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A FRAMEWORK FOR FINANCING SMALL-SCALE ENERGY EFFICIENCY PROJECTS IN THE TRANSITION COUNTRIES OF CENTRAL AND EASTERN EUROPE

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SUMMARY

This paper presents an integrated framework for financing and implementing small-scale (<$1M USD) energy efficiency projects in the transition economies of Central and Eastern Europe (CEE). Central themes of this framework are to:

- **Reduce the time, cost, and expertise** needed to prepare the underlying technical and financial assessments, and business plans.
- **Establish a revolving loan fund(s)** to service qualified projects at acceptable rates.

The basic process of qualifying and selecting small-scale projects is little different from that of traditional financing, but the unique feature proposed is to simplify and streamline the procedures so that smaller projects become cost-effective on their own or at reduced levels of bundling. This is accomplished while maintaining acceptable levels of the associated technical, financial, and implementation risks that relate to loan repayment.

A major benefit would be the availability of finance to small to medium-size private and municipal sector projects. In addition, a streamlined investment process targeting small-scale energy efficiency projects would promote economic development, environmental improvement, and improved living conditions in the transition economies.

INTRODUCTION

The need for streamlined financing has been strongly evidenced by conventional project preparation methods that have shown the time to develop, define, and implement energy efficiency projects can easily exceed two years and at a cost easily exceeding $200K. These two factors render small-scale energy efficiency projects uneconomic. A suggestion often provided for smaller sized projects is to bundle them into a larger package that is of an attractive size for consideration by a financial institution – *a size of at least $10 million*. Bundling requires the involvement of and agreement among multiple organizations in the project development/implementation process, which adds discontinuities, time, and cost.

An alternative to traditional market based financing is to create the processes and mechanisms that would address the checks that have developed with conventional financing methods in a way that enables small-scale projects to be implemented. This is accomplished through the development and application of streamlined methods to appraise and screen projects. In conjunction, would be the creation of a dedicated source of loan funds at interest rates attractive to private and municipal borrowers, and sufficient to recover costs that would maintain the Fund at a sustained level.

The framework is embodied in the Energy Efficiency Financing Fund (Fund), whose purpose is to finance small-scale energy efficiency projects (<$1 million in size) in transitioning economies.

Projects of this size are not addressed by conventional methods and organizations because they are not cost effective based on the development cost, hence are unable to provide returns sufficient to attract investment. The Fund provides a structure to lower the time and cost to develop and implement projects with an acceptable level of risk and return. Additionally, the Fund would selectively provide a share of financing for larger projects qualified by others using traditional methods.

The Fund would finance two basic types of projects:

- Small-scale projects (<$1 million each) that are not addressed by conventional financial methods and institutions as noted above. Projects of this size are estimated to include at least 20% of the energy and emission reduction potential, and these projects represent a total investment value that easily exceeds $1 billion in the CEE countries -- a not insignificant amount that would otherwise remain untouched.
- Larger projects ranging from $2-50 million in size account for the remaining ~80% of the market with an investment potential of at least $5-7 billion in the CEE countries. These projects are typically qualified by larger investors and require additional financing to spread risk. The Fund may choose to invest in these as a minority investor as a means of diversifying financial risk.

During the first two years, the Fund would rely upon limited donor contributions to establish operational procedures and credibility. At the end of the second year, additional capital would be solicited from investors, with a limited, but competitive rate of return in order for the Fund to meet the objectives of providing loans at affordable rates, ensure cost-recovery, and retain a portion of the earnings to increase the pool of funds for future operations.

This paper presents the structure of the financing framework and a preliminary description of the roles and responsibilities of the participants. It is anticipated that the roles and responsibilities of the participants will become more defined as the financing framework is developed.

OPERATION OF THE ENERGY EFFICIENCY FINANCING FRAMEWORK

The following discussion and diagram in figure 1 shows the flow of information (dotted lines) and funds (solid lines) for small-scale projects. The steps in the process are:

1. The project developer (a local organization with engineering, financial, and policy capability) identifies and develops a project(s) and communicates this to the fund and domestic bank. Development includes a contract with the project owner.
2. The Fund reviews the project materials and, upon approval, disburses payment to a pre-qualified domestic bank.
3. The pre-selected supplier and installer (S&I) provides and installs the equipment at the direction of the project developer.
4. Upon communication from the project developer that the installation is satisfactory, the domestic bank disburses initial payment to the supplier and installer.
5. The domestic bank collects payment from the project owner in the agreed time period.
6. The project developer evaluates the project and communicates the results to the domestic bank and the fund.
7. The domestic bank sends repayment to the Fund, completion payment to the S&I, and preparation/evaluation payment to the project developer.

