



BUREAU OF ENERGY EFFICIENCY
(Ministry of Power, Government of India)



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

Event Report: Training Program for Scheduled Commercial Banks on Energy Efficiency Financing in India

Mumbai (June 1-3, 2015)



USAID
FROM THE AMERICAN PEOPLE



Indian Banks' Association



July 2015

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.

PARTNERSHIP TO ADVANCE CLEAN ENERGY
DEPLOYMENT (PACE-D)

Technical Assistance Program

Event Report: Training Program for Scheduled Commercial
Banks on Energy Efficiency Financing in India
Mumbai (June 1-3, 2015)

Submitted to BEE on July 31, 2015

Table of Contents

| | |
|---|----|
| Acronyms | 1 |
| Overview | 3 |
| Government Initiatives | 4 |
| Training Program for Scheduled Commercial Banks on EE Financing | 5 |
| Training Workshop in Mumbai | 6 |
| Workshop Proceedings | 7 |
| Concluding Session | 20 |
| Annex – I Agenda | 21 |
| Annex – II List of Participants | 24 |
| Annex – III Training Feedback Evaluation | 31 |
| Annex – IIIA Participants Feedback Form | 45 |
| Annex – IV Quiz | 48 |
| Annex – V Pictures | 60 |
| Annex – VI Presentations | 61 |

ACRONYMS

| Acronym | Definition |
|----------------|---|
| AEEE | Alliance for an Energy Efficient Economy |
| BEE | Bureau of Energy Efficiency |
| CEAP | Corporate Energy Audit Program |
| CEEF | Commercializing Energy Efficiency Finance Program |
| CEO | Chief Executive Officer |
| COP | Chief of Party |
| CFLs | Compact fluorescent lamps |
| CMVP | Certified Measurement & Verification Professional |
| CTF | Clean Technology Fund |
| DCOP | Deputy Chief of Party |
| DELP | DSM based energy efficient lighting program |
| DGM | Deputy General Manager |
| DSCR | debt service coverage ratio |
| DSM | demand side management |
| EC | energy conservation |
| EE | energy efficiency |
| EEFP | Energy Efficiency Financing Platform |
| EESL | Energy Efficiency Services Limited |
| ESA | energy supply agreement |
| ESCOs | energy service companies |
| ESPC | energy saving performance contracting |
| FIs | financial institutions |
| GEF | Global Environment Facility |
| GoI | Government of India |
| HR | human resources |
| IBA | Indian Banks Association |
| IFC | International Finance Corporation |
| IOCL | Indian Oil Corporation Limited |
| IPMVP | International Performance and Verification Protocol |
| IREDA | Indian Renewable Energy Development Agency |
| IRR | internal rate of return |
| ISTSL | India SME Technology Services Ltd |
| JICA | Japan International Cooperation Agency |
| L&T | Larsen & Toubro |

| | |
|----------|--|
| LED | light emitting diode |
| MEDA | Maharashtra Energy Development Agency |
| M&V | measurement and verification |
| MW | Megawatts |
| MOP | Ministry of Power |
| MOUs | Memorandum Of Understanding |
| MSME | micro small and medium enterprises |
| NBFC | Non-Banking Financial Companies |
| NDPL | North Delhi Power Limited |
| NMEEE | National Mission for Enhanced Energy Efficiency |
| PACE-D | Partnership to Advance Clean Energy – Deployment |
| PRGFEE | Partial Risk Guarantee Fund For Energy Efficiency |
| PRSF | Partial Risk Sharing Fund |
| RE | renewable energy |
| SCBs | scheduled commercial banks |
| SDAs | state designated agencies |
| SIDBI | Small Industries Development Bank of India |
| SME | Small and Medium Enterprise |
| SOP | standard offer program |
| SPV | Special purpose vehicle |
| TA | technical assistance |
| TANGEDCO | Tamil Nadu Generation and Distribution Corporation Limited |
| TCCL | Tata Cleantech Capital Ltd. |
| UREDA | Uttarakhand Renewable Energy Development Agency |
| USAID | United States Agency for International Development |
| VAT | Value Added Tax |
| VCFEE | Venture Capital Fund For Energy Efficiency |
| WIIFM | What's in it For Me |

OVERVIEW

The market for energy efficiency (EE) products and services in India has gained momentum in the recent years. This is due to both regulatory impetus and commercial incentives for industrial process efficiency. Energy saving products and services in India could offer interesting capital investment opportunities. There are EE-focused credit lines backed by multilateral/bilateral funding available in the market today; along with commercial debt such as EE-focused loans offered by commercial banks and fiscal tools such as accelerated depreciation provided by the Government of India.

Similarly, there are some examples of equity funds established by the public sector to finance energy service companies (ESCOs) projects, or investments in ESCOs in India, such as the Green India Venture Fund and Global Environment Fund. In addition there are grant-based mechanisms for EE that have taken the form of subsidies offered by funds set-up by several ministries. Some grants are also provided at the state government level. There are also examples of Energy Saving Performance Contracting (ESPC) projects in the country, with most of them being public sector or municipal projects.

However, adoption of such measures remains limited largely due to barriers to large-scale implementation of EE. These include policy, institutional and financial barriers such as lack of non-recourse finance to EE projects, high transaction and project-related cost, risk perception of EE vis-à-vis conventional projects, gap in communication between financiers and EE project developers, and poor financial strength of energy service companies.

In order to overcome the bottlenecks in EE project financing, the BEE has initiated a training program to train the trainers from the training institutes of banks and financial institutions (FIs).

This effort is part of the Energy Efficiency Financing Platform (EEFP), one of the four initiatives under the National Mission for Enhanced Energy Efficiency (NMEEE).

The BEE, in collaboration with Indian Banks' Association (IBA), State Designated Agencies (SDAs) and with technical assistance from the USAID PACE-D TA Program, has initiated a training program for Scheduled Commercial Banks (SCBs) on EE financing. The objective of the training program is to train the trainers from the training institutes of banks and FIs on various aspects of energy efficiency financing through training modules specifically prepared for this purpose.

GOVERNMENT INITIATIVES

The Energy Conservation Act (EC Act) created the Bureau of Energy Efficiency (BEE), a statutory body under the Ministry of Power. The BEE promotes, manages, finances, and monitors energy efficient efforts throughout the economy, including the industrial sector, through energy audits. In order to overcome the bottlenecks in EE project financing, the BEE has initiated a training program to train the trainers from the training institutes of banks and financial institutions (FIs). This effort is part of the Energy Efficiency Financing Platform (EEFP), one of the four initiatives under the National Mission for Enhanced Energy Efficiency (NMEEE).

As part of the NMEEE, the BEE has constituted two funds i.e. Partial Risk Guarantee Fund for Energy Efficiency (PRGFEE) and Venture Capital Fund for Energy Efficiency (VCFEE). Both funds aim at bridging the gap between the demand and supply of capital investment in EE projects. In addition, the BEE has supported the Partial Risk Sharing Facility (PRSF), which is also an innovative financing mechanism for EE projects in India. The BEE is also developing a network with financial institutions, ESCOs and industry to build a sustainable market for EE in India. NMEEE features is presented in the figure 1 given below.

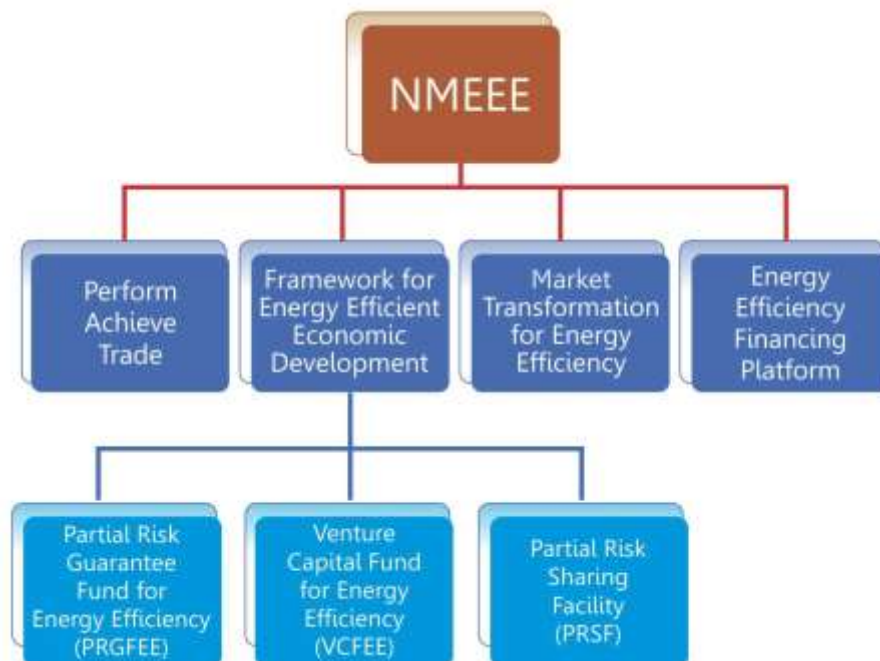


Fig 1: NMEEE Features

TRAINING PROGRAM FOR SCHEDULED COMMERCIAL BANKS ON EE FINANCING

The BEE, in collaboration with Indian Banks' Association (IBA), State Designated Agencies (SDAs) and with technical assistance from the USAID PACE-D TA Program, has initiated a training program for Scheduled Commercial Banks (SCBs) on EE financing.

