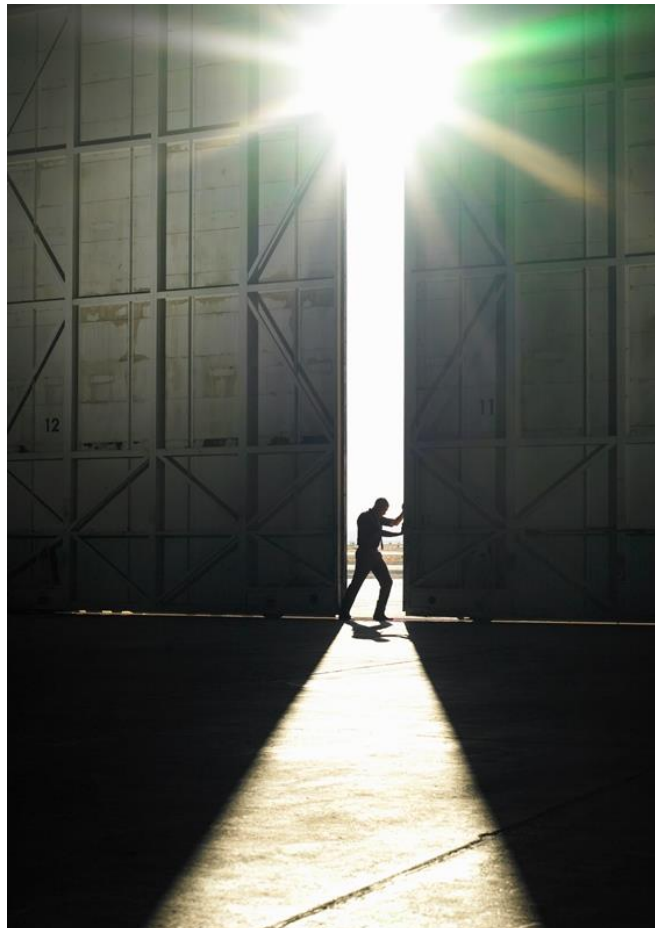


Ukraine: Facilitating Municipal Energy Efficiency Finance

Policy Paper



September 2015

**Social, Urban, Rural and Resilience Global Practice
Energy and Extractives Global Practice
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Funding for this policy paper and the broader technical assistance activity was provided by the Energy Sector Management Assistance Program (ESMAP).

Acronyms and Abbreviations

BSTDB	Black Sea Trade and Development Bank
CEEF	Commercializing Energy Efficiency Finance
CHP	combined heat and power
DCA	Development Credit Authority
DH	district heating
DIGH	Dutch International Guaranteed for Housing
EBRD	European Bank for Reconstruction and Development
EIB	European Investment Bank
EE	Energy Efficiency
EERF	energy efficiency revolving fund
EESL	Energy Efficiency Service Limited
ESA	energy service agreement
ESP	energy service provider
ESCO	energy service company
ESMAP	Energy Sector Management Assistance Program
ESPC	energy savings performance contract
EU	European Union
E5P	Eastern Europe Energy Efficiency and Environment Partnership
FI	financial institution
GDP	gross domestic product
GEF	Global Environmental Facility
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
IDA	International Development Association
IFC	International Finance Corporation
IFI	international financial institution
KfW	Kreditanstalt für Wiederaufbau
kWh	kilowatt hour
LED	light emitting diode
MOF	Ministry of Finance
m ²	square meter
M&V	monitoring and verification
NEFCO	Nordic Environment Finance Corporation
NIB	Nordic Investment Bank
NMEEE	National Mission for Enhanced Energy Efficiency
NYPA	New York Power Authority
O&M	operation and maintenance
PMU	project management unit
PPP	public-private partnership
R2E2 Fund	Armenia Renewable Resources and Energy Efficiency Fund
SIDA	Swedish International Development Cooperation Agency
SDA	state designated agencies
SDC	Swiss Agency for Development and Cooperation
SMEs	small and medium enterprises
TA	technical assistance
UAH	Ukrainian Hryvnia
UNDP	United Nations Development Program
USAID	United States Agency for International Development

Executive Summary

The Ukrainian government recognizes investing in energy efficiency (EE) as a pillar of its energy sector strategy for reducing reliance on imported natural gas, mitigating the financial and fiscal stresses of high energy costs, and supporting economic recovery and long-term growth. Major government initiatives have been or are being undertaken to scale up EE investments in industries and residential buildings, two of the largest final energy consumers. Efforts to support EE in the public sector also received a boost with the recent enactment of the ESCO Law and amendments to the Budget Code to enable energy performance contracting.

The municipal sector—which includes municipal buildings as well as municipal services such as public lighting, district heating, water and sanitation, solid waste, and public transportation—accounts for the lion’s share of final energy consumption in the public sector. However, it remains very challenging for EE project financing due to limitations in municipal borrowing and the nascent development of private energy service companies (ESCOs). While the absolute energy savings potential in the municipal sector is small compared with those of the industrial and residential sectors, delays in shoring up financing for municipal EE improvements could significantly aggravate municipal budget stress and impair municipal services, thus weakening municipal governments’ ability to effectively serve local populations.

Facilitating and scaling up municipal energy efficiency finance should be a key component of the government’s national EE support agenda. Although selected municipalities have received financing from international financial institutions (IFIs) to rehabilitate district heating and water and sanitation systems, overall demand for modernization investment in municipal utilities far exceeds available long-term financing. Municipal buildings—including schools, hospitals and other municipal social service facilities, most of them lacking appropriate thermal insulation and requiring comprehensive renovation—are generally deprived of any significant investment, a situation that will likely continue without deliberate national government support and intervention.

The most critical element of government support for municipal EE financing is to help create and foster the development of sustainable financing and delivery mechanisms. In the short term this would enable public funds to revolve, thus multiplying the impact of the initial funding. In the long term it would attract and leverage commercial financing while maximizing private sector participation.

There are three options through which the government could establish a sustainable financing and delivery mechanism that, while serving all potential municipal beneficiaries, would in particular help address key constraints on the financing of EE renovation of municipal buildings—a sector that is underserved by currently available financing mechanisms. They are (a) budget financing with capital recovery, (b) energy efficiency revolving fund (EERF), and (c) super ESCO. We here introduce each of these in turn; full descriptions appear in Chapter 4.

Budget Financing with Capital Recovery

Under this approach the government, acting through the Ministry of Finance (or another government agency), would provide funds to pay for the investment costs of the EE projects in municipal buildings, utilities or other public facilities. The funding may come from an IFI with the government providing a sovereign guarantee. The government may elect to provide some portion of the financing as a grant, but most of it would be “repaid” in the form of reduced outlays for energy bills of public entities in future years. The size of the reduced outlay would depend on the energy cost savings achieved. The flow of funds to pay for EE improvements would follow the same flow as the normal appropriations from the MOF. The repayment to the

MOF could be either part or all of the savings; the former would encourage public entities to participate in the program because they would receive a share of the savings achieved.

The program would be managed by a project management unit (PMU) within the administering ministry and would include technical assistance of various types, particularly for small municipalities with little or no implementation capacity. Private sector participation would be achieved through the procurement of energy efficiency services and the inclusion in contracts of performance requirements (for example, a requirement that the renovated building achieve a certain class of energy performance certification).

This option could be considered immediately for EE renovation of municipal buildings since it is broadly similar to some existing IFI lending arrangements with municipal utilities. However, it would increase the government's administrative burden and is less versatile than the next two options.

Energy Efficiency Revolving Fund (EERF)

A national EERF for the public sector could provide direct financing for EE projects, sometimes requiring co-financing from commercial banks. The EERF can be structured to aggressively seek out municipal EE projects; market EE loans; work closely with potential borrowers; and perform loan intake, supervision, and collection services. The EERF may offer various financial products or “windows” such as loans, guarantees and various services for capacity building and project preparation and implementation. Two of these windows are particularly relevant to the needs of Ukrainian municipalities: (a) loans to municipal utilities and creditworthy municipalities; and (b) direct investment projects through energy service agreements (ESAs) with municipal beneficiaries, especially those lacking the ability to borrow funds or to effectively implement EE projects. The ESA window would offer a full package of services to identify, finance, implement, and monitor EE projects with the involvement of private energy-service providers or private ESCOs. The beneficiary public entity would usually be required to pay some or all of its baseline energy bill into an EERF-established escrow account to cover the investment cost and associated fees during the ESA contract period.

The establishment of a national EERF requires a supporting legislative framework. Because such a framework currently does not exist in Ukraine, new legislation would need to be enacted to enable the establishment of the EERF.

Super ESCO

Ukraine already has some experience with public ESCOs through the establishment of UkrESCO and the Lviv ESCO. Also the cities of Dnepropetrovsk and Kyiv are expecting to receive loans and technical assistance to create municipal or public ESCOs within their jurisdictions. This concept can be expanded to other cities with significant municipal EE investment needs, or to the national level to create a national “super” ESCO. Established by the government, the national super ESCO would function as an ESCO for public facilities while also supporting the capacity development and project development activities of existing private sector ESCOs.

A national super ESCO could be entirely publicly owned or established as a public-private partnership (PPP). It would be designed to serve the needs of all of the public market segments, but could be particularly useful to focus on the underserved municipal sector. An appropriate role for the super ESCO is to engage private ESCOs as contractors for the implementation (such as installation, commissioning and performance monitoring) of municipal EE projects, thereby helping build their capacity. The super ESCO may also be in a position to arrange

financing for small private ESCOs to help them implement projects; this would build their capacity and credentials to serve both the public and private sectors.

The monopolistic behavior of super ESCOs is reason for caution; appropriate exit strategies and indicators should be developed to allow it to phase out when its goals have been achieved.