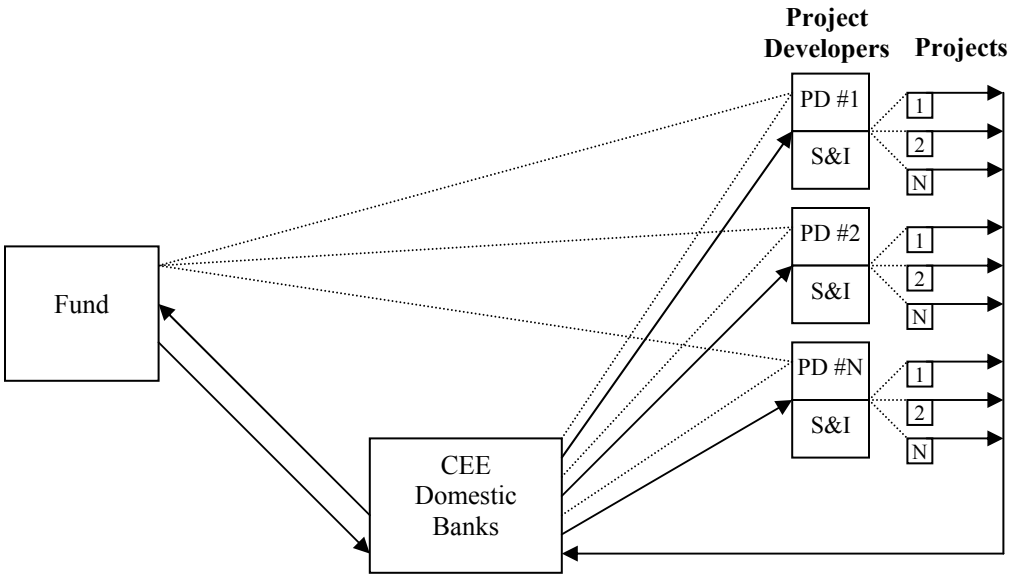

Figure 1. Flow of information (dotted lines) and funds (solid lines) for small-scale projects

The key to this structure lies with the ability of the in-country project developers to assess the technical, financial, and implementation components of each project to ensure minimal risk. This would be accomplished by implementing measures for which the efficiency improvement is easy to quantify and the credit worthiness of clients is firmly established (i.e. projects having low technical, financial, and implementation risks as shown in the risk matrix in figure 2).

Examples of projects with low technical risk for which the technical assessment is straight-forward and efficiency improvements are easy to quantify are:

- Weatherization and heat control equipment in buildings.
- Steam traps, pipe insulation, automated heat control equipment, and electric motors in industry.
- Fuel switching to natural gas to reduce reliance on brown coal.

Likewise, projects with low financial risk have good cash flow and the sponsor demonstrates the ability and commitment to repay the investment.

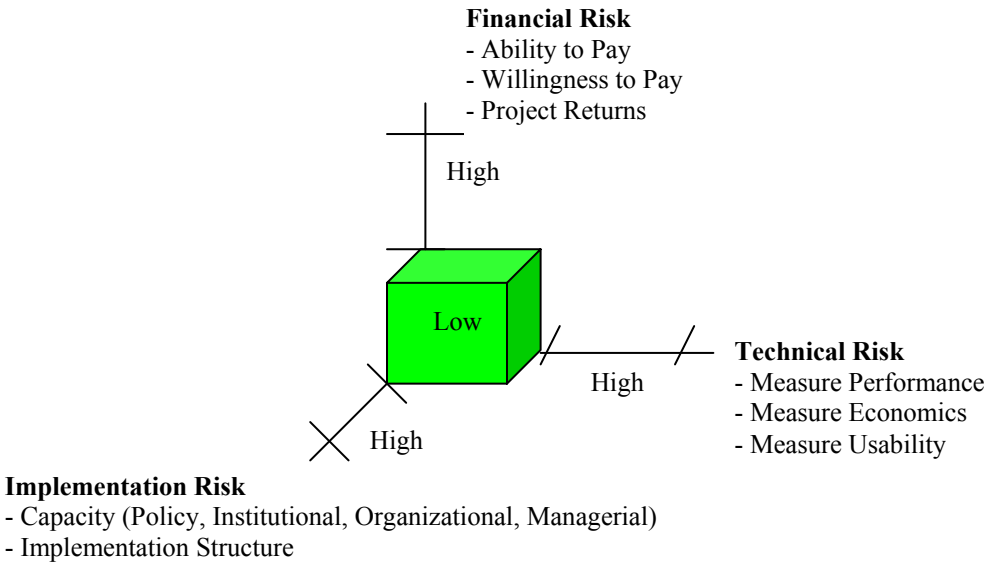

Figure 2. Project Risk Dimensions

Initially, only projects having low technical, financial, and implementation risk would be selected, and as experience is gained, the risk envelope would be expanded.

