

# RESHAPING EFFICIENCY:

Discussing innovative  
financing models  
to drive energy  
efficiency in India

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## Reshaping Efficiency: Discussing innovative financing models to drive energy efficiency in India

May 2015

Written by Carlos Dominguez Ordonez

## Acknowledgements

The IISD Public Procurement and Infrastructure Program is grateful to a number of individuals and organizations that contributed materially to this inquiry. This report has made it into your hands and/or screen because of their generous support.

We would particularly like to acknowledge the guidance and technical advice of Pradeep Singh, deputy dean, India School of Business (ISB), and Om Prakash Agarwal, executive director, Punj Lloyd Institute of Infrastructure Management, ISB.

We are also grateful to the following stakeholders for meeting with us and sharing their viewpoints:

- Bureau of Energy Efficiency (BEE)
- India School of Business (ISB)
- ICICI Bank
- YES Bank
- Small Industries Development Bank of India (SIDBI)
- Confederation of Indian Industry (CII)
- Energy Efficiency Services Limited (EESL), a joint venture of PSUs of the Ministry of Power, Government of India

## Table of Contents

1.0 State of Play of the Energy Efficiency Market in India .....	2
2.0 Previous Efforts to Kick-Start the Energy Efficiency Market .....	3
2.1 How infrastructure has been traditionally funded in India.....	3
2.2 Programs and Lines of Credit for Energy Efficiency Projects.....	3
3.0 The Case for an Energy Efficiency Financing Protocol in India.....	7
3.1 What Does a Robust Financing Protocol Need to Address? .....	7
3.2 Lessons Learned from Local Banks Already Providing Energy Efficiency Financing in India: The cases of SIDBI and ICICI Bank .....	9
4.0 A Business Model Based on Deal Aggregation for Energy Efficiency Financing.....	11
4.1 Deal Packaging and Securitization: How a pool of loans offsets credit risk .....	11
4.2 The Benefits of Using Special Purpose Vehicles and Credit Enhancements in Securitization .....	13
4.3 A Suggested Deal Aggregation Structure for Energy Efficiency Financing in India .....	15
4.4 International Experiences in Energy Efficiency Deal Aggregation: The WHEEL and PACE programs .....	16
4.5 Banks' Deleveraging and the Development of a Market for Attracting Investors through Debt Funds .....	17
5.0 Conclusions .....	19
6.0 References .....	20
Appendix A: Infrastructure Financing in India: A summary of recent developments .....	23
Appendix B: Activities to Foster Energy Efficiency Financing: An international overview .....	25

# STATE OF PLAY OF THE ENERGY EFFICIENCY MARKET IN INDIA



## 1.0 State of Play of the Energy Efficiency Market in India

India is facing unprecedented challenges in employment, health and climate conditions. Although all of these challenges are important, public practitioners and government representatives recognize worsened environment conditions as a critical area, given their negative effects on public health and the country's economic performance. With better environmental conditions, India's increasing population would enjoy higher living standards and augmented productivity, which would result in a more sustainable growth path. In spite of these tangible benefits and contrary to several reports recommending concrete environmental policy changes, the Government of India (GoI) seems to be implementing a mixed strategy for environment goals in its development plans.

For example, in December 2014, the country resisted international pressure to commit to capping greenhouse gas emissions in accordance with the last Lima Climate Change Conference (Gupta, 2015). However, at the same time it took bold steps to achieve ambitious goals in energy efficiency and the development of renewable energies. One of these ambitious goals is to increase the country's solar energy capacity five times by 2022, which would mean a 100 gigawatt increase from the current 2.6 gigawatt level (Robins, 2015).

**Despite the GoI's latest announcements and measures aimed at incentivizing the development of an Energy Efficiency market, it is a well-known fact that banks are not offering attractive loans to energy efficiency projects.**

Unfortunately, not all barriers to energy efficiency have been addressed. For example, the lack of attractive financing structures is still one of the biggest hurdles for the upscaling of solar and energy efficiency projects. Banks are not encouraging energy efficiency and renewable energy projects, for instance by offering low-cost, readily accessible loans. This may be because of a misperception that efficiency projects are risky bets with unreliable cost savings and huge performance risks. Further, established commercial banks usually assess energy efficiency projects as traditional asset-backed loans. This results in prohibitive collateral requirements and unaffordable loan terms for energy-saving schemes.

In India, commercial banks like the Small Industries Development Bank of India (SIDBI) and ICICI Bank have taken the lead in implementing lines of credit serving as pilots for mass-scaling energy efficiency. These programs were created in response to multilateral aid agencies suggesting the importance of energy efficiency in creating a competitive edge for energy-intensive industries. National authorities have also taken a leading role in coupling these internationally funded activities with established monitoring and verification protocols, and by designing risk guarantees to reduce perceived risks by lenders. Significant steps have also been taken by creating national agencies such as Energy Efficiency Services Limited (EESL) and the Bureau of Energy Efficiency (BEE), which are in charge of promoting the value of performance contracting and developing a set of measures aimed at growing the market for energy services companies (ESCOs).

It is still unclear why, in spite of the above-mentioned activities, the energy efficiency market has not yet taken off in India. The country has low numbers of ESCOs compared to its European and Chinese peers, and its banks are reluctant to finance efficiency projects using their own resources. National authorities, through the Ministry of New and Renewable Energy, have constantly emphasized the need to find alternative solutions to spread efficiency in energy-intensive sectors and to achieve national emission targets.

To address this challenge, the International Institute for Sustainable Development (IISD) has been undertaking research and creating friendly spaces to discuss, along with energy efficiency experts and public agencies, innovative actions aimed at spurring the energy efficiency market in India. One of the main conclusions drawn from these discussions is that energy efficiency projects still face financial constraints due to the lack of alternative ways for banks to assess energy efficiency projects and the negative impact of using traditional approaches to quantify energy savings.

The goal of this document is to give a general overview and provide context for the latest developments in the Indian efficiency landscape. First, we diagnose the causes of India's energy efficiency impoverishment, then discuss some of the previous activities implemented to achieve higher energy efficiency levels, and finally suggest a set of measures that, if implemented, would result in alternative practices for banks to evaluate energy savings and the subsequent development of energy efficiency. We will also present strategies for de-leveraging commercial banks once substantial levels of energy efficiency financing have been achieved.

## 2.0 Previous Efforts to Kick-Start the Energy Efficiency Market

### 2.1 How infrastructure has been traditionally funded in India

When it comes to the development of large infrastructure projects (including road, water, energy and telecoms), tradition dictates that the Gol and local private companies regularly provide funding through different instruments and mechanisms for project financing. Public support has also been provided using instruments like viability gap funding, soft loans, revenue shortfall loans and funding from multilateral financing institutions (Sahai & Dasgupta, 2013).

On the other hand, private sector participation has been channeled using the public-private partnership (PPP) model, although amounts provided by private developers have typically been sourced from local banks (usually 70 to 85 per cent of private capital comes from commercial debt). This scheme worked smoothly in the past, but in recent years, especially after the 2008 crisis, banks have been reluctant to fund infrastructure projects because of their long-term implementation and the difficulty of reaching bankable thresholds.

**In India tradition dictates that the Gol and local private companies regularly provide funding for infrastructure projects through the use of tools like viability gap funding and soft loans.**

The recently appointed government has showed interest in setting up an appropriate policy environment to foster infrastructure investment in India. Institutions like the Reserve Bank of India (RBI) have been promoting infrastructure funding by asking banks to issue longer-term bonds to match project life cycles and increasing the Priority Sector Lending targets.<sup>1</sup>

These measures align with a common misperception that the root cause of current infrastructure financing constraints is the lack of appropriate investment vehicles, rather than the limited availability of resources (Lall & Anand, 2009). In spite of this, several reports have stated that banks by themselves will be unable to cope with the amount of resources needed for infrastructure, and the role of private investors, especially local capital markets and international capital sponsors, will be pivotal in meeting the goals on investment requirements (Ashurst, 2010).

### 2.2 Programs and Lines of Credit for Energy Efficiency Projects

The vast group of programs for energy efficiency financing is made up of three types of projects: those led by financial institutions, those implemented by international development organizations, and those managed by the Gol (through national government-sponsored agencies). The latter two are briefly introduced below.

#### *Programs Sponsored by International Development Agencies*

##### *Japan International Cooperation Agency Financing Scheme for Energy Savings Projects*

The Japan International Cooperation Agency entered into a partnership with SIDBI to offer special financing for energy efficiency projects. This program is currently in phase II and recently received a new line of credit from the Japanese government. The objective of the second stage is to continue offering a financing alternative for micro, small and medium enterprises (MSMEs) implementing energy efficiency projects across different industrial sectors.