Moving Forward on the Municipal EE Financing Agenda

Pursuing any one of the three potential options will require deliberate efforts by the national government to raise long-term capital, develop a delivery system, build municipal implementation capacity, and increase private sector participation. The government should select an option for implementation only after a review and consultation with all relevant stakeholders—including government officials, mayors and city councils, municipal utility executives, private sector representatives, banks and financial institutions, consumer groups and the IFI community. The next step would be the detailed design and implementation planning for the selected option.

In the view of the authors of this policy paper, creating a dedicated EERF for the public sector—and focusing its initial efforts on financing EE renovation of municipal buildings—would fill a critical gap in municipal EE financing in Ukraine and help address perhaps the most pressing municipal EE investment needs of Ukrainian cities. According to recent World Bank assessments conducted together with the cities of Kiev, Ternopil and Kamenets-Podolski, EE renovation of municipal buildings is the top priority for all three city governments. The advantage of the EERF is that it could effectively replicate the main functions of the other two options with its different financial products.

1. Municipal Energy Efficiency Finance: Current Status in Ukraine

The Importance of Energy Efficiency in Ukraine

The Ukrainian government has placed a high priority on the implementation of energy efficiency (EE) measures. Improved EE is strategically important at the national level for three reasons:

- *Energy security.* Ukraine's dependence on imported natural gas, historically about 80 percent of total natural gas consumption, fell to about 50 percent in 2014 due to the contraction of the economy. However, the potential for energy savings in space heating, which dominates natural gas consumption, is substantial and remains untapped. Estimated specific heat energy consumption of the existing residential buildings in Ukraine ranges from 145 to 327 kWh/m², with a national average of 276 kWh/m²—compared with 160 kWh/m² in Poland, where heating systems have been modernized over the last 15 years or so and thermal retrofit of buildings has reached scale.¹ Large-scale thermal retrofit of the existing building stock in Ukraine will result in significant and permanent reduction in natural gas demand, going a long way towards reducing gas import dependency.
- *Financial savings and fiscal space.* Energy prices in residential and public sectors have historically been subsidized, draining the national budget while discouraging energy conservation and EE investment; in 2013 subsidies for residential gas and district heating amounted to about 7 percent of GDP (World Bank 2014c). Ukraine has now committed to energy subsidy reforms and to adjusting the prices of residential gas and district heating to cost-recovery levels based on international gas prices. Cost-effective heating system modernization and thermal retrofit of residential and public buildings are expected to significantly reduce the increases in actual energy costs for end-users, as well as help ease government fiscal stress by reducing energy and fuel subsidies and fiscal transfers to distressed public utilities.
- *Economic competitiveness.* Ukraine is one of the 10 most energy-intensive economies in the world. Although the country's energy intensity declined by 5 percent per year during 2000–12, it exceeds those of Germany and Poland by factors of 3.3 and 2.6, respectively.² By investing in EE and adjusting its economic structure over time, Ukraine stands to gain massively in energy productivity and global economic competitiveness.

Why Does Municipal Energy Efficiency Matter?

Energy consumption in the municipal sector—including end uses in municipal buildings and for providing municipal services such as public lighting, district heating, water supply and sanitation, solid waste, and public transportation—is small, accounting for about 6 percent of

¹ The Ukrainian estimates are from the draft “National Energy Efficiency Action Plan through 2020” (<http://saee.gov.ua/en/documents/147>), and the Poland figures are from ODYSSEE-MURE (<http://www.odyssee-mure.eu>).

² In 2012 Ukraine's overall energy intensity, measured by primary energy consumption per unit of GDP, was 0.36 ton of oil equivalent per \$1000 of GDP (GDP is measured in 2005 purchase power parity), compared with 0.11 in Germany and 0.14 in Poland (<http://www.iea.org/statistics>).

total final energy consumption in Ukrainian cities.³ However, efforts to improve EE in municipal sector have a significant impact on the cost and quality of vital municipal services, such as water supply and district heating. Such efforts also support the development of the energy service market and foster local government EE leadership. For municipal governments, then, investing in EE is an essential part of the local agenda for economic management and social development for three reasons:

- *The high cost of energy in municipal budgets.* The Ukrainian government has made a commitment to increase district heating and gas tariffs to cost-recovery levels. As a result, energy prices are already higher, creating pressures on municipal budgets.
- *The inefficiency of public facilities.* Most municipal buildings and associated energy systems are pre-1990 constructions that generally require significant capital improvements due to aging and lack of regular maintenance. Many of these buildings have high specific heat consumption but are still under-heated due to poor or absent thermal insulation and high infiltration (flow of outside air into the building). This wastes municipal budgets while not meeting thermal comfort requirements, a situation detrimental to children in kindergartens and schools.
- *The poor financial status of municipal utilities.* The historical tariff structures of district heating and water/wastewater services, along with subsidized tariffs to the residential sector, have led to inefficient use and underinvestment in maintenance and modernization of municipal utilities. This, in turn, has resulted in low operational efficiency and high losses. EE measures are central to reducing the inefficiency and losses endemic to municipal utility systems.

Investments in EE in municipal assets—including upgrading and rehabilitating heat generation facilities and district heating networks, and retrofitting other municipal service facilities and municipal buildings—will help make district heating and other municipal services affordable for consumers while increasing fiscal space for municipal economic and social development activities.

Lessons Learned from Past and Ongoing Initiatives

In Ukraine, the following financing mechanisms have been introduced to support investments, either in municipal EE projects or in municipal projects with an EE focus:

- Grants from donor agencies
- Loans from IFIs
- A USAID credit guarantee program
- ESCOs
- Commercial bank lending
- Municipal bonds.

A brief review of these financing mechanisms is provided in Annex A.

Despite efforts made by the government and the donor community over many years, the municipal EE market in Ukraine remains largely unserved, especially with regard to thermal retrofit of municipal buildings. There has been limited replication of donor pilots and grants without sustainable funding mechanisms in place. Some fundamental barriers—such as gas and

³ There is no appropriate statistical data for municipal energy use. This is estimated based on energy consumption assessment done for the cities of Kiev, Ternopil and Kamenets-Podolski.

heat tariffs, limitations on municipal borrowing, and contracting for EE services—are only beginning to be addressed. The main lessons learned from the experience so far are as follows:

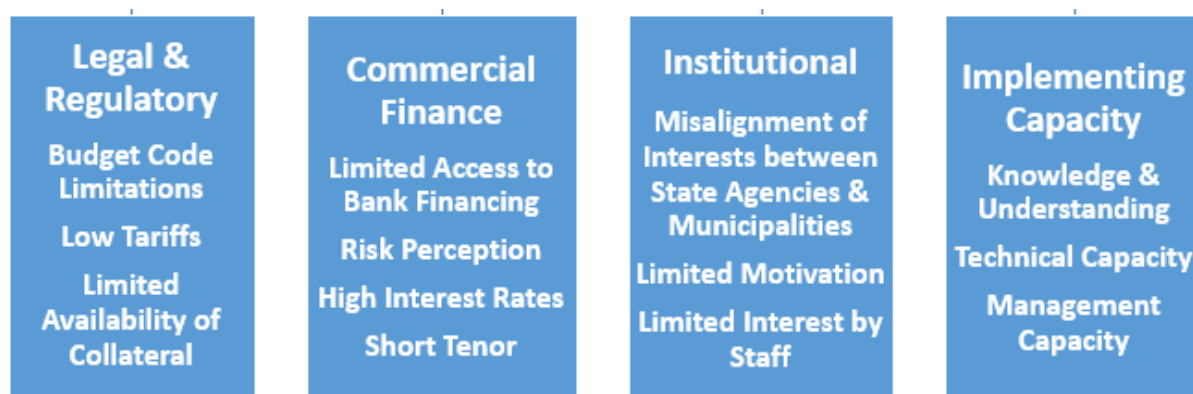
- Municipal EE projects face common and unique barriers that need both framework solutions (that is, reforms in such areas as tariffs, budget code, and public procurement rules) and specific delivery mechanisms to deal with the financing and implementation challenges faced by various types of projects in municipalities with different fiscal and technical capabilities.
- Financing is available but not always accessible and affordable—especially commercial financing. This highlights the importance of the national government’s role in helping secure long-term funds at an affordable cost to municipalities, as well as in promoting the use of sustainable financing mechanisms (such as revolving public funds or accessing commercial funds).
- Developing a national financing and delivery platform for thermal retrofit of municipal buildings would be an efficient way of addressing multiple delivery issues associated with this particular segment of the municipal EE market. It would also help overcome the weak fiscal and technical capacities of most municipalities in Ukraine.
- It is important for municipal governments to commit to establishing a track record of fulfilling contract obligations and energy bill payment discipline.
- Continued efforts are needed to produce and improve access to credible data and information, such as energy consumption baselines, costs and benefits of standard EE measures, links to co-benefits (such as improved comfort), and available incentives.

2. Barriers to Implementing Municipal Energy Efficiency Projects

The implementation of EE projects in Ukraine's municipal utilities and public buildings and facilities continues to face a number of barriers, such as lack of information on EE potential and benefits, lack of trained personnel, lack of incentives, high transaction costs, and scarcity of budgetary resources or external financing. In addition, several barriers specific to the public sector further hinder sustained EE improvements in that sector.

Overall, the barriers fall into four categories, as shown in Figure 1. This chapter will explain each in turn, and then describe recent government efforts to remove them.

Figure 1. Barriers to Scaling up Investment in Municipal Energy Efficiency in Ukraine



Legal and Regulatory Barriers

There are three legal and regulatory barriers, as follows:

- *Limitations resulting from the Budget Code of Ukraine.* Although the Budget Code allows municipalities to borrow funds from commercial financial institutions and to raise funds through issuing municipal bonds, it imposes certain limits on the maximum amount of borrowing and the maximum annual cost of debt service. Because most municipalities have already incurred loans for other infrastructure investments, they may be close to these limits, which constrains their ability to obtain external financing for EE investments.
- *Low tariffs.* The tariff structure has not allowed for full cost recovery, resulting in the municipal utilities' current poor financial condition. While the government is committed to gradually increasing the tariffs to the cost-recovery level, it will take some time to improve the utilities' financial condition.
- *Legal issues related to providing collateral.* Municipalities face several legal constraints related to pledging physical assets for commercial financing, as these assets are generally of low quality, have poor liquidity, and may be owned by local governments and therefore require approval of the municipal councils.

