused on large industrial customers. But this proved difficult to replicate. Next generation CHUEE is for mid-tier banks (rural development banks) with SME reach and poor access to financing. IFC is looking at innovative ways to refine the CHUEE model, trying to get the LFI to assume more and more risk in a gradual fashion for the SME segment. As the market grows, IFC will decrease their risk share until LFIs take on all the risk at some point. We are looking at the possibility to get dedicated CHUEE facilities, where not-traditional (private sector) partners are first-loss partners, such as large ESCOs, property developers/managers, industry associations, supply chains or large buyers who want to green their supply chain. The strategic partner should be able to play a significant role in the project pipeline.

CHUEE started in China, but has later been replicated in the Philippines (SEF – sustainable energy finance) and in other markets where liquidity is not a problem.”

*Alexander Ablaza, Sustainability and Climate Finance Specialist
International Finance Corporation*

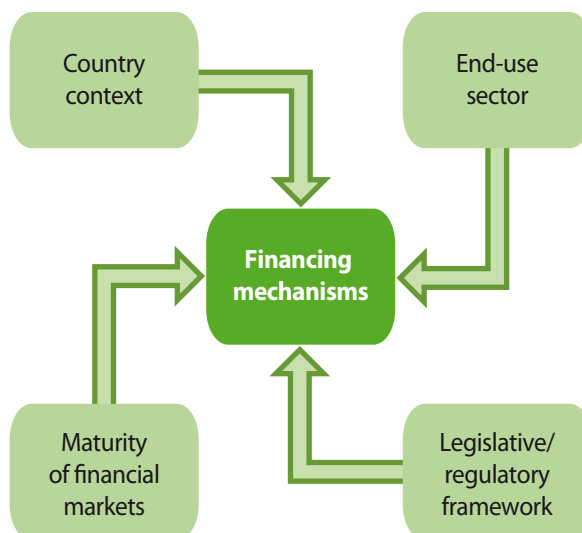
Conclusions and considerations

Public-private partnerships (PPPs) for EE financing can serve as an effective means to realize energy efficiency investments. They may not provide solutions to every problem or barrier related to scaling up of EE project implementation, nor are they applicable under all circumstances. Some PPP instruments may be complex and difficult to standardise, structure, and manage. When designed and implemented appropriately, however, PPPs can be a powerful tool to address many EE project implementation barriers including financing barriers.

The application of a PPP structure for EE financing depends on a number of characteristics including the country context, the legislative and regulatory framework, the existing energy services delivery infrastructure, and the maturity of the commercial financial market (Figure 11).

The three PPP approaches discussed in this report are applicable in different market environments and represent different degrees of public and private financing approaches.

Figure 11 Factors influencing applicability of PPP for EE financing



Source: Limaye, 2011.

Table 8 The policy pathway for public-private partnerships

Four phases	Ten critical elements	Thirty-eight steps
PLAN	1 Identify priority market segments	<ul style="list-style-type: none"> Assess market situation and financing needs Assess potential impact on market segments and define goals Define type of involvement needed to overcome barriers
	2 Select PPP approach and key elements	<ul style="list-style-type: none"> Compare the full costs and benefits of using PPP mechanism Evaluate suitable PPP mechanisms vs. government programmes Assess the costs, benefits and limitations of each mechanism Define the role and involvement of private sector partner Determine the key features of the PPP mechanism
	3 Develop PPP agreement	<ul style="list-style-type: none"> Complete project design relative to the PPP structure Select and design tendering process Define the implementation conditions

Four phases	Ten critical elements	Thirty-eight steps
IMPLEMENT	4 Identify major implementation steps	<ul style="list-style-type: none"> • Develop financial products • Define lending process • Develop risk assessment and management process • Build capacity of the private partners • Develop and implement marketing approach • Adjust products and processes to meet market needs • Develop and implement M and V procedures
	5 Manage implementation process	<ul style="list-style-type: none"> • Define and implement procedures for obtaining and assessing feedback • Require private partner to provide periodic progress reports • Develop procedures to adjust/refine financial products and delivery mechanisms
MONITOR	6 Manage contract	<ul style="list-style-type: none"> • Define project management and reporting responsibilities • Develop and implement procedures for records maintenance and reporting • Define approach for management of adjustments and changes • Develop and implement procedures for payment authorisation • Implement the approaches for the discharge of statutory duties
	7 Manage performance	<ul style="list-style-type: none"> • Develop financial and technical indicators • Review the monitoring reports to assure performance • Identify corrective actions needed • Modify/adjust PPP design and implementation procedures
EVALUATE	8 Evaluate PPP design	<ul style="list-style-type: none"> • Define the evaluation needs • Identify and document major evaluation parameters and indicators • Define who will conduct the evaluation • Develop outline of evaluation report
	9 Evaluate PPP implementation	<ul style="list-style-type: none"> • Identify major factors affecting implementation • Assess how the programme was monitored • Assess the adequacy of the data collection and reporting • Assure compliance with fiduciary requirements
	10 Summarise findings and recommendations	<ul style="list-style-type: none"> • Review the major findings of the evaluation report • Document the lessons learned • Define the major recommendations

Dedicated credit lines

Dedicated credit lines have been successful in educating LFI on the characteristics and benefits of EE financing and in enhancing their interest and commitment to finance EE projects. The funds provided by the public partner allow the LFI to provide below-market interest rates to the EE project developers. Or, when the public partner insists that market-based rates must be offered to avoid distorting the financial markets, the public-sector funds provide EE project developers the most preferential terms comparable to what the LFI would offer to its most creditworthy borrowers.

This PPP approach is most appropriate in somewhat less mature commercial financing markets, that may be characterised by one or more of the following:

- limited liquidity, particularly with respect to EE financing;
- limited knowledge and understanding of EE projects on the part of LFIs; and
- lack of LFI capacity to appraise EE projects and assess and manage risks.

Another important characteristic of dedicated credit lines is the leveraging funds from the LFIs to increase the total size of the fund available for financing a portfolio of EE loans. The leveraging can at least double the funds provided by the public partner.

Some additional lessons learned include:

- the programme design needs to allow for flexibility in changing the project design, key criteria and parameters related to the loan terms and conditions, should market experience suggest the need for such changes. The public partner must continue to be engaged in review and oversight of the LFI activities to identify if such modifications are needed;

- public-partner supervision, oversight and implementation support are important to identify and address strategic issues and to ensure a smooth operation of the programme, particularly in the early stages of implementation when the LFIs are building their capacity;
- the public-sector partner must carefully select private-sector LFI partners to ensure the selected LFIs are active in the targeted market segments; and
- the commitment of LFI top management is important for programme success. The public partner needs to ensure such commitment before signing the PPP agreement.

Credit lines are generally accompanied by a technical assistance programme, which helps build the capacity of LFI staff (loan officers, risk managers, and others involved in the lending decision). Such capacity enhancement can contribute to increased LFI lending in the future.

Dedicated credit lines, however, do not necessarily lead to long-term scaling-up and sustainability of EE financing. The market activities of the LFIs may not continue at the same level if the public funds provided by dedicated credit lines are no longer available. Therefore, a sustainability strategy should be included in the design of dedicated credit lines.



Risk-sharing facilities

Lessons learned from the implementation of risk-sharing facilities include:

- LFI top management must demonstrate commitment to the risk-sharing facility and sign the guarantee facility agreements;
- the importance of technical assistance cannot be overemphasised. Risk-sharing facilities are generally a new concept to both LFIs and the project developers and ESCOs who may be the potential borrowers. All successful risk guarantee programmes have included and have benefited from technical assistance activities targeted at LFIs, project hosts and energy service providers; and
- the PPP design must allow for monitoring and oversight by the public partner to identify market issues and make appropriate course corrections if market conditions so indicate.