The program carries out the following activities: researches and publishes a list of the energy efficiency equipment eligible for financing, provides training and technical assistance to loan officers and MSMEs, and conducts credit assessment and loan appraisal for the projects.

**SIDBI's financing scheme for energy savings projects is one of the most successful programs ever implemented in India. Currently in its second phase, it has granted more than 3,000 loans to more than 3,400 MSMEs.**

<sup>1</sup> For more information on the latest measures adopted by the Gol to increase infrastructure financing, please see Appendix A.

The United States Agency for International Development (USAID) reports that phase I of this project awarded more than 3,000 loans and assisted more than 3,400 MSMEs. The project provided several lessons and showed the potential for energy efficiency technologies if a series of supporting activities are put in place. These activities include a well-designed cluster-based financing approach, structured training programs, broad marketing campaigns, a dynamic energy savings equipment list, and effective monitoring and verification procedures (PACE-D, 2013).

#### ***Indian Renewable Energy Development Agency Ltd. Energy Efficiency Financing Scheme***

From 2004 to 2006, the Indian Renewable Energy Development Agency implemented a scheme to finance renewable energy and energy efficiency projects across India. The World Bank initially funded this line of credit with INR60 billion (US\$0.97 billion) that were channeled for more than 1,600 projects in the industrial, municipal and commercial sectors.

The scheme not only financed energy efficiency and renewable energy projects, but also funded energy savings equipment and promoted the manufacturing of locally developed efficiency equipment through soft loans for companies specialized in these technologies. However, the vast majority of the projects financed were in renewable energy, reflecting the unattractiveness of energy efficiency projects. This phase of the program also showed that some of the barriers for energy efficiency financing, such as limited creditworthiness of borrowers and ESCOs' lack of capacity, remained in place.

Later on, in 2006, the World Bank granted a second line of credit with US\$20 million committed for energy efficiency projects only. As of 2008, data provided by USAID indicated the entire amount of these resources had been used, meaning the second phase of the program was more effective in channeling funds for energy efficiency projects (USAID, 2008).

#### ***Asian Development Bank Industrial Energy Efficiency Project***

For more than six years (1994–2000) the Asian Development Bank (ADB) carried out one of the earliest projects on energy efficiency financing in India. The project was called the Industrial Energy Efficiency Project and sought to promote efficient and environmentally sustainable industrialization through loan awarding and technical assistance (ADB, 2002).

More than US\$150 million were provided, using the Industrial Development Bank of India (IDBI) as an intermediary. In the meantime, the project focused on reducing perceived risk by strengthening IDBI's skills in three areas: policy and program development for energy efficiency, institutional staff knowledge on new technologies, and raising awareness about the need to improve energy efficiency.

#### ***KfW Line of Credit for Energy Efficiency***

Managed by SIDBI, this energy efficiency financing program received the first line of credit of INR25 billion (US\$404 million) from the KfW Development Bank (German Development Bank) in 2009. The first phase of the project focused on providing loans for MSMEs willing to develop energy efficiency projects and was operational from 2011 to 2013. During this period more than 6,000 loans were disbursed to MSMEs, and the project also offered complementary support, such as preparing guidelines and procedures for loan processing, providing technical assistance to loan officers, and developing an appraisal tool and a methodology for monitoring results.

As of December 2014, the preparatory studies for launching the second phase of the program were finished, and KfW now plans to offer a second line of credit to SIDBI in recognition of the program's success. The new resources (the amount is still not defined) aim at alleviating India's increasing demand for energy by enhancing energy efficiency in the industrial sector (Alexeew, 2014).



## ***Government-Sponsored Programs***

### ***Technology Innovation Fund***

Supported by the Gol, this fund provides energy efficiency lending using commercial banks. The Ministry of Science and Technology has offered INR300 million (US\$4.85 million) in the form of soft loans to MSMEs willing to deploy upscaling, demonstration and commercialization of innovative technology-based projects, including energy efficiency.

The project started in 2011 and remains active, providing up to 80 per cent of a project's funding requirements, with promoters contributing a minimum of 20 per cent. The appointed entity for managing, analyzing and disbursing the loans is SIDBI, and the fund behaves as a revolving investment structure, meaning it replenishes the capital available for investment once companies start paying back the loaned amounts.

### ***Infrastructure Debt Funds***

In 2011 the Gol announced the establishment of infrastructure debt funds (IDFs) as a new investment vehicle to support infrastructure projects. This type of instrument is vital to addressing financing constraints and has the potential to channel institutional investors' resources through lower investment costs and periodic cash flows. Institutions like the ADB have already recognized the role of IDFs in bridging current financing needs, and have expressed their interest in leveraging their potential with supporting plans (ADB, 2014).

India introduced two different IDF structures in the debt funds sector: non-banking financial companies (NBFCs) and mutual funds. The former resemble banks in that they award loans to companies but by using resources from private investors instead of deposits. Meanwhile, mutual funds are investment vehicles bringing together private investors' resources and investing them in debt and equity products. The following are some brief examples of these types of mechanisms.

#### **India Infrastructure Finance Company Ltd.**

Incorporated under the Companies Act of 2006 and wholly owned by the Gol, India Infrastructure Finance Company Ltd. (IIFCL) covers the current financing needs faced by infrastructure projects, especially PPPs, as these are unable to access debt markets on their own or without some form of credit enhancement. Capital markets are the preferred place to raise funds via long-term debt in developed countries. Unfortunately, none of their potential has yet been tapped in India, where long-term debt markets face liquidity constraints and shortage of fixed income products, with investment tenures ranging from 7 to 12 years. To address this situation, institutions like IIFCL have stepped in to provide financial assistance through long-term loans for up to 20 per cent of a project's capital requirements. IIFCL is classified as an NBFC (Nair, 2013).

#### **India Infrastructure Project Development Fund**

This fund was opened in 2006 and acts as an alternative to mainstream PPPs in India. The initial investment was INR1 billion (US\$22.2 million), and the Ministry of Finance designed guidelines for bidders to include this financing alternative on their tendering proposals. The scheme is a revolving fund, meaning that it will be replenished as soon as borrowers start to pay back their loans. Usually, the India Infrastructure Project Development Fund funds up to 75 per cent of the project costs in the form of interest-free loans to the awarded bidder. According to the Press Information Bureau of India (2012), as of 2012, INR645 million (US\$12 million) had been awarded across 51 projects.

### ***Nascent Funds***

Some institutions that have traditionally financed infrastructure in India (e.g., Birla Sun Life, ICICI Bank, IIFCL, Infrastructure Leasing and Financial Services, and L&T Infrastructure Finance) have recently established IDFs. One good example is India Infradebt Limited, led by ICICI Bank. This NBFC fund was created in February 2013 and five months later closed its first transaction for INR500 million to fund a road project in the Himalayas.

# THE CASE FOR AN ENERGY EFFICIENCY FINANCING PROTOCOL IN INDIA



### 3.0 The Case for an Energy Efficiency Financing Protocol in India

As discussed in the introductory section, India faces significant barriers to developing a prosperous energy efficient market. Several research documents have already identified a list of causes that are hindering the adoption of energy efficiency projects. One of the primary challenges is the lack of financing mechanisms, which is due to the low confidence of commercial banks in the bankability of energy efficiency projects, and not from an absence of resources.

**The Energy Valuation Organization (EVO) made an important step in issuing a first energy efficiency financing protocol. Yet, the document is not a bespoke methodology for India and ignores aspects such as the local business practices and appraisal methods.**

Because banks do not have the tools to recognize and monetize the cash flows represented by units of energy that are “saved,” they are not able to evaluate if these cash flows themselves will be sufficient to meet loan obligations. On the other hand, most Indian companies have the technological competencies to undertake energy efficiency upgrades but lack affordable lending to carry out these projects. This funding mismatch is what an energy efficiency financing protocol seeks to address.

This protocol, known as the India-Adjusted Financing Protocol or Methodology, would be a standardized guideline to help commercial banks calculate how energy savings can equate to new, predictable cash flows. By using the guideline, financial institutions would be able to assess the bankability of energy efficiency projects by monetizing future energy savings into new cash flows.

Theoretically, a good starting point for the development of this methodology would be the work done by the Energy Valuation Organization (EVO). This institution has been working on the development of an International Energy Efficiency Financing Protocol (IEEFP), with the ultimate goal of becoming the global standard for educating and training licensed financing institutions (LFIs) on energy efficiency financing. The need for the IEEFP comes from a general belief that energy savings cannot be equated to available cash flows to service loans. The protocol therefore aims at increasing awareness of the benefits and risks of energy efficiency financing across market players.

