*Final Report*

# Western Balkans:
# Scaling Up Energy Efficiency in Buildings

**June 2014**


**Sustainable Development Department (ECSSD)**

**Europe and Central Asia Region (ECA)**

# 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 |
| ESPC | energy service performance contract |
| ESMAP | Energy Sector Management Assistance Program |
| ESCO | energy service company |
| ESA | energy service agreement |
| ESP | Energy efficiency service provider |
| ESPC | energy service performance contract |
| EU | European Union |
| GEF | Global Environment Facility |
| GFA | guarantee facility agreement |
| GWh | gigawatt-hours |
| 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 |
| MOF | Ministry of Finance |
| mtoe | million tons of oil equivalent |
| NEEAP | National Energy Efficiency Action Plan |
| NPV | net present value |
| PIU | project implementation unit |
| RE | renewable energy |
| TA | technical assistance |
| 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 |

# Acknowledgements

This report presents a summary of the main finding from the activity "Scaling Up Energy Efficiency in Buildings in the Western Balkans," which was financed by the Energy Sector Management Assistance Program (ESMAP) together with the World Bank's Europe and Central Asia Region.

The team was led by Jas Singh (Senior Energy Specialist and Task Team Leader) and included Dilip Limaye (Consultant) and Kathrin Hofer (Energy Specialist). The team would like to acknowledge contributions and valuable feedback provided by Gailius Draugelis, Feng Liu, Martina Bosi, Peter Johansen, Anke Meyer, Samira El Khamlichi, Jari Vayrynen, Rod Janssen (Consultant), Violeta Kogalniceanu (Energy Community Secretariat), and Ranjit Lamech. An interim report was issued in September 2013 and revised to include updates on several indicators and inclusion of four "guidance notes" in April 2014. The final report and guidance notes were edited by Chris Marquardt.

The assessment framework is based on six country reports prepared by Edmond Hido (Albania), Elvis Hadzikadic (Bosnia and Herzegovina), Nexhat Jashari (Kosovo), Ivan Gjoshevski (Macedonia) and Nenad Pavlovic (Montenegro and Serbia). Additional background case studies on Western European countries and beyond were also developed to provide additional models and examples. These cases were developed by Dilip Limaye, Kathrin Hofer, Melis Bitlis, Rod Janssen and Jas Singh.

The report also benefitted from two practitioners workshops held at the Energy Community Secretariat's offices in Vienna, Austria, where representatives from the Western Balkan countries provided feedback, shared their experiences, and discussed many of the models and options. Inputs were also provided by representatives from Armenia, Bulgaria, Czech Republic, Lithuania, Poland, and the United Kingdom. Additional feedback was provided by the European Bank for Reconstruction and Development (EBRD), the Deutsche Gesselschaft für Internationale Zusammenarbeit (GIZ), the U.S. Agency for International Development (USAID), and the United Nations Development Programme (UNDP).

# Executive Summary

Within the six countries of the Western Balkans—Albania, Bosnia and Herzegovina, Kosovo, the former Yugoslav Republic of Macedonia, Montenegro, and Serbia—energy efficiency (EE) is increasingly seen as a key pillar in national energy strategies, helping to enhance energy security, contribute to economic growth, and ensure environmental sustainability.

This is for several reasons. EE can reduce the region's heavy reliance on expensive imports, enhance competitiveness and job creation, and reduce the impact of widespread fossil fuel use. EE can also bring important social benefits, helping to improve local air quality (mitigating related adverse health impacts), improve indoor comfort levels through improved heating, and make energy more affordable for low-income families. Finally, EE is seen as a critical tool in helping to mitigate the effects of necessary and planned tariff reforms by offsetting the higher energy costs to the entire economy.

To realize these benefits, the Western Balkans countries will have to shift from broad policies and small-scale pilots to scaled-up financing and implementation. There is an urgent need to develop viable financing models in all sectors—as well as suitable delivery mechanisms, information systems, and necessary secondary legislation—in order to meet national targets and fuel economic development in a more sustainable manner. Buildings, which account for almost half of energy use in the regions, have been identified as a key sector in all of the country EE plans.

## Objectives

With support from the Energy Sector Management Assistance Program (ESMAP), the World Bank initiated this regional technical assistance activity to help scale up improvements in EE in buildings in Western Balkan countries through the sharing of best practices, policy and implementation options, case studies and plans. The project was carried out in two phases, the first of which delivered the following:

1. An **assessment framework** for implementing scalable EE building programs and mapping Western Balkan country progress;
2. **Key financing options** for public and residential buildings based on experience from Europe and elsewhere; and
3. A **"roadmap"** setting out a series of actions governments might consider to scale up the volume and pace of implementation.

## Key Messages

***Potential Benefits***

Within the Western Balkan region, a secure energy supply is critical to sustaining economic growth. Improving EE in buildings has been identified as a key priority and initial policy steps have been taken.

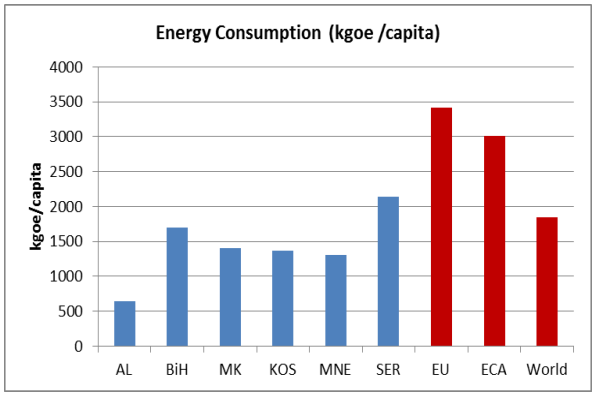
- EE is the lowest cost way to help meet growing energy demand, with new energy supply projected to require US$70 billion by 2030.
- EE improvements reduce the need for expensive energy imports, cut public spending, improve comfort levels and renew building stocks.
- Improving EE can help fuel economic growth in the Western Balkans and create local jobs.
- EE is one of the lowest-cost measures to reducing greenhouse gases and other adverse environmental and social impacts.

***Why Progress Has Been Limited***

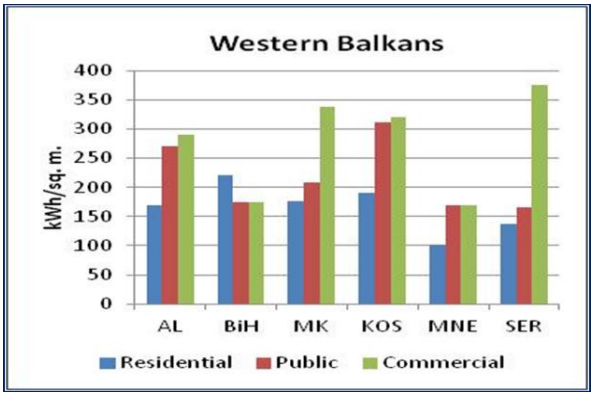
On-the-ground results have lagged behind the policy measures and there is growing concerns that some countries may be unable to achieve their national EE targets. Reasons for this gap include:

- Depressed energy pricing and norm-based billing for heating
- Under-resourced EE agencies and departments
- Inaccessible financing mechanisms
- Marginally or uncreditworthy municipalities and home owner associations, or debt capacity limitations
- Poor data on baseline energy use
- Underdeveloped EE service markets
- Piecemeal donor and government programs

**Energy Consumption per Capita, 2010 (kgoe)**




**Energy Use in Buildings, 2012 (kWh/m$^2$)**



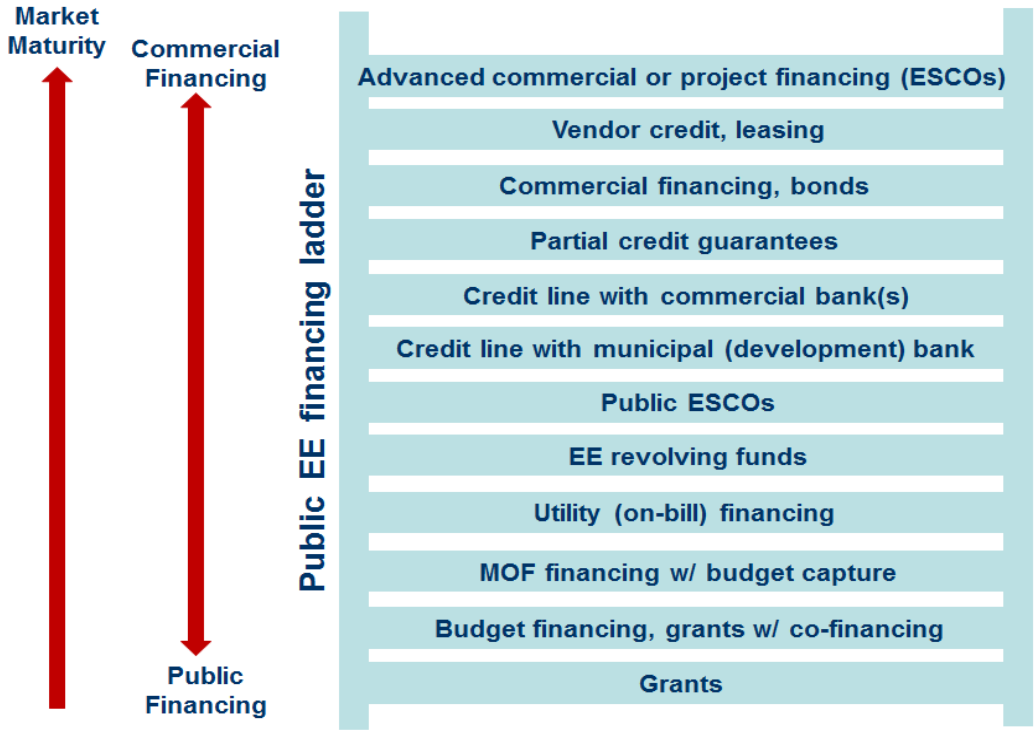

Although per capita energy use in the Western Balkan countries is about half that of the EU, the energy required to provide the same comfort levels is much higher, indicating significant potential and need for more-efficient energy use.

## Framework for Successful EE Programs in Buildings

Accelerating the pace of building renovation programs in the Western Balkans will require a two-pronged approach:

- **Broadening the portfolio of government interventions.** This requires government actions in the five key areas: enacting legislation, adopting policy and regulatory enhancements, improving market conditions, expanding finance and implementation, and building local capacity.
- **Deepening implementation efforts.** Leveraging commercial financing and investment in building renovations by developing national level programs for public and residential buildings.

**The Financing Ladder for Public Building EE**



## Financing Options for Residential Sector EE

**The Key Barriers**

- Low energy tariffs and lack of consumption-based billing for heating
- Small project size and relatively high transaction costs
- HOAs' creditworthiness and decision making process
- High risk perception and interest rates from commercial banks

**The Four Major Financing Options**

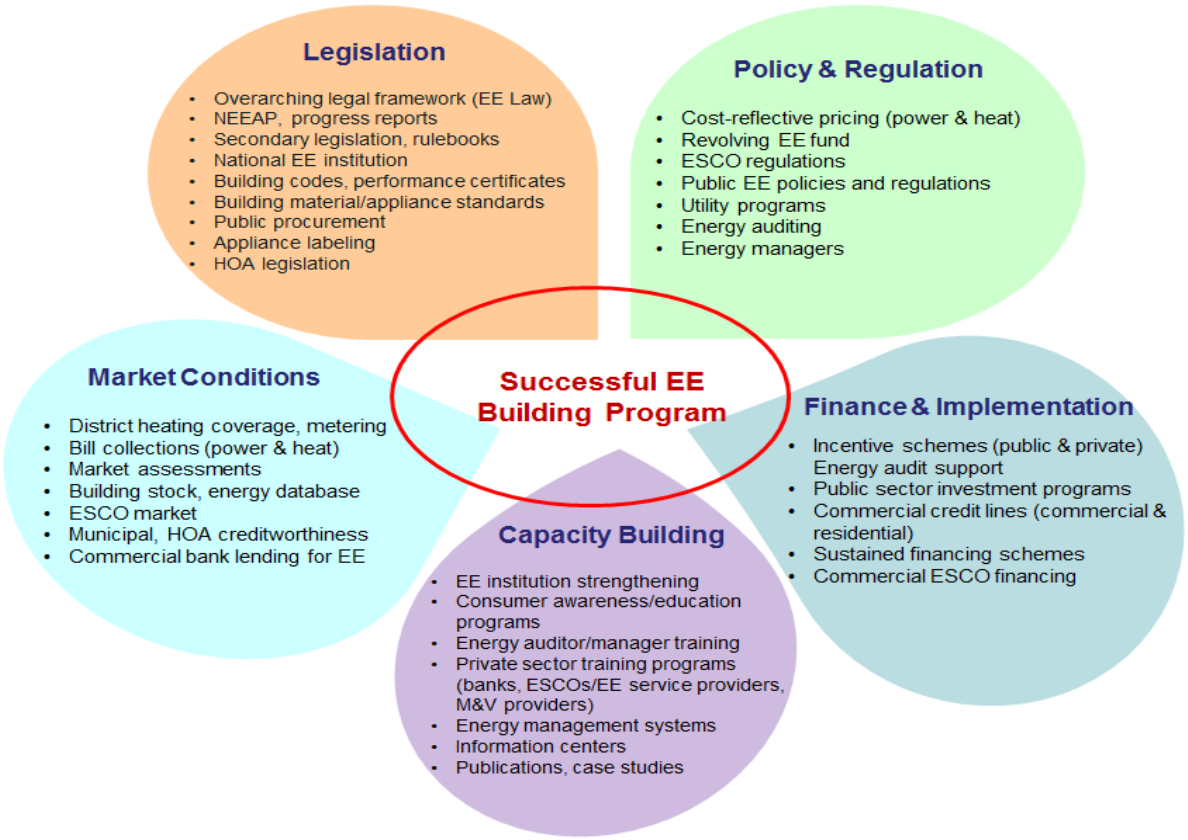
- EE funds
- Commercial bank financing (credit lines)
- Partial credit guarantees for commercial financing
- Utility EE credit programs (on-bill financing)

*Note:* Most residential EE financing programs include parallel incentive schemes.

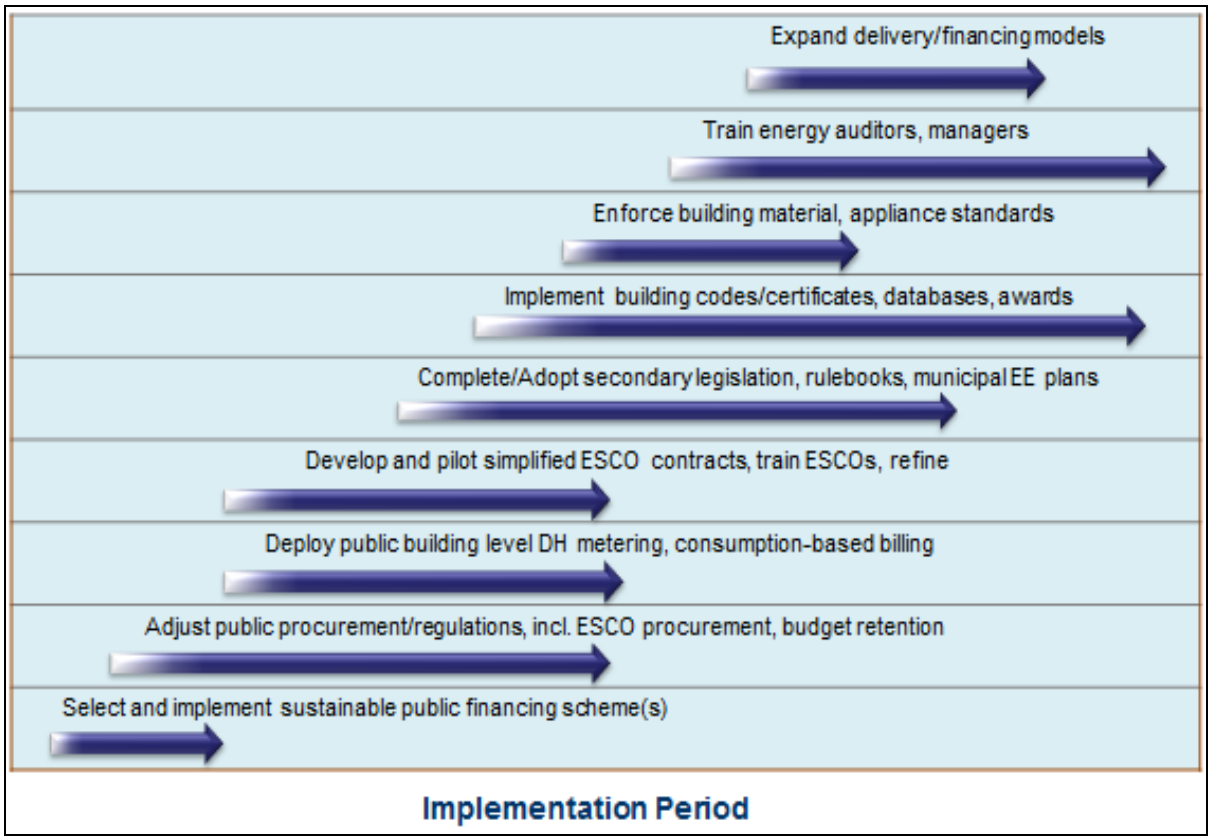
To scale up, governments will need to develop national-level programs with full policy frameworks, sustainable financing and implementation schemes, and supporting programs:

- Public and donor funds will need to be pooled and strategically leveraged with commercial financing.
- Programs will need to offer multiple financial products to reach all market segments.
- Simplified energy service company (ESCO) models will need to be developed to foster local industries.
- Greater efforts to implement at scale—from project bundling to wholesale financing—will help lower transaction costs and increase pace of building renovations.

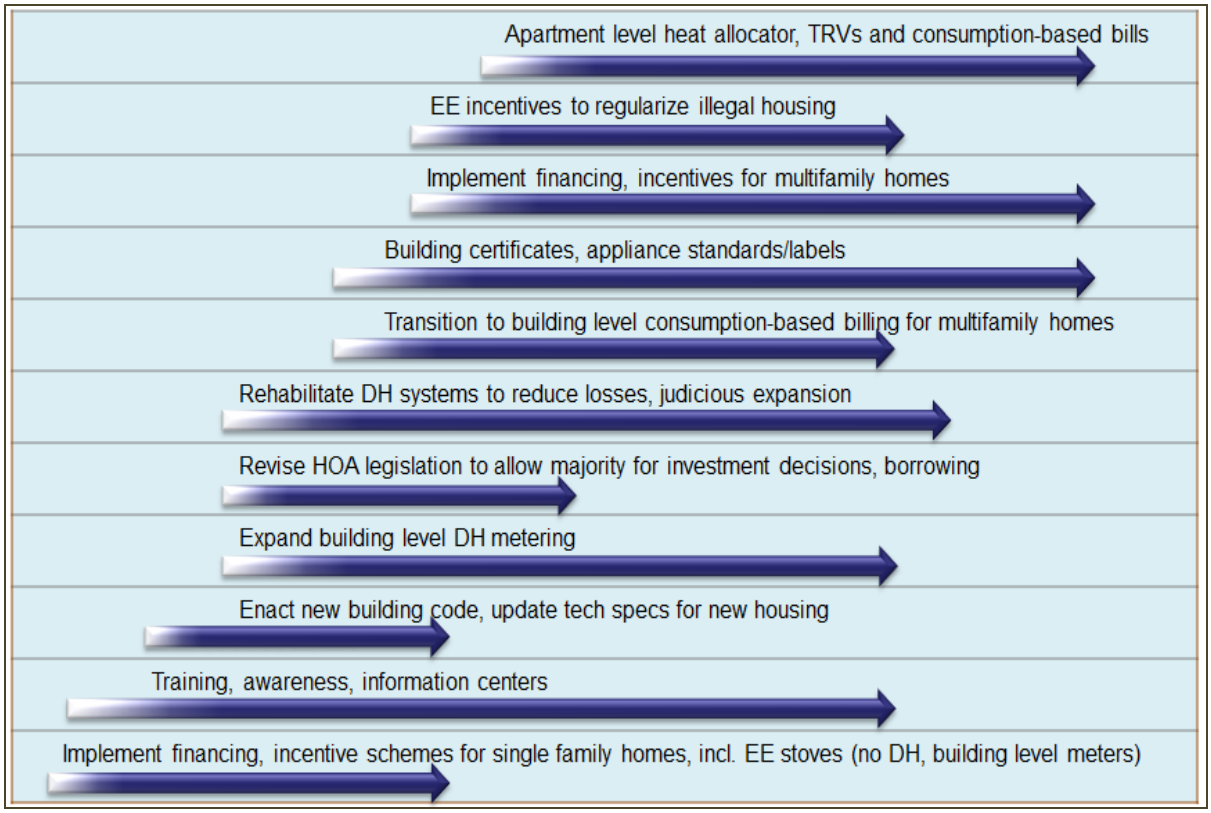
## Framework for Successful EE Programs in Buildings



### Roadmap for Scaling Up EE in Public Buildings




### Roadmap for Scaling Up EE in Residential Buildings



## Second Phase

The key findings and results of the first phase were presented at a regional workshop in Vienna in June 2013. At that time, four topics were agreed on for development of detailed guidance notes, including (i) establishing and operationalizing an EE Revolving Fund; (ii) municipal budgeting and financing; (iii) residential financing and incentive programs; and (iv) energy service business models and market development. Draft guidance notes were presented at a May 2014 workshop in Vienna and subsequently finalized.

# Introduction

## Background

1. **Within the Western Balkan region, a lack of sufficient and reliable energy supply threatens to create a regional energy crisis.** Currently, the six countries in the region[1] rely heavily on imported hydrocarbons, with energy imports accounting for up to 44 percent of total energy use (2010).[2] In 2012, the cost of energy imports was estimated at over €3 billion (about 2.1 percent of regional GDP). Over the coming two decades, demand for energy is projected to increase by almost 70 percent. The most rapid growth is expected in the commercial and public sector (140 percent), followed by the industrial sector (100 percent), and the residential sector (60 percent). This represents an average increase in energy demand of about 3 percent per year and would require some €53 billion in investments between now and 2030. The challenge of securing the energy resources needed to maintain economic growth will be further accentuated as the Western Balkan countries compete with Western Europe and the rising demand in energy exporting countries.[3] Energy efficiency (EE) is the most cost-effective clean and local energy "resource" that can be tapped to help meet this demand; increasing EE efforts can reduce the projected demand growth to about 2 percent per year, at a fraction of the cost of new energy supply infrastructure, while forestalling the impending regional energy crisis.