Risk-sharing facilities require less direct funding from the public partner relative to dedicated credit lines and, therefore, provide a greater leveraging effect. They also contribute to capacity building of the LFIs with respect to EE projects and help overcome the negative risk perceptions of LFIs. Such facilities provide LFIs hands-on experience with the low risks of EE projects, thereby increasing their interest in creating a sustainable EE lending business. The IFC partial risk guarantee programs in Eastern and Central Europe (HEECP and CEEF – see Case Study 2) have demonstrated that once LFIs are comfortable with EE lending and have developed new financial products to address specific EE market segments, the LFIs are inclined to continue and expand their EE lending businesses even after the conclusion of the risk sharing programme. The experience of the participating LFIs in CEEF, as mentioned in the CEEF case study, points out the potential sustainability of LFI EE lending activities. Designing exit strategies for the departure of the public partner, however, is important to ensuring sustainability of the EE investment market in the long run.

The specific design of the risk-sharing facility needs to be structured to meet the needs of the LFIs in the countries and markets where the PPP is being targeted. The IFC facility for the CHUEE in China was structured differently in terms of the risk sharing from the CEEF facility in Central and Eastern Europe.

One feature of risk-sharing facilities that has been attractive to the participating LFIs is the first-loss reserve provision, which pays for losses from the first losses incurred until the specified amount of the first-loss facility is exhausted.

Finally, the following elements are important in ensuring that risk-sharing facilities are effective:

- the success of a risk-sharing facility requires a somewhat mature commercial banking sector. The LFIs must have liquidity and appropriate procedures in place for due diligence, project appraisal and risk assessment. LFIs must also be willing to participate in a partnership that offers risk sharing and meet the requirements and terms and conditions imposed by the public partner. In addition, LFIs must be willing to dedicate staff for the capacity building needed to effectively implement EE lending;
- for a risk-sharing facility to be effective and generate additional lending, an energy services delivery infrastructure must be in place to develop and propose EE projects. If the commercial financing market is very immature, and the market is not able to generate a deal flow due to lack of energy service providers, risk-sharing facilities may not be appropriate; and
- a guarantee facility by itself is not sufficient to generate a scaling-up of EE lending. It needs to be packaged with a significant technical assistance programme for capacity building of the LFIs, project hosts and ESCOs. Without an adequate technical assistance programme, the risk-sharing facility may not provide the needed market impacts.



Energy Saving Performance Contracts

The ESPC model has many attractive features as a PPP mechanism for increasing EE lending by LFI. Considerable success has been achieved in IEA member countries (and in China), but ESPCs have not yet gained a substantial market in many developing countries. Lessons learned include:

- legislative and regulatory changes are generally needed to facilitate ESPCs in the public sector. The most successful ESPCs are in the United States and Canada, where the federal governments have undertaken important initiatives to facilitate and promote ESPCs in the public sector;
- successful implementation of ESPCs requires a mature commercial banking sector as well as a viable energy services delivery infrastructure;
- capacity building of both LFIs and ESCOs is a crucial element;
- also important is capacity building of public officials in areas such as energy auditing, preparation of bid documents, bid evaluation, contracting and M and V; and
- alternative models such as Public ESCOs and Super ESCOs may be useful in countries where the ESCOs are not well developed and lack the financial and technical capacity to undertake ESPCs on a large scale.

An important initiative that can facilitate ESPCs is the development of standardised procedures for energy auditing, contracts and agreements, and measurement and verification. The experience of different countries can contribute to the development of such standardised products.

Much can be learned from the successful ESPC models in countries such as the United States, Canada, and Germany, but such models and the experience from these countries may not be directly transferable to other countries because of differences in country characteristics, legislative and regulatory frameworks, market conditions, maturity of the commercial financing market, presence and capacity of ESCOs, and knowledge of public officials.

A wide range of ESPC models, some more complex than others, is available. When introducing the ESPC concept in a new country, policy makers should start with simpler models and learn from their implementation. The use of the ESPC in the public sector is often the best way to create a market and help jump-start such a market. The experience can then be used to gradually introduce newer, more complex models and procedures. In addition, the public sector needs to adopt appropriate regulatory and legislative changes to remove the barriers to ESPCs.

Summing up

Ultimately the goal is to increase private investment in EE. Public finance and/or regulatory policy are needed to kick-start the private finance market for EE in many countries. The three PPP approaches discussed in this report (dedicated credit lines, risk-sharing facilities, and ESPC mechanisms) are applicable to investment in EE in different market environments.

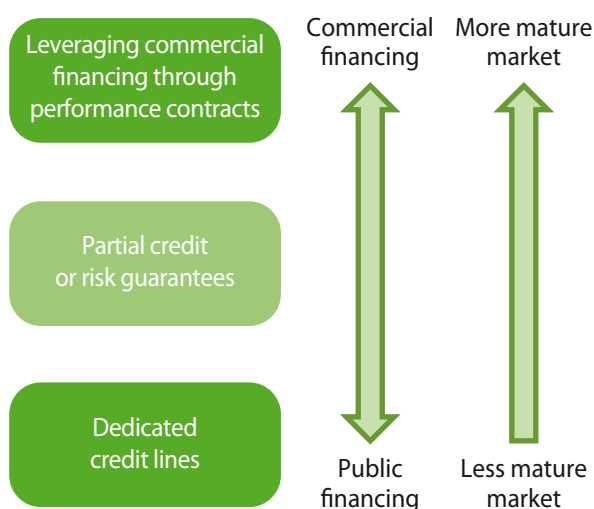
As illustrated in Figure 12, each of the three forms of PPP represents different degrees of public and private financing. Because dedicated credit lines involve a greater degree of public-sector financing in that the government or donor agency provides funding to the private partners (LFIs), they are more suitable for less mature markets.

With risk-sharing facilities, the public sector provides a lesser amount of financing, focusing more on the risk guarantee provided.

With Energy Saving Performance Contracts, the public sector provides no direct financing but creates the enabling legislative and regulatory frameworks and facilitates the negotiation of performance contracts between public agencies and ESCOs, which lead to financing from the private sector.

The implication for decision makers is that dedicated credit lines are most applicable when the commercial financial market is less mature and LFIs are not undertaking much financing of EE projects. The non-participation by LFIs may be due to lack of knowledge and understanding of the characteristics and benefits of EE projects and/or limited liquidity. Risk-sharing programmes, on the other hand, are useful when the commercial financing market is somewhat more mature, and LFIs are willing to consider financing EE but remain concerned about the potential risks of such projects. Finally, with a more mature commercial financing market, where LFIs have both the liquidity and the understanding and willingness for EE project financing, ESPC mechanisms can be useful for scaling up the LFI financing.

Figure 12 Public vs. commercial financing



Source: Limaye, 2011.

Some common factors have been identified in the policy pathway that may contribute to the success or failure of all three PPP mechanisms. These can be external factors (*i.e.* institutional framework, legislation, good understanding of the concept by the public-sector actors, and markets) and internal factors (management, reporting, coordination between public and private sector, etc.). Country context, financial market and legislative conditions are important in determining the suitability of a PPP approach to leverage private finance of energy efficiency.

No matter which form of PPP is chosen, good policy process and design are imperative to achieve the ultimate outcome of increased private financing of energy efficiency.

Annexes

The following three case studies describe how the three types of PPPs discussed in this publication were applied in different countries.

They are provided to reinforce the conceptual information in the preceding sections and to illustrate the policy pathway with practical issues and concerns that arise, the specific steps taken in implementation, and the lessons learned from real-world experience.

<i>Case Study</i>	<i>Type of PPP</i>	<i>Public and Private Partners</i>
Thailand Energy Efficiency Revolving Fund (EERF)	<i>Dedicated Credit Line</i>	<i>Department of Alternative Energy Development and Efficiency and 11 participating commercial banks</i>
IFC/GEF CEEF Programme	<i>Risk-Sharing Facility</i>	<i>International Finance Corporation and 14 participating banks</i>
FEMP/UESC	<i>Energy Saving Performance Contract</i>	<i>US Federal Energy Management Program and many private US utilities</i>



Case study 1: Thailand Energy Efficiency Revolving Fund

Dedicated credit line

Introduction

Thailand's Energy Efficiency Revolving Fund was established in 2003 by the Royal Thai Government (RTG) to stimulate and leverage commercial financing for EE projects, and to help commercial banks develop streamlined procedures for project appraisal and loan disbursement. The fund provides capital to Thai banks to fund EE projects, and the banks provide low-interest loans to EE projects in industries and buildings. It represents a working partnership between the RTG and 11 commercial banks. The source of the funds provided by RTG is the original fund created under Thailand's Energy Conservation Promotion Act.

