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Partnership to Advance Clean Energy - Deployment (PACE - D)
Technical Assistance Program

Financing Energy Efficiency in India:

A review of current status and recommendations for innovative mechanisms

October 2013

This report is made possible by the support of the American People through the United States Agency for International Development (USAID). The contents of this report are the sole responsibility of Nexant, Inc. and do not necessarily reflect the views of USAID or the United States Government. This report was prepared under Contract Number AID-386-C-12-00001.

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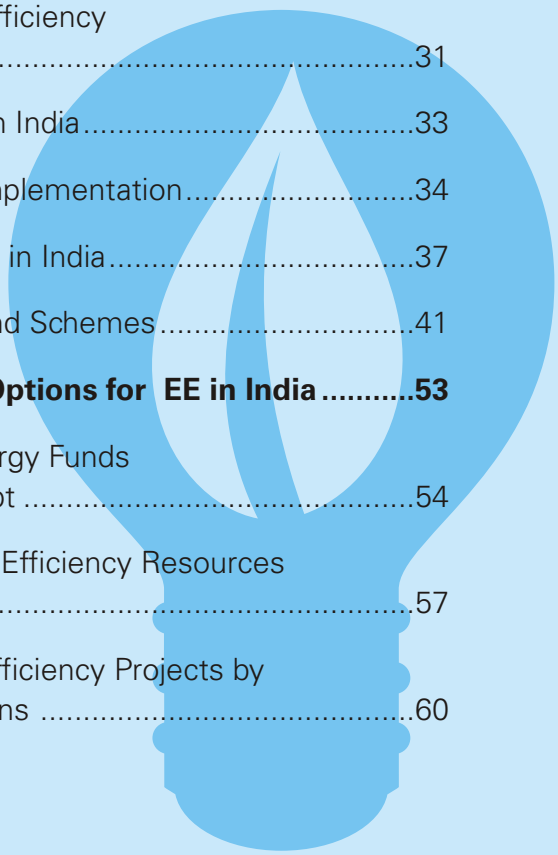

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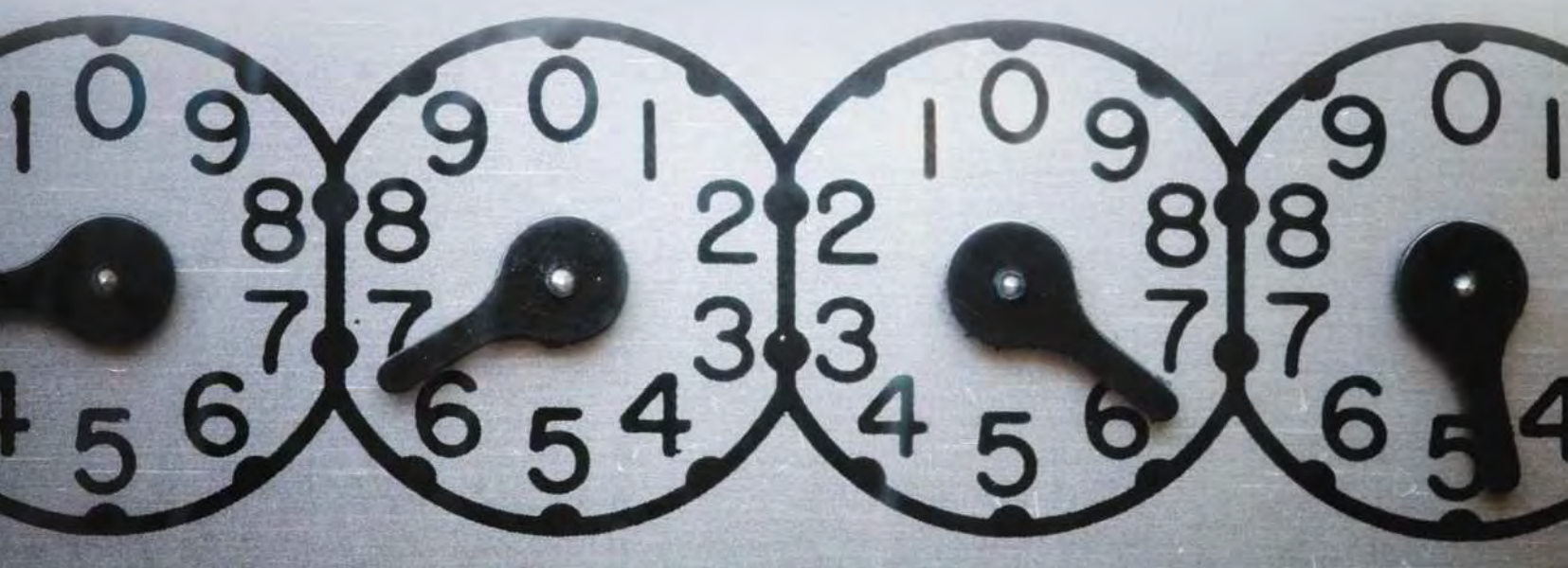


Acknowledgements

This report was prepared by a team of consultants including Nexant, Inc., SRC Global Inc. (SRC), and Emergent Ventures India (EVI), under the Partnership to Advance Clean Energy - Deployment (PACE - D) Technical Assistance Program, which is funded by the United States Agency for International Development (USAID). The principal authors of this report were Dilip R. Limaye, SRC and Prima Madan, EVI. Technical input and comments were provided by Aloke Barnwal and Vinod K. Kala of EVI. The report was prepared under the direction of Sanjay Dube, Nexant's Chief of Party, along with a Nexant team comprising of Kavita Kaur, Peter du Pont, and Jem Porcaro. The report was edited by Nidhi Jamwal.

The PACE - D Technical Assistance Program would like to express its sincere appreciation and gratitude to the numerous experts in India who were interviewed by the progam and who provided useful information on their experience and insights on energy efficiency financing in India. Additionally, we would like to thank members of the Advisory Team for Energy Efficiency Finance, who provided valuable input during the design of the report and suggestions to guide the research.

We would like to thank Jyoti Arora, Joint Secretary, Ministry of Power (MOP), Government of India; Ajay Mathur, Director General, Bureau of Energy Efficiency (BEE), Government of India; and their team at MOP and BEE for their valuable inputs.

Finally, we would like to thank Monali Zeya Hazra, Anurag Mishra, Apurva Chaturvedi, and S. Padmanaban of USAID/India, who provided extensive input throughout the report preparation period. Their thoughtful feedback helped shape the report and focus it on the design of innovative financing mechanisms that could be useful in the Indian context.

Executive Summary

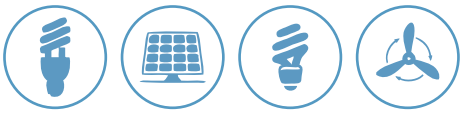
Investments in energy efficiency (EE) are being increasingly recognized as the most cost-effective options, in the short- to medium-term, to reduce costs, deliver increased economic productivity and competitiveness, increase energy security, and mitigate emissions of greenhouse gases (USAID, 2011). In a recent report, the Asian Development Bank (ADB) estimated that one to four percent investment in EE, as a share of overall energy sector investment, can meet as much as 25 percent of the projected increase in primary energy consumption in developing Asian countries by 2030 (ADB, 2013).

India clearly has a huge potential for cost-effective investments in EE, and this potential has been well documented in recent reports. For instance, using data from 1999 to 2004, two studies concluded that the potential for investment in EE measures in India was between USD 3.0 and 3.5 billion (Taylor et al., 2008; ADB, 2005). A 2011 report prepared for India's Planning Commission estimated the energy-saving potential to be in the range of 124 to 255 billion kWh, which translates into a value of approximately USD 11 to 22 billion at average tariffs (Planning Commission, 2011). A more recent report by ADB estimated that India will need to invest about USD 4.5 billion per year through 2020 in order to meet its established national energy-saving targets (ADB, 2013).

Despite this vast potential and need for EE investment, and the growing importance placed by national and state policymakers on EE, the rate of investment in EE technologies and projects is lagging far short of its potential. This is due to a number of well-documented technical, institutional, and financial barriers.

This report focuses on efforts to overcome these barriers and significantly scale up financing for EE technologies and projects. It reviews and documents recent Indian experience in establishing and using financial instruments and mechanisms for EE, at the national and state levels, and with international donor support. These instruments include mechanisms driven by policy, such as fiscal instruments, government-led funds that focus on EE and government-initiated market-based mechanisms; mechanisms based on debt or equity financing; and mechanisms related to energy savings performance contracts (ESPC). Based on a review and analysis of these existing financing mechanisms, the report presents recommendations for the development and piloting of seven innovative financing mechanisms that may help overcome some of the existing barriers to financing and thereby stimulate increased financing and implementation of EE projects in India.

The seven innovative financing mechanisms are summarized below.



1. **Establishment of State-Level Clean Energy Funds using the Public Benefit Charge concept:** The Public Benefit Charge (PBC), also known as a System Benefit Charge (SBC), is based on the fundamental concept that utility ratepayers should pay for a part of the cost of the economic, social and environmental benefits of clean energy (Limaye, 2011a). Clean energy funds based on the PBC have been successfully deployed by many states in the U.S. In some countries, international donor agencies such as the World Bank, ADB, or the European Bank of Reconstruction and Development (EBRD), have established clean energy funds. In India, the Energy Conservation Act, 2001 requires states to establish Energy Conservation Funds. The Karnataka Electricity Regulatory Commission is exploring to launch a State Clean Energy Fund (IIEC, 2012b) and assessing the feasibility of such a fund. The establishment of PBC-based funds at the state-level can help overcome many barriers to the implementation of EE and off-grid RE projects.

2. **Regulatory Schemes to acquire EE Resources using a Standard Offer Program (SOP):** The SOP is a mechanism under which a utility (or a government agency) purchases energy savings and/or demand reductions from energy users using a predetermined and pre-published rate based on verified delivered savings (Limaye, 2010b). It is analogous to a Feed-in-Tariff (FiT) program, which purchases renewable energy (RE) generated by utility customers or project developers at a pre-established price. However, in case of the SOP, the resource purchased is in the form of energy savings rather than energy production. The SOP provides a mechanism for scaling up the implementation of EE by treating EE as a resource similar to RE resources and paying for the results delivered by the EE programs. The results provide significant benefits not only to the participating project sponsors, but also the project implementers such as energy service companies (ESCOs), the electric utility, and the nation.

3. **Promoting Utility Financing of EE Projects by Establishing Energy Efficiency Obligations (EEOs):** EEOs are requirements imposed by governments or regulators on utilities or energy providers to meet specified energy savings targets. The EEOs use government authority to require investments by utilities/energy providers in EE programs (Swanson, 2012). Many EEO programs exist around the world, and their application and uptake is increasing. In the U.S., 26 states have EEO programs, known as EE Resource Standards (ACEEE, 2011). Also, the European Union, under its recent Energy Efficiency Directive, has mandated all of its member countries to implement EEOs with a savings target of 1.5 percent of retail energy sales per year from 2014 to 2020 (EU, 2011). Utilities in North America and Europe have shown considerable initiative in designing and implementing programs to achieve energy savings. In India, EEOs mandated by state electricity regulatory commissions can mobilize utility financing for EE projects and programs, and this would lead to substantial scaling up of EE with benefits to both utilities and energy consumers.

4. **Mainstreaming EE in Corporate Loans:** The lack of reliable and credible energy audits has been identified as a barrier to EE projects. To address this barrier, the European Bank for Reconstruction and Development (EBRD) has implemented the Corporate Energy Audit Programme (CEAP), which offers energy auditing services to its industrial and commercial clients during the evaluation of their corporate loan applications. The CEAP essentially

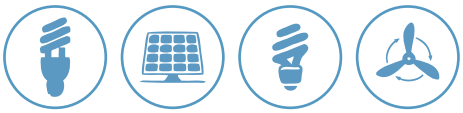
mainstreams EE loans within the Bank's corporate lending business and has achieved excellent results (D'Addario, 2013). Such a program can successfully address a large number of barriers to the private financing of EE and can also act as a replicable model for many banks. The implementation of a program similar to EBRD's CEAP in India could lead to a substantial increase in the number of EE projects financed by commercial banks and financial institutions.

5. **Energy Savings Insurance Facility:** One of the major barriers to the implementation of EE projects using performance contracting is the perception among banks and project hosts that EE projects are highly risky, despite the performance guarantees provided by equipment vendors and/or ESCOs. One way to address this perception is to establish a facility that would essentially "guarantee" the technical performance of EE technologies by providing insurance for the project's technical performance. Energy Savings Insurance (ESI) has been used in North America and Germany, and has proven to be useful as a supplement to the typical performance contracting models - Guaranteed Savings and Shared Savings (Limaye, et al., 2012). By backing up the ESCO's performance guarantee and providing risk protection to the bank regarding the loan repayment, application of an ESI scheme in India can enhance the ability of ESCOs to obtain bank financing.

6. **Establishment of a Clean Energy Financing Facility:** International experience shows that two of the most useful mechanisms to facilitate the scale up of EE financing are: (i) the establishment of an EE fund, clean energy fund, or a financing facility; and (ii) creation of a Clean Energy Bank (World Bank, 2013). In India, the Planning Commission, in its 12th five year plan (FYP) document, has endorsed the idea of a national fund to support EE financing, stating that: *"The need of the hour is to set up a special fund with seed capital that will be managed at an arm's length from the Government, with the participation of the private industry"* (GOI, 2013a). Such a financing facility would help increase the availability of funds for EE projects in India by providing financial resources and innovative financial products, and by leveraging commercial financing.

7. **Designation of EE as a Priority Lending Sector:** The Priority Sector Lending (PSL) program was initiated by the Government of India (GOI) as a policy initiative to increase the involvement of commercial banks in financing certain priority sectors. PSL supports many objectives of India's FYPs and establishes a target of 40 percent of net lending to sectors designated as priority sectors. RBI has reported that the success of PSL in the country is noteworthy (RBI, 2012). The benefits provided by EE investments directly align with the basic objectives of the PSL program. Efforts to scale up EE are hindered by the limited availability of commercial financing from banks and FIs, and therefore the designation of EE as a sector under the PSL program would substantially increase commercial lending for EE projects. It is desirable to request the RBI to include EE lending as a sub-target within the overall PSL target of 40 percent.

These mechanisms are not mutually exclusive, and some of them could potentially be combined for



implementation. For instance, creation of state-level clean energy funds could be combined with standard offer programs as mechanisms to fund implementation of EE obligations, and thereby stimulate EE investment and project implementation at the state level.

This report describes how each initiative would work, how it can help address some of the major financing barriers for EE, and what specific steps need to be undertaken to implement each mechanism in the Indian context.

1 Background

1.1 DRIVERS OF ENERGY EFFICIENCY IN INDIA

Energy efficiency is being increasingly recognized as the most cost-effective option, in the short- to medium-term, to reduce costs, deliver increased economic productivity and competitiveness, increase energy security, and mitigate emissions of greenhouse gases (USAID, 2011). A number of studies have established that EE has a major role to play in "low-carbon" energy policies (IEA, 2005). It is expected that EE will be responsible for 57 percent of CO_2 emissions reductions worldwide between 2002 and 2030 (IEA, 2011). Thus, EE is emerging as a viable solution for rapidly developing economies, such as India and China, which are experiencing unprecedented economic growth.

India's national interest in energy conservation dates back to the 1970s when the 1973 global oil crisis and resulting oil price increase triggered significant fiscal stress. Since then the country has traversed the path of EE, witnessing the formation of working groups, enactment and amendments to legislation, and establishment of public and private organizations that focus on promoting EE. In June 2008, the Indian Prime Minister Dr. Manmohan Singh released India's National Action Plan on Climate Change (NAPCC), which consists of eight national missions, including the National Mission on Enhanced Energy Efficiency (NMEEE) (NAPCC, 2008). The NMEEE seeks to upscale efforts to create a market for EE, which is estimated to be around USD 12.4 billion (NMEEE, 2010). The implementation plan for NMEEE, prepared jointly by the Ministry of Power (MOP) and Bureau of Energy Efficiency (BEE), was released in 2010.

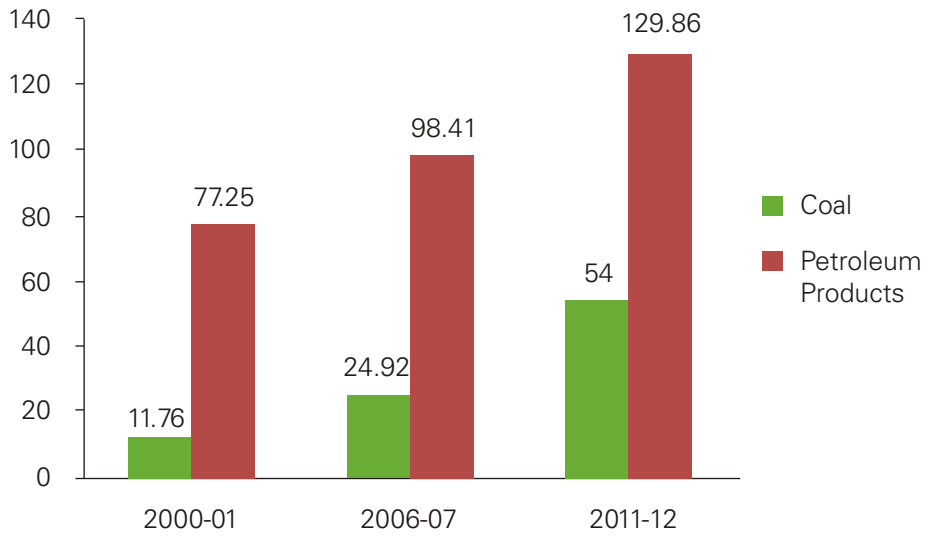
At present, India's energy portfolio is dominated by fossil fuels, primarily oil (which is mostly imported) and coal, high import dependence (mostly oil but increasingly coal too), large peak power and energy deficits, and high energy intensity. The country is thus facing severe challenges related to climate change, energy scarcity, and energy security. However, these challenges also act as drivers for deployment of EE technologies and measures in India. Some of these key drivers are discussed below.

1.1.1 Energy Scarcity and Energy Security

On a worldwide scale, India ranks fourth in terms of its primary energy consumption, after the U.S., China and Russia. In spite of being among the top five countries globally in terms of power generation and installed capacity, the average energy and peak power deficits in India, as estimated by the Central Electricity Authority (CEA), stand at 8.7 percent and 9 percent, respectively in the year 2012-13.

According to GOI estimates, approximately 90 percent of India's commercial energy supply comes from fossil fuels, with a very high dependence on imports *(See Figure 1: Imports of Coal and Petroleum Products in India).* According to India's 12th FYP (2012-17), the domestic production of energy sources will increase, but import dependence will continue to be high. For instance, nearly 78 percent of the demand for crude oil in the country will be met through imports by the end of the 12th FYP (GOI, 2013b). The high import dependence makes deployment of EE technologies more critical to bridge the supply-demand gap and reduce India's import dependence.

Figure 1: Imports of Coal and Petroleum Products in India (in mtoe)



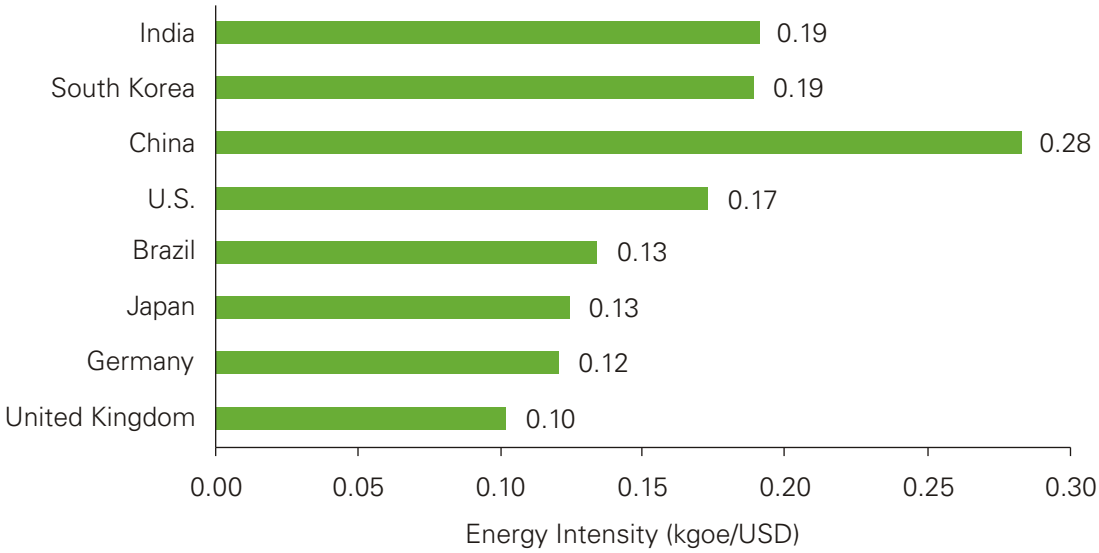
Source: GOI, 2013b

1.1.2 High Energy Intensity[1]

Energy intensity is an indicator of how efficiently energy is used in an economy. Since 1999, India's energy intensity, in terms of the ratio of total primary energy to Gross Domestic Product (GDP), has been decreasing and is expected to continue to decrease (GOI, 2013a). India's energy intensity is at par with the world average, but higher than most of the developed countries *(See Figure 2: Country-Wise Energy Intensity).* Simply put, this means there is enough potential for India to move towards a more energy efficient economy.

[1] Energy intensity is a measure of the EE of a nation's economy. High energy intensity indicates a high cost of using energy to support GDP.

Figure 2: Energy Intensity by Country (kgoe/USD)



Source: IEA, 2011

1.1.3 Climate Change

A major driver of EE in India is the growing challenge of climate change. In order to combat climate change, there is growing emphasis and need to improve EE across all sectors of the economy. This will not only reduce end-use energy demand, but also enhance the net energy supply capacity.

Keeping in mind these key drivers, the GOI is making efforts to create an enabling environment for promoting EE across all sectors. This is being done by evolving policy and institutional frameworks to support implementation of EE in the country.

1.2 ENERGY EFFICIENCY POTENTIAL IN INDIA

Energy efficiency has a huge potential to solve some of the most critical environmental and energy security challenges India faces today. A number of studies, including those conducted by the ADB, the World Bank, and others, have estimated the EE potential in India. However, these studies are not directly comparable, as they differ in the use of data type, assumptions and indicators. An overview of some of the studies on EE potential estimate in India is provided below:

- **ADB Study**: This study, based on the data from 1999 to 2001, focused on EE potential of electricity use within four sectors: industrial (generic and process), commercial and

municipal *(See Table 1: ADB Estimate of Electricity Efficiency Potential in India)*. It concluded that the total investment potential for EE measures in these four sectors was approximately USD 3.5 billion, of which USD 3 billion was in the industrial sector (ADB, 2005). A more recent report by ADB estimated that India will need to invest about USD 4.5 billion per year through 2020 in order to meet its established national energy-saving targets (ADB, 2013).

