Scaling Up Energy Efficiency in Buildings in the Western Balkans

Energy Services Market Development

Guidance Note

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Prepared by Dilip Limaye, Jas Singh and Kathrin Hofer

Contents

Abbreviations and Acronyms

General

CG	credit guarantee
DH	district heating
DSM	demand-side management
ECA	Europe and Central Asia
ECS	Energy Community Secretariat
EE	energy efficiency
EEO	energy efficiency obligation
EERF	energy efficiency revolving fund
ESMAP	Energy Sector Management Assistance Program
ESCO	energy service company
ESA	energy services agreement
ESP	energy service provider
ESPC	energy savings performance contract
EU	European Union
FI	financial institution
GEF	Global Environment Fund
GFA	guarantee facility agreement
GHG	greenhouse gases
GWh	gigawatt-hour
HOA	homeowner association
IFC	International Finance Corporation
IFI	international finance institution
kgoe	kilograms of oil equivalent
kWh	kilowatt-hour
MWh	megawatt-hour
M&V	measurement and verification
MB	management board
MOF	Ministry of Finance
mtoe	million tons of oil equivalent
NEEAP	National Energy Efficiency Action Plan
NPV	net present value
PIU	project implementation unit
PPP	public-private partnership
RE	renewable energy
TA	technical assistance
tCO2e	tons of CO2 equivalent
TRV	thermostatic radiator valves

Regional

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

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

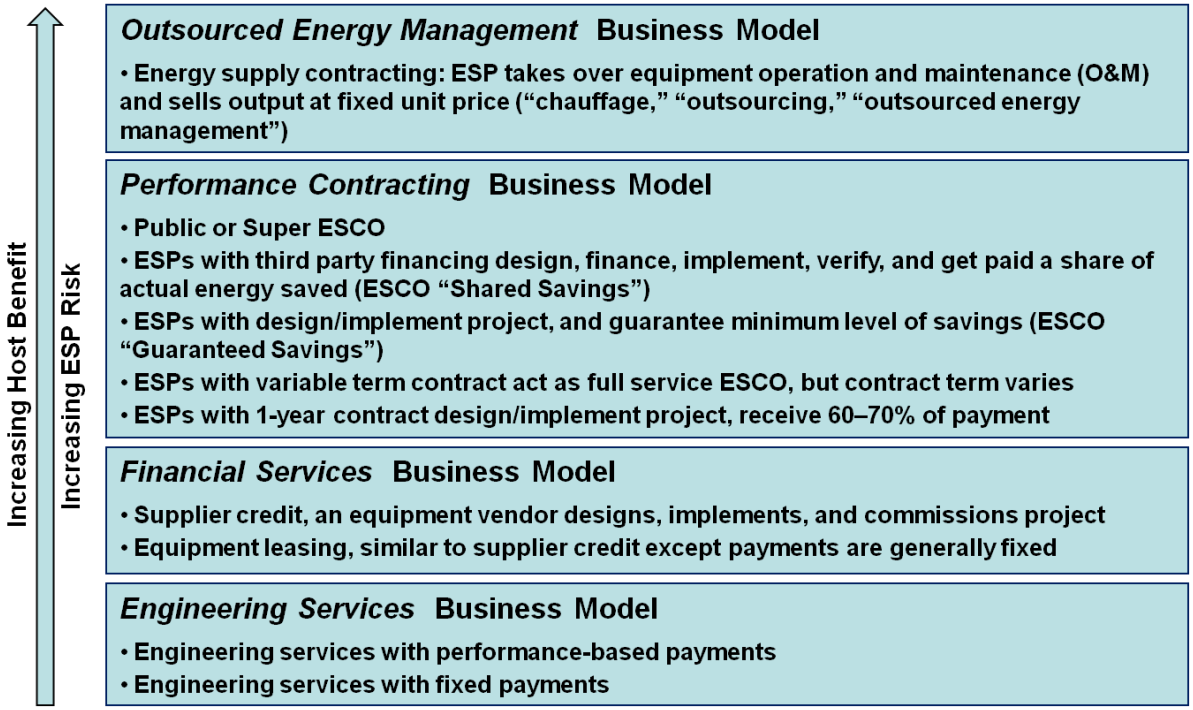
Executive Summary

The development of private sector energy service providers (ESPs), including energy service companies (ESCOs), that specialize in energy efficiency (EE) project development and implementation can help overcome some of the important barriers to scaling up implementation of energy efficiency (EE) projects, particularly in the public sector. ESPs can offer a range of services spanning the energy services value chain and provide the technical skills and resources needed to identify and implement EE opportunities, perform services using performance based contracts (thereby reducing the risks to the energy users), facilitate access to financing from commercial lenders, and enable the energy users to pay for the services from the cost savings achieved. However, the development of energy services markets faces a number of challenges and there are few active ESPs in the Western Balkan countries.

International experience shows that the public sector market can encourage the establishment and growth of ESPs by providing a stable demand for services, clear procurement rules, and access to public financing. This guidance note defines a strategy and "road map" designed to help governments in the Western Balkans develop ESPs in their countries.

The business models typically utilized by ESPs are illustrated in Figure ES-1.

Figure ES-1 – Summary of Energy Services Business Models



Source: Adapted by authors from World Bank 2006.

While ESPs can provide many services using these business models, the establishment and growth of ESPs face a number of challenges. In most developing countries, ESPs are small and have limited technical and financial capabilities. Their ability to obtain commercial financing is constrained by (i) their limited assets and weak balance sheets; (ii) their lack of or limited track record in the market; (iii) the perception of commercial lenders that EE projects are highly risky; and (iv) the lenders' unfamiliarity with, and lack of technical due diligence capabilities to properly appraise, EE projects. These constraints prevent them from accessing financing or guaranteed savings, as with ESCOs in Western Europe and North America.

Governments can encourage the establishment and growth of ESP industries by undertaking a set of legislative, regulatory, and policy initiatives targeted at (i) creating a large and stable demand for energy services projects in the public sector; (ii) removing barriers to public procurement of

EE services and establishing clear regulations, rules, and procedures for public agencies to work with ESPs; and (iii) facilitating adequate and affordable financing for ESP projects. As these markets are catalyzed, ESP activity can then extend to private industry and commercial buildings, this time using its stronger track record to access commercial financing.

This guidance note provides examples of actions taken by governments in many countries (such as Armenia, Bulgaria, Croatia, Czech Republic, Germany, Hungary, and India) to foster the energy services market and help establish and grow ESPs in their countries. Experience from these countries shows that governments need to adopt a three-pronged approach—involving policy and regulatory initiatives, technical assistance (TA), and financing strategies—to build ESP and public agency capacity, implement ESP projects in the public sector, and provide the platform for moving to more complex implementation and financing models in the future. TA or financing alone does not offer an effective strategy to overcome the multidimensional challenges of ESP market development; efforts in all three areas are needed.

Key conclusions of this guidance note are that (i) there is no specific formula that can be prescribed to instruct governments on how to develop energy services markets; and (ii) fostering the ESP market requires governments to undertake a concerted set of legislative, regulatory, policy, financing, and awareness/information initiatives. The roadmap in Figure ES-2 provides guidance to governments on the various initiatives that may help them develop the energy services markets in their countries.

Figure ES-2 – A Roadmap for Developing the Energy Services Market

Identify and assess current market situation	Identify existing ESPs and assess their capacity, strengths and limitations; assess budgeting and procurement regulations; understand public agency credit and borrowing capacity, financial markets, and their willingness to finance public agencies
Conduct stakeholder consultations	Consult with public officials (budgeting, procurement, technical, legal), existing and prospective ESPs, financiers, etc. to identify needs and challenges; identify barriers to public procurement of ESPs
Create demand for EE services	Increase knowledge, awareness and capacity of public agencies to identify/assess projects, establish goals and action plans, provide recognition/awards, standardize documents, bundle projects, conduct workshops, and accredit and/or certify ESPs
Remove barriers to public procurement of EE services	Allow multi-year contracts, allow agencies to retain energy cost savings, use "most value" instead of least cost in public bid evaluation, facilitate PPPs, allow leasing of EE equipment, and exclude ESP payments from public debt
Facilitate financing of ESP projects	Consider options such as establishing EE revolving funds, energy services agreements, funding energy audits of public agencies, providing grants or guarantees, creating risk-sharing facilities, creating public ESCO or Super ESCO, or facilitating forfeiting
Develop and test simple procurement models	To facilitate public agency procurement of ESP services, develop a simple and transparent procurement system with well-defined rules, regulations, and procedures and supporting documents
Expand to more complex models	Learn from results of the simple models to develop scale-up strategies; disseminate results; introduce more complex models involving greater engagement of ESPs and financiers; develop standardized documents/M&V protocols

Source: Prepared by Authors based on World Bank 2010c.

1. Purpose of this Guidance Note

The scaling up of energy efficiency (EE) projects in the Western Balkan countries is critical in order to achieve national targets and move towards a more sustainable energy future. Unfortunately, implementation has been limited by a number of significant barriers, which include the lack of know-how and high transaction costs associated with such projects. A potential mechanism to bridge these gaps is the development of private sector energy service providers (ESPs), including energy service companies (ESCOs), that specialize in EE project development and implementation. The term *ESP* is meant to be broader than *ESCO*, as it can include a range of companies that contribute to the delivery of EE projects, such as design and engineering firms, equipment suppliers, contractors and installers, construction management firms, utilities, and ESCOs.