The first version of the protocol was released in 2009 and was the result of a series of workshops held by the UN Foundation’s Energy Future Coalition and a group of international energy efficiency experts. One of the main conclusions drawn from these meetings was that LFIs seem to ignore the many potential benefits of energy efficiency projects, which is why they do not have the appetite to fund this type of projects. The workshop participants suggested that a set of instruments addressing this lack of understanding could be an effective way to tackle this issue. The first version of the IEEFP was born shortly after and was initially implemented in Thailand and Mexico. The EVO predicts that after a few review processes and some minor modifications, the protocol will provide a standardized approach for energy efficiency financing across the world.

At first glance, the IEEFP seems to be a good initiative to tackle the energy efficiency financing issue. However, the document ignores pivotal topics that financial staff may use to improve their credit assessment processes and reduce the perceived risks of these technologies. Further, its approach is generic and does not consider the specific contexts of countries wishing to implement it. The next section will address how to complement the financing protocol so that it takes India’s specific business mindset into account.

#### 3.1 What Does a Robust Financing Protocol Need to Address?

Although EVO did admirable work by developing a first set of international guidelines to encourage the financing of energy efficiency projects, the document needs to be further developed into a version responsive to every country’s particular conditions. In its current state, the protocol is a guide covering topics such as current energy efficiency technologies, energy efficiency market potential, ESCO-based business models, risks involved in energy efficiency financing, measurement and verification practices, and a few evaluation tools serving as baselines for credit risk assessment (EVO, 2009).

For the document to be a useful tool for credit risk assessment teams in specific countries, it needs to provide information on local energy efficiency regulatory frameworks and incorporate lessons learned from the first energy efficiency lines of credit implemented by leading financial institutions. It should also discuss innovative risk management mechanisms such as clear ring fencing and revenue collecting structures. Finally, it should also consider the particular risks presented in the geographical areas where projects are going to be implemented, as well as the cultural mindset represented in local traditional business behaviours and practices.

In India, USAID and the BEE have jointly organized a series of training courses on energy efficiency financing in an attempt to beef up the topics covered by the EVO protocol and to gauge the banking community’s feelings on the issue. These activities are developed under the umbrella of the Partnership to Advance Clean Energy-Deployment program. They include seminars and roundtables discussing national energy efficiency market trends, national public programs supporting the implementation of these technologies, and case studies that demonstrate payment performance and the technologies used to achieve efficiency (Chaturvedi, 2014).

These efforts to increase awareness of energy efficiency intricacies are praiseworthy, yet they have not created the expected effect on the energy efficiency market. Several meetings between IISD staff and local bank representatives concluded that banks already providing energy efficiency loans in India are doing so by using foreign donor lines of credit and are not taking a direct risk stake through the use of their own resources. This is a sign that risk perception persists and confirms the need to re-assess what has been already offered. Furthermore, in order to increase the chances of financing energy efficiency, the financing protocol needs to be tested using real-time projects in which banks conduct their assessment procedures using these guidelines.

Table 1 explains in detail what a future energy efficiency financing methodology needs to include (some topics may change after further meetings with stakeholders).

**TABLE 1. THEMATIC SCOPE FROM A FUTURE ENERGY EFFICIENCY FINANCING PROTOCOL.**

TOPICS COVERED BY THE PROTOCOL	
RISK ASSESSMENT TOOLS	DEVELOPING ENERGY EFFICIENCY BUSINESS LINES FOR COMMERCIAL BANKS
<p><b>Project appraisal and economics</b></p> <ul style="list-style-type: none"> <li>- <b>Project appraisal methods:</b> Include clearly defined credit risk methods in traditional loan assessments (acceptable net present value, internal rate of return, loan terms, etc.).</li> <li>- <b>Loan security transactions and collateral:</b> Explore alternative collateral-free methods to secure energy efficiency transactions.</li> <li>- Reviewing the financial capacity of borrowers: Analyze bank’s current credit assessment practices (bank approval criteria, documentation, risk management procedures, etc.).</li> <li>- <b>Standardizing agreements and documentation:</b> Define suggested guidelines to assess energy efficiency loans.</li> </ul> <p><b>Credit enhancement mechanisms to be coupled with energy efficiency financing</b></p> <ul style="list-style-type: none"> <li>- <b>Discuss integration strategies between credit enhancement programs and credit guidelines that may result in increased credit levels for energy efficiency projects.</b></li> </ul> <p><b>Current/needed regulatory frameworks to bulletproof the business models</b></p> <ul style="list-style-type: none"> <li>- <b>Discuss the appropriate regulatory frameworks for reducing risks in energy efficiency loans.</b></li> </ul>	<p><b>Energy efficiency business line development:</b></p> <ul style="list-style-type: none"> <li>- <b>Business development guidelines:</b> The approach will include specific guidelines and recommended procedures to develop energy efficiency financing as a new business line in banks and other LFIs.</li> </ul> <p>New commercial strategies and products need to be inclusive in their documentation, profiles and business practices in India and understand the country’s business mindset. This is crucial to minimize perceived risks from banks and other stakeholders.</p> <p><b>Defining business model and competent parties</b></p> <ul style="list-style-type: none"> <li>- <b>Incumbent companies for energy efficiency in India:</b> For example, the inclusion of BEE auditors as technically competent third parties in charge of measurement and verification review will be pivotal for the business model.</li> <li>- <b>Lessons learned and best practices on energy efficiency financing:</b> From banks already implementing energy efficiency financing (ring- fencing structures, escrow accounts and joint bank accounts, the inclusion of staff with technical knowledge, evaluation of each project on a case-by-case basis, etc.).</li> </ul>

## 3.2 Lessons Learned from Local Banks Already Providing Energy Efficiency Financing in India: The cases of SIDBI and ICICI Bank

The lessons introduced below emerged from recent discussions held between IISD members and energy efficiency experts. These conversations proved to be fruitful for defining which topics should be included in a future energy efficiency financing protocol, as banks like ICICI and SIDBI already have experience in financing energy efficiency projects. We will introduce some of these practices and explain why they might be useful for the protocol.

### *ICICI's Risk Appraisal Methodology*

ICICI Bank has been successful in using escrows to ring-fence its first projects, and its approach to project appraisal, on a case-by-case basis and using different lending models, seems to be a good path to follow.<sup>2</sup> This approach has been possible thanks to the inclusion of credit risk officials and other staff with no finance background. Instead, the main qualification has been technology, energy, and/or any other technical area in energy efficiency technologies and renewable energy. This provides the required knowledge and expertise to design appropriate financing structures according to every project's features, while new staff builds up financial expertise to team up with the existing credit assessment workforce.

In many of the projects financed by ICICI, the involved ESCOs did not have the financial strength to implement the projects by themselves, and therefore the bank tried to monetize the savings using an escrow account. Overall, all of the projects financed using this scheme presented outstanding payback performance. This is especially significant given that ICICI has financed projects from different backgrounds, including edible-oil refineries, textile companies, coal producers and public street light projects.

The bank has also implemented a few energy efficiency lines of credit using international funding. One of the most prominent ones through which the vast majority of projects have been financed was a line of credit for INR25 million (US\$400,000) implemented alongside the World Bank. Among the financed technologies, the bank included thermal energy efficiency (e.g., industrial boilers, waste heat recovery and industrial cogeneration) and electrical products (e.g., HVAC, lighting, water pumping and street lighting). All these projects have shown energy savings in the range of 15 to 30 per cent (PACE-D, 2013).