2. **Improving energy efficiency can also help fuel economic growth in the Western Balkans**. A recent World Bank study estimated energy cost savings of €2.5 billion from implementing cost-effective EE measures in the region.[4] According to a 2011 UNDP report, Western Balkan governments spend 7–11 percent of GDP on fossil fuel subsidies alone.[5] Transfers to financially distressed utilities, combined with direct and indirect subsidies to consumers, create a massive burden on the fiscal budgets. In addition, estimates indicate that the public sector in these countries spend over €400 million each year in energy costs for their buildings.[6] EE can help to substantially reduce energy subsidy and service spending, creating fiscal space for other development priorities. EE can also help reduce energy expenditures in the private sector, enhancing competitiveness and creating jobs. A European study found that €1 invested in EE has resulted in €4-5 in benefits (such as increased tax revenues, lower operating costs, and reduced unemployment and subsidies);[7] similar European studies found that building renovations, in particular, can be labor-intensive and create mostly non-exportable jobs, with 15–19 jobs created for every €1 million invested.[8] If public funds leverage private funds at a conservative 1:1 ratio, and these funds can revolve five times over a program's lifetime, this means that €100 million in public funds can create 15,000–19,000 jobs.

3. **Energy efficiency is also one of the lowest-cost means of reducing carbon dioxide ($CO_2$) emissions—a major contributor to climate change—and other adverse environmental and social impacts.** It is a relative inexpensive method of reducing both global and local pollution and, according to the McKinsey Global Institute, the top priority among measures to

[1] The Western Balkan region comprises Albania, Bosnia and Herzegovina, Kosovo, the former Yugoslav Republic of Macedonia, Montenegro, and Serbia.
[2] World Development Indicators Database, World Bank (http://data.worldbank.org/country).
[3] World Bank, *Status of Energy Efficiency in the Western Balkans: A Stocktaking Report.* Report No. AAA49-7B. Washington, D.C.: World Bank, 2010.
[4] Ibid.
[5] UNDP, 2011. "Fossil Fuel Subsidies in the Western Balkans." New York: UNDP Regional Bureau for Europe and the Commonwealth of Independent States (RBEC).
[6] World Bank reports and data.
[7] KfW, *Impact on Public Budgets of the KfW Promotional Programs "Energy-Efficient Construction", "Energy-Efficient Refurbishment", and Energy-Efficient Infrastructure" in 2011. Frankfurt, KfW, April 2013.*
[8] Center for Climate Change and Sustainable Energy Policy, Central European University, 2012. *Employment Impacts of a Large-Scale Deep Building Energy Retrofit Programme in Poland: Executive Summary*. Den Haag: European Climate Foundation.

mitigate climate change.[9] Regional work has shown similar conclusions about the priority governments should place on EE.[10] Further, as the region continues to seek EU integration, the need for more systematic EE and environmental improvements across the economies will become more crucial. EE can also help ease the social impacts of tariff reforms, since lower energy use can offset incremental increases in prices. A recent World Bank report argues that energy subsidies can be eliminated without hurting the poor through consolidated social assistance reforms and EE measures.[11] It goes on to show how targeted EE interventions can even reduce energy poverty,[12] with energy poor households in Albania benefiting the most from EE programs.

4. **Significant energy savings potential exists in the existing buildings stock**. Currently, buildings consume about half of the energy in the Western Balkans. Estimated energy savings in buildings range between 20 percent and 40 percent, with the highest potential expected in the public sector (35–40 percent), followed by the residential sector (10–35 percent). Although some efficiency gains are expected to be offset by increased demand given under-heating and relatively low penetration rates of appliances in some households, expected energy cost savings are significant. A 2012 regional market assessment commissioned by the Energy Community Secretariat (ECS) concluded that potential annual energy savings amount to about €462 million or 7,940 GWh.[13]

5. **The region's governments have identified improving energy efficiency in buildings as a key priority and have taken initial policy steps.** The governments have recognized the importance of EE and have developed EE Laws and National Energy Efficiency Action Plans (NEEAPs) targeting at least 9 percent energy savings by 2018.[14] Energy savings in buildings are included as one of the key means of attaining this target. Each country has taken important steps to strengthen its legislative and regulatory framework, mainly by transposing the relevant European Union (EU) directives[15] and passing some important secondary legislation. Most have established dedicated EE units, and some have even created incentive schemes through (mostly) existing environmental funds.

6. **Unfortunately, implementation progress has remained limited and ad hoc.** On-the-ground results have substantially lagged behind the more robust policy measures, and there is growing concern that some countries may be unable to reach their targets. Reasons for this gap include generally under-resourced EE units, inaccessible financing mechanisms, depressed energy pricing and norm-based billing for heating,[16] marginally or uncreditworthy municipalities and homeowner associations (HOAs), poor data on baseline energy use, and underdeveloped EE service markets. The current budget constraints in many of these countries will likely only exacerbate the situation. A number of government- and donor-funded programs have been initiated over the past decade to demonstrate the viability of EE investments in both public and residential buildings. However, implementation has remained fragmented and piecemeal.

[9] McKinsey Global Institute, 2008. *The Carbon Productivity Challenge: Curbing Climate Change and Sustaining Economic Growth.* N.p.: McKinsey Global Institute.

[10] See: Deichmann and Zhang, *Growing Green: The Economic Benefits of Climate Action*. Europe & Central Asia Report No. 76821. Washington, D.C.: World Bank, 2013; and World Bank, "Macedonia Green Growth and Climate Change." Washington, D.C.: World Bank, forthcoming.

[11] Larderchi et al., *Balancing Act: Cutting Energy Subsidies While Protecting Affordability*. Europe & Central Asia Report No. 76820. Washington, D.C.: World Bank 2013.

[12] *Energy poverty* is defined as households spending more than 10 percent of their household income on energy.

[13] Energy Savings International (ENSI), *Study on Energy Efficiency in Buildings in the Contracting Parties of the Energy Community*. Vienna: Energy Community Secretariat, 2012.

[14] EE Laws have been adopted in all Western Balkan countries except Albania and Bosnia & Herzegovina; all have adopted NEEAPs except Bosnia & Herzegovina. FYR Macedonia has adopted an indicated energy savings target of 12 percent by 2018; however, for official reporting purposes a 9 percent target is used.

[15] Directives on Energy Services (2006/32/EC), Ecodesign and Energy Labelling (2010/30/EU), and Energy Performance of Buildings (2010/31/EU); the new EE Directive (2012/27/EU) replaces the Energy Services Directive, but has not yet been adopted by the countries of the Energy Community.

[16] *Norm-based billing* relies on billing based on a building's heated area (in square meters) rather than actual heat consumption.

Because most project staff, data, and systems are orphaned as projects are closed, technical and implementation experience must be cultivated each time. Thus, while hundreds of buildings have been renovated within the region with positive results, the scale has remained low (most projects have retrofitted about 20–30 buildings per year)—with very limited replication and country ownership for national-level programs, a lack of sustainable financing schemes and models, and an absence of dedicated entities in place to support implementation. Energy service companies (ESCOs) and other service providers are unwilling to enter a market that lacks stable, predictable demand and consistent rules for determining baseline energy use and energy savings. Thus, a recent EU-commissioned report found that, whereas €1.5 billion in financing is available for clean energy (including EE) investments in the Western Balkans, only a small fraction has actually been deployed.[17]

## Scaling Up Energy Efficiency

In this context, the World Bank launched a regional project to scale up improvements in energy use in existing public and residential buildings in the Western Balkans by sharing best practices, policy and implementation options, case studies, and plans. With support from the Energy Sector Management Assistance Program's (ESMAP), the project was carried out in two phases. The first phase of the project included:

- An assessment framework for (i) implementing scalable EE programs in buildings; and (ii) mapping regional progress;
- Financing options for public and residential buildings based on experience from Western and Eastern Europe; and
- A "roadmap" for scaling up EE in buildings both in the public and residential sectors.

The key findings and results of the first phase were presented at a regional workshop in Vienna in June 2013 and are described in this report. Also during the June 2013 workshop, four topics were agreed on for development of detailed guidance notes. These included:

4. Establishing and operationalizing an EE Revolving Fund
5. Municipal budgeting and financing
6. Residential financing and incentive programs
7. Energy service business models and market development

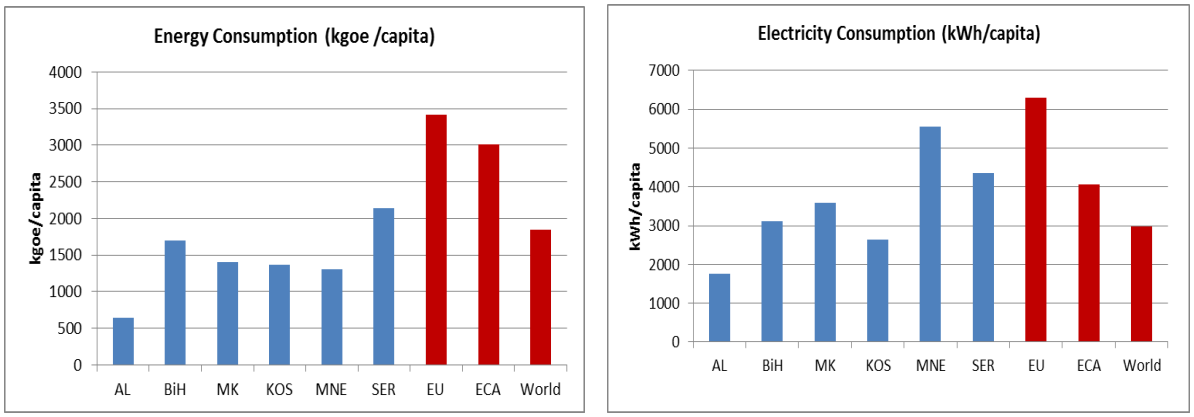
Draft guidance notes were presented at a May 2014 workshop in Vienna and subsequently finalized. Executive summaries of each guidance note are included in Annex D. The full notes are available from the authors upon request.

[17] Western Balkans Investment Framework (WBIF), *Financing Energy Efficiency Investments in the Western Balkans*. N.p.: WBIF, 2013.

# 1. Assessment Framework Findings

Overall, energy intensity in the Western Balkans has remained relatively flat over the past 10 years, indicating limited progress on EE implementation.[18] While energy and electricity consumption per capita have been increasing during the same period,[19] energy consumption is still significantly lower than (about half) that of the EU and Europe and Central Asia (ECA) regional averages (Figures 1a and 1b). With per capita consumption projected to increase significantly over the next decade and converge toward EU levels, additional pressures will be placed on these countries to undertake aggressive EE improvements to mitigate import and supply bottlenecks, maintain their competitiveness, and reduce the impact of this higher energy use on poorer end users and the environment.

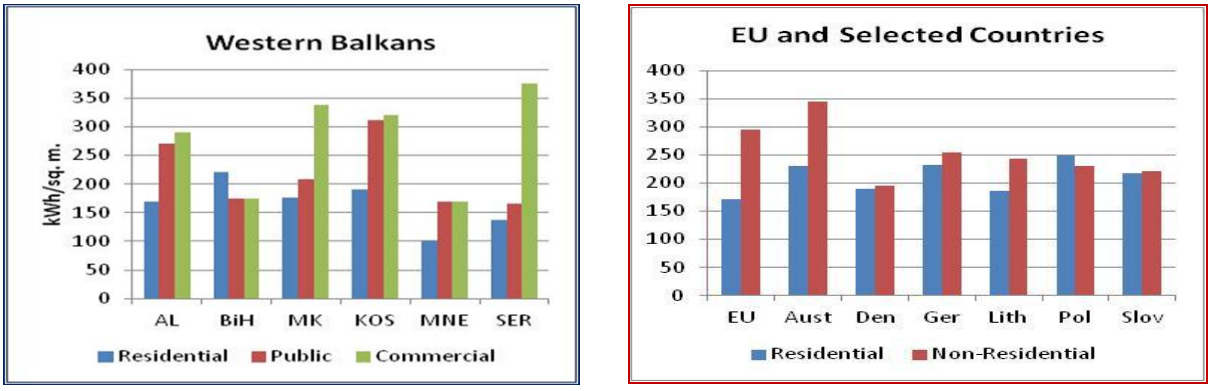
**Figures 1a and 1b – Energy and Electricity Consumption per Capita, 2010**




*Source:* World Development Indicators, World Bank.
*Note:* AL = Albania, BiH = Bosnia and Herzegovina, MK = FYR Macedonia, KOS = Kosovo, MNE = Montenegro, SER = Serbia, EU = European Union, ECA = Europe and Central Asia.

In the buildings sector, energy consumption per square meter varies significantly across the region in both the residential and non-residential sectors, but is already approaching the EU average (Figures 2a and 2b). However, given the warmer average temperatures and lower per capita energy use in these countries, substantial improvements will have to be achieved as their incomes rise and per capita energy use and indoor heating (or "comfort levels") increase.

**Figures 2a and 2b – Energy Consumption in Buildings (kWh/m$^2$)**



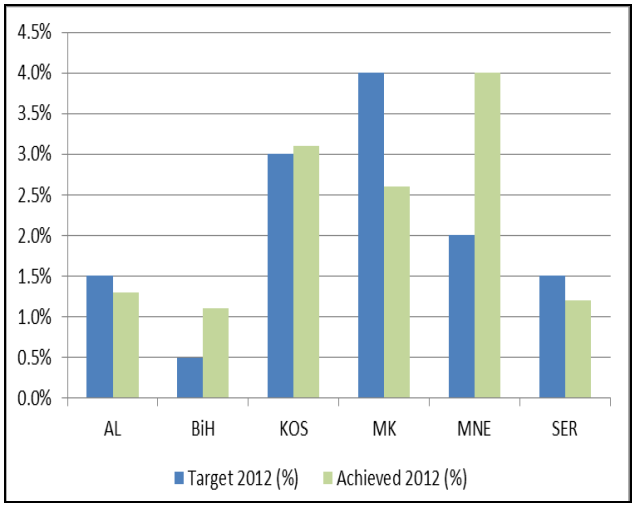

*Source, Figure 2a:* Prepared by Authors based on Energy Community Secretariat, 2012a, op.cit.; World Bank Institute, 2012/2013. *National Energy Efficiency Study*. Prepared for Serbia, Macedonia, and Kosovo.
*Source, Figure 2b:* Odyssee, Energy Efficiency Indicators for Europe (http://www.odyssee-indicators.org/database/database.php).
*Note:* Available EU data does not distinguish between commercial and public buildings.

[18] World Bank, *Status of Energy Efficiency in the Western Balkans: A Stocktaking Report.* Report No. AAA49-7B. Washington, D.C.: World Bank, 2010.
[19] With the exception of Montenegro, where per capita electricity consumption between 2005 (first year with available data) and 2010 decreased by almost 13 percent.

Improving EE has thus been identified as a key priority in all six countries, and, as noted previously, some important initial steps have been undertaken to improve the enabling policy frameworks. However, many of these initial steps have not yet translated into large quantifiable results. As shown in the reported progress toward achieving the 2012 energy savings targets set forth in the first NEEAPs (2010–12), three countries appear to have met or exceeded the interim target for the first three-year period, with progress in the other countries falling short (Figure 3). As the policies adopted begin to take effect and implementation plans are realized, these figures are expected to improve. However, to achieve the ambitious energy savings targets set for 2018, a significant scaling up of EE improvements across the region and across sectors will be needed.

**Figure 3 – NEEAP Targets and Progress Achieved 2010–12**

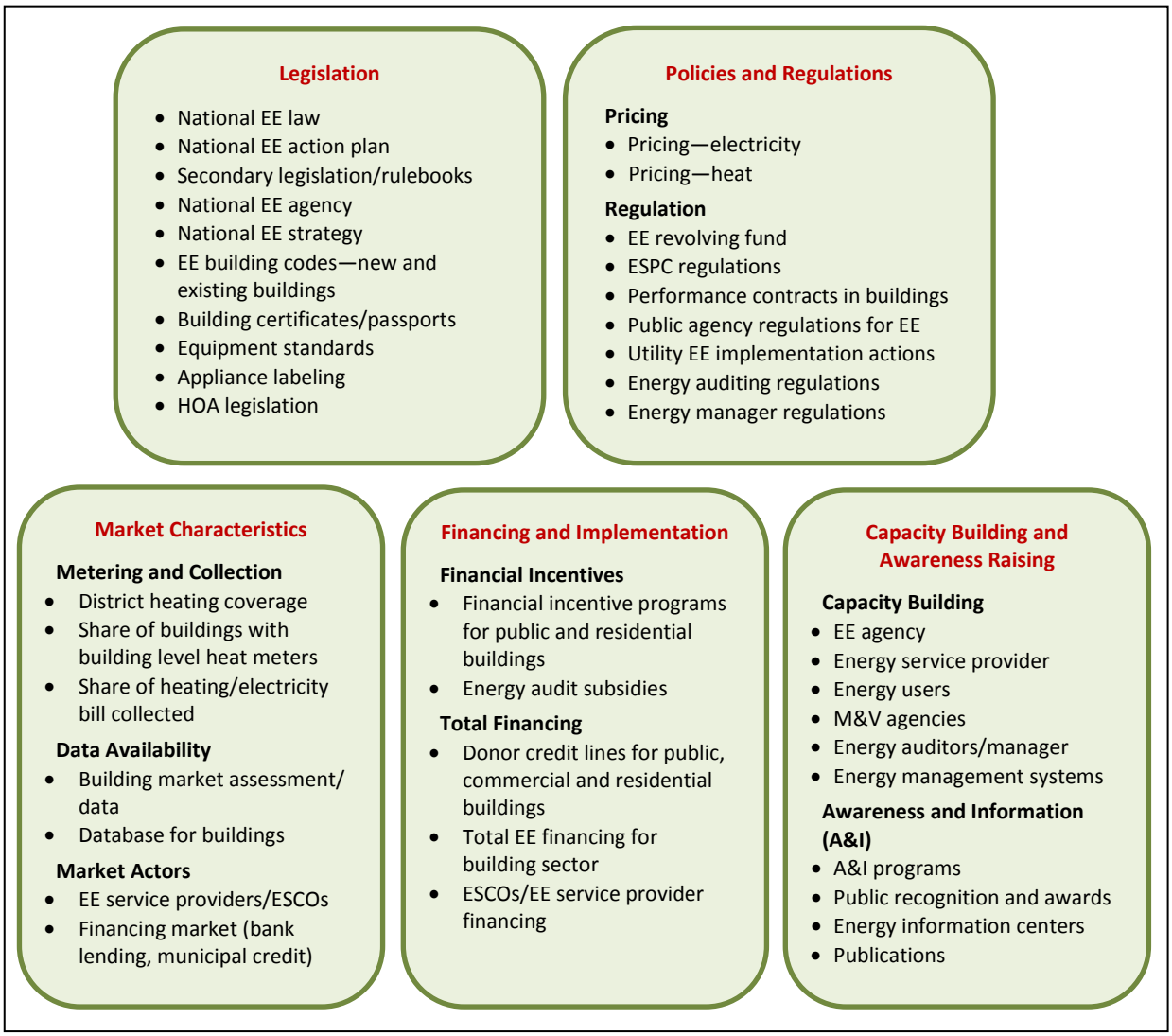
| | Interim Target (2012) | | Achieved (2012) | | Final Target (2018) | |
|---|---|---|---|---|---|---|
| | Mtoe | % | Mtoe | % | Mtoe | % |
| AL | 0.027 | 1.5 | 0.023 | 1.3 | 0.168 | 9 |
| BiH | 0.016 | 0.5 | 0.035 | 1.1 | 0.287 | 9 |
| KOS | 0.031 | 3.0 | 0.032 | 3.1 | 0.109 | 9 |
| MK | 0.066 | 4.0 | 0.042 | 2.6 | 0.151 | 9 |
| MNE | 0.013 | 2.0 | 0.025 | 4.0 | 0.059 | 9 |
| SER | 0.125 | 1.5 | 0.102 | 1.2 | 0.752 | 9 |




*Source:* Energy Community Secretariat, 2014. "Second EE Action Plans of the Contracting Parties. Assessment by the Energy Community Secretariat." Energy Community Secretariat. March 2014.
Note. ECS report is based on GIZ calculations. Statistical data for Montenegro could not be confirmed and were considered optimistic.

Lessons from EU and other international experience show that successful EE programs require a mix of policy tools and program instruments to overcome the typical financial, institutional, technical, and behavioral barriers present in most markets. For buildings, an Assessment Framework was developed to assess individual country progress and identify country-specific and regional gaps for future interventions, while at the same time improving coordination between donor programs and investment programs. The Framework includes five major categories, or "building blocks": legislation, policies and regulations, market characteristics, financing and implementation, and capacity building and awareness raising (Figure 4).

**Figure 4 – Key Building Blocks and Elements of the Assessment Framework**

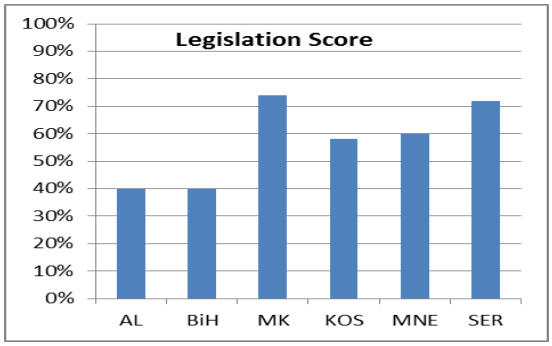
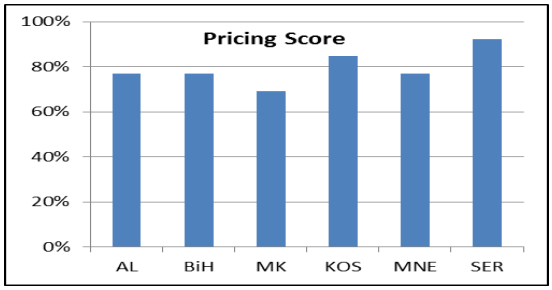
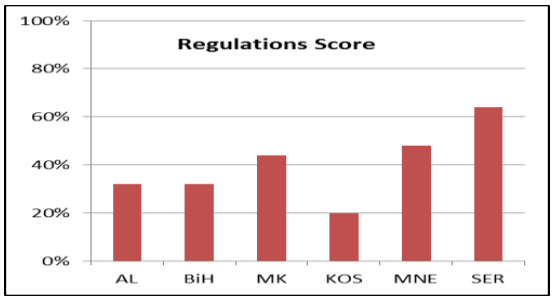
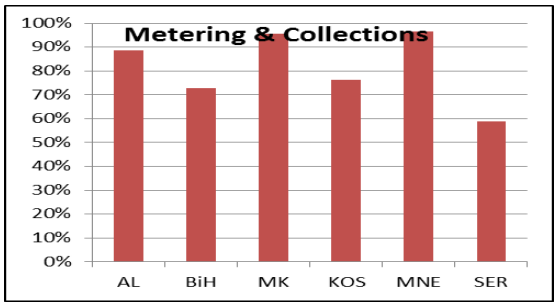
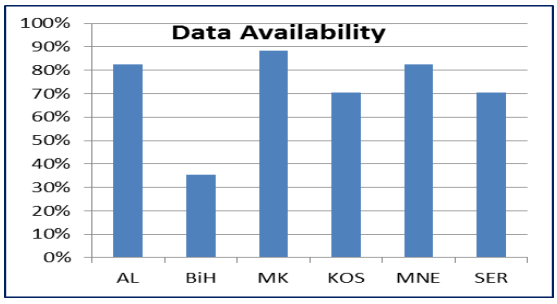
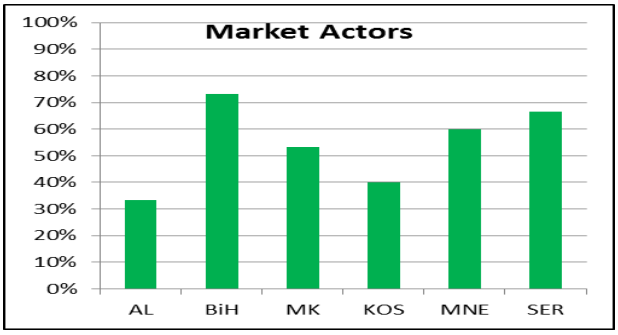



*Source:* Authors.