ESPs can provide the technical skills and resources necessary to identify and implement EE opportunities. They can also perform their services using performance-based contracts, thereby reducing the risks to the energy user; facilitate access to financing from commercial lenders; and enable the energy users to pay for the ESP services from the cost savings achieved. However, the aforementioned barriers to development mean there are few active ESPs in the Western Balkan countries.

International experience shows that, if a sustainable ESP industry is to be established, potential ESPs need to be convinced that (i) there is a large and stable demand for a range of energy and EE services; (ii) there are clear regulations, rules, and procedures on how ESPs will be contracted and paid; and (iii) adequate and affordable financing is available in the commercial financing market for EE projects. The public sector market can provide a logical stimulus to the establishment and growth of ESPs since it can provide a stable demand for services, set clear rules in bidding documents, and access public financing more easily (World Bank 2010a). This guidance note defines a strategy and roadmap for governments in the Western Balkans to help develop ESPs/ESCOs in their countries by implementing appropriate legislative and regulatory initiatives, removing regulatory and institutional barriers to the use of energy savings performance contracts (ESPCs) in the public sector, developing clear procurement and financing rules, and engaging ESPs for EE project implementation.

2. Scaling up EE in the Western Balkans

In the Western Balkans, improving EE has been identified as a key priority, because it can contribute to efficient economic growth while providing one of the lowest-cost measures for reducing greenhouse gas (GHG) emissions (World Bank 2013). The potential for EE is quite large: a recent World Bank study (2010b) estimated energy cost savings of some US$3.4 billion from implementing cost-effective EE measures in the region. In 2012, a regional market assessment commissioned by the Energy Community Secretariat (ECS) estimated potential annual energy savings at about €462 million or 7,940 GWh (ECS 2012). Buildings in the Western Balkans consume about half of the total energy, and estimated energy savings in buildings range between 20 and 40 percent, with the highest potential expected in the public sector (35–40 percent). Although energy savings in the entire public sector were not estimated, the ECS study identified annual energy savings in schools and hospitals to be 515.4 GWh or €35.4 million.

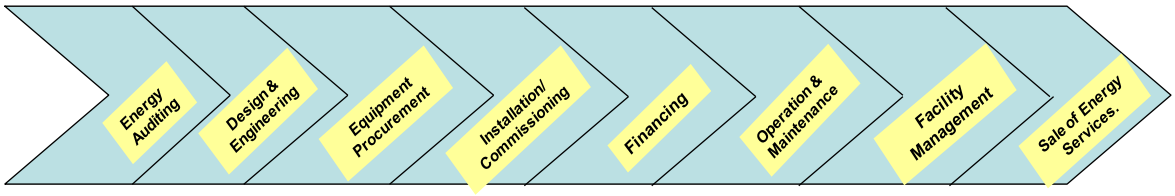
International financial institutions (IFIs), the European Commission, and other donors have organized many financing facilities and technical assistance (TA) programs for the Western Balkans region. A recent report by the Western Balkans Investment Framework (WBIF 2013) estimated that total funding of about €1.5 billion is available—mostly through credit lines offered by local banks, with some TA and grant facilities. However, the vast majority of this funding remains unutilized due to the lack of appropriate delivery mechanisms to link EE projects with the available financing.

Global experience with financing of public sector EE projects demonstrates a number of potential financing mechanisms, ranging from grant and budget financing, to EE revolving funds and public ESCOs, to more advanced commercial or project financing by ESCOs (World Bank 2013a). The long-term goal of governments should be to move from public financing to commercial financing as financial and energy services markets mature. Because there are few operating ESPs, to accomplish this goal Western Balkan governments need to develop and implement policies and programs to foster the establishment of ESPs focused on delivering EE.

3. What is an Energy Service Provider?

An ESP is an enterprise that provides services spanning the energy services value chain. This includes energy auditing, design and engineering, equipment procurement, installation and commissioning, financing, operation and maintenance, facility management, and sale of energy services (Figure 1).

Figure 1 – The Energy Services Value Chain



Source: Limaye 2009.

Traditionally, companies that have provided energy services using ESPC models have been referred to as *energy service companies* or *ESCOs*. Thus, many governments and donor programs have focused on developing local ESCO industries to help tap their EE potentials. However, many other companies that may not commonly be recognized as traditional ESCOs—such as energy suppliers and utilities, equipment manufacturers, engineering/design and installation contractors, construction management firms, and financial institutions—can also provide one or more elements of the EE value chain. This guidance note thus refers to this broader range of companies as *ESPs*.

Benefits of Energy Service Providers

ESPs offer a number of advantages to end users in many sectors—public, commercial, and industrial. For example, ESPs can:

- Mobilize private sector innovation and entrepreneurship to identify and deliver EE
- Provide access to the latest energy efficient products, technologies, and equipment
- Help mobilize private financing
- Use a variety of business models for the range of services and products offered
- Provide high-quality installation, operation, and maintenance
- Implement projects more efficiently and generally at a higher benefit-cost ratio
- Provide training to facility engineers and managers on operations and maintenance, thereby improving staff skills
- Provide performance guarantees, thereby reducing the project risk to the energy users.

Table 1 shows how ESPs can address some of the barriers to EE implementation.

Table 1 – How ESPs can Address Barriers to Implementation

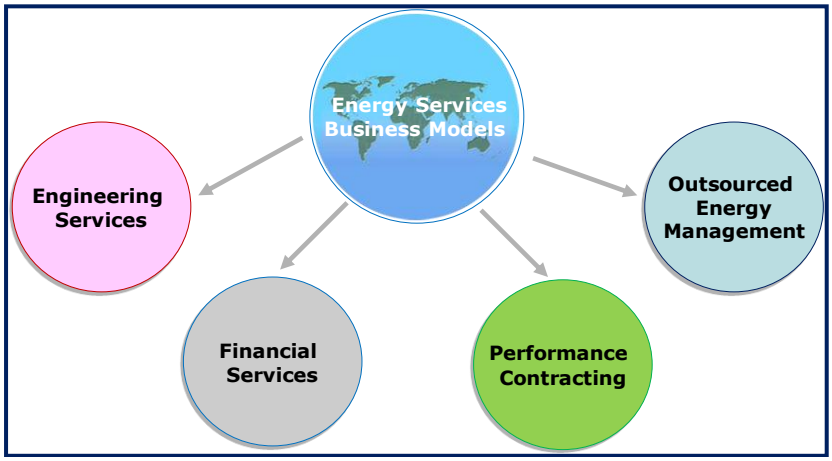
Implementation Barriers	How Addressed by ESPs
Inadequate information and technical know-how	Provide technical skills and expertise from competent private sector firms to identify, assess, and implement EE projects
Small projects with high project development/ transaction costs	Utilize standard streamlined tools for auditing, EE option identification and assessment, energy services agreements, etc.; bundle smaller projects for similar types of facilities
Low interest and motivation	Demonstrate benefits of equipment renewal and facility modernization, facilitate hassle-free installation, and offer simplified turn-key arrangements
Lack of internal budgets for EE improvements	Arrange project financing, usually with loan repayments from project cost savings allowing positive cash flow throughout
High risk perception of commercial lenders	Offer performance-based contracts; clearly define the benefits/costs of EE projects upfront; demonstrate low risk of EE projects already implemented

Source: Prepared by Authors.

4. ESP Business Models

ESPs can use a wide range of business models to offer the services and products identified above. Figure 2 illustrates four main business models.

Figure 2 – Energy Services Business Models



Source: Prepared by Authors.

A discussion of each model follows.

Engineering Services Business Model

The Engineering Services Business model focuses primarily on energy audits, identification of EE options, project design and engineering, equipment procurement, and project installation. The payments for these services include the basic fees for services plus success fees or a share of the savings. The difference between the traditional engineering, procurement, and construction model and this business model is that some of the payments (success fee and/or savings share) to the ESP are performance based. But the ESP is not involved in financing the project.

Financial Services Business Model

In this model the ESP provides financing for the EE project. The financing may be in the form of loans (debt), project equity, or equipment lease. The payments for the ESP services will be derived from the energy cost savings, to service debt, provide a return on equity investments, or make lease payments. Typical ESPs that may offer such services are banks and other financial institutions, equipment suppliers and leasing companies, and distribution utilities. Utilities may

recover the payments though the energy bills. Equipment suppliers typically provide such financing through "supplier credit," wherein the services include designing and implementing the EE project with deferred payments from the host.