The fund was initially structured for a three-year period and has been extended twice. Phase III of the programme will be completed by the end of 2011 (Table A1).

Table A1 Thailand Energy Efficiency Revolving Fund

Fund size	Phase I: USD 55 million Phase II: USD 55 million Phase III: USD 82.5 million (including USD 27.5 million for renewable energy)
Eligible borrowers	Industrial and commercial facility owners, ESCOs, and project developers
Eligible projects	EE and renewable energy
Loan size	Up to 100% of project costs Limited to USD 1.4 million per project
Loan term	7 years
Interest rate	Up to 4% (negotiable)
Participating banks	11
Projects financed (up to April 2010)	335 EE projects 112 renewable energy projects

Sources: Prasert Sinsukprasert, Financing Energy Efficiency and Renewable Energy: Thailand's ENCON Fund, International Energy Efficiency Forum, Astana, Kazakhstan, 27-30 September 2010; and Boonrod Sajjakulnukit, Thailand's Experience with Its Energy Conservation Fund and Revolving Fund, Asia Clean Energy Forum, June 2008.

Planning

The Energy Conservation Promotion Act

In 1992, Thailand enacted the Energy Conservation Promotion Act (ENCON)⁹ to guide Thailand's energy conservation and renewable energy policy. The act outlines three major areas for energy conservation programmes:

- A compulsory programme for large energy users (Designated Facilities),¹⁰ which comprise approximately 4 500 large commercial and industrial facilities (buildings and factories).
- A voluntary programme that applies to smaller facilities, primarily targeting small and medium-sized enterprises (SMEs), and covers a range of activities such as research, development and demonstration, information campaigns, and other special projects.
- Establishment of the Energy Conservation Promotion Fund (ENCON Fund). The ENCON Fund was created using the revenue from a tax of THB 0.04 (about USD 0.001) per litre on all petroleum products sold in Thailand. This tax provides annual inflows of approximately THB 2 billion (about USD 65 million at current exchange rates) per year.

The ENCON Act designated the Ministry of Energy as the primary agency responsible for implementation of the provisions of the Act. Under the Ministry, three organizations have the major responsibilities. The Department of Alternative Energy Development and Efficiency (DEDE) is the primary government agency responsible for implementing EE under the ENCON Act.

9 Kingdom of Thailand. The Energy Conservation Promotion Act. 1992.

10 Designated Facilities were defined in the Act as facilities with electrical demand greater than 1.0 MW or annual energy use of more than 20 TJ/year of electrical energy equivalent.

Provisions for designated facilities

Key provisions of the ENCON Act were the requirement for the designated facilities to appoint an energy manager; submit data on energy use to DEDE every six months; conduct energy audits (using a subsidy from DEDE) and provide the audit reports to DEDE; and develop and submit to DEDE plans and targets for improving EE.

Although many of the designated facilities complied with the requirements for auditing and reporting, the actual implementation of EE projects was much less than had been anticipated due to the low priority given to energy costs and EE by management of industrial and commercial facilities, limited technical capabilities for implementation, and limited access to external capital.

New initiatives to promote energy efficiency

To overcome barriers and stimulate increased activity towards financing and implementation of EE projects, DEDE adopted two major new initiatives in 2003. One initiative was a subsidy programme for funding EE projects. The other was the Energy Efficiency Revolving Fund, which was designed to facilitate and promote investment in EE by engaging the commercial finance sector in providing low-interest loans for EE projects.

Planning and design of the Energy Efficiency Revolving Fund

The Energy Efficiency Revolving Fund (EERF) was initially launched as a pilot programme for three years. The planning and design of EERF were based on an Energy Efficiency Market Assessment study conducted in cooperation with commercial banks. The study estimated the technical and economic potential for EE projects in industries and buildings, and recommended the establishment of an initial fund of THB 1 to 2 billion.

The planning of the EERF was influenced by the initiatives of the Industrial Finance Corporation of Thailand (IFCT),¹¹ a private-sector bank that specialized in providing banking services to industrial customers. IFCT was participating in a programme funded by the World Bank to provide loans to stimulate the installation of high-efficiency chillers in industrial cooling systems. The World Bank programme had complicated loan transactions, and IFCT suggested to DEDE that a simplified loan programme under the ENCON Act would be more useful for promoting EE in the industrial sector.

The initial size of the fund was selected as THB 2 billion (about USD 55 million at the then current exchange rate). Six participating banks were initially selected as partners in the EERF. Each bank was provided a credit line in the range of THB 100 to 400 million (about USD 2.5 to 10 million). The EERF funds were provided to the banks at zero interest rate. The banks were allowed to charge an interest rate of up to 4% to cover their management and administration costs and risk coverage.

Implementation

The EERF was launched in 2003 with six participating banks; the total has now increased to 11.

DEDE executes a standard contract with each participating bank. The contract provisions include the maximum amount of loans by the bank for any specific project, total amount of all loans by the bank, interest rate charged by DEDE to the bank, maximum interest to be charged by the bank to borrowers, term of the loan, repayment of EERF funds by the bank upon receipt of loan repayments from the borrowers, treatment of default by the borrower of repayment of the bank loan, and treatment of default by the bank in repayment of the EERF funds.

11 IFCT later merged with the Thai Military Bank to form the TMB Bank.

Major steps in the process

The processing of loans under the EERF involves the following major steps:

- **Identification of EE project eligible for loan:** The project may be identified by the owner of an industrial or commercial facility or through an energy audit of the facility conducted by an ESCO or other energy services provider. A feasibility study assesses the technical feasibility, estimates the potential energy and cost savings, and determines the financing needs and loan repayment requirements using the EERF scheme. If the results are acceptable, the facility owner submits a loan application to EERF through a participating bank. Third parties, such as ESCOs, are also eligible to apply for an EERF loan on their own account.
- **Financial analysis of the project:** The bank conducts a project appraisal and, to the extent that it has technical staff, may also carry out a technical analysis of the proposed EE measures. If the results are acceptable, the bank forwards the application to DEDE.
- **DEDE assessment:** DEDE determines whether the project meets certain specified criteria and conditions, indicating if the project is eligible for a loan and if the proposed energy-saving measures are technically feasible. DEDE then informs the bank if the project has been approved.
- **Bank approval of loan:** Once DEDE has approved the project, the bank considers and approves the loan, and submits a disbursement and repayment plan to DEDE.
- **Project implementation:** The borrower uses the loan funds to invest in, and implement, the EE project.
- **Loan repayment:** The borrower repays the loan principal and interest to the bank and also submits reports to DEDE on the project's energy savings. Within seven days of receiving a repayment, the bank repays the principal amount to DEDE.

Project eligibility

The eligible projects (EE measures) are as defined in the ENCON Act. No minimum level of energy savings is applied.

For industry, the criteria include: improvement in combustion efficiency of fuels; prevention of energy loss; recycling of energy wastes; substitution of one type of energy by another; more efficient use of electricity through improvements in power factors, reduction of maximum power demand during peak demand, use of appropriate equipment and other approaches; and use of EE machinery or equipment as well as use of operation control systems and materials that contribute to energy conservation.

For buildings, the criteria include: reduction of heat from sunlight entering buildings; efficient air-conditioning, including maintaining room temperature at appropriate level; use of EE construction materials and demonstration of qualities of such materials; efficient use of light; use and installation of machinery, equipment, and materials that contribute to energy conservation; use of operation control systems for machinery and equipment; and other measures for energy conservation.

EERF loans may be used for purchase and installation of equipment; engineering design and supervision fees, and any savings guarantee fee payable to an ESCO; the cost of works necessary for installing and operating equipment, such as equipment foundations, gas pipelines, etc.; and transportation costs, demolition costs, import taxes and duty and any value-added tax associated with these costs.