Table 1: ADB Estimate of Electricity Efficiency Potential in India

Sector	Investment Potential INR billion (USD million)*
Industrial – Generic EE Measures	42 (1050)
Industrial – Process EE Measures	79 (1975)
Commercial	6.6 (165)
Municipal	13 (325)
Total	**141 (3500)**

** INR / USD based on 2005*
Source: ADB, 2005

- **World Bank Study:** The World Bank's study of EE financing in Brazil, China and India provides a comprehensive estimate of EE potential in India. This study, based on data from 2003 to 2004, concludes that the EE potential in all sectors of the Indian economy could be as high as 50 billion kWh annually, with an investment potential of approximately INR 140 billion (USD 2.27 billion[2]) (Taylor, et al., 2008).
- **CII/IREDA Study:** The Confederation of Indian Industry (CII) and the Indian Renewable Energy Development Agency (IREDA) jointly concluded in the Investor's Manual for Industrial EE that there is an annual EE saving potential of INR 37.5 billion (USD 607 million), with an investment opportunity of INR 82.5 billion (USD 1.33 billion), in 16 major sectors of Indian industry (CII and IREDA, 2003).
- **Planning Commission's Low Carbon Study:** The Planning Commission's Expert Group on Low Carbon Strategies for Inclusive Growth estimated the energy saving potential in all Indian sectors (domestic, commercial, industrial and agricultural) through two scenarios: (i) 'determined effort' and (ii) 'aggressive effort' (Planning Commission, 2011).

  According to the Planning Commission's 2011 Interim Report, the total energy savings potentials in various sectors under 'determined effort' and 'aggressive effort' scenarios at the consumer end are 105 billion kWh and 217 billion kWh, respectively. Assuming transmission and distribution losses of 15 percent, these translate into generation savings of 124 billion kWh under the 'determined effort' scenario, and 255 billion kWh under the 'aggressive effort' scenario (approximately USD 11 to 22 billion at average tariff prices) *(See Table 2: Net Electricity Generation Required in 2020 under Determined Effort and Aggressive Effort Scenarios).*

[2]Exchange rate, as on October 4, 2013, INR 61.80-USD use to convert INR to USD.

Table 2: Net Electricity Generation Required in 2020 under Determined Effort and Aggressive Effort Scenarios (in billion kWh)

Sector	Determined effort for efficiency improvement	Aggressive effort for efficiency improvement
Appliances	80	147
Agriculture	5	10
Industrial	20	60
Total savings	105	217
Savings in net electricity generation	124	255

Source: Planning Commission, 2011

- **National Productivity Council Study for BEE**[3]: The National Productivity Council's study, *'State-wise Electricity Consumption and Conservation Potential in India'*, conducted for BEE, covered various sectors, such as agricultural pumping, municipal water and sewage pumping, street lighting, commercial buildings having connected load of more than 500 kW, representing Small and Medium Enterprises (SMEs), large industries, and households. It estimated that the implementation of EE measures in all these sectors would lead to overall electricity savings of 75.4 billion kWh. This, the study noted, was higher than the overall energy deficit of 73.1 billion kWh reported in 2007-08 *(See Table 3: Estimated Energy Consumption and Saving Potential Across Selected Sectors in 2007-08).*

Table 3: Estimated Energy Consumption and Saving Potential Across Selected Sectors in 2007-08 (in billion kWh)

Sector	Consumption	Saving potential
Agriculture pumping	92.33	27.79
Commercial buildings/ Establishments with connected load >500 KW	9.92	1.98
Municipalities	12.45	2.88
Domestic	120.92	24.16
Industry (including SMEs)	265.38	18.57
Total	**501.00**	**75.36**

Source: NPC, 2010

[3]Available at : http://www.emt-india.net/eca2009/14Dec2009/CombinedSummaryReport.pdf, last accessed on March 1, 2013

1.3 POLICY INITIATIVES FOR EE IN INDIA

In the last decade, the GOI has developed and implemented several policy and institutional initiatives to encourage adoption of EE in the country. These include enacting laws and amendments to legislations, announcing the NAPCC and the NMEEE, and developing green rating systems. All of these initiatives are aimed at achieving EE potential of the country.

1.3.1 THE ENERGY CONSERVATION ACT, 2001

The Energy Conservation Act (EC Act) was enacted in October 2001 (effective from March 1, 2002)[4]. The EC Act requires large energy consumers to adhere to energy consumption norms, and also directs new buildings to follow an Energy Conservation Building Code (ECBC). Electrical appliances need to meet minimum energy performance standards (MEPS) and display energy consumption labels.

The EC Act, 2001 led to the formation of the BEE under the MOP, as a statutory body entrusted with regulatory powers for enforcement of various recommendation of the Act *(See Box 1: Key Directives of the EC Act, 2001).* There are penalty provisions under the EC Act for non-compliance.

[4] Legal Frame Work for Energy Conservation, MSDA, http://www.msda.nic.in/downloads.html, last accessed on September 17, 2013

Box 1: Key Directives of the EC Act, 2001

- Minimum energy consumption standards for appliances and labeling of energy use;
- Prohibition on manufacture, sale and import of equipment and appliances not conforming to standards;
- Identification of energy intensive industries and other establishments to be notified as Designated Consumers (DC);
- EE improvement in unorganized sectors, such as domestic and agriculture sectors;
- Energy audits by accredited energy auditors and implementing techno-economic viable recommendations;
- Amendment of ECBC to suit local conditions;
- Establishment of Central and State Energy Conservation Funds;
- Energy-use inspection of DCs; and
- Enforcement of energy consumption norms.

1.3.2 THE ELECTRICITY ACT, 2003

The Electricity Act came into force in June 2003, with the key aim of consolidating laws relating to generation, transmission, distribution, trading and use of electricity; and to reform legislation by "promotion of efficient and environmentally benign policies". The Act mandates efficiency in all aspects of power sector – generation, transmission and distribution of electricity. In 2005, under Section 3(1) of this Act, the central government notified the National Electricity Policy (NEP) for the development of country's power sector based on optimal utilization of resources. NEP puts additional emphasis on higher efficiency levels of power generating plants, stringent measures against electricity theft, promoting energy conservation measures, and boosting renewable energy sources. NEP has accorded high priority to demand-side management (DSM) and has made periodic energy audits compulsory for energy intensive industries. The focus is also on labeling of appliances and high efficiency pumps in agriculture. NEP has also made suggestions for load management and differential tariffs and emphasized encouraging and promoting ESCOs. These initiatives have been implemented by BEE.

1.3.3 ENERGY CONSERVATION BUILDING CODE (ECBC)

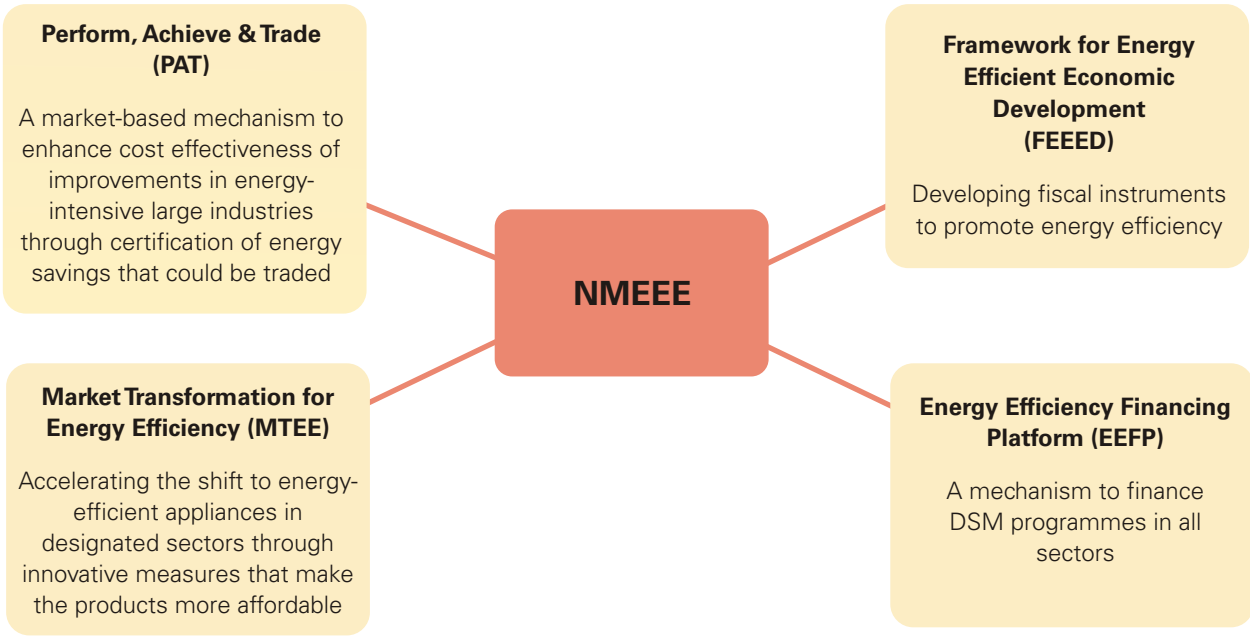
The ECBC was launched by the MOP in May 2007 as a first step towards promoting EE in the country's building sector. ECBC not only addresses the design of new, large commercial buildings, but also aims at optimizing the buildings' energy demand based on their location in different climatic zones of India. It sets minimum EE standards for design and construction. Nearly 100 buildings across the country are already following this code. Compliance with ECBC has been incorporated into the mandatory Environmental Impact Assessment (EIA) requirements for large buildings. While ECBC norms started as a voluntary initiative, a few states have already made it mandatory and several others are in the process of doing the same.

1.3.4 NATIONAL MISSION ON ENHANCED ENERGY EFFICIENCY (NMEEE)

In order to achieve a sustainable development path that simultaneously advances economic and environmental objectives, the GOI released the NAPCC in June 2008 (NAPCC, 2008). The NAPCC consists of eight key national missions to guide the country through the climate change challenge. The NMEEE is one of the eight missions that focuses on the Indian government's increased and renewed emphasis on achieving EE in the national economy (NMEEE, 2010).

NMEEE promotes innovative policy and regulatory regimes, financing mechanisms, and business models. It seeks to not only create markets for EE, but also to sustain them in a transparent and time bound manner. The BEE, designated as the legal entity for executing initiatives under NMEEE, engages in public-private partnerships to implement various EE programs. NMEEE has put in place four new initiatives to enhance EE in the country *(See Figure 3: Initiatives under NMEEE, NAPCC).*

Figure 3: Initiatives under NMEEE, NAPCC



Source: NMEEE, 2010

1.3.5 NATIONAL MISSION ON SUSTAINABLE HABITAT (NMSH)

The NMSH, focused on sustainable buildings, is also a national mission under the NAPCC. It aims to make the habitat (i.e. the living environment of humans) sustainable through enhancement of EE in buildings, effective solid waste management, and modal shift to public transport. The NMSH objectives will be achieved via two initiatives: (i) extending the application of ECBC (at present applicable to only new and large commercial buildings) to retrofitting buildings; and (ii) conducting research and development on bio-chemical conversion, wastewater use, sewage utilization, and waste recycling options. The research is expected to encourage recycling of material and urban waste management.

The NMSH also focuses on improving resilience of infrastructure, community-based disaster management, and measures for improving the warning system for extreme weather events. Capacity building is also a significant part of this mission.

1.3.6 12TH FIVE YEAR PLAN (FYP)

The 12th FYP strives for faster and more inclusive growth along with a vision for promoting sustainability. According to the 12th FYP, India will require new energy efficient practices in urban housing and transport to achieve environmental sustainability. This Plan also calls for the use of energy efficient technologies in coal-based electricity generation such as the introduction of super critical and ultra-super critical boilers. The Plan aims to promote EE in industries, farms and offices in order to limit growing energy demand. Also, highly energy-efficient appliances are to be promoted through labeling and mandatory standards. The 12th FYP identifies the need to develop and adopt transport policies and related technologies for more energy efficient vehicles in India *(See Box 2: Key Features of the 12th FYP (EE Component))*.

Box 2: Key Features of the 12th FYP (EE Component)

- **EE in equipment and appliances***:* The 11th FYP had already envisaged coverage of 21 appliances under the Standards and Labeling (S&L) programme of BEE. This programme is expected to be continued and expanded in the 12th FYP.
- **EE in transport**: In order to improve EE in the transport sector, a labeling scheme is envisaged as part of the 12th FYP. This will cover two initiatives: (a) introduction of fuel economy norms effective from the first year of the 12th FYP; and (b) technical study for two-wheelers, three-wheelers and commercial vehicles (trucks and buses). The fuel economy norms will be made mandatory from 2015 onwards under the EC Act, 2001. The targeted energy saving in the transport sector by the end of the 12th FYP is 4.3 mtoe.

- **EE in industry**: The 12th FYP envisages that the PAT scheme will continue to evolve for the Indian industry but it would be useful to have a combined EE package including the PAT scheme and an Energy Conservation Fund. Such a combined EE package would be implemented by a unified central government agency, i.e. the BEE. Under the EC Act, the BEE is already empowered to levy fees for services provided for promoting efficient use of energy and its conservation. The Energy Conservation Fund could be used to leverage and/or finance energy-efficient technology upgrades for the domestic industry, particularly non-PAT industry, on terms softer than commercial borrowing. The 12th Plan identifies the UK Carbon Trust Fund to be a workable model for such an effort.[5]

Source: GOI, 2013a

1.3.7 GREEN BUILDING RATING SYSTEMS AND RELATED INITIATIVES IN INDIA

India's building sector is growing at a rapid pace and is expected to increase five-fold from 2005 to 2050. Also two-thirds of the commercial and high-rise residential structures that will exist in 2030 are yet to be built. Keeping in mind the huge growth potential of the building sector, there was a need to develop a system/initiative that would define the parameters for "green" or energy-efficient buildings, and also differentiate these from conventional buildings. This led to the development of building rating tools in India.

The BEE developed a rating system based on the "Star Labeling Program". It is meant for use in the Business Process Outsourcing (BPO) and office buildings; but does not apply to residential buildings. However, BEE is now working on benchmarking standards for residential buildings.

In addition, the Indian Green Building Council (IGBC) and The Energy and Resources Institute (TERI) have introduced green building rating systems, which have been designed keeping in mind the Indian building requirements and the different climatic zones of the country *(See Box 3: Green Building Rating Systems in India).*

[5] Available at http://www.carbontrust.com/, last accessed on September 05, 2013.

Box 3: Green Building Rating Systems in India

IGBC and LEED India

IGBC promotes IGBC Green Rating Systems for existing buildings, green homes, townships, special economic zones (SEZs), factory buildings, and landscape rating. IGBC has introduced these systems with a view that these rating programmes would help projects address all aspects related to the environment and represent an effective tool to measure the performance of the building/project. All of its programs are voluntary and consensus-based in nature. The ratings are based on points earned for green features of buildings under specified categories; buildings are then certified as silver, gold or platinum. The IGBC Green Rating System includes the following:

- **IGBC Green Existing Buildings (Operations and Maintenance) Rating System:** The rating is focused on sustained performance of buildings with respect to green features. The overarching objective of this rating system is to facilitate building owners and facility managers in implementation of green strategies, measure their impacts, and sustain performance in the long run.
- **IGBC Green Homes Rating System:** This is the first rating programme developed in India, exclusively for the residential sector. It is based on accepted energy and environmental principles and strikes a balance between known established practices and emerging concepts.
- **IGBC Green Townships Rating System:** This rating system is applicable for large developments and townships. Townships can be predominantly commercial, industrial or retail, but should necessarily comprise of a residential component.
- **IGBC Green SEZ Rating System:** IGBC along with the Ministry of Commerce and Industry (MOCI) has prepared the Green SEZ guidelines. IGBC has further developed IGBC Green SEZ Rating System, as an extension of the Green SEZ guidelines, which encourages the projects to exceed the requirements of many codes and standards.
- **IGBC Green Factory Building Rating System:** This rating system addresses sustainability in industrial buildings. The programme is fundamentally designed to address national priorities and quality of life for factory workmen. It is currently in pilot programme phase.
- **IGBC Green Landscape Rating System:** It is the first rating program developed in India exclusively for landscapes. Landscape facilities in residential, commercial, institutional, industrial, amusement, resorts, campus, airport/ hotels, hospitals, retail, sez's, convention center, temples, IT parks, heritage sites, film cities and similar facilities, government offices, community parks, botanical garden, clubs, guesthouses, and memorial parks can apply for the rating tool.
- **LEED India Green Building Rating System:** The Leadership in Energy and Environmental Design (LEED-India) Green Building Rating System is a nationally and internationally accepted benchmark for the design, construction and operation of high performance green

buildings. It was created out of the need for indigenizing the LEED rating to suit the Indian context. The IGBC set up a team called the "LEED India Core Committee" to achieve this task. The first LEED India rating program, referred as LEED India Version 1.0, was launched in October 2006. LEED-India has separate ratings for the Core and Shell buildings and for New Construction and Major Renovation for commercial buildings. These are also voluntary and consensus-based programs.

Currently around 433 buildings are green rated out of which nearly 183 are green home projects which are either pre-certified or certified under the IGBC green homes rating system. Nearly 16 are either pre-certified or certified under the IGBC Green Factory Building rating system and 234 are either LEED pre-certified or certified.[6]

GRIHA Rating System

Green Rating for Integrated Habitat Assessment (GRIHA) is the national rating system of India. Adopted by the GOI in 2007, this rating system is conceived by TERI and jointly developed with the Ministry of New and Renewable Energy (MNRE). It is a green building design evaluation system suitable for all kinds of buildings in different climatic zones of the country.

GRIHA can be applied to all types of projects, such as offices, retail spaces, institutional buildings, hotels, hospital buildings, healthcare facilities, residences, and multi-family high-rise buildings. However, it is not applicable to industrial complexes and housing colonies.

Under this rating system, different levels of certification (one star to five stars) are awarded based on the number of points earned by the project.

Recently, SVAGRIHA (Small Versatile Affordable GRIHA) was launched by Association for Development and Research of Sustainable Habitats and TERI. SVAGRIHA is a significantly simplified, faster, easier and more affordable rating system meant for projects with built-up area of less than 2,500 sq. m.

So far, 11 buildings have been rated under GRIHA and three under SVAGRIHA. Another 272 projects are being evaluated by GRIHA. Since it is mostly applicable to the commercial developments, no residential project has been rated by it so far.[7]

[6] *Available at http://www.igbc.in/site/igbc/testigbc.jsp?desc=22905&event=22869, last accessed on September 17, 2013)*

[7] *Available at http://www.grihaindia.org/#&home, last accessed on February 15, 2013*

2 Barriers to Energy Efficiency in India

As discussed in the previous section of this report, there is the need for deploying energy efficient technologies and measures across all sectors in India. However, adoption of such measures and technologies remains limited largely because of barriers to large-scale implementation of EE. A number of recent studies have identified barriers to EE in developing countries, including India (see, for example Taylor, et al, 2008). This section of the report provides a brief description of the barriers that are particularly relevant to India.

2.1 POLICY BARRIERS

In the last decade, several voluntary EE regulations have been introduced in India. In addition, a number of programs focused on implementation of EE, such as the PAT scheme and ECBC, have also been launched. However, implementation of such schemes/programs has not progressed as anticipated because of their voluntary nature. Procurement delays for equipment and services often also tend to delay the implementation process.

2.2 INSTITUTIONAL BARRIERS

The EC Act, 2001 led to the formation of BEE, which is the premier organization focused on EE deployment in India. While the GOI has created an institutional structure for EE, bodies like the BEE are constrained in terms of their capacity to support implementation of EE projects at the scale envisaged under the NMEEE. The capacity of the local level bodies, such as the state designated agencies, also needs to be built to support EE initiatives. ESCOs, which have an important role in delivering EE projects, often lack the institutional and financial capacity to deliver effective EE projects.

2.3 BARRIERS RELATED TO ENERGY END-USERS AND PROJECT DEVELOPERS

Several barriers related to energy end-users and project developers hinder implementation of EE measures and technologies, some of them include:

- *High cost of energy efficient products:* The relatively high initial cost of energy efficient products and appliances often limits their uptake. This happens because the end-users do not undertake a life cycle analysis of the products and their costs while buying a product. Most EE projects in industries or buildings are investment intensive, and the developers/owners are not aware of the likely benefits of installing energy efficient products. Also, there is limited availability of potential financing mechanisms for EE. All these create significant barriers to the large-scale implementation of EE projects in India.

- *Issue of split incentives:* "Split incentives" between energy decision makers and those who finally bear the costs of EE are a major barrier to scaling up of EE. For instance, there are "split incentives" between "owner" and "renter". The "owner" purchases the energy equipment whereas the "renter" enjoys the benefits (energy savings) from the use of such equipment. Similarly, in the case of commercial construction, a developer builds a property and sells/leases it to the consumers once the building is constructed. While the costs associated with green features in a building are borne by the developer, its benefits - low electricity and water bills, better working environment and productivity, improved indoor air quality, etc. - accrue to the owners or tenants.

- *Limited technical knowledge of EE*: Most project developers have limited technical knowledge about various aspects of EE. Therefore, they hesitate to implement such technologies.

- *Lack of internal funds for EE*: Internal funds are generally not readily available for procurement of the equipment or products needed for EE project implementation, both in the public and private sectors in the country. As such, the uptake of EE is very limited due to the need for external financing, which is often difficult to obtain.

2.4 FINANCIAL BARRIERS

Finance plays a key role in facilitating large-scale implementation of EE projects and energy efficient technologies. There is a growing adoption of energy efficient measures in India; however, several barriers continue to stall sufficient financing of such projects and technologies. Some key barriers to financing EE projects include:

- *Lack of non-recourse finance*[8] *for EE projects* - A large number of FIs do not perceive EE measures as a separate project. Thus, they are unwilling to provide loans without any lien on assets of the parent entity. This makes it difficult for the implementing organization to raise finance for such projects, as most organizations utilize their borrowing limits for their core businesses.

- *Perceived difficulty in evaluating financial returns of EE projects* - Banks and FIs may have difficulties in evaluating financial returns from EE projects. This hinders the availability of both debt and equity finance for EE projects.

- *High transaction costs due to small project size* - EE projects are relatively small in size and have a high transaction cost, compared to other conventional lending by banks and FIs. This not only makes EE projects less attractive for conventional bank financing, but also limits the interest of international FIs (such as multilateral and bilateral donor organizations) to whom the scale of financing is important.

[8] Non-recourse finance refers to a loan where the lending bank is only entitled to repayment from the profits of the project the loan is funding, or from project assets, but not from other assets of the borrower.

- *High project development costs* - EE projects have a relatively high proportion of "soft costs" that banks/FIs are reluctant to finance. These "soft costs" include the costs of project evaluation, project development, and contract negotiation; as well as costs of equipment replacement, plant shutdown, and training of maintenance personnel. These "soft costs" increase the financial resources required by EE project developers.

- *Risk perception of EE vis-à-vis conventional projects* - One of the biggest hurdles in financing EE projects is their competition with other investments (conventional energy and other) for finance. Entrenched industries have an advantage, as loan officers are more familiar with conventional energy projects. Thus, traditional projects receive priority over EE projects, even when they do not offer the best business case, or do not provide the best return.