### *Technical Expertise and Risk Management from SIDBI*

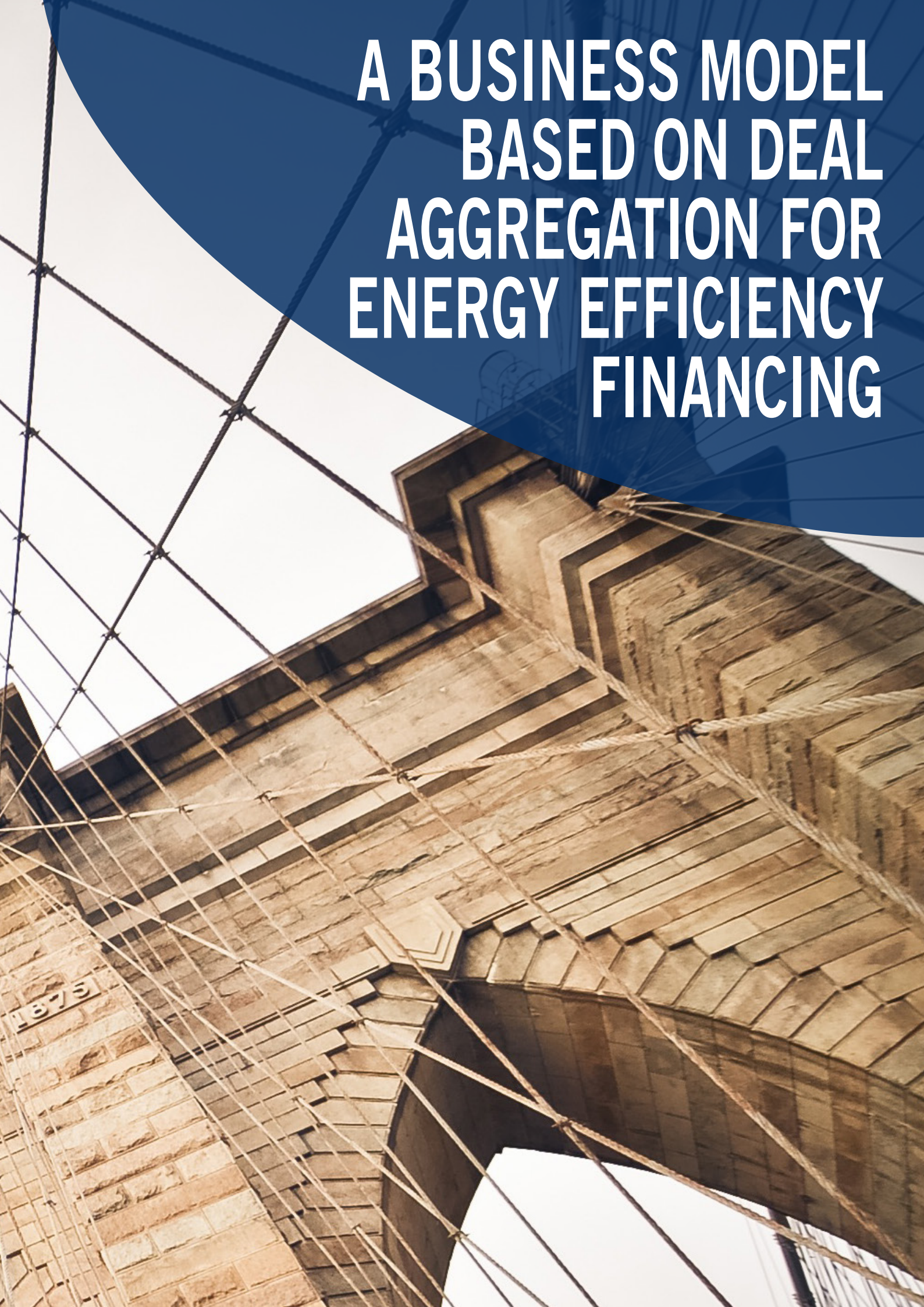
SIDBI is one of the main actors lending to energy efficiency projects at the level of small- and medium-sized deals. Not only has it been funding energy efficiency projects for small- and medium-sized enterprises (SMEs), but it has also implemented programs like the Partial Risk Guarantee Fund and the Credit Guarantee Fund Trust for Micro and Small Enterprises. These schemes act as catalyzers to facilitate energy efficiency financing by reducing projects' risks and ruling out the need for collateral through monetary cushions and insurance.

In 2007 and 2008, SIDBI received the first lines of credit from Japan International Cooperation Agency to finance existing energy efficiency projects. A second line of credit was implemented using KfW funds, and it was based on pre-selected machinery and equipment. Eventually, the French Agency for Development (Agence Française de Développement, AFD) came in with a third line of credit. Currently, the bank is implementing the three programs in parallel.

SIDBI has also liaised with The Energy and Resources Institute (TERI) and created an energy efficiency program based on five technology clusters. In the program, TERI studied a number of different technologies and conducted several energy audits to define potential projects. TERI is now structuring the implementation phase and will oversee the project savings once the equipment has been installed. Meanwhile, SIDBI will provide the financing and credit risk assessment with the aid of previously developed assessment templates. These tools will allow energy efficiency project hosts to calculate expected energy savings by providing only information regarding their energy consumption and the equipment or measures to be implemented.

<sup>2</sup> ICICI has achieved outstandingly shorter payback periods by effectively using escrow accounts, moratoriums, payback periods matching cash flows and alternative collateral structures on its loan appraisal systems.

# A BUSINESS MODEL BASED ON DEAL AGGREGATION FOR ENERGY EFFICIENCY FINANCING



## 4.0 A Business Model Based on Deal Aggregation for Energy Efficiency Financing

Besides introducing a bespoke financing protocol for India, it is also important to explore the value of a business model with the capacity to spur energy efficiency financing across industrial sectors. This type of model may be the case for adopting a mechanism to pick a group of energy efficiency deals from a particular industry and pooling them into a single package that could later be offered to banks. This would create a business model that not only increases the deal size, but also diversifies the credit risk and reduces the transaction costs involved from individual energy efficiency loans.

For businesses willing to implement energy efficiency projects, the benefits offered by this model go beyond enabling access to financing. In fact, regardless of their size, companies across industries that adopted this model would improve their competitive position, since a less energy-intensive process means reduced operating costs. For the country as a whole, apart from the visible economic and environmental benefits, the model could also be regarded as the first step toward the development of a market for the securitization of this type of product.

**The value of a business model for energy efficiency deal aggregation goes beyond increasing funding for these projects. In fact, it helps to develop local capital markets and to diversify the investor base for energy efficiency projects.**

At this point, the particularities of this business model need to be further explored. However, it is important to mention that it would resemble in many aspects the process used to securitize any financial product. To illustrate how these two models would be linked, sections 3.1 to 3.5 will delve into the concept of securitization and suggest an initial model for energy efficiency deal aggregation in India. Finally, the discussion will analyze some examples of energy efficiency loan aggregation currently used in the United States and explore the implementation of a market for institutional investors to fund energy efficiency projects.

### 4.1 Deal Packaging and Securitization: How a pool of loans offsets credit risk

Few experts would cast doubt on the capacity of structured finance products to channel resources into assets that would otherwise be considered illiquid. This is the case for the energy efficiency sector, where investors have traditionally recognized that loans are unattractive because of their small size and perceived risks but few structured products have been created to tackle these complications. The situation is exacerbated by the fact that wind, solar and energy efficiency equipment is difficult to finance given its huge capital upfront, lack of performance data and loss value from the system once it has been installed.

Default risk worsens when energy efficiency loans are looked at individually, as there are no standardized procedures to measure energy savings and because the lender is placed at the mercy of the equipment's performance. If the project fails, banks cannot rely only on the strength of the borrower's balance sheet to recoup the payments. To a minor extent, in India the creditworthiness of energy efficiency projects can also be affected by external events, such as a substantial increase in energy bills, technology performance risks and lack of political support for public projects.

Securitization is the right solution to reduce some of these risks and increase capital injection from financial markets. To devise a deal aggregation mechanism sensitive to the Indian context and to explore the benefits of asset bundling, it is necessary to start with the basic concept of securitization and the parties involved in it.

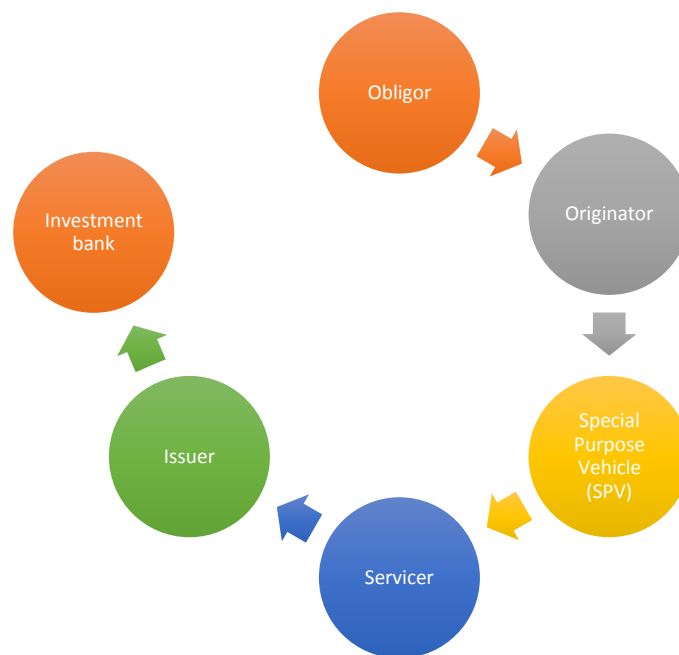
#### ***Securitization, Loan Bundling and Deal Structuring***

A basic description of securitization is directly related to its main objective, which is to pool and convert a package of illiquid assets into a risk-sensitive, marketable security. These standardized issuances give investors the right to receive the cash flows generated by the underlying assets. The interest rate paid by the security is consistent with the underlying asset's credit risk and the robustness of the underpinning structure.