Developing the project pipeline

DEDE and the banks share responsibility for publicising and promoting the EERF. DEDE does not have a specific budget allocated to fund promotion, and its promotional activities are limited to seminars about the fund for prospective clients from the industrial and commercial sectors.

Some participating banks have been proactive in promoting the fund to their existing customers, mainly through workshops and seminars.

Risk assessment and management

Participating banks use their credit evaluation and project appraisal criteria to evaluate the loans. Loan applications are assessed mainly on the basis of the project proponent's balance sheet and assets, rather than on the cash flows and savings from the EE project itself. Therefore, the loans are "asset-based", rather than "project-based", lending.

The banks are principally concerned with two issues in assessing loan applications: (i) capacity of the applicant to make repayments of loan principal and interest in accordance with an agreed repayment schedule; and (ii) value and quality of the applicant's collateral.

The bank's technical staff, or DEDE if the bank has no technical staff, conducts the technical assessment.

Monitoring

DEDE uses a range of key performance indicators (KPIs) to monitor the fund's performance. These KPIs include development of the project pipeline (number of inquiries received by DEDE and how inquirers heard about the fund); number of days taken by DEDE to approve projects for loan applications; estimated and actual energy savings per project; performance of each participating bank; number of loans approved; and total value of loans approved.

Evaluation

By April 2010, the total number of projects financed by EERF was 335 EE projects and 112 renewable energy projects. The total investment in these projects was USD 453 million, and the estimated annual energy cost savings were USD 154 million, providing an average payback of about three years.

DEDE has conducted a detailed analysis of the projects completed in Phases I and II (Table A2).¹²

Table A2 Results of EERF Phases I and II

	<i>Phase I</i>	<i>Phase II</i>	<i>Total</i>
Project cost (Million USD)	85.7	94.8	180.5
EERF loan (Million USD)	47.7	47	84.7
Average simple payback (Years)	2.4	2.5	2.4
Electricity savings (Million USD)	15.6	15.7	31.3
Oil savings (Million USD)	19.5	23.0	42.5
Total savings (Million USD)	35.1	38.7	73.8

12 Boonrod Sajjakulnukit, Thailand's Experience with Its Energy Conservation Fund and Revolving Fund, Asia Clean Energy Forum, June 2008.

Lessons Learned

Prior to the establishment of EERF, very few EE projects were being implemented with bank financing. DEDE was successful in obtaining commercial bank participation in financing of EE projects by providing zero-interest funds to the commercial banks; assisting banks in getting a better understanding of EE projects; and promoting the EERF to industrial and commercial energy users through workshops and seminars.

An important factor in the success of the EERF was that it used simplified procedures for project application, appraisal and loan processing.

The banks found the programme attractive, because they were able to obtain “deal flow” by offering loans at interest rates below market and therefore saw an opportunity to leverage new business.

Project proponents, particularly large industrial and commercial energy users, were able to obtain external financing from banks when they could not access internal funds.

The EERF did, however, require banks to assume all the credit risk. Consequently, banks generally used asset-based financing and provided loans only to customers with strong balance sheets or other assets. The EERF did not facilitate credit enhancement and simply provided low-cost funds to the creditworthy borrowers. The result was that very few ESCO projects were financed (only three in Phases I and II combined), because most of the ESCOs in Thailand have limited financial capacity and weak balance sheets. Thailand, subsequently, has created an ESCO fund to address the need for financing ESCO projects.¹³



13 Asavin Chintakananda, The Thailand ESCO Fund, presentation at the Stakeholder Workshop on Implementation of the Kerala State Energy Conservation Fund, Thiruvananthapuram, 14 July 2010.

Case study 2: Commercialising Energy Efficiency Finance (CEEF)

Risk-sharing facility

Introduction

The Commercialising Energy Efficiency Finance (CEEF) Programme was launched in April 2003 as a joint programme of the International Finance Corporation (IFC) and Global Environment Facility (GEF), with IFC acting as the executing agent for the GEF. CEEF was initiated, based on the experience from the “Hungarian Energy Efficiency Co-Financing Program” (HEECP), which had been initiated in Hungary in 1997. The countries included in CEEF were the Czech Republic, Slovakia, Estonia, Latvia, and Lithuania. In 2005, Hungary was added, and HEECP was merged into CEEF. The CEEF Programme was successfully completed in December 2008 (Table A3).

Table A3 CEEF Programme¹

Countries	<i>Czech Republic, Slovakia, Hungary, Latvia, Lithuania, Estonia</i>
Participating banks	<i>14</i>
Project developers/ESCOs	<i>41</i>
Projects financed	<i>700 (includes 600 blockhouse³ projects)</i>
Project investment	<i>USD 208 million</i>
Value of guarantees provided	<i>USD 49.5 million</i>
Estimated CO₂ reduction	<i>145 700 tons per annum</i>
Cost per ton of CO₂ reduction	<i>USD 2.50</i>
Investment in leveraged projects²	<i>USD 122 million</i>
Project investment including leveraged projects	<i>USD 330 million</i>
Estimated CO₂ reduction including leveraged projects	<i>310 500 tons per annum</i>

Notes:

1. Prepared by the authors based on the results of the CEEF programme evaluation conducted by Danish Management Group for IFC.

2. Leveraged projects are investments made by their participating banks without using the IFC guarantee.

3. Blockhouses are multi-family residential buildings built in the Soviet era.

Planning

Country Context

IFC and GEF had earlier launched the HEECP programme in cooperation with the government of Hungary and had successfully demonstrated the risk-sharing model using a partial risk guarantee fund. IFC studied a number of other countries to explore the replication of the risk-sharing model for leveraging commercial financing for EE projects and determined that five countries in Eastern and Central Europe – Czech Republic, Slovakia, Estonia, Latvia and Lithuania – exhibited conditions that made them suitable for the IFC partial guarantee instrument.

As near-term EU accession countries, they faced aggressive schedules for energy price rationalisation and environmental emissions reduction, which were expected to drive the market. In each of these countries, IFC identified an opportunity to catalyse a substantial deepening of the capacity of the capital markets to support EE finance.

In each CEEF country, capital markets were observed to be at a stage of development where the competitive dynamics encouraged the development of new market niches using new financial products, but where it was unlikely that any substantial lending for EE projects could be expected to result due to the limited knowledge, experience and capacity of the LFI with respect to EE project financing.

Barriers

IFC had identified the following important barriers to implementation of EE projects: weak credit and unfamiliar risk profiles of energy users and ESCOs; extremely cautious financial institution (FI) lending practices; lack of collateral value of EE project equipment; lack of relevant expertise and capacity in local FIs; poor capability on the part of project hosts and ESCOs to prepare “bankable” EE projects; relatively high “transaction costs” associated with EE project development and financing; lack of medium- to long-term financing needed to allow EE projects to be self-financing through savings; and high interest rates.

Programme objectives

CEEF was designed to address the barriers through: (i) risk sharing and risk management through partial credit guarantees provided to LFIs for loans to EE projects, and

(ii) technical assistance for capacity building within LFIs, ESCOs, project developers, and project hosts (Table A4).

The primary short-term measures to achieve the CEEF objectives were reduction of credit risk, lowering of transaction costs, and development of the institutional capacity of the EE and financial services industries in the CEEF countries to develop and finance EE investment projects.

Specific CEEF objectives were to reduce credit risk on EE financing for eligible LFIs (making transactions possible and gaining credit approval for use of the LFI's own funds); and provide targeted technical assistance to stimulate deal flow and uptake of financial products offered under the guarantee facility (in support of both partner LFI marketing and delivery of EE financing services as well as ESCO preparation of projects and programmes for investment).