- *Communication gap between financiers and project developers* - On one hand, banks and FIs have limited knowledge and awareness about EE project characteristics; on the other hand, EE project developers are often unaware of the project packaging and presentation requirements of the financial community. This creates a communication gap and hinders implementation of the EE projects. There is also a lack of standardized contracts, agreements, and project proposal templates that could facilitate such communication.

- *Lack of knowledge and awareness of conventional lenders* - Banks and FIs do not have sufficient knowledge and understanding of EE technologies and the technical, economic and financial characteristics of such projects. They are yet to develop the approaches and techniques for EE project appraisal and risk assessment, which further reduces their inclination to lend to such projects.

- *Limited capacity of EE service providers* - EE service providers, such as ESCOs, have limited capacity with respect to technical, business, and project and risk management skills. These skills are crucial for efficient project development and execution, and can enable EE service providers to develop "bankable projects" that can be presented to and understood by loan officers. Also, formal measurement and verification (M&V) procedures and protocols for Energy Saving Performance Contracts (ESPCs) have neither been sufficiently developed nor widely accepted in India, which also limits the capacity of ESCOs to effectively deliver EE projects.

- *Lack of capacity of project hosts* - Project proponents or "hosts" lack the capacity to understand the basic concepts of ESPC. They also do not fully understand the need for appropriately structuring energy services and financing agreements for EE projects. Hence, they are unable to develop bankable proposals for projects implemented by ESCOs.

- *Concerns about financial strength of ESCOs* - The ESCO industry in India is still at a nascent stage and lacks financial strength. This greatly limits the adoption of the ESCO mode of financing. This poor financial strength further limits ESCOs' ability to find funding sources. For instance, lenders usually require high levels of collateral or strong borrower balance sheets to provide financing. ESCOs, however, often lack such collateral or strong balance sheets (or may not be willing to commit their available collateral for EE projects). Banks and FIs also lack experience in lending to ESCOs and consider the ESPC business to be risky.

3 Instruments for Financing Energy Efficiency in India

There are a number of examples of financial instruments that have been used to address the existing barriers to EE financing in India. Some of these instruments have been introduced recently and some are still in a design phase. Some of the existing instruments were introduced for implementing policies such as the NMEEE, the EC Act, and regulatory directives introduced at the local level.

The existing instruments and mechanisms for EE can be classified as follows:

- Debt-based financing mechanisms for EE
- Fiscal instruments facilitating EE project implementation
- Equity based financing for EE
- Grants to facilitate EE implementation
- Energy Saving Performance Contracting (ESPC)
- Government EE Funds and Schemes

This section of the report reviews the current status of these instruments for financing EE in India.

3.1 DEBT-BASED FINANCING MECHANISMS FOR EE

In the last few years, several debt-based financing mechanisms have been implemented in India. These mechanisms are either backed by bilateral and multilateral donor financing, commercial bank lending, or government support.

3.1.1 Debt-Based Mechanisms Backed by Donor and Multilateral Financing

Over the years, bilateral donors and multilateral institutions have supported the creation of innovative financing options for EE projects in India. While the support has largely been in the form of debt via specific lines of credit through Indian banks and FIs, some of it has also been in the form of technical assistance (TA).[9]

[9] An example of such a project is the Global Environment Facility (GEF) and World Bank initiative, which provides TA to BEE and SIDBI to facilitate financing EE in MSME clusters to improve EE and reduce GHG emissions by utilizing increased commercial financing for EE. This project has been explained in Annex A of this report.

A snapshot of donor and multilateral based schemes in India is provided below. Apart from the five schemes discussed, the World Bank is currently working towards introducing a Partial Risk Sharing Facility (PRSF) for supporting EE financing (especially focused on PAT) in India. Details of this scheme are not yet available.

3.1.1.1 JICA - SIDBI Financing Scheme for Energy Saving Projects in MSME Sector

The Japan International Cooperation Agency (JICA) has extended the second line of credit to the Small Industries Development Bank of India (SIDBI) under Phase II of the MSMEs Energy Saving Project for financing EE opportunities in MSMEs.[10] This project, initiated in 2012, is aimed at sustaining efforts of the previous phase, which was immensely popular among the MSMEs in different industrial sectors. The objective of Phase II is to encourage MSME units to undertake energy saving investments in plants and machinery, so as to reduce energy consumption, enhance EE, reduce CO_2 emissions, and improve the profitability of units in the long run. The funding for Phase II is INR 16.7 billion (USD 270 million) over a period of three years.

The key components of the JICA-SIDBI scheme include: (i) drawing up the list of EE equipment eligible under the scheme; (ii) training and technical assistance to loan officers and MSMEs; and (iii) processing of loans *(See Box 4: Eligibility Criteria under the JICA-SIDBI Scheme).*

Phase 1 of this project (from 2008 to 2011) processed more than 3,000 loans and provided assistance to more than 3,400 MSMEs. It was one of the most successful schemes on financing EE in the MSME sector in India. The experience of Phase 1 showed that there is a high demand for EE equipment in MSMEs and a cluster-based financing approach is useful. JICA and SIDBI have highlighted that a number of factors contributed to success of this credit line: (i) the credit line was

Box 4: Eligibility Criteria under the JICA-SIDBI Scheme

- New and existing MSME units, as per the definition of the Micro, Small and Medium Enterprises Development (MSMED) Act, 2006; however, units graduating out of medium scale will not be eligible for assistance.
- Existing units should have a satisfactory track record of past performance and sound financial position.
- Energy saving projects will be screened for compliance with the Energy Saving Equipment List, which is available on the SIDBI or the JICA project website.
- Units should have at least the minimum investment grade rating of SIDBI.
- Sectors such as the arms industry, narcotics industry, or any unlawful businesses are not eligible. Similarly, such projects which may result in negative social and environmental impact are also not eligible under this scheme.
- Equipment/machinery with energy saving potential less than 10 percent is not eligible.

[10] Available at http://www.sidbi.com/sites/default/files/JICA%20-SIDBI%20financing%20scheme%20for%20MSME%20projects%20Phase%20II.pdf, last accessed on January 12, 2013

accompanied with a robust TA component that helped overcome many barriers faced by the MSME sector; (ii) the awareness campaigns and focused group meetings conducted in 28 major clusters provided a much needed means of communicating the essence of the project to the intended beneficiaries; (iii) a robust and dynamic energy saving equipment list, developed under this credit line, greatly reduced the administrative and procedural delays for sanctioning/disbursement of the loan to the beneficiary; and (iv) an effective monitoring and evaluation procedure greatly enabled assessment of the impact of the credit line.

It is estimated that the project resulted in annual electrical energy savings of 477.7 million kWh and annual thermal energy savings of 446.5 billion kCal, resulting in CO_2 emission reductions of 463,600 tons per annum (JICA and SIDBI, 2011).

In Phase II, which commenced in 2012, SIDBI had supported a total of 845 energy saving projects by February 2013, aggregating USD 112 million of sanctioned loans. The auto components sector had the largest share of energy saving sub-projects followed by the foundry and engineering sectors. Like Phase I of the credit line, Phase II also consists of a robust TA component supporting project activities at every stage (JICA and SIDBI, 2013).

The large uptake of loans under the JICA-SIDBI line of credit demonstrates that there is a large EE potential in the MSME sector. It demonstrates the effectiveness and attractiveness of a financing mechanism that has simplified application procedures (e.g., through the development of a list of eligible equipment) that can accelerate the uptake of technology improvements in the MSMEs sector.

3.1.1.2 IREDA EE Financing Scheme

IREDA implemented a scheme for financing RE and EE projects through soft loans from 2004 to 2006 (IIP, 2012) with funds provided by the World Bank. The credit line provided equipment financing, project financing, and loans for RE and EE manufacturing in the industrial, commercial and municipal sectors. The scheme financed up to 80 percent of project costs, or up to 75 percent of equipment costs, at an interest rate ranging from 5 to 12 percent, with a three-year moratorium and up to a 12-year loan term.

The total funding under the scheme was INR 60 billion (about USD 0.97 billion). The scheme financed more than 1,600 projects during its term (2004-2006); however, most of these projects were in RE.

The line of credit was introduced with a view to addressing the lack of internal capital for EE, limited commercial financing for EE, and high project development and transaction costs. While the scheme proved to be quite successful for RE projects, the take-up of financing for EE projects was very limited, indicating that some of the barriers for EE project financing, such as limited creditworthiness

of borrowers and limited capacity of ESCOs to develop bankable projects, hold true for India.

3.1.1.3 ADB – Industrial Energy Efficiency Project

From 1994 to 2000, ADB was instrumental in initiating and funding the Industrial Energy Efficiency Project (IEEP) to promote efficient and environmentally sustainable industrialization (ADB, 2002). ADB provided a loan to the Industrial Development Bank of India (IDBI) for on-lending to industrial firms. The total funding provided was USD 150 million.

The key objective of this project was to support investments in EE and related environmental improvement measures by energy-intensive industries in India. The IEEP focused on increasing the economic and technical efficiency of energy use. The project also included TA to strengthen IDBI's capabilities in three areas: (i) policy and program development for IEEP; (ii) institutional strengthening through training; and (iii) raising awareness about the need to improve EE *(See Box 5: Projects Eligible for Loans under ADB-IEEP).*

A total of 26 subprojects, involving 31 energy improvement schemes, were funded under this effort.

Some key results of IEEP were:

- IEEP substantially achieved its objectives of EE, environmental improvement, and technological improvements relating to energy-efficient processes.
- All subprojects were financed on commercial terms with rates of interest ranging from 15 to 20 percent, thus proving the IEEP assumption that market-based investments for EE can result in cost savings for Indian industry.
- The internal rate of return for sub-projects varied from 12 to 51 percent, against the loan covenant of at least 12 percent.
- The overall estimate of investment catalyzed is USD 1,064 million against ADB's investment of USD 150 million in 26 subprojects. However, ADB's Project Performance Report indicates that it was not possible to evaluate the actual EE improvements achieved.

Box 5: Projects Eligible for Loans under ADB-IEEP

- Modification of existing production processes by installing energy-efficient equipment;
- Technological restructuring of existing production facilities;
- EE-related licensing or other technology acquisition subprojects; and
- Cogeneration projects, including waste heat recovery and conversion of biomass waste into heat/electrical energy.

IEEP offers some important lessons for EE financing in India. For instance, it highlighted that while IDBI was an effective agency for channeling funds under the IEEP, its focus was on large industry, and did not address the needs of small and medium sectors of industry. Also, the effectiveness of TA was limited because it was initiated 18 months after the loan became effective. The Project Performance Report concluded that objectives related to policy changes and institutional development were not fully achieved. Despite the fact that the credit line was fully deployed, it was unclear how much of the investment was in EE per se, as opposed to in general plant expansion and modernization. The sub-borrowers' demand for loans for EE projects was not as high as expected, and the revolving fund to provide additional financing for EE was not established. Overall, the project was not highly rated for efficacy and efficiency (ADB, 2002).

3.1.1.4 USAID – Energy Conservation Commercialization (ECO-I) Program

Under the USAID ECO-I program, USAID provided funds to the ICICI Bank to on-lend to EE projects (IIP, 2012). Finance was given for up to 50 percent of project costs at a commercial interest rate. The objective of the financing was to provide loans for EE projects in industrial, commercial and municipal facilities. The project also aimed at demonstrating different approaches and financial mechanisms for increasing access to commercial financing for EE projects, as well as to increase the exposure of commercial banks and improve their appraisal skills.

The program was operational from 2002 to 2004, and ICICI Bank financed a number of innovative EE projects with zero defaults. Some of the key achievements of ICICI Bank included the financing of:

- The first ESCO shared savings project for energy-efficient municipal street lighting, which was successfully completed in 2005.
- Waste heat recovery cogeneration project in a copper smelter.
- Biomass cogeneration project in a food manufacturing facility.

A key lesson learned from this effort was that a bank truly interested in financing EE can develop innovative financing schemes for EE projects in cooperation with host facilities or an ESCO.

3.1.1.5 ICICI Bank Lending for EE

For more than a decade now, the ICICI Bank has been financing EE projects in the industrial, commercial, SME, and public sectors (ECO-Asia, 2008). Most of its projects have been supported through an INR 25 million (USD 0.40 million) credit line from the World Bank, and all loans have been fully repaid. The majority of projects received loans based on cash flow financing at an annual percentage rate of seven to nine percent, with terms of three to five years. ICICI has financed a

range of products, including EE equipment, thermal EE (e.g., industrial boilers, waste heat recovery, and industrial cogeneration), and electrical products (e.g., heating ventilation and air-conditioning, lighting, water pumping, and street lighting). The energy savings from the projects range from 15 to 30 percent. ICICI has, however, discontinued schemes that specifically focus on financing EE projects. It continues to finance EE projects as long as they meet the bank's general lending criteria.

3.1.1.6 KfW Credit Line for Energy Efficiency

SIDBI is currently offering a credit line that provides financing for investments in EE projects to existing MSMEs under a line of credit from KfW Development Bank (KfW and SIDBI, 2010). This credit line has total funding of INR 25 billion (USD 404 million). The key objective of the project is to finance EE improvements in the MSME sector in order to overcome the lack of capital for investing in EE. The project also aims to reduce energy intensity by 20 percent and GHG emissions by 30 tons per one million rupees (USD 16,181) invested through its activities. This project has been operational since November 2011 and is expected to continue until October 2013 *(See Box 6: Eligibility Criteria to Qualify for a Loan under the KfW Credit Line)*.

TA activities under the credit line included preparing guidelines and procedures for loan processing, TA to loan officers, developing an assessment tool, and a tool for monitoring results. The assessment tool has been designed, developed, and disseminated to all SIDBI loan officers to check the eligibility of investment proposals.

Two major lessons were learned from this project: (i) the TA activities are very important in building the capacity of bank loan officers with respect to EE project characteristics; and (ii) the requirement for meeting the minimum emission reductions (30 tons per million INR invested) has proved to be a key barrier to financing projects under this credit line as both borrowers and loan officers have had difficulties in evaluating the eligibility of proposed EE projects with respect to this requirement. This has led some SIDBI loan officers to focus on other donor credit lines that do not have such requirements, resulting in far fewer approved loans than anticipated.

Box 6: Eligibility Criteria to Qualify for a Loan under the KfW Credit Line

- Be an existing MSME unit (as per the definition of the MSMED Act, 2006).
- Have a satisfactory track record of past performance and sound financial position.
- Score above the minimum investment grade rating as per SIDBI's existing loan policy.
- EE projects proposed by SMEs should result in a minimum energy savings of 20 percent as well as reduction of 30 tons of CO_2 equivalent per million INR of investment.
- Should upgrade existing installations and not aim only at expansion of production capacities.

3.1.2 GOI supported EE debt-financing - Technology Innovation fund

In addition to the above-mentioned schemes backed by international organizations, GOI has set up the Technology Innovation Fund that provides an example of commercial EE lending supported by the government. The Technology Information Forecasting and Assessment Council (TIFAC) under the Ministry of Science and Technology has created a revolving fund of INR 300 million (USD 4.85 million) for technology innovation and has placed it within SIDBI to provide assistance in form of soft loans to MSMEs. The financial assistance is meant for development, up-scaling, demonstration and commercialization of innovative technology-based projects, including EE.[11] This collaborative program of TIFAC and SIDBI seeks to develop MSMEs' capabilities to innovate and bring high-risk innovations to the market.

Under this collaborative program, assistance up to 80 percent of a project's total cost, which would normally be not more than INR 10 million (USD 0.16 million), is provided. Higher assistance is considered selectively based on innovation content in the projects, and if the interest rate does not exceed five percent per year. The promoters' contribution is required to be a minimum of 20 percent of the total project cost.

This fund was started in 2011 and has supported three projects as of April 2012.

3.1.3 Commercial EE Financing Programs

There have been many instances of commercial bank/FI financing of EE projects. However, it has been observed that banks and FIs do not track EE lending as a distinct area of business, unless they have initiated a specific EE-focused lending program. Thus, a clear demarcation of specific EE lending by banks and FIs is not available.

Normally, banks include EE projects in their overall portfolio and use general lending criteria and requirements to evaluate EE projects. However, some commercial banks have had specific EE focused loans and schemes that have been implemented in the recent past *(See Table 4: Highlights of EE Loan Financing Schemes of Banks).*

[11] Available at http://www.sidbi.com/sites/default/files/products/TIFAC-SIDBIBrochure.pdf, last accessed on March 1, 2013

Table 4: Highlights of EE Loan Financing Schemes of Banks

Features/ Program title	SBI Energy Efficiency Loan Scheme for MSMEs	SBI Green Home Loans	Canara Bank – Energy Saving Loan Scheme for SMEs	Union Bank of India energy efficiency loan scheme for small and medium enterprise	YES Bank initiative for lending for EE
Sponsoring agency	SBI	SBI	Canara Bank	Union Bank of India	Yes Bank
Type of program	Financing EE equipment and measures	Concessional home loans for green buildings	Concessional loan financing of SME EE projects supported by a partial grant for energy audits as part of Canara Bank's "Green Banking Program"	Financing EE in MSMEs	Loan to SMEs and companies in industrial, commercial and agricultural sector, at commercial interest rate.
Implementing agency	SBI	SBI	Canara Bank	Union Bank of India	Yes Bank
Start date/end date	2004-ongoing	Not available			Not available
Objective(s)	Provide technology upgrades and equipment financing for energy-efficient equipment to existing bank customers	- Encourage investments in green homes by providing easier loan terms. - SBI Green Housing Loan is for customers who are buying properties in green projects which reduce carbon emissions and promote RE	- Finance energy-saving products and equipment in SMEs - Undertake Energy audits and DPR development - Project appraisal - Loan disbursement	Provide technology upgrades and equipment financing for energy-efficient equipment to bank customers	Provide technology upgrades and equipment financing for energy-efficient equipment to bank customers
Sectors targeted	Existing SBI customers, mostly SMEs	Residential	SMEs (does not include ESCO projects)		SMEs, industrial, commercial and agriculture
Barriers addressed	Lack of internal capital for EE	Higher upfront costs associated with Green building vis-à-vis conventional buildings	Limited financing for EE projects in SMEs	Lack of internal capital for EE	- Limited financing for EE projects in SMEs - Lack of internal capital for EE

Features/Program title	SBI Energy Efficiency Loan Scheme for MSMEs	SBI Green Home Loans	Canara Bank – Energy Saving Loan Scheme for SMEs	Union Bank of India energy efficiency loan scheme for small and medium enterprise	YES Bank initiative for lending for EE
Financing mechanism(s)	- Finance up to 90 percent of project costs or INR 10 million (USD 0.16 million) - Commercial interest rate - Provided some limited funding for energy audits that was then included in the project loan	- Concessional loan: 5 percent discount on the margin money, 0.25 percent concession on interest rate and waiver of processing fees for customers going in for the green projects. - Maximum term – 25 years (up to a maximum age of 70) - Quantum of loan – Minimum loan amount of INR 0.5 million (USD 8091).	- Partial grant (up to INR. 50,000 / USD 809) for energy audit and cost of preparing DPR - Loan of up to INR 1 million (USD 16181) or 90 percent of project cost under liberal terms - Limited loan guarantee facility under the Credit Guarantee Trust Fund for Small and Medium Enterprises (CGTSME) scheme	- Total quantum of loan should not exceed INR 10 million (USD 0.16 million) or 75 percent of the total project cost whichever is lower. - The project cost should include cost of energy auditing and consultancy, energy saving equipment, software, cost of effecting modifications to the existing machinery etc. - Project should have minimum DSCR of 1:3 - Subsidy from IREDA - Presently IREDA is granting subsidy of INR 25, 000 (USD 404) up to the project cost of INR 10 million (USD 0.16 million) to each project for covering partial cost of energy audit. - Subsidy will be available for initial 100 projects received by IREDA on first-come-first served basis	- The loan provided with tenure typically three years at the ongoing commercial interest rate. Financing is based on collateralization of assets or a guarantee.
Eligibility criteria	The focus is mainly on EE improvement in industrial facilities.	Home loan applicant investing in a green building	- Existing clients of Canara Bank - SMEs whose energy costs are more than 20 percent of production cost	- All units categorized under SMEs whose original investment in plant and machinery is less than and INR 100 million (USD 1.61 million) and turnover up to INR 1 billion (USD 16 million). - Actual cost of energy of the unit should be more than 20 percent of the total cost of production. Unit should possess energy audit report issued by energy consultant/auditor approved by IREDA	

The State Bank of India (SBI) was one of the first banks to provide finance to EE projects in India. The loan term is generally five to seven years and interest is offered at prevailing commercial rates. The products financed include EE retrofits, new equipment, and cogeneration in the textile, food, paper, and machining industries (ECO-Asia, 2008). SBI also runs a focused EE Loan Scheme for MSMEs. This program was initiated in 2004 as a part of the World Bank's Three-Country Energy Efficiency Project. However, no information is available on the number of loans disbursed under this scheme. In addition, SBI recently launched a loan specifically targeting promotion of green buildings in India by providing concessional home loans.[12] However, the loan never really took off due to lack of proper marketing and visibility of the program.

Following the SBI loan scheme for the MSME sector, the Canara Bank (Crestar Capital, 2011) and the Union Bank of India[13] developed lending facilities in 2004. Both these schemes are self-sponsored and provide concessional loan financing for SME EE projects for technology upgrades and equipment financing. Both programs are at present operational; however, no information could be gathered on the number of loans disbursed under them. One of the key learnings from these programs is that techno-economic appraisals of EE projects present a key challenge.

ICICI Bank recently launched an Environment Friendly Home Loan product with the objective of promoting green residential buildings.[14] The loan project was launched in August 2012 and is currently being implemented on a pilot basis in Delhi National Capital Region (NCR).

Yes Bank initiative has disbursed INR 500 million (USD 8.09 million) (ECO-Asia, 2008). It is not clear how much of this was specifically for EE. Some of the products financed included EE equipment, industrial boilers, waste heat recovery, and industrial cogeneration.

It is generally observed from the experience of these banks and FIs that most of these initiatives did not achieve much success due to reasons such as: (i) there was a lack of a robust marketing plan supporting the introduction of such loans to potential customers; (ii) the concessions offered were often found to be insufficient to induce EE initiatives and technologies; (iii) banks do not consider EE to be separate from their business-as-usual lending, which makes it difficult to measure the actual amount of EE funding arising out of these initiatives; and (iv) it is crucial to accompany EE targeted initiatives with robust capacity building on EE project appraisal for bankers. Many of the above-mentioned initiatives lacked such capacity building, thereby limiting their success.

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[12] Accessed from http://www.bankbazaar.com/guide/banks-in-india/sbi/sbi-green-home-loans/, last accessed on February 10, 2013

[13] Accessed from http://www.3countryee.org/UBIloan/index.htm, last accessed on January 30, 2013

[14] Information provided is on the basis of discussions with ICICI Bank. No published information is yet available on the ICICI environment friendly home loan scheme.