The objective of the training program is to train the trainers from the training institutes of banks and FIs on various aspects of EE financing through training modules specifically prepared for this purpose.

In the first phase of training, the BEE is organizing a series of three day training of trainers' workshops on EE project financing across different states with the help of SDAs. The trainees will be nominated from training institutes of the SCBs. The trainees will receive certificates of participation after the successful completion of the training. After the completion of the first phase of the training program a pool of trainers will be created who in turn will further train the bank officials in credit/risk/project financing teams on EE financing to create awareness and further facilitate EE financing in India. The training workshops will focus on building the capacity of loan officers and risk managers and provide an overview on the technical and economic characteristics of EE projects, business models, financing needs, and risk management approaches. The BEE, with the support of USAID PACE-D TA Program, has also developed a training manual that covers all the training modules/presentations required for the understanding of EE projects and their characteristics. The manual aims to help the banks and FIs in the technical/financial evaluation of EE projects.

TRAINING WORKSHOP IN MUMBAI

The first training workshop on EE finance for SCBs was organized in collaboration with the Maharashtra Energy Development Agency (MEDA) at Mumbai on June 1-3, 2015. At this event, Dr. Ajay Mathur, Director General, BEE launched a booklet on “Success Stories for EE Projects Financed in India” developed by the Small Industries Development Bank of India (SIDBI) and a “Training Manual for Energy Efficiency Financing in India” developed by the PACE-D TA Program in collaboration with the BEE.

The training workshop in Mumbai covered the following seven modules:

- Module 1: Market Opportunity
- Module 2: EE Project Characteristics
- Module 3: EE Implementation Business Models
- Module 4: Technical Appraisal of EE Projects
- Module 5: Financial Appraisal of EE Projects
- Module 6: International Best Practices and Approaches
- Module 7: Measurement and Verification (M&V) Case Studies

Agenda

The agenda of the training workshop in Mumbai is attached in Annex 1.

Participants

The inaugural session of the training workshop was attended by over 90 participants including representatives from the public and private sector banks, financial institutions, Energy Service Companies (ESCOs) and research organizations.

Eighteen officials from six banks/FIs and one consulting agency participated in the training. The list of participants is attached in Annex -2.

WORKSHOP PROCEEDINGS

Day 1: June 1, 2015

Opening Session

Mr. Hemant Patil, Manager-Energy Conservation, MEDA welcomed the distinguished guests, participants and speakers to the training program. He highlighted the need for energy efficiency. He also explained the initiatives taken by the BEE for funding energy efficiency projects and mentioned that the workshop's objective was to train the trainers who will impart the training to other officers in their banks. He concluded the address by stating that EE measures are low hanging fruits and large-scale investment is required to harness the benefits. He mentioned that the training workshop will help loan officers to get trained and appraise EE projects.

Dr. Bhaskar Natarajan, Deputy Chief of Party (DCOP) for EE, USAID PACE-D TA Program, provided an overview of the Program and its activities on EE financing. He mentioned that in the area of EE financing, the Program has published a report on the market landscape of EE financing



in India and identified seven innovative mechanisms that can help facilitate investments in the sector. In addition, the Program provided inputs to the operational rules for PRGFEE, prepared terms of reference for selecting M&V agency, and also prepared training modules and manuals on EE financing. Dr. Natarajan also highlighted that the PACE-D TA Program is partnering with Tata Cleantech to assist their clients to identify EE projects for financing, under

the Corporate Energy Audit Program (CEAP). He said that the Program will continue to provide support to the BEE on EE finance as required by BEE.

In her special address, Ms. Rema Menon, Senior Vice President, IBA said that there is a gap in financing EE projects due to limited perception and understanding of EE projects from bankers. To address this gap, bankers need to be trained on EE project financing. Towards this goal, the BEE and IBA have executed a Memorandum of Understanding (MOU) to organize a series of EE finance training workshops. She mentioned that IBA will provide the required training support to banks on EE financing. She said that in the first phase of the training program, training will be organized in four zones--North, East, West and South--where the banks have their training colleges. The program will widen its scope in the second phase and provide training to officials from banks that are not associated with the training colleges. Ms. Menon added that IBA will work with the BEE to maximize the benefits from PRGFEE and VCFEE for the implementation of EE projects.

Mr. A.K. Gupta, Director Finance, Energy Efficiency Services Limited (EESL) in his address

highlighted the relevance of EE projects worldwide. He said that EE is at a nascent stage and there is a need to expand financing for EE. The banks are reluctant to fund EE projects due to lack of awareness and he hoped that the training workshop would provide a platform to discuss various risks and mitigation measures to accelerate EE financing in India. Mr. Gupta also mentioned that the guarantee scheme such as PRGFEE would help ESCOs to invest in EE projects.



Ms. Vineeta Kanwal, Assistant Energy Economist, BEE delivered the vote of thanks. She reiterated that the BEE has signed a MOU with IBA to engage bank officials in the EE finance training program over the next four to five years. The BEE has planned to organize workshops across all zones in India. She also mentioned that the first phase of the training program is intended to train the trainers. She hoped that the trainers will further train bank officers and keep BEE informed of their activities.

Technical Sessions

Experiences in Financing Energy Efficiency Projects - Mr. Rajiv Kumar, DGM, SIDBI

Mr. Kumar shared SIDBI's experience in financing EE projects in micro, small and medium enterprises (MSMEs). He mentioned that SIDBI is a development financial institution that provides direct finance and also micro-finance to MSMEs. According to him, MSMEs consume almost half



the energy consumed by the industrial sector. Most MSMEs are energy inefficient since they lack adequate technical knowledge on EE. Leveraging EE technologies can serve as a strategic tool to make MSMEs more competitive. Mr. Kumar highlighted SIDBI's initiatives for funding MSMEs, to support sustainable development, end to end energy efficiency (4E) solutions product launch and PRSF with the support of Global Environment Facility and Clean Technology Fund. SIDBI

disbursed cumulative assistance of around INR 5,950 crores to more than 6,800 MSME units as on March 31, 2015. It has also launched a revolving fund for retrofit projects, after organizing and reviewing the detailed energy audits. Mr. Kumar also emphasized that MSMEs require handholding for the implementation of EE measures and the main challenge remains in funding for EE equipment, and measurement and verification.

Experiences in Financing Renewable Power- Mr. Gulshan Malik, DGM, State Bank of India (SBI)

Mr. Malik presented SBI's experience in funding for renewable energy projects. He underscored the need to implement EE projects by addressing the challenges and barriers to meet power

supply and demand. He mentioned that SBI receives projects mostly from the renewable sector, particularly solar and wind energy projects, and his presentation would focus on financing of renewable energy projects. These projects are of short duration projects and have no issue of coal linkages, etc. He informed that the viability of renewable energy projects is better due to the absence of operational costs. As the capital cost for renewable energy projects keep falling, the banks are getting comfortable to finance them. He said that the direct sale of power to the industry improves the viability of these renewable projects as well. He concluded that we should learn from these experiences and finance EE projects accordingly.

Tata Cleantech's Experience in Financing Energy Efficiency Projects - Mr. Pankaj Sindwani, Vice-President, Tata Cleantech Capital Ltd. (TCCL)

Mr. Sindwani shared TCCL's experience in appraising and financing clean energy projects. TCCL is a joint venture of Tata Capital and IFC and the company's focus areas include renewable energy, EE and water. He said that a large number of expansion and retrofit loans have an EE component and are still not classified as EE loans. As a result these loans get classified as balance sheet term loans. Mr. Sindwani also mentioned that ESCOs are not being able to access finance as they are not well capitalized. Project finance loan means non-recourse financing, and ESCOs do not have collateral. Project finance needs to ensure cash flows for loan repayment. Since bankability of the projects is very crucial, the detailed project reports must have good evaluations and assessment of EE technologies for its implementation. Mr. Sindwani also mentioned that M&V is a key issue in EE project implementation. According to him, the deemed savings model has several advantages for EE project financing. He said that ESCOs set ambitious timelines for project implementation and often lack qualified finance professionals. Mr. Sindwani emphasized that EE financing is the need of the hour and TCCL will work with different stakeholders to facilitate project financing. He said that the PRGFEE and other funds will definitely help EE financing but there is a need to launch these funds at the earliest.