Table A4 How CEEF addressed financing barriers

Barrier	CEEF Project Response
Lack of debt financing: experience and capacity deficit in host country financial sector	Provision of guarantee to induce/support FI lending. TA support to FIs to develop understanding of market opportunity; facilitate introduction to ESCOs; and develop credit analysis skills and financial products.
High perceived risk for SME borrowers and EE projects by FIs	TA support to develop credit analysis skills for appraising EE project risk; provision of partial guarantee to mitigate actual risk to FI.
Lack of collateral value associated with EE projects/equipment	Provision of partial guarantee to mitigate FI risk; TA support to FIs to develop project finance capabilities and value the positive security features of EE projects: cost savings that improve free cash flow of end-user, and essential-use nature of EE equipment.
Excessive collateral requirements imposed by FIs	Provision of partial guarantee to mitigate actual risk to FI.
Extraordinarily risk-averse financial markets, resulting from historical experience with poor credit procedures	Provision of partial guarantee to mitigate actual risk to FI. Selection of priority markets, e.g., SMEs, where project finance techniques can be applied, viability of borrowers demonstrated and competition between FIs can result in new lending.
Lack of well-prepared projects.	Selection of markets where fundamental economics of EE projects are attractive; TA support to ESCOs to assist in project structuring and presentation to FIs.

Source: IFC.

Implementation

Partnerships with LFIs

CEEF worked in partnership with LFIs by providing partial guarantees to share in the credit risk of EE finance loan transactions, which the partner FIs would fund with their own resources.

The transactions eligible for the programme included capital investments aimed at improving EE in buildings, industrial processes, and other energy end-use applications. Even though many EE investments were economically attractive, most financial intermediaries were reluctant to finance these transactions due to their unfamiliarity with such projects and the perceived weak client/project credit profiles.

The CEEF Programme, therefore, assisted the banks and FIs to make the financing of EE projects possible. Projects targeted by CEEF included EE investment projects by small enterprises, street lighting projects by small towns and villages, and replacement of outdated heating technologies in hospitals.

Risk sharing

The risk sharing was achieved through a programme that used an innovative partial guarantee structure under which IFC guaranteed 50% of the project risk on a *pari passu* basis to the participating FIs. GEF committed USD 17.25 million to the programme, of which USD 15 million was for the guarantee facility (the remaining USD 2.25 million was used for programme operating costs and for technical assistance). A portion of the GEF contribution was set aside as a first-loss reserve.

IFC committed an additional USD 75 million for guarantees, so the total of GEF and IFC funds could be used to guarantee up to USD 180 million in loans from private FIs. Equity contributions from project sponsors (30%) would add another USD 57 million, thereby enabling total project investments of USD 237 million.

Such investment was expected to contribute to the competitiveness of these economies as well as to improved local and global environmental conditions. The programme represented an important tool to support each of the national strategies for meeting EU accession goals and targets.

Technical assistance

GEF funds for technical assistance were leveraged with funds from bilateral funding agencies. The programme had two main purposes: (i) help prepare projects for investment; and (ii) build EE and FI industry capacities in each country. For FIs participating in the guarantee programme, technical assistance was designed to help market their EE finance services, prepare projects for investment, develop new EE finance products, and build their capacities to originate EE project financings. For EE and ESCO businesses, the technical assistance aimed to build their corporate capacities and develop EE projects. For targeted EE market promotion activities, the technical assistance was generally undertaken in cooperation with other organisations.

Key programme elements

CEEF was highly market oriented, with market-based pricing and availability to multiple financial intermediaries. The programme also sought to catalyse investment across a broad range of end-user groups and market segments. In addition, the programme's technical assistance components were targeted at building EE finance expertise in the financial sector and hence the ability of ESCOs to market and finance EE projects. By creating incentives for local FIs to enter the EE financing market, the programme helped to increase the local financial sector's experience and capacity to provide EE project finance on an ongoing and, eventually independent, basis.

Specific project design elements included:

- Increasing the awareness and interest of Estonian, Latvian, Lithuanian, Czech and Slovak¹⁴ FIs in financing EE projects
- Establishing guarantee facility agreements (GFAs) with participating FIs, documenting procedures for approving and providing individual project guarantees (transaction guarantees)
- Reducing the credit risk of individual EE project financing
- Lowering transaction costs related to project development and financial structuring

Monitoring

The programme monitoring was carried out by the CEEF field offices in each of the countries based on information provided by the participating banks. IFC signed GFAs with 14 participating banks (FIs). A total of 829 projects were financed using the guarantees. Of these, 72 were individual projects and 757 portfolio projects (mostly blockhouses in Hungary). A total of 41 project developers/ESCOs were involved in the implementation of the guaranteed projects. The total amount of the guarantees provided to the projects was USD 49.5 million. These projects represent a total investment of approximately USD 208 million. The projects were implemented in five of the six target countries: Czech Republic, Slovakia, Latvia, Lithuania and Hungary.¹⁵ The projects have generated CO₂ reductions of 145 700 tons per year and energy savings of 846 TJ per year.

None of the project guarantees provided under CEEF were called,¹⁶ and the GEF cost per ton of CO₂ reduction for the guaranteed projects was USD 2.5

per ton based on the current losses (up to the end of 2008). If the leveraged or indirect projects are included, the GEF cost is reduced to USD 1.2 per ton of CO₂ reduction.

Evaluation

IFC engaged a third-party evaluation contractor to conduct a formal evaluation of CEEF.

The evaluation team concluded¹⁷ that the programme achieved significant progress relative to the objective of expanding the availability of commercial financing for EE projects in the target markets. The guaranteed projects were estimated to have led to additional implementation ("leveraged" projects or indirect effects) of projects by FIs and ESCOs without using the IFC guarantees, with total project investments of USD 80 million and CO₂ reductions of 164 800 tons per year. Thus, the total guaranteed and leveraged projects resulting from the CEEF programme represent USD 330 million, 310 500 tons per year CO₂ reductions, and energy savings of 1 956 TJ per year.

The evaluation concluded that the technical assistance has led to substantial capacity building of the FIs, as well as ESCOs and project development companies. In terms of country-specific results, the programme achieved very good progress relative to the goals in Hungary, the Czech Republic, and Slovakia. The progress in Latvia and Lithuania, however, was limited.

The evaluation also concluded that the commercial EE financing activities of the participating FIs increased substantially as a result of CEEF and that the FIs have developed new financing products tailored to the EE market. Further, the EE financing activities of these FIs have continued after the end of the CEEF programme, thereby demonstrating the programme's sustainability.

14 Hungary was added to this list when HEECP was merged with CEEF in 2005.

15 No guarantee agreements and projects were in Estonia.

16 In HEECP, a total of USD 153 000 was paid out for guarantees that were called.

17 Danish Management Group, Final Process and Impact Evaluation, Commercialising Energy Efficiency finance (CEEf) and Hungarian Energy Efficiency Co-Financing Program (HEECP), Report submitted to IFC, February 2010.

Lessons Learned

The major lesson learned from CEEF (and its predecessor HEECP) is that a risk-guarantee programme can be successful in leveraging financing from commercial financial institutions. The risk guarantee allows the FIs to address their risk perceptions and undertake the financing of EE projects. Many of the participating FIs in CEEF (particularly in Hungary and the Czech Republic), after gaining experience with project financing of EE projects, have proceeded with additional financing without the IFC guarantee and have continued and expanded their financing of EE projects after the end of the CEEF programme.

IFC and GEF have adapted the CEEF model in developing and implementing risk-sharing programmes in other countries such as Russia, China, Vietnam, and the Philippines.

The key factors influencing the programme's success in the different countries are: (i) EE market maturity and acceptance of the guarantee product; (ii) attitudes and interests of FIs; (iii) staff knowledge, experience and contacts; and (iv) staff capability and enthusiasm. The programme was more successful in Hungary, the Czech Republic, and Slovakia than in the Baltic countries, where the EE market is in the developmental stage, with less interest on the part of FIs in EE project financing and fewer ESCOs in the market.