3.2 FISCAL INSTRUMENTS FACILITATING EE PROJECT IMPLEMENTATION

3.2.1 Accelerated Depreciation

The Indian Income Tax Act of 1961 prescribes depreciation rates for all components of the cost of an asset, including civil works, plant and machinery. In keeping with this Act, the GOI offers accelerated depreciation benefits (80 percent in the first year) for a range of energy-efficient equipment and devices. Accelerated depreciation benefits can be applied to: (i) specialized boilers and furnaces; (ii) instrumentation and monitoring systems for monitoring energy flows (e.g., digital heat loss meters, infra-red thermographs, waste heat recovery equipment, and cogeneration systems); (iii) electrical equipment (e.g., automatic voltage controllers, time-of-day energy meters, and power factor controllers for alternating current motors); and (iv) EE manufacturing devices (e.g. burners, thin film evaporators, fluid drives and fluid couplings, gas cylinders, glass manufacturing equipment, and RE devices).

The availability of this accelerated depreciation improves the economic attractiveness of the investment in EE. However, no statistics are available on how many energy users have taken advantage of this depreciation benefit.

3.2.2 Development Incentives and Tax Rebates for EE Housing

Some local governments in India are piloting programs to promote EE investments in residential buildings. For instance, the Municipal Corporation of Greater Mumbai[15] and the Pune Municipal Corporation[16] plan to offer rebates for certified Eco-Housing projects on development fees paid by developers and property taxes paid by residents. The Greater Noida Development Authority in Delhi NCR is already offering additional Floor Area Ratio (FAR) of five percent for IGBC rated (Gold/Platinum) green buildings. This incentive has encouraged many developers to apply for green building certification for their upcoming projects. Thus, the Noida region is witnessing growth in construction of green buildings in the residential sector.

3.3 EQUITY FINANCING FOR EE IN INDIA

Equity funds are generally provided by venture capital or private equity funds to finance entrepreneurial endeavors for development and/or deployment of new EE technologies. There are, however, some examples of equity funds established by the public sector for financing ESCO projects, or investments in ESCOs. Such funds may be used to provide "last mile" equity investment[17] for EE projects, or provide funding to ESCOs to facilitate project implementation. Public

[15] Available at http://mcgm.gov.in/irj/portal/anonymous/qlecohousing, last accessed on February 10, 2013

[16] Available at http://www.punecorporation.org/informpdf/dev_permission/Eco_housing3.pdf, last accessed on February 10, 2013

[17] Most banks/FIs will provide only a part (generally no more than 70 percent) of the investment needed for an EE project as debt financing and require the project developer or promoter to invest the remaining 30 percent as equity. In cases where the project developer is unable to mobilize the entire 30 percent equity, an equity fund may provide the balance as "last mile" equity to make the project financeable.

equity funds are designed to partner with private sector venture funds to leverage their expertise and resources. An example of this is the proposed BEE Venture Capital Fund for Energy Efficiency (VCFEE), discussed later in this report.

The participation of private equity funds in EE is small globally due to the small capital requirements of such projects. EE projects do not meet the minimum investment size criteria of larger private equity funds. Also, the private equity market for EE is yet to gain ground in India as most of their funding is presently focused on RE.

However, there are examples of two private equity funds that are focusing on EE in India to some extent.

3.3.1 Green India Venture Fund

Green India Venture Fund (GIVF) is set up by IFCI Venture[18] with the objective of investing in companies setting up CDM projects and other commercially viable projects/businesses. GIVF aims to invest in projects that focus on reducing or eliminating negative ecological impact; improving the productive and responsible use of natural/other resources; promoting use of alternative/non-conventional/RE sources; and synchronizing business practices for maintaining ecological balance and sustainable environment.

The fund capital is about INR 3.3 billion (USD 53.39 million) with a Green Shoe option[19]. The IFCI Venture Capital Fund will contribute a sponsor contribution of 10 percent towards the fund capital. The balance would be raised from other FIs/banks/companies/multilateral agencies and foreign investors. The fund clearly specifies the segments that can use investment under GIVF *(See Box 7: Segments for Investment under GIVF)*.

Box 7: Segments for Investment under GIVF

- **EE**: Equipment, industrial process, lighting, building material, glass;
- **Renewable/non-conventional energy**: Wind, solar, biomass and any other renewable/non-conventional energy source;
- **Energy storage**: Fuel cells, advance batteries, hybrid systems and other energy storage technology/process/equipment;
- **Waste management** including waste recycling, waste usage, etc.;
- **Water and waste water**: Water treatment and water conservation;

[18] Accessed from http://www.ifciventure.com/Funds-Green%20India%20Venture, last accessed on January 5, 2013

[19] Green Shoe Option is a provision contained in an underwriting agreement that gives the underwriter the right to sell investors more shares than originally planned by the issuer. This would normally be done if the demand for a security issue proves higher than expected. Legally referred to as an over-allotment option. a green shoe option can provide additional price stability to a security issue because the underwriter has the ability to increase supply and smooth out price fluctuations if demand surges. Typically such an option allows underwriters to sell up to 15 percent more shares than the original number set by the issuer, if demand conditions warrant such action.

- **Pollution control projects**/processes and technologies;
- **Transportation**: Vehicles, logistics, structures, fuels etc. aimed at improving efficiency and/or reducing negative environmental impact;
- **Materials**: Nano, bio, chemical and other materials with clean and environment friendly applications,
- **Afforestation** and reforestation activities,
- **Manufacturing/industrial process** aimed at reducing negative ecological impacts; and
- Any other projects as per the objective of the fund.

Investments under GIVF are to be made by way of equity and equity linked instruments in companies aimed at achieving the fund's investment objective. At least 50 percent of investments under the fund shall be made in companies engaged in energy/power-related activities/ projects. The fund expects to develop a balanced and diversified portfolio with an appropriate mix of investments in various companies engaged in the segments listed in Box 7. The fund's investments are likely to be made in early stage or expanding capital stage companies. The expected investment size is from INR 20 million (USD 0.32 million) to INR 300 million (USD 4.85 million). The fund has so far invested in 10 companies across its focus segments.

3.3.2 Global Environment Fund

The Global Environment Fund (GEFund) is a private investment fund that invests in businesses providing cost-effective solutions to environmental and energy challenges.[20] The fund is dedicated to clean technology, emerging markets, and sustainable forestry. GEFund has successfully raised the INR 6.4 billion (USD 104 million) South Asia Clean Energy Fund (SACEF). Investors in this fund include the ADB (USD 16 million of seed capital), U.S. Overseas Private Investment Corporation (OPIC), the International Finance Corporation (IFC), Wells Fargo, and Japan Bank for International Cooperation (JBIC). The majority of the investments under this fund in India will be in small companies dealing in wind and solar projects, as well as off-grid solar opportunities.

GEFund invests in industries and companies that provide environmental benefits; contribute to sustainable development; and/or help overcome environmental challenges. It focuses on investments in companies operating in four major areas: clean energy, environmental services, efficient transportation, and sustainable natural resources.

All investments are on a commercial basis, and returns are not expected to be less than market returns.

Recently GEFund has made an investment of INR 150 million (USD 2.43 million) in Kalki Technologies, a provider of energy efficient systems. This company supplies products, services, and solutions that monitor, manage, and optimize energy generation and transmission assets for public and private sector utilities across the globe.

[20] Available at' http://www.globalenvironmentfund.com/about-gef/, last accessed on March 1, 2013

3.4 GRANTS TO FACILITATE EE IMPLEMENTATION

Grant based mechanisms for EE in India have taken the form of subsidies offered by funds setup by several government ministries. Some grants have also been provided at the local government level. A review of these schemes is provided below.

3.4.1 GOI Subsidy Schemes

The GOI offers several subsidy schemes for the promotion of MSMEs to address the need for technology upgrades in this sector. Apart from other qualifying equipments, these schemes also include subsidies for investments in energy saving devices. Some key highlights of these schemes are mentioned below.

3.4.1.2 The Technology Upgradation Fund Scheme for the Textile Industry[21]

The Technology Upgradation Fund Scheme (TUFS), which is the "flagship" scheme of the Ministry of Textiles, is meant for modernization and technology upgrades in the textile sector. TUFS aims at making funds available to the domestic textile industry for technology upgrades of existing units and also for setting up new units with state-of-the-art technology. This will enhance the textile industry's viability and competitiveness in both domestic and international markets.

TUFS was launched in 1999 for a five year period, and subsequently extended to March 31, 2007. The scheme was then restructured on April 28, 2011 and approved for operation until March 31, 2012. Under this scheme, GOI funding is limited to interest reimbursements or capital/margin money subsidies on a technology upgrade project. It mainly provides for reimbursement of five percent (four percent in respect of new standalone/replacement/ modernization of spinning machinery) of the interest charged by the FIs/banks for technology upgrade projects. As of June 30, 2010, a total of 28,302 applications with a project cost of INR 2077.47 billion (USD 33.62 billion) were sanctioned under TUFS. This totaled to a loan amount of INR 850.91 billion (USD 13.77 billion). However, there is no separate calculation for the loan amount meant exclusively for energy-saving devices.

In order to provide a network of financial organizations to sanction and disburse loans, the nodal agencies – IDBI, SIDBI and IFCI -- have co-opted various institutions. These include All India Financial Institutions, Scheduled Commercial Banks, Co-operative Banks, State Finance Corporations, State Industrial Development Corporations, and National Cooperative Development Corporations.

[21] Available at http://www.ministryoftextiles.gov.in/faq/faq_tuf.pdf, last accessed on February 15, 2013

3.4.1.2 Credit Linked Capital Subsidy Scheme

The Credit Linked Capital Subsidy Scheme (CLCSS) was launched by the Ministry of MSME in 2000. The objective of this scheme is to facilitate technology upgrades in the specified products/sub-sectors by providing an upfront capital subsidy to small scale industry (SSI) units, including small units, khadi, village and coir industrial units. The capital subsidy is provided on the institutional finance used by SSIs for modernization of their production equipment (plant and machinery) and techniques.

This scheme originally provided a 12 percent capital subsidy to SSI units on their institutional finance, which was not to exceed INR 4 million (USD 64,725). However, the rate of subsidy was enhanced in September 2005 from 12 percent to 15 percent, with a maximum limit on loans for eligible units capped at INR 10 million (USD 0.16 million). The ceiling on the subsidy is INR 1.5 million (USD 24,272) or 15 percent of the investment in eligible plants and machinery, whichever is lower. CLCSS also indirectly provides for machinery with energy savings potential, thereby promoting EE in the MSME sector.

3.4.1.3 Scheme for Technology and Quality Upgradation Support to Micro, Small and Medium Enterprises

This scheme, launched in 2010, is one of the ten components of the National Manufacturing Competitiveness Programme (NMCP) of the GOI. It focuses on two important aspects: (i) enhancing competitiveness of the MSME sector through EE and product quality certification; and (ii) improving the product quality of MSMEs to help them become globally competitive.

Some key activities of grants related to EE under this scheme include:

- *Capacity building of MSME clusters for EE/clean development* - This scheme provides support, in the form of grants, to organize awareness programs. Sub-activities under this category include enhanced awareness of EE in manufacturing processes, energy audits of MSMEs, and adoption of energy efficient technologies by MSMEs. The GOI provides financial support equivalent to 75 percent of the actual expenditure, up to a maximum of INR 75,000 (USD 1,213) per program. The remaining balance is to be contributed by the participants, cluster associations, etc. The implementing authority for this activity is the Ministry of MSMEs.

- *Implementation of energy efficient technologies (EET) in MSME units* - The basic objective of this activity is to encourage MSMEs in adopting energy efficient technologies. For this purpose, bankable detailed project reports (DPRs) for implementation of energy efficient

technologies are invited from the MSMEs. The GOI provides financial support equivalent to 25 percent of the project cost for implementation of EET, per the approved DPR. The maximum amount of government assistance is INR 1 million/USD 16,181 (the average subsidy for one EET project is estimated to be INR 0.5 million/USD 8,090). SIDBI is the implementing agency for this activity.

The Scheme for Technology and Quality Upgradation Support to MSMEs has been actively pursued with roughly 20 awareness programs organized on product certification. Also, 286 product certification reimbursements have been made under this scheme so far.

3.4.1.4 Other Subsidy Schemes

Similar subsidy schemes are also available from the MOCI and the Ministry of Food Processing Industries. The Integrated Development of Leather Sector Scheme (IDLSS) of the MOCI addresses the technology upgrade needs of the leather industry. Similarly the Food Processing Technology Upgradation Fund Scheme (FPTUFS) of the Ministry of Food Processing looks into the food processing industries. Like the CLCSS, both these schemes promote EE in their respective sectors. All the three schemes – CLCSS, IDLSS and FPTUFS -- were valid up to March 31, 2012.

3.4.2. Other Financing Schemes

In addition to the direct government schemes, there are GOI-supported financial intermediaries that also offer incentives and rebates to promote EE projects (ECO-Asia, 2008). *(See Box 8: Incentives and Rebates from IREDA and Other Agencies).*

Box 8: Incentives and Rebates from IREDA and Other Agencies

Incentives and rebates provided by IREDA

- An interest rebate of one percent for furnishing security of a bank guarantee, or a pledge of fixed deposit receipt, or an unconditional and irrevocable guarantee of an All India Public Financial Institution with an "AAA" rating, or the equivalent.
- An interest rebate of 0.5 percent for timely payment of interest and repayment of loan installments.
- Special concessions for entrepreneurs belonging to under-privileged sectors and for entrepreneurs establishing EE projects in specific locations.
- In addition to the above mentioned measures, IREDA also offers a 100 percent grant for carrying out pre-implementation activities, including an energy audit and preparation of detailed project reports. These grants are provided on a cost-reimbursable basis upon loan approval (i.e. after the audit and analysis have resulted in a bankable project).

Other incentives and rebates available to EE projects

- *Grants from state nodal agencies (SNAs)*: Some SNAs such as the Maharashtra Energy Development Agency, and the Gujarat Energy Development Agency, offer grants of INR 25,000 (USD 400) for EE. These grants can be applied towards the cost of energy audits carried out by industries and public sector organizations (urban local bodies).
- *Utility billing pass-through mechanism to recover investments in end-use efficiency*: With technical assistance from the USAID/India's ECO II Program, the Bangalore Electricity Supply Company (BESCOM) successfully demonstrated the use of a utility billing pass-through mechanism for the purchase of CFLs (World Bank, 2009). This program, implemented by BESCOM, used a pre-qualification process that resulted in significant price reductions for high-quality CFLs from a number of suppliers. It allowed BESCOM customers to purchase CFLs from short-listed suppliers (Philips, Osram, and Asian Electronics) at a number of pre-designated retail shops. CFLs were provided at no up-front cost to the customers, who paid for them in the form of deductions from their monthly utility bills over a period of nine months. The program mobilized an investment of more than USD 0.5 million (USD 8,091) for 125,000 CFLs installed in the BESCOM service area. This model has been successfully replicated by utilities in Mumbai (Reliance Energy Limited, Tata Power Limited, and the Maharashtra State Electricity Distribution Company Limited).

3.5 ENERGY SAVING PERFORMANCE CONTRACTING (ESPC) IN INDIA

ESPCs and ESCOs were first established in the U.S. in the late 1970s as a result of energy crisis and the rapid increase in oil prices due to the Organization of the Petroleum Exporting Countries (OPEC) oil embargo and the Iranian revolution. An ESPC involves providing an energy consumer, or "host

facility," a range of services related to the adoption of energy efficient products, technologies, and equipment. The services provided may also include financing of the EE upgrades so that the host facility has to put up little or no capital. The host facility pays for the services from the money it saves from reduced energy consumption. In many cases, the compensation is contingent on demonstrated performance, in terms of EE improvement or some other measure. Thus, it creates a system where the services and equipment can be paid from the actual energy cost savings. The ESPC is implemented by service providers that are traditionally known as ESCOs.

Although specific approaches to the ESPC vary, they can generally be characterized into two basic types of agreements - "shared savings" and "guaranteed savings." In both the models, the ESPC provides a complete range of implementation services, and generates energy and cost savings. In the shared savings model, the ESCO finances the project with a bank loan. The host facility makes no investment and shares the achieved savings with the ESCO in accordance with a prescribed formula. In the guaranteed savings model, the ESCO provides a performance guarantee and the host facility provides the project financing, sometimes with a bank loan. The ESCO is then paid for its services upon the satisfaction of the performance guarantee.

The following sub-sections highlight some of the ESPC-based projects in India.

3.5.1 USAID ECO-I Program

In 2001, USAID initiated the first phase of the project ECO-I. This project studied the mechanisms for encouraging and facilitating ESCO development and performance contracting implementation in India. Under ECO-I, case studies of ESCOs and standard performance contracts were developed. Also, a fund, managed by ICICI Bank, was created to finance demonstration projects. The first public sector ESPC project financed and implemented in India was under ECO-I. This was a street lighting EE project for the city of Nashik in Maharashtra.[22]

Under this project, the ESCO installed 486 street light controllers covering roughly 19,000 street lights at various lighting stations to improve street lighting efficiency, resulting in improvement in the existing electrical distribution network, reduction in cable losses, and power factor optimization. The project resulted in annual energy cost savings of INR 17.7 million (USD 0.29 million) or about 34 percent. It was implemented as a five-year shared savings agreement. The technology also increased the brightness of lights during rush hours, and regulated the voltage based on time, area and car density.

[22] This project was conducted by Sahastronic Controls Private Limited using financing provided by ICICI Bank under a line of credit from USAID.

3.5.2 BEE - Public Sector ESPC Approach

In 2003, BEE, in cooperation with the ADB, initiated the Energy Efficiency Enhancement Project (EEEP) to create innovative approaches to encourage development of a sustainable EE market in India. An important element of this project was the development of financial mechanisms to encourage participation of ESCOs in implementation of EE projects in the public sector (ADB, 2005).

EEEP developed an approach for applying the ESPC model in the public sector. This approach included the definition of a financing model involving an ESCO, a financing institution, equipment suppliers, and the host public agency. It also included a "payment security mechanism" that would provide some assurance to the ESCO and the lender of receipt of payments for the performance contracting services. To demonstrate the application of this approach in the public sector, BEE proposed a program to implement EE measures in high profile central government buildings, which was implemented by the Central Public Works Department (CPWD).

The central government buildings in India are managed by the CPWD. Hence, the performance contracting projects were managed by the CPWD. BEE educated CPWD regarding the performance contracting model and the role of ESCOs in the implementation of such projects.

The following process was adopted by CPWD to implement the performance contracting in central government buildings:

- BEE prepared a draft RFP in late 2003 and provided it to CPWD.
- BEE engaged consultants to conduct energy audits of the target buildings.
- CPWD modified and adapted the draft RFP and issued it publicly to ESCOs in January 2004.
- There was no separate process to invite Expressions of Interest (EOI) to short-list potential bidders.
- Proposals were received in May 2004 and the evaluation process was completed in October 2004.
- Several contractors were selected (after protracted negotiations) and the contracts were signed in 2004-2005.

3.5.3 Municipal ESPC Projects

Municipalities in India known as urban local bodies (ULBs) spend over 50 percent of their operating budgets towards energy costs. Reducing these costs through implementation of EE measures can thus contribute significantly to the financial viability of such bodies. A number of studies and energy audits have pointed out the large potential for improvement in EE and reduction of energy costs by the ULBs through optimum pumping systems design, upgrading or replacement of street lighting, and improved operational procedures. However, the implementation of such measures by ULBs has been constrained by their limited technical knowledge about EE options and lack of available capital.

The Alliance to Save Energy initiated work under the USAID Watergy Program for the implementation of ESPC projects in Karnataka and other states. It identified policy reforms, conducted energy audits, developed various tools and resources, and conducted training and capacity building programs for the ULB staff (Nexant, 2005). However, the actual implementation of EE projects was delayed due to a number of institutional barriers.

In 2005, the World Bank funded a project to develop a framework for ESPC in municipal water utilities (World Bank, 2005). Later, BEE published a manual for EE projects in municipalities, with a special focus on the ESPC approach (BEE, 2008).

The Tamil Nadu Urban Development Fund (TNUDF) sponsored an important municipal EE project. This Fund was established in 1996 as an autonomous financial intermediary to improve the operational efficiency and access private capital. The fund was incorporated as a Trust Fund with private equity participation for implementing urban infrastructure improvement projects, facilitate private participation in infrastructure financing, and develop poverty alleviation projects. TNUDF adapted the strategic ESPC framework and approach defined by the World Bank, and launched an initiative in 2007 to implement ESPC projects in seven municipalities on a bundled basis (TNUISF, 2007). The Tamil Nadu model has now been replicated in the state of Gujarat.

A number of municipal street lighting projects have also been implemented by ULBs using the ESPC process.[23] These have either involved replacement of existing mercury vapor lamps with efficient fluorescent tube lamps (T-5 lamps), or installing controls on lighting circuits. Municipal street lighting programs have resulted in significant energy savings by using a shared-savings model.

A good example is the Akola Municipal Corporation's (AMC) street lighting EE project. Under this project, AMC replaced over 11,500 existing street lights with efficient T-5 fluorescent lamps. The

[23] Examples include projects in Akola, Latur, Ujjain, Indore and Pune Municipal Corporations by Asian Electronics; in Bangalore by EIPro; and in Sangl-Miraj by Sahastronic Controls.

project used a performance contracting approach under which the selected contractor, Asian Electronics Limited (AEL), invested 100 percent of the implementation cost. The contractor also undertook the responsibility for maintaining the newly-installed lamps and replacing the failed lamps. AEL's compensation for its services was based on a shared savings approach, under which AMC paid AEL 95 percent of the energy savings over the six-year life of the performance contract. AEL was also paid an annual fee for maintaining the lamps.

AMC's project resulted in an annual energy savings of 2.1 million kWh (56 percent), representing reduced electric bills of INR 6.4 million (USD 103,559) per year. The total project cost was estimated to be INR 5.7 million (USD 92,233). The internal rate of return for AMC's project was 99 percent. The successful implementation of this project has already led to similar projects being implemented in the states of Maharashtra and Karnataka. Examples include the city of Sangli in Maharashtra and several municipalities in the state of Karnataka. These projects have indicated that most municipal street lighting projects cost less than INR 5 million (USD 80,906) and result in successful reflows.

3.6 GOVERNMENT EE FUNDS AND SCHEMES

In order to implement policies such the NAPCC and the EC Act, the GOI introduced funds and schemes to facilitate EE financing in the country. These funds and schemes in turn are deployed through a mix of financing mechanisms, which are equity, debt, grant or guarantee based. These funds and schemes are discussed below.

3.6.1 Perform, Achieve and Trade (PAT) Scheme

One of the flagship programs of NMEEE is the PAT Scheme. The PAT scheme is a market-based mechanism to make EE improvements in energy-intensive large industries *(See Table 5: Key Features of the PAT Mechanism)* more cost-effective by certification of energy savings that can be traded (NMEEE, 2008, EVI, 2011; BEE, 2011). The PAT mechanism is designed not only to help "designated consumers" achieve their legal obligations under the EC Act, but also to provide them with necessary market-based incentives to overachieve their targets.