Securitization is also an effective tool for risk diversification. In line with modern portfolio theory, a pool of securitized loans resembles an investment portfolio whose returns depend on a group of diverse, uncorrelated assets. Therefore, a well-diversified security will be backed by a number of loans with a broad array of technologies and borrowers, and belonging to different geographical areas. An additional key aspect that reduces default risk for the transaction is the originator’s ability to assess the securitized loans at the first level. In other words, if the originator has strict credit evaluation policies, chances are higher the selected loans for the transaction will have better credit quality.

A particular feature of any securitization is the structuring costs originators face when issuing a security. This process is always lengthy and expensive because of all the parties involved and the substantial diligence efforts reflected in the high salaries paid to lawyers, accountants, researchers and fund managers. For energy efficiency in particular, the deal size is an additional burden, as it stands on average at US\$100, 000 for industrial facilities. Therefore, this type of securitization usually faces excessive structuring costs relative to the deal size, and it only becomes profitable when a group of loans has been pooled to achieve a sizable package (Bazilian, Alcorta, De Simone, & Pedersen, 2014). Some experts estimate that funding costs for the energy efficiency industry may be reduced in the range of 3 to 7 per cent if appropriate collateralizations are structured and marketed (Nelder, 2013).

Deal structuring is of particular interest for the originator, and it will define the financing costs to a certain degree. Therefore, selecting the appropriate deals to back the security, partnering with seasoned investment banks and legal counsels, and establishing clear legal agreements and liens for the issuance will be key factors in achieving low interest rates. Figure 1 shows the parties and describes the roles involved in a typical securitization process.



**FIGURE 1: PARTIES INVOLVED IN A SECURITIZATION TRANSACTION.**

Source: Lowder and Mendelsohn (2013).

In Figure 1, the **obligors** are the residential or commercial owners implementing the energy efficiency and renewable energy projects in their facilities and servicing the loans from savings. The **originator** is the involved financial institution creating the loans and/or accounts receivable. In the energy efficiency and renewable energy space these players may be solar companies, ESCOs, or third-party finance providers such as public development banks or commercial banks. The **special purpose vehicle (SPV)** is the trust created for pooling the loans and forms the collateral for the security issuance.



In turn, the **servicer** is the entity managing the SPV and overseeing crucial aspects of the deal, such as compliance with the agreement and collection of payment from the obligors. Meanwhile, the **issuer** is in charge of the deal structuring and setting up the cooperation agreements with **investment banks** and legal advisors. Finally, the chosen investment bank will assist the originator in creating an SPV into which the group of loans will be grouped and the security issued. This company also structures the deal, coordinates the market offering to potential investors and executes the sale (Lowder & Mendelsohn, 2013).

Notes may take a variety of forms, including bonds, stocks and different types of asset-backed products. Among the latter, it is common to find asset-backed securities (ABS), collateralized debt obligations, collateralized loan obligations and credit default swaps. The structure of all these is partly similar, but the type of assets being bundled may be different. For example, ABS may entitle investors to cash flows generated from assets that are not necessarily linked to loans and mortgages, such as revenues generated from credit card debts, cell phone towers and franchise fees.

### ***Which Structured Finance Product Is the Most Suitable for India?***

The chosen vehicles to structure securitization deals in India will be conditioned to the development of local capital markets and the interest from banks to increase the amount of loans to energy efficiency projects. If investment banks with presence in the country have no track record in structuring securitization deals, the process will require international investment banks to come in and structure initial pilot issuances in order to kick-start a market.

International experience shows that solar energy securitizations have been structured using ABS rather than any other existing structure. This choice has been supported by the fact that, unlike bond and stocks financing, ABS and collateralized loan obligations allow for risk tranching and thus more flexibility for institutional investors to invest according to their risk profile. As we will see in subsequent sections, some issuances, such as that of SolarCity and the PACE program in the United States, have already used securitized bonds backed on energy efficiency and renewable energy loans. Given the similarities in terms of risks and profits, it is likely that energy efficiency securitizations in India may be initiated using the same instruments as those used in the United States.

## **4.2 The Benefits of Using Special Purpose Vehicles and Credit Enhancements in Securitization**

### ***SPVs and Deal Structuring***

SPVs are the cornerstone of modern financial structures. Underwriters use these types of trusts to isolate the pools of assets being used as collateral for instruments such as ABS, mortgage-backed securities and collateralized debt obligations. SPVs are also used to transfer the assets from the originator's balance sheet using a "true ownership" contract. Consequently, when a portfolio of assets belongs to the trust, the assets' credit risk is segregated from the originator's corporate risk, and only their performance will define the stability of the resulting cash flows. At this point the assets are said to be "bankruptcy remote."

The establishment of an SPV and the variety of loans that are transferred to it also make it possible to create a structure that diversifies the credit risk. Here, in line with modern portfolio theory, risk diversification is achieved thanks to exposure to a set of uncorrelated assets. An additional advantage offered by SPVs comes in the form of tranching, which is the natural credit enhancement mechanism used in any securitization. When a note has been tranching, it presents a number of different risk levels matching a broad scope of investment profiles. Risk levels are organized according to the investor's seniority in accessing the underlying asset's cash flows, with the lowest seniority being in an equity position. A tranching note is usually known in the financial world as a "waterfall."

## ***The Importance of Credit Enhancement Mechanisms in Energy Efficiency Securitization***

Credit enhancements may be regarded as a type of insurance for improving the creditworthiness of borrowers and covering lenders against unexpected losses. Although they might be used to reduce credit risk across different financial transactions, they are widely seen in structured finance products. For energy efficiency in particular, the benefits of using credit enhancements have been mainly documented in the first energy efficiency and solar securitizations carried out in the United States.

As discussed in section 3.3, the first energy efficiency bond issues used mechanisms like overcollateralization, excess interest and liquidity reserve accounts. The first two are briefly defined and explained below.

### ***Overcollateralization***

According to experts in the field, one of the main risks of energy efficiency projects relates to the lack of historical data on default loans and high probabilities of an uneven debt repayment. These are perils that cannot be optimized once a group of energy efficiency projects has been bundled, and for this reason it is necessary to include a credit enhancement mechanism like overcollateralization as a way to improve the creditworthiness of the structure.

Overcollateralization provides a safe cushion for institutional investors by leaving part of the pooled assets isolated from the securitization transaction. For example, if \$100 million in assets are set aside in an SPV and from these \$10 million are allotted as collateral, then the issued security will amount to \$90 million, and the remaining assets will serve as a bolster for unexpected losses.

### ***Excess Interest Spread***

**In the United States, the first securitizations on renewable energy projects used credit enhancement mechanisms such as overcollateralization and excess interest reserve accounts.**

**For the business model in India, publicly supported credit enhancements may be appropriate to increase the credit rating of the operation.**

This credit enhancement technique consists of creating a backstop account and funding it with the difference in interest received from the underlying loans and that obtained from the issued notes in the securitization. For the fund to receive a positive cash flow, the interest paid must be lower than the interest rate received from the pooled assets (Sandback, 2013).

The reserve account will be structured as an escrow, meaning the investment bank or the structuring company will not have access to it. Only if any of the underlying assets defaults will the affected investors have access to the funds and recover the lost amount.

### ***Credit Enhancement Mechanisms Suitable for India***

Specialists in energy efficiency securitization usually suggest public entities play a pivotal role in structuring and funding credit enhancement instruments for those countries with unripe capital markets. Examples of these mechanisms are first-loss reserve, co-investment and mezzanine investments. A deep explanation of these mechanisms is beyond the scope of this document, but the key point is that the government, whether as investor or lender, is in the first position for bearing losses from defaulted loans.

Clearly, the inclusion of these structures may create traction in the nascent energy efficiency markets by driving the appearance of structured finance products. For India in particular, public and semi-public institutions at national and local levels (such as EESL and BEE) may act as risk-absorbing entities providing funds to create more stable securitized structures. These instruments generally place these entities as co-investors taking equity and lower seniority positions to increase the credit rating of higher tranches (Lowder & Mendelsohn, 2013).

### 4.3 A Suggested Deal Aggregation Structure for Energy Efficiency Financing in India

Designing a structured deal may prove to be a challenge in a country with undeveloped capital markets. Not only would it be difficult to find appropriate partners, but without a clear regulatory framework to settle disputes and full government support, the transaction would rarely attain investment-grade levels. Further, the value of publicly supported credit enhancements is notorious in India, as few financial and insurance companies are expected to cover the default risk coming from energy efficiency projects.