Of the factors shown under implementation risk, only policy actions are not addressed by the integrated framework. Given that projects are based in small to medium sized private enterprises and municipalities, diseconomies result from building extensive institutional and managerial capacity, and creating an implementation structure within the municipality. These capabilities reside in the project developer, supplier and installer, and through the implementation of predominantly passive measures[*].

Based on a preliminary estimate, the implementation time and cost can be reduced substantially over conventional financing methods from 50-100 to 12-24 weeks and from $200-500K to $15-30K.

Large Scale Projects

Large-scale projects are institutionally and financially more complex. The Fund would play a passive role in this size project, leaving the lengthy and costly qualification process to others, and investing only in a minority share.

KEY ELEMENTS

This section presents the key elements of the integrated framework necessary for its operation. As discussed above, the central element lies with the project developers, which is to develop and

[*] Passive measures require little or no user interaction/attention for operation and maintenance to provide delivery of energy services.

implement projects having minimal technical and financial risk. The aspects of the implementation element concerning contract structure, and verification and evaluation are also discussed. The entire process is streamlined by using standardized procedures and formats to address these elements.

Technical Risk

Technical risk involves the performance of energy efficiency measures to 'deliver' the reduced levels of consumption and cost as predicted. This risk can be segmented into the selection, installation, and operation of the measures.

Initially, a maximum of a two-year payback would be sought with measures selected on the basis of known performance and requiring minimum effort in terms of an audit. These would include a limited number of measures and/or application areas and passive measures (requiring limited user expertise and input) as opposed to active measures (requiring significant user expertise and input). Such measures would include:

- Weatherization and heat control equipment in buildings.
- Steam traps, pipe insulation, automated heat control equipment, and electric motors in industry.
- Fuel switching to natural gas to reduce reliance on brown coal.

Personnel experienced in the particular application would accomplish identification of measures. Applicable measures would be identified in a walk through audit and require minimal analytical verification – the identification of short payback measures is easily accomplished by an expert that knows the application area. Longer payback measures require a greater level of analysis, but specification of both types of measures would be supported by the **project performance knowledge base** discussed below.

A key aspect is to pre-specify measures and applications based on experience and knowledge to date. A target for initial donor financing is the creation of a **project performance knowledge base** surveying all projects completed to identify which measures work, how well, and under what conditions. This type of information is invaluable to specifying measures and would be continually up-dated as project evaluations/verifications are completed. This information base would be used by the project developers and the Fund to ensure that projects meet performance criteria. Additional measures would be specified as new information/knowledge is acquired.

Measures would be installed by reputable vendors/installers to maximize the quality of the installation. The vendors/installers would be pre-qualified, thus able to support numerous installations at reduced levels of time and cost as opposed to separate tenders for each installation.

Financial Risk

Financial risk involves selection of the participant and structure of the repayment. It is necessary to select projects where the sponsor is creditworthy, able to pay, and demonstrates the commitment to pay.

The first screen is to accept project owners that would only accept a turnkey type contract from the provision of finance, to specification of measures, to installation, and finally to collection. Ideally, the turnkey contract can be negotiated on a single source basis, but a tender allowing a turnkey contract may be considered. If a tender breaks the process up, the decision to not bid is automatic.

The second step is to qualify the creditworthiness of project owners. This would be done on the basis of credit history, and the ability and commitment to repay the loan on schedule. Aspects of this would include:

- Records proving that utility bills are fully paid and that payments are made on time. Payment is verified with receipts stamped/certified by the utility company(ies).
- For government/municipal customers, need to determine that budget is and will be sufficient.
- For private customers, identify collateral or establish 'escrow' accounts.
- The existence and amount of incentives.
- References, future income flows, and key customers with past and future sales.

Standardizing the financial information requirements and review process is key to holding down transaction costs, particularly as each country has different laws and customs. To accomplish this, the Fund would work with the bank in each country to develop country-specific application and lending and collateral requirements.