Designated consumers report their energy consumption figures based on audits conducted by any one of the BEE accredited agencies. The Bureau can also independently verify the accuracy of reported values.

Table 5: Key Features of the PAT Mechanism

Program title	PAT Scheme
Sponsoring agency	BEE, Ministry of Power
Type of program	Innovative, market-based mechanism to enhance cost effectiveness of improvements in EE in energy-intensive large industries through tradable energy savings certificates (ES-Certs).
Implementing agency	BEE is setting up the overall framework for the scheme and Energy Efficiency Services Limited (EESL) will work as an implementation and monitoring agency for the entire scheme.
Start date/end date	Project design completed in 2010; program launched in 2012.
EE/GHG Goals	According to GOI, the estimated size of this entire scheme will be about INR 700 billion (USD 11.33 billion), and will lead to 98 million tons of GHG mitigation.
Sectors targeted	Designated consumers (large energy-intensive users) - aluminum, cement, chloralkali, iron and steel, fertilizer, pulp and paper, textile, thermal power plants. Targets set for 428 industrial units.
Barriers addressed	Lack of a market mechanism to incentivize large energy users to implement EE projects.
Financing mechanism(s)	Market-based trading of energy savings certificates.
Eligibility criteria	EE projects in designated consumers.
Total funding	There will be no direct funding from BEE for the PAT operations. Instead, there will be market-based trading.
Major activities	Feasibility and design studies have been completed. Implementation is expected soon.

3.6.2 BEE Venture Capital Fund for Energy Efficiency (VCFEE)

The VCFEE is part of the Energy Efficiency Financing Platform (EEFP), which is being established under the NMEEE. It aims at creating a market for EE in India by making innovative policy and regulatory regimes, launching financing mechanisms, and business models *(See Table 6: Key Aspects of the VCFEE)*. VCFEE is being set up with the overall objective to ensure that adequate risk capital is made available for EE projects in India *(See Box 9: Eligibility Criteria for Projects for Funding under the VCFEE)*.

Box 9: Eligibility Criteria for Projects for Funding under the VCFEE

- The project should seek to achieve demonstrable energy savings and mitigate emissions of greenhouse gases, and project sponsors/participants must offer a viable method to monitor and verify the same.
- It should be a new project, not takeover of an existing project.
- It should use viable technologies to be developed after energy audits/feasibility studies.
- The investment period of the fund shall be up to five years, with the option of early exit. In case of successful completion of the project prior to five years of investment, VCFEE may exit at the discretion of its Board of Trustees.

BEE has engaged a consultant to develop operational documents and is also in the process of hiring a project appraisal unit. Since the VCFEE is not yet operational, no results have been documented for this fund.

Table 6: Key Aspects of the VCFEE

Program title	BEE Venture Capital Fund for Energy Efficiency (VCFEE)
Sponsoring agency	BEE, Ministry of Power
Type of program	Venture Capital Fund
Implementing agency	BEE
Start date/end date	Yet to be launched
Objectives	• Provide equity financing for EE projects or companies, specifically related to the following: – Financing for incubation of new EE technologies – Technology transfer leading to local manufacturing – Project financing for last mile equity
Sectors targeted	Industrial, commercial, and municipal
Barriers addressed	• High risk of new technologies • Perceived low returns on investment • Limited equity availability for EE projects
Financing mechanism(s)	Co-invest in companies or projects. The Fund will provide last mile equity support to specific EE projects, limited to a maximum of 15 percent of total equity required, through Special Purpose Vehicle (SPV) or INR 20 million (USD 0.32 million), whichever is less
Total funding	INR 950 million (USD 15.37 million)

3.6.3 BEE Partial Risk Guarantee Fund for Energy Efficiency (PRGFEE)

The Partial Risk Guarantee Fund for Energy Efficiency (PRGFEE) has been set up under the NMEEE, with the key objective of leveraging commercial financing for EE in the country. This fund is expected to promote EE financing by commercial banks by providing a risk sharing facility that will offer partial risk guarantee to Participating Financial Institutions (PFIs). It will guarantee a maximum of 50 percent of the loan (only principal) provided by a PFI. In case of default, the fund will cover the first loss up to a maximum of 10 percent of the total guaranteed amount, and cover the remaining default (outstanding principal) amount on a pari-passu (equal footing) basis up to a maximum guaranteed amount *(See Figure 4: Process Flow of the PRGFEE in India)*. Like VCFEE, BEE is the implementing body for PRGFEE *(See Table 7: Key Features of the PRGFEE) (See Box 10: Eligibility Criteria for Participating in the PRGFEE).*

Figure 4: Process Flow of the PRGFEE in India

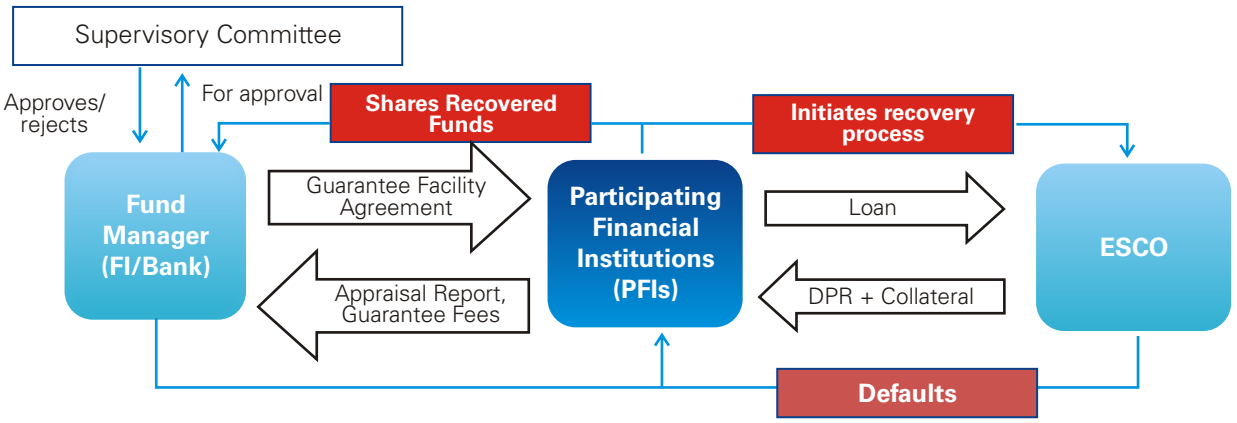


Table 7: Key Features of the PRGFEE

Program title	Partial Risk Guarantee Fund for Energy Efficiency (PRGFEE)
Sponsoring agency	BEE, Ministry of Power
Type of program	Risk Sharing Fund
EE/GHG Goals	The PRGFEE is part of the overall implementation strategy of the NMEEE. No specific targets or GHG goals specifically for PRGFEE are available. However, it has been estimated that as a result of implementing NMEEE, by the end of five years, about 23 million tons of oil equivalent (mtoe) of fuel will be saved, capacity addition of over 19,000 MW avoided, and emissions of carbon dioxide reduced by 98.55 million tons annually.
Sectors targeted	Government buildings and municipalities

Program title	Partial Risk Guarantee Fund for Energy Efficiency (PRGFEE)
Barriers addressed	• Limited commercial EE financing • Perception of high risk associated with EE projects • Lack of collateral or guarantees to eliminate repayment risk
Major activities	• Conducting and coordinating the competitive bidding process for the selection of the Project • Coordinating the signing of the Guarantee • Project Appraisal Unit (PAU) • Agreement between the PFIs and BEE • Preparing progress reports and statement of accounts on the operation of the fund, and providing these to the Fund's Steering Committee

Although the PRGFEE has not been launched, all related operational issues have been resolved and now BEE is moving forward with its implementation. The Bureau has hired consultants for developing the operational documents for this fund and has also appointed IFCI as the project appraisal unit. INR 750 million (about USD 12.14 million) worth of funding has been allotted for the first year of PRGFEE. It is likely that PRGFEE will receive periodic funding in subsequent years. Since PRGFEE is yet to be implemented, no results are available.

Box 10: Eligibility Criteria for Participating in the PRGFEE

- Any commercial bank, FI, or bank-owned leasing company in India may participate.
- Eligible borrowers for individual projects include BEE-empanelled ESCOs, or joint ventures including ESCOs.
- Eligible projects under the PRGFEE, for which PFI can apply for a guarantee, could be credit facilities extended by PFI to ESCOs for EE projects. The support under PRGFEE will be limited to government buildings and municipalities in the first phase.
- The guarantee will not exceed INR 30 million (USD 0.49 million) per project, or 50 percent of loan amount, whichever is less.

3.6.4 Credit Guarantee Trust Fund for Micro and Small Enterprises (CGTMSE)

The Credit Guarantee Scheme (CGS)[24] was launched by the Ministry of MSME to resolve the problem of limited available collateral and to encourage banks to gradually move away from a completely risk-averse stance towards SSIs. The main aim of CGS is to strengthen credit delivery

[24] Accessed from http://www.cgtsi.org.in/About_us.aspx, last accessed on February 15, 2013

systems and facilitate credit flows to the Micro and Small Enterprise (MSE) sector. *(See Table 8: Key Aspects of* the *CGTMSE).*

In order to operationalize CGS, the GOI and SIDBI together set up the Credit Guarantee Trust for Micro and Small Enterprises (CGTMSE) to ensure collateral security free loans to small entrepreneurs and SSIs *(See Box 11: Eligibility Criteria under the CGTMSE).*

Box 11: Eligibility Criteria under the CGTMSE

Any collateral/third party guarantee free credit facilities, (both fund as well as non-fund based) extended by eligible institutions to new as well as existing MSE, including service enterprises, with a maximum credit cap of INR 10 million (USD 161,812), are eligible to be covered under the scheme.

Eligible lending institutions: All scheduled commercial banks and specified Regional Rural Banks, National Small Industries Corporation (NSIC), North Eastern Development Finance Corporation (NEDFC), and SIDBI, which have entered into an agreement with the Trust for the purpose. The eligible lending institutions, on entering an agreement with CGTMSE, become Member Lending Institutions (MLIs) of CGTMSE. There are 131 MLIs of CGTMSE.

Eligible borrowers: New as well as existing MSEs.

Rehabilitation assistance: In case the unit covered under CGTMSE becomes sick due to factors beyond the control of the management, assistance for rehabilitation extended by the lender could also be covered under the scheme, provided the overall assistance is within the credit cap of INR 10 million (USD 161,812).

Non-eligibility: Any facility given on the basis of collateral security or third party guarantee shall be disqualified for coverage under the scheme. The Trust also reserves the right to reject any application for the guarantee cover, if it deems necessary.

Table 8: Key Aspects of the CGTMSE

Program title	Credit Guarantee Trust for Micro and Small Enterprises
Sponsoring agency	Ministry of MSME and SIDBI
Type of program	Credit Guarantee Fund
Key objectives	The main objective of CGTMSE is that the lender should give importance to project viability and secure the credit facility purely on the primary security of the assets financed. The other objective is that the lender availing the guarantee facility should endeavor to give composite credit to the borrowers, so that the borrowers obtain both term loan and working capital facilities from a single agency. The CGS seeks to reassure the lender that in case a MSE unit, which availed collateral free credit facilities, fails to discharge its liabilities to the lender, the Guarantee Trust would make good the loss incurred by the lender up to 75 to 85 percent of the credit facility.
Sectors targeted	MSEs
Barriers addressed	• Limited commercial financing for MSEs • Perception of high risk associated with MSE projects • Lack of collateral or guarantees to eliminate repayment risk
Financing Mechanism	The guarantee cover available under this scheme is up to 75 percent (or 80 percent) of the sanctioned amount of the credit facility, with a maximum guarantee cap of INR 6.25 million/INR 6.5 million (USD 105,178). The extent of guarantee cover for micro enterprises is 85 percent for credit up to INR 0.5 million (USD 8,090), whereas the extent of guarantee covers is 80 percent for (i) MSEs operated and/or owned by women; and (ii) all credits/loans in the North East Region (NER). In case of default, the Trust settles the claim up to 75 percent (or 80 percent) of the amount in default of the credit facility extended by the lending institution.

At present, CGTMSE is one of the most successful guarantee schemes operating in India. It has successfully encouraged collateral free lending to MSEs. As of March 31, 2012, the scheme had extended guarantees for loans of over INR 380 billion (USD 6.15 billion) covering approximately 0.8 million MSEs. Although it has not been used much for financing EE projects, it offers a successful case study for designing similar schemes in the country.

The major reason for the success of the CGTSME scheme is its provision of credit guarantees that allow MSMEs to o0btain financing. Many of these MSMEs would otherwise be considered non-creditworthy by banks and would therefore not be able to borrow any funds for their working capital

or other needs. The MSMEs are thus able to obtain financing without having to offer collateral (which they have difficulty in providing).

3.6.5 National Clean Energy Fund[25]

The National Clean Energy Fund (NCEF) is a non-lapsable corpus under the Public Accounts of India. It is created through a levy of clean energy cess of INR 0.50 per ton on coal produced domestically and imported into India. The formation of NCEF was announced in the Union Budget 2010-11, and the cess came into effect in July 2010. As of March 31, 2012, NCEF had collected cumulative revenues of INR 43.15 billion (USD 698 million), and is expected to collect a further INR 38.64 billion (USD 625 million) in FY 2012-13[26] *(See Table 9: Characteristics of National Clean Energy Fund)*.

The NCEF was created for funding research and innovative projects in clean energy technologies.[27] As per the guidelines, NCEF assistance cannot exceed 40 percent of the total project cost. However, there is evidence that this limit is not strictly complied with, and in some cases, NCEF has funded up to 100 percent of the project cost. Under this fund, the participating organizations need to make a minimum financial commitment of 40 percent of the project cost. It has sanctioned about INR 3.50 billion (USD 56.63 million) until now.

Table 9: Characteristics of National Clean Energy Fund

Program title	National Clean Energy Fund
Sponsoring agency	Ministry of Finance
Type of program	Fund
Implementing agency	Ministry of Finance
Start date/end date	July 2010 - ongoing
Objectives	Funding research and innovative projects in clean energy technologies

[25] Most of the information contained in this section has been taken from the report "Framework & Performance of National Clean Energy Fund (NCEF)" by Centre for Budget and Governance Accountability (CBGA) and Shakti Sustainable Energy Foundation. Available at http://www.cbgaindia.org/files/policy_briefs/Policy%20Brief-Framework%20&%20Performance%20of%20National%20Clean%20Energy%20Fund%20(NCEF).pdf, last accessed on March 15, 2013.

[26] Available at http://indiabudget.nic.in/ub2012-13/rec/tr.pdf, last accessed on December 15, 2012.

[27] Available at http://finmin.nic.in/the_ministry/dept_expenditure/plan_finance2/Guidelines_proj_NCEF.pdf, last accessed on December 15, 2012.

Program title	National Clean Energy Fund
Types of technologies targeted	• Integrated community energy solutions, smart grid technology, renewable applications with solar, wind, tidal and geothermal • Advanced solar technologies, geothermal energy, bio-fuels from cellulosic biomass/algae/any waste, offshore marine technologies (wind, wave and tidal) and onshore wind energy technologies, hydrogen and fuel cells
Barriers addressed	Availability of financing both grants for demonstration and soft loans for large projects for faster diffusion of RE and EE technologies
Financing mechanism(s)	Viability gap funding or loan up to 40 percent of project cost
Eligibility criteria	• Individual/consortium of organizations in the government/public/private sector • The project must be sponsored by a ministry/department of the government. • Project should not have availed any other benefits

Currently, at least 80 percent of the NCEF corpus is unutilized; also, the proposal assessment and approval process is very cumbersome and time consuming. There the need for additional institutional capacity within NCEF. Also, there is currently limited focus and inadequate involvement of Indian research institutes and industry.

3.6.6 Kerala State Energy Conservation Fund

The Kerala State Energy Conservation Fund (KSECF) was set up in response to the EC Act of 2001 (The EC Act requires establishment of energy conservation funds at the state level to facilitate implementation of EE projects). While many Indian states have considered setting up such a fund, the state of Kerala was the first one to establish the KSECF (Government of Kerala, 2010). This fund is managed by the Energy Management Centre (EMC) Kerala.

The KSECF was initiated in January 2010 with four key objectives:

- *Provide financing support for EE projects in Kerala;*
- *Facilitate the development of the EE market;*
- *Build capacity of banks/FIs and develop model financial transactions; and*
- *Leverage commercial financing.*

KSECF targets industrial, commercial, municipal, public buildings, and residential sectors. It aims to address financing barriers, such as lack of internal capital for EE in the state, limited commercial financing, high project development and transaction costs associated with EE, lack of knowledge, and high risk perception of banks/FIs for EE projects.

KSECF was started with an initial funding of INR 40 million (USD 0.64 million), consisting of INR 20 million (USD 0.32 million) from the state budget and INR 20 million (USD 0.32 million) as a grant from the BEE. The funding was slated to be increased at a later stage. The fund has six financing mechanisms (ECO-Asia, 2009), approved by the KSECF Board, for financing EE projects in the state. These mechanisms are discussed in detail in the Annex A of this report. However, none of these financing mechanisms are at present active in the state, as they are still in the planning phase.

So far, KSECF has financed two projects in cooperation with Energy Efficiency Services Limited (EESL) - one for waste heat recovery, and the other for development of the State Energy Conservation Action Plan. The state government plans to increase the capitalization of KSECF with funds from the sale of carbon credits from the state's compact fluorescent lamp (CFL) program. In addition, the EMC has petitioned the Kerala Electricity Regulatory Commission to impose an "EE cess" of INR 0.01 per kWh, which should be credited to the KSECF.

3.6.7 EE Financing Initiatives Resulting from Regulatory Directives

The Electricity Act empowers the state regulatory commissions to issue directives for promoting EE and demand-side management (DSM). Two mechanisms have been identified as potential methods for utility-driven EE implementation: (i) the recovery on EE investments through a billing pass-through mechanism; and (ii) the creation of a pool of funds to implement EE projects (ECO-Asia, 2008).

Maharashtra has already created a pool of funds mechanism. Utilities in the state were able to use a load management charge (LMC) to initiate EE projects under a directive from the Maharashtra Electricity Regulatory Commission (MERC). Under Section 23 of the EC Act, MERC issued a directive to distribution licensees to curb demand. This directive was applicable to the Maharashtra State Electricity Board, Brihan-Mumbai Electric and Supply Undertaking, MulaPravara Electric Cooperative Society, Tata Power Company Limited, and Reliance Energy Ltd. MERC allowed these power supply companies to levy the LMC on customers whose consumption exceeded 500 kWh per month. Utilities across Maharashtra levied a fee of INR 1 per kWh for electricity consumed in excess of 80 percent of the consumption recorded in the corresponding billing months of 2004. The MERC directive also allowed a rebate of INR 0.50 per kWh for customers whose consumption was lower than 80 percent of the consumption during the corresponding billing months of 2004. In its detailed order, MERC directed the utilities to maintain a separate account for the LMC collected by

them. It further insisted upon utilization of the LMC funds to initiate energy conservation and DSM initiatives. Through this pool of funds, the utilities implemented various EE initiatives in the residential sector and for street-lighting.

The load management charge was discontinued after a period of 1.5 years by order of the Appellate Tribunal. However, this regulatory intervention resulted in utilities developing DSM programs and budgets that are consolidated in the tariff approval process. MERC now allows utilities to pass DSM program expenditures through the tariff by combining them in the rate base, following the submission of an implementation plan, which must include a monitoring and assessment component.

4 Recommendations for Innovative Financing Options for EE in India

As demonstrated in this report, India has a huge potential for improving EE. However, many barriers limit the adoption of EE measures and technologies. Some mechanisms have been deployed by the national and state governments and donor agencies to overcome these barriers. But, new or innovative mechanisms are needed to help realize the country's full potential for EE. Based on a review of existing mechanisms and discussions with experts in the field of EE financing, this section presents seven innovative financing mechanisms that could help overcome some of the barriers and contribute towards increased implementation of EE in India. Some of these mechanisms could potentially be combined for implementation. For instance, creation of state-level clean energy funds could be combined with standard offer programs as mechanisms to fund implementation of EE obligations, and thereby stimulate EE investment and project implementation at the state level.

The innovative mechanisms identified and discussed in this report include the following:

- Establishment of state-level clean energy funds using the public benefit charge concept.
- Regulatory schemes to acquire EE resources using a Standard Offer Program (similar to the Feed-in-Tariff for RE resources).
- Promoting utility financing of EE projects by establishing EE obligations.
- Encouraging Indian banks and FIs to mainstream EE in corporate loans by establishing programs similar to the EBRD's Corporate Energy Audit Program.
- Creation of a facility to provide energy savings insurance.
- Establishment of a "Clean Energy Financing Facility" to facilitate financing of EE projects on a pilot basis.
- Designation of EE financing as Priority Sector Lending.

4.1 ESTABLISHMENT OF STATE LEVEL CLEAN ENERGY FUNDS USING THE PUBLIC BENEFIT CHARGE CONCEPT

4.1.1 What is a public benefit charge and how can it be used to establish a Clean Energy Fund?

Clean energy funds have received increasing acceptance in both developed and developing countries. Such funds can be established as special purpose funds by national or state governments for financing clean energy projects. In some countries, international donor agencies such as the World Bank, the ADB, or the EBRD, have established clean energy funds. In India, the EC Act requires that all states establish Energy Conservation Funds. A review of international best practices in clean energy funds was recently conducted as part of a project for the Karnataka Electricity Regulatory Commission (IIEC, 2012a). The aim of this review was to examine the approaches and methods used for establishing such funds.

Some of the best examples of clean energy funds are in the U.S. Most of these funds have been created at the state-level using various mechanisms. The most common, reliable and sustainable source of funding is a tariff surcharge, cess or levy established by the regulator and collected by the utility via the customer's electricity bill. Such a surcharge or levy is known as a Public Benefit Charge (Limaye, 2011). *(See Box 14 : The Public Benefit Charge Concept).*[28]

[28] Center for Climate and Energy Solutions, Public Benefit Funds, available at http://www.c2es.org/what_s_being_done/in_the_states/public_benefit_funds.cfm, last accessed on June 15, 2013

Box 12: The Public Benefit Charge Concept

The Public Benefit Charge (PBC), also known as a System Benefit Charge (SBC), is based on the fundamental concept that utility ratepayers should pay for a part of the cost of the economic, social and environmental benefits of clean energy. In restructured electricity markets, utilities generally do not have an economic incentive for investing in clean energy projects that provide public benefits. Therefore, policymakers and regulators have established the PBC as a broad-based and competitively neutral approach to fund clean energy.

A PBC is generally implemented through a charge on customers' utility bills, either based on their energy usage or through a flat fee. It is designed to create a funding mechanism for clean energy (and sometimes also for certain low-income assistance programs and projects). It can be created through national or state government statutes or regulatory orders. PBC is generally applied to all customers ("non-bypassable") and is designed to provide a sustainable, long-term funding source.

In India, the International Institute for Energy Conservation (IIEC) has been working with Karnataka Electricity Regulatory Commission (KERC) to explore the possibility of developing a Clean Energy Fund in Karnataka (IIEC, 2012b). This project is funded by the British High Commission (BHC), Foreign and Commonwealth Office.