Experiences of Projects Appraisal at Indian Renewable Energy Development Agency (IREDA) - Mr. KP Philip, Senior Manager, IREDA

Mr. Philip highlighted the need for EE and RE technologies to offset the negative impacts of conventional sources such as coal and oil. He introduced IREDA's activities, operational areas, and different financing schemes for EE and RE projects. Mr. Philip also explained the financing norms for EE projects and lessons learnt in EE financing with specific reference to benchmarking for green field projects and revenue savings for retrofit projects. He mentioned that IREDA provides loans with interest rates starting from 11 percent for a maximum period of ten years. The minimum loan amount is INR 50 lakhs. He said that IREDA does not opt for collateral if the payment is securitized. IREDA has funded more than 50 projects and mobilized over INR 800 crores for EE finance. Mr. Philip said that IREDA depends on energy audit reports for technical project assessment. He said that funds can be directly released to the company/leasing company/ESCO. According to him, one of the effective ways of financing EE is to allocate a part of the working capital for EE projects. Mr. Philip presented an example of an innovative financing wherein IREDA funded the Tamil Nadu Generation and Distribution Corporation Limited which in turn financed sugar mills for cogeneration resulting in 183 MW of new capacity. Mr. Philip said that this model can be successfully replicated in other states. He concluded that there is an immense

potential to tap EE in India and that there is a need for concrete action to realize the benefits.

Questions & Answer

Question to Mr. Rajiv Kumar, DGM, SIDBI: How is SIDBI financing solar energy projects?

Reply: In the initial phase, 50 percent of the energy generation from solar should be utilized for captive consumption of SME. However SIDBI has recently come out with the policy wherein the promoter can install projects up to 5 MW and wheel the power to grid.



Question to Mr. Pankaj Sindwani, Vice-President, Tata Cleantech Capital Ltd.: What are the pointers to be considered in the detailed project report?

Reply: If an energy efficiency project would result in 30 percent savings, the loan applicant should provide backward analysis to show how the 30 percent savings were arrived technically. The type of contract between the host and ESCO will also matter in such cases.

Question to the Panel: Is there any financing scheme such as microfinance for implementing EE programs, for example solar water heating, at the society level?

Reply: The government may mandate to install solar waters for new buildings gradually. SIDBI is currently providing funds, through the ESCO mode, to set up an energy efficiency- solar project at a society level.

Second Session: Financing Issues of Industries to Implement EE projects

Financing for Future Lighting - Mr. Shyam Sujan, Secretary General, ELCOMA India

Mr. Sujan highlighted the status of power supply versus demand, growth of compact fluorescent lamps (CFLs), and light emitting diodes (LEDs). According to him, CFL manufacturing has increased from 19 million units in 2002 to 1,000 million units in 2014. Similarly, LED production is expected to touch one billion by 2020. Mr. Sujan presented ELCOMA's roadmap which included standards, policy prescriptions for increased energy efficiency, and skill development for the lighting industry that will create a pool of technically qualified professionals. He invited industries to participate by investing in research and development centres and test labs, and to work with ELCOMA to develop ESCO models for EE investments.

Introduction to BEE's Schemes on EE Financing - Ms. Vineeta Kanwal, Assistant Energy Economist, BEE

Ms. Kanwal gave a detailed presentation on BEE's schemes on EE financing. She presented the existing global energy scenario and the need for EE to meet the rapid growth in energy demand. She also explained the EE initiatives including EEFP, and the key features of PRGFEE, PRSF and VCFEE. She outlined the barriers in EE implementation in terms of higher upfront capital, lack of technical knowledge, and limited capacity of service providers to provide expert advice.

She mentioned that as a part of the EEFP initiative, the BEE has signed MOUs with FIs to develop financing mechanisms to facilitate a commercial and sustainable EE market in India. The BEE recently signed a MOU with IBA to collaborate for organizing EE financing training workshops for SCBs. Ms. Kanwal mentioned that in the first phase of the training program, the focus will be on trainers from banks that currently have training institutes; however in the second phase, the program will widen its scope to include trainers from other banks as well.

Energy Efficiency Schemes in Maharashtra - Mr. Hemant Patil, Manager-Energy Conservation, MEDA

Mr. Patil mentioned that MEDA has made it mandatory for the government buildings to use only four or five star appliances such as ceiling fans, lights, air conditioners and chillers. He highlighted that MEDA was the first state to take an initiative on value-added tax (VAT) and submitted a proposal to the state government on VAT reduction for CFL which has been accepted. In the near future, MEDA has plans to create a market for ESCOs in energy efficiency water pumping, and introduce mandatory energy audit and energy efficiency installations. Mr. Patil also said under the demand-side management-based energy efficient lighting program (DELP), two to four LEDs will be distributed to all consumers across the state. He also mentioned that funds such as PRGFEE and VCFEE would be largely beneficial to achieve MEDA's strategic plans.

Questions & Answer

Question to Mr. Shyam Sujan, Secretary General, ELCOMA: Since there is potential of about INR 25000 crore LED investment in India; is it possible to get chip manufacturing technology to India?

Reply: Chips are manufactured outside India and we have to import chips. Chip manufacturing would be feasible only in large-scale and hence there are only seven to eight companies across the world involved in manufacturing.

Third Session: Role of ESCO Models in Existing EE Market

The mission of an ESCO in Implementing Energy Efficiency while Removing Barriers - Mr. Mohit Khatri, DGM - Finance, EESL

Mr. Khatri explained the characteristics of ESCO, energy performance contracting, difference between ESCO and consulting engineer and EESL's street light methodology. He mentioned that EESL prefers to implement brown field i.e. retrofit projects rather than green field projects as the former is considered as energy efficiency due to replacement. According to him, ESCOs who can mobilize financing to implement EE projects are preferred by clients since they can receive returns from the energy savings attributed by the EE projects and thereby energy savings is guaranteed. He said that ESCOs are a "one stop" solution for EE projects. He highlighted that EESL has identified projects in agriculture, municipalities and DSM through street lighting. Mr. Khatri also said that EESL has signed MOUs with several state agencies for lighting projects.

Role of ESCOs in Existing EE Market - Mr. Koshy Cherail, Vice President, Alliance for an Energy Efficient Economy (AEEE)

Mr. Cherail highlighted AEEE's activities including (a) development of model ESCO EPC contracts, (b) development of a business model for utility-affiliated ESCOs, (c) conduct of market assessment of PRGFEE and VCFEE funds, (d) World Bank-EESL M&V protocol for street lighting. He also said that AEEE conducts certified M&V Professional (CMVP) examinations and 108 professionals have been certified as CMVPs till date. Mr. Cherail mentioned that ESCOs have been successful in implementing projects involving EE street lighting in municipalities. He highlighted the barriers in ESCO finance and explained learnings from AEEE-ESCO interactions. He also mentioned that AEEE and its member companies carried out a survey on the expectations on the second cycle of Perform, Achieve and Trade (PAT) mechanism and has submitted the findings to BEE. AEEE has also assisted the USAID PACE-D TA Program to assess the EE projects in the pipeline with ESCOs which could potentially seek assistance from PRGFEE and VCFEE.

ESCO Models - Mr. Raj Mohan, CEO, DESL

According to Mr. Mohan, DESL, one of the oldest ESCOs in India, has managed to deliver EE savings across a range of projects in industry both in India and abroad. He said that ESCOs are in a unique situation wherein the returns are from the savings achieved and savings are linked to actual energy savings realized. He mentioned that ESCOs can be clubbed in three categories: (a) countries with very high growth and large operating market - only four countries (China, USA, Germany and France) fall in this category, (b) countries with moderate growth but limited size of the overall market - Japan, South Korea, Brazil and few European countries can be considered in this, (c) and countries with low growth and low market size - India along with many other countries falls in this category. Mr. Mohan said that in the previous empanelment cycle of BEE, 137 ESCOs including some large companies such as Larsen & Toubro, Schneider, Power grid, and North Delhi Power Ltd. were empanelled. He explained the ESCO process and different business models adopted by ESCOs. He also provided several international examples on ESCO models and mentioned that India has a lot to learn from these countries so that the benefits can be realized.