When structuring a model of aggregation, only companies with certain traits will be suited for taking up a coordinating role. In India, suitable companies will be either local banks with expertise in financing energy efficiency projects or public entities with a mandate to develop these technologies. As explained in section 2, institutions like SIDBI and ICICI Bank are in a good position among commercial banks to lead the structuring activities. The second path would require public entities like BEE or EESL to take this responsibility. To a certain extent, even big international ESCOs, such as those coming from the United States or Europe, have the financial strength and the capacity to carry out the coordination activities. In any case, the ideal situation may require the organizer to establish a SPV against which the loan package will be subscribed.

The role of the deal coordinator is also crucial for minimizing the credit risk. Depending on how wisely different project variables are assessed and combined, a package of deals will be heterogeneous enough to offset the credit risk at the loan level. A group of energy efficiency projects may have lower chances of default if it has marked differences in terms of funding structure, technologies involved, geographic location, loan size, etc. In India, for example, energy efficiency seems to revolve around three representative cases: small companies implementing projects with low capital requirements, large companies implementing small projects and large companies implementing large projects.

The stability of the business model will revolve around three main characteristics: the organizer's negotiation strength, the organizer's ability to attract investors and borrowers, and the setting up of an escrow account where the SPV guarantees project delivery and finance. This list may be changed or expanded, with its final shape emerging after detailed stakeholder consultation and research.

#### *The Business Model in Brief*

A model of energy efficiency deal aggregation can be structured in two different ways. In the first case, a financial institution is the leading company in charge of structuring the transaction. Regardless of whether that company provides the initial funding for the projects, its role will be to bundle a group of energy efficiency loans and sell it to a third party. The offered product can take different forms: a one-off debt transaction offered to third-party banks, and regular bonds or more complex financial product such as ABS, sold in capital markets. Usually, buyers of this type of product would be other financial institutions or institutional investors willing to get exposure to this specific sector.

**EESL has pointed out a group of small municipal lighting projects as the first potential candidates to be bundled into an energy efficiency loan package.**

Alternatively, a large ESCO may be entrusted with both implementing the energy efficiency projects and coordinating the grouping activities. One special benefit of using an ESCO to structure the transaction is the possibility of reducing performance risks, as these companies are directly in charge of implementing the selected projects. In addition, when these companies have the financial ability to fund the projects themselves, it is easier to collect monetized energy savings through escrow accounts or any other type of ring-fencing structure.

Moreover, as we will see in the Warehouse for Energy Efficiency Loans (WHEEL) and PACE programs, these schemes represent a wonderful deleveraging opportunity for those ESCOs already providing financing. This could be done by, for example, issuing a bond against a group of deals and collecting funds to finance the next group of loans. In

addition, under this second scheme any of the financial products described for the first case could also be used. Therefore, it seems to be the most interesting alternative for a model of energy efficiency deal aggregation in India.

An aggregated deal structure using ESCOs may bring additional benefits to the energy efficiency market in India. Higher-deal volumes and a clearly identified organizational structure behind the deal structuring act as cornerstones for institutional investors to step in with additional investment vehicles, such as debt and equity funds. These types of mutual funds can increase the investor base and may act as a bridge to fill the gaps left by commercial banks and government financing programs. More concrete ideas may be explored in this field, especially regarding the supporting mechanisms that may be used by the national governments in order to assist these structures.

To conclude, it is important to say that EESL has pointed out a group of small municipal lighting projects as the first potential candidates to be bundled into an energy efficiency loan package. The public profile of these projects sets up an ideal environment for institutions like EESL or SIDBI to act as cluster companies in charge of structuring the transaction.

#### 4.4 International Experiences in Energy Efficiency Deal Aggregation: The WHEEL and PACE programs

Section 3.3 ventured into describing a business model of energy efficiency deal aggregation. This is a particularly challenging task, since there are few records of similar programs in other countries. In fact, taking securitization alone, the number of securitized instruments in India is small when compared to other more advanced markets, and this makes the scope for these ideas even wider. The need to develop a model of energy efficiency deal bundling and/or securitization is essential, especially as banks have started to recognize that financial innovation is the next big step in the clean energy space (Clark, 2015).

The purpose of this section is to present a couple of groundbreaking models that, while not related to securitization per se, resulted in the issuance of financial products that increased funding for renewable energy projects. These projects were developed in the United States, a country that has taken a leading role in this field and has an adequate regulatory framework and well developed markets for the introduction of such mechanisms. Although the situation in India is far from being the same, we hope some lessons could be learned and replicated in other, less developed countries.

While both the Property Assessed Clean Energy (PACE) and Warehouse for Energy Efficiency Loans (WHEEL) schemes were launched only a few years ago, they have already shown positive results in increasing funding for energy efficiency and renewable energy projects. The two programs issued securities with attractive financing terms, offering yields between 5.5 and 6 per cent, a 10-year to 15-year tenor, and credit ratings from AA to AAA (Lowder & Mendelsohn, 2013). Of particular interest is the analysis of the structures underlying the deals, especially when it comes to examining the credit enhancement mechanisms used in the transactions.

##### *PACE Program*

Managed as a hybrid program, PACE's main goal is to increase mainstream funding to energy efficiency and renewable energy projects in residential and commercial areas. The program was launched in 2008 and has been implemented in various municipalities across the United States. The city of New York, through the New York City Housing Authority, has actively used this initiative. The program represents one of the most innovative business models for energy efficiency financing in the city, with a bond issuance featuring a coupon of 4.75 per cent and a US\$104 million deal. The breakthrough of the issued security remains on the credit enhancement mechanisms used to provide security to investors, such as overcollateralization, excess interest and a liquidity reserve account. The structure was also a low risk bet for investors, as the cash flows backing the transaction were linked to charges on top of property tax bills (Tempkin, 2014).

In the PACE program, municipalities issued a bond in exchange for funds to finance the upfront costs associated with energy efficiency and renewable energy residential projects. Unlike a regular securitization, where the servicer entity usually leads the cash collection activities, the PACE program introduced an innovative mechanism that substantially reduced risks by directly collecting fees from the property taxation bills. In addition, municipalities never undertook the project activities, so homeowners bore the performance risk (Berger, 2013).

On one hand, the PACE program is an exceptional example of a government-backed deal aggregation structure and sheds light on the market's appetite for this type of structure. It also outlines the potential attributes an energy efficiency-backed security needs to have when issued. On the other hand, the deal structuring of PACE may not be fully replicable in other locations, as the involved municipality must be in a strong financial position to initially fund the projects and to structure the transaction. Furthermore, the purpose of the deal coordinator in PACE was limited to structuring the deal and issuing the bonds, rather than undertaking project development. This is a characteristic that may be necessary for India, given the lack of ESCOs with the expertise and strong financial position needed to carry out these activities.

### **WHEEL Program**

Initiated in March 2013, WHEEL represents an interesting securitization model that aims to increase the amount of funds for home improvements in energy efficiency and clean energies. The National Association of State Energy Officials administers the program, pooling unsecured loans into a specially created warehouse until the amount is big enough to support a bond sale to institutional investors. The program was initially launched in the state of Pennsylvania, where a group of 1,500 unsecured loans totaling US\$15 million were financed and securitized by mid-2014.

The model has successfully freed up public resources, since the loans were provided directly by state and local programs. This has allowed for more money to be channeled into energy efficiency. WHEEL also lowers the capital burden for participating homeowners, who now face lower financing costs for their efficiency projects.

Many experts in the energy efficiency sphere argue that WHEEL has tremendous potential to reduce greenhouse gas emissions in the coming years, and furthermore, the scheme seems perfectly suited to help in the development of local capital markets. An additional benefit of WHEEL is that it eliminates buyer's remorse by working with pre-selected contractors who undertake the project and are not paid back until the customer is fully satisfied (Clouse, 2014). Regarding the transaction structure and as it happens with PACE, WHEEL also represents a close example to what India may need as a securitization program. The only difference would be that the coordinator would only be in charge of pooling and isolating the loans, instead of developing and financing the projects by itself.

In general, if well structured, securitized assets offer institutional investors the additional benefit of diversified credit risk and a broader set of credit enhancement mechanisms that could be applied to each of the security tranches. Moreover, as these transactions are backed on cash flows from an uncorrelated, diverse set of loans, the SPV containing the assets has a low default risk, and its performance may only be jeopardized in the face of systemic default scenarios, such as those events that were triggered by the 2008 financial debacle.