4.1.2 How can the Clean Energy Fund initiative help?

The establishment of a clean energy fund at the state level can help overcome many barriers to EE implementation *(See Table 10: Addressing the Barriers to EE with a Clean Energy Fund).*

A clean energy fund can be utilized in a number of ways to help finance EE programs (as well as off-grid RE programs). These include: soft loans, leveraging commercial financing, interest 'buy-down' on commercial loans, loan guarantees, audit subsidies, grants for public sector projects, subordinated loans and rebates.

Table 10: Addressing the Barriers to EE with a Clean Energy Fund

Barrier	How the Fund Addresses the Barriers
Lack of knowledge and awareness	Fund demonstration projects; publicize success stories
New EE technologies	Finance projects with innovative technologies; provide training and education, publicize success stories
Limited funds availability	Provide funds for projects; supplement conventional bank/FI financing

Barrier	How the Fund Addresses the Barriers
Small project size	Facilitate financing of small projects; standardize and aggregate projects
Limited applications of project financing	Educate banks/FIs on applicability of project financing; provide risk guarantees
Lack of bank/FI experience	Provide information and training to banks/FIs; work with banks/FIs to finance demonstration projects
Perception of risk	Provide risk guarantees; document and publicize success stories
Collateral or strong balance sheet requirement	Provide credit guarantees; assist ESCOs in project financing
High transaction costs	Standardize project financing application forms; create forum for interaction among banks/FIs and project developers
High development costs	Finance and/or subsidize energy audits; educate consumers on benefits of EE and on role of ESCOs
Lack of investment grade proposals	Develop guidelines and procedures for project proposals; finance demonstration projects
Monitoring, measurement and verification methods and tools	Develop guidelines and procedures for M&V; demonstrate the applications in early projects
Limited infrastructure for implementation	Provide a clear signal to the market that the Fund will be financing projects on an on-going basis

Source: Adapted from Limaye, 2010a

4.1.3 What needs to be done?

As mentioned earlier, the EC Act mandates the establishment of state energy conservation funds. While some states have established such funds, with funding support from BEE, these funds have been small, and they have not been deployed effectively to finance EE projects.

The BHC-IIEC project in Karnataka has conducted a review of international experiences with the PBC and designed the Karnataka State Clean Energy Fund (KSCEF), which will be the first fund in India to be created using the PBC concept. KERC is expected to notify the rules and regulations for this fund in the near future. KSECF has a substantially larger size than the state energy conservation funds, and is likely to be deployed for a range of EE and off grid RE projects.

The required activities are:

- Monitor the results of the KERC Clean Energy Fund;
- Document the results of this Fund; and
- Explore the establishment of similar funds in other states.

4.2 REGULATORY SCHEMES TO ACQUIRE ENERGY EFFICIENCY RESOURCES USING A STANDARD OFFER PROGRAM

4.2.1 What is EE Resource Acquisition using a Standard Offer Program?

EE provides benefits to the electric power system in terms of reducing electricity consumption and peak loads in a reliable, predictable and measurable manner. As a result, energy savings can be compared on an economic, financial, and environmental basis to the power production of a conventional power plant (CPP) or a RE resource. Energy savings can help replace the power that would otherwise have been produced by a CPP or RE. EE can therefore be treated in the electric power system as a resource that can be acquired in a manner analogous to renewable or conventional energy resources. An innovative mechanism for acquiring EE resources is the SOP.

The SOP is a mechanism under which a utility (or a government agency) purchases energy savings and/or demand reductions from end users using a predetermined and pre-published rate based on verified savings (Limaye, 2010b). It is analogous to a Feed-in-Tariff (FiT) program, which purchases RE generated by utility customers or project developers at a pre-established price. However, in case of the SOP, the resource purchased is in the form of energy savings, rather than energy production. Payments are based on a verified value of electricity savings (in kWh and/or kW) accruing to the power system as a result of the energy saving products, technologies, and/or equipment implemented in energy-using facilities (Eyre, 2012) *(see Box 12: International Overview of the Standard Offer Program)*.

A SOP is generally established by a government or a regulatory agency. Such an agency defines the mechanism to be utilized for funding the SOP payments for acquiring the EE resources. The funding could come from a government budget allocation, regulatory tariff surcharges (such as a public benefit fund), or special taxes. Once the funding mechanism is identified and the funds are allocated, it is necessary to appoint a program administrator (PA). The PA may be a government agency, utility, an NGO, or a public-private partnership. The PA develops and publishes the list of eligible project developers or project sponsors (PS), including EE technologies and the guidelines, rules and procedures for the SOP.

Box 13: International Overview of the Standard Offer Program

The concept of SOP originated in the U.S. where such programs are in service for more than 20 years now. It was pioneered in the 1990s in New York and New Jersey, while Texas and California instituted such programs more than a decade ago. These prototype SOPs have led to impressive, cost-effective energy savings, particularly in the commercial sector. They also figure prominently in the DSM portfolios of these states. In recent years, agencies and utilities in more than 15 additional U.S. states have added SOP style programs to their portfolios of EE programs (IIEC, 2013).

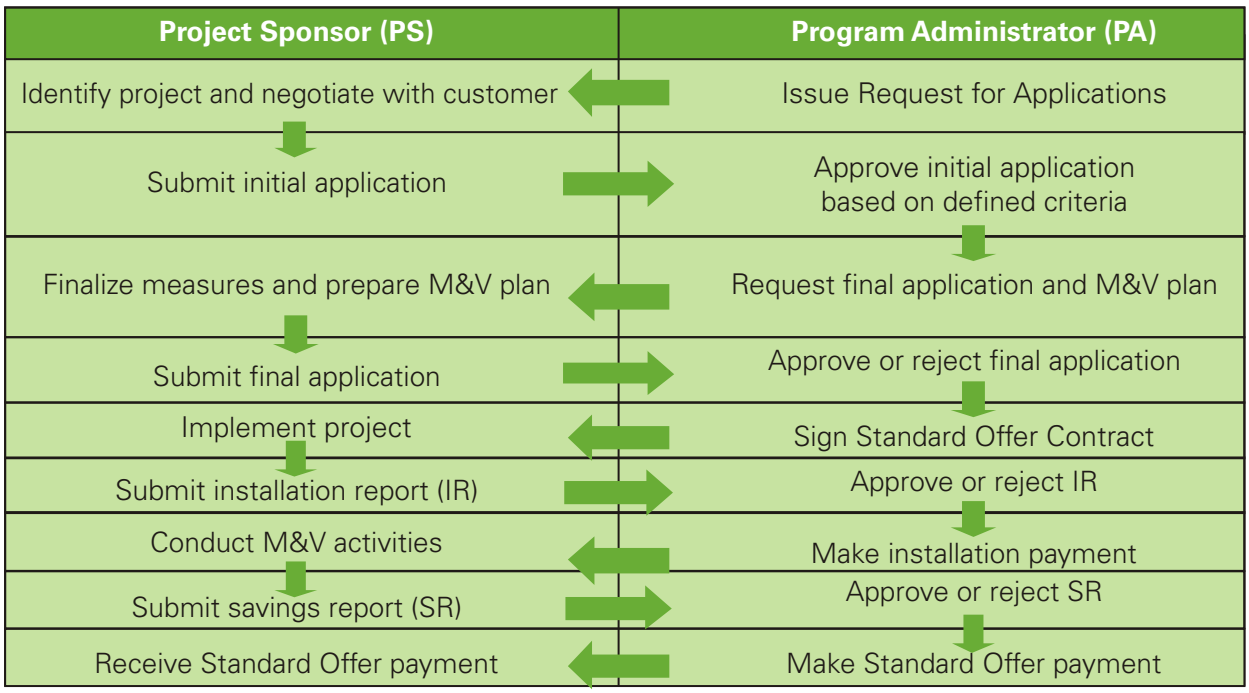
Other countries, such as Canada, South Africa, and Portugal have also introduced SOP programs. In the U.K., the Department of Energy and Climate Change (DECC) launched a Renewable Heat Incentive (RHI) program for businesses.[29] This initiative compensates the energy savings produced by geothermal heat pumps in a manner similar to its FiT system that compensates RE fed into the grid. The U.K. Parliament is also considering adopting a far more extensive SOP program.[30]

In South Africa, the national utility Eskom, under a directive from the government and the electricity regulator, operates three programs that can be designated as SOPs as per the definition in this report. These include the Standard Offer Program, the Standard Product Program, and the Performance Contracting Program (Skinner, 2012).

Project sponsors develop and submit preliminary proposals to the PA to confirm the eligibility for the SOP payments. These proposals include the definition of the sponsor organization, EE measures to be implemented, expected savings, M&V plan, and specification of the M&V agency. Post confirmation, a formal agreement is signed between the PS and PA.

The PA implements the project and requests the M&V agency to verify and report the savings. The PA, upon verification that the EE resources (savings) have been delivered, initiates payment to the PS. The payment may be in several installments *(See Figure 5: A Typical SOP Process)*.

Figure 5: A Typical SOP Process



Source: Adapted from Limaye, 2010b

[29] Available at, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48041/1387-renewable-heat-incentive.pdf, last accessed on March 10, 2013

[30] Available at, Report to United Kingdom Parliament: Electricity Demand Reduction: Consultation on Options to Encourage Permanent Reductions in Electricity Use, http://www.decc.gov.uk/assets/decc/11/consultation/electricitydemandreduction/7075-electricity-demand-reduction-consultation-on-optio.PSf. last accessed on March 10, 2013

4.2.2 How can SOP initiative help?

The SOP provides a mechanism for scaling up the implementation of EE by treating EE as a resource similar to RE resources and paying for the results delivered by the EE programs. The results include significant benefits not only to the participating project sponsors, but also to project implementers (such as ESCOs) and the electric utility. These benefits are listed below.

- Reduces the end-user's first cost barrier.
- Reduces the long-term power supply costs.
- Facilitates commercial financing by guaranteeing timely payments for delivered energy savings.
- Provides a simple and transparent program structure.
- Makes payments only for verified delivered savings.
- Promotes innovation in EE project implementation.
- Provides opportunities for ESCOs to implement projects.

4.2.3 What needs to be done?

At present, IIEC is conducting a review of international experiences with SOP in a project funded by New Delhi-based Shakti Sustainable Energy Foundation (IIEC, 2013). This project will define the potential applicability and benefits of SOP in India.

The specific actions that need to be undertaken include:

- Review results of the assessment conducted in the Shakti project;
- Designate the appropriate organization(s) that would design and implement the SOP at the national and/or state levels;
- Identify appropriate funding sources;
- Develop a pilot program to test the feasibility and benefits of the SOP; and
- Scale up the SOP implementation through a national organization or state-by-state implementation.

4.3 PROMOTING UTILITY FINANCING OF EE PROJECTS BY ESTABLISHING ENERGY EFFICIENCY OBLIGATIONS

4.3.1 What are Energy Efficiency Obligations?

Energy Efficiency Obligations (EEOs) are requirements imposed by governments or regulators on utilities or energy providers to meet specified energy savings targets.[31] The EEOs use government authority to require investments by utilities/energy providers in EE programs (Swanson, 2012). Typically, EEOs require utilities to achieve a certain level of energy savings (because EE resources are generally less expensive than most other resource options) and establish energy savings targets within a long-term framework. It requires obligated parties to achieve energy savings through promoting increased end use EE. An EEO effectively states public policy and provides a clear benchmark for measuring progress. An EEO may require obligated energy providers to obtain savings directly, or may allow them to purchase savings obtained by others. Implemented effectively, EEOs are useful mechanisms for mobilizing utilities to support end use EE.

EEOs are sometimes coupled with "white certificates" to account for achieved energy savings. White certificates serve as units of measurement for the energy savings resulting from individual energy saving projects. Utilities may use these certificates to document the achieved energy savings. Some white certificates allow trading of achieved energy savings (often termed "tradable white certificates") involving independent EE providers and obligated utilities. *(See Box 13: Energy Efficiency Obligations - International Overview).*

Box 14: Energy Efficiency Obligations - International Overview

Many EEO programs exist around the world, with governments continuing to design new programs. In the U.S., 26 states (ACEEE, 2011), most recently Wisconsin and Arkansas, have EEO programs (also known as EE Resource Standards). In the European Union, Italy, the U.K., France, and Flanders (Belgium) have implemented Energy Efficiency Resource Standards (EERS) (Staniaszek and Lees, 2012); while Poland and other members are considering their adoption. In Australia, New South Wales and Victoria have EEOs, and China too has recently announced an EEO-type program. While these programs vary in their design and structure, the common element is the financing of EE projects by the obligated utilities. Penalties are imposed on the utilities if they fail to meet the designated targets.

The European Union, under its recent Energy Efficiency Directive, has mandated all its member countries to implement EEOs with a savings target equal to 1.5 percent of retail energy sales per year from 2014-2020 (EU, 2011).

[31] EE obligations are also called "energy efficiency resource standards" (EERS), "energy efficiency portfolio standards" (EEPS), or "energy efficiency commitments" (EEC)

All EEO programs require appropriate M&V frameworks to confirm that the savings targets are being met.

4.3.2 How can the EEO initiative help?

The EEOs mobilize utility financing for EE projects and programs by imposing a requirement on the utilities to deliver energy savings and conducting verification of achieved savings.

To meet their obligations, utilities either invest directly in EE projects, or acquire EE savings achieved by others by purchasing energy savings or white certificates (if allowed by the regulatory mechanisms). They may also contribute to a fund that provides energy savings services across defined end users and groups of customers. Utilities may meet their energy savings obligations by using funds created by a public benefit charge (see section 4.1) or by establishing an SOP (see

section 4.2). Regardless of which method is used by the utility, there is increased funding available for EE projects.

4.3.3 What needs to be done?

In India, the BEE PAT scheme, discussed in Section 3.6.1 of this report, uses the concept of tradable energy savings certificates similar to the EEO. However, in this case the obligation is on energy users rather than on utilities. To adopt the EEO approach for utilities in India, regulators at the national or state level need to develop appropriate schemes to impose the obligations for energy savings on utilities.

The major steps in implementing an EEO program are:

- Review and document international experience with EEOs;
- Assess the feasibility and benefits of adapting some of this experience to India;
- Develop a concept paper on EEOs and review with Central Electricity Regulatory Commission (CERC), Forum of Regulators (FOR) and state regulators;
- Develop a road map for implementation; and
- Work with one or more selected states to implement EEOs.

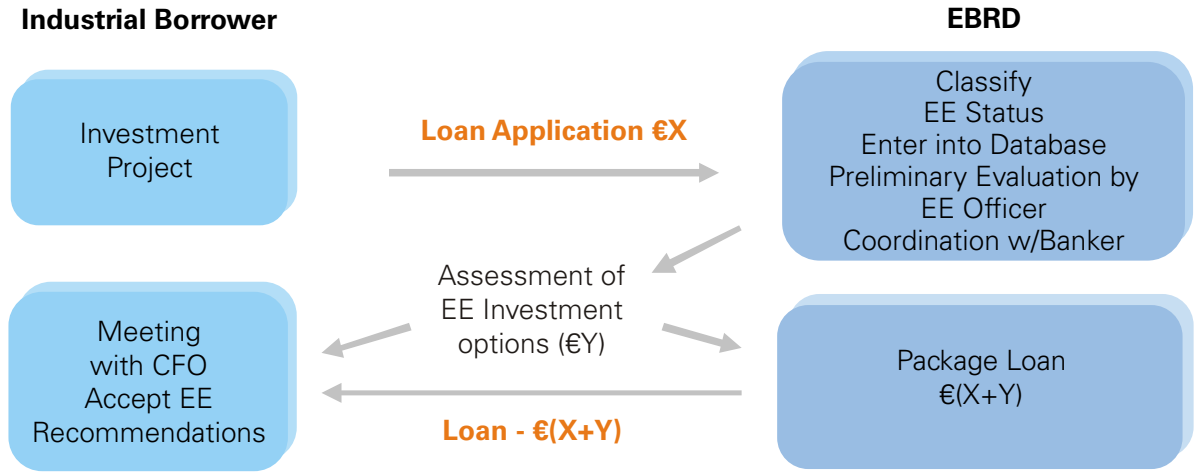
It should be noted that it is not clear whether specific legislative authority exists in the Electricity Act or other legislation to enable state electricity regulatory commissions to impose EEOs. Modifications to the Electricity Act may be needed to successfully implement this measure.

4.4 MAINSTREAMING EE IN CORPORATE LOANS

4.4.1 What is meant by mainstreaming EE?

Most banks do not consider EE potential when they consider applications for loans from their corporate customers. Mainstreaming EE involves assessment of EE potential and integration of its financing into customers' investment strategy, as part of the evaluation of any new corporate loans. An excellent example of this is the Energy Efficiency Audit and Technical Assistance Programme of the EBRD, which is a part of EBRD's Sustainable Energy Initiative (EBRD, 2012) *(See Figure 6: Overview of EBRD CEAP).* A key element of the EBRD Sustainable Energy Initiative is the Corporate Energy Audit Programme (CEAP) *(See Box 15: The EBRD Corporate Energy Audit Programme).*

Figure 6: Overview of EBRD CEAP



Source: D'Addario, 2013

Box 15: The EBRD Corporate Energy Audit Programme

Lack of reliable and credible energy audits have been identified as a barrier to EE projects. To address this barrier, EBRD has implemented the CEAP, which offers energy auditing services to its industrial and commercial clients during the evaluation of their loan applications. The EE audits typically assess: basic energy inputs; supply arrangements and the associated reliability and risks, monitoring and measurement systems and their accuracy; energy use and its technical requirements; an energy balance for the company; and appropriateness of new energy sources and their performance against current international best practice. As a result of EBRD's assessment of the EE investments, about 60 percent of clients voluntarily implemented the identified EE opportunities using EBRD loans.

The EE potential of any loan application is discussed at the client's site, parallel to the loan discussion between the bankers and the client. If, at this stage, the EBRD engineers find that the client already has a strategic investment plan in place, they propose revision of the plan, also offering an energy audit. If the client company does not have any plan in place, EBRD may ask the company to establish an energy management system (EMS) as part of the loan agreement.

It may not always be possible to complete an energy audit before the loan closure. In such a situation, EE financing is accommodated later through various financing mechanisms. In cases where both the loan application and the energy audit can be completed in parallel, EBRD's engineers work together with the client engineers to prepare detailed report on EE measures, which the company can undertake on its site. The report provides detailed information to the corporate decision makers to determine whether to implement these measures, including estimated investment costs, returns on investment, and payback period. If the company agrees to implement the EE measures, EBRD also offers to finance the increased costs (above the original loan application) on same terms as the original loan.

EBRD currently has four in-house energy engineers auditing 100 projects per year at a cost of roughly USD 1.4 million. EBRD reports that the results of the audit and TA Program indicate about 1000:1 leverage of EE investments relative to audit expenses (D'Addario, 2013).

4.4.2 How can the mainstreaming EE initiative help?

The implementation of a program similar to EBRD's CEAP can lead to a substantial increase in the number of EE projects financed by commercial banks and financial institutions. Such a program can successfully address a large number of barriers to the private financing of EE and can also act as a replicable model for other banks. It also offers several advantages to both the bank and the company. *(See Table 11: Advantages of the CEAP to the Bank and the Company)*

Table 11: Advantages of the CEAP to the Bank and the Company

For the bank	For the company
Through their integration with standard loan evaluations, EE transactions become part of standard loan operations.	The EE opportunity is presented to the CFO or other financial decision maker, and not left in the domain of the technical staff.
The transaction costs are significantly reduced, since the borrower credit evaluation and sector analysis must, in any event, all be performed for the underlying loan application.	The company need not choose between investment in their core business and investment in EE – in effect, the company's borrowing capacity is augmented by investing in EE.
The relatively small size (often, about 10 percent) of the EE loan, compared to the underlying loan, makes it possible to add the EE transaction to the underlying loan.	The company accepts the bank's EE analysis as authoritative with regard to the risks and benefits of the EE measures proposed
The project analysis performed for the EE loan demonstrates that it will improve the cash position of the borrower	Training in EMS assures the ongoing contribution of the EE measures to the company's bottom line and makes it possible to identify new EE opportunities

4.4.3 What needs to be done?

Discussions with banks and financial institutions in India (HSBC Bank, ICICI Bank, and Tata Cleantech Capital) indicate their interest in adopting the EBRD CEAP as a part of their corporate sustainability initiatives. All three organizations have requested additional details on the EBRD program.

The following steps are required to successfully implement such a program in one or more Indian banks:

- Obtain additional information and document the structure and functioning of the EBRD program;

- Discuss the potential benefits with selected Indian banks;
- Provide technical assistance and auditing resources to the banks to pilot test the program and its benefits (EBRD's initial efforts related to this program benefited from funding provided by bilateral grants that covered the cost of the auditors);
- Work with HSBC, ICICI, Tata Cleantech Capital and/or other banks to implement a pilot program; and
- Develop a plan to mainstream the program in the selected banks and to scale up the program with other banks.

4.5 ENERGY SAVINGS INSURANCE FACILITY

4.5.1 What is Energy Savings Insurance?

One of the major barriers to the implementation of EE projects using performance contracting is the perception of banks and project hosts that EE projects are highly risky. This perception exists despite the performance guarantees provided by equipment vendors and ESCOs. One way to address this credibility issue is to establish a facility that would essentially "guarantee" the technical performance of EE technologies by providing technical performance insurance. Simply put, such a facility would back-up the performance guarantee offered by the equipment supplier, or ESCO, and make up the shortfall, should the equipment fail to perform according to the guarantee. The insurance would provide greater comfort to banks/FIs and to project hosts regarding the feasibility and performance of the EE technology.

The first ESI was offered 15 to 20 years ago in the U.S. (Mills, 2001). However, it failed to make much headway in the EE marketplace as most of the work was being performed for public sector host facilities by large ESCOS, which could back their guarantees with strong balance sheets. However, with EE moving firmly into the commercial market, where hundreds of ESCOs are now operating, many without the financial strength of large ESCOs, ESI provides a backstop to the performance guarantees made by these smaller ESCOs.

ESI is widely practiced in Canada and in the U.S., where several insurance companies are already offering ESI, which traditionally has been used to guarantee power reductions at retrofitted buildings. State governments have also helped develop the ESI market by demanding such insurance from firms providing energy management services in state-owned facilities. *(See Box 16: Typical Energy Savings Insurance Facility).*

4.5.2 How can the Energy Savings Insurance initiative help?

ESI is a formal insurance contract between an insurer and, either the building owner, or third-party provider of energy services. In exchange for a premium, the insurer agrees to pay any shortfall in

energy savings below a pre-agreed baseline, less a deductible. ESI has traditionally been used for existing buildings that are retrofitted to achieve savings. However, several insurers are now looking at new buildings where a logical baseline (e.g. existing energy codes) can be defined. Pricing is typically expressed as a percentage of energy savings over the life of the contract. The premium is paid once, in the first year of operation. Such policies are non-cancelable, so the owner is guaranteed to have access to the insurance for the originally agreed contract term. ESI typically insures annual savings expectations (a "volumetric" approach), although the authors of this report found one example where a payback time was insured.