Lack of Access to Commercial Financing

Due to the weak financial condition of municipalities and district heating (DH) utilities, internal funds available for EE investment are very limited. Municipalities face a number of barriers to raising external funds from commercial financing sources:

- *Limited access to commercial bank financing.* Commercial banks consider Ukrainian municipalities and utilities as having limited creditworthiness. Municipalities also generally have difficulties in providing adequate collateral for commercial financing.
- *Perception of high risk.* Most banks consider loans to municipalities or DH utilities as riskier than loans to private sector organizations such as SMEs.
- *High interest rates.* Interest rates on commercial bank financing are very high from the perspectives of municipalities and DH utilities.
- *Lack of long-term loans.* Investments in infrastructure improvement for utilities have relatively long payback periods. Commercial financing is rarely available for such long periods.

Three prefeasibility studies on renovating schools and hospitals in the cities of Kiev, Ternopil and Kamenets-Podolski are cases in point on the difficulties of making financially viable municipal EE projects bankable.⁴ While all three projects have a financial internal rate of return (FIRR) above 13 percent, they are far below the current 25 percent interest rate for which commercial banks are willing to lend on a short-term basis—and this has not yet taken into consideration the collateral requirements. It would require about 50 percent grant coverage of the investment cost to bring the FIRR to 25 percent.

Institutional Barriers

The three main institutional barriers are as follows:

- *Lack of alignment between state authorities and municipalities.* Approval of investment programs of municipal utilities are subject to oversight of multiple national regulatory authorities. Municipalities are also less interested in EE investments in municipal buildings and facilities whose energy bills are paid from the state budget.
- *Limited incentives.* Municipal utilities have little incentive to improve energy efficiency in public buildings and facilities as reduced consumption will lead to reduced cash flows and further affect their weak financial situation.
- *Limited interest by utility managers.* Utility managers face a number of laws, budgetary instructions, and rigid public procurement rules and regulations, all of which tend to discourage them from innovative activities to improve energy efficiency.

Implementation Capacity

There are three main barriers to do with implementation capacity, as follows:

- *Lack of knowledge and understanding of EE opportunities.* Municipal and utility officials are limited in their grasp of the options for improving EE.
- *Limited technical capacity.* Facility managers and engineers are unable effectively to identify and implement EE measures in municipal utilities and public buildings and facilities
- *Limited management capacity.* Managers in municipal governments and utilities have limited capacity to manage complex technical projects for improving EE.

⁴ These prefeasibility studies were conducted as part of the World Bank's "Energy Efficiency Transformation in Ukrainian Cities" technical assistance project.

Recent Government Efforts to Remove Key Barriers

Two key recent legislative changes (first half of 2015) have had a positive impact on municipal EE project financing:

- The new ESCO Law provides a legal basis for ESCOs to enter into long-term contracts with state- and municipally-owned buildings and facilities.
- Amendments to the Budget Code introduce long-term budgetary repayment obligations under energy service contracts and regulate the repayment basis and methodology.

The government also has stated its commitment to increasing heat and gas tariffs to full cost-recovery levels.

Finally, efforts are under way to establish a state energy efficiency fund, one of whose main focuses will be financing the modernization of DH systems.

Over the past 20 years many other central and eastern European countries have already faced similar challenges, and have met with varying varied amounts of success in addressing them through developing and implementing various financing and delivery mechanisms for municipal EE projects. Their experiences and models are reviewed in the next chapter.

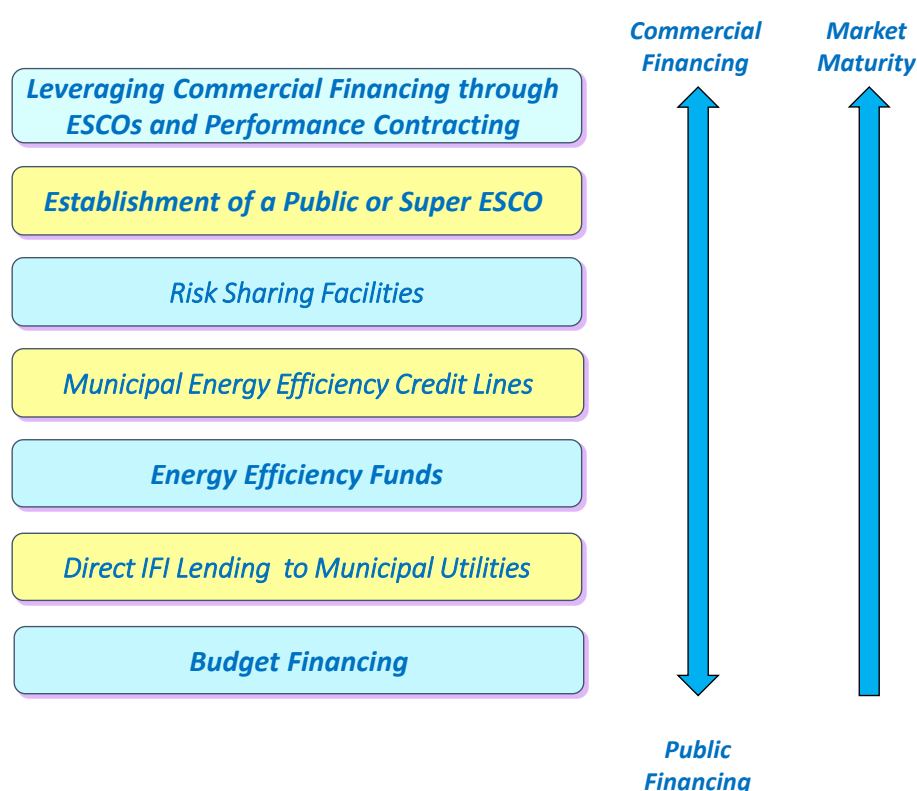
3. International Experience in Delivering Municipal Energy Efficiency Projects

Going beyond all-grant financing, various countries have implemented a wide range of financing and delivery mechanisms, either to enhance the financial leverage of public funds or to gain access to commercial funding for municipal EE projects. These include:

- Budget financing with capital recovery (financing by the MOF or a parent budgeting agency using donor funds, with repayments in the form of reduced future budgetary outlays);
- Direct lending by IFIs to municipal utilities;
- Establishment of an EE revolving fund;
- Establishment of an EE credit line for municipalities through existing financial institutions, such as a development bank or commercial banks;
- Creation of a risk-sharing facility, such as a partial credit guarantee program, to cover commercial loans;
- Establishment of a public or super ESCO; and
- Leveraging commercial financing using energy service companies (ESCOs) under the energy saving performance contracting (ESPC) approach.

Figure 2 illustrates these options in the form of a “financing ladder” for municipal projects, moving from public (bottom) to commercial (top) financing. A brief description of each of these options follows.

Figure 2. Illustrative Financing Ladder for Municipal EE Projects



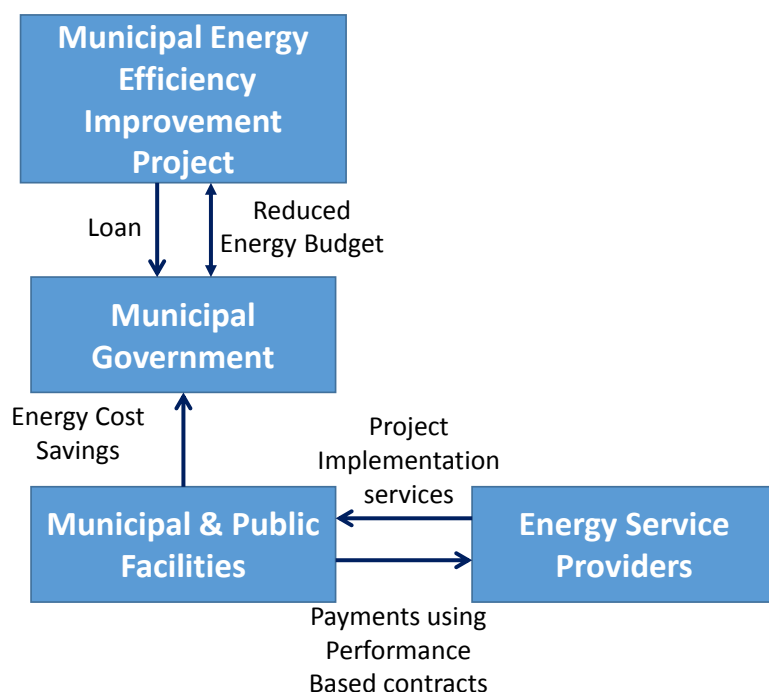
Source: Authors.

Budget Financing with Capital Recovery

Under this approach, financing is provided by a government agency, such as a finance ministry, using a combination of government budget allocations and IFI or donor funds. This funding covers the investment costs of the EE projects in public buildings and facilities of municipal governments. The funding recipient “repays” the funds using the savings generated by the investment project in the form of reduced budgets for energy bills of the municipal government in future years (“budget financing”). The size of the reduced outlay is usually based on the amount of energy cost savings. The flow of funds to pay for EE improvements follows the same flow as the normal appropriations from the MOF. The repayment to MOF could be complete or partial; the partial approach encourages municipal utilities and public agencies to participate in the program because they retain a share of the savings achieved.

Figure 3 shows a typical structure of a municipal EE improvement project using budget financing. An illustrative example of this approach is a project financed by the World Bank in the former Yugoslav Republic of Macedonia (see Box 1).