Role of ESCO Models in Existing EE Market - Mr. Anil Mishra, Senior Executive, Lloyds Insulations

Mr. Mishra introduced Lloyds Insulation and said that their core business was to save energy through better insulation. He shared real time case studies such as Indian Oil-Gujarat Refinery Vadodara Insulation Audit, and Building Energy Audit of the Reserve Bank of India in Bhopal. Mr. Mishra explained the technical aspects and financial benefits of the initiatives and highlighted major energy consumption and energy loss areas. He also provided an overview of a project where Lloyds insulated an air-conditioned building in ammunition storage hangar for the Indian Navy. As a part of this project, Lloyds carried out thermal and heat load analysis to identify solutions for energy saving.

Valedictory Session

Session Summary and Introduction to Training Manual on EE Financing in India-

Mr. Nithyanandam Yuvaraj Dinesh Babu, Chief of Party, USAID PACE-D TA Program

Mr. Babu provided an overview of the USAID PACE-D TA Program's technical assistance to prepare the training manual and modules. He explained that the training manual comprised of three sections: 1) market opportunity and business models; 2) project appraisal (technical and financial); and 3) M&V including international approaches and case studies. Mr. Babu also encouraged feedback from the stakeholders for improving the manual and modules on an ongoing basis.

Bankers' Perspective on EE Financing - Mr. K Unnikrishnan, Deputy Chief Executive, IBA

In his address, Mr. Unnikrishnan mentioned that IBA was pleased to be associated with BEE on the training program. He emphasized that the bankers are ever willing to finance projects which are viable. Mr. Unnikrishnan was optimistic that bankers would understand the nuances of EE project financing via the upcoming workshops and they will further guide the entrepreneurs in the best possible way. Mr. Unnikrishnan assured IBA's full support to the BEE and other stakeholders on this initiative. He also highlighted that IBA is in the process of preparing a report on 'responsible financing'.

Special Address – Mr. A.K. Gupta, Director (Finance), EESL

Mr. Gupta reiterated main discussion points of the inaugural session. He said that EE financing was not considered as regular financing as there are no upfront cash flows, and savings have to be considered as deemed cash flows and this is a challenge for bankers. Mr. Gupta hoped that the training would be beneficial to all bankers and help accelerate EE project financing and investment.

Introduction to Success Stories in EE financing - Mr. Rajiv Kumar, DGM, SIDBI

Mr. Kumar provided an overview of SIDBI which is a development financing institution focused on MSME financing in India. He said that EE can provide immediate benefits and thus it is important to promote the usage of energy efficient technologies within MSMEs. Mr. Kumar also mentioned that SIDBI has formulated a number of schemes for MSME financing such as Japan International Cooperation Agency -SIDBI financing scheme, KfW-SIDBI financing scheme, Sustainable Finance scheme and Financing End to End Energy Efficiency Investments in MSMEs (4 E financing Scheme). He mentioned that the booklet on success stories in EE financing was prepared by SIDBI-India SME Technology Services Limited (ISTSL) to showcase SIDBI's experience to other SCBs and non-banking financial companies (NBFC). Mr. Kumar said that the booklet will enhance the confidence of banks and other FIs to fund EE projects.

This was followed by release of the booklets on '**Success Stories in EE Financing**' and '**Training Manual on EE Financing in India**' by Dr. Ajay Mathur, Director General, BEE.

Keynote Address - Dr. Ajay Mathur, Director General, BEE

In his keynote address, Dr. Mathur mentioned that the training program demonstrates the robust engagement between the EE and finance sectors. He said that on the banking side, SIDBI has



taken the lead to finance EE projects and on the implementation side, DESL has been a leader. He further stated that the creation of EESL would allow for growth and to promote large scale EE deployment in India. According to Dr. Mathur, performance-based contract is the most plausible option for EE projects but the key challenge is to expand and reach out to all commercial banks. He said that that plain vanilla financing (standard type of financing where due diligence of projects has been completed and ready to finance) is required

for EE projects. He also mentioned that dedicated credit lines are important for EE projects and commercial banks should strive to establish dedicated credit lines for EE financing.

In addition, Dr. Mathur said that risk assessment and mitigation measures are highly important with respect to borrower capacity, technology guarantee and vendor guarantee. According to him, SIDBI's approach is a step in the right direction. He stated that SIDBI proposes to have dedicated staff at the cluster level who will introduce EE to the MSMEs. Dr. Mathur mentioned that risk mitigation instruments such as PRGFEE and PRSF would provide guarantee up to 50 percent, which is expected to accelerate large-scale EE projects deployment. Dr. Mathur also emphasized loan/credit officers, risk mitigation officers and banks to learn EE finance concepts by performing transactions. He said that energy productivity is a metric that can be a useful tool for capturing notional revenue streams that occur. Dr. Mathur said that the BEE was pleased to partner with IBA to provide the training on EE financing to SCBs. He also thanked the USAID PACE-D TA Program for providing the technical assistance, and SIDBI for boosting confidence among bankers for their success stories on EE financing. Dr. Mathur also mentioned special thanks to MEDA for organizing the first training workshop.

Vote of Thanks - Mr. Hemant Patil, Manager (Energy Conservation), MEDA

Mr. Patil proposed the formal vote of thanks with a positive message that the training program will accelerate large-scale implementation of EE projects.

Training Session

Day 2 (June 2, 2015)

Module 1: Market Opportunity - Dr. Bhaskar Natarajan, DCOP-EE, USAID-PACE D TA Program

Dr. Natarajan presented an overview of the importance of EE and its overall role in Government

of India's commitment to climate change. He outlined the market opportunities and pointed out that several other countries have succeeded in achieving benefits of EE and India needs to follow the same success path. He highlighted the countries that have taken the lead in EE and ensured that while the energy consumption reduced, the economic growth continued on its upward trend. He enumerated on the ongoing BEE initiatives and concluded by saying that all stakeholders need to work together to realize the EE potential in the country.

Questions & Answer

Question: Is accelerated depreciation of 80 percent applicable to EE projects?

Reply: Yes, there is list of applicable EE measures eligible for 80 percent depreciation.

Question: Does maintenance of motors also considered as an EE measure?

Reply: Yes, maintenance of motors improves efficiency a lot. Bad maintenance will contribute to huge amount of losses thus maintenance plays a vital role in conserving energy.

This was followed by a quiz on Module 1.

Module 2: Energy Efficiency Project Characteristics - Mr. Vinay Deodhar, Director, Clean Technologies Consultants

Mr. Deodhar discussed the key characteristics of different EE projects. His presentation focused on the types of EE projects in different sectors, consumer motivations for EE projects, and a typical EE project in selected sectors. He mentioned that EE projects are possible in every sector including SME clusters, buildings, municipalities and railways. He also explained the characteristics of EE projects, ESCOs and EE business models. According to him, most EE projects are of relatively small project size, with investment less than INR 1 crore and have a short simple payback periods ranging from one to three years. However, a number of implementation business models for EE projects are available that consumers can adopt as per their requirement. Mr. Deodhar highlighted the role of ESCOs and discussed a typical process chart for an ESCO project. He also presented several case studies to demonstrate the energy efficiency project characteristics.

EE Projects in SME Sector and Appraisal Process - Mr. Rajiv Kumar, Deputy General Manager, SIDBI

Mr. Kumar mentioned that there is a great potential for EE technologies in the MSME which should be tapped to address climate change issues. He explained a case study on MSME industry and energy efficiency measures adopted to reduce energy losses. Mr. Kumar explained about replacement and retrofit of equipment, and financing for existing and new units. He said that EE could improve product quality and employee standards, as well as enhance safety. Most importantly, EE can help to achieve reduced specific energy consumptions. Mr. Kumar also provided details of SIDBI's tools on EE including a list of energy savings equipment (version 7.6) across twenty six industrial sectors covered.

Questions & Answer

Question: Can you share EE savings equipment list of service providers with public sector banks?

Reply: This list is available on SIDBI's website and you can use this as basic reference.

Question: Can you share your experience of financing existing and new MSME units?

Reply: There is a huge potential in retrofit (existing) segment that needs low investment but yields high benefits. Case study videos are being prepared on MSME financing to increase confidence levels.

Question: What is the lower and upper limit of EE project loan prescribed by SIDBI?

Reply: SIDBI does not provide loans below INR 10 lakh and the maximum loan limit is INR 15 crore. In a normal project case, the equipment-based loan concessional rate is 0.75 basis points below the normal lending rate and projects which are preceded by detailed by energy audit shall avail concession rate of additional 0.25 basis points below the normal lending rate.