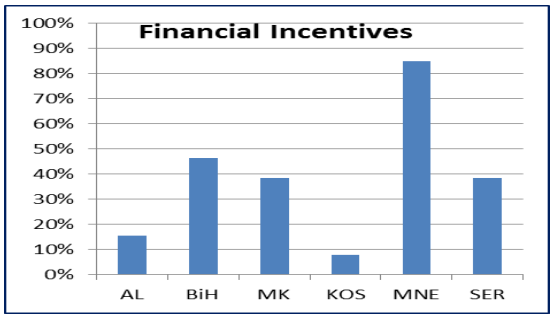
Within the Assessment Framework's five building blocks, multiple indicators were then developed as proxies for assessing country-specific progress on the basis of documented results. Most of these indicators represent "check marks" to actions taken (e.g., adoption of NEEAP, financial incentive program launched) but some also include numeric indicators (e.g., the percentage of buildings with building-level meters, the number of donor credit lines in place). The detailed Assessment Framework is included in Appendix A of this report.

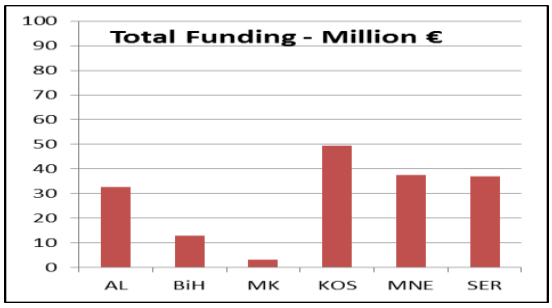
Overall progress in each of the five building blocks was then summarized using a simple scoring system that aggregated the check marks and in some cases specific indicators within each building block category. The resulting scoreboards (Table 1) give a reasonable representation of the level of progress achieved by each country in each area as well as well as some of the country and regional gaps. It should be noted that the Assessment Framework provides only a current snapshot of progress and is intended as a rapid assessment tool only. It is also based on available data, which in some cases was incomplete.

**Table 1 – Scores and Major Regional Gaps in the Five Building Blocks**

| The Scoreboard | Major Regional Gaps |
|---|---|
| **Building Block 1: Legislation** | |
|  | • Adoption of some secondary legislation/rulebooks and execution of appropriate enforcement mechanisms<br>• Approval of building codes and certificates and appropriate compliance mechanisms<br>• Revisions of public procurement provisions related to energy-efficient products, ESCOs, and other EE service contracting<br>• Enactment and compliance checking of building materials/appliance standards and labeling |
| **Building Block 2: Policies and Regulations** | |
|  <br>  | • Design, adoption and launch of EE revolving fund (or other suitable sustainable financing mechanism) in public buildings<br>• Enactment of regulations on energy service performance contracts (ESPC) in buildings<br>• Amendments of public sector regulations and policies to support EE (e.g., public procurement of EE at the municipal level, retention of savings, multi-year contracting, ESPCs in public agencies)<br>• Enactment of regulations on utility EE implementation, including EE obligations/white certificates<br>• Approval of obligations for energy managers for large energy users |
| **Building Block 3: Market Characteristics** | |
|  <br>  | • Universal installation of heat meters in buildings connected to district heating (DH) systems<br>• Establishment of a national building stock database and system for data collection, verification, updating, and benchmarking<br>• Development of sustainable EE services market (e.g., certified energy audit firms, active ESCOs, commercial banks offering EE loans, share of municipalities with borrowing capacity)<br>  |

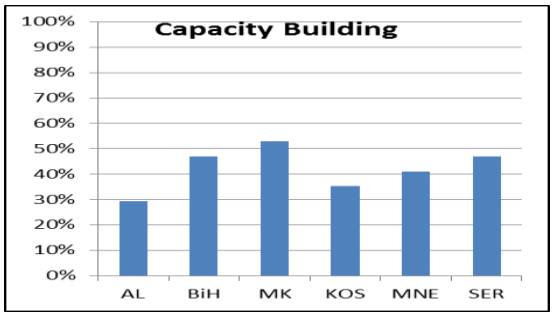
Building Block 4: Finance and Implementation

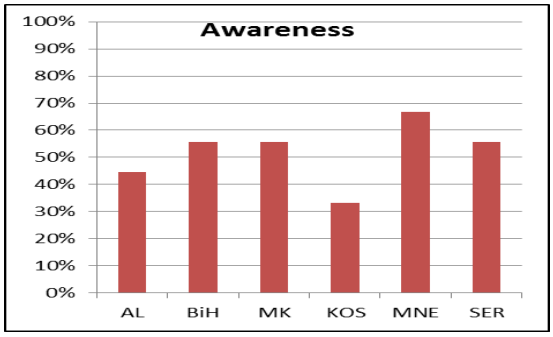



- Introduction of financial incentives for EE improvements in public and private buildings
- Availability of grants to support energy audits
- Availability and scale of investment financing for public building renovation programs
- Deployment of financing by commercial banks to support EE in commercial and residential buildings
- Sustained financing programs in place
- Existence and volume of commercial ESCO financing

Building Block 5: Capacity Building and Awareness Raising




- National, sustained training programs for EE agencies, energy auditors, energy managers in place
- Sustained training in place for private sector (ESCOs/EE service providers, banks, M&V providers)
- Funding in place for ongoing public awareness, education
- Adoption of energy management systems and appropriate training in place
- Building performance displays or recognition programs in place for high building performance
- EE information centers in operation
- Programs in place to develop and disseminate EE publications (e.g., guides, handbooks, case studies)

*Source*: Authors.
*Note*: M&V = measurement and verification.

# 2. Financing Options

As noted in the Section 1, the absence of sustainable financing mechanisms for the public and residential sectors represents a critical gap in the Western Balkans. In the buildings sector, international experience shows that a wide range of financing options and instruments are available to address some of the existing market barriers. These options range from predominantly public financing to commercial financing; their suitability will depend on the maturity of local markets and the creditworthiness of the underlying borrowers.

## A. Financing Options for the Public Sector

The ECS-commissioned regional market assessment identified 515 GWh per year in energy savings potential for schools and hospitals across the six countries. Assuming each country expects to achieve 9 percent energy savings in this market segment, in order to contribute to the national EE targets, investment capital of some €226 million would be needed over a 10-year period (Table 2). Such a high level of investment would require substantially improving the leverage for public/donor funds, as well as recycling of these funds, to realize the sizeable energy savings and relatively attractive payback periods (5.3–7.6 years).

**Table 2 - EE Potential in Schools and Hospitals**

| Country | Potential Energy Savings | | Investment Needed (€, millions) | Average Simple Payback Period (years) |
|---|---|---|---|---|
| | Energy (GWh/year) | Expenditure (€, millions/year) | | |
| Albania | 53.7 | 5.1 | 33.3 | 6.5 |
| Bosnia and Herzegovina | 69.8 | 4.5 | 32.4 | 7.2 |
| Kosovo | 79.3 | 4.3 | 23.3 | 5.4 |
| FYR Macedonia | 36.8 | 3.2 | 18.8 | 5.3 |
| Montenegro* | 7.1 | 0.7 | 5.6 | 7.6 |
| Serbia | 268.7 | 17.6 | 114.8 | 6.5 |
| **Total** | **515.4** | **35.4** | **226.2** | **6.4** |

*Source:* Energy Community Secretariat, 2012, op.cit.
* Estimated.

Despite these attractive payback periods and the energy savings potential, EE financing is plagued by a number of market failures and "barriers." Global experiences, along with findings from the Assessment Framework, identified the following key barriers in the public buildings sector in these six countries: (i) a limited number of creditworthy municipalities and borrowing capacity; (ii) restrictive budgeting and procurement regulations; (iii) low energy tariffs; (iv) norm-based billing systems (i.e, billing per square meter rather than actual supply) for heating; (v) relatively high interest rates charged by commercial banks; (vi) small project sizes, leading to high project development and transaction costs; and (vii) low existing comfort levels.

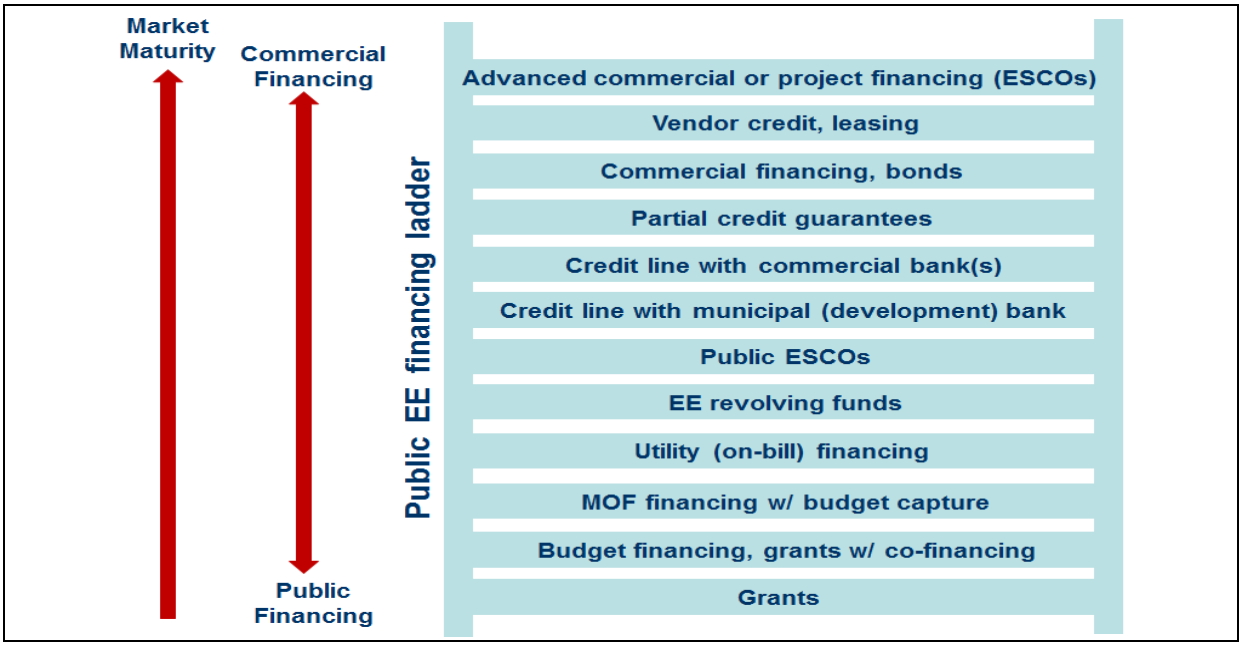
The World Bank's experiences around the world show that there are a number of financing options for public buildings that can help address some of these barriers (Figure 5) and adequately serve the target markets. In a given country or market, this "financing ladder" can help guide policymakers to select one or more options that can then be designed to provide accessible financing products.

Over time, as local markets evolve, the goal is to move up the ladder to more commercial financing mechanisms. Once a mechanism is selected, the design should include elements to facilitate the introduction of a subsequent option, thereby helping to ensure constant evolution and "climbing of the ladder." For example, use of public financing schemes—such as MOF

financing with budget capture, EE funds, or public ESCOs[20]—can address markets not currently served by existing commercial financial institutions.

However, use of these mechanisms alone may not ensure evolution over time. Therefore, introducing pilots and other schemes, such as simplified ESCO contracts, could help begin to develop ESCO markets, thereby allowing public entities better access to commercial financing in the medium term and ESCO financing in the long term. (A detailed summary of these financing options is presented in Appendix B.)

**Figure 5 – Financing Ladder: Energy Efficiency Financing Options for Public Buildings**




*Source:* Adapted from World Bank Institute, 2013. *Financing Options for the National Program for Energy Efficiency in Public Buildings (NPEEPB) in the FYR Macedonia, 2012–18*; and ESMAP, 2013. "Energy Efficient Cities Initiative Guidance Note on Financing Municipal Energy Efficiency Projects," World Bank, May 2013 draft.

Of course, this ladder is only meant as an illustrative guide to assist with selection. In reality, not all mechanisms are mutually exclusive and governments need not move up every step of the ladder. The selection of appropriate mechanisms and the subsequent design of them will depend on a number of factors, including (i) current legislative and regulatory conditions; (ii) the maturity of financial and public credit markets; (iii) the current state of the local EE service markets, including ESCOs and energy auditors; and (iv) the technical and financial capabilities of public entities to undertake EE projects.

Once the basic mechanisms are selected, these mechanisms must then be carefully designed to suit the local market characteristics. During the design phase, one mechanism can be developed to offer more than one financial product. For example, EE revolving funds are, in their simplest form, revolving loans using public funds. However, it is common for EE revolving funds to offer multiple financial products—such as loans, loan guarantees and ESCO financing. Multiple product offerings are generally recommended, as they allow different municipalities with different capacities to be better served under one program. On the basis of the analysis in Section 1, the following three options appear most viable in the Western Balkans in the near term:

1. Ministry of Finance (MOF) financing with budget capture
2. EE revolving funds
3. Public ESCOs

[20] See Options 1–3 later in this section for explanations.

For each option, a brief description is provided below along with typical design features and characteristics. Designs can vary, however, and detailed designs can be as important, if not more so, as the selection of the mechanism itself. Although international finance institutions (IFIs) and other donors could be potential financiers under all three options, these programs should be government-led and should ideally include government contributions.

### *Option 1. MOF Financing with Budget Capture*

Under this option, the Ministry of Finance funds municipalities and/or public entities through existing budgetary mechanisms to pay the upfront costs of EE investments, often based on calls for proposals or existing budget request systems. The subsequent repayments could be structured through a budget "capturing" system, where future budgetary provisions are reduced until the loan has been fully repaid. This would allow these funds to revolve, provided that the MOF uses the reflows to finance additional EE projects. Ideally, to ensure that the municipality maintains a positive cash flow, the size of the reduced budgetary outlay should reflect the measured or estimated energy savings. A portion of the loan could be forgiven as an additional incentive, but this would reduce the funds available to finance new EE projects.

Project implementation is typically carried out by a temporary project implementation unit (PIU) located within the MOF. To facilitate implementation of EE projects and address limited capacity in the public sector, the PIU may provide support for project preparation, implementation and monitoring either against a fee or covered from the public budget. An example of a budget capture mechanism is the World Bank–supported Municipal Services Improvement Project (MSIP) in Macedonia (Box 1).

**Box 1. The Municipal Services Improvement Project in Macedonia**

Begun in August 2009, the MSIP aims to improve transparency, financial sustainability and delivery of targeted municipal services in Macedonia. The project is financed by a World Bank loan to the government, which the Ministry of Finance (MOF) then lends to eligible municipalities and public sector entities based on municipal investment proposals.

Investments are focusing on municipal services projects that generate revenue and/or reduce costs, including EE in public buildings and street lighting. Municipalities repay the loans through a budgetary mechanism from revenues or cost savings generated by the investments.

In addition, the project supports local capacity building through a PIU in the MOF by funding technical assistance, training or consultancy services for municipalities that lack the capacity for project design and implementation.

The total loan value of projects completed or approved in the investment pipeline to date is €19.9 million. Eleven projects have been completed, including a few EE projects, and 20 are currently under implementation. About one third of municipalities have started to increase their revenue earnings and/or cost savings from the completed projects. An additional 21 municipalities are preparing investment projects with PIU support.

*Sources:* World Bank, 2009. *Project Appraisal Document for a Municipal Services Improvement Project in Macedonia*. World Bank: Report No. 462 16-MK. Washington, D.C., March 2009; World Bank, 2012a. *Project Paper on a Proposed Additional Loan and Restructuring for the Municipal Services Improvement Project in Macedonia*. World Bank: Report No. 67713-MK. Washington, D.C., April 2012; World Bank, 2013b. *Implementation Status and Results Report*. MSIP: Sq.no 11. Washington D.C., June 2013.

The budget capture mechanism may be particularly well suited for municipalities that are not creditworthy or countries with an underdeveloped municipal credit market, as there is no repayment risk and it is relatively easy to implement. It can also help build capacity among municipalities to implement such projects while demonstrating the benefits of EE retrofits in public facilities. However, such schemes may not be sustained once the funds are disbursed and/or the donor-funded project (and PIU) is closed. Also, it is difficult for such schemes to achieve larger scale because both the level of MOF resources for such a scheme and the capacity of the PIU will be limited.

### *Option 2. EE Revolving Fund*

An "EE revolving fund (Fund)" is generally an independent entity established by the government and managed by either an existing entity (e.g., a development bank) or a fund management company (referred to as a Fund Manager) selected by the government through a competitive process. Under either option, the Fund operator is supervised by a board of directors, appointed by the government, which can include both government and nongovernment stakeholders. When a fund manager is engaged, it is recommended using a performance contract, taking into account several factors, such as cost recovery, deal flow, defaults, or customer satisfaction.

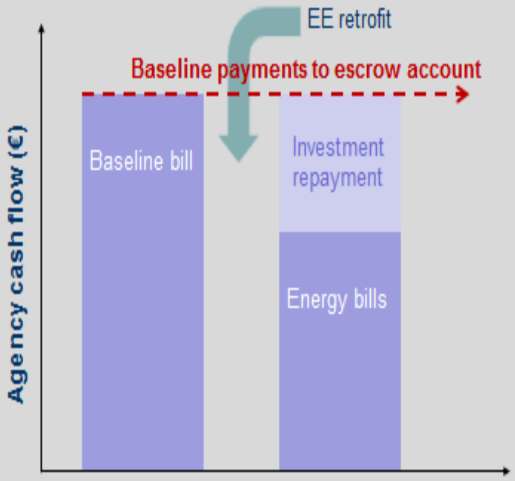
Depending on the local market conditions and needs, the Fund may provide a full range of financial services (such as energy auditing, procurement, supervision, and monitoring) as well as financial products such as the following:

- Loans to creditworthy municipalities with sufficient collateral and equity (and sometimes also to other creditworthy enterprises and utilities);
- Energy service agreements (ESAs) to other entities (Box 2) without their own budgets or capacity to implement projects;
- Guarantees for commercial bank loans; and
- ESCO financing and re-financing for public sector EE projects.

**Box 2. Energy Service Agreements**

Under an ESA, an EE Revolving Fund, ESCO or other EE service provider offers a full package of services to identify, finance, implement and monitor EE projects for clients. The client is usually required to pay all, or a portion of, their baseline energy bill, to cover the investment cost and associated fees until the contract period ends. ESA payments can also be bundled with a client's energy bills.

In this case, the figure on the right illustrates the basic idea of a client's cash flows under the ESA, with payments equal to their baseline energy bill. In some cases, the contract duration is fixed; in other cases, the contract can be terminated after an agreed level of payment has been made, which can encourage the client to save more energy.




For municipal clients, ESAs are generally not viewed by MOFs as municipal debt, since they can be viewed as long-term contractual commitments or a form of utility service. If both the client and the Fund are public, public procurement rules may not be required, making financing simper. This provides a dual advantage to the client of being relatively simple to carrying very little risk.

*Sources:* Authors; Kim et al., 2013. *Innovations and Opportunities in Energy Efficiency Finance.* New York: Wilson Sonsini Goodrich & Rosati, May 2013.

Regardless of the financing products, repayments are based on the estimated or verified energy cost savings, thereby allowing funds to revolve while the public borrower maintains a positive cash flow. The repayment risk generally rests with the Fund, so some arrangements to secure payments are often made. This could include bundling energy utility payments with the Fund repayment; if the municipality does not pay, the threat exists for a disruption in utility services or possible disconnection. Alternatively, the Fund could request that the MOF redirect a portion of future budgetary transfers from the public agency to the Fund (similar to a budget capture scheme) until the Fund has recovered its payments. It is also recommended that the pricing of any technical assistance (TA) provided by the Fund allow for cost recovery, although the level of pricing may depend on the sources of the Fund and the nature of the public sector client being served. An example of an EE Revolving Fund is the Bulgarian Energy Efficiency Fund, or BEEF (Box 3).

**Box 3. The Bulgarian Energy Efficiency Fund**

BEEF, established in 2005, was capitalized by a US$10 million Global Environment Fund (GEF) grant and an additional US$5 million in seed capital from the governments of Bulgaria and Austria as well as private shareholders (Eurobank EFG, Lukoil AD, Brunata Bulgaria, Enmona AD and others). BEEF was designed as a self-sustaining, revolving mechanism specialized in financing EE investments in industrial SMEs, public and residential sectors. BEEF is governed by a Management Board which includes government, private sector, and NGO representatives. Day-to-day operations is administered by a competitively selected Fund Manager, constituted by a consortium of three firms (Econoler International, EnEffect Consult and Elena Holding), and compensated under a performance contract.

BEEF provides EE loans on a commercial lending basis, partial credit guarantees and portfolio guarantees to ESCOs. The Fund financed or guaranteed about 160 projects valued at over US$80 million by 2011. Around 54 percent of loans were provided to municipalities and the rest to corporate and other clients (such as hospitals and universities). While the number of partial credit guarantees remained relatively low, BEEF issued more than 30 portfolio guarantees for ESCO projects, providing coverage for the first 5 percent of defaults in the project portfolio. The self-financing rate of BEEF was at 133 percent in 2010.