Figure 3. Structure of a Municipal EE Improvement Project Using Budget Financing



Source: Authors.

Box 1. Example of Budget Financing: Macedonia

The World Bank provided a loan of \$25 million (later expanded to \$75 million) to Macedonia to fund the Municipal Services Improvement Project (approved in 2009), which sought to improve the transparency, financial sustainability, and delivery of municipal services in the participating municipalities through a focus on revenue-generating public services and investment projects with cost-saving potential. The loan funds were managed by the Ministry of Finance and were on-lent to participating eligible municipalities through sub-loan and grant agreements on the same terms as the World Bank loan. The loan repayments were in the form of reduced budget outlays to the municipalities for energy.

Eligible borrowers were creditworthy municipalities that had received MOF approval to borrow, with publicized budgets and audit reports. The loan program was supplemented by technical assistance funds for capacity building and institutional reform, and also by a performance-based investment grant fund that provided incentives and rewards to municipalities for implementing reform initiatives to improve service delivery performance.

Source: World Bank (2009 and 2012b).

Direct IFI Lending to Municipal Utilities

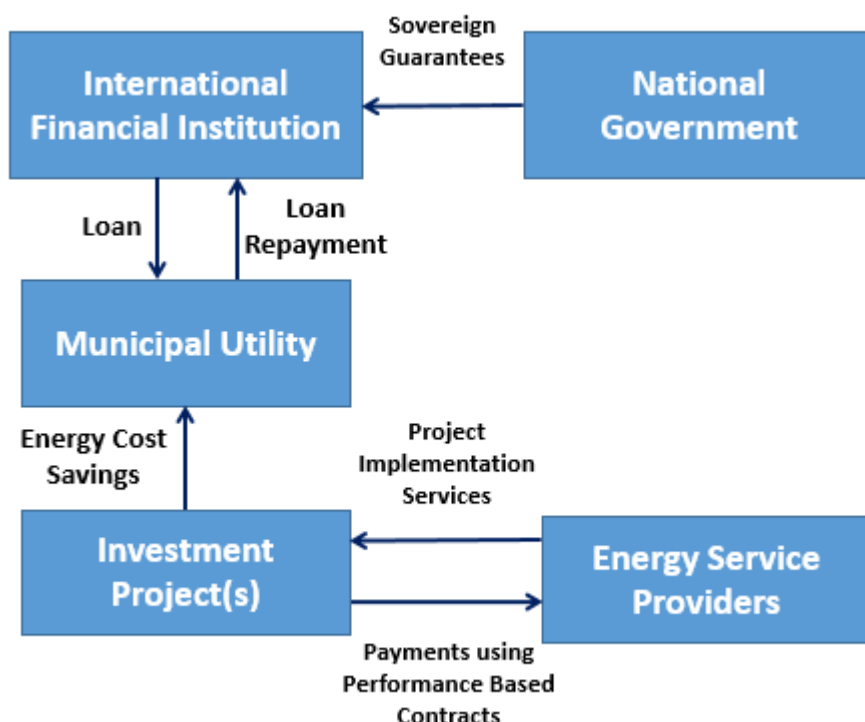
Improving EE in municipal utilities often entails large infrastructure investments. In such cases, an IFI may provide a loan directly to a municipal utility, with a sovereign guarantee from the national government. The advantages of this option are as follows:

- While the municipal utility may be capable of repaying the loan with low risk, it may not meet the creditworthiness requirements of commercial banks, and may therefore not be able to get the needed financing without the IFI loan.
- Incentives are aligned between the lender and borrower to seek approval for, and systematic adjustment of, economically justified tariffs from the national regulator.
- The IFI and the utility can closely work together during project preparation and implementation, creating an opportunity for customized capacity building in areas such as feasibility analysis, procurement, and financial management.

A disadvantage of this approach is that it requires the IFI to appraise each loan, which makes it impractical to serve the needs of many small- and medium-sized municipal utilities.

Figure 4 shows the structure of this financing option, and Box 2 describes an example of it in the form of a World Bank loan to the Municipal District Heating Company of Krakow.

Figure 4. Direct Lending by IFI to Municipal Utilities



Source: Authors.

Box 2. Krakow Municipal District Heating Project

The objective of the World Bank's Krakow Municipal District Heating Project was to improve the EE of the heating systems by (a) continuing the modernization program for the city's district heating systems, (b) helping consumers decrease their heat energy consumption by improving the EE at the end-user level, and (c) developing in Krakow the knowledge and mechanisms necessary for financiers to fund end-user EE projects.

The Municipal District Heating Company of Krakow modernized the district heating system and used its subsidiary ESCO to deliver energy management services on a turn-key and performance basis. Created with extensive World Bank assistance, the ESCO helped clients (a) identify energy saving opportunities within their buildings, (b) arrange project financing through local banks, and (c) repay the investments from the energy cost savings which the ESCO guarantees. Project payback periods are established to suit the needs of the consumer, the banks and the ESCO.

The project was supported by a Global Environment Facility (GEF) grant to remove barriers to market-oriented transactions and increase public and private sector investments in EE in buildings. This included a guarantee facility to demonstrate the technical and commercial viability of building EE retrofit projects, and grants to cover the direct incremental costs of higher-cost EE measures.

The total financing was \$78 million from IBRD and \$26 million from GEF.

Source: World Bank (2001).

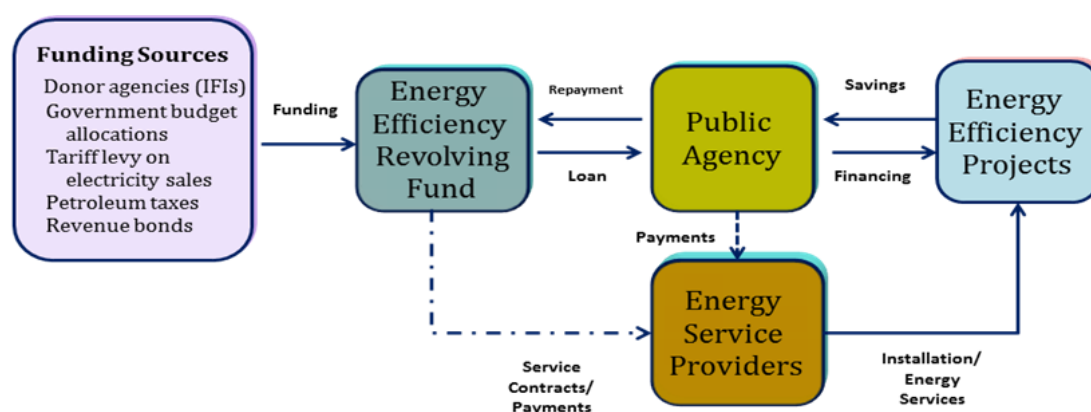
Energy Efficiency Revolving Fund

An energy efficiency revolving fund (EERF) has been demonstrated to be a viable option for scaling up EE financing in the public sector. Under a typical EERF, created using public funds and IFI loans, financing is 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 and creating a sustainable financing mechanism (World Bank 2014b).

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.

EERFs have been successfully deployed in Bulgaria, Romania and (more recently) in Armenia. The typical structure of an EERF is shown in Figure 5, and Box 3 provides an illustration of the Armenian R2E2 fund.

Figure 5. Typical Structure of an EERF



Source: World Bank (2014a).

Box 3. Armenia Renewable Resources and Energy Efficiency Fund (R2E2 Fund)

The Fund was established in 2005 and capitalized with a US\$8 million IDA credit. The Fund is overseen by a Board of Directors, which includes government, private sector and academia and operates on a fully commercial basis.

The Fund currently implements a World Bank/GEF project that provides EE services in public sector facilities—such as municipal street lighting, schools, hospitals, and administration buildings (average size about US\$100,000). It is expected to finance projects worth US\$8.7 million between 2012 and 2015 and provide technical assistance for project preparation and capacity building.

The Fund provides loans to municipalities and public entities with revenue streams independent of the state budget, and energy service agreements (ESAs) to schools and other public facilities, which are not legally independent:

- Loans will be provided under an ESA, whereby the Fund will also provide additional services against a service fee (conduct a preliminary screening; carry out the procurement of design and works; oversee construction and commissioning; pay the contractors for services provided; and monitor the

sub-projects). The loans will be treated as municipal debt, with fixed repayment obligations to be made within their budget provisions in future years. The amount of the repayments will be designed to allow fund clients to repay the investment costs and service fee from the accrued energy cost savings.

- **Energy Service Agreements:** The Fund will first determine the average baseline energy use, identify the general scope of a sub-project, develop bidding documents, conduct the procurement, finance the project, oversee construction and commissioning, and monitor the sub-project. The ESA will obligate the facility to pay the baseline energy costs (with adjustments for energy prices, usage, etc.) over the life of the agreement. In such cases, there is no loan or debt incurred by the client entity. With these payments, the Fund will pay the energy bills on the facility's behalf and retain the balance to cover its investment cost and service fee of up to 10 years. The agreement will also be designed so that the duration can be adjusted if the Fund recovers its full investment earlier or later.

To support the build-up of an ESCO industry in Armenia, the Fund uses simplified ESCO contracts to shift some performance risks to private construction firms/contractors.

Source: World Bank (2012a).