Some of the other important lessons learned include:

- IFC's local presence in each market was very important to programme success, because continual follow-up was required to ensure take-off.
- The skills, capabilities, experience, and enthusiasm of the IFC field staff contributed significantly to programme success in Hungary and the Czech Republic.
- The technical assistance component, although performed on an ad hoc basis, was an important element in the programme success. The seminars and training, conducted in response to market needs, were successful and appreciated by event participants.
- IFC changed the programme to make operations more flexible and responsive to market changes, to create new products and delivery mechanisms, and to develop better relationships with the FIs and other programme stakeholders. The field staff and stakeholders appreciated these changes, which led to large project volumes.

The evaluation, however, also concluded that, although the CEEF programme achieved very good success in three countries (Czech Republic, Hungary and Slovakia), the results were not overly positive in the Baltic countries (Estonia, Latvia and Lithuania). Several reasons were cited for the lack of success: the programme design needed to be customised to country conditions; IFC did not have skilled and experienced staff in these countries' local offices, with the capabilities and experience well-matched to local conditions and needs; and, suitable local partners were not available.

Case study 3: US Federal Energy Management Program – Utility Energy Services Contracts (FEMP/UESC)

Example of Energy Service Performance Contracts

Introduction

The US federal government is the largest utility customer in the United States, with an annual energy bill in excess of USD 5.8 billion. Over the last decade, the government has undertaken to lead by example with respect to rational energy management and utilization. The responsibility for energy management in federal facilities is assigned to the Federal Energy Management Program (FEMP) of the US Department of Energy (DOE).

Utility Energy Services Contracts (UESCs) represent a key part of FEMP. Under the UESC, FEMP actively fosters partnerships between federal agency facilities and private local utilities. Such partnerships jointly plan and implement EE, water conservation, and renewable energy projects at Federal facilities nationwide (FEMP, 2011).

The rationale for UESCs is that energy managers of public facilities are challenged to identify the most cost-effective measures for implementing necessary capital improvements due to budget constraints, rising energy costs, and increased mandates to reduce energy and water consumption in federal facilities. Recognising this challenge, local utility companies are significantly expanding the range of energy-saving services and incentive programmes offered to customers.

Under a UESC, the local utility company agrees to provide a federal agency with services, products or both, designed to make that agency's facilities more energy efficient. Federal facilities can also obtain project financing from a utility company through a UESC. During the contract period, the agency pays for the cost of the UESC from the energy and other cost savings resulting from the EE improvements. After the contract's term, the energy and water efficiency improvements continue to realize the cost savings for the life of the improvements, and the savings can be used to do more projects.

UESCs provide an easy way for federal agencies to contract for the broad spectrum of energy management services offered by utilities. Federal agencies may either use appropriated funds or secure third-party project financing through the utility. Implementing projects through UESCs continues to be a major force behind many federal facilities meeting energy management goals. To date, federal agencies have used UESCs to invest nearly USD 2 billion in their facilities.

Planning

The Energy Policy Act (EPAct) of 2005 and Executive Order 13423 require federal agencies to reduce energy consumption by 30% and establish additional goals for water conservation, energy management and renewable energy use. To achieve these goals, the federal sector needs to invest at least USD 4 billion of public and private funds in federal facilities and must learn how to optimally operate and maintain facilities. A series of Congressional enactments, executive orders, and other directives mandate specific EE, renewable energy use and water conservation goals for federal agencies and facilities (FEMP, 2009).

FEMP has undertaken a number of initiatives to improve EE of federal government facilities and has recognised that local utilities can provide agencies with the financing and technical expertise to meet this challenge. The planning of FEMP initiatives, including UESCs, has involved a number of executive orders and legislative acts (Box A1)

Box A1

History of US Federal Energy Efficiency Program

The first major legislation regarding energy conservation for Federal facilities was the National Energy Conservation Policy Act, Public Law 95-619, enacted in 1978. The Energy Policy Act of 1992, Public Law 102-486, and the Energy Policy Act of 2005, Public Law 109-58, both substantially amended and expanded provisions relating to Federal facility energy use. The United States Code excerpt, 42 USC 1851-1862 reflects those laws and other relevant amendments through January 2006.

The Energy Independence and Security Act of 2007(EISA), Public Law 110-140, further amended and expanded law on Federal facility energy use. Executive Order 13423, "Enhancing Government Performance through Effective Environmental, Energy, and Fleet Management," issued in January 2007, rescinds previous Executive Orders pertaining to energy, environment and transportation. Some of EO 13423's directives were subsequently adopted into law by EISA.

Relevant legislation and executive orders include:

- 1975:** Energy Policy and Conservation Act
- 1977:** Department of Energy (DOE) Organization Act
- 1978:** National Energy Conservation Policy Act (NECPA)
- 1988:** Federal Energy Management Improvement Act (FEMIA)
- 1991:** Executive Order 12759
- 1992:** Energy Policy Act of 1992 (EPAAct 1992)
- 1994:** Executive Order 12902
- 1999:** Executive Order 13123
- 2001:** Executive Order 13221
- 2005:** Energy Policy Act of 2005 (EPAAct 2005)
- 2007:** Executive Order 13423
- 2007:** Energy Independence and Security Act (EISA)

Source: FEMP, 2009

Implementation

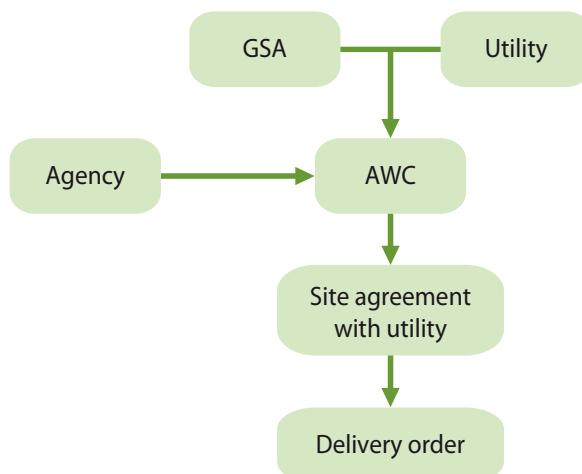
Types of UESCs

The types of contracting mechanisms under UESC include areawide contracts, as well as site-specific contracts. Contractual and procurement templates for agreements, such as model utility service agreements and master agreements or basic ordering agreements are also available.

Areawide contracts

Federal regulation authorises the General Services Administration (GSA) to establish areawide contracts (AWCs) with utility companies; federal agencies within the service territory of those utility companies may utilize their services. AWCs are indefinite-delivery, indefinite-quantity (IDIQ) contracts, which establish the general terms and conditions under which the utility must provide service to their federal customers, and they incorporate many of the required federal clauses. Agencies place delivery orders for services offered under the contract; the contract contains the details and technical specifications for the EE project or other services to be delivered (Figure A1).

Figure A1 Structure of areawide contracts



Source: FEMP, 2009.

The GSA has established more than 150 utility areawide contracts to procure utility services for federal facilities around the country.

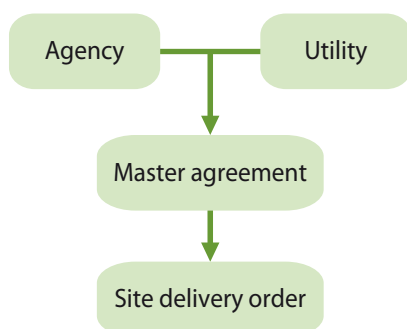
Site-specific contracts

Where an areawide contract does not exist, federal agencies must contract directly with their serving utility company using a site-specific contract.

Model utility service agreements

Model utility service agreements for civilian and Department of Defense (DOD) agencies were developed by a collaboration of FEMP, the Edison Electric Institute (EEI), federal technical and contracting experts, and utility partners. The agreements serve as a template for agencies to use in establishing site-specific UESCs or implementing task orders under an AWC (Figure A2).

Figure A2 Structure of model utility service agreements

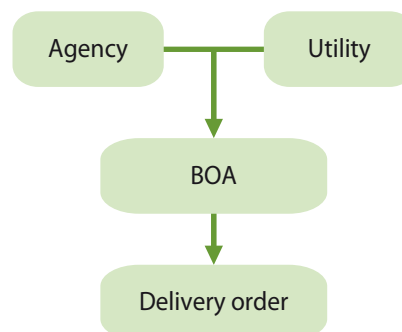


Source: FEMP, 2009.