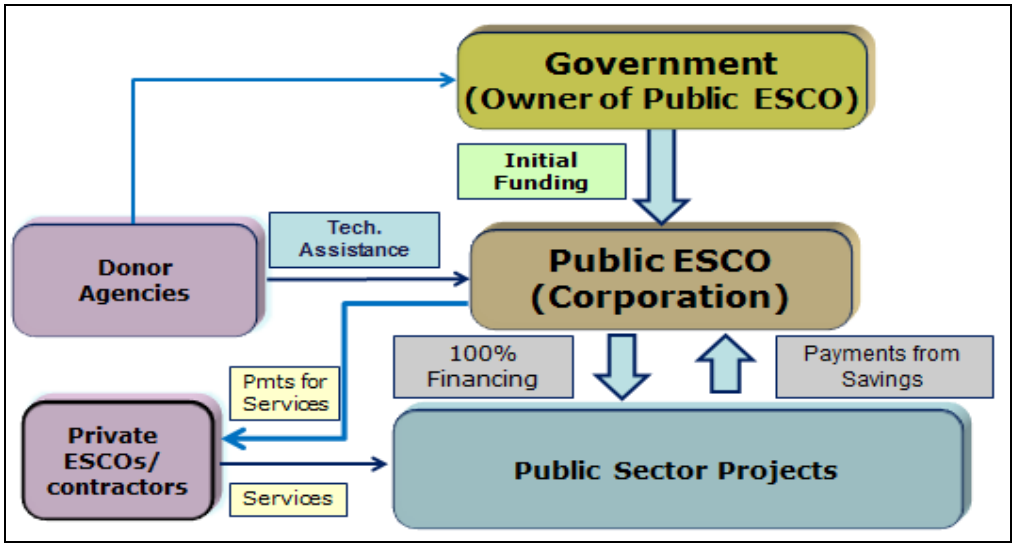
*Source:* World Bank, 2010b. "Implementation Completion and Results Report for the Bulgaria Energy Efficiency Project." Report No. ICR00001575. Washington, D.C., September 2010; Dukov, 2012. "Energy Efficiency and Renewable Sources Fund." Presentation at the World Bank Energy Week. Washington, D.C., February 2012.

In markets where the availability of commercial funding for EE is limited and/or characterized by high risk aversion or few creditworthy public sector clients, EE Revolving Funds could be used to provide direct financing. Specific design features could vary considerably, depending on the existing market conditions, Fund structure, clients to be served, services offered, and so on. However, all Funds should be designed to develop the market and avoid becoming a monopoly by crowding out other market actors. If public clients are subject to fee-for-service TA, the Fund must be incentivized to be efficient in terms of overhead and service costs. Moreover, Funds must take some risks and not simply seek implicit MOF guarantees for all repayments; otherwise the Fund will simply be acting as a government PIU.

### *Option 3. Public ESCO*

A public ESCO is a government-owned corporation established primarily to undertake EE projects in the public sector. As a public enterprise, it can often sign contracts with other public agencies without going through a competitive process. This helps to overcome some of the more difficult procurement and other administrative challenges public agencies face when engaging private ESCOs. The public ESCO is better able to access public, donor, and other funds and, thus, can offer 100 percent project financing to its clients. Clients generally repay the public ESCO based on the estimated energy costs savings, although sometimes a verification procedure is performed. The public ESCO will then subcontract all actual implementation to local contractors, thereby fostering a local ESCO industry. Public ESCOs can thus serve as an incubator for local ESCOs, while allowing the concept of energy service performance contracts (ESPCs) to become accepted and providing the local ESCOs with experience and a track record for their future marketing (Figure 6).

**Figure 6. Typical Structure of a Public ESCO Model (Super ESCO)**




*Source:* Limaye, 2013. "Scaling Up Energy Efficiency: The Emerging Model of the Super-ESCO." Presentation at the IFC International ESCO Financing Conference. Johannesburg, May 2013.

A number of variations of the public ESCO model have been used, depending on the local conditions and capabilities of existing entities. Some of the more common include "super ESCOs," utility-based ESCOs, utility demand-side management (DSM) ESCOs, and internal ESCOs.[21] Typically, public ESCOs are formed when the local ESCO market is still nascent and public efforts are deemed necessary to catalyze ESCO business models. It can also be a way of accelerating investments in the public sector, which private ESCOs may be unable to serve in the near term, and of providing economies-of-scale. However, caution should be given to the monopolistic behavior of public ESCOs; appropriate exit strategies and indicators should be developed to allow them to phase out when their goals have been achieved. An example of a Fund acting as a super ESCO is the Renewable Resources and Energy Efficiency Fund (R2E2) Fund in Armenia (Box 4).

**Box 4. Super ESCO in Armenia**

The R2E2 Fund was established in 2005 initially as a PIU for a World Bank–supported EE/renewable energy (RE) project. The Fund operates on a fully commercial basis and is governed by a board of trustees made up of representatives from the government, private sector, NGOs, and academia. Day-to-day activities are managed by a government-appointed executive director, supported by technical and financial staff. 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, and administration buildings as well as street lighting—using a revolving fund scheme. The Fund offers two financing products to eligible public entities:

- *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-to-10–year contract period. The Fund designs the project, hires subcontractors, oversees construction and commissioning, and monitors the subproject. In this case, the client entity incurs no debt; rather, the Fund directly pays the energy bills to the utility on the client's behalf, and retains the balance to cover its investment cost and service fee. The ESA is designed so that the duration can be adjusted if the Fund recovers its full investment earlier (or later).

[21] A **public ESCO** refers to any publicly owned EE service provider whose loans are repaid through energy cost savings. A **super ESCO** is a type of public ESCO that directly contracts with public entities and then subcontracts with smaller ESCOs/contractors on a competitive basis. Under a **utility-based ESCO** scheme, a public entity contracts directly with its utility for EE services without additional procurement and usually repays via its utility bills. A **utility DSM ESCO** is a publicly owned ESCO that uses funds from a DSM surcharge to invest in public agencies at no cost to the agency. An **internal ESCO** is a unit within a public agency that acts as an ESCO, provides technical and financial services, and receives payments through internal budget transfers. (*Source*: Singh et al., *Public Procurement of Energy Efficiency Services: Lessons from International Experience* (Washington, DC: World Bank, 2010.)

- *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 repayment amounts 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.

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.

The R2E2 Fund is expected to finance an estimated 85 projects worth about US$6 million between 2012 and 2015 and to demonstrate a sustainable financing and implementation model for the public sector. As of January 2014, the Fund signed 20 loans and ESAs valued at US$3.05 million since 2011.

*Source:* World Bank, 2012b. *Project Appraisal Document for an Energy Efficiency Project in Armenia.* World Bank: Report No. 67035-AM. Washington, D.C., March 2012.

## B. Financing Options for the Residential Sector

The ECS-commissioned market assessment discussed in Section 2A also estimated potential energy savings in residential buildings in the Western Balkans to be about 6,162 GWh per year. To achieve 9 percent of this potential, expected investment needs amount to €2.7 billion (Table 3). While some markets could achieve this through mostly commercial financing, these projects would likely require both further tariff reforms and some level of incentives to overcome the longer payback periods associated with these investments, which have an average payback period of eight years.

**Table 3. EE Potential in the Residential Sector**

| Country | Potential Energy Savings | | Investment Needed (€, millions) | Average Simple Payback Period (years) |
|---|---|---|---|---|
| | Energy (GWh/year) | Expenditure (€, millions/year) | | |
| Albania | 542.1 | 40.2 | 270.8 | 6.7 |
| Bosnia and Herzegovina | 1,883.9 | 89.8 | 638.1 | 7.1 |
| Kosovo | 329.6 | 29.9 | 211.2 | 7.6 |
| FYR Macedonia | 498.7 | 38.4 | 260.2 | 6.8 |
| Montenegro* | 149.6 | 12.8 | 138.3 | 10.8 |
| Serbia | 2,758.4 | 132.1 | 1,215.9 | 9.2 |
| **Total** | **6,162.3** | **343.2** | **2,734.5** | **8.0** |

*Source:* Energy Community Secretariat, 2012a, op.cit.

The residential sector also faces a number of barriers hampering these EE investments. The key barriers are (i) small project size and relatively high transaction costs, (ii) low energy tariffs, (iii) perception of high risk on the part of commercial banks, (iv) HOAs' decision-making processes and creditworthiness, (v) norm-based billing systems for heating, (vi) relatively high commercial bank interest rates, and (vii) high discount rates (or hurdle rates) on the part of residential consumers.

International experience indicates that there are four major *financing* options to help overcome these barriers and support EE improvements in residential buildings:

1. EE funds
2. Commercial bank financing
3. Partial credit guarantees
4. Utility EE programs

(A tabular summary of the options—including descriptions, advantages and disadvantages, and examples—can be found in Annex C.)

The review did not explicitly focus on *incentive* schemes, which in many developed countries are equally if not more important than financing. Such mechanisms can include grants or subsidies for audits and investments, rebates, tax incentives, interest buy-downs, and so on. This was because it did not appear that any of the Western Balkan countries would be able or likely, in the near term, to establish a sustainable mechanism for providing financial incentives for residential EE programs. However, a more detailed review of residential financing and incentive programs was developed in the second phase, of which a summary is included in Annex D.

As in the case of financing options for public buildings (Section 2A), the selection, design features, and products offered under each of the four options needs to be tailored to the specific market conditions. The following sections briefly describe each option in turn, including typical design characteristics.

### *Option 1. EE Funds*

*EE Funds* are specialized institutions or funds created by national or state governments (often with assistance from IFIs/donors) to support EE projects, mostly in the residential sector. Unlike EE revolving funds in the public sector, this type of fund generally does not require full repayments from borrowers, but rather "revolves" by offering concessional loans or incentives and then recovering the funds from various revenue sources—such as annual government budget allocations, energy or environmental taxes, state or municipal bonds, revenues from privatizations, and IFI/donor funds. The size of an EE Fund can vary substantially across countries: in many U.S. states and some EU countries, it has ranged from 1 to 2 percent of electricity sales revenues.

As in the case of the public sector, EE Funds may be a viable option in countries with limited availability and/or accessibility of commercial bank financing for a large segment of residential customers. To address these barriers, EE Funds can offer residential clients a range of financing products (such as investment grants or rebates, energy audit subsidies, low-interest or longer-tenor[22] loans, and interest buy-downs[23] of commercial bank loans) as well as services (such as audit templates, information on certified auditors/manufacturers/products, guidebooks, case studies, online EE calculators). EE Funds and commercial bank financing are not mutually exclusive options; where the EE Fund is providing only a portion of the financing, efforts should be made to coordinate with partner banks to streamline applications and approvals. An example of an EE Fund is the Eco Fund in Slovenia (Box 5).

**Box 5. Slovenia's Environmental Fund**

The Environmental Fund (or "Eco Fund") in Slovenia was established in 1993 as a legal public entity to support investments in environmental protection. Its main sources of financing include earmarked asset funds (revenues from privatizations), donations, obligations and funds borrowed from national and international institutions. In 2010, the total assets of the Eco Fund amounted to €181 million with a self-sustaining financing rate of around 64 percent. Since 1995, the Eco Fund has provided soft loans and guarantees to companies, municipalities, and households for EE and RE investments.

In 2008 the Eco Fund began supporting implementation of the NEEAP through a household grant scheme. The grants support EE and RE investments in existing residential buildings, construction of low-energy and passive houses, and installation of low-carbon and efficient energy sources (such as solar heating systems, high-efficiency wood biomass boilers, and heat pumps).

Between 2008 and 2011 the Fund provided households with more than 28,000 grants, worth a total of €39.6 million, for eligible investment projects. The grants were mainly for window replacements (30 percent), thermal insulation of the façade (23 percent), and installation of solar panels (19 percent) and biomass boilers (10 percent). Also, between 2004 and 2010, the Eco Fund provided €75 million in soft loans for EE and RE projects.

*Sources:* OECD, 2012. *Environmental Performance Reviews: Slovenia*. Paris, June 2012; Kovacic, 2011. "Eco Fund's Financial Incentives for Investments in Energy Efficiency and the Use of Renewable Sources." Presentation. December 2011.

[22] *Tenor* refers to a loan's term length as expressed in years, months, or days.

[23] In an *interest buy-down*, the EE Fund subsidizes a portion of the interest rate assessed by the lender.

### *Option 2. Commercial Bank Financing*

One of the more common mechanisms for financing residential EE programs is through commercial bank lending programs. Often this takes the form of IFI/donor credit lines to commercial banks for on-lending to residential consumers. The purpose of such credit lines is to provide a dedicated source of financing for homeowners, particularly in markets where no commercial bank lending exists for residential EE improvements. Such schemes can also (i) create interest in, and capacity for, financing EE projects on the part of commercial banks and (ii) support the transition toward market-based, scaled-up EE programs.

Most loans are offered to customers on a commercial basis (i.e., at prevailing interest rates) to avoid creating market distortions or competitive advantages for certain banks. However, depending on market conditions, funding sources, and target markets (e.g., special credit lines for low-income households), credit lines may offer longer tenors and other favorable terms (e.g., partial grants in the form of loan forgiveness) in order to stimulate the market, demonstrate commercial viability or achieve other goals with socioeconomic benefits. Credit lines are often supported by TA to help standardize project appraisal methods and procedures, increase deal flow and reduce transaction costs, and strengthen participating banks' capacity to identify and manage project risks. An example of commercial bank financing is the Poland Thermo-Modernization (TM) Program (Box 6).

**Box 6. The Thermo-Modernization Program in Poland**

The TM Program was launched in 1998 with the aim of (i) improving EE in residential, non-commercial and public buildings and (ii) promoting the use of RE and co-generation in local heating systems. The program provides a 20 percent subsidy ("TM Bonus") on commercial bank loans for eligible projects. TM Bonuses are financed from the state budget and managed by the state-owned Bank Gospodarstwa Krajowego (BGK).

The program operates through 16 participating banks that provide loans for EE projects to HOAs, cooperatives, individuals, municipalities, local authorities, and commercial companies. Clients submit combined loan and TM Bonus applications, including an energy audit, to one of the participating banks. After approval and implementation of the EE measures, TM Bonuses are provided to participating banks and passed on to clients in the form of reduced outstanding principal of the loan ("loan forgiveness").

Since 1998 the TM Program has supported more than 24,000 EE projects, with about 90 percent being implemented in residential buildings. The total value of EE investments catalyzed by the program is estimated at US$3 billion, including US$2.3 billion in commercial bank financing. A sample of audits suggests an estimated annual energy savings of 3,636 GWh and annual emission reductions of 1.4 million $tCO_2$. Since 1998 the state budget has allocated about Zl 1.42 billion (US$450 million) in subsidies.

*Source:* World Bank, 2013c. *Implementation Completion and Results Report for the Energy Efficiency Project in Poland*. World Bank: Report No. Report No: ICR2643. Washington, D.C., April 2013.

### *Option 3. Credit Guarantees*

A credit guarantee (CG) is a risk-sharing mechanism (or "facility") designed to encourage commercial banks to finance EE projects for the premises of marginally creditworthy client by partly covering potential losses from loan defaults. Under the general structure of a CG, a public or private agency (e.g., a development bank, insurance company, or IFI/donor) signs guarantee facility agreements (GFAs) with participating commercial banks to issue project- or portfolio-based loan guarantees that cover a portion of loan losses from defaults. Although the actual amount or percentage of the covered loss may vary, the typical guarantee is for a 50-50 sharing of the losses between the bank and the CG facility.[24] Other GFAs are structured as a "first loss" facility that absorbs 100 percent of the losses up to a specified amount.

[24] World Bank, 2013 (draft). "How to use Public Funds to Leverage Commercial Financing for Clean Energy in East Asia: Lessons from International Experience." Washington, D.C., 2013 (forthcoming).

Participating banks sign loan agreements with residential customers specifying loan terms and conditions, and assume the primary responsibility for conducting due diligence and processing the loans. The CG facility may specify certain project or borrower eligibility criteria, terms and conditions for the project appraisals, rights to approve specific projects or project portfolios and/or provisions of TA to commercial banks or other market actors. In case of loan defaults, the CG facility would cover the specified portion of the loss.

Although such instruments can be an effective way to stimulate commercial bank lending, banks must have (i) large enough project pipelines to justify such schemes and (ii) enough clients that would benefit from the moderate credit enhancement that the CG facility would provide. An example of a CG is IFC's Commercializing EE Finance (CEEF) Program in Central and Eastern Europe (Box 7).

**Box 7. IFC's Commercializing EE Finance Program in Central and Eastern Europe**

Launched in April 2003 as a joint program of IFC and GEF, the CEEF Program sought to enhance commercial financing of EE investments in six countries in Eastern and Central Europe (the Czech Republic, Estonia, Hungary, Latvia, Lithuania, and the Slovak Republic). The program offered partial credit guarantees, using a 50 percent *pari passu* risk-sharing structure, to 14 participating banks for loans to EE projects in buildings, industrial processes, and other energy end-use applications. In addition, the program also provided TA to participating banks and ESCO business in order to help preparing bankable project pipelines and to build capacity in the EE market.

Between 2003 and 2008 CEEF provided US$49.5 million in partial guarantees for more than 800 EE projects with total investments of more than US$200 million. Around 70 percent of the projects focused on EE improvements in multi-family residential buildings, and more than 40 project developers and ESCOs were involved in implementing the program. Overall, the default rate was less than 0.5 percent.

*Sources:* World Bank, 2013d (draft), op.cit.; IEA, 2011. *Joint Public-Private Approaches for Energy Efficiency Finance.* Paris, 2011.

### *Option 4. Utility EE Programs*

A growing set of countries have developed regulations to encourage or oblige their utilities to implement EE programs, given their technical capacity and their relationship with energy users. Demand-side management (DSM) programs in the United States showed that utilities could successfully implement residential EE programs; similar schemes have been implemented in Asia and Latin America with good results. A variation of utility EE programs are utility EE obligations (EEOs), primarily used in the EU. Experience with EEOs is expected to increase significantly in the EU, given that the new EE Directive[25] includes provisions on EEOs with a savings target equal to 1.5 percent of retail energy sales per year from 2014 to 2020. Typically, EEOs are regulatory requirements on energy suppliers to meet defined EE targets, with financial penalties for failure to achieve the targets. The costs of the EE investments required to achieve the target are usually recovered through the tariff mechanisms. EEOs may be combined with a "white certificate" trading scheme, under which excess savings achieved by one utility may be purchased by a utility that is in a deficit position relative to the target.[26] Although utilities can be well placed to undertake such programs, governments must carefully develop regulatory mechanisms to address potential conflicts with their traditional business of energy sales.

In the EU, EEOs have been implemented in Belgium, Denmark, France, Ireland, Italy, the Netherlands, and the U.K., where the residential sector has been a major target market. To meet the obligations, the utilities may (i) directly implement EE measures in residential buildings, (ii) engage contractors to do the implementation, (iii) purchase energy savings achieved by others, or

[25] The new EU directive entered into force on 4 December 2012; member states must implement most of its provisions by 5 June 2014. http://ec.europa.eu/energy/efficiency/eed/eed_en.htm.
[26] Regulatory Assistance Project (RAP), 2012. *Best Practices in Designing and Implementing Energy Efficiency Obligation Schemes*. Prepared for the IEA DSM Program. June 2012.

(iv) establish a fund that can be utilized for EE measure implementation. Formal measurement, reporting, and verification of the savings are required. Box 8 presents a case study of the EEO program in Italy.

**Box 8. EE Obligations in Italy**

The Italian EEO scheme, initiated by the Legislative Decrees of March 1999 and May 2000, obligates all electricity and natural gas suppliers to meet specified savings targets. Trading is allowed through a "white certificate" scheme that establishes incentives for exceeding, and penalties for not meeting, the targets. The cost recovery is achieved through a common tariff surcharge. The cumulative aggregate targets are as follows:

| Year | Target (Mtoe)* |
|---|---|
| 2008 | 2.2 |
| 2009 | 3.2 |
| 2010 | 4.3 |
| 2011 | 5.3 |
| 2012 | 6.0 |

* Million tons of oil equivalent.

The results indicate that 80 percent savings have been achieved in the residential sector. There are several options for measurement and verification (M&V), including deemed savings,** deemed savings with some measurements, and metering. Most of the installed measures have been simple, such as efficient lighting (mostly compact fluorescent lamps) and low-flow showerheads, with some heating and residential appliances.

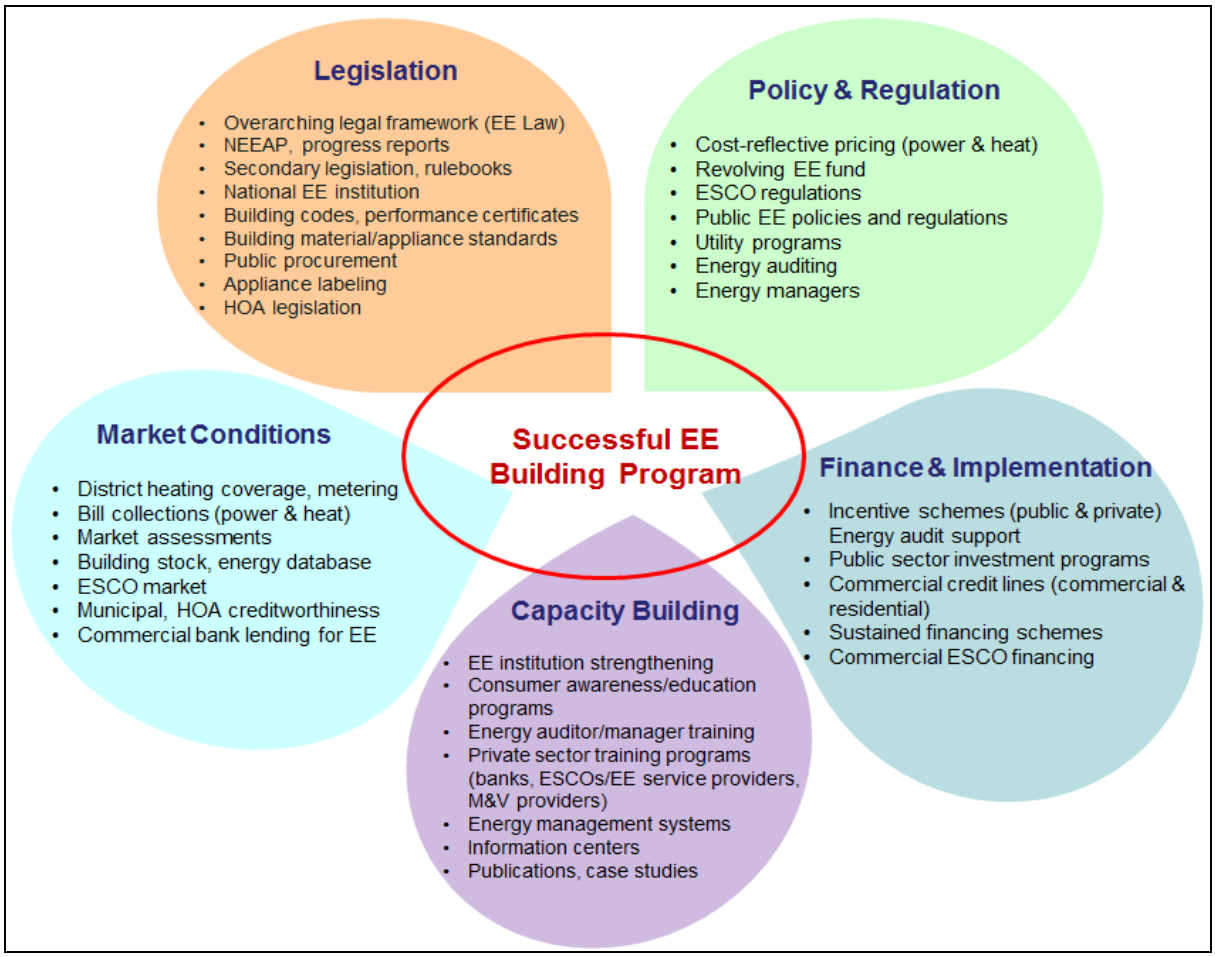
*Source:* Regulatory Assistance Project, 2012, op.cit.