Municipal Energy Efficiency Credit Line

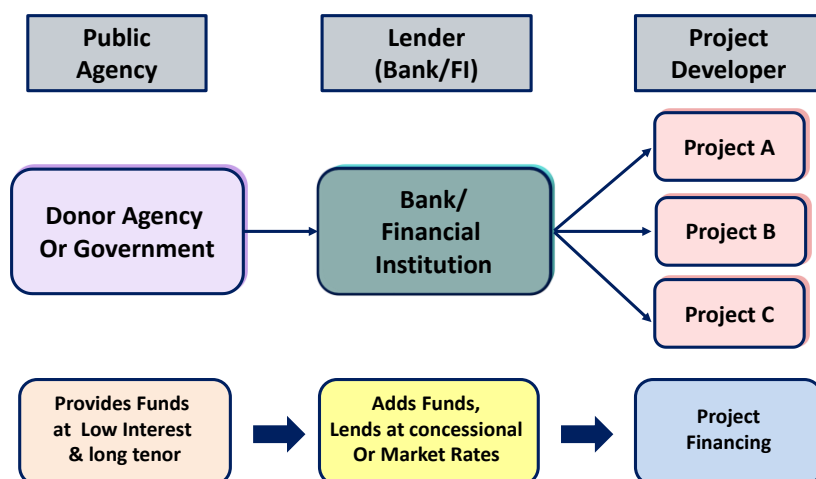
A municipal EE credit line is a financing mechanism that makes funds available to local banks and financial institutions (FIs) to provide debt financing of EE projects in utilities and public buildings and facilities. The major purpose of such a credit line is to increase the funding available from these lenders for debt financing of municipal energy efficiency project investments.

Dedicated EE credit lines may be established by governments, multilateral or bilateral financial institutions, or governments in cooperation with international donor agencies. The funds provided by the donors or governments to lenders are often leveraged by additional funds provided by the participating banks and/or financial institutions to increase the total amounts available for debt financing.

Dedicated EE credit lines for municipal projects address many of the issues related to insufficient lending by banks and financial institutions. By establishing a credit line and providing funding, governments or donor agencies can help overcome some of the barriers to commercial financing. Most EE credit lines also have a technical assistance component to build lender capacity relative to EE project financing. However, issues related to creditworthiness and adequate collateral limit their use in municipalities.

The typical structure of an EE credit line is shown in Figure 6. Box 4 provides an illustration of a municipal EE credit line in Serbia.

Figure 6. Illustrative Structure of EE Credit Line



Source: Limaye (2013a).

Box 4. Example of Municipal Credit Line in Serbia

The German bank KfW has launched a dedicated credit line for municipal environmental infrastructure and energy efficiency investments in Serbia. A total of €100 million will be made available and disbursed to eligible municipalities and public sector utility companies via Serbian on-lending banks, following the standard procedures for municipal borrowing. This is a continuation of the current KfW project on "Municipal Infrastructure via the Financial Sector". To provide more incentives for Serbian municipalities to invest in energy efficiency and environmental projects, KfW and the European Commission signed an agreement at the end of 2011. A grant scheme will be implemented to award grants of 15–20 percent of the loan amount financed from the KfW credit line after their successful completion.

Source: http://www.meglip.org/wp/?page_id=4.

Risk-Sharing Facility

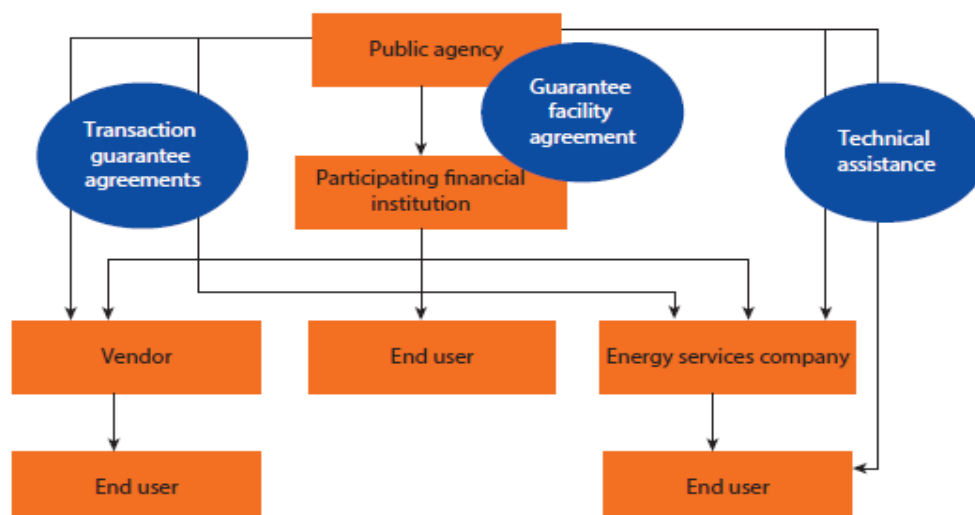
A major barrier to commercial financing of municipal EE projects is commercial lenders' perception that EE projects are inherently riskier than their traditional investments is. A risk-sharing facility is designed to address this by providing partial coverage of the risk involved in extending loans for EE projects. The facility—essentially a bilateral loss-sharing agreement—generally includes a subordinated recovery guarantee and might also have a “first loss reserve” to be used to absorb up to a specified amount of losses before the risk sharing occurs.

A partial risk-guarantee facility, provided by a government, donor agency, or other public agency, can assist municipal utilities and public agencies by: (a) providing them access to finance, (b) reducing the cost of capital, and (c) expanding the loan tenor or grace periods to match project cash flows (Mostert 2010).

Such a facility would also build commercial lenders' capacity to finance EE projects on a commercially sustainable basis.

A typical structure of a risk-sharing facility is shown in Figure 7. Box 5 provides the example of the IFC/GEF risk sharing program for Commercializing Energy Efficiency Finance in Central and Eastern Europe.

Figure 7. Typical Structure of Risk-Sharing Facility



Source: Taylor et al. (2008).

Box 5. Risk Sharing Facility Example – Commercializing EE Finance (CEEFF)

The Commercializing Energy Efficiency Finance (CEEFF) Program was launched in April 2003 as a joint program of the IFC and the GEF. The countries included in CEEFF were the Czech Republic, Hungary, Estonia, Latvia, Lithuania, and the Slovak Republic. CEEFF was designed to work in partnership with local lenders by providing partial guarantees to share in the credit risk of EE loan transactions that the partner lenders would fund with their own resources. The transactions eligible for the program included capital investments aimed at improving the efficiency of energy use in buildings, industrial processes, and other energy end-use applications.

Risk sharing was achieved through a partial guarantee structure under which the IFC guaranteed 50 percent of the project risk on an equal basis with the participating lenders.

Technical assistance was an important component of the program to (a) help prepare projects for investment and (b) build capacity in the EE and lender industries in each country.

CEEFF resulted in substantial increased investments by commercial lenders for EE projects. Although few of these projects were for municipalities, CEEFF did lead to a major lending program for financing EE in schools in Hungary.

Source: IFC (2004).

Public or Super ESCO

Several countries have taken a more active role in promoting EE projects using the performance contracting approach by creating either public or “super” ESCOs that are wholly or partly owned by the state. Often this was done to promote ESCOs in general, examples being China (pilot EMCs created by the World Bank in Beijing, Shandong, and Liaoning) and Poland (MPEC). In Ukraine, the establishment of UkrESCO is also an example of this approach. Such public ESCOs were typically formed when the local ESCO markets were nascent and some public effort was deemed necessary to catalyze them. The advantage of a public ESCO is that

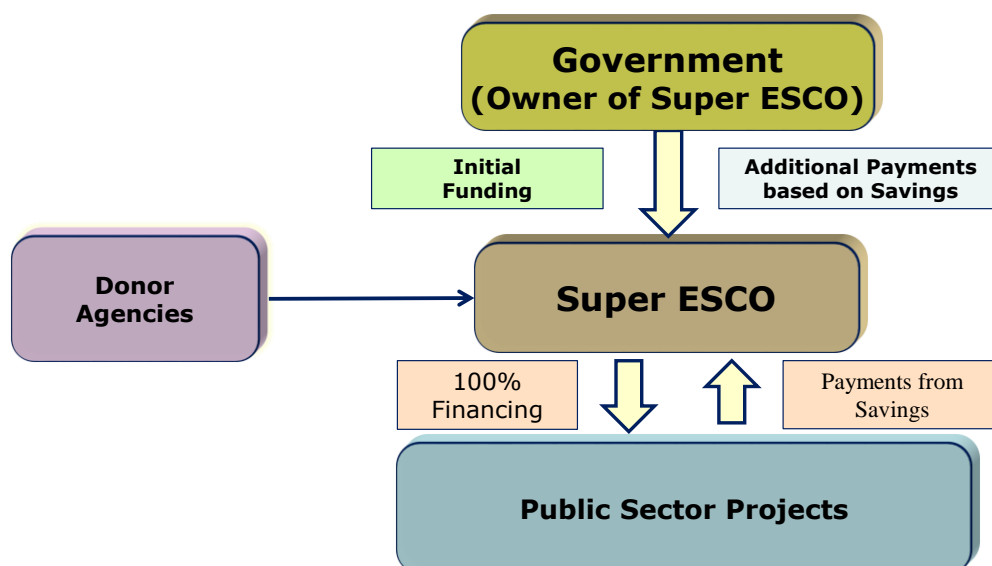
there is often no competitive process required for project development since a public agency is simply contracting with another public entity.

The *super* ESCO is a special type of public ESCO. Established by the government, it functions as an ESCO for the public sector market (hospitals, schools, municipal utilities, government buildings, and other public facilities) while also supporting the capacity development and project development activities of existing private sector ESCOs. The government (possibly with help from IFIs) capitalizes the super ESCO with sufficient funds to undertake public sector ESPC projects and to leverage commercial financing.

A primary function of the super ESCO is to facilitate access to project financing by developing relationships with local or international financial institutions. The super ESCO may also provide credit or risk guarantees for ESCO projects, or act as a leasing or financing company to provide ESCOs and/or customers with EE equipment on lease or on benefit-sharing terms (Limaye and Limaye 2011).

A super ESCO can be uniquely positioned to overcome a number of the barriers faced by smaller ESCO companies. With its size and credibility as a public institution, a super ESCO has the capacity both to support the growth of a nation's private domestic ESCO business and to finance EE projects. Figure 8 illustrates the structure of a super ESCO.