Master agreements or basic ordering agreements

Master agreements (MAs) or basic ordering agreements (BOAs) are used by federal sites anticipating execution of multiple delivery orders under an AWC or site-specific contract. These agreements establish general terms and conditions for specific task orders placed under them. Individual task orders are placed under MAs or BOAs, which provides the details regarding the specific services to be delivered. Any federal agency can establish an MA or BOA with its utility (Figure A3).

Figure A3 Structure of basic ordering agreement



Source: FEMP, 2009.

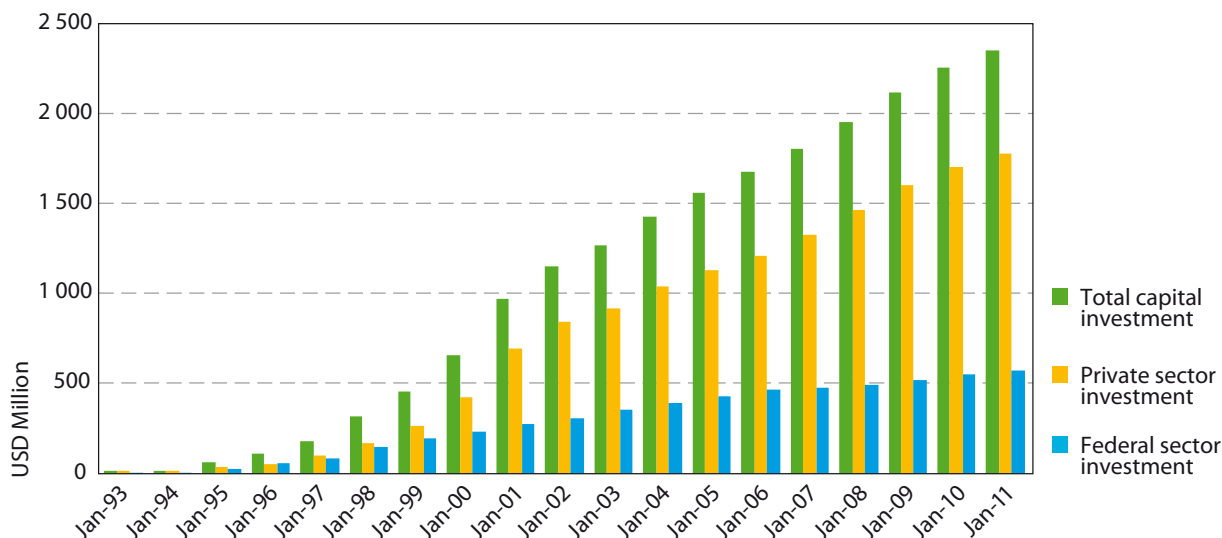
Based on successful BOAs and other contracting vehicles, such model agreements contain approved, required clauses for federal contracts, and are the most comprehensive compilation of contractual language for UESCs available. Model agreement clauses can be added to an AWC or BOA. Model agreements can also be used alone.

Competition among utilities

A federal agency may open UESCs to competing franchised utility companies to ensure that it gets the best value for its projects. Federal agencies are not legally required to compete for UESCs provided by the “established source” utility in the utility’s franchised service territory. If services are available, the Energy Policy Act of 1992 states that no restriction should prevent federal facilities from directly benefiting from the services the same as any other customer.

The exception is if more than one serving utility is offering utility energy services (e.g., a gas company and an electric company). In this case, the Federal Acquisition Regulations and good fiscal management require federal agencies to evaluate each utility and select the best value. This evaluation can be as simple as a discussion or as rigorous as a formal competitive procurement.

Figure A4 UESC investment over time



Source: FEMP, 2011

Federal agencies must decide whether to compete and the level of the competition. In its model agreement, however, the GSA requires utility companies to competitively select technical subcontractors that do the actual work. The model agreement also requires subcontractor plans to comply with federal utility contract requirements (either GSA areawide or other delegated authority contract).

Monitoring

No requirement exists for federal agencies to report all UESC project data to one central database. FEMP, however, collects project data from many agencies and utility companies on a voluntary basis. Agencies also report the total dollar amount of financed UESC projects to FEMP in their annual report on federal energy usage to Congress.

Evaluation

Formal evaluation reports are not available from FEMP for the UESC programme. However, the DOE compiles some data indicating that the programme has been very successful, e.g., in terms of cumulative UESC investment over time (Figure A4) and illustrative results of UESC for selected federal agencies (Table A5).

Lessons Learned

FEMP and GSA mechanisms to facilitate UESCs have substantially benefited federal agencies by simplifying the contracting process. Many federal agencies have realised substantial energy savings and cost reduction benefits. Federal agencies have reported the following advantages of the UESC concept (FEMP, 2011): flexible contracts, streamlined procurement processes, measurement and verification flexibility, ability to include water efficiency measures, ability to leverage rebates and incentives, repayment integrated within existing utility bills, availability of technical support from FEMP, and ability to implement EE projects without using direct appropriations.

Table A5 Illustrative results of UESC for selected federal agencies

Federal Agency	Results of UESC
National Institutes of Health	<i>Saved at least USD 5 million in annual energy costs at its main campus in Bethesda, Maryland, through energy conservation measures.</i>
USDOE Fermi National Accelerator Labs	<i>EE upgrades to centralized cooling system save USD 900 000 in annual energy costs.</i>
Chet Holifield Federal Building	<i>Comprehensive energy and water efficiency programme, saving USD 640 000 in annual energy costs.</i>
US Army Fort Knox	<i>Extensive energy conservation projects and efficiency measures save the base USD 2.8 million due to reducing electricity and gas use.</i>
US Postal Service	<i>Two utility energy projects (in New York and Baltimore) cut energy consumption by 44% for a total annual savings of USD 460 000.</i>
Dallas Veterans Administration Medical Center	<i>Implemented first thermal energy storage technology at a VA medical facility to reduce operating costs by USD 223 650 each year.</i>
NASA John F. Kennedy Space Center	<i>Energy cost savings in excess of USD 5 million.</i>
White Sands Missile Range	<i>Implemented post-wide efficiency plan to reduce utility costs by USD 2.7 million.</i>
US Army Fort Lewis	<i>Reduced annual energy costs by more than USD 700 000.</i>

Source: EERE, 2011.

Agencies that were able to compete for utility services indicated that the competitive process led to a more cost-effective solution.

Limitations of the UESC concept were reported as follows:

- in many cases, only one utility is available, and competition may not be feasible;
- the UESC mechanism requires a significant amount of planning, and agencies working for the first time with this approach need to be careful in the contract negotiation with the utility;
- care must be taken to minimise operational disruptions for the agency;
- the current FEMP contract templates do not have a very flexible or streamlined approach for change orders; and
- taking on a large and complex EE project with multiple measures may lead to potential disputes and dissatisfaction. It may be better for the agency to work with the utility on a smaller project first and develop the experience with the UESC process before undertaking large and complex projects.

The US federal government also took a very long time and a series of legislative changes and executive orders to facilitate the FEMP process within which UESC operates.

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Glossary of terms

Chauffage: type of energy performance contracting where an energy service company (ESCO) takes over operations and maintenance of the energy-using equipment in a customer's facility and sells the energy output (e.g. steam, heating/cooling, lighting) to the customer at an agreed price under a long-term contract. Also known as Energy Supply Contracting.

Collateral: physical and contractual assets pledged by a borrower or lessee as security for amounts owed to a lender or lessor.

Collateral value: cash value that a lender can realize from collateral that may be repossessed and resold in the event of borrower default.

Competitive dialogue: dialogue on a future project conducted between a public partner and several potential private partners with a view to soliciting tenders for the project, prior to the interested private partners' submission of their proposals.