Energy Savings Performance Contracting Business Model

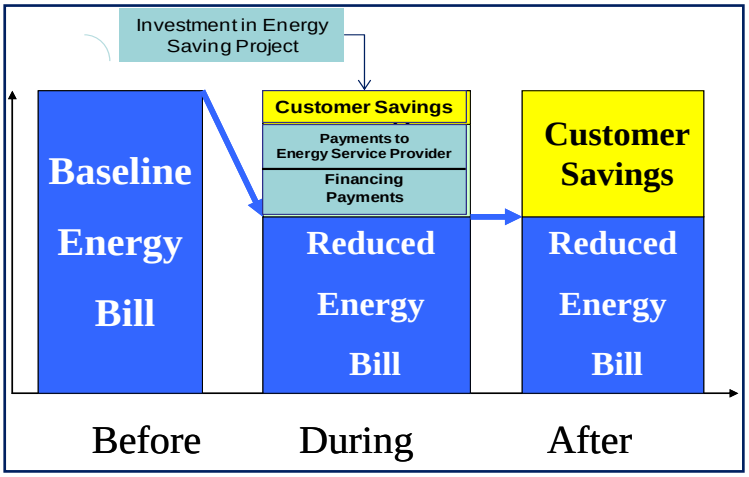
ESPCs have been introduced in many countries to help address some of the more difficult issues associated with facilitating EE investments in the public sector (World Bank 2010c). The concept of an ESPC involves an ESP offering an energy consumer (also called the *host facility* or *project host*) a range of services related to the implementation of an EE project (such as products, technologies, equipment, and systems). The ESP may also provide or arrange financing, so that the host facility has to supply little or no capital. Also, at least part of the compensation from the host facility is typically contingent upon demonstrated project performance, and is usually structured in a manner such that the project costs (for the ESP services) can be paid from the resulting energy cost savings.

The four major characteristics of ESPCs are as follows:

- The ESP provides a full range of energy services related to financing and implementation of EE projects designed to reduce energy use and costs;
- The payments for such services are made by the energy user (also referred to as *project host*) from the cost savings resulting from the projects;
- The payments are generally contingent upon satisfying certain performance guarantees provided under the ESPC; and
- The ESP assumes most of the technical, financial, and performance risks.

Figure 3 illustrates the basic ESPC model.

Figure 3 – ESPC Model



Source: Adapted from World Bank 2014b.

In this model, an ESPC is signed between the project host and the ESP. An investment is made in the energy saving project to reduce the energy bill. The financing of the investment may be by the ESP or the project host. During the term of the agreement a portion of the energy savings is used to repay the financing, another portion pays for other services provided by the ESP, and a small portion is retained by the project host. After the term of the agreement, the project host retains the entire savings.

Two basic versions of the ESPC model are common in North America and other countries like China, Japan, Korea, and Thailand: Shared Savings and Guaranteed Savings.

- **Shared Savings.** In the Shared Savings Model, the ESP generally provides or arranges for most or all of the financing needed for the implementation of the project. The ESPC

specifies the sharing of the cost savings (which are measured and verified using a pre-specified protocol) between the ESP and the host facility over a period of time. The host facility generally makes no investment in the project and gets a share of the savings during the contract period and 100 percent of the savings after the contract period, thus maintaining a positive cash flow throughout the life of the project.

- **Guaranteed Savings.** In the Guaranteed Savings Model, the host facility generally takes the loan on its own balance sheet. The ESP guarantees certain performance parameters in the ESPC, and specifies the methods for measurement and verification (M&V). Payments are made once the project performance parameters have been confirmed.

Although these two are the most commonly used ESPC models, neither has worked effectively in developing countries due to the complexity of these models and the need for very strong ESP balance sheets. Therefore, three simpler models have been developed (World Bank 2010a) and are better suited for Western Balkan countries until the markets develop further:

- **Public or Super ESCO.** In this case, the ESCO is a public enterprise that can enter into ESPCs or simpler agreements, provide financing, and then subcontract implementation to private ESPs. This overcomes the critical financing hurdle and centralizes procurement of private ESPs as well as provides training and oversight (see under "Public or Super ESCOs" at the end of Section 5).
- **Variable-Term Contract.** This is similar to the common ESP models, except that the contract term can vary based on actual savings. If actual savings are less than expected, the contract can be extended to allow the ESP to recover its agreed payment. A variation is the "First Out" model (used in Canada), where the ESP takes all the energy savings benefits until it has received its agreed payment.
- **One-Year Contract.** The ESP gets payment of 60–70 percent in the first year, often with the bulk based on a commissioning test (comparing post-project with promised net present value, or NPV), with the remaining being paid 6–12 months later to ensure continued performance and persistence of savings.

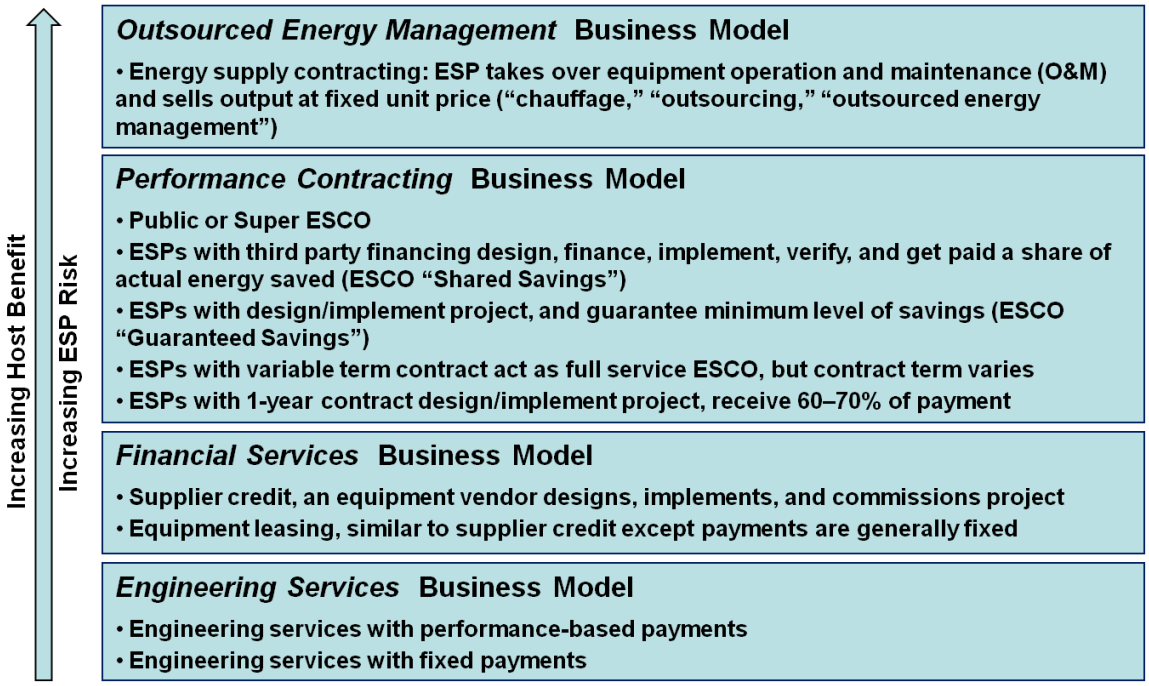
Outsourced Energy Management Business Model

The Outsourced Energy Management model may also be referred to as an *energy performance management contract*, or simply *energy supply contracting*. This model represents a form of outsourcing in which the costs for all equipment upgrades, repairs, and so forth are borne by the ESP and the ESP sells the energy output (such as steam, heating and cooling, or lighting) to the end user at an agreed price. Ownership of equipment may remain with the ESP (Build-Own-Operate model) or may be transferred to the customer (Build-Own-Operate-Transfer model). This business model is common in EU countries, where contracts for this type of arrangement tend to be substantially longer than the other contract types, ranging from 10 to 30 years.

Summary

Figure 4 summarizes the different energy services business models.

Figure 4 – Summary of Energy Services Business Models



Source: Adapted by authors from World Bank 2006.

Challenges to the Development of ESPs

While ESPs can provide many services using the range of business models mentioned above, the establishment and growth of ESPs face a number of challenges. In most developing countries, ESPs are small and have limited technical and financial capabilities. Their ability to obtain commercial financing is constrained by (i) their limited assets and weak balance sheets; (ii) their lack of or limited track record in the market; (iii) the perception of commercial lenders that EE projects are highly risky; and (iv) lenders' unfamiliarity with, and lack of technical due diligence capabilities to properly appraise, EE projects. In the case of the performance contracting model (with some exceptions, such as public/super ESCO models), since financial institutions usually require the project "promoter" or developer to make an equity investment (often a minimum of 30 percent of total project cost), ESPs are limited in terms of how many projects they can undertake at any particular time. Also, the costs of project development and financing transactions are relatively high for EE projects and ESPs often lack the financial resources required to invest in developing many projects.

Many of these challenges can be alleviated if the public sector offers opportunities for ESPs to undertake projects in public buildings and facilities. Unfortunately, working with public agencies in Western Balkan countries introduces a new set of issues that can constrain ESPs from successfully undertaking public sector EE projects:

- Public agencies are often unable to enter into long-term contracts. Since energy services projects generally require payments from energy savings over time, removing this constraint is of critical importance.
- In some cases, public sector budgeting processes do not allow the agency to retain the cost savings from EE projects, thereby precluding the option of paying for energy services from cost savings. This issue tends to be less critical for municipal borrowers but more relevant for purely budget-funded entities, such as ministries.
- Most public procurement rules require the selection of the lowest bidder based on a fixed package of goods and services. In energy services, the EE measures may not be fixed and the lowest-cost supplier is not necessarily the "best" provider of energy services, particularly for projects involving varying levels of energy savings.