Figure 8. Typical Structure of a Super ESCO



Source: Limaye (2013).

Examples of super ESCOs include the New York Power Authority (NYPA) in the United States, Fedesco in Belgium, Fakai Super ESCO in China, and Energy Efficiency Services Limited (EESL) in India, arguably the most successful super ESCO (see Box 6).

Box 6. Energy Efficiency Services Limited: India's Super ESCO

The government of India established Energy Efficiency Services Limited (EESL) as a super ESCO to carry out public sector undertakings under the Ministry of Power. EESL functions as the implementation arm of the National Mission for Enhanced Energy Efficiency (NMEEE). The purpose of setting up a separate corporate entity was to develop an energy efficiency market that was virtually nonexistent in the country. It has the mandate to implement EE projects in the public sector and facilitate and promote the development and growth of the private ESCO industry through partnerships and subcontract arrangements. The initial capital of EESL is about US\$50 million.

Some of the major functions of EESL are energy efficiency planning and implementation in the residential sector, commercial buildings, industrial sites, municipal street lighting and water pumping, and agricultural pumping. EESL also does capacity building of utilities and state designated agencies (SDAs) responsible for EE implementation under India's Energy Conservation Act.

EESL has successfully collaborated with state and local government agencies to implement a wide range of projects including LED lighting in homes, efficient agricultural pumps, efficient street lighting, and efficient chillers in commercial buildings. EESL has engaged in a number of partnerships with private sector organizations to implement these projects.

Source: EESL (2015).

Leveraging Commercial Financing with Private ESCOs

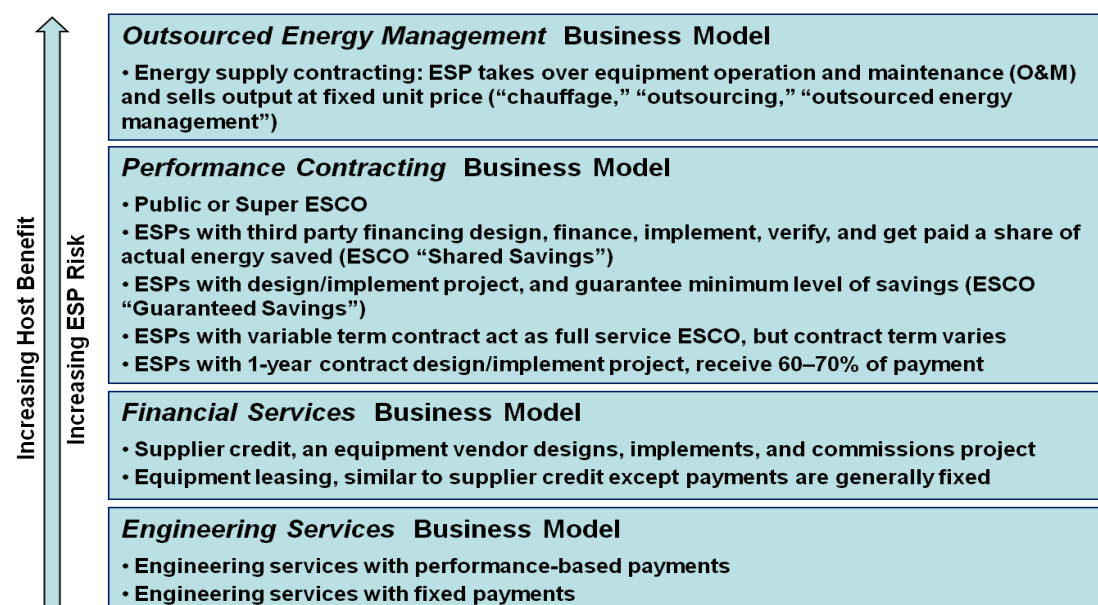
At the top of the “financing ladder” for municipal projects described earlier is the development of private sector energy service providers, such as ESCOs that specialize in EE project development and implementation. Private ESCOs can help overcome important barriers to scaling up implementation of public sector EE projects. They can (a) offer a range of services spanning the energy services value chain and (b) 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 municipal utilities and public agencies), facilitate access to financing from commercial lenders, and enable energy users to pay for services out of the cost savings achieved.

Performance contracting refers to energy efficiency implementation services offered by private ESCOs under energy savings performance contracts (ESPCs). These have the following key attributes (SRC Global 2005):

- ESCOs offer a complete range of implementation services, including design, engineering, construction, commissioning, and maintenance of EE measures, and monitoring and verification of the resulting energy and cost savings.
- ESCOs provide or arrange financing (often 100 percent) and undertake “shared savings” or “guaranteed savings” contracts, such that the payments to the ESCO are less than the cost savings resulting from the project implementation.
- Under the performance contract, ESCOs offer specific performance guarantees for the entire project (as opposed to individual equipment guarantees offered by equipment manufacturers or suppliers) and generally guarantee a level of energy and/or cost savings.
- Payments to the ESCO are contingent upon demonstrated satisfaction of the performance guarantees.
- Most of the technical, financial, and maintenance risk is assumed by the ESCO, thereby substantially reducing the risks to the energy user.

The business models typically utilized by ESPs are illustrated in Figure 9.

Figure 9. Summary of Business Models for Energy Service Companies (ESCOs)



Source: World Bank (2014b).

Before an energy service market for the public sector can be developed, the government must first undertake a set of legislative, regulatory, and policy initiatives targeted at:

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

Table 1 provides more detail on these initiatives.

Table 1. Government Actions to Foster Private ESCOs

Create Demand for EE Services	Remove Barriers to Public Procurement of EE Services	Facilitate Financing of ESP Projects
<ul style="list-style-type: none"> • Increase PA knowledge and awareness of ESPs • Increase PA capacity to identify ESP opportunities • Require EE targets and action plans • Develop standard, templates, benchmarks, and M&V schemes • Organize workshops with PAs and ESPs • Aggregate similar projects across PAs • Accredite or certify ESCOs 	<ul style="list-style-type: none"> • Allow PAs to sign multiple-year contracts • Allow retention of energy cost savings to pay ESPCs • Change procurement rules to select most value, not least cost • Exclude ESP payments from PA debt • Require consumption-based billing for district heating • Allow PAs to engage in PPPs and EE equipment leasing • Encourage PAs to use simple ESCO business models 	<ul style="list-style-type: none"> • Establish EE revolving fund with loan facility • Establish EE revolving fund with ESAs • Provide budgetary grants • Provide risk-sharing facility • Facilitate forfeiting of ESPCs • Establish public or super ESCO

Note: ESA = energy service agreements; ESPC = energy savings performance contract; M&V = measurement and verification; PA = public agency; PPP = public-private partnership.

Source: World Bank (2014).

Comparison of the Finance and Delivery Models

Table 2 provides a comparative assessment of the key characteristics of the finance and delivery models discussed above.

Table 2. Summary of Characteristics of Finance and Delivery Models for Municipal Energy Efficiency Projects

Financing Option	Conditions	Pros	Cons	Issues to be addressed in Ukraine	Examples
1. Budget financing with capital recovery: financing by MOF using government budget allocations or IFI/donor funds, investment grant or budget financing	<ul style="list-style-type: none"> • Credit barrier is too high, underdeveloped banking sector, collateralization is difficult • Financing should target new and under-developed markets, programs must be efficiently administered, initial subproject results should be intensely disseminated, need viable co-financing • Availability of funding for EE projects 	<ul style="list-style-type: none"> • Easy to implement • Can directly finance municipal utilities and public agencies 	<ul style="list-style-type: none"> • Sustainability is questionable, even if repayment is obtained through budget financing 	<ul style="list-style-type: none"> • Who will manage and administer the funds? • Is there sufficient implementation capacity? 	<ul style="list-style-type: none"> • Hungary • Lithuania • Armenia, Belarus • FYR Macedonia • Montenegro • Serbia
2. Direct lending by IFIs to municipal utilities	<ul style="list-style-type: none"> • Large project size • Poor creditworthiness and lack of collateral for municipal utilities • Capability to repay loan with low risk 	<ul style="list-style-type: none"> • Higher probability of tariff reform to obtain cost-based tariffs • Collaborative project preparation and implementation • Long tenor concessional loan 	<ul style="list-style-type: none"> • Requires IFI appraisal of each investment • Unsuitable for small and medium utilities 	<ul style="list-style-type: none"> • What are the appraisal needs? • Need reform to create viable borrowers 	<ul style="list-style-type: none"> • Krakow
3. Energy efficiency revolving fund	<ul style="list-style-type: none"> • Insufficient liquidity in banking sector, major aversion to risk among lenders • Use of grant funds as subordinated debt can help mobilize commercial co-financing • TA to disseminate information on EE subproject performance/financial data critical to sustainability • Need for professional, well-incentivized Fund Management Team 	<ul style="list-style-type: none"> • Can be structured to address financing needs and evolving capacity of municipalities 	<ul style="list-style-type: none"> • May require new legislation • May be difficult to cover administrative costs of the Fund from its revenues 	<ul style="list-style-type: none"> • Needs a strong and capable fund manager or management team • Needs supporting legislative framework for establishment 	<ul style="list-style-type: none"> • Bulgaria • Romania • Armenia
4. Risk-sharing program (partial credit guarantee)	<ul style="list-style-type: none"> • Well-developed banking sector, banks are liquid and willing to accept some risks • Sufficient market activity to develop project pipeline • Guarantees cannot solve systemic banking or credit problems. 	<ul style="list-style-type: none"> • Has worked well in some Central and Eastern European countries • May scale up commercial financing 	<ul style="list-style-type: none"> • Needs a relatively mature banking sector and eligible borrowers • Poor experience of WB and USAID in some countries 	<ul style="list-style-type: none"> • Is the banking sector mature enough? • How many municipalities are creditworthy? 	<ul style="list-style-type: none"> • USAID DCA in FYR Macedonia, Bulgaria and other countries • Bulgaria, CEEF (Central/Eastern Europe), China, Croatia, Hungary, Poland