## **4.5 Banks' Deleveraging and the Development of a Market for Attracting Investors through Debt Funds**

As we have discussed, a business model based on deal aggregation offers diverse benefits for the energy efficiency sector in India. However, with the increase in energy efficiency financing, new and alternative funding sources may appear. In particular, institutional investors (e.g., pension funds and insurance companies) could make use of investment vehicles like equity and debt funds to pump resources into energy efficiency projects. Eventually, this would broaden the investor base, making the model less dependent on banks.

Additionally, investment banks may also tap into a new group of small investors that would otherwise find energy efficiency prohibitive due to the high initial investment needed. This category, mainly composed of individuals and SMEs with excess liquidity, could have direct exposure in these securities or invest indirectly through the use of investment vehicles like debt and equity funds. For India, these funds would constitute a new niche in the energy efficiency investment spectrum, as there is no record of mutual funds investing in energy efficiency and renewable energy projects.

**By creating a market for aggregated energy efficiency and renewable energy loans, deal coordinators and investment banks may be tapping into a new group of institutional investors.**

**In particular, pension funds and insurance companies may use investment vehicles like equity and debt funds to channel resources into energy efficiency projects.**

### ***Debt funds***

Debt funds are mutual fund schemes in which a group of private investors come together and bundle their resources to get exposure to investment products that may usually be out of reach at an individual level. Debt funds are exposed to debt instruments like bonds, fixed deposits, treasury bills, commercial notes and securitized products, among others.

According to their investment mandates and risk profile, debt funds are set up to maximize the investor's return using a mix of products with different maturity profiles and performing across different macroeconomic scenarios. For instance, floating rate funds are specialized in floating rate securities generating profits from changes in interest rates. When interest rates go up, these funds perform well, based on higher coupon payments. Conversely, income funds invest in medium- and long-term corporate and government bonds. These investment vehicles generate substantial returns if the outlook for reference rates shows a downward trend (ICICI, 2013).

In India, the size of the debt funds market is swelling as a result of the latest measures implemented by the RBI. The activities aim to boost capital markets by withholding tax on bonds and relaxing capital controls (Wong, 2014). Therefore, the near future seems promising for debt funds, and it is estimated their number will increase significantly, taking into account that as of today only five infrastructure debt funds are operating (Ashworth, 2014).

## 5.0 Conclusions

When announcing this year's national budget, the Gol asserted it would put substantial effort into attracting more private investment. In fact, one of the main discussions revolved around the idea of creating a more business-friendly environment as a way to increase the amount of private funding in infrastructure. The government expects to do this through a vast number of measures, including relaxing banking regulations and reducing taxation levels in certain industries. This clearly shows an ambitious stance in the pursuit of higher economic growth, but sadly, it also shows that Indian leaders are planning to increase the country's production without considering a smarter use of available resources.

As far as energy issues are concerned, the government did not state commitments or goals aimed at achieving lower energy consumption levels. Instead, officials announced the construction of five electrical mega-plants as a measure to increase India's energy capacity. With an explicit announcement for tackling energy deficiencies from the supply side, it is clear that little interest has been put in implementing smarter paths for achieving energy security.

The current policy environment brings little support for the ideas in this document, but it also highlights the importance of finding alternative ways to implement them. This is crucial in the face of forecasts estimating economic growth of at least 8 per cent for 2015, which will undoubtedly boost industrial production levels and result in more infrastructure projects ("India budget to boost investment," 2015). Painfully, there's no certainty the country will grow through the use of smarter energy consumption practices.

The methodologies and business models here presented are the result of research and conversations held with finance and energy experts. This shows that the knowledge and expertise for implementing innovative ideas is already there. Yet, the latest public announcements prove that for these measures to be implemented, stronger public support is needed. India seems to be ready to enter into an age of attractive economic development, but doing this through the energy efficiency path requires redefining current public priorities.

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## Appendix A: Infrastructure Financing in India: A summary of recent developments

### Post-Election (May 2014) Position

The new government promised several drastic changes in economic policy, especially with reference to infrastructure development in India. Some of these were stated in the budget, and others were brought in as regulatory changes by the RBI, the Securities Exchange Board of India (SEBI), and other governmental and quasi-governmental institutions. The High Level Committee on Financing of Infrastructure also released its second report in June 2014, highlighting general and sectoral recommendations for increasing investment in infrastructure financing.

### RBI Initiatives to Support Infrastructure Financing

1. One of the most significant regulatory modifications was announced through the RBI circular released on July 15, 2014. This circular followed up on the budgetary promise that banks would be encouraged to lend to infrastructure by issuing long-term bonds with waivers on the cash reserve ratio, statutory liquidity ratio and Priority Sector Lending targets. The RBI has also now allowed banks to lend to very long-term projects, with an option to refinance them periodically. Banks can, for instance, lend to a 25-year project, with an option to roll the loan over after five years.<sup>3</sup>
2. For existing infrastructure and project loans, the RBI has relaxed the norms on take-out financing, announced via a notification released on August 7, 2014. While subject to certain conditions (standard loans, and a minimum loan of INR10 billion or US\$160 million), the minimum take-out requirement has been reduced from 50 to 25 per cent.

### SEBI Proposals to Encourage Infrastructure Financing

1. The SEBI released a consultation paper on November 4, 2014 aimed at removing restrictions on infrastructure financing. The intention is to allow foreign venture capital investors to participate in the infrastructure sector as core investment companies. This is seen as a move to attract more foreign investment without derailing the current norms on foreign venture capital investors and their current inability to invest in NBFCs in India.
2. SEBI has also introduced infrastructure investment trusts based on real estate projects. This should be particularly relevant and useful for infrastructure assets with stable cash flows (such as roads and highways projects).

### Indian Infrastructure Debt Funds

The Indian Finance Ministry has approved a tripartite agreement (between the trusts that run the ports owned by the Indian government, the private developers of these ports and IDFs) for take-out financing of PPP projects in the ports sector.

### Tax Measures

The Central Board of Direct Taxes released a circular in July 2014 that extends the lower rate of 5 per cent for withholding taxes on long-term infrastructure bonds. The low taxes deadline for these bonds has been extended from July 2015 to July 2017.

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<sup>3</sup> A brief summary of the RBI Circular will be provided in the Annex.

### Other News and Proposals

- An amendment to the Land Acquisition Act will be tabled in the winter session of the Indian parliament to water down the mandatory consent of at least 70 per cent for PPP projects and 80 per cent for private projects.
- 3P India will be launched as a company that will follow Finance Ministry policies to address weaknesses and support mainstreaming PPP projects in India.
- The IFC has issued “masala bonds” for INR10 billion (US\$160 million), the proceeds of which will be used to invest in local Indian infrastructure projects.
- A memorandum of understanding for setting up the U.S.-India Infrastructure Collaboration Platform was signed in September 2014. This collaboration is intended to increase the participation of U.S. companies in Indian infrastructure development.

## Appendix B: Activities to Foster Energy Efficiency Financing: An international overview

### *Current Practices in Brazil*

Brazil, the biggest economy and most populated country in Latin America, is a market with huge untapped energy efficiency potential. Although the federal government has implemented several measures to spur the market since the mid-1990s, in recent years its energy consumption levels have risen at faster rates than the GDP and have overtaken those of advanced economies such as France and the United Kingdom (Gorini, 2014). In light of this situation, several measures still need to be implemented to fully develop the market, and in the context of this document we will discuss some of the initiatives that have proven to be successful. In particular, we will look at the national law imposing compulsory energy efficiency investments by national utilities, the creation of a national ESCO association and the implementation of an energy efficiency guarantee mechanism.

One of the most successful initiatives to kick-start the energy efficiency market in Brazil was the development of an accreditation program for ESCOs (see Box 1). Yet, receiving the certificate not only means an increased perception of quality from the energy efficiency community. In fact, it brings financing benefits to the accredited ESCOs through the coupling of the QualiEsco program with other support schemes. For example, by mid-2014 the Brazilian Association of Energy Services Companies (ABESCO) launched the BNDES MPME program, an innovative line of credit offering attractive financing terms for qualified ESCOs. BNDES MPME offers loans with an interest rate of 4 per cent per year, with a maximum 10-year term. The program substantially reduces funding costs, as ESCOs don't have to leverage themselves with funding sources that have traditionally been more expensive. For example, development banks' energy efficiency loans have charged 12 per cent per year in interest, and commercial banks charge up to 25 per cent per year in interest (Ambiente Energia, 2014).