- In some cases, payments owed under ESP contracts are treated in the public agency accounting system as debt. Such accounting treatment can limit the ability of public agencies with limited borrowing capacity to engage ESPs.
- Because some public buildings connected to district heating (DH) networks are billed on the basis of heated floor area rather than energy consumed, there may be no incentive for the public building administrators to reduce energy use and no generated cost savings from which to repay debt. However, this issue has already been resolved in many Western Balkan countries.
- Many public agencies lack the capacity to evaluate ESP proposals, negotiate ESP contracts, and manage and supervise the ESPs.

ESPs also face many challenges in raising the financing needed for EE projects in public agencies. Most public agencies do not have sufficient internal funds (budgetary resources) to make the capital investment needed for EE projects. Therefore the ESP needs either (i) to arrange financing for the public agency from commercial financing sources or (ii) to obtain financing directly from such sources. Both options face several barriers. Many public agencies are not creditworthy from the perspective of commercial lenders, and even creditworthy agencies are often already at their borrowing limits. Also, commercial banks and financial institutions are generally reluctant to lend to public agencies because they cannot provide adequate collateral for the debt financing. As described above, ESPs can also find it difficult to raise debt funds to finance public EE projects due to their limited asset base, weak balance sheets, and limited track records. Many of these challenges can be addressed by governments through legislative, regulatory, and procurement initiatives.

5. How Governments Can Foster ESPs

Governments can assist the establishment and growth of ESP industries by undertaking a set of legislative, regulatory, and policy initiatives targeted at:

- Creating a large and stable demand for energy services projects in the public sector;
- Removing barriers to public procurement of EE services and establish clear regulations, rules and procedures for public agencies to work with ESPs; and
- Facilitating adequate and affordable financing of ESP projects.

This section reviews each initiative in turn; they are summarized in Table 2.

Table 2 – Government Actions to Foster ESPs

Create Demand for EE Services	Remove Barriers to Public Procurement of EE Services	Facilitate Financing of ESP Projects
• Increase PA knowledge and awareness of ESPs • Increase PA capacity to identify ESP opportunities • Require EE targets and action plans • Develop standard, templates, benchmarks, and M&V schemes • Organize Workshops with PAs and ESPs • Aggregate similar projects across PAs • Accredit or certify ESPs	• Allow PAs to sign multiple-year contracts • Allow retention of energy cost savings to pay ESPs • Change procurement rules to select most value, not least cost • Exclude ESP payments from PA debt • Require consumption-based billing for DH • Allow PAs to engage in PPPs and EE equipment leasing • Encourage PAs to use simple ESP business models	• Establish EE revolving fund with loan facility • Establish EE revolving fund with energy services agreements (ESAs) • Provide budgetary grants • Provide risk-sharing facility • Facilitate forfeiting of ESP contracts • Establish public or super ESCO

Note: PA = public agency; PPP = public-private partnership; M&V = measurement and verification.
Source: Prepared by Authors.

Creating a Demand for Energy Services in the Public Sector

The public sector is a very large energy user in the Western Balkans. As discussed in Section 2, buildings[1] in the Western Balkans represent about half of total energy consumption. They are generally very energy inefficient because of the use of old, outdated equipment; inadequate maintenance; limited budgets for purchasing efficient equipment; and lack of knowledge of and incentives for EE improvements. Public agencies generally lack the capacity to identify, finance, and implement EE projects, and ESPs can offer useful and valuable services to them. But for ESPs to enter the market, they need to be assured that there is a large and stable demand for their services. Governments can take a wide range of actions to create such a demand:

- Increase public agency knowledge and awareness of the need for EE and the role that ESPs can play in implementing EE projects.
- Improve public agency capacity to identify and assess EE opportunities, including developing training programs, tools, and case studies.
- Establish binding targets for EE improvement in public agencies and provide incentives to agency staff for meeting or exceeding these targets.
- Require public agencies to develop EE action plans to meet the binding targets.
- Develop standardized documents such as audit templates, benefit-cost assessment tools, request-for-proposal (RFP) and bidding documents, and energy services contracts and agreements.
- Develop and disseminate data and benchmarks on energy consumption in different types of public buildings.
- Provide technical assistance to public agencies for identifying EE project opportunities, developing RFPs and bidding documents, procuring ESP services, and monitoring their performance.
- Develop simple but effective measurement and verification (M&V) protocols (See Box 1).
- Organize workshops involving public agencies and ESPs to publicize the ESP models, facilitate interaction between public agencies and ESPs, and give ESPs an indication of the forthcoming procurements from public agencies.
- Bundle similar projects across multiple public agencies, creating larger projects with relatively lower transaction costs that will be more attractive for ESPs.
- Accredit and/or certify ESPs, thereby giving public agencies greater confidence to enter into contracts with them.
- Harmonize procurements to help ensure a steady stream of RFPs each period to avoid bunching and large gaps.

[1] Buildings include federal and municipal buildings as well as universities and schools, hospitals, public lighting, water utilities, and other public facilities.

Box 1 – Measurement and Verification (M&V)

A key element of energy services, M&V involves defining the following:

- Baseline energy consumption of the existing systems (prior to introduction of EE measures)
- Formulas and procedures for determining baseline energy consumption
- Adjustment factors to be applied to the baseline energy consumption (these are factors that could reasonably be expected to increase or decrease energy usage and are outside the control of the ESP, such as changes in outdoor temperature for air-conditioning measures)
- Occupancy and equipment operations schedules
- Formulas and procedures for determining the post-EE project installation energy consumption
- Procedures for performing the statistical validation and level of anticipated accuracy of results
- Specification of equipment and procedures used to collect, measure, or obtain results
- Method and format of reporting results to the customer
- Schedule of reporting to the customer

A number of internationally accepted methodologies and protocols for M&V exist, from simple "deemed savings" approaches to complex metering, modeling, and simulation. There is a trade-off between the accuracy and precision of M&V and the cost of M&V. It is important to develop standardized M&V approaches for public sector EE projects, but it is also important to keep such approaches simple and inexpensive. *Deemed savings* is a pre-determined, validated estimate of energy and peak demand savings attributable to an EE measure instead of energy and peak demand savings determined through M&V activities. Under the deemed savings approach, the public agency and the ESP agree to a simplified savings calculation procedure and the savings are then "deemed," or calculated, using this procedure. For less developed markets, use of deemed savings can greatly reduce M&V costs, although it shifts some of the actual project performance risk back to the public client.

Source: World Bank 2010a.

Removing Barriers to Public Procurement of EE Services

Legislation, Regulations, Procedures

Governments in the Western Balkans have a number of options for removing the barriers that currently prevent ESPs from supplying EE services to public agencies. They include the following:

- *Revise legislation* to allow public agencies to sign multiple-year contracts. Such contracts are usually needed if the agency is to pay for the energy services from the energy cost reductions achieved. In some countries, EE repayments can be categorized as utility payments, which are implicitly multi-year contracts.
- *Change public budgeting regulations and procedures* to allow public agency budgets to retain energy savings from EE projects. This is critical if public agencies are to make EE repayments from the savings.
- *Change government procurement rules,* which currently require that projects be predefined and that the lowest bidder be selected. Instead, the rules should allow bidders to propose a wider range of EE solutions, and the government should select ESPs based on the proposal offering the best value (such as highest NPV).
- *Enact legislation or regulations* to allow public agencies to participate in public-private partnerships (PPP) for implementing EE projects, which can help particularly with the outsourced energy management model.
- *Amend procurement regulations or procedures* to facilitate public agencies' leasing of energy efficient equipment.

- *Change public accounting and budgeting regulations/procedures* to exclude ESP investments from public agency debt.[2] Given the limited public debt capacity in the Western Balkans region and numerous competing priorities, this change would help motivate public agencies to work with ESPs since they would be able to retain their debt capacity for their other investments.
- *Require a transition of all public agencies on DH* to consumption-based metering and billing.

Procuring ESP Services

ESPs can greatly assist EE implementation and help mobilize commercial financing to the public sector. But procurements of ESP services can be complex, since they (i) are a blend of goods, works, services, and sometimes financing; (ii) use an output-based rather than input-based approach to defining the project scope; (iii) rely on a variety of cost factors and varying public benefits for evaluation; and (iv) require payments based on performance, which requires credible baseline and post-project energy use data (World Bank 2013a). While these issues are complex, governments should build upon existing procurement precedents in other sectors that can serve as reference points.

In some recent procurement laws dealing with PPPs, standard contract models have been developed to deal with similar issues; these include management services contracts, output-based and performance-based infrastructure contracts, and cost-plus contracts. Based on these precedents, efforts should then be undertaken to develop tailored bidding documents for simplified ESP contracts that seek to (i) use simplified design and construction contracts; (ii) specify a minimum level of energy savings that must be achieved rather than prescribing the specific EE measures to be installed; (iii) base selection on the highest NPV; (iv) link at least part of the ESP payment (20–30 percent) to a commissioning test (comparing post-project with promised NPV); and (v) include at least one deferred payment (e.g., 6–12 months after commissioning). Figure 5 illustrates a range of approaches to allow and promote public procurement of ESPs.