Box 16: Typical Energy Savings Insurance Facility

The following information illustrates some of the terms of a typical energy savings insurance (ESI) facility in the U.S. market.

Basic Structure: The ESI covers the performance guarantee provided by the ESCO or contractor with an insurance policy that will make up the difference between the guaranteed savings and actual savings. The ESCO or contractor is the policyholder with the host facility as "additional insured" and the lender as the loss payee.

Coverage: Generally the insurance is an annual policy that covers the total contractual savings over the guaranty period for individual projects. The policy term extends through the end of all endorsed project guarantee terms.

Policy Limits: Typical policy limits are

- USD 50 million Policy Term Limit
- USD 50 million Lifetime Series Aggregate
- Each individual project added by endorsement with a specific sub limit and annual self-insured retention equal to 10 percent of guaranteed value of savings

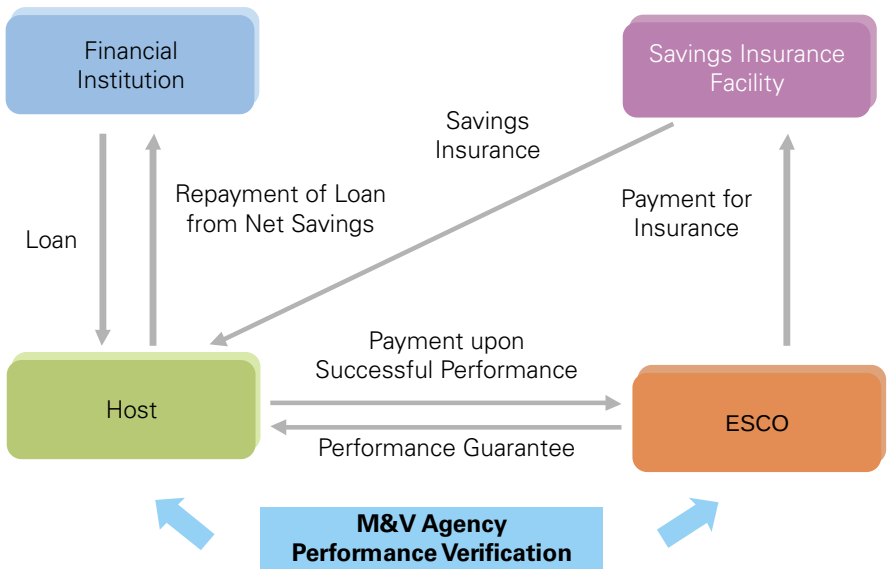
Insurance Premiums:

- One-time premium per project equaling about two percent to five percent of the total guaranteed energy savings for the project.
- Pricing is determined based on:
  - ESCO or Contractor Experience
  - Types of Technologies / Energy Conservation Measures
  - Project Length
  - Contract Size
  - Value of Savings Guarantee

ESI can be helpful for the two most common performance contracting models - Guaranteed Savings (project host as borrower) and Shared Savings (ESCO as borrower). The following discussion is adapted from a recent report on industrial EE in India (Limaye, et al, 2012) published by the Institute for Industrial Productivity (IIP).

In the first model of Guaranteed Savings, the host finances the project using its own funds or bank financing. The terms of the performance guarantee, and the M&V scheme, are specified in the energy services agreement between the host and the ESCO. The ESI provides a performance guarantee to the host regarding the technical performance of the project and specifies that if the equipment installed by the ESCO fails, or falls short of the performance guarantee, the ESI will pay a specified amount to cover the deficiency (or the loan service, if the host facility has borrowed funds from the bank). The facility requires M&V to be conducted by an independent third-party agency. In this manner, the facility provides comfort and risk protection to the host regarding the technical performance of the project and thereby facilitates the host's decision to undertake the project *(See Figure 7: Savings Insurance Facility with Project Host as the Borrower)*.

Figure 7: Savings Insurance Facility with Project Host as the Borrower

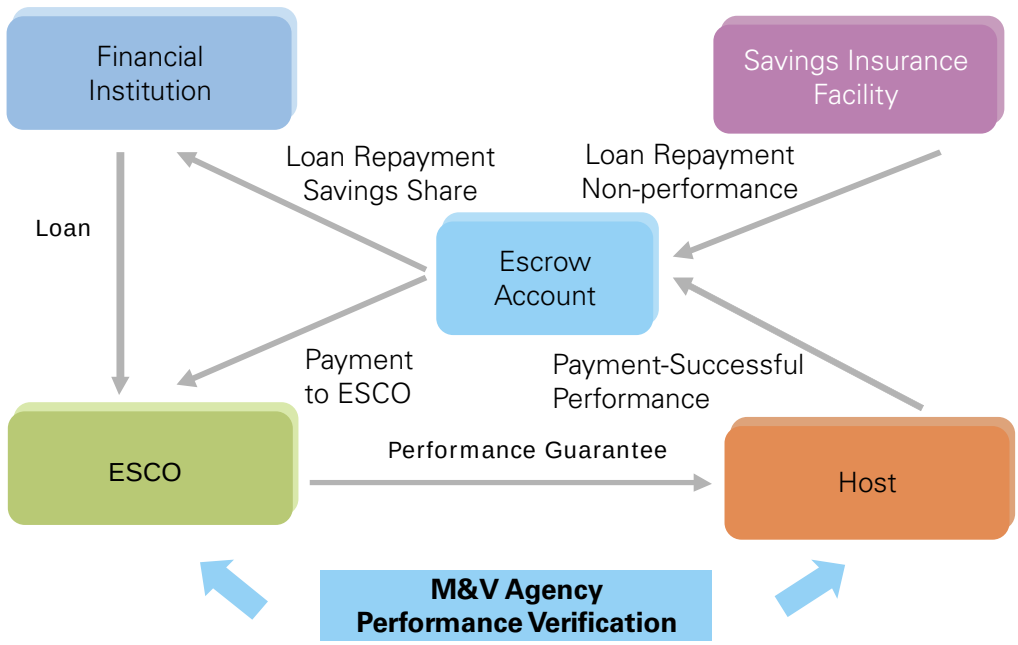


Source: Limaye, et al, 2012

In the second model of Shared Savings, the ESCO signs a contract with the host facility to implement the EE project and provides an appropriate performance guarantee. The ESCO borrows funds from the bank to implement the project. When the project is installed and performance is verified as per the specified M&V protocol, the host makes payments into an escrow account at the bank. The loan repayments to the bank are made from the escrow account and the remaining amount is paid to the ESCO *(See Figure 8: Savings Insurance Facility with ESCO as the Borrower)*.

As in the case of the host financing model, the insurance facility evaluates the capacity of the ESCO and the technical characteristics, including the risks of the project, and provides a performance guarantee to the bank. If the performance of the project fails or falls short of the guaranteed level, the host does not pay the ESCO (or pays an amount less than what may be required to pay the loan repayment). In such a situation, the facility makes a payment to the escrow account that is sufficient to pay the bank loan repayment.

Figure 8: Savings Insurance Facility with ESCO as the Borrower



Source: Limaye, et al, 2012

The insurance facility thus backs up the ESCO's performance guarantee and provides risk protection to the bank regarding the loan repayment. Such a scheme should enhance the ESCO's ability to obtain bank financing. As in the case of host financing, the insurance facility will require that M&V be conducted by an independent third-party agency.

4.5.3 What needs to be done?

In order to make the ESI financing mechanism work, there is a need to identify an organization, or organizations, willing to provide the energy savings insurance. Since this is a new concept in India, some government support will be essential in establishing the first ESI facility.

One option would be to encourage an existing insurance agency already providing industrial and commercial risk insurance, such as the National Insurance Company Limited. However, initially, such an organization will need substantial technical assistance and support for assessing the risks of EE technologies.

The specific action items are:

- Define the need for and structure of the ESI facility;
- Identify potential organizations that may be capable and interested;
- Document international experience with ESI;
- Define the TA and capacity building needs;
- Pilot test the ESI concept;
- Develop the detailed implementation plan; and
- Establish the facility.

4.6 ESTABLISHMENT OF A CLEAN ENERGY FINANCING FACILITY

4.6.1 What is a Clean Energy Financing Facility?

International experience shows that different types of financing mechanisms have been designed and implemented in a number of countries to facilitate and scale up financing of EE projects (World Bank, 2013). Two of the most useful mechanisms have been: (i) the establishment of an EE fund or a clean energy fund or financing facility; and (ii) creation of a Clean Energy Bank.

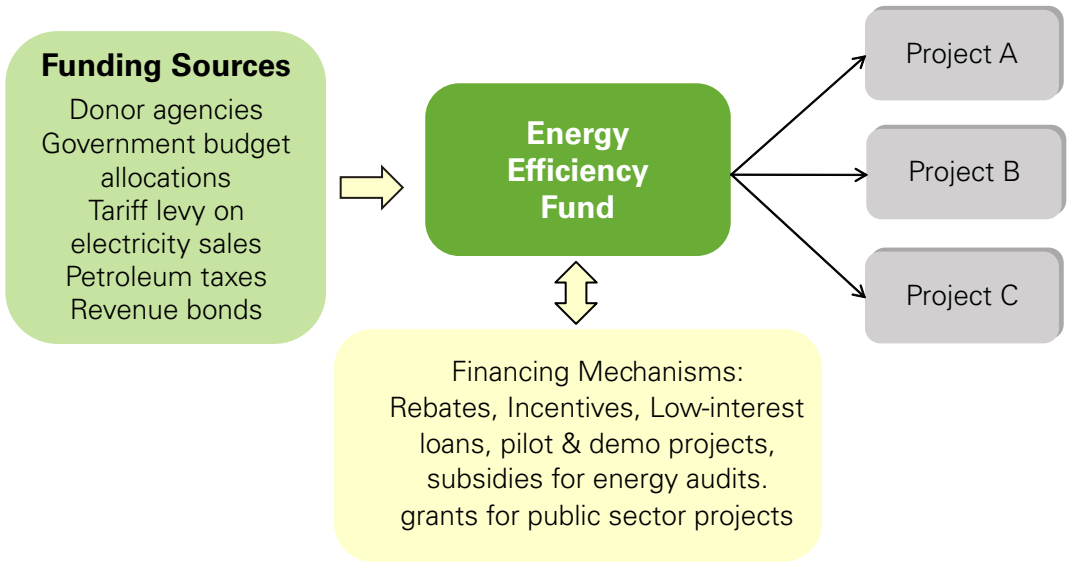
An EE or Clean Energy Fund is a special purpose fund established by governments, regulators, and/or donor agencies for financing EE projects. Experience with such funds indicates that a wide range of financing approaches can be used to deploy funds for EE projects.

A Clean Energy Bank (also called Green Energy Bank) is a bank or FI dedicated to financing clean energy projects. Such a bank can be established with public funds that can be used to leverage private or commercial financing, thereby providing needed liquidity for financing EE (and off-grid RE) projects.

India could use one of these approaches to establish a clean energy financing facility at the national level. *(see Figure 9: Structure of an Energy Efficiency Fund).*

While some funds have been established by donor agencies, such as the World Bank, others have been created by national governments, such as in Thailand. In the U.S., electricity regulators have established Public Benefit Funds using the PBC mechanism.[32]

Figure 9: Structure of an Energy Efficiency Fund



Source: Limaye, 2011b

Some of the best examples of clean energy funds are in the U.S. Most of these funds have been created at the state level using various different mechanisms. The most common approach in the U.S. has been to assess a surcharge (levy or cess) on electricity sales. The funds are collected by the electric utility and used in various ways:

[32] See Section 4.1 for a discussion of the public benefit charge

- *used directly to finance EE projects (such as in California)*[33]
- *handed over to a specially created agency to administer the financing programs (such as in New York State)*[34]
- *mobilized through a newly created EE utility (such as in Vermont) (Efficiency Vermont, 2010)*

Some states have used taxes, general revenues or state revenue bonds to create clean energy funds. This approach is currently being explored in the State of Karnataka in India (*See Section 4.1)*.

Another approach to establishing a national-level EE fund is to use government budgets or special taxes. For example, Thailand has established the Energy Conservation Fund (ENCON Fund) using the money collected from petroleum taxes (Thailand, 2010). Similar national EE funds have been established in Korea, China, Sri Lanka, Bulgaria and the U.K. *(See Box 17: National EE Funds in Various Countries).*

The legal provision for establishing a "Central Energy Conservation Fund" already exists in the EC Act, wherein, under Section 13, the BEE is empowered to levy fees for services provided for promoting efficient use of energy and its conservation.

[33] See California's Long-term Energy Efficiency Strategic Plan, available at http://www.californiaenergyefficiency.com/index.shtml, last accessed on June 15, 2013.

[34] See New York State Energy Research and Development Agency, http://www.nyserda.org/About/default.asp, last accessed on June 15, 2013.

Box 17: National Energy Efficiency Funds in Various Countries

Thailand: Thailand established the Energy Conservation Fund (ENCON Fund) under the Energy Conservation Promotion Act, 1992 (Thailand, 2010). The funding came from a levy on petroleum products sold in Thailand, with the aim to fund sustainable energy initiatives and incentive programs, as well as research and development.

Korea: In 1980, the Korean Ministry of Knowledge Economy (MKE) established the Korea Energy Conservation Fund to promote the development of EE initiatives by providing long-term, low interest loans for investments in EE projects (KEMCO, 2008). MKE has assigned Korea Energy Management Corporation (KEMCO) to manage this fund, which offers grants, loans, ESCO financing, and other financing mechanisms for a wide array of projects.

China: China has established aggressive targets for reducing energy intensity and has designated the responsibility of implementing these targets to the provincial governments. Some of the provinces, such as the Province of Hebei, have established EE funds through a levy on electricity consumption. Hebei is using its fund to provide incentives and subsidies to enterprises who implement EE measures (USAID, 2010).

Sri Lanka: The Government of Sri Lanka established the Energy Conservation Fund under the Ministry of Power and Energy to finance EE projects. In 2007, this fund was transferred to the newly created Sustainable Energy Authority of Sri Lanka.[35]

Bulgaria: The Bulgarian Energy Efficiency Fund (BEEF), established under the Bulgarian Energy Efficiency Law of 2004, is designed as a dedicated, revolving EE facility with in-house technical and financial evaluation capabilities. BEEF is operated as a non-for-profit institution, and income from fees charged to the clients of the fund need only cover the operating costs and losses from defaults. BEEF aimed to complement existing lending facilities of local commercial banks and facilitate them to achieve higher leverage on its investments (World Bank, 2010).

U.K.: The U.K. government has established the Carbon Trust, a not-for-profit organization, with the mission to accelerate the move to a low carbon economy. It was established with core grant funding from the U.K. Department of Energy and Climate Change. The Carbon Trust provides specialist support to help businesses and the public sector to cut carbon emissions, save energy and commercialize low carbon technologies. It works with industry and academia to accelerate the development and deployment of low carbon technologies by targeting support where it can make the biggest difference (Carbon Trust, 2010).

[35] Sri Lanka Sustainable Energy Authority, http://www.energy.gov.lk/

There are several examples of clean energy banks established by various national or state governments in the recent past (Brookings-Rockefeller, 2012). These include:

- ***Connecticut's Clean Energy Finance and Investment Authority (CEFIA)*** - The first state-based clean energy finance bank in the U.S was established in 2011.[36] It was created as a key component of a broader energy law that received wide bipartisan support. CEFIA is a quasi-public clean energy finance authority that combines several existing state clean energy and EE funds. It enables the new entity to make loans, and to leverage its capital with private capital, permitting private investment in and alongside the bank, with the investors receiving a reasonable rate of return on their investments.

- ***New York State Green Energy Bank*** - Governor Andrew Cuomo of New York State has proposed a USD 1 billion "NY Green Bank". It would be a quasi-independent authority to provide capital for clean energy projects. The NY Green Bank also aims to leverage scattered resources and open the door to projects that might struggle to attract investment on their own (Cuomo, 2013). The key objectives of the proposed Green Bank are to: (i) establish the State as the leader in low carbon economic growth by encouraging investment in the cleantech economy, and (ii) lead on energy policy and improve residents' economic prospects and quality of life.

- ***U.K. Green Investment Bank*** - The U.K. Green Investment Bank is a funding institution created by the U.K. government in 2012. It was set up to attract private funds for financing of private sector investments related to environmental preservation and improvement. It is structured as a public limited company and is owned by the Department for Business, Innovation and Skills (BIS). The Green Investment Bank's initial capital is USD 4.8 billion, which is expected to enable the Bank to catalyze an additional USD 24.15 billion of investment in green infrastructure. The Bank's early targets are "offshore wind, waste and non-domestic EE".

- ***Australia Clean Energy Finance Corporation*** - The Australian government has announced its decision to establish a USD 10 billion commercially oriented Clean Energy Finance Corporation (CEFC), which will provide a new source of finance to RE, EE, and low emissions technologies. The objective of the CEFC is to overcome capital market barriers that hinder the financing, commercialization and deployment of clean energy technologies. The CEFC will invest in firms and projects utilizing clean energy technologies, as well as manufacturing businesses that focus on producing the inputs required. However, the CEFC will not provide grants, as it is intended to be commercially oriented and has to make a positive return on its investments.

[36] Available at www.cga.ct.gov/2011/act/pa/pdf/2011PA-00080-R00SB-01243-PA. pdf, last accessed on February 15, 2013.

4.6.2 How can the Clean Energy Financing Facility initiative help?

A clean energy financing facility (whether a fund or a bank) can help overcome the major challenges to scaling up of EE project implementation by providing financial resources to such projects. However, there is a limitation too. As a bank, the proposed entity would be regulated by and be subject to the rules and regulations of the RBI. In contrast, an EE Fund or financing facility would have greater flexibility in developing and implementing a range of financing products such as:

- Low-interest loans
- Credit or risk guarantees
- Other credit enhancement tools to reduce interest costs
- Using the project cash flow as partial collateral for debt financing
- Facility for aggregation of small projects
- Leveraging commercial financing
- Standardizing processes to reduce transaction costs.

The financing facility would help increase the availability of funds for EE projects in India by providing financial resources and innovative financial products, and by leveraging commercial financing. Such a facility could be structured as a public institution or a public-private partnership. It could be managed by a government agency, such as IREDA, or by a bank or financial institution engaged by the government.

It should be noted that the Planning Commission, in its 12th FYP document (Planning Commission, 2013) has endorsed the idea of a national fund to support EE financing. The report specifically states: *"The need of the hour is to set up a special fund with seed capital that will be managed at an arm's length from the Government, with the participation of the private industry."* The Planning Commission report envisages an EE fee that" *will be deposited in the Central Energy Conservation Fund managed by the BEE..... The collections from the fee could be supplemented by international funding, as well as block grants from the Central Government through the NCEF."*

As suggested by the Planning Commission document, the proposed Energy Efficiency Financing Facility could be used to leverage and/or finance energy-efficient technology, and provide financing *"on terms softer than commercial borrowing."*

4.6.3 What needs to be done?

The legal provision for establishing a national Energy Conservation Fund already exists in India. It could be established by the central government and supplemented by funding from the National

Clean Energy Fund (NCEF), or by budget allocations from the MOP. The fund could be managed by BEE or a fund management organization selected by the government. In this regard, the specific actions required are:

- Define the needs for a National Energy Conservation Fund.
- Develop the charter, structure, roles and functions of the Fund.
- Identify the size of the initial capitalization.
- Identify potential funding sources, including the energy conservation fee, the NCEF, the National Climate Fund, multilateral and bilateral financial sources, and private funding sources.
- Develop the financing mechanisms and products.
- Define the governance and management/administrative structures

4.7 DESIGNATION OF ENERGY EFFICIENCY FINANCING AS PRIORITY SECTOR LENDING

4.7.1 What is Priority Sector Lending (PSL)?

The PSL program was initiated by the GOI as a policy initiative to increase the commercial banks' involvement in financing certain priority sectors, such as agriculture, exports and small-scale industries. At the direction of GOI, the Reserve Bank of India (RBI) initiated the PSL program of directed credit as a major public policy intervention. The aim of such a move was to ensure that:

- Sectors that do not otherwise have adequate access to commercial financing get access to credit at an affordable rate; and
- There is adequate flow of resources to those segments of the economy.

PSL supports many objectives of India's FYPs and establishes a target of 40 percent of net lending to sectors designated as priority sectors. RBI has reported that the success of PSL in the country is noteworthy (RBI, 2012).

In 2011, RBI appointed a Committee, chaired by M V Nair, to re-examine the existing PSL program and suggest revised guidelines with regard to "priority sector lending classification and related issues." The committee completed its initial findings and prepared a report in February 2012. This was followed by RBI's request for public comments on the report from stakeholders including banks, non-bank FIs, and other institutions and members of the public. *(see Box 18: The RBI Priority Sector Lending Program)*

Box 18: The RBI Priority Sector Lending Program

Directed credit through the priority sector dispensation is a major public policy intervention for ensuring that (a) vulnerable sections of society get access to credit at an affordable rate, and (b) there is adequate flow of resources to those segments of the economy, which have a higher employment potential and help in making a large impact in poverty alleviation. Priority sector lending also supports pursuit of many objectives envisaged in the Five-Year Plans. Accordingly, there have been changes in scope and extent of coverage of beneficiaries under priority sector. Over the years, success of priority sector lending in the country is noteworthy. This is reflected in improved reach of the banking system, higher credit flow to identified segments and more importantly, increased coverage of vulnerable sections. Following mandated lending prescriptions, commercial banks have achieved success in making credit available at an affordable cost to diverse segments of beneficiaries.

Going forward, country's vision is of universal financial access through affirmative financial inclusion, which will mainstream the marginalized by ensuring 'Access'. Until we achieve the desired level of financial deepening at all levels of society, in rural as well as urban area, the need for directed lending will continue as a necessary lynchpin of the macro policy framework.

Source: RBI, 2012

4.7.2 Why EE should be PSL?

The benefits of EE are well-documented. In addition to reduced costs, improved productivity, employment generation, and enhanced energy security, EE also provides fiscal benefits to the nation. However, as indicated in this report, efforts to scale up EE are hindered by the limited availability of commercial financing from banks and FIs. Since the benefits of EE directly align with the basic objectives of the PSL regulated by RBI, it is desirable to include EE lending as a sub-target within the overall PSL target of 40 percent.

As discussed earlier in this report, commercial banks and FIs have little interest or motivation to finance EE projects. This is due to EE projects' relatively small size, high transaction costs, limited collateral, lack of knowledge and awareness about EE projects and technologies, and limited senior management interest and commitment. At present, there are no compelling mechanisms to easily overcome these barriers.

Under the PSL program, certain investments are designated as priority investments and targets are established for the minimum percentage of lending to be committed by all banks and FIs. Therefore, if EE financing is designated by the RBI as "priority sector lending", it would require banks/FIs to include EE lending as an important business area and immediately create substantial top

management interest and commitment. This, in turn, would lead to most banks/FIs undertaking activities that can overcome the other barriers. The net result would be substantially increased commercial debt financing for EE projects.