** The *deemed savings* methodology estimates the energy savings from a project by previously agreed means, usually based on engineering estimates, instead of requiring actual measurements of savings.

# 3. Roadmap for Scaling Up EE in Buildings

Accelerating the pace of building renovation programs in the Western Balkans will require a two-pronged approach: broadening the portfolio of government interventions and deepening implementation efforts. The first requires government actions in the five key areas noted in Section 1—enacting legislation, adopting policy and regulatory enhancements, improving market conditions, expanding finance and implementation, and building local capacity (Figure 7). Deepening implementation efforts is the subject of this section.

**Figure 7. Framework for Successful EE Programs in Buildings**




*Source:* Authors.

Recent building renovation projects implemented by the World Bank and others donors in the Western Balkans have demonstrated that substantial energy savings can be achieved with reasonable paybacks and substantial co-benefits.[27] However, these projects, most of which have been in the public sector, have also shown some limitations of current approaches, such as:

- Limited linkages between ongoing policy enhancements and investment programs;
- Limited replication of pilot and demonstration programs;
- Lack of sustainability of project implementation models and staff (i.e., PIUs);
- Difficulties in scaling up renovation projects beyond about 20–30 buildings per year; and
- Lack of private sector involvement (from ESCOs, for instance) in mobilizing financing and assuming technical (or performance) risks.

[27] For example, EE projects in public buildings in FYR Macedonia, Montenegro, and Serbia have demonstrated energy/cost savings of 30–45 percent per building, with payback periods of 6–8 years. Corollary benefits included improved comfort, better health (reduced sick days), increased public/student awareness about EE, and urban renewal.

Because the two main tools have been loans and grants, and because loans are restricted to only the most creditworthy municipalities or households while grants typically go to the poorest ones, there remains a large unserved "middle market." Despite a series of government and donor projects, countries have had limited success moving up the financing ladder and sufficiently catalyzing the market to sustain itself.

Therefore, the following principles are offered to help foster and accelerate scalable implementation:

- Require all public funds to revolve, which will oblige public and other beneficiaries to repay the investment costs based on the energy cost savings.
- Prioritize leverage of public funds through a variety of strategies—such as requirements for borrower co-financing or contributions, pooling of donor funds, commercial co-financing, or performance-based contractor payments.
- Offer multiple financing products/instruments to serve both municipal and residential markets.
- Introduce explicit mechanisms to develop, test, and replicate successful ESCO models.
- Develop national-level, sustainable implementation and financing models and institutional setups that can recover costs, sustain themselves across individual project periods, and expand as the market develops and demand increases.
- Foster multiple strategies to increase the pace of retrofits—from bundling of projects to benefit from economies of scale, to wholesale models that rely on a variety of decentralized delivery mechanisms, to challenges and competitions that help stimulate participation.

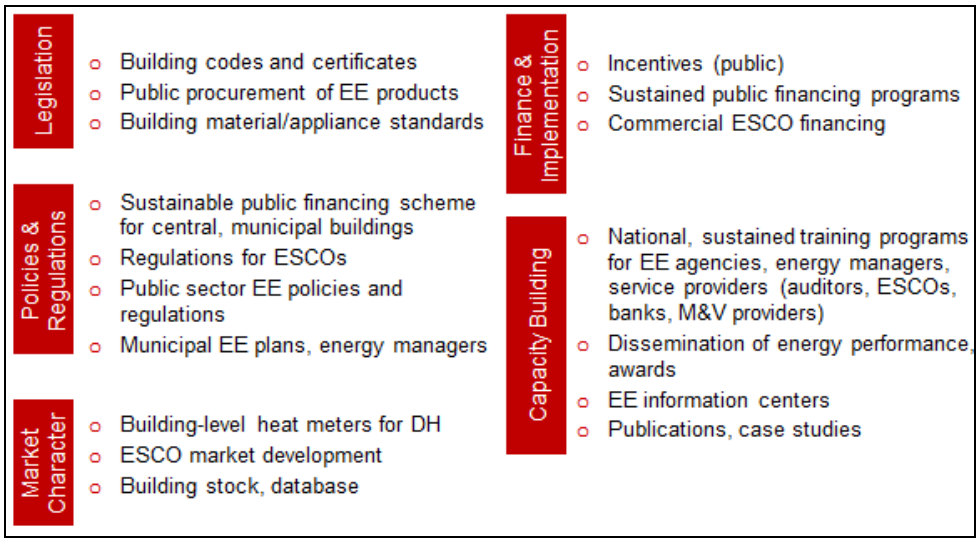
Adopting these principles will require that the governments advance from donor-driven projects to country-led programs with a balance of policies, regulations with enforcement, financing and incentive programs, and information and education. Of course, even the introduction of simple concepts, like repaying the upfront investment costs for public entities, may involve a set of more complex changes to the current systems. For instance, (i) public entities must show energy bill payment discipline and be subject to cost-reflective energy pricing and consumption-based billing; (ii) the government should allow public entities to retain energy budget savings to allow them to repay the investments; and (iii) public entities must first meet basic comfort levels before energy savings can be realized. Further, accelerated efforts are needed to complete the policy and regulatory packages related to EE in buildings, such as (a) adopting and enforcing building codes/certificates, material/appliance standards, and appliance labeling and (b) completing building databases.

The preliminary roadmap presented is based on these principles and follows the findings from the Assessment Framework and lessons from regional and international experience. The first part focuses on the public and municipal sectors and the second on the residential or household sector.

## A. Roadmap for Scaling Up EE in Public Buildings

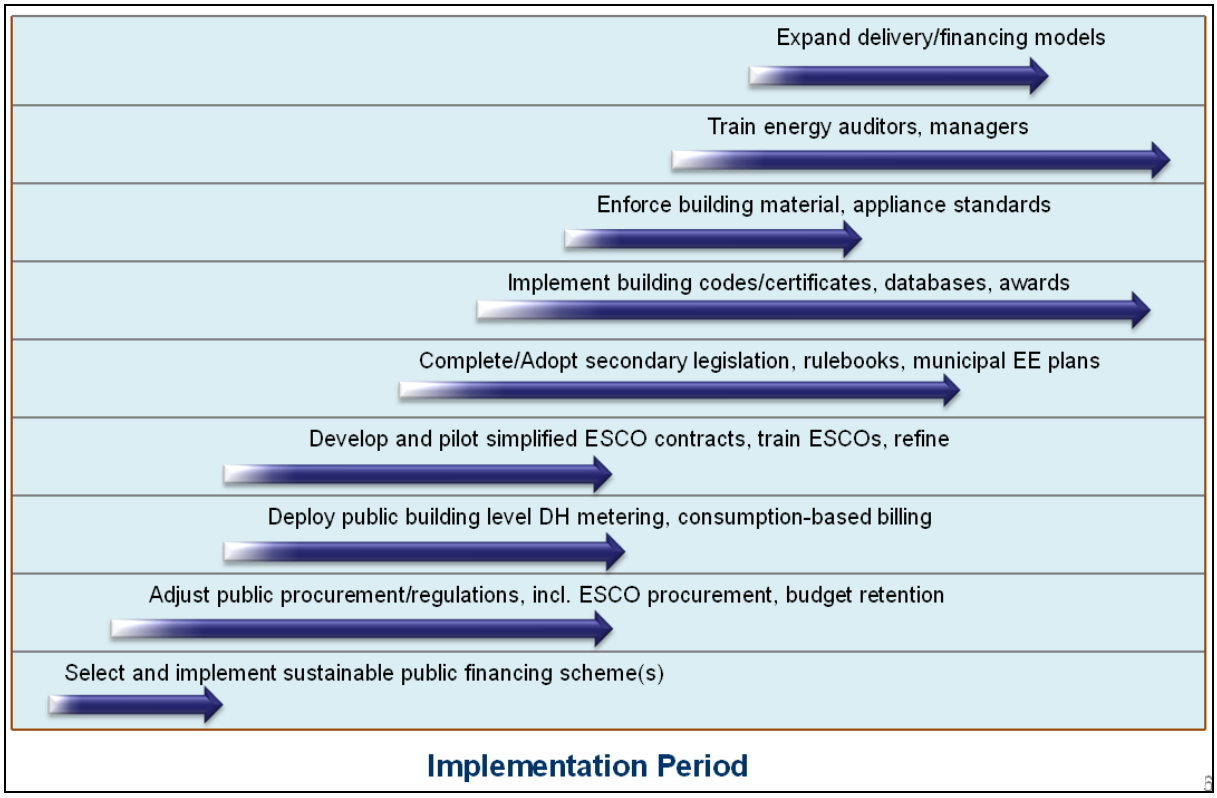
As outlined in Section 1 on the Assessment Framework, a number of key regional gaps in the public sector have made achieving significant energy savings a major challenge (Figure 8). While the gaps do differ among countries, the gaps presented are common to at least half of the countries analyzed. Addressing these gaps will require a mix of policy and program instruments in each of the five key areas. The Roadmap for the Public Sector presented in Figure 9 seeks to (i) highlight key actions governments and donors can take, (ii) to sequence and prioritize them, and (iii) to estimate relative timelines for achieving them. It should also be noted that this roadmap is based on regional characteristics; some countries may already making progress in several areas.

**Figure 8. Major Regional Gaps in the Public Sector**




*Source:* Authors.

**Figure 9. Roadmap for Scaling Up EE in Public Buildings**




*Source:* Authors.

There is a wealth of existing literature on many of the actions contained in the roadmap. The following section will only briefly elaborate on the roadmap's initial recommendations, as these focus more on deepening financing and implementation, which is a key gap noted earlier. It also complements the important policy and other TA and capacity building being provided by other donors in the region.

### *Recommendation 1. Select and Implement Sustainable Public Financing Scheme(s)*

Now that a decade or more of primarily donor-driven pilot and demonstration projects have laid the groundwork, the countries in the Western Balkans need to shift to national-level public building programs with appropriate, sustainable financing scheme(s) that follow the principles

presented above and options outlined in Section 2. Broad stakeholder consultations are recommended to ensure that the mechanism(s) selected and designs adopted reflect the needs of the various market actors, financiers, and target borrowers.

### *Recommendation 2. Adjust Public Procurement/Regulations, Including ESCO Procurement and Budget Retention*[28]

Public sector agencies typically have rigid procurement and budgeting rules that they see as necessary to ensure proper use of public funds and value for money. Unfortunately, sometimes these rules can encourage the opposite—by favoring lower-cost equipment that has much higher operating costs over its life-span. Public agencies that try to amortize these higher upfront costs may be prevented from entering into multiyear contracts or retaining energy cost savings that may be needed to pay contracts in later years. Therefore, the Western Balkan countries generally need to adjust public sector regulations in some key areas.

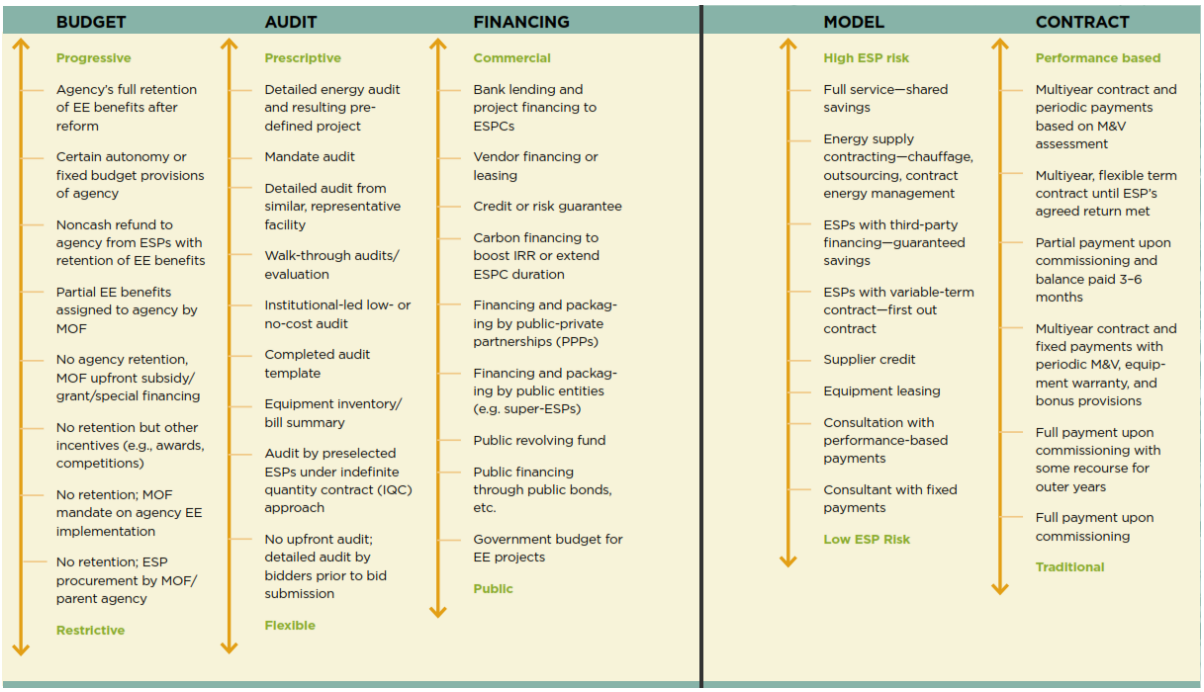
- *Multi-year contracting.* Without multi-year budgeting, public agencies typically cannot enter into multi-year contracts, since they would not be allowed to commit future funding that has not yet been appropriated. Borrowing or contracting over multiple years is often necessary for EE improvements, as it allows public agencies to amortize the higher upfront costs over several years. The introduction of 3–5 year budget planning, such as under the medium-term expenditure framework (MTEF),[29] can help reconcile multiyear obligations within the annual budget envelope, provided that the budget planning process is sufficiently robust. Some countries—Germany, South Korea, and the United States among them—have also amended budgeting or procurement laws specifically to allow public entities to enter into multi-year contracts, including ESPCs.
- *Retention of energy costs savings.* Without the ability to keep cost savings, most public agencies in the Western Balkans lack the incentive to implement EE measures. Such rules also constrain the agencies' ability to repay loans or enter into multi-year ESPCs if the payments would be derived from energy cost savings in future years. Municipalities and some autonomous entities (e.g., hospitals and schools) receive budgetary allocations based on a formula and thus may not experience budgetary reductions if energy costs go down. Resolving this often requires amending existing budgeting rules and procedures to allow public agencies to retain the energy savings at least for the length of the ESPC or EE loan period. (The first column in Figure 10 includes other options for budget retention based on international experiences.)
- *Exclusion of ESPC/ESA repayments from public debt.* Since ESPCs and ESAs are long-term contractual obligations, many countries have concluded that these commitments should not be treated as public debt.[30] Given the limited public debt capacity in the region, similar decisions taken by MOFs would encourage public agencies or municipalities to undertake EE measures because they would not have to reprioritize their other investments.
- *Facilitate procurement of ESCOs*. There is consensus that ESPCs can greatly facilitate EE implementation and help mobilize commercial financing for the public sector. Unfortunately, ESPC procurement can be complex, since this type of contract (i) is a blend of goods, works, services, and sometimes financing; (ii) uses an output-based rather than input-based approach to defining the project scope; (iii) relies on a variety of cost factors for evaluation, which therefore necessitates a highest net present value (NPV)

[28] Based on: Singh et al., 2010, op. cit.; ESMAP, 2012a. "Public Procurement of Energy Efficiency Services, Getting Started". ESMAP: Briefing Note 09/10. Washington, D.C., 2012.
[29] The MTEF is a multiyear budgeting system that allows governments to plan expenditures for a number of years in advance. See http://go.worldbank.org/80OVWNYE30 for more information on MTEF.
[30] In Germany, for example, because ESPCs are viewed as an alternative to credit financing, they are not counted against public debt as long as the cost savings are greater than repayment obligations.

rather than a lowest-cost assessment; and (iv) requires payments based on performance (i.e., energy savings with agreed comfort levels and service quality), which requires credible baseline and post-project energy use data. While each of these issues can be complex, it is recommended to identify and build off of existing procurement precedents in other sectors that can serve as reference points. Recent procurement laws dealing with public-private partnerships (PPPs), management services contracts, output-based and performance-based infrastructure contracts, cost plus contracts, and so on offer models that deal with similar issues. Building on these precedents, efforts should then be undertaken to develop tailored bidding documents for simplified ESCO 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; and (iv) link at least partial payments (20–30 percent) to a commissioning test (comparing post-project with promised NPV) and one deferred payment (e.g., 6–12 months after commissioning). Lessons from international experience reveal a continuum of approaches to allow and promote public procurement of ESCOs (Figure 10).[31]

- *Encouraging or requiring purchase of energy-efficient equipment.* Five main purchasing policies and program models have been used to require or encourage public agencies to procure energy-efficient equipment such as lighting products, office equipment, pumps, and windows. These are as follows: (i) EE appliance labels (e.g., Australia, China, EU, Japan, United States); (ii) development of catalogues of technical specifications related to energy performance (e.g., EU, Japan, Mexico, United States); (iii) life-cycle costing or "best value" awards, which look at the lowest-cost product over the life-span of a piece of equipment (e.g., Australia, EU, United States); (iv) preferences for energy-efficient products that exceed minimum standards (e.g. Australia, China, EU, Japan, South Korea, United States); and (v) development of lists of qualifying energy-efficient products (e.g., China, EU, South Korea, United States).

**Figure 10. Facilitating Public Procurement of ESCOs**




*Source:* ESMAP, 2012, op.cit.

[31] For more information on ESCO procurement, see Singh et al., 2010, op.cit.; and ESMAP, 2012, op. cit., both available at http://www.esmap.org/node/270.

### *Recommendation 3. Use Consumption-Based Billing for Public Buildings*

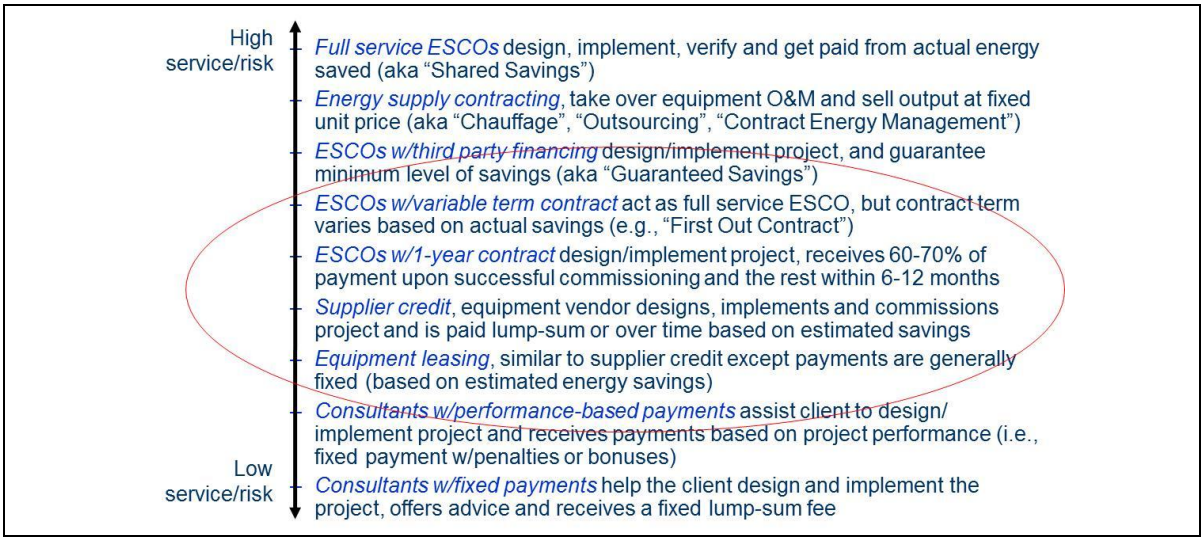
Currently, most public buildings connected to district heating (DH) networks are billed on the basis of heated floor area, providing no incentive to reduce energy use. Transitioning to consumption-based billing is thus critical to provide proper price signals to public building owners/managers and create energy cost savings cash flows from which EE loans can be repaid. Although in Albania, Kosovo, and Montenegro less than 5 percent of non-residential buildings are connected to DH systems, connection rates in the remaining three countries range from 12 to 40 percent. (The remaining buildings are heated by decentralized heating systems such as building-level boilers or electrical or biomass heaters, and are generally subject to fuel costs based on actual consumption.)

Therefore, while public agencies should be required to transition to consumption-based billing, particularly if they wish to benefit from a government renovation program, it need not be a precondition for such programs. Metering should be a required first step, both to measure actual baseline consumption and to assess expected changes in budgetary provisions resulting from the change in billing practices. This should be followed by temperature reading and controls, so that baseline comfort levels are recorded and positive behavior for lowering indoor heating temperatures is rewarded. Temperature controls can be introduced at either the substation level or the building level. However, to move to consumption-based billing, installation of temperature controls at building level (and associated construction of substations) is usually required.[32]

### *Recommendation 4. Develop and Pilot Simplified ESCO Contracts*

Currently, the ESCO market is underdeveloped in the Western Balkans, with only a handful of active companies. While the EE markets continue to develop, there is little measureable progress to foster successful ESCO models and businesses. Part of the challenge rests with the underdeveloped legal frameworks for ESCOs, which would lay out the rules and requirements for ESCOs operating in a given market. Equally important is the need to develop appropriate business models, simplified for the given market conditions, to help create a platform from which the industry can build and evolve over time. A variety of ESCO business models are currently being implemented around the world, ranging from full-service/high-risk contracts to low-service/low-risk contracts (Figure 11), with those deemed most relevant for the Western Balkans in the near-term in the circle.

**Figure 11. Examples of Different ESCO Business Models**




*Source:* ESMAP, 2012. op.cit.

[32] ESMAP, 2012b. *Modernization of the District Heating Systems in Ukraine: Heat Metering and Consumption-Based Billing.* Washington, D.C.: World Bank, 2012.

International ESCOs, and some local ones, can generally mobilize quickly in a given market if the market signals are correct. Most assess three conditions that need to be met:

1. Predictable and stable demand for ESCO services, which the public sector is often best placed to provide;
2. Reliable sources of local financing with creditworthy clients, which strong sustainable financing schemes can address; and
3. Clearly defined rules for how ESCOs are expected to operate in a given market, which the public sector can provide within its public tenders—such as guidelines for defining baselines, requirements for audits, sources of financing, rules for payments and verification, and so on.