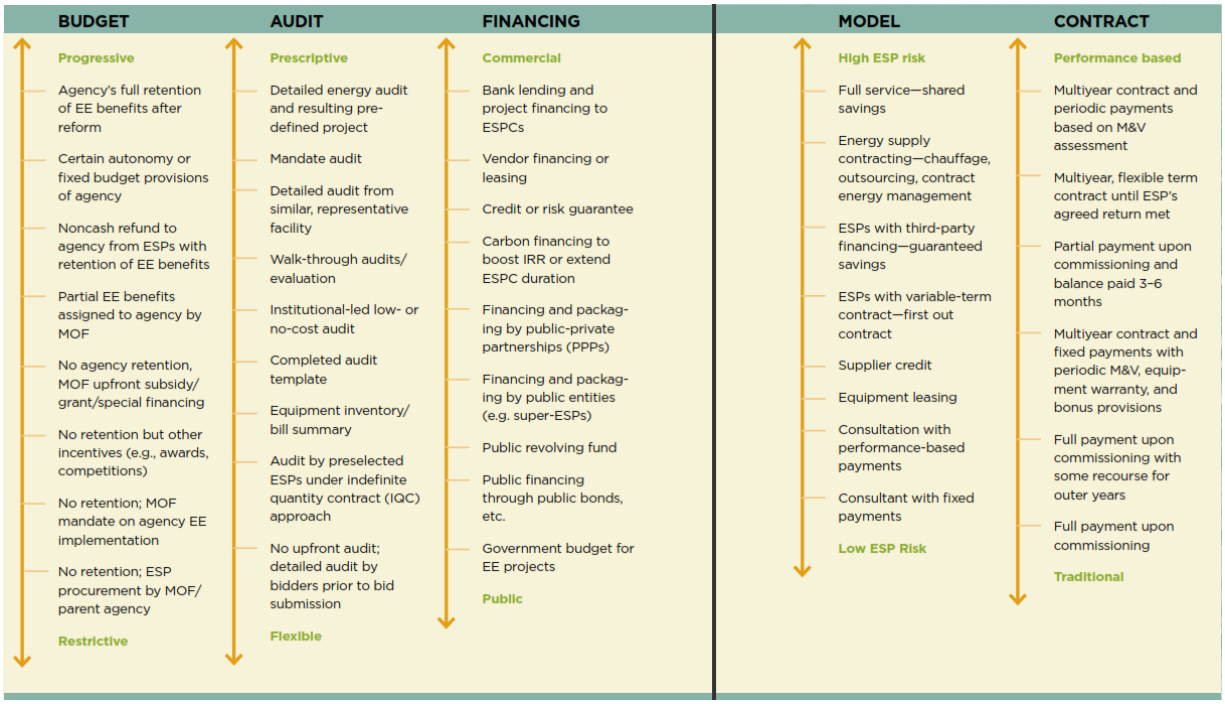
As discussed in Section 4, governments can also facilitate procurement of ESP services through the use of simplified business models, such as:

- *Supplier credit:* an equipment vendor designs, implements, and commissions the project with a one -time deferred payment to the supplier;
- *Equipment leasing:* similar to supplier credit, except payments are generally made over an extended time period;
- *ESPs with 1-year contracts* design/implement project, receive 60–70 percent of payment; or
- *ESPs with variable-term contracts* act as full service ESCOs, but the contract term varies.

Such models can help create a basis which the ESPs can build upon and evolve over time.

[2] In Germany, for example, ESPCs are viewed as an alternative to credit financing and, thus, are not counted against public debt as long as the cost savings are greater than repayment obligations.

Figure 5 – Range of ESP Approaches

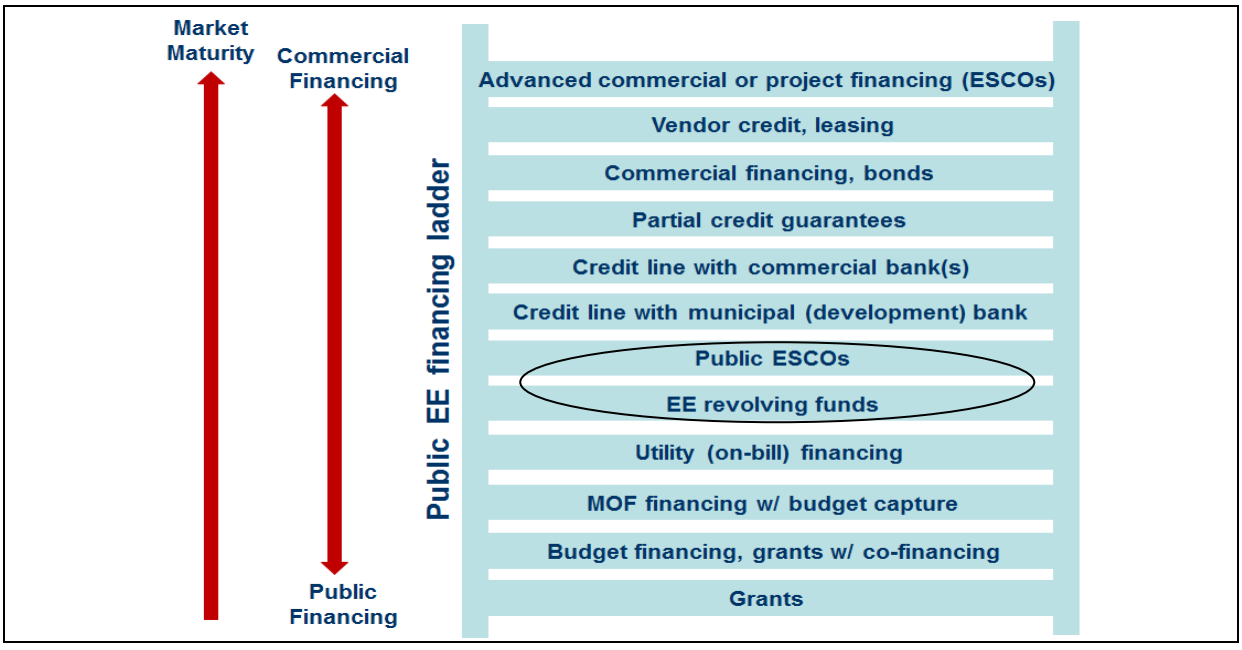


Source: World Bank 2010c.

Facilitating the Financing of ESP Projects

The World Bank's experiences around the world show that there are a number of financing options for ESP projects in public buildings that can help address some of the barriers to EE implementation. These options can be represented as a "financing ladder" (see Figure 6) to help guide policymakers in selecting one or more options that can then be designed to provide accessible financing products. The following discussion focuses on the two options circled in Figure 6: (i) EE revolving funds and (ii) public, or "super," ESCOs.

Figure 6 – Public Energy Efficiency Financing Options Ladder



Source: World Bank 2013a.

EE Revolving Funds

EE revolving funds offer viable options for governments to stimulate ESP projects in the public sector.[3] Such funds have been successfully deployed by national or state governments, with assistance from the World Bank and GEF, in Armenia (World Bank 2013c), Bulgaria (World Bank 2010d), and Romania (World Bank 2009). They offer a range of long-term financing options for public sector EE projects, such as:

- *Loans to (i) public agencies that are creditworthy and have borrowing capacity or (ii) to ESPs that provide services to these public agencies*, such as those offered by the Bulgarian Energy Efficiency Fund (BEEF).
- *Energy services agreements (ESAs) with public agencies that have little or no borrowing capacity and/or do not have the capacity to contract with and manage ESPs.* Under an ESA, the fund offers a full package of services to identify, finance, implement, and monitor EE projects. The public agency is usually required to pay to the fund all, or a portion, of its baseline energy bill to cover the investment cost and associated fees during the contract period. The fund can then engage ESPs to provide some or all of the implementation services using performance-based agreements. A good example of an ESA is provided by the Armenia R2E2 Fund (see the Armenia case study in Annex A).
- *Risk sharing facilities, designed to address the perception held by lenders that EE projects are inherently riskier than their traditional investments*. These provide partial coverage of the risk involved in extending loans for EE projects. This approach facilitates bank lending to ESPs and helps develop the energy services market. An example is the IFC/GEF partial risk guarantee program in Hungary (see the Hungary case study in Annex A).
- *Forfeiting or sale of ESP receivables*. Forfeiting is useful in situations where an ESP is providing its own equity for project financing. It is a form of transfer of future receivables from one party (the seller—an ESP) to another (the buyer—a financial institution).[4] An example of forfeiting is provided by the Bulgarian ESCO Fund (BEF) established under the Law for Special Investment Companies by the Bulgarian company Enemona.

Public or Super ESCOs

Another option for financing ESP projects in the public sector is the creation of a public, or "super," ESCO.[5] Examples of *public* ESCOs include the HEP ESCO in Croatia (HEP 2013), the Krakow ESCO in Poland, and UkrESCO in Ukraine (World Bank 2010a).[6] Recent *super* ESCOs include Fedesco in Belgium (Madam 2013), Fakai Super ESCO in China (ECO-Asia 2009), and EESL in India (EESL 2013). Public and super ESCOs facilitate contracting with other public agencies, help reduce transaction costs associated with complex public sector procurements, allow for financing of performance contracts from international donor agencies, and help develop ESPs by engaging them as subcontractors in the implementation process. They can thus serve as incubators for local ESPs, while allowing the concept of ESPCs to become accepted and providing the local ESPs with experience and track records for their future marketing.