This was followed by a quiz on Module 2.

Raising of Funds by ESCO and Creation of Security - Mr. A.K. Gupta, Director Finance EESL

Mr. Gupta presented a case study on financing lighting project referred as DELP and explained about the bill savings and deemed savings approach. He mentioned about the creation of an escrow account to which revenues will be transferred. He also explained about project implementation via a special purpose vehicle (SPV), deferred payment, bond raising and international funding.

Module 3: Business Models for EE Project Implementation - Mr. Bhaskar Natarajan, DCOP-EE, USAID PACE D TA Program

Dr. Natarajan presented an overview of the various business models for EE project implementation. He discussed models such as corporate lending and energy audit, performance contract models including the shared savings, guaranteed savings, and deemed savings models, and energy supply contracting. He also discussed the project economics of the different models. He further explained the indicative structure of the Energy Supply Agreement (ESA), International Finance Corporation-Risk Guarantee Fund and the structure of commercializing energy efficiency finance (CEEF) Program. Dr. Natarajan concluded by stating that ESCO models have excellent potential but they also face significant challenges. ESCOs have proven to be successful in several countries including China and stakeholders need to work together to make them successful in India.

Module 4: Project Appraisal (Technical) - Mr. Vinay Deodhar, Director, Clean Technologies Consultants

Mr. Deodhar presented on various technical aspects of EE project appraisal. His presentation focused on technical project appraisal, key considerations in EE projects, examples of EE

measures in industries, list of EE technologies, risk assessment and risk mitigation of EE projects. He emphasized that during the technical evaluation, the evaluator must evaluate key points related to technology performance, authenticity and the developer of the savings estimates, reality of savings estimates, and factors impacting the savings. He emphasized that the technical appraisal of EE projects should include detailed evaluation of the products and technologies, assessment of savings calculation procedures, and consideration of risks and uncertainties in the savings estimates and project implementation plan. Mr. Deodhar also provided examples of EE projects in key sectors and underscored the need for environmental and legal appraisal. He said that it was important to comply with all environmental regulations and meet the legal requirements for the EE projects as well.

This was followed by a quiz on Modules 3 and 4.

Day 3 (June 3, 2015)

Recap of Day 1 and Day 2

Dr. Bhaskar Natarajan, DCOP- EE, USAID-PACE D TA Program provided a summary of the deliberations of day 1 and day 2 of the training program.

Module 5: Project Appraisal (Financial) - Mr. Vinay Deodhar, Director, Clean Technologies Consultants

Mr. Deodhar presented an overview of the key elements in financial appraisal and discussed tools such as simple payback, discounted cash flows, and internal rate of return (IRR). He also focused on the critical elements of financial appraisal including meeting debt-service coverage ratio, debt equity, and IRR. Mr. Deodhar provided a case study of financial analysis of EE project for two scenarios: a) when ESCO is involved and revenue is shared between the host and ESCO, and b) when host implements the project. In addition, he gave an overview of the loan security conditions such as EE project equipment as collateral, loan security end user as borrower, ESCO as borrower, reviewing financial capacity of borrowers, etc. He also explained about establishing EE business units, vendor finance programs and establishing credit lines with ESCOs.

This was followed by a quiz on Module 5.

EE Financing Case Studies - Mr. Milind Chittawar, Managing Director, See-tech Solutions Private Limited

Mr. Chittawar presented a case study (See-tech) to demonstrate the difficulties in EE financing. See-tech, a Grade-2 ESCO empanelled by BEE, has undertaken a number of ESCO projects and delivered guaranteed savings for the last two decades.

Mr. Chittawar referred to a case study on an EE project in a five star hotel where See-tech Solutions recommended implementing EE measures to contribute 19 percent energy savings. He mentioned that the project was financed by See-tech Solutions, and detailed M&V is carried out to establish savings. Mr. Chittawar also mentioned that the banks which finance EE projects should also keep a track of energy savings attributed by the EE project which they finance.

Module 6: M&V International Best Practices and Approaches - Mr. Shirish Deshpande, Director, Energetic Consulting Pvt. Ltd.

Mr. Deshpande's presentation focused on M&V of EE projects and related methodologies and protocols. He explained that the costs of M&V depends on EE technologies and measures to be implemented and the approach and methodology to be utilized. According to him, M&V costs are generally between 5 to 10 percent of the project investment Mr. Deshpande explained that there is a trade-off between accuracy and cost of the M&V. Simple approaches are preferred to reduce costs and minimize potential for disputes in EE projects particularly through the ESCO mode. He stressed on the need for engaging independent third party verification agency and presented the international protocols for M&V.

Module 7: M&V Case Studies - Mr. Shirish Deshpande, Director, Energetic Consulting Pvt. Ltd.

Mr. Deshpande presented case studies on M&V which included a case study on lighting wherein all options defined under the International Performance Measurement and Verification Protocol (IPMVP) were presented. These options include: Retrofit Isolation Methods (Option A – Partially measured or one time measurement and Option B – Longer or continuous measurements) and Whole Facility Methods (Option C – Whole facility energy analysis and Option D – Computer simulation).

He also shared a M&V template and stressed on the importance of including all measured values for the reporting period, description of data format (headings, units, etc.), how performance criteria has been met, identification of any performance deficiencies that need to be addressed by ESCO, etc. Mr. Deshpande also presented case studies on a textile unit and a paper manufacturing unit.

This was followed by a quiz on Modules 6 and 7.

Soft Skills for Effective Training - Mr. Rohit Agarwal, Trainer, USAID PACE-D TA Program

Soft skills such as communication, language and approach play a key role in the success of training programs. As such, a special session on soft skills was organized to familiarize the participants with the do's and don'ts of effective training. In his presentation, Mr. Agarwal mentioned that training was largely about skills and application that can lead to behavioral change. He pointed out the key differences between teaching, training and facilitation and explained that for a comfortable learning environment, physical, social and psycho-emotional were essential for adult learning. He also highlighted the difference between pedagogy (science of teaching children) and andragogy (characteristics of adult learners). Mr. Agarwal focused on the "What's in it For Me (WIIFM)" concept and said that it was important to mention the WIIFM factor at beginning of presentation so that the participants know what the session is all about and what how they can leverage the new knowledge. He also suggested that trainers should avoid using a lot of theory as it could get dull and passive. Instead, trainers should try to link each topic with practical applications and design interactive sessions to have a two-way dialogue with participants.

At the end of each module, the participants were given a short quiz to enhance their understanding of the terms and approaches related to EE financing. Quiz questions on each module is attached in Annex 4.

CONCLUDING SESSION

The training workshop concluded with certificate distribution. Mr. Hemant Patil, Manager-Energy Conservation, MEDA distributed certificates to bank officers who participated in the training. He also gave away the prizes to the winners of the quiz of each module.

Vote of Thanks - Mr. Pranav Khanna, Project Engineer, BEE
Mr. Khanna proposed a formal vote of thanks on behalf of BEE. He thanked MEDA for providing logistic support for the training program, the banks for sparing their senior officers to participate in the training, and speakers for taking the time to share their experiences with the trainees. He also thanked the USAID PACE-D TA Program for its technical support to the BEE in organizing the training workshop. He also informed the participants that BEE will organize its second training workshop in Nainital on June 8-10, 2015 and hoped that these initiatives will build the capacity of banks to provide loans to EE projects and create an overall impact.

Key Takeaways of Training Workshop

Access to finance for EE projects is an issue and needs to be addressed collectively by all stakeholders.

Bank officers should learn from SIDBI's experience in financing EE projects.

Banks should keep themselves updated on EE financing experiences.

Banks should get prepared for taking benefit of BEE's PRGFEE and VCFEE.

Banks should actively engage with ESCOs to further EE project financing.

Trainers should organize training in their respective banks and impart training on EE financing to credit/loan officers.