The third aspect of reducing financial risk is to guarantee a positive cash flow so that the total payment for servicing the loan is less than the amount that otherwise would have been paid for energy.

Contract Structure

The contract structure must be standardized, simple and straightforward to ensure clarity. At a minimum, the contract should contain provisions to cover the following:

- Customer to provide some minimal level of the outlay, say 20%.
- Customer is guaranteed a positive cash flow.
- Repayment is structured to not exceed 3 years from the acceptance date for measures having a simple payback of 1 year and not to exceed 4 years from the acceptance date for measures having a simple payback of 2 years.
- Specification of the verification method.

Standardization and simplified provisions would facilitate bundling of projects to enlarge the market for goods and services.

In the event of a dispute, the contract should also contain a provision that both parties agree to the decision reached by an independent arbitrator that both parties agree to in advance rather than upon a lengthy legal process.

Supply and Installation

The goods and services for the installation (works) would be contracted as a package to include the design, provision of materials and equipment, and installation of materials and equipment.

This is to provide for a single source of responsibility for the installation process in order to remove virtually all sources of miscommunication and misunderstanding.

Two to three competitively selected 'Basic Ordering Agreement' (BOA) type of contracts would be established with supply/installation firms. This type of contract would provide assurance to the firms of a continuing work relationship, providing quality is maintained. Criteria for selection should include:

- Capability for performing integrated design, supply, installation.
- Staff and experience with similar projects.
- Reputation to be verified with check of 5 references.
- Financial viability.
- Assessment of market prospects of goods and services.
- Determination of management skill.
- Rates/costs.
- Ability and willingness to provide guarantees covering the quality of installation and performance of the equipment (not necessarily full performance contracting guarantees, but basic guarantees of workmanship and equipment warranties).

The installation process would proceed in five steps as follows:

1. The project developer would conduct the initial site visit to determine the applicable measures.
2. The project developer would then issue a request for a bid from the 2-3 S&I firms pre-qualified through the BOA contracts. The bid would consist of time to complete the installation, cost, and a written proposal of the work to be accomplished.
3. The selected installation contractor(s) would perform the installation. There would be a provision for some pre-payment. There would be a penalty for late completion and/or an incentive for early completion.
4. Final payment would be subject to acceptance of the installation by the project developer and the project owner or his designee. Acceptance criteria would include the granting of all required approvals, the cleanliness of the installation, and the proper functioning of the equipment.
5. For active measures, the contractor would be required to provide training and maintenance for a specified period, say one year.

Verification

Verification of energy efficiency improvements would be based on an easy to understand process such as one of the following drawn from the International Performance Measurement & Verification Protocol developed by the US DOE:

1. Payment Based. This is a simple comparison of the utility bills pre and post retrofit, adjusting for any differences in the per unit rate for energy. If adjustment is required, the current rate that a customer is paying would be used to calculate what bills would have been for consumption that occurred in the pre-retrofit period. The applicability of this method would be determined during the audit and interview to identify changes in building/facility operation or other factors that may significantly affect future consumption, which may require the use of another method.

2. Physical Units Based. This method also relies upon the utility bills provided to establish the financial viability of the customer. If the physical units of energy are not shown on the bills, the bills would be converted to physical units using the energy prices for the corresponding period. The comparable physical units post-retrofit energy would be compared to the weather adjusted pre-retrofit consumption. The difference between the two would determine the efficiency improvement. The weather adjustment method would simply adjust the physical units of energy divided by degree-days or production volume for the corresponding periods to obtain an estimate of consumption per degree-day or construction volume. The applicability of this method is also subject to changes in building/facility usage or other factors that may have significantly affected consumption in the pre and post retrofit periods, which may require the use of another method.

3. Estimated Savings. This method relies simply on the predicted energy efficiency improvement. The estimated savings method may be used in favor of a more complex method and certainly as a substitute for methods 1 and 2 for buildings/facilities for which billing data is not available and/or changes in building/facility usage or the occurrence of other factors that may significantly affect energy consumption in the pre and post retrofit periods.

An alternate repayment method such as lease contracts may be agreed upon providing the repayment method is simple and transparent as in the 3 methods described above.

The verification method selected would also be part of the contract.

Evaluation

The project developer would perform technical and process evaluations on all projects. The technical evaluations would determine the energy efficiency improvement and the process evaluation would identify the procedural improvements to include the actions of and interactions with the banks, suppliers, and installers.