[3] A more detailed discussion is provided in a separate guidance note on EE revolving funds (World Bank 2014b).
[4] The original creditor (the ESP) cedes his claims to future revenues from the project and the new creditor (the FI) gains the right to claim these future receivables from the debtor (the client). The ESP receives a discounted one-time payment from the FI that then allows it to invest in new ESPC projects.
[5] Additional information on public and super ESCOs is provided in World Bank 2013a.
[6] http://www.esco.krakow.pl/about_us/about_us/english.

6. International Examples of Government Initiatives to Foster the Energy Services Market

Many governments have taken actions to foster the energy services market and help establish and grow ESPs in their countries. Some examples are provided in Table 3.

Table 3 – Illustrative Government Actions to Foster ESPs

Government Action	Country	Summary Description
Procurement Agent	Germany	The Berlin Energy Agency helps public agencies, on a fee-for-service basis, to identify EE opportunities; it also provide standard templates for audits, RFPs, bid evaluation, contracts, etc. and as well as guidance throughout ESP procurement process
Facilitating public procurement	Czech Republic	The government reformed public procurement procedures to facilitate ESP contracts; uses multiple criteria in ESP bid evaluation; and certifies "energy experts"
Project bundling	Hungary	The Ministry of Education issued single procurement for all schools and competitively selected an ESP consortium to provide EE services to all schools under a master contract
Forfeiting	Bulgaria	The Bulgaria ESCO Fund used financing from EBRD to purchase the cash flows from an ESP project; this allowed the ESP to free up funding for additional projects.
EE revolving fund with loan facility	U.K.	Salix Finance was established by U.K. DECC to provide loan financing exclusively for public sector projects; it has worked with 138 public agencies and financed over 11,000 projects, many of which are implemented by ESPs
EE revolving fund with ESAs	Armenia	The Armenia R2E2 Fund offers public agencies ESAs under which it designs the project, hires ESPs, oversees construction, and monitors the project under a fixed-price, long-term agreement
Public ESCO	Croatia	A public ESCO was established in the national utility, HEP, to (i) develop, finance, and implement EE projects using local businesses as key delivery agents and (ii) provide opportunities for ESPs to tap into new energy efficiency business opportunities
Super ESCO	India	A public sector entity (EESL) was established to develop, finance, and implement EE projects in the public sector using private ESCOs as subcontractors or partners

Source: Prepared by Authors.

Table 4 shows the results with respect to public-sector ESP projects in developed countries.

Table 4 – Public Sector ESP Markets and Results from Selected Developed Countries

Country	Market Size	Results	No. of Projects
Canada (Federal Buildings Initiative)	C$320 million (~US$ 300 million)	• 20% reduction in energy intensity • C$40 million energy savings • 285,000 tons of CO_2e reduction	85 ESP projects (7,500+ buildings)
Germany	€200 million (~US$260 million)	• 20–30% reduction in energy costs • €30-45 million energy cost savings	~2,000 ESP projects
Japan	¥10 billion (~US$115 million)	• 12% reduction in energy intensity • 265,000 tons of CO_2e reduction	50 ESP projects in 2006
South Korea	223 billion Won (~US$185 million)	• N/A	~1,400 public ESP projects
USA (Federal Energy Management Program)	US$3.8 billion	• ~30 trillion btu/year • US$11.7 billion in energy cost savings	500+ ESP projects

Source: World Bank 2010c.

7. Lessons Learned from International Experience

This section summarizes the key lessons learned from international experience with regard to (i) policies and regulations and (ii) technical assistance.

Policies and Regulations

- The development of an ESP/ESCO market and the establishment and growth of ESPs require strong and sustained government commitment and actions and can take 5–10 years or more.
- One strategy governments have employed to develop their local ESP industries is to promote ESP projects in the public sector.
- Stakeholder consultations can be very effective in identifying potential solutions to market and regulatory (e.g., budget, procurement) barriers and gaining buy-in from all sides on market development activities and solutions.
- Pilot efforts are generally needed to test alternative procurement and financing schemes for ESPs.
- Formal accreditation and/or certification schemes for ESPs can help improve the credibility of ESPs with public agencies and facilitate EE project transactions between them, provided they are carried out transparently and do not create barriers to market entry.
- There is a wide range of ESP business models. Governments should encourage the adoption of simple business models suitable for local market conditions (such as leasing, supplier credits, and one-year ESP contracts) to initiate ESP projects in public agencies.
- To facilitate public agency procurement of ESP services, governments need to develop a simple and transparent procurement system with well-defined rules, regulations, procedures, and supporting documents.

Technical Assistance

- TA needs to be provided to both public agencies and ESPs to facilitate the agencies' procurement of ESP services. This might include organization of pre-bid workshops, development of procurement guidelines, and so on.
- A key element of developing a market for ESP services is to educate public agency decision-makers on the potential role and benefits of ESPs in implementing EE projects. To avoid unrealistic expectations, this should include discussion of exactly what ESPs can and cannot do.
- Upfront data collection, benchmarking, and market assessments in such areas as EE potential, ESP capabilities, and available financing are critical to identifying barriers and TA needs.
- Once the procurement and financing schemes are sufficiently evolved, the development of standardized documentation (such as audit templates, RFPs and contracts, and M&V protocols) can assist with scale-up. Governments may have many options for addressing the financing challenges of ESPs. The selection of the appropriate option(s) should be based on the local legislative and regulatory situation and energy services and financing market conditions.
- Simple financing models, such as establishment of EERFs (with the ESA option and/or forfeiting) and public ESCOs, can be effective in helping develop the ESP market.
- To serve the needs of all public agencies and provide opportunities for ESPs to participate in EE project implementation, the development of an ESA approach appears to be a suitable model for the region. (See under "EE Revolving Funds" in Section 5 and the Armenia case study in Annex A.)

- The establishment of public or "super" ESCOs can help the development of the energy services market and the financing of ESP projects, as long as such public entities have a clear mandate to engage ESPs in project implementation. Governments must ensure that such public organizations do not "crowd out" private sector ESPs from the market.

Conclusion

A major conclusion from these lessons is that governments need to adopt a three-pronged approach—involving policy and regulatory initiatives, TA, and financing strategies—to build ESP and public agency capacity, implement ESP projects in the public sector, and provide a platform for moving to more complex implementation and financing models in the future. TA or financing alone has not proven an effective strategy in overcoming the multidimensional challenges of ESCO development; efforts in all three areas are needed.

Table 5 presents results of ESP markets in selected countries. It should be noted that in China the focus of the ESP activities has primarily been in the industrial sector, whereas in India, South Africa, and Thailand both buildings and industry have been targeted. In the Czech Republic (as in the rest of the EU) the main focus has been on buildings.

Table 5 – Energy Services Markets in Selected Developing Countries

Country	Initiation	No. of ESPs	Characteristics
China	1998	>500	• World Bank support • Focus on industry • Mostly Guaranteed Savings
Czech Republic	1994	15	• Government and donor funds • Focus on public sector • Guaranteed Savings most common
India	1995	>120	• Strong accreditation scheme • Focus on buildings and industry • High growth in recent years
South Africa	2004	>100	• Financing from Eskom • Focus on both industry and buildings • ESCO accreditation scheme
Thailand	1999	45	• Government funding support • Focus on both industry & buildings • Guaranteed and Shared Savings

Source: Limaye 2014.

8. Roadmap for Establishing an Energy Services Market

Private sector ESPs represent a useful option for scaling up implementation of EE projects. However, in many countries—including all of the Western Balkan countries—few ESPs are currently operating and the development of energy services markets faces a number of challenges. Governments can foster the establishment and growth of ESPs by using the ESPC approach to public sector procurement of energy services. Experience with public sector ESPCs can build the capacity of ESPs and enable them to extend their services to the private sector.

As indicated in the case studies in Annex A, governments have implemented a wide range of initiatives to encourage the establishment of energy services markets. Key conclusions of this guidance note are that (i) there is no specific formula that can be prescribed to instruct governments on how to develop energy services markets; and (ii) fostering the ESP market requires governments to undertake a concerted set of legislative, regulatory, policy, financing, and awareness/ information initiatives.

The roadmap in Figure 7 provides some guidance to governments on the various initiatives that may help them develop the energy services markets in their countries.

Figure 7 – A Roadmap for Developing the Energy Services Market

Identify and assess current market situation	Identify existing ESPs and assess their capacity, strengths and limitations; assess budgeting and procurement regulations; understand public agency credit and borrowing capacity, financial markets, and their willingness to finance public agencies
Conduct stakeholder consultations	Consult with public officials (budgeting, procurement, technical, legal), existing and prospective ESPs, financiers, etc. to identify needs and challenges; identify barriers to public procurement of ESPs
Create demand for EE services	Increase knowledge, awareness and capacity of public agencies to identify/assess projects, establish goals and action plans, provide recognition/awards, standardize documents, bundle projects, conduct workshops, and accredit and/or certify ESPs
Remove barriers to public procurement of EE services	Allow multi-year contracts, allow agencies to retain energy cost savings, use "most value" instead of least cost in public bid evaluation, facilitate PPPs, allow leasing of EE equipment, and exclude ESP payments from public debt
Facilitate financing of ESP projects	Consider options such as establishing EE revolving funds, energy services agreements, funding energy audits of public agencies, providing grants or guarantees, creating risk-sharing facilities, creating public ESCO or Super ESCO, or facilitating forfeiting
Develop and test simple procurement models	To facilitate public agency procurement of ESP services, develop a simple and transparent procurement system with well-defined rules, regulations, and procedures and supporting documents
Expand to more complex models	Learn from results of the simple models to develop scale-up strategies; disseminate results; introduce more complex models involving greater engagement of ESPs and financiers; develop standardized documents/M&V protocols

Source: Prepared by Authors based on World Bank 2010c.