ANNEX - I AGENDA



Training of Trainers under 'Training Program for Scheduled Commercial Banks on Energy Efficiency Financing in India'

June 1-3, 2015

Agenda

Venue: Isfahan Hall, Hotel Suba International, Plot 211, Chakala,
Sahar Road, Andheri East, Mumbai

| DAY-1 (June 1, 2015) | | | |
|--|-------|--|---|
| 10.00 | 10.30 | Registration | |
| Inaugural Session | | | |
| 10.30 | 10.40 | Welcome Address | Mr. Hemant Patil, Manager – Energy Conservation, Maharashtra Energy Development Agency |
| 10.40 | 10.50 | EE Financing Initiatives under the USAID PACE-D Technical Assistance Program | Dr. Bhaskar Natarajan, Deputy Chief of Party-Energy Efficiency, USAID PACE-D TA Program |
| 10.50 | 11.00 | Special Address | Ms. Rema Menon, Vice President, Indian Banks' Association |
| 11.00 | 11.10 | Thematic Address | Mr. A. K. Gupta, Director – Finance, EESL |
| 11.10 | 11.15 | Vote of Thanks | Ms. Vineeta Kanwal, Assistant Energy Economist, Bureau of Energy Efficiency |
| Tea Break (11.15 – 11.30) | | | |
| SESSION 1: Experiences in Financing Energy Efficiency Projects | | | |
| <i>Session Chair: Mr. Rajiv Kumar, DGM, SIDBI</i> | | | |
| 11.30 | 11.45 | EE Financing in MSMEs | Mr. Rajiv Kumar, Deputy General Manager, SIDBI |
| 11.45 | 12.00 | Experience of Financing Renewable Power | Mr. Gulshan Malik, Deputy General Manager, SBI |
| 12.00 | 12.15 | Tata Cleantech's Experience in Financing Energy Efficiency Projects | Mr. Pankaj Sindwani, Vice-President, Tata Clean-Tech Capital Limited |
| 12.15 | 12.30 | IREDA's Experience in Tapping the EE Market Potential | Mr. K.P Philip, Senior Manager, IREDA |
| 12.30 | 12.45 | Financing for future Lighting | Mr. Shyam Sujan, Secretary General, Electric Lamp and Component Manufacturers Association of India (ELCOMA) |
| 12.45 | 13.00 | Q&A session | |
| Lunch Break (13.00 to 14.00) | | | |
| SESSION 2: Financing Issues of Industries to Implement EE Projects | | | |
| <i>Session Chair: Mr. Shyam Sujan, Secretary General, ELCOMA</i> | | | |
| 14.00 | 14.30 | Introduction to BEE's Schemes on EE Financing | Ms. Vineeta Kanwal, Assistant Energy Economist, Bureau of Energy Efficiency |
| 14.30 | 15.00 | Energy Efficiency Schemes in Maharashtra | Mr. Hemant Patil, Manager – Energy Conservation, Maharashtra Energy Development Agency |
| Tea Break (15.00 to 15.15) | | | |



| SESSION 3: Role of ESCO Models in Existing EE Market | | | |
|--|-------|---|--|
| <i>Session Chair: Mr. A K Gupta, Director (Finance), EESL</i> | | | |
| 15.15 | 15.45 | The mission of an ESCO Implement energy Efficiency while removing barriers | Mr. Mohit Khatri, DGM Finance Representative of EESL |
| 15.45 | 16.05 | Role of ESCOs in Existing EE Market | Dr. Koshy Cherail, President, AEEE |
| 16.05 | 16.25 | ESCO Models | Mr. R Rajmohan, CEO, DESL Energy |
| 16.25 | 16.45 | Role of ESCO Models in Existing EE Market | Mr. Anil Mishra, Senior Executive, Lloyd Insulations |
| Session Break (16.45-17.00) | | | |
| Valedictory Session | | | |
| 17.00 | 17.05 | Introduction to "Training Manual on EE Project Financing" | Mr. Nithyanandam Yuvaraj Dinesh Babu, Chief of Party, USAID PACE-D TA Program |
| 17.05 | 17.10 | Bankers' Perspective on EE Financing | Mr. K Unnikrishnan, Dy. Chief Executive, Indian Banks Association |
| 17.10 | 17.15 | Special Address | Mr. A K Gupta, Director (Finance), EESL |
| 17.15 | 17.20 | Introduction to "Success stories for EE Projects Financed in India" | Mr. Rajiv Kumar, Deputy General Manager, SIDBI |
| 17.20 | 17.25 | Release of "Success Stories for EE Projects Financed in India" and "Training Manual for EE Project Financing in India" | |
| 17.25 | 17.35 | Keynote Address | Dr. Ajay Mathur, Director General, BEE |
| 17.35 | 17.40 | Vote of Thanks | Mr. Hemant Patil, Manager – Energy Conservation, Maharashtra Energy Development Agency |
| High Tea and End of Inaugural Function (17.40 to 17.50) | | | |

End of Day 1



| DAY 2 (June 2, 2015) | | | |
|-----------------------------------|-------|--|--|
| 10.00 | 10.20 | Market Potential for EE Projects (Module 1) | Dr. Bhaskar Natarajan, Deputy Chief of Party-Energy Efficiency, USAID PACE-D TA Program |
| 10.20 | 10.40 | EE Project Characteristics (Module 2) | Mr. Vinay Deodhar, Director, Clean Tech Solutions |
| 10.40 | 11.10 | Discussions and Quiz | <ul style="list-style-type: none"> Ms. Kavita Kaur, Communication Specialist, USAID PACE-D TA Program Mr. Pranav Khanna, Project Engineer, BEE |
| 11.10 | 11.30 | EE Projects in SME sector and Appraisal process | Mr. Rajiv Kumar, Deputy General Manager, SIDBI |
| Tea Break (11.30 to 11.45) | | | |
| 11.45 | 12.10 | Raising of Funds by ESCO and creation of security | Mr. A K Gupta, Director (Finance), EESL |
| 12.10 | 12.30 | EE Project Implementation Business Models (Module 3) | Dr. Bhaskar Natarajan, Deputy Chief of Party-Energy Efficiency, USAID PACE-D TA Program |
| 12.30 | 12.50 | Discussions and Quiz | Ms. Kavita Kaur, Communication Specialist, USAID PACE-D TA Program |
| Lunch (12.50 to 13.45) | | | |
| 13.45 | 14.15 | EE Project Appraisal – Technical (Module 4) | Mr. Vinay Deodhar, Director, Clean Tech Solutions |
| 14.15 | 14.35 | Discussions and Quiz | <ul style="list-style-type: none"> Ms. Kavita Kaur, Communication Specialist, USAID PACE-D TA Program Mr. Pranav Khanna, Project Engineer, BEE |
| 14.35 | 15.00 | Quiz Prize Distribution | Mr. Hemant Patil, Manager – Energy Conservation, Maharashtra Energy Development Agency |
| 15.00 onwards | | High Tea | |

| DAY 3 (June 3, 2015) | | | |
|-----------------------------------|-------|--|--|
| 10.00 | 10.15 | Recap of Day 1 and Day 2 | Dr. Bhaskar Natarajan, Deputy Chief of Party-Energy Efficiency, USAID PACE-D TA Program |
| 10.15 | 10.45 | EE Project Appraisal (Financial) (Module 5) | Mr. Vinay Deodhar, Director, Clean Tech Solutions |
| 10.45 | 11.05 | Discussion and Quiz | <ul style="list-style-type: none"> Ms. Kavita Kaur, Communication Specialist, USAID PACE-D TA Program Mr. Pranav Khanna, Project Engineer, BEE |
| Tea Break (11.05 to 11.20) | | | |
| 11.20 | 11.40 | EE Financing Case Studies | Mr. Milind Chitawar, Managing Director, See-Tech Solutions Private Limited |
| 11.40 | 12.30 | M&V International Best Practices, Approaches & Case Studies (Module 6 and 7) | Mr. Shirish Deshpande, Director, Energetic Consulting Pvt. Ltd. |
| 12.30 | 12.50 | Discussion and Quiz | Dr. Bhaskar Natarajan, Deputy Chief of Party-Energy Efficiency, USAID PACE-D TA Program |
| Lunch (12.50 to 13.40) | | | |
| 13.40 | 14.45 | Soft-Skills for Effective Training | Mr. Rohit Agarwal, Trainer, USAID PACE-D TA Program |
| 14.45 | 15.00 | Quiz Prize Distribution and Group Picture | <ul style="list-style-type: none"> Mr. Hemant Patil, Manager-Energy Conservation, Maharashtra Energy Development Agency Mr. Pranav Khanna, Project Engineer, BEE |
| 15.00 | 15.10 | Certificates Distribution to Master Trainers | Mr. Hemant Patil, Manager – Energy Conservation, Maharashtra Energy Development Agency |
| 15.10 | 15.15 | Vote of Thanks | Mr. Pranav Khanna, Project Engineer, BEE |
| 15.15 onwards | | High Tea | |

End of Training Workshop





BUREAU OF ENERGY EFFICIENCY

(Ministry of Power, Government of India)



ANNEX – II LIST OF PARTICIPANTS

Training of Trainers under "Training Program for Scheduled Commercial Banks on Energy Efficiency Financing in India"