### *Recommended Donor Actions to Support the Scale-Up of EE Programs in Public Buildings*

In addition to the roadmap, which sets out a series of actions for the governments to take in order to scale-up the volume and pace of implementation, IFIs and other donors should also be encouraged to undertake and agree to the following actions:

- Phase out pilot, grant-funded renovations in public buildings and support creation of sustainable schemes including pooling of financing with other donors;
- Help develop simplified ESCO contracts and standardize successful EE project/ESCO models to lower transaction costs (e.g., audit templates, ESCO bidding documents, M&V protocols, EE calculators);
- Provide support to complete policy and regulatory frameworks, as well as necessary amendments to public sector regulations and procedures;
- Enhance systems to share best practices and lessons with public building EE investment programs; and
- Implement training and capacity building programs at all levels.

## B. Roadmap for Scaling Up EE in Residential Buildings

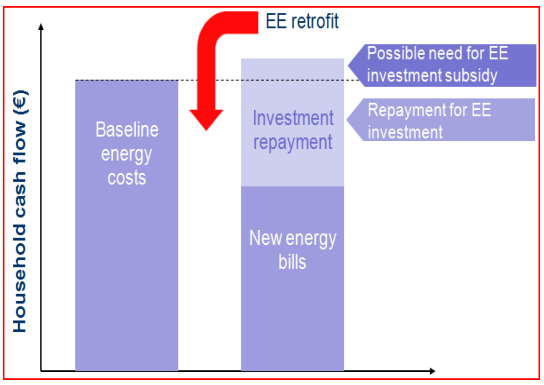
Because households in the Western Balkans represent about 60-70 percent of energy use in buildings, scaling up EE in residential buildings will be critical to achieving the national energy savings targets by 2018. As noted in Section 2, achieving 9 percent of the energy savings potential in this sector would require mobilizing some €2.7 billion, resulting in savings of €343 million and 6,162 GWh per year. EE improvements can also yield significant corollary benefits, including enhanced comfort levels, improved building aesthetics (and home values), improved health, and reduced vulnerability to future tariff increases (Box 9).

However, despite these well-documented opportunities and benefits, a number of specific barriers continue to hamper implementation of scalable EE programs in residential buildings throughout the region. Figure 12 provides an overview of these gaps based on the results of the Assessment Framework presented in Section 1.

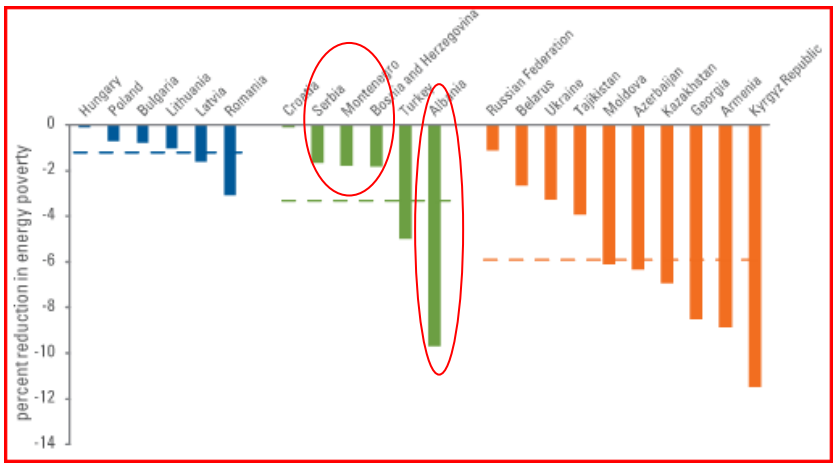
Although international experience shows that a variety of tools and instruments are available to address these barriers, they need to be carefully selected, adapted, and designed to suit local conditions. To achieve the vast EE potential at a reasonable scale, actions in all five areas noted above will be required. Further, engagement across a broad range of stakeholders—including national and local governments, building/home owners, HOAs, building developers, construction companies, financiers, manufacturers, and energy utilities—is also needed. The Roadmap for the Residential Sector presented in Figure 13 proposes specific actions for governments to initiate, with recommended priority, sequencing, and timelines. As with the Roadmap for the Public Sector (Figure 9), this roadmap is based on regional conditions; some countries may have already progressed in certain areas.

## Box 9. Can Households in the Western Balkans Afford Energy Efficiency?

Residential EE is significantly more complex than other sectors for a variety of reasons: its heterogeneous nature and the presence of multifamily housing and HOAs, norm-based billing for heating, lower income levels and creditworthiness, lower levels of comfort (i.e., under-heating), and individual homeowner behavior. So can they afford EE? A recently study in Kosovo, the region's poorest country, confirmed that in almost all cases, energy savings could pay for EE investments while allowing households modest increases in comfort levels to meet heating norms without increasing their monthly energy expenditure—even with modest tariff adjustments. This requires credit schemes to be developed with sufficiently long tenors to cover the higher payback periods. If this is not possible—due to excessively high investment costs, low energy pricing, low comfort levels, and so on—a onetime investment subsidy may be needed, particularly for low-income households (see graph at right).

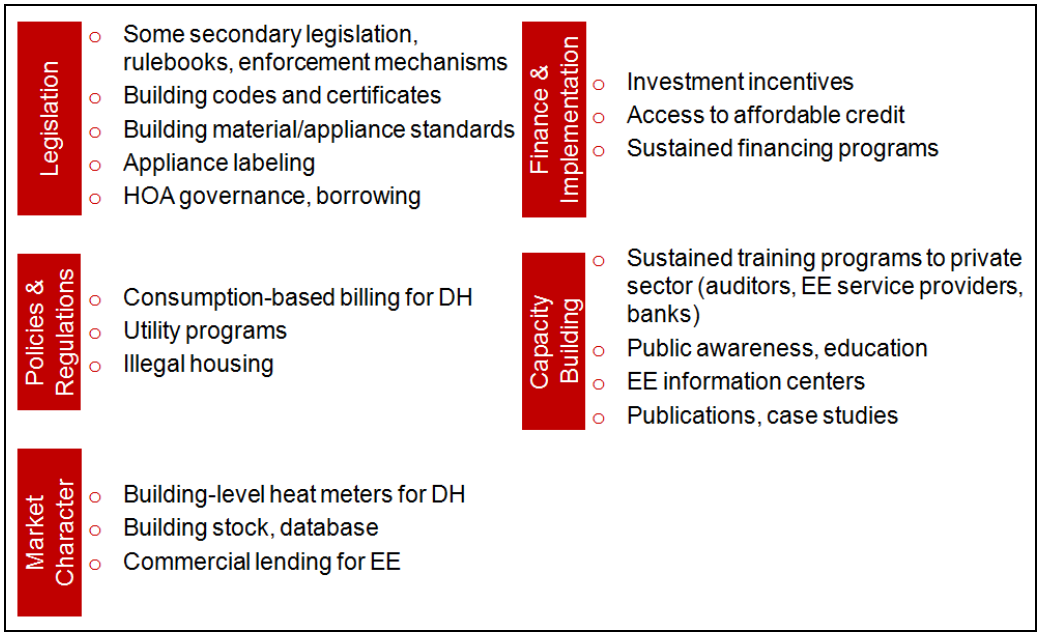



Similarly, a World Bank report on energy subsidy reform in the Europe and Central Asia region concluded that EE incentive programs should be coupled with planned tariff adjustments to help mitigate the impact on households. The study assumes a 10 percent reduction in energy demand through implementation of basic EE measures (e.g., lighting, insulation, caulking of windows). The graph (left) illustrates the expected reductions in energy poverty (defined as households spending more than 10 percent of their income on energy) across the region from EE programs.



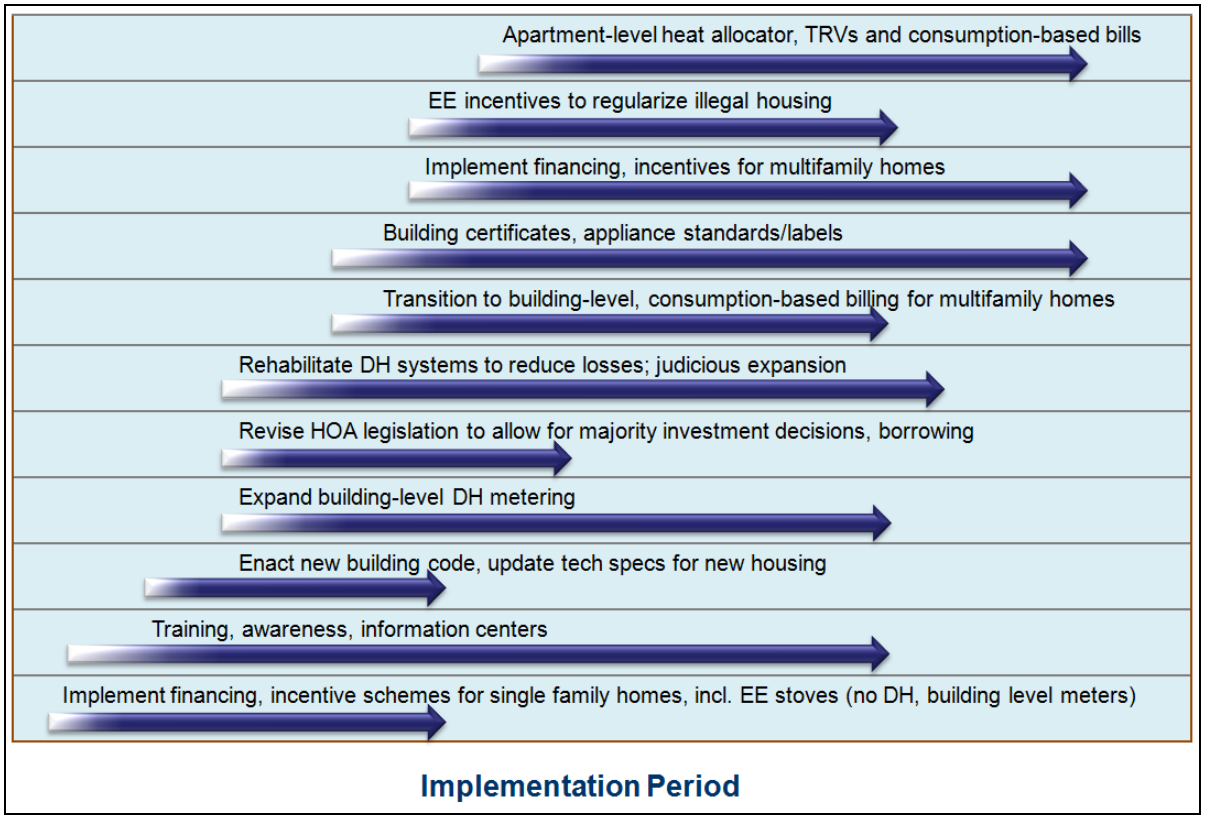

*Source:* World Bank Institute, 2013. *National Building Energy Efficiency Study for Kosovo.* Prepared by Eptisa. 2013; Laderchi et al., 2013, op.cit.

**Figure 12. Major Regional Gaps in the Residential Sector**




*Source:* Authors.

**Figure 13. Roadmap for EE in Residential Buildings**




*Source:* Authors.

As with the public sector roadmap, there is substantial information available in all of the topics noted in the residential roadmap. As illustrated, this roadmap does require more parallel actions to be taken given the more complex nature of the sector. And some countries may have different policy and political priorities, which may require some adjustments to the sequencing of specific actions. The following section discusses the roadmap's key initial recommendations.

### *Recommendation 1. Implement Financing and Incentive Schemes for Family Homes*

While multifamily apartments offer very high EE potential, they are also more difficult to address given the presence of HOAs and billing based on heated floor area rather than on actual consumption. The vertical piping schemes commonly used in many buildings also pose technical challenges. Therefore, it is recommended to start with simpler programs targeting "family homes" (1–2 dwellings per building) that have either building-level metering or no access to district heating (to ensure their bills are based on actual consumption). In the Western Balkans, such buildings are a relatively high share of the regional building stock (in some countries more than 50 percent) and represent the largest EE potential (345,500 MWh per year).[33] This would better allow the programs to develop and refine various financing schemes and implementation models, begin collecting information on actual energy savings, refine awareness and outreach campaigns, and begin to develop the EE service industry.

In addition, given the widespread use of traditional woody biomass in the region, the selected financing/delivery scheme(s) should specifically assess the possibility of including targeted financing and incentive elements to improve the efficiency of heating stoves in residential buildings. Currently, the share of households using biomass in urban areas varies from 34 percent (Albania and Serbia) to almost 90 percent (Kosovo). In rural areas, households relying on

[33] Energy Community Secretariat, 2012, op. cit.

biomass are 51 percent in Albania and 89–98 percent in the other five countries.[34] Corollary benefits from switching to more efficient stoves (or alternative heating options) include reduced indoor air pollution, improved indoor comfort, and reduced deforestation.[35]

### *Recommendation 2. Increase Information Outreach*

A key challenge with residential owners is their heterogeneous nature, which affects how they make purchasing and investment decisions, how they operate appliances and heating systems, and what levels of comfort they require. Although proper awareness campaigns and public education cannot easily overcome these issues, they can provide a base level of information from which more informed decisions can be made. Information programs can involve a range of media, from utility fliers to public posters to radio/TV spots to websites.

Information outreach can also greatly facilitate positive actions by homeowners that decide to pursue EE improvements, by showing how to get started. In particular, websites that gather the relevant information—such as examples of other homes that have undertaken EE, measures that can be taken based on the building type, EE calculators, lists of certified service providers and equipment suppliers, contact details for financing and incentive programs, and advice for working through HOAs—can offer a simple "one-stop shop" and reduce the transaction costs associated with undertaking EE. Periodic surveys should be done to assess the effectiveness of these activities along with feedback mechanisms to improve them.

### *Recommendation 3. Follow a Balanced Approach to Consumption-Based Billing*[36]

Consumption-based billing is critical because it gives homeowners the pricing signals and incentives they need to reduce their energy use. Without it, EE measures cannot create the energy cost savings cash flows from which EE loans can be repaid. Fortunately, this is not as significant an issue as it is in other countries, since the share of residential buildings connected to DH is relatively low in the region—varying from 0 percent in Montenegro to 48 percent in FYR Macedonia.[37] Still, transitioning to consumption-based billing schemes will be needed before residential EE programs can be implemented at scale. Given the technical, political, and institutional challenges associated with this transition, a two-phase approach is recommended:

1. The first phase would focus on installing devices to allow customers to measure and control energy use at the *building level*. This would require the installation of building-level heat meters and temperature controls,[38] which in turn would require the installation of individual heat substations with heat exchangers. To increase public acceptance of consumption-based billing systems, there is a need to demonstrate value for money by also improving DH service quality and reducing network losses. In Poland, for example, installation of building-level meters was done in parallel with improvements in the DH network: the building-level metering rate increased from around 21 percent to 100 percent, while DH losses were reduced by about 50 percent between 1991 and 2000.[39] Consumers are generally more willing to accept changes in billing if there is a corresponding increase in service quality and visible effort to reduce service costs. Billing

[34] Energy Community Secretariat 2012. *Biomass Consumption Survey for Energy Purposes in the Energy Community*. Prepared by Centre for Renewable Energy Sources and Savings. 2012.
[35] Delivery options will be analyzed under a separate World Bank regional study, supported by WBIF, on the use of biomass for heating purposes.
[36] Based on ESMAP, 2012, op. cit.
[37] DH coverage in Albania is 2.5 percent; in Kosovo, 5 percent; in Bosnia and Herzegovina, 12 percent; and in Serbia, 27 percent.
[38] Temperature controls can also be installed at the substation level only. However, in this case, heat supply would depend on the average demand of buildings served by the substation. Transitioning toward consumption-based billing will not be possible without temperature control at the building level.
[39] World Bank, 2000. *Implementation and Completion Report for Heat Supply Restructuring and Conservation Project in Poland.* World Bank: Report No. 20394. Washington, D.C., June 2000.

based on actual energy use will also create an incentive for consumers and HOAs to improve building-wide EE, since all homeowners would benefit from reductions in building energy costs. An ESMAP study in Ukraine estimated that building-level heat consumption could be reduced by 15–25 percent by installing building-level metering and heat control devices coupled with rehabilitation of the associated distribution network.[40]

2. The second phase would focus on installing devices to allow consumers to measure and control their energy use at the *apartment level*. This would require installation of thermostatic radiator valves (TRVs), bypass piping (if needed), and heat-cost allocators on all radiators in each apartment. In this case, the heating bill is usually allocated to individual apartments on the basis of floor area and the reading of the heat-cost allocators in each apartment.

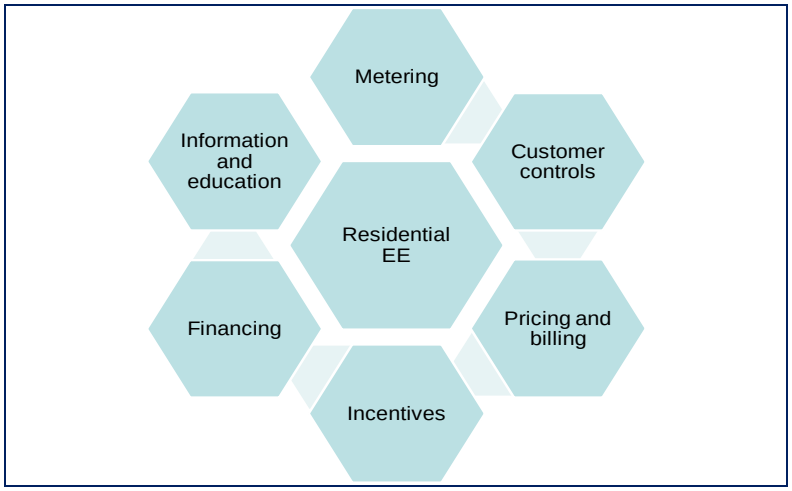
### *Recommendation 4. Create Effective Homeowner Associations*

For multifamily apartment buildings, organizations are typically needed to address common owner issues, collect payment for municipal services (such as heating, water, and solid waste), and address building-level maintenance and improvements. Although these tasks can be carried out by facility management or maintenance companies, they are more often done by HOAs. HOAs do need to have legal status in order to open bank accounts, borrow money for building improvements, enter into contracts with service providers, and so on. They also need supporting legislation to clarify how investment decisions can be made (e.g., 51 percent or simple majority or 100 percent). While simple repairs and maintenance can be done ad hoc by requesting small contributions from each homeowner, more capital-intensive upgrades, such as those that involve EE, require that HOAs request large contributions from each homeowner, set up and build reserve or renovation accounts, or be able to borrow from commercial banks on behalf of owners. The banks, in turn, need assurances that the owners will repay these loans. HOAs must ensure that any EE benefits are fairly distributed across all homeowners and that good behavior (for lower heat consumption) is rewarded. Proper monitoring of energy savings can also help avoid potential disputes while demonstrating the benefits to all HOA members.

### *The Need for a Multi-Pronged Approach*

Scaling up EE improvements in residential buildings is complex and requires a multi-pronged, phased approach combining six elements: metering, customer controls, pricing and billing reforms, incentives, financing, and information and education (Figure 14).

**Figure 14. Key Elements of Residential EE Scale-Up**




[40] ESMAP, 2012, op. cit.

Ultimately, lessons learned from international experience show that implementing EE programs in the residential sector at scale is very resource intensive and requires both a long-term commitment and sector reforms that help to create an enabling environment and proper incentives. When marketing EE to households, the substantial energy cost savings and corollary benefits, such as improved comfort, should be highlighted. Supporting regulations to address HOA governance and borrowing, metering and billing reforms, heating controls, and appliance labeling and building codes/certificates are critical to help to drive the market. Finally, the development of accompanying programs to provide accessible and affordable financing, targeted incentives, information, training, and so forth can help homeowners implement the EE measures.

# 4. Detailed Guidance Notes

The key findings and results of the project's first phase, as summarized in this report, were presented in June 2013 at a regional workshop in Vienna at which stakeholder delegations from all six Western Balkan countries were represented. This report reflects the discussions and feedback received at the conference. It was also circulated and shared with the Energy Community Secretariat, donors, government counterparts, and other stakeholders.

Workshop participants were also invited to vote for specific areas for more in-depth review in the second phase of the project. The three areas receiving the most interest were (i) establishing and operationalizing an EE Revolving Fund, (ii) municipal budgeting and financing, and (iii) residential financing and incentive programs. A second tier of topics included (iv) energy service business models and market development, (v) transitioning to consumption-based billing, (vi) utility residential EE programs, and (vii) low-income household EE programs.

The first four areas were selected as topics for detailed **guidance notes**. These were developed in the second phase, presented at a May 2014 workshop in Vienna, and subsequently finalized. The full guidance notes are available from the authors on request; the executive summaries of each are included in Annex D.