References

Berger, Susanne. 2011. "Energy Saving Partnership Berlin: Supporting ESCO markets on a regional basis." Presentation at the "Financing Retrofit: Public Sector" conference, Dublin, Ireland.

Czech Republic. 2000. *Act on Energy Management: 25 October 2000.* Prague, Czech Republic.

ECS. 2012. Energy Community Secretariat. *Study on Energy Efficiency in Buildings in the Contracting Parties of the Energy Community*. Prepared by ENSI. Vienna, Austria..

ECO-Asia. 2009. ECO-Asia Clean Development and Climate Program. *Development of a Super ESCO to Implement a 600 MW Energy Efficiency Power Plant in Hebei, China*. December 2009.

EESL. 2013. "Performance Review and Business Plan for 2013-14." Presentation to the Ministry of Power, New Delhi, India.

HEP. 2013. Vlasta Zanki, HEP. "Experience Implementing ESCO Projects in Croatia." Presentation at the KfW Energy Forum, Frankfurt.

International Energy Agency (IEA). 2003. *Energy Policies of IEA Countries: Hungary*. Paris.

International Finance Corporation (IFC). 2008. Smart Lessons in Energy Efficiency, Washington D.C.

Joint Research Centre (JRC). 2010. Angelica Marino, Paolo Bertoldi, and Silvia Rezessy. *Energy Service Companies Market in Europe - Status Report 2010*. Prepared by the Institute for Energy. Ispra, Italy.

Limaye, Dilip R. 2009. *Developing an Energy Services Business Training Module: Vietnam Energy Efficiency Program*. Hanoi.

———. 2013a. *Developing an Energy Services Business, e-Learning Module*. Washington, DC: World Bank Institute.

———. 2013b. *Scaling Up Energy Efficiency In Buildings in The Western Balkans: Case Study - Hungary - Schools Energy Efficiency Program.* Washington, DC: World Bank.

———. 2014. "Business Models for Private Sector-led Energy Efficiency." Presentation to the Executive Power Breakfast, USAID Energy sector Capacity Building Program, Amman, Jordan.

Limaye, Dilip R. and Emily S. Limaye. 2011. "Scaling Up Energy Efficiency: The Case for a Super ESCO." *Energy Efficiency Journal* 4:133–144.

Madam, Christophe. 2013. "Engaging Energy Service Companies (ESCOs), Case Study: Fedesco Belgium." Presentation at the KfW Energy Forum, Frankfurt, November.

Malek, Bohuslav. 2011. "Energy Efficiency in Public Buildings: Experiences from the Czech Republic." Presentation at the World Bank Institute Training Seminar on Public Procurement of Energy Efficiency Services, Skopje, Macedonia.

Sochor, Vladimir. 2011. "Energy Efficiency in Public Buildings: Experiences from the Czech Republic." Presentation by SEVEn, World Sustainable Energy Day, Prague, Czech Republic.

Ürge-Vorsatz, Diana, Pierre Langlois, and Silvia Rezessy. 2005. "Why Hungary? Lessons Learned from the Success of the Hungarian ESCO Industry." http://www.eceee.org/library/conference_proceedings/ACEEE_buildings/2004/Panel_6/p6_30/paper.

Western Balkans Investment Framework (WBIF). 2013. *Financing Energy Efficiency Investments in the Western Balkans*. Vienna, Austria.

World Bank. 2006. World Bank/GEF. *Energy Efficiency Portfolio Review and Practitioners' Handbook*. Washington, DC.

World Bank. 2009. *Implementation Completion report, Global Environment Facility Trust Fund Grant in the Amount Of US$ 10 Million to Romania for an Energy Efficiency Project*. Washington DC.

World Bank. 2009b. *Project Appraisal Document for a Municipal Services Improvement Project in Macedonia*. World Bank: Report No. 462 16-MK. Washington, DC.

World Bank. 2010a. Jas Singh, Dilip Limaye, Brian Henderson, and Xiaoyu Shi. *Public Procurement of Energy Efficiency Services.* Washington, DC.

World Bank. 2010b. *Status of Energy Efficiency in the Western Balkans: A Stocktaking Report.* Report no. AAA49-7B. Washington DC.

World Bank. 2010c. *Guidance Note: Public Procurement of Energy Efficiency Services: Getting Started*. Washington, DC.

World Bank. 2010d. *Implementation Completion and Results Report for the Bulgaria Energy Efficiency Project.* Report No. ICR00001575. Washington, DC.

World Bank. 2010e. *Implementation Completion and Results Report for the Bulgaria Energy Efficiency Project*. Report No. ICR00001557. Washington, DC.

World Bank. 2012a. ESMAP. *Modernization of the District Heating Systems in Ukraine: Heat Metering and Consumption-Based Billing.* Washington, DC.

World Bank. 2012b. *Project Paper on a Proposed Additional Loan and Restructuring for the Municipal Services Improvement Project in Macedonia.* Report no. 67713-MK. Washington, D.C.

World Bank. 2013a. *Scaling Up Energy Efficiency in Buildings in the Western Balkans*. Interim report. Washington, DC.

World Bank. 2013b. Xiaodong Wang, Richard Stern, Dilip Limaye, Wolfgang Mostert, and Yabei Zhang. *Leveraging Commercial Financing for Clean Energy in East Asia*. Washington, DC.

World Bank. 2014a. *Guidance Note: Financing Municipal Energy Efficiency Projects*. Washington, DC.

World Bank. 2014b. *Guidance Note: Energy Efficiency Revolving Funds.* Washington, DC.

World Bank. 2014c. *Armenia, World Bank Energy Mission: January 27–31, 2014*. Aide-mémoire. Washington, DC.

Annex A. International Examples of Government Initiatives to Foster the Energy Services Market

This annex presents four case studies of countries where government initiatives have promoted the development of energy services markets: Armenia, Croatia, Czech Republic, and Hungary.

1. Armenia

Introduction

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

Energy Services Agreements

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

- For municipalities and public entities with revenue streams independent of the state budget, loans are provided. These loans do count as municipal debt, with fixed repayment obligations to be made within their budget provisions in future years. The amounts of the repayments are designed to allow clients to repay the investment costs and service fees from the estimated energy cost savings. The client can pay additional fees for the Fund to implement the project on its behalf.
- For schools and other public entities that are not legally or budget independent, ESAs are used. Under the ESA, a public entity pays the Fund its baseline energy costs (with adjustments for energy prices, usage, and other factors) over the 7–10-year contract period. The Fund designs the project, hires subcontractors, oversees construction and commissioning, and monitors the subproject. In this case, the client incurs no debt; the Fund directly pays the energy bills to the utility on the client's behalf, retaining the balance to cover its investment cost and service fee. The ESA is designed so that the duration can be adjusted if the Fund recovers its full investment earlier (or later).

In addition, R2E2 has a TA component that includes developing recommendations for amendment of legal and regulatory framework, public outreach campaigns, direct advisory assistance to public agencies, and training.

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

Projects

By January 2014, the Fund had commissioned 19 projects for public clients at a total estimated cost of US$2.35 million (World Bank 2014c). The Fund has strengthened its implementation capacity by hiring EE, institutional, and procurement consultants, and has initiated a marketing campaign to increase the demand for investment funds from prospective public clients and build the 2014 pipeline.

Assuming a 20-year useful life of the project investments, the estimated lifetime energy savings are 32.3 GWh and GHG reductions are 7,930 tons of CO_{2e}.

Lessons Learned

The experience of the Armenia R2E2 Fund indicates that:

- The ESA option can be quite attractive for public agencies.
- A marketing and public awareness campaign is important in creating the demand for energy services among public agencies.
- By engaging ESPs to provide some of the implementation services, the Fund is helping build ESP capacity in Armenia.

2. Croatia

Overview

The Croatian Energy Law (2001) and the Government's Energy Strategy (2002) called for the implementation of programs to increase EE and develop RE resources. According to the Law, local authorities had to participate in national EE programs, integrate EE activities into their development plans, establish local EE action plans, and report annually to the government on the savings achieved (World Bank 2010e). However, by 2001, no private or public entity was either developing or implementing EE projects in Croatia. The key barriers to EE investments were identified as lack of financing; lack of capacity and know-how among key stakeholders, and lack of consumer demand for EE services.