June 1-3, 2015

Venue: Isfahan Hall, Hotel Suba International, Plot 211, Chakala, Sahar Road, Andheri East, Mumbai

Sign-in-Sheet

Participants

| S. No | Name | Designation | Organization | Email Id | Mobile No | Gender (M/F) |
|-------|-----------------|----------------------|--------------|---|---------------------------|--------------|
| 1. | Somya Kant | CFO | RECPDCL | somyak@recl.nic.in | 9968284084 | M |
| 2. | Mukund Kumar | Sr Executive (Engg) | RECPDCL | mukund.kumar07@gmail.com | 8879324090 | M |
| 3. | Tanuj Sud | | RECPDCL | tanuj.sud@kspartners.co.in | 9811141682 | M |
| 4. | Varij Sharma | | RECPDCL | varij.sharma@kspartners.co.in | 9871578039 | M |
| 5. | Gaurav Sobti | Asstt Vice President | HDFC Bank | gaurav.sobti@hdfcbank.com | 8879415857 | M |
| 6. | Rishi Raj Dixit | Sr Manager | UCO Bank | rishirajdixit@yahoo.in | 9898063468/ 7745887788 | M |
| 7. | S V Varadarajan | Sr Manager (Faculty) | UCO Bank | varadasvmr@yahoo.com; vtc.bhopal@ucobank.co.in | 8358016050 | M |
| 8. | Veena V Angane | Sr Manager | Canara Bank | veeangane@gmail.com | 9869345320 | F |
| 9. | Atul M Parkar | | ICICI Bank | atul.parkar@icicibank.com | 7506392176 | M |





BUREAU OF ENERGY EFFICIENCY

(Ministry of Power, Government of India)



| S. No | Name | Designation | Organization | Email Id | Mobile No | Gender (M/F) |
|-------|----------------------|-----------------------------|---------------------------------------|---------------------------------------|------------|--------------|
| 10. | Harshal Dicholkar | CMI | ICICI Bank | harshal.dicholkar@icicibank.com | 9821623374 | M |
| 11. | S K Kadam | CMI | ICICI Bank | santosh.ka@icicibank.com | 8451906193 | M |
| 12. | Ashutosh Tandon | Associate Operation Officer | IFC/World Bank Grp | atandon1@ifc.org | 9987245726 | M |
| 13. | Prasanna Warkhede | Dy Engg | PWD | pw.narkhede@gmail.com | 9821297296 | M |
| 14. | Hiraman V Botre | Sr.Accountant | MEDA | hiraman.botre9@gmail.com | 9923345599 | M |
| 15. | Sudhir Shringare | Sr Associate VP | Darashaw | sudhir-shringare@darashaw.com | 9224365262 | M |
| 16. | Sachin Dhorz | Asstt VP | Darashaw | sachin-dhorz@darashaw..com | | M |
| 17. | Dr.Navneet Kaur | Asstt Professor | NIBM | navneet.kaur@nibmindia.org | 7775920038 | F |
| 18. | Prakash Padalwar | Electrical Manager | BNN Power | bnnpower@gmail.com | 9869540157 | M |
| 19. | Amruteswar | Manager | Tata Capital | amruteswar..mahapatra@tatacapital.com | 9930171202 | M |
| 20. | D S Bhise | Manager | Tata Power – DSM cell | deepak.bhise@tatapower.com | 9029002532 | M |
| 21. | Sadanand Manekar | Designer | Oxiona Energy Solutions India Pvt Ltd | ledconsult@gmail.com | 9321574006 | M |
| 22. | Y M Wadakar | CA | Oxiona Energy Solutions India | yupendra@yahoo.com | 9819098812 | M |
| 23. | S C Manekar | Director | Oxiona Energy | | 9821646962 | M |
| 24. | Milind Sathe Wadekar | Director | Oxiona Energy | | | M |
| 25. | Shivan Giani | Managing Director | ECON Engineers | shivangiani18@gmail.com | 9819061389 | M |





BUREAU OF ENERGY EFFICIENCY

(Ministry of Power, Government of India)



| S. No | Name | Designation | Organization | Email Id | Mobile No | Gender (M/F) |
|-------|-------------------|------------------------|------------------------------|-----------------------------------|-------------|--------------|
| 26. | Abhishek Pange | Consultant | Energetic Consulting Pvt Ltd | abhishek@ecpl.co.in | 9967381384 | M |
| 27. | Vishwas Naware | ESCO & EA | Energyca | info@energyca.in | 09820162008 | M |
| 28. | Rajiv Rathod | Architect | Energyca | ruju.ecologyc@gmail.com | 9967187118 | M |
| 29. | Sujat Faxwala | Director | Elcomn | sujat@elcomn.in | 9833636464 | M |
| 30. | Rathin Vyas | CEO | Enerco Energy Solutions | rathinvyas@econserve.in | 9890737447 | M |
| 31. | Pramod Deo | Addl VP –DSM/EE | Reliance Energy Ltd | pramod.deo@relianceade.com | 9323552952 | M |
| 32. | Mukesh Bhanushali | Deputy General Manager | Reliance Infrastructure Ltd | mukesh.bhanushali@relianceada.com | 9322131353 | M |
| 33. | Anurag Thatte | Deputy General Manager | Reliance Infrastructure Ltd | anurag.thatte@relianceada.com | 9320499374 | M |
| 34. | Dipti Padwal | Deputy General Manager | Reliance Infrastructure Ltd | dipti.padwal@relianceada.com | 9323956185 | F |
| 35. | Deepak Kajrolkar | Manager | Reliance Infrastructure Ltd | deepak.kajrolkar@relianceada.com | 7498288005 | M |
| 36. | Kailas R Nerkar | Asstt V P | Reliance Infrastructure Ltd | kailas.nerkar@reliance.com | 9325118240 | M |
| 37. | M K Paul | Sr General Manager | Reliance Engg Grp | mrinal.paul@ril.com | 9867614690 | M |
| 38. | D S Gandhe | Chairman | Prerna | gandheds@gmail.com | 9822026195 | M |
| 39. | Jay Parekh | COO | Pranat Engineers Pvt Ltd | jay@alienergy.in | 9820282412 | M |
| 40. | Jittin Kapoor | Asstt Director | NPC | | 9987019892 | M |





BUREAU OF ENERGY EFFICIENCY

(Ministry of Power, Government of India)



| S. No | Name | Designation | Organization | Email Id | Mobile No | Gender (M/F) |
|-------|---------------------|---------------------------|---------------------------------|--|--------------|--------------|
| 41. | Dr.S L Patil | Executive Director | CPPA Maharashtra | drpatil.india@gmail.com | 9833041468 | M |
| 42. | Milind Nazare | Proprietor | Kusum-Sham Electricals Mumbai | rmnazare@gmail.com | 9870196349 | M |
| 43. | Nutan Shah | CEO | Inava Instruments International | info@inava.in | 9892547852 | M |
| 44. | Virendra Kumar Jain | Consultant | RCF Ltd | vk221953@yahoo.com | 9869001044 | M |
| 45. | Dr B B Shrivastava | Director | | drbbshrivastava@gmail.com | 09619154821 | M |
| 46. | R L Birla | Consultant | PEERS | peers@logicalhub.com | 022-28985441 | M |
| 47. | Sujit Sonkar | Business Head & Partner | Partner & Founder | sujit@iuss.in | 9867911539 | M |
| 48. | Pradeep Shah | CEO | Dipilec Enterprises | pshah@dipilec.com | 09820890813 | M |
| 49. | M S Patil | Sr Manager | Lubrizol India Pvt Ltd | m spatil@lubrizol.com | 9930306876 | M |
| 50. | N C Patil | Deputy Manager | Lubrizol India Pvt Ltd | n ipt@lubrizol.com | 9920692128 | M |
| 51. | Hemendra Tiwari | DGM & Energy Manager | Bhushan Steel Ltd | hemendra.tiwari@bhushansteel.com | 9987578385 | M |
| 52. | Hemant Walavalkar | Head Business Development | Ecube India Pvt Ltd | | 9819087673 | M |
| 53. | Nainesh Jadawala | Representative | Dynamic Consultant | agsmarketing @gmail.com | 9819761878 | M |
| 54. | Priye Ranjan V | Manager | Credit Analysis & Research Ltd | priyerajan@carerating.com | 8452043241 | M |
| 55. | Sajid Mapari | Proprietor | Unitech Corp | sjd2050@gmail.com | 9821362638 | M |