5. Dedicated municipal EE credit line with commercial institution	<ul style="list-style-type: none"> • Well-developed banking sector, willingness of banks to accept risks and EE as line of business, sufficient market activity to develop project pipeline • Need for parallel TA to develop strong demand, create sustained quality pipeline 	<ul style="list-style-type: none"> • Leveraging of private funds 	<ul style="list-style-type: none"> • Needs municipalities or ESCOs that have borrowing capacity 	<ul style="list-style-type: none"> • Will the participating financial institutions provide loans to municipal utilities and public agencies? • How many municipalities are creditworthy and have borrowing capacity? 	<ul style="list-style-type: none"> • KfW credit line in Serbia • Hungary • China, Turkey, Ukraine, Uzbekistan
6. Public ESCO or super ESCO	<ul style="list-style-type: none"> • No private sector ESCO industry, but interest/demand to develop ESCO industry • Contracting between public ESCO and public sector clients may be easier than with private sector service providers 	<ul style="list-style-type: none"> • Can address financing issues and build ESCO capacity 	<ul style="list-style-type: none"> • Need to create a new organization • Need to provide funding 	<ul style="list-style-type: none"> • Where will such a public ESCO be located? • Will donors be interested in funding such an entity? 	<ul style="list-style-type: none"> • Ukraine Public ESCO (EBRD) • Croatia HEP ESCO (WB/GEF), Armenia, Uruguay, EESL (India)
7. Commercial financing using private ESCOs/performance contracts	<ul style="list-style-type: none"> • Supportive policies and enabling environment • Introduction of simpler business models first • Appropriate financing schemes • Early market development through public sector projects • Development of PPP models to kick-start market 	<ul style="list-style-type: none"> • Can address public sector EE implementation issues 	<ul style="list-style-type: none"> • Needs a market with operating private ESCOs 	<ul style="list-style-type: none"> • Are there any private ESCOs in the market? • Are private ESCOs and/or municipalities creditworthy for commercial project financing? 	<ul style="list-style-type: none"> • WB China ESCO program

Source: *Authors*.

4. Assessment of Finance and Delivery Options for Ukraine

This chapter reviews the potential applicability to Ukraine of the finance and delivery models identified in Chapter 3. For assessing the suitability and benefits of the financing mechanisms, three distinct types of municipal entities are considered:

1. Municipal utilities;
2. Creditworthy municipalities, or municipal entities with own budgets; and
3. Municipal entities without their own budgets and/or little or no capacity to implement projects.

The financing options may have different applicability, advantages and limitations for each type. The key characteristics in the Ukrainian context are summarized in Table 3.

Table 3. Characteristics of the Municipal Energy Efficiency Financing Options in Ukrainian Context

Characteristics	Budget Financing with Capital Recovery	Direct IFI Lending to Utilities	EE Revolving Fund	Dedicated Municipal Credit Line	Risk Sharing Program	Public or Super ESCO	Private ESCO Performance Contracting
Type of Financing	Loans and TA; may include some grants	Loans	Loans, TA, energy service agreements	Loans, TA	Guarantees, TA	Loans	Loans
Municipal Entities Served*	I, II and III	I only	I, II and III	II only	I and II	I, II and III	I and II
Management and Governance	PMU within MOF	PMU created for the project by IFI	Board of directors Fund management team	IFI, participating financial institutions	IFI, participating financial institutions	Board of directors	IFI, participating financial institutions
Project Development	By PMU	By IFI and PMU	Fund management team	Participating financial institutions	Participating financial institutions	Management team of public or super ESCO	Private ESCOs
Project Implementation	Utilities, Type II municipalities and public entities	Utilities	Utilities, Type II municipalities and public entities Fund Mgmt. Team	Type II municipalities and public entities	Type II municipalities and public entities	Management team of public or super ESCO	Private ESCOs
Advantages	<ul style="list-style-type: none"> • Easy to implement • Analogous to existing models • Can address all three types 	<ul style="list-style-type: none"> • Collaborative project preparation & implementation 	<ul style="list-style-type: none"> • Addresses needs of all three types • Multiple windows to address financing needs and evolving capacity of municipalities 	<ul style="list-style-type: none"> • Can leverage commercial financing • Existing credit lines provide experience 	<ul style="list-style-type: none"> • Can leverages commercial financing • Existing guarantee programs provide experience 	<ul style="list-style-type: none"> • Can address needs of all three types • Multiple windows to address financing needs and evolving capacity of municipalities 	<ul style="list-style-type: none"> • Can address needs of all three types • Can leverage commercial financing
Limitations	<ul style="list-style-type: none"> • Requires capable PMU • Sustainability not assured 	<ul style="list-style-type: none"> • Applicable only to municipal utilities • Requires individual project appraisal 	<ul style="list-style-type: none"> • Needs new legislation for implementation • Need a strong and capable Management Team 	<ul style="list-style-type: none"> • Cannot address needs of Type III • Only serves municipalities or ESCOs that have borrowing capacity 	<ul style="list-style-type: none"> • Cannot address needs of Type III • Only serves municipalities or ESCOs that have borrowing capacity 	<ul style="list-style-type: none"> • Need the creation of new organizations • Needs capable management team 	<ul style="list-style-type: none"> • Need a mature ESCO industry
Can be Implemented under Current Regulations?	Yes	Yes	No	Yes	Yes	Yes	Yes, with new ESCO Law

Source: Authors.

* Types of public markets: I – Municipal Utilities; II – Creditworthy Municipalities or Municipal Entities with their own budgets; III - Municipal entities without their own budgets, having poor credit and/or little or no capacity to implement projects.

Narrowing Down the Options: Rationale and Results

Although the seven EE financing options introduced in the previous chapters and summarized in Tables 2 and 3 are all applicable in Ukraine, they are not equally viable in terms of serving all the needs of the municipal utilities and public entities. Four of the options do not appear to be suitable for the needs of Ukrainian municipalities in the short-to-medium term (approximately the next five years), and in particular for retrofitting municipal buildings:

- Direct IFI lending to municipal utilities could be very attractive for Ukraine’s municipal utilities, which have large needs for investments in infrastructure to improve energy efficiency. But such direct loans would be impractical for EE projects in public buildings and facilities for cities as well as smaller municipalities. Therefore, the application of this financing mechanism would be limited.
- Dedicated municipal credit lines can be attractive and useful for financing projects using commercial lending, but will be limited to creditworthy municipal entities that have sufficient borrowing capacity. These financing options will therefore serve the needs of only a small segment of the public sector.
- Similarly risk sharing or guarantee programs would be limited to creditworthy municipal entities and would not meet the needs of the other municipalities or public agencies.
- While commercial financing can be leveraged using performance contracting and private ESCOs, such financing will also be available only to creditworthy municipalities. The private ESCO market is nascent and will take many years’ focused efforts to mature.

The three most applicable options—all of which can meet the needs of a broad segment of the municipal entities and public sector market—are:

- Budget financing with capital recovery
- Energy efficiency revolving fund
- Public ESCO or super ESCO

These three options should be considered further for financing of municipal EE projects.

Budget Financing with Capital Recovery

Under this approach the government, acting through the Ministry of Finance (or another government agency), would provide funds to pay for the investment costs of the EE projects in municipal buildings, utilities or other public facilities. The funding may come from an IFI with the government providing a sovereign guarantee. The government may elect to provide some portion of the financing as a grant, but most of it would be “repaid” in the form of reduced outlays for energy bills of public entities in future years. The size of the reduced outlay would depend on the energy cost savings achieved. The flow of funds to pay for EE improvements would follow the same flow as the normal appropriations from the MOF. The repayment to the MOF could be either part or all of the savings; the former would encourage public entities to participate in the program because they would receive a share of the savings achieved.

The program would be managed by a project management unit (PMU) within the administering ministry and would include technical assistance of various types, particularly for small municipalities with little or no implementation capacity. Private sector participation would be achieved through the procurement of energy efficiency services and the inclusion in contracts of performance requirements (for example, a requirement that the renovated building achieve a certain class of building energy performance certification).

This option could be considered immediately for EE renovation of municipal buildings since it is broadly similar to some existing IFI lending arrangements with municipal utilities. However, it would increase the government's administrative burden and is less versatile than the next two options.

Energy Efficiency Revolving Fund (EERF)

A national EERF for the public sector could provide direct financing for EE projects, sometimes requiring co-financing from commercial banks. The EERF can be structured to aggressively seek out municipal EE projects; market EE loans; work closely with potential borrowers; and perform loan intake, supervision, and collection services. The EERF may offer various financial products or “windows” such as loans, guarantees and various services for capacity building and project preparation and implementation. Two of these windows are particularly relevant to the needs of Ukrainian municipalities: (a) loans to municipal utilities and creditworthy municipalities; and (b) direct investment projects through energy service agreements (ESAs) with municipal beneficiaries, especially those lacking the ability to borrow funds or to effectively implement EE projects. The ESA window would offer a full package of services to identify, finance, implement, and monitor EE projects with the involvement of private energy-service providers or private ESCOs. The beneficiary public entity would usually be required to pay some or all of its baseline energy bill into an EERF-established escrow account to cover the investment cost and associated fees during the ESA contract period.

The establishment of a national EERF requires a supporting legislative framework. Because such a framework currently does not exist in Ukraine, new legislation would need to be enacted to enable the establishment of the EERF.

Super ESCO

Ukraine already has some experience with public ESCOs through the establishment of UkrESCO and the Lviv ESCO. Also the cities of Dnepropetrovsk and Kyiv are expecting to receive loans and technical assistance to create municipal or public ESCOs within their jurisdictions. This concept can be expanded to other cities with significant municipal EE investment needs, or to the national level to create a national “super” ESCO. Established by the government, the national super ESCO would function as an ESCO for public facilities while also supporting the capacity development and project development activities of existing private sector ESCOs.