4.7.3 What needs to be done?

RBI has indicated that it will continue to examine the PSL categories and make appropriate changes. Recently representatives of the Institute for Industrial Productivity (IIP) met with RBI to discuss the possibility of designating EE lending as PSL. This meeting was held as part of an industrial energy efficiency project being conducted by IIP (Limaye, et al, 2012). Based on the discussions, IIP submitted a letter to RBI requesting PSL designation for EE lending. A similar request was also made independently by HSBC Bank. However, RBI is yet to act on these requests.

The basic principle of PSL targets is to "include those sectors that impact large segments of the population and the weaker sectors, and which are employment-intensive, as part of the priority sector." RBI recently included "loans to individuals for setting up of off-grid solar and other off-grid RE solutions for households" in the definition of PSL. However, getting RBI to include EE as a separate category in PSL guidelines will be a challenging task and may not be achieved easily in the short term.

In order to get RBI to designate EE as PSL, GOI (through the MOP, IREDA, MNRE and the Ministry of Finance) needs to be encouraged to request RBI to take such an initiative. An argument needs to be made that EE has been designated as a national priority through the NMEEE under the NAPCC. (NAPCC, 2008). NMEEE calls for a substantial scaling up of financing for EE through: (i) creation of mechanisms that would help finance EE programs in all sectors of the economy by capturing future energy savings (Energy Efficiency Financing Platform); and (ii) developing fiscal instruments to promote EE (Framework for Energy Efficient Economic Development). Both these mandates of NMEEE would be facilitated by the PSL designation.

The RBI could substantially help scaling up of EE project financing if one or more of the following actions are taken:

- Designate a specific target of financing (5 percent to 10 percent) for EE as PSL.
- Allow project cash flows to be considered as partial collateral rather than insist on asset or balance-sheet based debt financing.
- Include Energy Efficient Equipment and Service Businesses (irrespective of their size) to be included in the PSL definition.

A rationale with such recommendations needs to be made to RBI.

Acronyms

Acronyms	Definition
ADB	Asian Development Bank
AEL	Asian Electronics Ltd.
AMC	Akola Municipal Corporation
BEE	Bureau of Energy Efficiency
BEEF	Bulgarian Energy Efficiency Fund
BESCOM	Bangalore Electricity Supply Company
BHC	British High Commission
CCA	carbon credit aggregation
CDM	Clean Development Mechanism
CEFIA	Clean Energy Finance and Investment Authority
CEFC	Clean Energy Finance Corporation
CERC	Central Electricity Regulatory Authority
CFL	compact fluorescent lamp
CGS	credit guarantee scheme
CGTMSE	Credit Guarantee Trust Fund for Micro and Small Enterprises
CLCSS	Credit Linked Capital Subsidy Scheme
CPP	conventional power plant
CPWD	Central Public Works Department
DC	designated consumers
DECC	Department of Energy and Climate Change
DPR	detailed project report
DSM	demand-side management
EBRD	European Bank for Reconstruction and Development
EC	energy conservation
ECBC	Energy Conservation Building Code
ECO	Energy Conservation Commercialization
EE	energy efficiency
EEFP	Energy Efficiency Financing Platform
EEOs	Energy Efficiency Obligations
EEPS	Energy Efficiency Portfolio Standards
EERS	energy efficiency resource standards
EESL	Energy Efficiency Services Limited
EET	energy efficient technologies
EIA	environment impact assessment
EMC	Energy Management Centre
EMS	energy management system
ES-Certs	Energy Savings Certificates
ESCO	energy service companies
ESI	Energy Savings Insurance

Acronyms	Definition
ESPC	Energy Saving Performance Contracting
FAR	floor area ratio
FI	financial institution
FiT	feed-in tariff
FOR	Forum of Regulators
FPTUFS	Food Processing Technology Upgradation Fund Scheme
FYP	five year plan
GDP	gross domestic product
GEF	Global Environment Facility
GEFund	Global Environment Fund
GRIHA	Green Rating for Integrated Habitat Assessment
GIVF	Green India Venture Fund
GOI	Government of India
IDBI	Industrial Development Bank of India
IDLSS	Integrated Development of Leather Sector Scheme
IEEP	Industrial Energy Efficiency Project
IFC	International Finance Corporation
IFCI	Industrial Finance Corporation of India
IGBC	Indian Green Building Council
IIEC	International Institute for Energy Conservation
IMG	Inter-Ministerial Group
IIP	Institute for Industrial Productivity
IREDA	Indian Renewable Energy Development Agency
JBIC	Japan Bank for International Cooperation
JICA	Japan International Cooperation Agency
KEMCO	Korea Energy Management Corporation
KfW	Kreditanstalt für Wiederaufbau
KGOE	kilograms of oil equivalent
KSECF	Kerala State Energy Conservation Fund
kWh	kilowatt hour
LEED	Leadership in Energy and Environmental Design
LMC	load management charge
M&V	measurement and verification
MCGM	Municipal Corporation of Greater Mumbai
MERC	Maharashtra Electricity Regulatory Commission
MLI	Member Lending Institution
MNRE	Ministry of New and Renewable Energy
MOCI	Ministry of Commerce and Industry
MOF	Ministry of Finance
MOP	Ministry of Power
MSME	Micro, Small and Medium Enterprises
MSMED	Micro, Small & Medium Enterprises Development

Acronyms	Definition
MTOE	million tonnes of oil equivalent
MW	megawatt
NAPCC	National Action Plan on Climate Change
NCEF	National Clean Energy Fund
NCR	National Capital Region
NEDFC	North Eastern Development Finance Corporation
NEP	National Electricity Policy
NMCP	National Manufacturing Competitiveness Programme
NMEEE	National Mission for Enhanced Energy Efficiency
NPA	non-performing asset
NSIC	National Small Industries Corporation
OPEC	Organization of the Petroleum Exporting Countries
OPIC	Overseas Private Investment Corporation
PA	program administrator
PAT	Perform Achieve and Trade
PBC	Public Benefit Charge
PFI	participating financial institution
PMC	Pune Municipal Corporation
PRGFEE	Partial Risk Guarantee Fund for Energy Efficiency
PRSF	Partial Risk Sharing Facility
PS	project sponsor
PSL	Priority Sector Lending
ULBs	Urban Local Bodies
RBI	Reserve Bank of India
SACEF	South Asia Clean Energy Fund
S&L	standards and labeling
SBC	System Benefit Charge
SBI	State Bank of India
SEC	Specific Energy Consumption
SEZ	Special Economic Zone
SIDBI	Small Industries Development Bank of India
SNAs	State Nodal Agencies
SOP	Standard Offer Program
SSI	Small Scale Industry
SVAGRIHA	Simple Versatile Affordable GRIHA
TA	technical assistance
TERI	The Energy and Resources Institute
TIFAC	Technology Information Forecasting and Assessment Council
TNUDF	Tamil Nadu Urban Development Fund
TUFS	Technology Upgradation Fund Scheme
VCFEE	Venture Capital Fund for Energy Efficiency

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Annex A

(I) Financing Mechanisms under the Kerala State Energy Conservation Fund

Kerala State Energy Conservation Fund (KSECF) includes six financing mechanisms to provide financing support to EE projects in the state. Each of these mechanisms is distinct from the other and has its own eligibility criteria and requirements. The salient features of these six mechanisms are explained below.

Energy Audit Subsidy Scheme

KSECF offers a subsidy to encourage and promote energy audits for industrial, commercial and institutional facilities in the state *(see Table 12: Key Features of KSECF's Energy Audit Subsidy Scheme).*

Table 12: Key Features of KSECF's Energy Audit Subsidy Scheme

Features	Description
Eligibility	The following types of facilities are eligible to apply for funds under the EAS scheme: • Industrial plants • Commercial buildings • Hospitals and health care facilities • State and local government buildings • Municipal pumping facilities (water treatment, waste water, etc.) • Municipalities operating street lighting • Universities and colleges • Schools • Religious facilities
Amount of funding provided	KSECF will provide 50 percent of the cost of the energy audit subject to the terms and conditions
Maximum amount	The maximum amount of funding provided by KSECF for an audit of a single facility shall be the lesser of INR 100,000 (USD 1,600) or 15 percent of the facility's annual energy consumption during the prior year.

Features	Description
Total Budget	The total budget for this scheme during the fiscal year 2009-2010 was INR 2.5 million (USD 40,453). No information is available the following years.
Requirements	The following are the requirements to obtain funds under the EAS scheme: • The facility must be meet the above eligibility criteria • The energy audit must be conducted by an Energy Auditor or Manager certified by the BEE. • KSECF shall select and maintain lists of certified energy auditors and managers for industrial, commercial and public sector projects. • Applications for funding must provide documentation of the source of funds for the applicant's share of 50 percent of the total costs. • Upon receipt of the customer application, KSECF shall solicit bids from its list of auditors, and select and assign the auditor to the applicant. • The energy audits must be completed within 3 months of authorization by KSECF. • KSECF will reimburse 50 percent of the actual cost of conducting the energy audit up to the maximum as defined above. A payment of 25 percent shall be made by KSECF to the auditor at the initiation of the audit. KSECF shall pay the auditor the remaining 25 percent upon completion and submission of the audit report and acceptance by KSECF and the customer. • Any costs incurred prior to the approval of the application under the EAS scheme shall not be eligible for 50 percent reimbursement. • Detailed engineering design is considered a part of the implementation process and will not be eligible for 50 percent reimbursement. • Equipment purchases are not eligible for 50 percent reimbursement. • No single organization will receive more than 20 percent of the total funds available under this scheme. The facility or the energy auditor will be required to submit a Detailed Project Report (DPR) documenting the audit results as specified by KSECF, before cost reimbursement is made.

Interest Buy-Down Scheme for Commercial/Industrial Customers

Investments for EE projects can be increased by improving the economics of such projects (discounted payback, cash flow, and net present value). This can be achieved by making the financing available at a low interest rate. Keeping in mind this, the KSECF introduced Interest Buy-Down Scheme (IBD). Under this scheme, KSECF works with commercial FIs and provides them an "interest buy-down", which enables FIs to reduce the interest charged to the borrower. The IBD in turn allows KSECF to provide financing for a larger number of projects with the available resources.

To implement this scheme, KSECF has selected a number of participating FIs and negotiated the terms of the scheme, including any interest reduction offered by the FIs. The participating FIs have signed agreements with KSECF. A borrower interested in obtaining financing for an EE project submits an application simultaneously to KSECF and to one of the participating FIs. KSECF is responsible for validating that the project meets the required criteria. The FI conducts credit evaluation and other assessments to determine the eligibility of the borrower to get the loan. Post evaluation, the FI approves the loan terms in accordance with its commercial lending practices. KSECF then provides funds to the FI to reduce the interest rate to the borrower. Finally, the FI issues the loan at a lower interest rate than the commercial borrowing rate *(see Table 13: Key Features of Interest Buy-Down Scheme under KSECF).*

Table 13: Key Features of Interest Buy Down Scheme under KSECF

Features	Description
Eligibility	The following types of facilities are eligible to apply for funds under the IBD: • Industrial plants • Commercial buildings • Hospitals and health care facilities • Universities and colleges • Schools • Multifamily buildings • The facility also needs to meet the criteria for commercial borrowers established by the financial institution.
Eligibility of project	Any EE project that provides energy and cost savings in an eligible facility is eligible for the IBD scheme provided that: • It is supported by an energy audit conducted by an accredited energy auditor • The DPR is submitted with the application • The simple payback for the project (capital costs divided by average annual cost savings) is not less than two years and not more than seven years

Features	Description
Participating FIs	Any FI may participate in the IBD program by signing a Participation Agreement with KSECF.
Project size	The minimum project size is established by the participating FIs. The maximum project size is also established by the FI, but KSECF provides interest buy down for only the first INR 110 million (USD 1.7 million) of investment.
Amount of Interest Buy-Down	KSECF provides an interest buy-down of four percent below the standard commercial borrowing rate of the FI, which can be negotiated and specified in the Agreement between the FI and KSECF. The KSECF IBD only applies for the first five years of the loan. If the loan period is longer than five years, the interest rate will revert to the standard commercial borrowing rate after five years.
Payment to FI	KSECF makes a one-time front-end payment to the FI at the time of the closing of the loan financing to enable the FI to offer an interest rate four percent below its standard commercial borrowing rate for the first five years of the loan.

Energy Efficient Appliance Financing (EEAF) Scheme for Domestic Customers

KSECF facilitates the purchase of efficient refrigerators and air conditioners by providing zero interest loans through a local FI. In addition, it has initiated a cooperative program with manufacturers of EE refrigerators and air conditioners. Under this program, the manufacturers are provided rebates for purchases of these appliances in Kerala.

Under this scheme, KSECF selects a FI interested in, and willing to provide financing to domestic customers for purchase of four star and five star refrigerators and air conditioners. KSECF then provide funds from the EEAF scheme to the FI to allow the customer to obtain one year zero interest loans for purchase of an the appliance. The FI invites applications from customers for purchase of qualifying energy efficient appliances (initially four star and five star refrigerators and air conditioners). It also conducts the appropriate credit analysis and due diligence of the proposed customer. The customer gets a zero interest loan, payable over a one year period. KSECF in turn reimburses the FI for the interest cost of the loan.

Apart from this, the KSECF selects a group of manufacturers and/or suppliers of four star and five star refrigerators and air conditioners using a competitive process. The aim of this exercise is to promote efficient appliances in cooperation with the select manufacturers across the stare. The manufacturers participating in the program are provided a rebate, or a discount for the customer

purchasing the appliance. Thus, the customers get a double benefit from choosing to buy the efficient appliances- rebate plus a zero interest loan *(see Table 14: Key Features of KSECF's Energy Efficient Appliance Financing Scheme)*

Table 14: Key Features of KSECF's Energy Efficient Appliance Financing Scheme

Features	Description
Customer eligibility	The EELF scheme will be available to any domestic customer in Kerala.
Eligibility of appliances	The EEAF scheme is applicable to BEE four star and five star rated refrigerators and air conditioners.
Participating FIs	KSECF will select a FI and sign a Participation Agreement with the FI. KSECF shall inform customers of the participating FI.
Interest rate	The FI shall offer a zero interest loan to the customer. KSECF shall provide the FI with a lump-sum payment to cover the interest costs
Loan term	The term of the loan shall be one year
Participating manufacturers	KSECF shall select, using a competitive bid process, a group of manufacturers and suppliers of the eligible appliances and conduct a cooperative marketing and promotion campaign for the efficient appliances with these manufacturers/suppliers. The manufacturers and suppliers will be selected based on their willingness to offer a rebate or discount to customers in Kerala.
Fund size	KSECF shall provide a fund of INR 3 million (USD 48,000) as the initial financing for the EEAF scheme. Of this amount INR 20 million (USD 0.3 million) will be for the interest subsidy to the FI and INR 10 million (USD 0.2 million) for the cooperative marketing and promotion program. The size of the EEAF will be increased in future years.

Energy Efficiency Grant Scheme for Public Sector Projects

KSECF offers grants for EE projects in the public sector to encourage and promote the implementation of such projects. This is done in cases where the project has a high social value and the project sponsor is not able to obtain funding for the project without some assistance in the form of a grant *(see Table 15: Key Features of KSECF's Energy Efficiency Grant Scheme for Public Sector Projects).*

Table 15: Key Features of KSECF's Energy Efficiency Grant Scheme for Public Sector Projects

Features	Description
Eligible organizations	The following types of facilities are eligible to apply for funds under the scheme: • Public hospitals and health care facilities • State and local government buildings • Municipal pumping facilities (water treatment, waste water, etc.) • Municipalities operating street lighting • Public universities and colleges • Public schools • Religious facilities • Low income housing
Eligibility of the project	Any EE project that provides energy and cost savings in a facility is eligible for the Energy Efficiency Grant (EEG) scheme, provided that: • The EE project demonstrates high social value. • It is supported by an energy audit conducted by an accredited energy • auditor • The DPR is submitted with the application • The simple payback for the project (capital costs divided by average annual cost savings is not less than one years and not more than seven years.
Amount of funding provided	KSECF will provide up to 50 percent of the cost of the public sector EE project as a grant up to the maximum specified herein.
Maximum amount	The maximum amount of funding provided by KSECF as a grant for a single project shall be the lesser of INR 0.2 million (USD 3,200) or 30 percent of the facility's annual energy consumption during the prior year.

Performance Contracting Scheme for Public Sector Projects

Under this scheme, KSECF provides assistance to public agencies in the state to adopt the performance contracting process for implementing EE projects. KSECF will develop the rules and procedures for engaging ESCOs under performance contracts to implement EE projects in the public sector. KSECF assists interested public agencies in developing the Requests for Expressions of Interest (EOI) for qualifying and short-listing ESCOs, and the more detailed Requests for

Proposals (RFPs) to select the ESCO as a performance contractor. KSECF provides technical assistance, funding and other needed resources for implementing the performance contracting process. In the year 2009, it was decided that KSECF shall fund the costs of technical assistance and energy audits for 2009-2010 program. KSECF shall also absorb the costs related to the process of issuing and evaluating EOIs and RFPs, and selecting and negotiating a contract with the winning ESCO.

Partial Credit Guarantee Scheme under KSECF

The KSECF's Partial Credit Guarantee Scheme for EE Projects provides guarantee cover on loans made by participating FIs for EE projects. It does not require collateral/third party guarantees, like in the case of Ministry of MSME's scheme of Credit Guarantee Fund for Micro and Small Enterprises. A higher level of guarantee cover is provided to give greater comfort to lending institutions under the KSECF scheme. The guarantee cover provided by the fund is separate and in addition to that available to small industries under CGTMSE. This ensures that the benefit of availing CGTMSE for their normal business does not get affected. The guarantee cover will also be made available to medium and smaller large enterprises not covered under CGTMSE. KSECF works closely with CGTMSE, and the CGTMSE administers the scheme for which KSECF pays a processing fee for all transactions (for providing guarantee cover and making guarantee payments, if necessary).

Under this scheme, assistance is available to SME units and smaller large units in the industrial sector and owners of commercial buildings. In addition to this, the assistance is also available to ESCOs for EE projects in SME units and smaller large industrial units, EE projects in privately or government owned buildings, and street-lighting and water pumping EE projects in urban local bodies *(see Table 16: KSECF's Partial Credit Guarantee Scheme for Energy Efficiency Projects).*

Table 16: KSECF's Partial Credit Guarantee Scheme for Energy Efficiency Projects

Features	Description
Facility eligibility	The following types of facilities are eligible to apply for funds under the PCG scheme: • Smaller Industrial plants • Commercial buildings • Hospitals and health care facilities • Universities and colleges • Schools • Multifamily buildings The facility needs to meet the criteria for borrowers established by the financial institutions participating in the PCG scheme

Features	Description
Eligibility of the project	Any EE project that provides energy and cost savings in an eligible facility is eligible for the PCG scheme, provided that: • It is supported by an energy audit conducted by an accredited energy auditor • The DPR is submitted with the application to the FI. • The simple payback for the project (capital costs divided by average annual cost savings) is not less than two years and not more than seven years.
Participating FI	KSECF shall work with a number of participating financial institutions, who will sign a Risk Sharing Facility Agreement (RSFA) with KSECF
Project size	The minimum project size shall be established by the participating FIs. The maximum project size may also be established by the FI, but KSECF will provide a guarantee of no more than INR 1 million (USD 16,000) per project in the first year of the scheme.

(II) Grant Based Financing Assistance for EE

The Global Environment Facility (GEF) and the World Bank are implementing a new initiative on financing EE in MSME clusters to improve EE and reduce GHG emissions from MSMEs by utilizing increased commercial financing for EE[37], this is being done through SIDBI and the BEE. The grant agreement was signed on September 13, 2010 and effectuation of this grant took place on October 28, 2010. Under this project, GEF has provided funding of INR 452 million (USD 7.2 million) to SIDBI, which is to be utilized over a period of four years. In addition to this, the GEF has also provided a grant of INR 112.5 million (USD 1.8 million) to BEE for implementing EE measures in MSMEs. A project management unit has been set up in SIDBI, New Delhi to channelize the grant to the targeted beneficiaries. *(See Table 17 : Key Features of the World Bank/GEF Project for EE Financing in MSMEs)*

The project is currently focusing on four main activities:

(i) Activities to build capacity and awareness for EE in MSMEs,

(ii) Activities to increase investments in EE in MSMEs,

(iii) Knowledge management; and

(iv) Project management.

Under this initiative, capacity building contracts across five identified project clusters of MSMEs have been assigned to various consultants.

[37] Available at http://www.sidbi.com/?q=world-bank-gef-project-financing-energy-efficiency-msmes, last accessed on 15th January 2013

Table 17 : Key Features of the World Bank/GEF Project for EE Financing in MSMEs

Program title	World Bank/GEF Project for EE Financing in MSMEs
Sponsoring agency	World Bank/GEF
Counterpart agency	BEE and SIDBI
Type of program	EE investments in the Indian MSME sector financed from local commercial financing sources through project development support and deployment of performance-linked grants for demonstration purposes. The program will provide soft support; the nature of the support from World Bank/GEF is in form on grant to BEE and SIDBI in implementing the program activities. Also includes capacity building of MSMEs and banks/FIs, and knowledge management
Implementing agency	BEE and SIDBI
Start date/end date	May 2010-August 2014
Objective(s)	To improve efficiency in SME clusters and reduce GHG emissions through commercial investments in EE goods and services. • Increase demand for EE investments by adopting a cluster approach to facilitate the development of customized EE products and financing solutions • Raise the quality of EE investment proposals from technical and commercial perspectives, and increase the capacity of project developers and bank loan officers and branch managers • Expand the use of existing guarantee mechanisms for better risk management by banks to catalyze additional commercial finance for EE • Establish a monitoring and evaluation system for the targeted clusters
Key Components	• Implementing outreach efforts to build capacity and awareness to improve EE, with the goal of facilitating financing of MSME EE projects by commercial banks and FIs • Facilitating and contributing to the growth of EE investments through project development support and deployment of performance-linked grants • Supporting knowledge management at the programmatic level
EE/GHG goals	Including both direct and indirect impacts of the project, it is expected that an incremental EE investment of approximately INR 2.75 billion (USD 44 million) catalyzed in the project life and also result in reduction of CO_2 emissions by 4.8 million tons over the lifetime of investments

Program title	World Bank/GEF Project for EE Financing in MSMEs
Sectors targeted	MSMEs
Barriers addressed	• The gap in understanding between energy auditors and EE practitioners, who prepare technical proposals for MSME clients, and the local banks that evaluate loan proposals • Higher transaction costs as a percentage of investment due to the small project size • Lack of information among banking sector stakeholders on the potential market for lending and the portfolio benefits • Insufficient and inaccurate information about EE among MSMEs • Perceived difficulties in working with this customer class
Eligibility criteria	MSMEs in the five selected clusters
Total funding	BEE – INR 112.5 million (USD 1.8 million) SIDBI – INR 452 million (USD 7.3 million)

U.S. Agency for International Development
1300 Pennsylvania Avenue, NW
Washington, DC 20523
Tel: (202) 712-0000
Fax: (202) 216-3524
www.usaid.gov