# Annex A: The Assessment Framework

| Preliminary Assessment Framework for Scaling Up EE in Buildings | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Western Balkan Countries | | | | | | |
| | Albania | Bosnia & Herzegovina | Republic Srpska | FYR Macedonia | Kosovo | Montenegro | Serbia |
| **Part 1** | **EE Enabling Legislation** | | | | | | |
| National Energy Efficiency Law | | | | | | | |
| Draft Submitted for Adoption | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Adopted by Legislature | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ |
| National EE Action Plan | | | | | | | |
| Draft Submitted for Adoption | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Adopted | ✓ | | | ✓ | ✓ | ✓ | ✓ |
| Progress Reports Submitted as Required | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 2nd NEEAP Submitted for Approval | | | | | ✓ | | ✓ |
| 2nd NEEAP Adopted | | | | | ✓ | | ✓ |
| Secondary Legislation/Rulebooks | | | | | | | |
| Some Secondary Legislation/Rulebooks Drafted and Submitted for Adoption | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Full legal and institutional framework drafted | | | | | | | |
| Some Secondary Legislation/Rulebooks Adopted | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ |
| Full legal and institutional framework implemented | | | | | | | |
| National EE Entity (Agency or Dept. of Existing Ministry) | | | | | | | |
| Established | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ |
| Operational | ✓ | | | ✓ | ✓ | ✓ | ✓ |
| National Energy Efficiency Strategy | | | | | | | |
| National Energy Efficiency Strategy Adopted | | | ✓ | ✓ | ✓ | ✓ | |
| EE Building Code - New Buildings | | | | | | | |
| Draft Submitted for Adoption | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Adopted | ✓ | | | ✓ | ✓ | ✓ | ✓ |
| Currently In Force | ✓ | | | ✓ | ✓ | ✓ | ✓ |
| Compliance Checking in Place | | | | | | ✓ | ✓ |
| Commissioning Testing Mechanism in Place | | | | | | | ✓ |
| EE Building Code - Major Renovations | | | | | | | |
| Draft Submitted for Adoption | | | | ✓ | ✓ | ✓ | ✓ |
| Adopted | | | | ✓ | ✓ | ✓ | ✓ |
| Currently In Force | | | | ✓ | ✓ | ✓ | ✓ |
| Compliance Checking in Place | | | | | | ✓ | ✓ |
| Commissioning Testing Mechanism in Place | | | | | | | ✓ |
| Building Certificates/Passports | | | | | | | |
| Draft Submitted for Adoption | | ✓ | ✓ | ✓ | | ✓ | ✓ |
| Adopted - Voluntary | | ✓ | ✓ | | | ✓ | ✓ |
| Adopted - Mandatory | | ✓ | ✓ | ✓ | | ✓ | ✓ |
| Certification System in Place | | ✓ | ✓ | ✓ | | | ✓ |
| Inspection System in Place | | | ✓ | ✓ | | | |
| Public Procurement | | | | | | | |
| Required by national government for EE Products | | | | ✓ | | ✓ | ✓ |
| Specific provisions for ESCOs/EE Services | | | | ✓ | | | ✓ |
| Specif provisions for Outsourcing/Energy Service Contracts | | | | | | | |
| Equipment Standards - Building Material (Insulation, Windows, etc.) | | | | | | | |
| Some Standards Drafted and Submitted for Adoption | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Insulation Standards Adopted | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Standards for Windows & Glass Adopted | | ✓ | ✓ | ✓ | | ✓ | ✓ |
| Compliance Checking and Inspection Mechanism in Place | | ✓ | ✓ | | | | |
| Equipment Standards - Energy Using Systems | | | | | | | |
| Some Standards Drafted and Submitted for Adoption | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Standards for Lighting Adopted | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ |
| Standards for Heating & Air Conditioning Adopted | | ✓ | ✓ | ✓ | | | ✓ |
| Standards for Refrigeration Adopted | | | | ✓ | | | |
| Compliance Checking and Inspection Mechanism in Place | | | | | | | |
| Appliance Labeling | | | | | | | |
| Some Labeling Schemes Drafted and Submitted for Adoption | ✓ | | | ✓ | ✓ | ✓ | |
| Labeling for Lighting adopted | ✓ | | | ✓ | ✓ | | |
| Labeling for Air Conditioners adopted | | | | ✓ | | | |
| Labeling for refrigerators adopted | | | | ✓ | ✓ | | |
| Compliance Checking and Inspection Mechanism in Place for Labeling | | | | ✓ | ✓ | | |
| Voluntary Office Equipment Labeling in Place | | | | | | | |
| HOA Legislation | | | | | | | |
| Legal status of entities | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Borrowing Enabled | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Established governance rules | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | | | | | | | |

*Note:* For the analysis presented in Section 1 of this Report, including scoring boards, the results of the Assessment Framework (Parts 1–5) for the Federation of Bosnia and Herzegovina and the Republic Srpska (which together make up current-day "Bosnia and Herzegovina") were combined.

| Preliminary Assessment Framework for Scaling Up EE in Buildings | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Western Balkan Countries | | | | | | |
| | Albania | Bosnia & Herzegovina | Republic Srpska | FYR Macedonia | Kosovo | Montenegro | Serbia |
| **Part 2** | **EE Policies & Regulations** | | | | | | |
| Pricing - Electricity - Residential | | | | | | | |
| Average cost-based | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Environment/Energy Taxes | | | | | | | ✓ |
| Lifeline Pricing for Low Income | ✓ | ✓ | ✓ | | ✓ | | ✓ |
| Average Annual Increase over 5 years > 3% | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Pricing - Electricity - Non-Residential | | | | | | | |
| Average cost-based | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Environment/Energy Taxes | | | | | | | ✓ |
| Average Annual Increase over 5 years > 3% | ✓ | | | ✓ | ✓ | ✓ | ✓ |
| Pricing - Heating Energy - Residential | | | | | | | |
| Average cost-based | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Building-level consumption-based billing | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Dwelling unit level consumption-based billing | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ |
| Pricing - Heating Energy - Non-Residential | | | | | | | |
| Average cost-based | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Consumption-based billing for buildings > 30% | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Consumption-based billing for buildings > 60% | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| EE Fund (Revolving Fund) | | | | | | | |
| Proposed for Adoption | ✓ | | ✓ | ✓ | | | ✓ |
| Adopted | | | | | | | ✓ |
| Dedicated Funding Source | | | | | | | ✓ |
| Operational | | | | | | | |
| Regulations re ESPC in Buildings | | | | | | | |
| Supp. legislation/policies developed | ✓ | | | | | | ✓ |
| Supp. legislation/policies adopted | | | | | | | |
| Standard RFPs/contracts developed | | | | | | | |
| Regulations Related to Public Agencies | | | | | | | |
| Energy efficient public procurement at municipal level | | | | ✓ | | ✓ | ✓ |
| Require Municipal EE Action Plans | | | ✓ | ✓ | | ✓ | ✓ |
| Allow retention of savings | | | | ✓ | | | |
| Allow multi-year contracts | | | | ✓ | | ✓ | ✓ |
| Allow ESPC in public agencies | | | | ✓ | | | ✓ |
| Allow public agencies to incur loans | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ |
| Energy Service Agreements not treated as debt | | | | | | | |
| Allow equipment leasing | ✓ | | | ✓ | | ✓ | ✓ |
| Regulations Related to Utility EE Implementation Actions | | | | | | | |
| Voluntary utility programs | ✓ | ✓ | ✓ | | | | ✓ |
| Draft EE obligations prepared | ✓ | | | | | | |
| EE obligations adopted | | | | | | | |
| Energy Auditing Regulations | | | | | | | |
| Draft auditing regulations prepared | | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Mandatory audits - large users | | ✓ | | | ✓ | ✓ | ✓ |
| Auditor training programs | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ |
| Auditor certification | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Energy Managers Regulations | | | | | | | |
| Required for large users | | | | | ✓ | ✓ | ✓ |
| Training program for energy managers | ✓ | ✓ | ✓ | | | ✓ | ✓ |
| Certification of energy managers | | ✓ | ✓ | | ✓ | ✓ | |
| | | | | | | | |

| Preliminary Assessment Framework for Scaling Up EE in Buildings | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Western Balkan Countries | | | | | | |
| | Albania | Bosnia & Herzegovina | Republic Srpska | FYR Macedonia | Kosovo | Montenegro | Serbia |
| **Part 3** | **Market Characteristics** | | | | | | |
| % of Buildings with District Heating | | | | | | | |
| Non-Residential | 0 | 12 | 12 | 40 | 5 | 0 | |
| Residential | 0 | 12 | 12 | 48 | 5 | 0 | 27 |
| Building Level Metering for Heating | | | | | | | |
| % with - non-residential | 100 | 30 | 30 | 100 | 100 | 100 | 30 |
| % with - residential | 100 | 45 | 45 | 100 | 100 | 100 | 0 |
| Heating Bill Collections | | | | | | | |
| % collections - non-residential | 100 | 80 | 80 | 97 | 72 | 100 | 70 |
| Increase in % (last 5 years) | | | | 10 | | | |
| % collections - residential | 100 | 85 | 85 | 97 | 22 | 100 | 70 |
| Increase in % (last 5 years) | | | | 10 | | | |
| Electricity Bill Collections | | | | | | | |
| % collections - non-residential | 75 | 95.4 | 95 | 96.3 | 90 | 90 | 97 |
| Increase in % (last 5 years) | 5 | | | 1.4 | 9 | | 3 |
| % collections - residential | 62 | 95.4 | 95 | 86.2 | 90 | 90 | 97 |
| Increase in % (last 5 years) | < 0 | | | 2.1 | 9 | | 3 |
| Wood Fuel Use | | | | | | | |
| % of Urban Households | 34.8 | 72.0 | | 59.3 | 89.9 | 55.5 | 34.3 |
| % of Rural Households | 51.3 | 92.4 | | 95.2 | 98.3 | 94.0 | 89.3 |
| Wood Use as % of Gross Energy consumption | 10.8 | 20.6 | | 16.2 | 18.1 | 7.9 | 11.6 |
| Public Buildings Market | | | | | | | |
| Major building types identified | ✓ | | | ✓ | ✓ | ✓ | ✓ |
| Market size estimated | ✓ | | | ✓ | ✓ | ✓ | ✓ |
| EE potential estimated | ✓ | | | ✓ | ✓ | ✓ | ✓ |
| Investment needs estimated | ✓ | | | ✓ | ✓ | ✓ | ✓ |
| Residential Buildings Market | | | | | | | |
| Major building types identified | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Market size estimated | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| EE potential estimated | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Investment needs estimated | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Commercial Buildings Market | | | | | | | |
| Major building types identified | ✓ | | | ✓ | ✓ | ✓ | ✓ |
| Market size estimated | ✓ | | | ✓ | ✓ | ✓ | ✓ |
| EE potential estimated | ✓ | | | ✓ | ✓ | ✓ | ✓ |
| Investment needs estimated | ✓ | | | ✓ | ✓ | ✓ | ✓ |
| Buildings Data Base (Stock and Energy Use) | | | | | | | |
| Database designed | ✓ | ✓ | | ✓ | | ✓ | |
| Initial data collected and entered | ✓ | ✓ | | ✓ | | ✓ | |
| responsibility for database update assigned | | | | ✓ | | | |
| Data updated annually | | | | | | | |
| Building energy benchmarking completed | | | | | | | |
| Energy Service Providers | | | | | | | |
| Number of Certified Audit Firms = 3 to 5 | | ✓ | | | | | |
| Number of Certified Audit Firms 5 to 10 | | ✓ | | | | | |
| Number of Certified Audit Firms >10 | | | | | | | ✓ |
| Number of ESCOs (with > I ESPC) = 1 to 2 | | ✓ | | | | | ✓ |
| Number of ESCOs (with > I ESPC) = 2 to 4 | | | | | | | |
| Number of ESCOs (with > I ESPC) > 4 | | | | | | | |
| Financing Market - Public | | | | | | | |
| % of municipalities with borrowing capability = 15-25% | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| % of municipalities with borrowing capability = 26 to 50% | | ✓ | | | | ✓ | |
| % of municipalities with borrowing capability > 50% | | ✓ | | | | | |
| Local public revenue as % of total public revenue | 12 | 17 | 11 | 16 | 27 | 15 | 14 |
| Financing Market - Residential | | | | | | | |
| No. of banks offering EE loans = 1 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| No. of banks offering EE loans = 2 to 4 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| No. of banks offering EE loans > 4 | ✓ | | | ✓ | | ✓ | ✓ |
| Financing Market - Commercial | | | | | | | |
| No. of banks offering EE loans = 1 | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| No. of banks offering EE loans = 2 to 4 | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| No. of banks offering EE loans > 4 | | | | ✓ | | ✓ | ✓ |
| | | | | | | | |

| Preliminary Assessment Framework for Scaling Up EE in Buildings | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Western Balkan Countries | | | | | | |
| | Albania | Bosnia & Herzegovina | Republic Srpska | FYR Macedonia | Kosovo | Montenegro | Serbia |
| **Part 4** | **Financing and Implementation** | | | | | | |
| Financial Incentive Programs - Residential Bldgs | | | | | | | |
| Planned/Proposed | | ✓ | | ✓ | | ✓ | ✓ |
| Adopted | | ✓ | | ✓ | | ✓ | ✓ |
| Operational - pilot stage | ✓ | ✓ | | ✓ | | ✓ | |
| Operational - full-scale | | | | ✓ | | ✓ | |
| Program for low-income homes | | | | ✓ | | ✓ | |
| Program for EE services to regularize illegal settlements | | | | | ✓ | ✓ | |
| Financial Incentive Programs - Public Bldgs | | | | | | | |
| Planned/Proposed | | ✓ | ✓ | | | ✓ | ✓ |
| Adopted | | ✓ | ✓ | | | ✓ | ✓ |
| Operational - pilot stage | ✓ | ✓ | | | | ✓ | ✓ |
| Operational - full-scale | | | | | | ✓ | |
| Energy Audit Subsidies | | | | | | | |
| Public program in place | | | | | | ✓ | |
| Residential program in place | | | | | | | |
| Commercial program in place | | | | | | | |
| Financing for Building EE - Public Bldgs (last 5 yrs) | | | | | | | |
| No. of donor investment grant programs in place | 3 | 1 | 1 | 2 | 3 | 3 | 2 |
| No. of buildings covered | 48 | 51 | 34 | 45 | 256 | 60 | 100 |
| Total investment (million €) | 7.6 | 12 | 8 | 3.3 | 40 | 24.5 | 36.9 |
| No. of donor-funded credit lines in place | | | | 3 | | 2 | 2 |
| No. of banks offering EE loans under these CLs | | | | 5 | | 4 | |
| No. of loans/projects financed | | | | | | 30 | |
| Amount of funding deployed (million €) | | | | | | 13 | |
| Government financing program in place | | ✓ | | | | | |
| Size of program (million €) | | 1 | | | | | |
| Financing for Building EE - Residential (last 5 yrs) | | | | | | | |
| No. of credit lines in place | 1 | 4 | 1 | 3 | 1 | 1 | 3 |
| No. of banks participating in credit lines | 6 | | 2 | 4 | 2 | 2 | 4 |
| No. of loans/projects financed | 2500 | N/A | N/A | N/A | 2000 | 80 | N/A |
| Total amount of funding deployed (million €) | 10 | | | | 10 | | |
| Financing for Building EE - Commercial (last 5 yrs) | | | | | | | |
| No. of credit lines in place | 1 | 4 | 1 | 5 | 1 | 1 | 4 |
| No. of banks participating in credit lines | 6 | | 2 | 16 | 2 | 2 | 6 |
| No. of loans/projects financed | 500 | N/A | N/A | N/A | N/A | N/A | N/A |
| Total amount of funding deployed (million €) | 15 | | | | | | |
| Energy Service Companies | | | | | | | |
| No. of ESCO projects | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Volume of ESCO projects (million €) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | |

| Preliminary Assessment Framework for Scaling Up EE in Buildings | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Western Balkan Countries | | | | | | |
| | Albania | Bosnia & Herzegovina | Republic Srpska | FYR Macedonia | Kosovo | Montenegro | Serbia |
| **Part 5** | **Capacity Building and Awareness** | | | | | | |
| Capacity Building - Energy Entity | | | | | | | |
| Donor-funded programs conducted | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Annual program plan and budget established | | ✓ | ✓ | | | | |
| Capacity Building - Energy Service Providers | | | | | | | |
| Donor-funded programs conducted | ✓ | | | | | | |
| Annual program plan and budget established | | | | | | | |
| Capacity Building - Energy Users | | | | | | | |
| Donor-funded programs conducted | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| Ongoing full-scale program in place | | | | | | | |
| Capacity Building - M&V Institutions/Providers | | | | | | | |
| Donor-funded programs conducted | | | | ✓ | ✓ | ✓ | ✓ |
| Model protocols developed | | | | | ✓ | | ✓ |
| Annual program plan and budget established | | | | | | | |
| Training - Energy Auditors | | | | | | | |
| Donor-funded programs conducted | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Templates for audits developed | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ |
| Training program for certification established | | ✓ | | ✓ | | ✓ | |
| Capacity Building - Energy Managers | | | | | | | |
| Donor-funded programs conducted | | ✓ | ✓ | ✓ | | ✓ | ✓ |
| Training program for certification established | | | | | | ✓ | |
| Energy Management Systems | | | | | | | |
| EMS selected for large energy users | | | | | | | ✓ |
| Donor-funded programs conducted | | ✓ | ✓ | ✓ | | | ✓ |
| Training program for EMS established | | | | ✓ | | | |
| Awareness and Information (A&I) | | | | | | | |
| Donor funded program conducted | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| National government program in place | ✓ | | | ✓ | ✓ | ✓ | |
| Consumer awareness measured/evaluated | ✓ | | | | ✓ | ✓ | ✓ |
| Performance Displays and Recognition | | | | | | | |
| Recognition or awards for high performance | | | | | | | |
| Publicizing public building performance | ✓ | | | | | | |
| Energy Information Centers | | | | | | | |
| Energy Information Centers Established | | ✓ | ✓ | ✓ | | ✓ | |
| Publications | | | | | | | |
| Case study database operational | | ✓ | | | | | ✓ |
| Handbooks/Guidebooks developed/disseminated = 1 to 3 | | ✓ | ✓ | ✓ | | ✓ | ✓ |
| Handbooks/Guidebooks developed/disseminated > 3 | | ✓ | ✓ | ✓ | | ✓ | ✓ |
| | | | | | | | |

# Annex B: Financing Options for the Public Sector

| Option | Description | Market conditions | Examples | Pros | Cons |
|---|---|---|---|---|---|
| **Grants** | Public budget, IFI/ donor funds provided to public entities to cover 100% of EE project costs | • No market capacity, need to pilot and demonstrate EE benefits<br>• Availability of grant funds<br>• Limited creditworthiness | Armenia, Belarus, FYR Macedonia, Kazakhstan, Kosovo, Montenegro, Serbia | Builds market capacity, easy to implement, can directly finance municipalities (incl. uncreditworthy/ budgetary independent entities) | Not sustainable/scalable, relies on limited grant resources |
| **Budgets/ Grants w/ co-financing** | Partial budget support/grants with some co-financing (loans, equity) from public entities | • Low market capacity, some co-financing is available<br>• Availability of grant funds<br>• Limited creditworthiness | Bosnia & Herzegovina, FYR Macedonia, Lithuania, Montenegro, Poland, Serbia | Builds market capacity, easy to implement, can directly finance municipalities that may not be able to borrow, co-financing increases ownership | Not sustainable or scalable, relies on limited grant funds |
| **MOF financing w/ budget capture** | Budget financing to public agencies/municipalities, with repayment through reduced future budgetary outlays | • Underdeveloped public/ municipal credit markets<br>• Limited equity among public agencies<br>• High commercial bank lending rates and low tenors<br>• Availability of budgetary space for MOF financing | Belarus, FYR Macedonia (MSIP), Hungary, Kosovo, Lithuania | Builds market capacity, relatively easy to implement, can directly finance municipalities that are not able to borrow, could allow funds to revolve (if MOF reinvests reflows), no repayment risks | Requires MOF to allocate substantial budget for financing, sustainability relies on MOF PIU, scale relies on PIU and borrower capacities, reducing future budget provisions can be complex |
| **Utility (on-bill) financing** | Utility borrows and finances EE investments in public clients; recovers investments through customers' utility bills | • Requires regulations for utility participation<br>• Strong financial position and financial management of utilities<br>• Payment discipline among public clients, adequate energy pricing and billing practices | Brazil, China, India, Mexico, Sri Lanka, Tunisia, United States, Vietnam | Streamlined repayments, lower repayment risk if risk of utility disconnection, builds off of utility relationships and services, can be done on a sustainable and scalable basis | Requires changes in utility regulations and billing systems, creates potential for monopolistic behaviors, financing competes with local banks, may be easier for power utilities than heating ones |
| **EE revolving funds** | Independent, publicly-owned entity provides financing for EE to public clients, repayments based on estimated energy cost savings | • Underdeveloped public/ municipal credit market<br>• Access to public budget or IFI loans/grants to capitalize fund<br>• Credible and proactive fund manager can be recruited<br>• Public agencies able to enter into multiyear obligations and retain energy cost savings | Armenia, Bulgaria, India, FYR Macedonia (proposed), Romania, Serbia (proposed), Uruguay | Builds market capacity, can directly finance municipalities that are not able to borrow, can better leverage funds by pooling, greater potential for bundling of projects and development of simple ESCOs, centralized implementation and procurement can lower costs, can recover operating costs through fees | Recovering operating costs in early years is difficult, using private fund manager to oversee public funds may not be politically desirable, heavy reliance on good fund manager, need mechanisms to help ensure public client repayment, fund can act monopolistic |
| **Public** | Publicly owned company that | • Underdeveloped public/ municipal credit | Armenia, China, Croatia, Poland, | Builds ESCO market capacity through subcontracting, helps | Public ESCO can be monopolistic and may be subject to public sector |

| Option | Description | Market conditions | Examples | Pros | Cons |
|---|---|---|---|---|---|
| **ESCO** | provides financing for EE projects with public entities with repayments based on energy cost savings | market<br>• No local, active, capable ESCOs<br>• Rigid public procurement rules make ESCO hiring difficult<br>• Credible public entity exists with demonstrated capacity to subcontract/manage subprojects | Ukraine, United States, Uruguay | address public procurement and financing issues, centralized implementation and procurement can lower costs, greater potential for bundling of projects and development of simple ESCOs models | bureaucracies (procurement, staffing, budgeting), appropriate exit strategy may be needed if private ESCO/ESPs enter the market, public ESCO requires access to long-term financing |
| **Credit line with municipal (development) bank** | Dedicated municipal bank lending to public agencies for EE, using government or IFI funds | • Underdeveloped public/ municipal credit market<br>• High commercial bank lending rates and low tenors<br>• Existence of credible municipal or development bank willing to lend for EE and assume repayment risks<br>• Municipalities must have ability and willingness to borrow<br>• Public agencies able to retain energy cost savings, pay based on consumption | Brazil, India (municipal infrastructure fund), Mexico, Turkey (proposed) | Builds commercial lending market by demonstrating public agencies can repay, allows public agencies to undertake own procurement/implementation which can allow for greater scale, allows for lower interest rates, funds can revolve (if bank relends reflows for EE) making it more sustainable | Relies on strong banking partner with incentive and ability to proactively develop pipeline and offer good financial products, serves only creditworthy municipalities, some municipal banks do not do proper risk assessments and appraisals or take risks |
| **Credit line with commercial bank(s)** | Selected commercial bank(s) lending to public agencies for EE, using government or IFI funds, or purchase of account receivables from private ESCOs (i.e., factoring) | • Good banking partners willing to lend and assume risks<br>• Municipalities must have ability and willingness to borrow<br>• Public agencies able to retain energy cost savings, pay based on consumption<br>• Reasonable, competitive lending rates, reasonable tenors, collateral requirements | China, Germany, India, Poland, Serbia, Turkey, Tunisia | Builds capacity of commercial banks to market and appraise EE projects, mobilizes commercial financing which can deliver scale and be sustainable, allows public agencies to undertake own procurement/implementation | Relies on strong banking partner with incentive and ability to proactively develop pipeline and offer good financial products, serves only creditworthy municipalities able to borrow, requires complementary TA to work well, EE investments have to compete with other investment for limited capital, some credit lines distort the market |
| **Partial credit guarantee** | Risk-sharing facility that can offer partial coverage to commercial lenders from EE loan defaults | • Good banking partners willing to lend and assume some risks<br>• Municipalities must be marginally creditworthy and willing to borrow<br>• Public agencies able to retain energy cost savings, pay based on consumption<br>• Reasonable, competitive lending rates | Bulgaria, CEEF (regional), China, FYR Macedonia, Hungary, Philippines, Poland, Tunisia | Allows banks to expand their potential customer base, mobilizes commercial financing which can deliver scale and be sustainable, can allow more banks to participate thereby increasing competition, can help address overcollateralization/short tenor issues, allows public agencies to undertake own procurement/ implementation | Relies on network of strong banking partners with ability to proactively develop pipeline and assume some risks, partial risk coverage may only allow lending to a few additional municipalities, can create moral hazard depending on risk coverage |

| Option | Description | Market conditions | Examples | Pros | Cons |
|---|---|---|---|---|---|
| **Commercial financing, bonds** | Municipalities take commercial bank loans or issue bonds to finance EE investments | • Requires well-developed municipal credit and rating systems<br>• Financiers willing and able to lend to public sector for EE projects<br>• Large municipalities with strong technical capacity willing to bundle many EE projects together | Bulgaria, Denmark, India, United States | Mobilizes commercial financing which can deliver scale and be sustainable, elements of competition can help lower financing costs, can help address overcollateralization/short tenor issues, allows public agencies to undertake own procurement/ implementation | Only makes sense for very large bundles of projects, only highly creditworthy municipalities can use these schemes, relatively high transactions costs |
| **Vendor credit, leasing** | Equipment suppliers that provide energy-efficient equipment under lease contract, usually with lease payments based on estimated energy savings | • Large, credible local and/or international vendors able and willing to finance public EE projects<br>• Local bank financing available for vendor leasing<br>• Creditworthy municipalities able to sign long-term vendor contracts<br>• Public agencies able to retain energy cost savings, pay based on consumption | China, EU, United States | Mobilizes commercial financing which can deliver scale and be sustainable, can help address overcollateralization/short tenor issues, financing and procurement in one contract, lease may not count against public debt | Relies on local banks and leasing companies to provide reasonable cost financing and assume credit risks, serves only very creditworthy public agencies, vendors must be able to take on substantial debt and offer long-term financing to municipalities, financing tied to certain products/brands, only some building components suited for leasing (lighting, solar water heaters, boilers) |
| **Advanced commercial or project financing (ESCOs)** | ESCO finances and implements public EE projects, often with at least part of repayment tied to energy savings over contract duration | • Large, credible local and/or international ESCOs able and willing to finance and bid on public EE projects<br>• Local bank financing available for ESCO lending, municipal lending against performance guarantees or ESCO refinancing<br>• Creditworthy municipalities able to sign long-term contracts w/ ESCOs<br>• Public agencies able to retain energy cost savings, pay based on consumption<br>• Municipalities must have capacity to procure and negotiate complex ESPCs | Canada, Czech Republic, Germany, Hungary, India, Japan, South Korea, United States | Mobilizes commercial financing which can deliver scale and be sustainable, can help address overcollateralization/short tenor issues, full project cycle (audit through commissioning) outsourced to one firm, ESPC may not count against public debt, public agency shifts technical risks to third party | Relies on local banks and ESCOs to provide reasonable cost financing and assume credit risks, serves only very creditworthy public agencies, ESCOs must be able to take on substantial debt and offer long-term financing to municipalities, financing may be tied to certain products/brands (if ESCO is equipment supplier), transaction costs make only very large projects feasible, ESCO industry is very difficult to develop, public procurement issues take time to solve, new ESCOs often not credible to clients and banks, require clear 'rules of the game' (M&V protocols) |

*Source:* Based on ESMAP, 2012, op.cit.; Singh et al., 2010, op.cit.