#### **BOX 1. QUALIESCO: ACCREDITATION SCHEME FOR ENERGY SERVICES PROVIDERS.**

QualiEsco was born in 2011 as one of ABESCO's flagship initiatives. The program's purpose is to build confidence in energy efficiency projects and to increase awareness of ESCOs' qualities by creating a systematic set of rules that, if met, will result in the accreditation of member ESCOs as high-quality providers. As of 2014, 21 of the 76 companies registered in the association had completed the process and received the QualiEsco certification.

To be certified, companies undergo a documentary analysis evaluating their experience in a particular type of service. The evaluation criteria take into account the following aspects:

- Registration of the performance achieved in aspects like energy efficiency, audit and assessments in projects executed
- Technical capacity of the staff to carry out the work
- Post-implementation report of completed projects

For more details on the criteria to qualify as certified ESCO, go to [www.abesco.com.br/qualiesco/](http://www.abesco.com.br/qualiesco/)

### **The Energy Efficiency Guarantee Mechanism**

This credit enhancement mechanism introduced by ABESCO in July 2012 uses the AAA credit rating from the Inter-American Development Bank to incentivize energy efficiency borrowing. The program benefits private sector lenders, ESCOs, and ESCO clients by covering up to 80 per cent (up to US\$800, 000) of energy efficiency projects with up to seven years tenor. The program offers two insurance products: Comprehensive Risk Guarantee and Technical Risk Guarantee. The former is the more comprehensive and covers defaults on both the technical and financial creditworthiness of a project.

It is estimated the program will create energy efficiencies in the commercial and residential sectors in the order of 4 million megawatts of energy in the next 20 years and will reduce greenhouse gas emissions by 9.6 million tons of carbon dioxide in the same period (Mecanismo Garantidor de Eficiência Energetica, 2014).

## **BOX 2. MANDATORY INVESTMENTS ON ENERGY EFFICIENCY BY PUBLIC UTILITIES.**

In 1998, through Resolution 242, Brazil's national electricity regulator, Agência Nacional de Energia Elétrica (ANEEL), established that energy distribution companies were required to invest 0.5 per cent of their annual revenues into energy efficiency projects under regulatory oversight (ANEEL, 1998). In 2001 the measure was re-stated by issuing Law 9991. Under the new enactment, the supervisory body established that activities should be aimed at increasing energy efficiency in low-income zones and should include not only implementation, but also the research and development of lower-consumption schemes.

The program paved the way for ESCOs to thrive and supported the growth of the Brazilian energy efficiency market. In fact, according to academic reports, energy efficiency projects implemented by ESCOs were valued at BRL190 million (US\$108 million) in 2006 and had increased to BRL300 million (US\$171 million) by 2009. Today, the Energy Efficiency Program remains the largest source of financing for energy-efficient ventures, with more than INR1.8 billion invested in energy efficiency projects.

### ***Ongoing Activities in Mexico***

The situation in Mexico is similar to what Brazil has been going through in recent years. According to the 2013–2027 national energy strategy, between 2000 and 2011 the country's energy consumption grew at an average rate of 2.08 per cent, whereas the national GDP increased in the same period at an average rate of 1.82 per cent. If that trend continues, in the coming years (approximately by 2020) Mexico is going to face an energy deficit. Given this scenario, the Mexican federal government has increased efforts to establish policies to manage energy consumption levels from the supply and demand side (Secretaria de Energia de Mexico, 2013).

The Mexican Government stimulated the creation of new ESCOs through different initiatives, most of them using international expertise and financing through the establishment of partnerships. One of the most renowned was the creation of a partnership program between the U.S. National Renewable Energy Laboratory and the National Commission for Energy Conservation in 2008. The objective of this program was to promote energy efficiency technologies and to serve as a technical authority in energy efficiency matters.

Mexico has also created a national association for energy efficiency companies. The Mexican Association of ESCOs was established in 2006 and currently recognizes 25 companies that are expected to generate potential energy savings of 116 billion kilowatts, or 10 per cent of the country's annual consumption, as of 2006.

One of the foremost efforts sponsored by an international organization was the implementation of a pilot program to test an Energy Efficiency Financing Protocol in Mexico. This project is explained in Box 3.

## **BOX 2. MANDATORY INVESTMENTS ON ENERGY EFFICIENCY BY PUBLIC UTILITIES.**

In 2004, as part of an ongoing effort to develop the first version of the International Energy Efficiency Financing Protocol (IEEFP), EVO decided to develop an assessment project in Mexico and Thailand.

Activities in Mexico were expected to outline approaches and methods that with few modifications may become suitable frameworks to develop private financing in the energy efficiency local market and be replicable in other locations. The implementation time was eight months and the project was divided into five phases: (i) identifying a governmental project coordinator, (ii) searching for sponsors and funding, (iii) researching the financial market in order to identify the needs of the parties involved, (iv) developing workshops with banks and ESCO representatives, and (iv) delivering training seminars to achieve LFI and ESCO agreements.

Although no measurements were taken to give an idea for the achieved results, feedback provided by EVO resulted in the following suggestions for energy efficiency project financing (Hansen, Langlois, & Bertoldi, 2009):

- ESCOs should not provide collateral requirements in excess of the project cash flows and installed equipment
- The minimum amortization time should be seven years plus the construction period
- Local currency must be used for repayment
- Costs must be coherent with current market interest rates
- The project must provide explicit measure and verify savings

## Efforts Currently Under Way in Japan

Energy efficiency in Japan has been the best way to reduce energy bills since energy prices increased almost 20 per cent from 2001 to 2011 (Organisation for Economic Co-operation and Development [OECD], 2014). The country has been a leader in energy efficiency programs in Asia and boasts a strong and well-developed energy efficiency industry. ESCO creation has been spurred through a set of activities implemented in the mid-1990s, including feasibility studies, measurement and verification programs, and the establishment of a national association for ESCOs in 1999. Of particular importance has been the job performed by the Japan Association of Energy Services Companies, the organization in charge of designing and implementing advertising campaigns highlighting the benefits of energy efficiency and instructing market players in energy business opportunities, benefits and risks.

Among market participants, big sector corporations owning their own ESCOs have dominated the energy efficiency landscape. Nevertheless, there is a lot of potential for small- and medium-sized ESCOs to grow and take a significant market stake from big players. In fact, data provided by Lawrence Berkeley shows that the number of energy efficiency companies has steadily increased since 1997, proving that large corporations do not dominate the energy efficiency market anymore (Vine, Murakoshi, & Nakagami, 1997). This is supported by data, given that in 2003 60 ESCOs were registered to the association and as of June 2014 that number had increased to 87 affiliates (Japan Association of Energy Services Companies, n.d; Murakoshi, Hidetoshi, & Masuda, 2003).

Among the latest energy efficiency developments is the announcement by Japan's Ministry of Economy, Trade and Industry that it will provide US\$779 million to help SMEs in the industrial sector install equipment to reduce energy consumption levels. The implemented technologies include but are not limited to LEDs and smart boilers (Watanabe, 2015). This new budgetary commitment is a clear example of how the Japanese government has traditionally incentivized energy efficiency. Public support has been based not only in establishing a clear set of policies, but in fostering the development of efficient technologies with direct financial support.

### BOX 4. JAPAN'S CENTRAL GOVERNMENT'S FINANCIAL SUPPORT TO ESCO PROJECTS.

In Japan, public authorities are actively involved in providing financial support and subsidies for energy efficiency retrofit projects. The Japanese government has made significant efforts to maintain the subsidy over time as a way to increase the credibility and recognition of the energy efficiency industry. As of today, the government provides a subsidy covering 33 per cent of the total project costs for private sector facilities and 50 per cent for public facilities. The natural result of the subsidy program has been the attainment of higher cash flows and higher returns for energy efficiency projects, enabling access to better and increased private financing for ESCOs.

The types of projects eligible for participating in the program, their size and the percentage of costs covered are depicted below (project range in US\$ millions and percentage subsidized in parentheses):

1. Project to introduce equipment with lower energy consumption (\$0 to \$125.5, 33 per cent)
2. Project to install and promote highly energy-efficient systems in residential buildings (\$0 to \$19.1, 33 per cent)
3. Local authorities' energy-saving diffusion-and-promotion projects (\$0 to 32.7 million, 50 per cent)
4. Energy management systems for building (\$0 to \$32.7 million, 50 per cent)
5. Local authorities' energy-saving planning (\$0 to \$4.5 million, 100 per cent)

Alternatively, results beyond incentivizing participation in the energy efficiency market have also been achieved. For example, as a consequence of public funding offsetting a greater proportion of project costs, better credit terms have been achieved for energy efficiency loans, like the need for borrowers to set aside lower collaterals and lower interest rates.

For more details on this initiative, see Perera, Silva and Liebert (2014).

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