A national super ESCO could be entirely publicly owned or established as a public-private partnership (PPP). It would be designed to serve the needs of all of the public market segments, but could be particularly useful to focus on the underserved municipal sector. An appropriate role for the super ESCO is to engage private ESCOs as contractors for the implementation (such as installation, commissioning and performance monitoring) of municipal EE projects, thereby helping build their capacity. The super ESCO may also be in a position to arrange financing for small private ESCOs to help them implement projects; this would build their capacity and credentials to serve both the public and private sectors.

The monopolistic behavior of super ESCO is reason for caution; appropriate exit strategies and indicators should be developed to allow it to phase out when its goals have been achieved.

The Potential Role of IFIs and Donors

For all three shortlisted financing options, IFIs and donors can play a major role in their establishment and operation in three ways: (a) financial assistance, (b) capacity building, and (c) other technical assistance.

Financial Assistance

Financial assistance may be provided in the form of loans, grants and guarantees. The loans would have the structures and characteristics of typical IFI loans, with sovereign guarantees. IFIs may also provide or arrange for grant funds (from the Global Environment Facility, for example). Another financing option would be risk-sharing facilities (that is, partial credit or risk guarantees) to the EERF or to the public or super ESCO.

Capacity Building

One of the most important ways in which IFI can assist is through technical assistance for capacity building. Technical assistance may be provided to:

- *Municipalities* – to help mayors, city councils, utility executives, facility managers, and facility engineers understand the need for and the importance of EE implementation, and to obtain information on the technical options for energy efficiency in municipal utilities and public buildings and facilities;
- *Banks and financial institutions* – to provide information on the characteristics of EE projects, implementation business models, financial and technical appraisal, monitoring and verification (M&V), and business opportunities in financing EE projects;
- *Energy service providers* – to build their capacity for EE project development, understanding of the perspectives of banks and financial institutions, M&V protocols, and preparation of “bankable” project proposals; and
- *M&V agencies* – to create the M&V infrastructure and provide international protocols and supporting tools for conducting M&V of EE projects.

Other Technical Assistance

IFIs may also provide other types of technical assistance to facilitate the scaling-up of financing of EE projects. This may include (a) providing templates for conducting energy audits and (b) developing standard contract terms and conditions for ESPCs, customized Ukraine-specific M&V protocols, and a M&V User Guide.

Moving Forward on the Municipal EE Financing Agenda

Pursuing any one of the three potential options will require deliberate efforts by the national government to raise long-term capital, develop a delivery system, build municipal implementation capacity, and increase private sector participation. The government should select an option for implementation only after a review and consultation with all relevant stakeholders—including government officials, mayors and city councils, municipal utility executives, private sector representatives, banks and financial institutions, consumer groups and the IFI community. The next step would be the detailed design and implementation planning for the selected option.

In the view of the authors of this policy paper, creating a dedicated EERF for the public sector—and focusing its initial efforts on financing EE renovation of municipal buildings—would fill a critical gap in municipal EE financing in Ukraine and help address perhaps the most pressing municipal EE investment needs of Ukrainian cities. According to recent World

Bank assessments conducted together with the cities of Kiev, Ternopil and Kamenets-Podolski, EE renovation of municipal buildings is the top priority for all three city governments. The advantage of the EERF is that it could effectively replicate the main functions of the other two options with its different financial products.

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Annex A: Summary of Past and Current Initiatives and Programs for Municipal Energy Efficiency Financing in Ukraine

In Ukraine, the following financing mechanisms have been introduced to support investments, either in municipal EE projects or in municipal projects with an EE focus:

- Grants from donor agencies
- IFI lending
- Credit guarantee program
- ESCO activities
- Commercial bank lending
- Municipal bonds.

We will here discuss each in turn.

Grants from Donor Agencies

Grant funding for municipal EE has come from a variety of donors such as the European Union (EU), Global Environmental Facility (GEF), the Swedish International Development Cooperation Agency (SIDA), the U.S. Agency for International Development (USAID), Dutch International Guarantees for Housing (DIGH), the Swiss Agency for Development and Cooperation (SDC), and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

Other donors active in support of municipal EE investment include the Eastern Europe Energy Efficiency and Environment Partnership (E5P), which represents the largest grant initiative so far for supporting municipal EE projects in Ukraine. The E5P includes contributions from the EU and individual donor countries. The grants are used to leverage national funds and loans from IFIs. E5P grants have been committed to projects in modernizing district heating systems, upgrading water and wastewater systems and saving energy in public buildings.

IFI Lending

Ukraine has a number of investment projects financed by loans from IFIs including the World Bank, the European Bank for Reconstruction and Development (EBRD), the Nordic Environment Finance Corporation (NEFCO), the European Investment Bank (EIB), the Nordic Investment Bank (NIB), and the Black Sea Trade and Development Bank (BSTDB). Box 1 provides a list of recent IFI projects in energy efficiency.

Box A-1. IFI Lending for EE Investments in Ukraine

- **World Bank:**
 - Specific Investment Loan for the Urban Infrastructure Project – US\$140 million
 - Financial Intermediary Loan to Ukreximbank – US\$200 million
 - District Heating Energy Efficiency Project (\$332 million), combined with a \$50 million loan from the Clean Technology Fund
 - Urban Infrastructure Project II (\$300 million), combined with a \$50 million loan from the Clean Technology Fund
- **EBRD** municipal EE project financing, providing direct loans to municipal utilities using municipal guarantees registered by the Ministry of Finance and approved by the Cabinet of Ministers
- **NEFCO** municipal EE project financing instruments, offering concessional financing in local currency for energy-saving measures in schools, kindergartens, hospitals, and sport facilities and for street lighting, and loans to municipalities to finance thermal modernization of public buildings
- **EIB** loan of €15.5 million to upgrade water supply and wastewater treatment in the City of Mykolayiv
- **NIB** loan to Odessa to rehabilitate the city's district heating system
- **BSTDB** loans to Ukrainian companies and financial institutions that may be open to cooperation with municipalities in the area of EE.

Source: Authors.

The USAID Development Credit Authority (DCA) provides credit guarantees to private lenders, particularly for local currency loans. These guarantees cover up to 50 percent of the risk in lending to projects (including partial coverage of interest payments to bondholders) that correspond to USAID's development objectives. Within the framework of the Ukraine Municipal Energy Reform Program started in 2013, USAID has plans to launch a DCA facility in Ukraine aimed at EE financing for participating municipalities.

Activities by Energy Service Companies

In Ukraine, where public sector budgets are constrained and the need to improve the energy performance of public buildings is high, the ESCO approach can offer many advantages. However, the role of Ukraine's ESCOs has been restricted by budgeting and procurement regulations, limited ESCO capacity, and lack of demonstrated experience in energy savings performance contracting. ESCO activities have been limited to energy audits, engineering and design services, some equipment supply through leasing or supplier credit, and outsourcing of end-use energy services (such as space heating). ESCOs have also participated in thermal modernization of some public buildings conducted using budgetary funds.

Some of the ESCOs operating in Ukraine resulted from donor-supported activities. These include:

- UkrESCO, established with the help of EBRD loans with sovereign guarantees;
- Regional ESCOs (ESCO-West, ESCO-East, and ESCO-Center) established with the help of USAID and other donors;
- ESCO Rivne, established with assistance from UNDP and the GEF;

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- “Ecological Systems,” an ESCO in Zaporizhia (a city in southeastern Ukraine) created by local engineers who were early proponents of energy-savings; and
 - Municipal ESCOs currently under preparation in Kyiv and Dnepropetrovsk.

As mentioned in Chapter 2, a new ESCO law was recently passed by the Verkhovna Rada (the Supreme Council, Ukraine’s unicameral parliament) that will remove most of the key legislative and regulatory barriers to ESCOs and facilitate increased ESCO activities.

Commercial Bank Lending

Although several Ukrainian banks are willing to finance EE measures, they prefer to focus on the industrial and commercial sectors, where they can get adequate collateral and encounter less political interference in case of disputes. Most municipal utilities cannot afford medium-term loans when interest rates exceed 20 percent in local currency. Moreover, Ukraine’s commercial banks usually grant loans with tenors of less than three years, with no grace periods—terms that do not suit the payback profiles of EE investments.

Some commercial banks are inclined to work with district heating companies that operate large combined heat and power (CHP) facilities, which have the collateral for commercial loans. However, commercial bank lending in this area is complicated by the position of the Ministry of Finance (MOF), which usually does not support municipal guarantees for loans with high interest rates. The procedure has recently been made even more complicated by the national government, which now requires the Cabinet of Ministers to approve issuance of municipal guarantees.

Municipal Bonds

Funds raised through the issuance of municipal bonds account for over 90 percent of current municipal borrowing in Ukraine. However, most recent municipal bond issuances have been to meet Ukraine’s international commitments by restructuring of existing municipal debt or refinancing at lower interest rates.⁵ Very little of the bond financing has been for municipal services projects.

During the whole period of municipal bond market development, only two projects in the municipal services sector were financed through bond issues by municipal utilities:

- In 2002 Ukrecocomresurs, a state-owned solid waste collection and disposal company, placed two bond issues with 10- and 20-year maturities, for a total nominal value of Hrv 100 million.
- One municipality issued corporate bonds for rehabilitation of its DH system.

No other corporate bond issues for infrastructure development purposes have been registered with the State Commission for Securities and Stock Market (SCSSM), reflecting the low level of activity by municipal utilities in the corporate debt securities market.

⁵ The reduction in new municipal bond issuance is also due to a technical memorandum signed between the government of Ukraine and the IMF that stipulates measures aimed at limiting the size of the combined sovereign debt.