# Annex C: Financing Options for the Residential Sector

| Option | Description | Market conditions | Examples | Pros | Cons |
|---|---|---|---|---|---|
| EE Funds | Independent entity providing financing for EE (e.g., loans, ESA, guarantees) | • Local commercial banks unable/unwilling to enter EE market | Bulgaria, Greece, Romania, Slovenia | • Can be sustainable; mandated to promote EE<br>• Can develop specialized products; centralized experience and lessons | • May distort market<br>• Could create monopoly<br>• May not operate efficiently<br>• Can be captured by political interests |
| Commercial Bank Financing | Commercial banks provide loans for EE | • Developed financial market familiar with EE<br>• Creditworthy customers | Austria, Belgium, Bulgaria, Czech Republic, Germany, Lithuania, Netherlands, Poland, Romania, Spain, UK | • Sustainable<br>• Allows for competition of financing and builds off existing credit system | • Only serves creditworthy customers<br>• May involve high interest rates<br>• Banks may lack incentive to market aggressively |
| Partial Credit Guarantees | Partial coverage of potential losses from EE loan defaults | • Developed financial market familiar with EE<br>• Creditworthy/marginally creditworthy clients<br>• Banks willing to provide EE loans | Bulgaria, Greece, Romania, Slovenia | • Encourages commercial banks to finance EE<br>• Helps overcome risk perception of banks<br>• Can lead to sustainable commercial financing | • Requires mature banking sector interested in EE financing<br>• May need substantial capacity building of banks<br>• May serve only creditworthy customers |
| Utility EE programs | Utility implement EE in residential buildings in the form of DMS or an EEO scheme | • Payment discipline and adequate billing practice<br>• Financial capacity of utilities to provide upfront financing<br>• Effective delivery mechanism to implement programs | Belgium, Denmark; France, Ireland, Italy, Netherlands, UK | • Can be done sustainably<br>• Builds off of utility relationships and services<br>• Allows for simple collections (on-bill repayment) | • Utilities lack incentives to reduce energy sales<br>• Regulations may limit new utility services, billing<br>• Can create a monopoly |

# Annex D: Guidance Notes—Executive Summaries

This annex contains the executive summaries from each of the four guidance notes prepared in Phase 2. The complete guidance notes are available from the authors upon request.

1. *Establishing and Operationalizing an Energy Efficiency Revolving Fund*
2. *Municipal Budgeting and Financing*
3. *Residential Financing and Incentive Programs*
4. *Energy Service Business Models and Market Development*

## 1. Establishing and Operationalizing an Energy Efficiency Revolving Fund

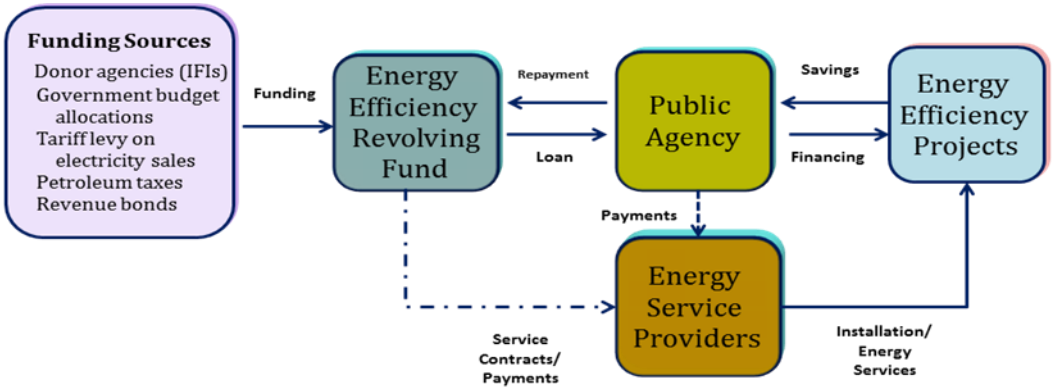
An energy efficiency revolving fund (EERF) is a viable option for scaling up energy efficiency (EE) financing in the public sector in the Western Balkans. Under a typical EERF targeting the public sector, loans are provided to public agencies to cover the initial investment costs of EE projects; some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

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

This guidance note is intended for government decision makers interested in establishing such EE revolving funds.[41] It defines the typical structure of such funds, conditions under which they can be useful and effective, ways they can address some of the financing barriers, and implementation options. The note also provides examples, case studies, and lessons learned, and a "roadmap" for establishing such funds.

The typical structure of an EERF is illustrated in Figure D1.

**Figure D1. Typical Structure of an EERF**




An EERF is generally capitalized from a range of sources, such as concessional loan or grant funds from donor agencies, government budget allocations, special tariffs or levies on electricity sales, petroleum taxes, revenue bonds, environmental charges, or other sources. The fund then

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

provides financing to public agencies to finance EE investments in public sector buildings and other facilities, such as street lighting. The agencies can then use the accrued energy cost savings to repay the principal and interest on the debt. The installation and other services for project implementation would generally be provided by independent energy service providers (ESPs).

The establishment of an EERF generally requires the development of a legal framework comprising national legislation as well as supporting secondary legislation or regulations that will define the structure of the EERF. Options include creating the fund under an existing ministry, energy agency, or development bank; creating a new legal entity (independent corporation or new statutory agency); not-for-profit entity; or establishing a public-private partnership (PPP).

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

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

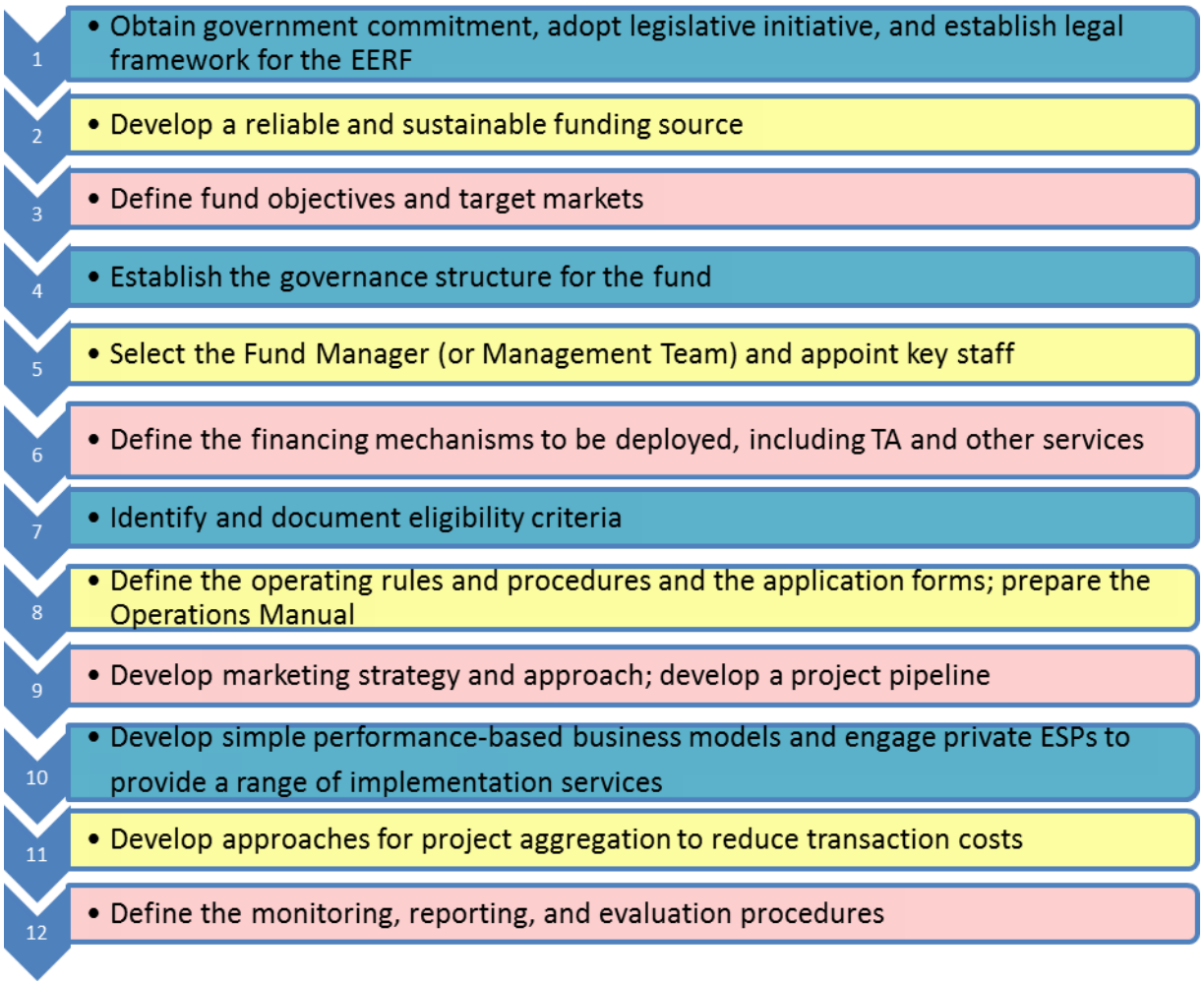
The EERF should also provide technical assistance to public agencies and ESPs, and may provide procurement and implementation services that will transfer some of the implementation risk to ESPs and facilitate the development of an energy services market. The guidance note summarizes how an EERF can overcome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

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

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

The major steps involved in establishing an EERF are summarized in Figure D2.

**Figure D2 – Major Steps in Establishing an EERF**




## 2. Municipal Budgeting and Financing

To support energy efficiency (EE) capital investments in municipal public buildings and services in the Western Balkans region, this guidance note outlines current regional policies and procedures for municipal budgeting and financing, identifies shortcomings, and presents a "roadmap" of recommended options for improvement. These recommendations can help support capital investments for providing a variety of municipal services, not just those for EE.

In general, municipal budgeting is more centralized in the region than in the rest of the EU, with local government revenues representing only about 11-25 percent of consolidated public revenues. Further, the heavy use of "conditional transfers" from national to local budgets further diminishes municipalities' authority to allocate funding based on their priorities. In three countries—Albania, Kosovo, and the former Yugoslav Republic of Macedonia—local governments receive more than 40 percent of their revenues from conditional or earmarked grants from their national governments. Despite this, capital investments (and the need for additional investments) are higher than in the rest of the EU because of chronic underinvestment over the past two decades. Although the current process of fiscal decentralization is designed to increase local governments' budgetary autonomy, progress has been relatively slow.

Municipal budgeting practices and lack of access to finance further restrict municipal efforts to reduce operating costs through EE. Municipalities' one-year budgeting, inability to retain energy cost savings in future years, line item budgeting, and other practices make investing in EE much more difficult. Similarly, many municipalities in the region face substantial limitations on borrowing, some do not have sufficiently strong accounting for commercial bank lending, most

do not have credit ratings or borrowing histories, and many are prohibited from assigning public assets to collateralize loans; all this makes it increasingly difficult for viable EE projects to secure appropriate financing.

The guidance note describes these barriers and points to a range of solutions that other countries—from across the EU and beyond—have used to overcome these same difficulties. The Western Balkan countries will need to carefully select and adapt these solutions to suit their individual needs.

Selected main findings and lessons are as follows:

- EE investments in public buildings are usually not a high priority for local government officials. The major reason for this is the lack of information and awareness of local decision makers regarding the need and economic potential for improving EE in municipal public buildings; this is urgently needed.
- Municipal energy planning can be an important means of improving EE in municipal public buildings; its application is supported by national EE Laws.
- Implementation of EE measures identified in Municipal Energy Efficiency Action Plans (MEEAPs) needs financial support either from the national government or from the private sector in the form of energy service companies (ESCOs).
- A legal framework that allows municipalities to establish long-term contracts with ESCOs is in place in four of the six countries, with Bosnia and Herzegovina and Macedonia being the exceptions. The development and implementation of ESCO projects are now impeded by the local municipalities' lack of relevant capacity. Both municipalities and potential ESCOs lack experience and trust in long-term cooperation.

Recommended milestones in the fields of municipal finances and budgeting, which should be including in a roadmap for the scaling up EE in public buildings in the Western Balkans are as follows:

1. Implementation of EE issues as a criterion for allocating national investment funds ("conditional subsidies").
2. Earmarking of funds provided through national EE funds for municipalities.
3. Establishment of specific national support programs for EE in municipalities.
4. Development, implementation, monitoring, and regular updating of local EE action plans (MEEAPs and SEAPs).
5. Introduction of energy accounting in municipal budgeting and finance.
6. Establishment of national grant programs supporting the development of local energy action plans and energy audits in municipal buildings.
7. Establishment of national support programs for the introduction of energy management systems in municipalities.
8. Establishment of national support programs for the setup and implementation of ESCO models in municipal public buildings and services.
9. Improvement of the ability of municipalities to access credit.

Further development and implementation of this roadmap should be based on a broad consensus among the six national governments, local authorities and their associations, and the international donor community. It should be reviewed and updated on an annual or similar basis.

## 3. Financing Energy Efficiency Measures for Residential Building Stock

Within the Western Balkans region, a secure energy supply is critical to sustaining economic growth. Currently, the region relies heavily on imported hydrocarbons and maintains high energy intensity relative to GDP. This places a huge burden on companies, which require affordable and

reliable infrastructure services to be competitive; the public sector, which spends significant budgetary resources on energy; and households, which have to pay a high portion of their income for energy services. As energy pricing is further rationalized, a higher burden will be placed on all sectors, especially poorer households.

The residential sector is a significant energy consumer. Its share of total final energy consumption ranges from 28 percent to 32 percent (compared with the EU average of 27 percent). Fairly simple renovations such as insulation, heating system upgrades, and improvements to windows and lighting could reduce consumption in this sector by some 9 percent, with payback periods generally under 8 years. Such improvements could help ease the impact of future tariff increases while helping reduce the region's projected energy supply/demand gap.

Unfortunately, there are a number of barriers preventing energy efficiency (EE) measures from being implemented in Western Balkans countries. Key ones have included:

- *Pricing barriers*: energy subsidies, absence of consumption-based billing, affordability, high cost of commercial financing;
- *Technical barriers*: lack of access to district heating (DH) or centralized heating in apartment buildings, lack of metering where DH/centralized systems exist, poor building maintenance, underheating, and lack of controls to adjust temperature levels;
- *Legal and regulatory barriers*: insufficient building code enforcement, apartment privatization and building ownership, and homeowner association (HOA) legislation; and
- *Information*: lack of awareness of EE and potential benefits, lack of information about how to implement EE measures, and limited information on quality/standards for EE materials/appliances

Governments have introduced a variety of policies, incentives, and financing/implementation programs to help remove these barriers. These include:

- *Financial mechanisms:* EE measures stimulated by subsidies, loans, or price fluctuations;
- *Fiscal mechanisms*: EE activities financed and/or stimulated by the use of taxes;
- *Delivery mechanisms*: EE activities stimulated by the availability of specific assistance or imposition of certain legal obligations; and
- *Institutions*: EE activities developed/managed by public institutions.

**Lessons learned** can be summarized as follows:

- The implementing agency and delivery channels should be structured to maximize the chances for widespread deployment of funds.
- The administrative burden placed on fund recipients should be tailored to the segment targeted.
- Standardization of supporting tools for smaller projects is a success factor.
- Although the level of incentive must be tailored to local market conditions, it should be clearly linked with supporting long-term growth on a commercial basis.
- The types of incentives should be consistent with the goal of supporting integrated projects that provide substantial savings.

A **roadmap** for improving EE is presented below. Taking into account the current situation in the Western Balkans, experiences from other countries (particularly of the new EU member or EU11 states (EU-MS), and lessons learned from the many EE programs launched in the EU, the following steps are recommended for improving EE and for supporting achievement of National Energy Efficiency Action Plan (NEEAP) targets:

- Step 1: Implement financing incentive schemes for single-family houses including stoves (no DH and no building-level meters)
- Step 2: Increase awareness and establish centers
- Step 3: Issue new building codes
- Step 4: Implement building-level DH metering
- Step 5: Improve HOA legislation to allow majority investment decisions financed through borrowing
- Step 6: Rehabilitate DH systems to reduce losses including reasonable expansion
- Step 7: Initiate transition to building-level, consumption-based billing
- Step 8: Request building certificates and appliance standards and labeling
- Step 9: Implement financing incentives for apartment buildings
- Step 10: Implement EE incentives to regularize illegal housing
- Step 11: Implement apartment-level heating-cost allocators as well as thermostatic radiator valves (TRVs) and consumption-based billing

## 4. Energy Services Market Development

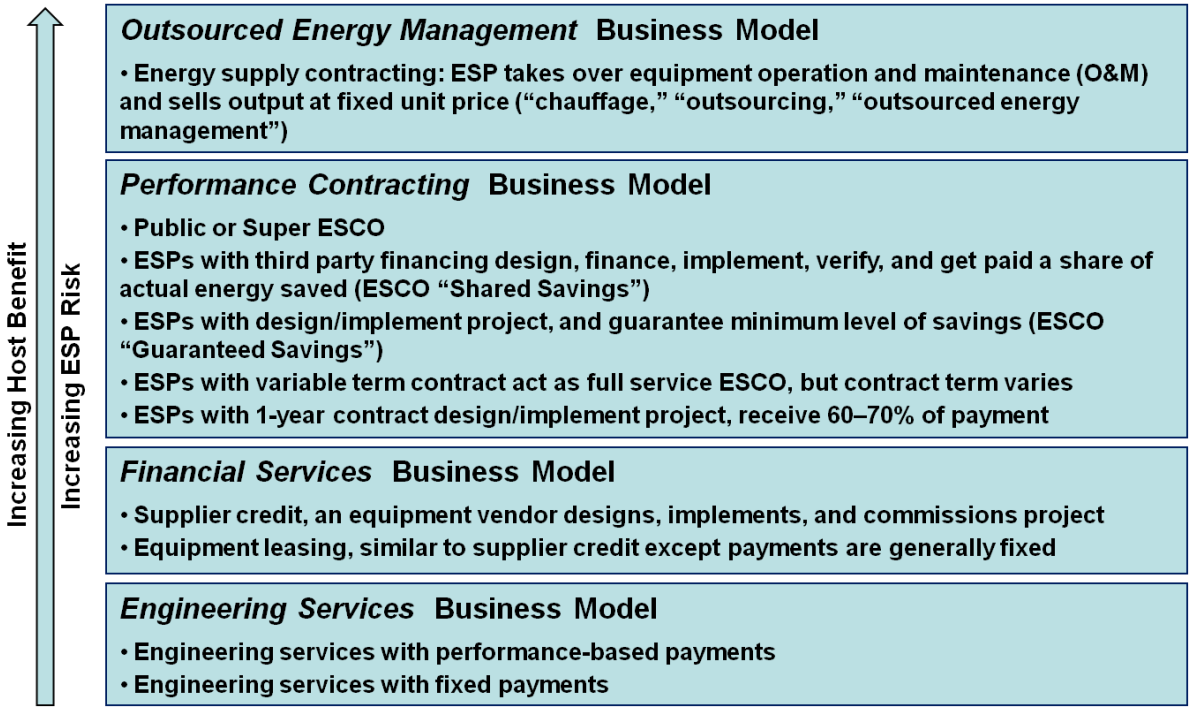
The development of private sector energy service providers (ESPs), including energy service companies (ESCOs), that specialize in energy efficiency (EE) project development and implementation can help overcome some of the important barriers to scaling up implementation of energy efficiency (EE) projects, 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 "roadmap" designed to help governments in the Western Balkans develop ESPs in their countries.

The business models typically utilized by ESPs are illustrated in Figure D3.

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.

**Figure D3 – Summary of Energy Services Business Models**




*Source:* Adapted by authors from World Bank 2006.

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 D4 provides guidance to governments on the various initiatives that may help them develop the energy services markets in their countries.

**Figure D4 – 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.

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