The results of the evaluations would serve three purposes. The first would be to augment the **project performance knowledge base** to increase the certainty by which the risk factors are reduced. This information would help to expand the risk envelope, thus provide for the implementation of additional measures. The third use would be to continually improve the overall process, which would lead to further efficiencies and cost reductions for the lending process.

Other Implementation Actions

Policy changes needed for municipalities to implement energy efficiency projects are well covered in the literature, but in summary these are:

- Increased municipal discretion for the use of budgeted funds.
- Reduced import tariffs and taxation for social goods.
- Ability to retain all or a portion of the savings over a specified period of time.
- Reduced energy subsidies.
- Municipal energy regulations that require meters and payment based on actual consumption.

- Measures to improve the fiscal soundness of the municipal energy systems (tariffs, reduced supply losses, production efficiency, reduced subsidies, etc.).

While it is recognized that the above policy actions are highly desirable, it is not the purpose of this framework to directly address these, but rather encourage their adoption through the implementation of projects.

The combination of supply & installation, verification, and evaluation actions performed by the project developer eliminates the need to build these capabilities in the municipality and other institutions. Thus training and selection of project developers can be more focused with a lower level of and more productive use of resources.

General Comments

This section provides additional information and comments regarding aspects and operation of the integrated framework. These features are essential for the significant reduction in time and cost, and expertise to enable the provision of financing for small-scale energy efficiency projects.

It cannot be emphasized enough that the **project performance knowledge base** is a cornerstone for reducing the technical and installation risks. This knowledge base would facilitate measure identification and screening, economics, usability, and installation through direct comparison with the performance of similar measures under similar conditions and through the lessons learned.

Use of a resource akin to RENEUER (http://www.reneuer.com) would help with many aspects of the framework, from screening proposed projects to communicating with sponsors, establishing expectations and contract terms, and to bundling projects.

One can expect bad loans, but this can be minimized with well-designed loan review procedures, close collaboration with local banks with extensive lending experience, solid collection systems, and procedures for excluding additional loans to offenders. And the evaluation component would assess each project (successful and failed) to strengthen the project development and selection processes through a catalog of lessons learned.

A point not made above is the qualification of project developers. The number of project developers would be limited based on a qualification process that would emphasize the capacity of selected project developers to handle all the risk dimensions. This includes capacities ranging from the ability to conduct specific analyses, to contract administration, to exchanging information with decision-makers.

A number of features provide significant reductions in risk and short-term capacity building:

- The Fund's staff would evaluate the technical, financial, and implementation risks rather than rely upon the staff of the domestic banks to perform these functions, which relegates the role of domestic banks to disbursement and collection agents. This would reduce the need for training and reliance on numerous domestic bank staff of the critical function of assessing risk.
- The project developer's staff would perform all functions associated with assessing, implementing, and evaluating the projects. The selection of a limited number of project developers would ensure that these functions are conducted professionally by organisations

staffed with the needed range of expertise and eliminate the need for training and reliance on municipal and other staff to perform these functions.

- The use of BOA contracts would greatly reduce the time to identify and select qualified firm to supply and install the measures. Further, combining the supply and install functions would eliminate miscommunication that occurs in the specification and installation phase.

The capacities of domestic institutions would increase through the process of observation and subsequently to increasing levels of participation in the project development and lending process as opposed to the traditional method of extensive training and preparation for the limited number of projects that might materialize.

Finally, the rationale for the Fund lies not only with the ability to finance small-scale projects, but to do so in the form of a loan. In many of the CEE countries, an entity is often prohibited by law from engaging in lending unless the 'lending' organization registers as and meets the requirements of a domestic bank. This requirement has severely inhibited the operation of Energy Service Companies and other in-country organizations seeking to finance energy efficiency projects. This requirement is met by locating the financing entity outside the boundaries of the CEE countries and relying upon the local banks to disburse and collect funds.

BENEFITS

National level benefits are reduced energy use, which can free up energy for export or reduce energy imports and improve balance of payments. Another national level benefit is increased employment indirectly for the production of measures and directly through the installation of measures.

Benefits accrue to energy consumers through reduced energy bills, improved thermal comfort, and healthier environments by reducing the output of emissions and other waste streams. The reduced energy bills would enable savings and expenditures on other goods and services, which feed back to the development and diversification of the economy.

A potential additional financial benefit to the Fund and the client would be the marketability of the carbon asset through a centralized source. This would increase the financial attractiveness of projects and could be used to help maintain a lower loan cost, which is important to reaching the market contained in small to medium municipalities.

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