Credit analysis: analysis undertaken by a lender to determine the creditworthiness of a borrower or other party who is making commitments for loan repayment. The analysis is based on financial statements (balance sheet and income statements) as well as on a range of topics pertaining to the party or business, including business track record and future prospects, payment record on prior loans or other obligations (e.g. utility bills), management, and other matters.

Credit enhancement: extra security provided to lenders to support a loan, such as, for example, extra collateral, a guarantee from a party other than the borrower (such as a financial institution, other project participant, or government), a debt service reserve, etc.

Creditworthy: party, project or other entity considered worthy of receiving credit or a loan.

Dedicated credit line: credit line established by a public entity (such as a government agency and/or donor organization) to enable financing of EE projects by a private-sector organisation (bank or financial institution).

Due diligence: analysis conducted by a lender or investor on a given project and/or company to determine whether to make a loan or investment.

Energy audit: report and analysis summarizing a given facility's energy use, consumption, cost, energy-using systems and equipment, and opportunities/measures for saving energy, reducing waste and improving efficiency.

Energy Saving Performance Contract (ESPC): a contract under which a wide range of energy services is provided by an energy service company to a customer such that payments for these services are made by the customer contingent upon the satisfaction or pre-specified performance measures.

Energy service company (ESCO): business that develops, engineers, installs, provides or arranges financing and provides operations services for projects designed to improve the energy efficiency and maintenance costs for facilities under long-term (typically 3 to 10 year) contracts. ESCOs operate with a range of business models. ESCOs generally act as project developers for a wide range of tasks, performing a complete set of energy efficiency services for their customers and assuming the technical and performance risks associated with the project.

Energy supply contracting model: see Chauffage.

Equity: in the context of analyzing a balance sheet, equity refers to net worth, or assets minus liabilities. In the context of a project financing, equity refers to an investment contribution, usually in cash, by the project owners, developers or energy service companies toward the total project costs.

Feasibility study: assessment of the economics and technical viability of a given project and other factors affecting the ability, practicality and economics of implementing the project.

Financial product: structure of financing (including terms, conditions, pricing, security and documentation requirements) provided by a bank or financial institution to address the financing needs of a particular market, sector or project.

First-loss guarantee: type of guarantee under which a public agency agrees to pay for a defined share of the initial losses incurred by the lender under the EE lending programme up to a specified amount (the first-loss guarantee amount). The lender incurs losses only when the total loan loss exceeds the first-loss guarantee amount.

Guaranteed savings agreement: agreement within an ESPC in which the customer takes the loan, and the ESCO guarantees certain performance parameters (such as efficiency, energy savings, cost savings, and/or other performance parameters) in the ESPC. Payments are made by the customer to the ESCO only after the performance guarantee is satisfied, using the M and V methods outlined in the ESPC.

Guarantee facility agreement (GFA): agreement signed between a public agency and a local financial institution (LFI) that provides a partial guarantee by the public agency to cover a share of loan losses resulting from EE lending. See partial risk guarantee facility (PRGF).

International financial institution (IFI): institutions that have been established to provide financial services for their clients, have been chartered by more than one country, and operate under international law. Because their owners or shareholders are generally national governments, and sometimes other international institutions and other organisations, they can be considered as public agencies. In many cases they are multilateral development banks.

Leverage: use of debt by a project to enable the project to be financed with less equity; the portion of a project that is financed with debt and expressed in terms of the debt/equity ratio in a project's financing plan. In the context of concessional finance, the amount of total project investment supported or stimulated by the concessional financing. Also called "gearing".

Limited (two-stage) procurement: proposal process in which an open invitation is extended to all parties for expressions of interest (EOI); once replies have been received, the public agency evaluates the EOIs and selects a short list of qualified candidates who are invited to submit proposals.

Local financial institution (LFI): public or private financial institution that provides financial services for its clients in the local market.

Measurement and Verification (M and V): determination of energy savings resulting from an EE project based on agreed methods or protocols (which usually includes definition of baseline energy use, as existed before the EE project implementation) and measurement or estimation of energy savings relative to the baseline).

Negotiated agreements: in the context of public-private partnerships (PPPs), a method for selecting the private-sector partner(s) whereby the public sector negotiates with one or more potential private partners and develops a PPP.

Open public procurement: in the context of PPPs, a method for selecting the private-sector partner(s) whereby an unlimited number of potential private partners can tender for the PPP contract. The public agency selects the best partner(s) based on defined criteria.

Outsourcing: arrangement by which a service provider arranges for a service to be supplied by a third party rather than providing the service with its own staff.

Pari passu: in the context of finance, *pari passu* refers to loans, bonds or classes of shares that have equal rights of payment, or equal seniority. In the context of GFAs, *pari passu* indicates that the losses associated with EE lending are shared equally (50-50) between the public agency and LFI.

Partial risk guarantee facility (PRGF): arrangement by which a public agency (government agency or IFI) provides partial guarantees to cover loan losses incurred by an LFI on commercial loans; the LFI still bears some of the potential risks associated with the project. The three types of partial guarantees are pro-rata, first-loss, and second-loss guarantees. The percentage of the loss covered by the guarantee may vary; a common form of PRGF is for a 50-50 ("*pari passu*") sharing of the losses between the LFI and the public agency.

Performance guarantee: guarantee by an equipment or service provider of the effective performance of the equipment or project/system, as measured by defined specifications and measures.

Portfolio guarantee: arrangement by which a public agency covers all loans by the LFI to a class of borrowers (the portfolio).

Project finance: form of financing in which lenders look solely or primarily to the physical and contract assets of the project being funded and/or the project cash flows as the loan collateral and security. Also known as limited- or non-recourse finance.

Project guarantee: risk guarantee provided by the public agency for an individual project

Pro-rata guarantee: guarantee to share the loss between the LFI and the public agency according to a pre-specified formula. Typically the percentage share of the public agency is between 50% and 80%.

Public agency: in the context of this report, a government agency or IFI; denotes the public partner in the PPP.

Public ESCO: type of ESCO established as a public agency to provide ESCO services to public-sector agencies.

Public-private partnership (PPP): mechanisms that use public policies, regulations or financing to leverage private-sector financing for EE projects. In this report, they comprise partnerships that involve either private-sector finance and/or delivery of energy services to the public sector, or public-sector finance for private-sector EE projects.

Risk allocation: distribution of project risks among parties to a project. Effective risk allocation requires identification and analysis of all project risks. Risks should be allocated to parties best capable of managing them technically and financially.

Risk-sharing facility: partial risk or partial credit guarantee programmes established by a public entity (such as a government agency and/or IFI) to reduce the risk of EE project financing to the lender (by sharing the risk through a guarantee mechanism), thereby enabling increased private-sector lending to EE projects.

Second-loss guarantee: type of partial risk guarantee facility (PRGF) where the public agency covers incremental losses beyond a specified initial loss rate. For example, suppose the LFI has an average loss rate of 1% of its loan portfolio. When asked to move into a new business segment that it perceives to have higher risk (such as EE loans), the LFI would expect the average loss rate to be higher. Because the guarantee is partial, the second loss coverage may start at a percentage loss at or somewhat below 1%.

Shared savings agreement: in the shared savings model of ESPC, the ESCO provides and/or arranges for most or all of the financing needed for project implementation, and assumes the customer credit risk. The resulting cost savings are shared between the ESCO and the customer over a period of time under a pre-specified formula in the ESPC. The sharing of the payments generally is structured such that the ESCO recovers its implementation costs and obtains the looked-for return on its investment within that period.

Super-ESCO: type of ESCO established by a government; it functions as an ESCO for the public-sector market (hospitals, schools, municipalities, government buildings, and other public facilities), and also supports capacity development and project development activities of existing private-sector ESCOs, including helping create new ESCOs.

Tendering process: process whereby potential private partners bid to participate in the PPP.

Transaction costs: costs for preparing a loan (or investment) incurred up to the point of loan/investment closing usually for project development, lender due diligence, and preparation of loan and related legal documents. EE projects typically have high transaction costs relative to their size.

Turnkey construction: commitment of a single party, a contractor, to completely construct and install a project on time, on budget, and according to specifications.



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