Public ESCO

The World Bank implemented a project to increase the demand for and supply of EE projects and services by creating a public ESCO. The principal objectives were to:

- Create a core developer of EE projects within Hrvatska elektroprivreda d.d. (HEP—the national power utility). This new energy service company (HEP ESCO) would develop, finance and implement EE projects on a commercial, for-profit basis, using local businesses as key delivery agents; and
- Provide a framework for other emerging service providers to tap into new EE business opportunities.

The project consisted of four major components:

- Energy saving investments—implemented by HEP ESCO under ESPCs with public and private buildings, public lighting, water pumping systems, and small cogeneration/district heating systems.
- HEP ESCO project development and financing—to finance preliminary project development and provide bridge financing for project design services and initial energy saving investments.
- A credit-enhancement mechanism at the Croatian Development Bank (HBOR)—to enhance the creditworthiness of HEP ESCO as well as other ESPs and end users.
- Technical assistance related to training, information dissemination, outreach, and measurement and verification—provided to HEP ESCO staff and project partners, other EE businesses, HBOR, and appropriate nonprofit or consumer groups.

HEP ESCO began operations in 2004. By the end of the project implementation period (June 2010), the following results had been achieved:

- HEP ESCO implemented 31 EE projects on a commercial, for-profit basis, for a total cumulative value of US$29.5 million in EE investments in six market segments: public lighting, schools, hospitals, cogeneration, industry, and commercial buildings.

- HEP ESCO was able to gradually improve its operational and financial performance, thus demonstrating the commercially and financial viability of EE investments and the ESPC model.
- The project's credit enhancement facility helped engage commercial banks in the financing of EE projects. The TA activities improved the banks' understanding of EE, which in turn helped them market EE loans to their customers. Five banks participated either in the risk-sharing facility or in direct loans for EE projects.
- The project successfully helped overcome key barriers to the development of an EE market. The activities funded under the project had a direct transformational effect in terms of increased availability of EE products and services in the Croatian market.

A very important result was that HEP ESCO helped create a framework for other service providers to develop and participate in the energy services market. By establishing strong business relationships with partners such as engineering firms, distributors, equipment manufacturers and suppliers, and installers, HEP ESCO helped develop business opportunities for private firms, build capacity, and transfer skills and know-how. By June 2010, about 22 engineering/consultancy firms and academic research institutions were offering energy services.

Lessons Learned

The establishment of a public ESCO with responsibilities to develop, finance and implement EE projects on a commercial, for-profit basis, using local energy services businesses as key delivery agents, can be an attractive option to kick-start an energy services industry.

3. Czech Republic

Overview

The Czech Republic provides a good example of government initiatives that have helped establish what is now a well-developed energy services market. The first energy service company in the Czech republic was established in 1993, and there are about 10 active ESCOs in the Czech market today (Sochor 2011). By 2011, a total of 200 energy services projects had been completed, with a total investment of €200 million and total energy savings of 800 terajoules. Most of these projects have been implemented at the local government level (municipalities).

As a part of the country's accession to the EU, the Czech Parliament enacted the Energy Management Act (Czech Republic 2000).[7] This Act has a number of provisions consistent with the requirements of EU directives on EE, including requirements for EE master plans, energy performance of buildings, building certification, appliance labeling, and minimum energy performance standards, as well as general principles of energy supply contracting and energy savings performance contracting.

Legislative and Regulatory Initiatives

There is no special legislation covering ESPC; however, ESPC in the public sector is facilitated by (Malek 2011):

- The Act on Public Contracts (1995)
- A handbook on energy services as a working tool for the public sector (1999)
- Regulations defining how public contracts can be negotiated (2005)

These regulations have resulted in a special procedure for tendering for ESPC projects that has been in use for about 10 years. This procedure is accepted by the Czech Anti-Monopoly Office and recognized by the ESPs bidding on public sector contracts, and provides clarity for the public

[7] This Act was amended several times, most recently in 2013; see http://www.twobirds.com/en/news/articles/2012/energycertificates-buildings-amendement-energy-management-act1212

agencies. It differs from the usual tenders for the supply of equipment or services in that its objective is to reduce energy and utility costs and the following procedure is used:

- The scope of the project is not defined. Instead, baseline data from the existing energy and utility systems (typically heat and electricity, including lighting, and sometimes also including maintenance and personnel costs) are included in the RFP.
- Bidders suggest the actual measures to be installed.
- The bid document contains the basic terms and conditions of the proposed contract between client and the ESP.
- A two-stage procedure is used, the first stage being pre-qualification.
- In the second stage, shortlisted bidders receive detailed tender information including baseline data, may undertake on-site visits, develop their technical solutions, and propose the savings.
- The bid evaluation is typically based on multiple criteria, such as guaranteed savings, sharing of additional savings beyond the guaranteed amounts, investment costs, and technical quality of the bid.
- A contract is then negotiated with the best-evaluated bidder.

The procurement procedure allows for multi-year contracts and retention of savings.

Another important initiative in the Czech Republic is the certification of energy experts in four categories: (i) energy auditing, (ii) inspection of air conditioning, (iii) inspection of boilers, and (iv) certification of buildings. Applicants must meet specified education and experience requirements and pass written and verbal tests to be certified. Such certification has led to increased credibility of ESPs with energy users.

Lessons Learned

The Czech experience points out that, with appropriate legislative and regulatory initiatives, a number of barriers to ESPCs in the public sector can be overcome and increased use of ESPCs can be facilitated. In addition, a formal certification scheme for energy service professionals can improve the acceptance by energy users of the ESPs.

4. Hungary

Overview

Hungary has been reported as one of the most successful cases for the energy services business in Europe. For instance, the International Energy Agency considers Hungary to be "one of the leading countries to develop the scope of ESCOs in the 90s" (IEA 2003). In addition to ESCOs, utilities in Hungary have also championed offering performance-contracting type services. Many key electric suppliers claim that EE services will play a more significant role in their product offerings as they face competitive markets (JRC 2010). As of 2010, there were 20 to 30 active ESCOs operating in Hungary, mainly in the public sector, with some activity in residential sector (blockhouses) and in combined heat and power plants/renewables.

Hungary has seen a significant growth in its EE business, ESCO activity, and market acceptance and has been considered as the most "ESCO-friendly" country in Central and Eastern Europe (Ürge-Vorsatz, et al 2005). The main factors contributing to the growth of the energy services industry in Hungary are as follows:

- Due to rapid and aggressive economic reforms, enterprises came under pressure to reduce costs and started to outsource EE upgrades.
- Banks in Hungary typically had high liquidity and were willing to provide long-term financing. In addition, loans were available in local currency, thereby eliminating perceived currency risks.

- Leasing was permitted and encouraged early in Hungary through institutional reforms, enabling this concept to be used for many types of projects, including EE equipment.
- Most subsidies and cross-subsidies were eliminated in the economic reforms.
- Utilities have been active in entering energy service agreements and performance contracts to capture/retain customers in anticipation of competitive markets.

Project Bundling

Hungary provides an excellent example of project bundling in the public sector. In 2006, although the energy services market had developed significantly, there were no EE projects in schools. The Ministry of Education (MOE) initiated a large-scale program covering all schools, employing an innovative "pooled" public tender process to offer municipalities the opportunity to better access private sector financing to implement much-needed school renovations. The program, called Szemünk Fénye ("the light of our eyes"; see IFC 2008), was designed as a national program for improving lighting and heating systems in schools under which one contractor was selected by MOE and any municipality in the country could work with this contractor to implement EE measures using the performance contracting approach. The advantage to the municipalities was that they would not have to go through a competitive bidding process for each individual project.

The winner of the tender was a consortium led by the Országos Takarékpénztár (OTP) Bank.[8] The Consortium signed a 20-year framework agreement with MOE that specified the implementation terms and conditions. Individual municipalities and other school operators could engage this consortium without going through additional tender process for each individual project. They were not obligated to use the consortium, but if they did not, they would have to follow the public procurement (tendering) procedures. The overall program was able to take advantage of an EU capital subsidy program for public buildings in Hungary that provided a grant of 20 percent of the capital cost. Also the Hungarian National Development Bank provided some low-interest funds to OTP to help finance the projects, and OTP also availed itself of a partial credit guarantee facility (50 percent risk sharing) available from IFC and GEF. The financial structure for the projects was roughly 20 percent EU grant, 70 percent OTP financing, and 10 percent equity from the Caminus Group (Limaye 2013b).

As of the end of the program in December 2012, a total of 354 projects had been completed with a total investment of Ft 13.0 billion (about US$65 million). Almost 85 percent of the measures installed by the OTP consortium were efficient lighting in schools and municipal office buildings. There were a few projects involving gas-based heating systems improvement. The estimated energy savings were 456,000 gigajoules per year, and the estimated annual cost savings were Ft 1.67 billion or about US$8.9 million.

Lessons Learned

The Hungarian experience shows that the growth of the energy services industry can be facilitated by cost pressures on energy users, the existence of mature financial markets, cost-based tariffs, and regulatory initiatives such as permitting leasing of EE equipment. Also, utilities can be players in the energy services markets as they face competitive pressures. Finally, bundling of projects can be a very good approach to facilitating public sector EE projects.

[8] Other members of the consortium included Caminus, one of the most accomplished ESCOs in Hungary; Sza-Co and Ratherm, energy engineering services and implementation companies; and GE Hungary and Viessmann, major equipment suppliers.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