BUREAU OF ENERGY EFFICIENCY

(Ministry of Power, Government of India)



| S. No | Name | Designation | Organization | Email Id | Mobile No | Gender (M/F) |
|-------|------------------|--------------------|---|-------------------------------|------------|--------------|
| 56. | Pankaj Doshi | Director | Vikram Fixtures | pankajdoshi16111960@gmail.com | 9867161934 | M |
| 57. | Anil Gachke | Proprietor | Electrical Contractors Association of Maharashtra | ajitdat@gmail.com | 9842942367 | M |
| 58. | Rajiv Shukla | General Manager | Idam Infrastructure | rajiv.shukla@idaminfra.com | 9324213638 | M |
| 59. | Prahalad J Bhatt | Executive Director | | pjbhatt25@rediffmail.com | 7208092752 | M |
| 60. | Ajit Patil | General Manager | Century Rayon | ajitpatil@cenrayon.com | 7498257753 | M |
| 61. | Suresh Kotla | Acting Director | ISCVT | skotla@india.iscvt.org | 9867950035 | M |
| 62. | Lokesh Chouraria | Sr Engg | Laurien Bharat Pvt Ltd | lokeshjbp@gmail.com | 9702769326 | M |
| 63. | Aditya Saxena | Director | Essem I I S Pvt Ltd | | 9819302901 | M |
| 64. | Arup Gupta | Manager | Arup Gupta Care | | 9004456782 | M |
| 65. | Y V Thakre | Secretary General | Taloja Manufacture Associate | tma.taloja@gmail.com | 9920289019 | M |
| 66. | Bharat Vasandani | Strategy | Fountain Head Ltd | bharat@fountainheads.com | 9820789895 | M |
| 67. | R T Aga | Addl EE | Mahagen Co | | 9107493967 | M |
| 68. | Lina Patil | Addl Ex Engg | Mahagen Co | lvpatil@rediffmail.com | 9819553828 | F |
| 69. | S D Jha | RM West | Moserbaer India | sd.jha@moserbaer.in | 9833958205 | M |





BUREAU OF ENERGY EFFICIENCY

(Ministry of Power, Government of India)



Speakers

| S. No | Name | Designation | Organization | Email Id | Mobile No | Gender (M/F) |
|-------|-------------------------------------|-----------------------------|---------------------------------|---------------------------------|----------------|--------------|
| 1. | Dr. Ajay Mathur | Director General | BEE | | | M |
| 2. | Vineeta Kanwal | Asstt Energy Economist | BEE | | | F |
| 3. | Pranav Khanna | Project Engineer | BEE | pkhanna@beenet.in | 9953600902 | M |
| 4. | Dr. Bhaskar Natarajan | Deputy Chief of Party-EE | USAID PACE-D TA Program | bnatarajan@pace-d.com | 9971491848 | M |
| 5. | Nithyanandam Yuvaraj Dinesh Babu | Chief of Party | USAID PACE-D TA Program | ydbabu@nexant.com | | M |
| 6. | Kavita Kaur | Communication Specialist | USAID PACE-D TA Program | kkaur@nexant.com | | F |
| 7. | Rohit Agarwal | Trainer | USAID PACE-D TA Program | | | M |
| 8. | Hemant Patil | Manager-Energy Conservation | MEDA | | | M |
| 9. | Rajiv Kumar | Deputy General Manager | SIDBI | rajivkr@sidbi.in | 9711441998 | M |
| 10. | Gulshan Malik | Deputy General Manager | SBI | gulshan.malik@sbi.co.in | 9958799433 | M |
| 11. | Pankaj Sindwani | Vice President | Tata Clean-Tech Capital Limited | pankaj.sindwani@tatacapital.com | 91-22-61828282 | M |
| 12. | K P Philip | Senior Manager | IREDA | kpphilip@ireda.gov.in | 9810165918 | M |
| 13. | Rema Menon | Vice President | IBA | rema@iba.org.in | 9819065512 | F |
| 14. | K Unnikrishnan | Deputy Chief Executive | Indian Banks Association | | | M |





BUREAU OF ENERGY EFFICIENCY
(Ministry of Power, Government of India)



| S. No | Name | Designation | Organization | Email Id | Mobile No | Gender (M/F) |
|-------|-------------------|--------------------------------|------------------------------|---------------------------------------|------------|--------------|
| 15. | A K Gupta | Senior Executive | EESL | akguptaa@eesl.co.in | 9868549078 | M |
| 16. | Mohit Khatri | Deputy General Manager-Finance | EESL | mkhatri@eesl.co.in | 9810007213 | M |
| 17. | R Rajmohan | Chief Executive Officer | DESL | rajmohan@deslenergy.com | 9650300612 | M |
| 18. | Dr. Koshy Cherail | President | AEEE | koshy@aeee.in | 9910695700 | Mr |
| 19. | Anil Mishra | Director-Technical | Lloyd Insulations | anilkumar.mishra@lloydinsulations.com | 9594019983 | M |
| 20. | Vinay Deodhar | Director | Clean Tech Solutions | vdeodhar@gmail.com | 9930491493 | M |
| 21. | Shyam Sujan | Secretary General | ELCOMA | | 9810344739 | M |
| 22. | Milind Chittawar | Managing Director | See-Tech Solutions Pvt Ltd | milind.chittawar@seetechsolutions.in | 9422145534 | M |
| 23. | Shirish Despande | Director | Energetic Consulting Pvt Ltd | shirish@ecpl.co.in | 9322854471 | M |



ANNEX – III TRAINING FEEDBACK EVALUATION

TRAINING OF TRAINERS UNDER "TRAINING PROGRAM FOR SCHEDULED COMMERCIAL BANKS ON EE FINANCING IN INDIA

The Mumbai workshop was attended by 18 participants from six banks/financial institutions and one consulting agency. Feedback questionnaire was circulated to all the participants for providing their feedback and suggestions. A sample of the feedback questionnaire is attached as Annex III A.

The summary of the overall feedback of the training program provided by the participants is given below :

More than 70% of the participants rated the program high on Quality of Speakers/Trainers

Almost 45% of the participants rated the program high¹ rating to Relevance to their organisation's work area

More than 50% rated the program high on the following Relevance to their work within the organization

More than 60% rated the program high on structure of the program

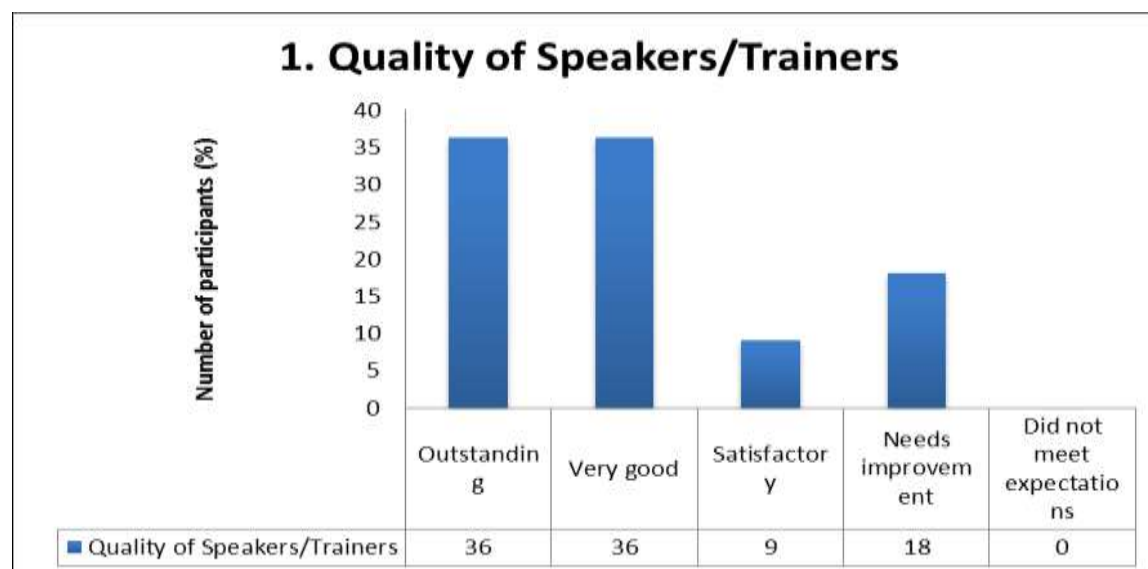
More than 60% rated the program high on topics covered in the program

More than 60% rated the program high on quality of the classroom interactions

More than 60% rated the program high on quality of training and reading materials

More than 60% rated the program high on appropriateness of reading materials

The feedback summary charts for the above 8 parameters are presented below:

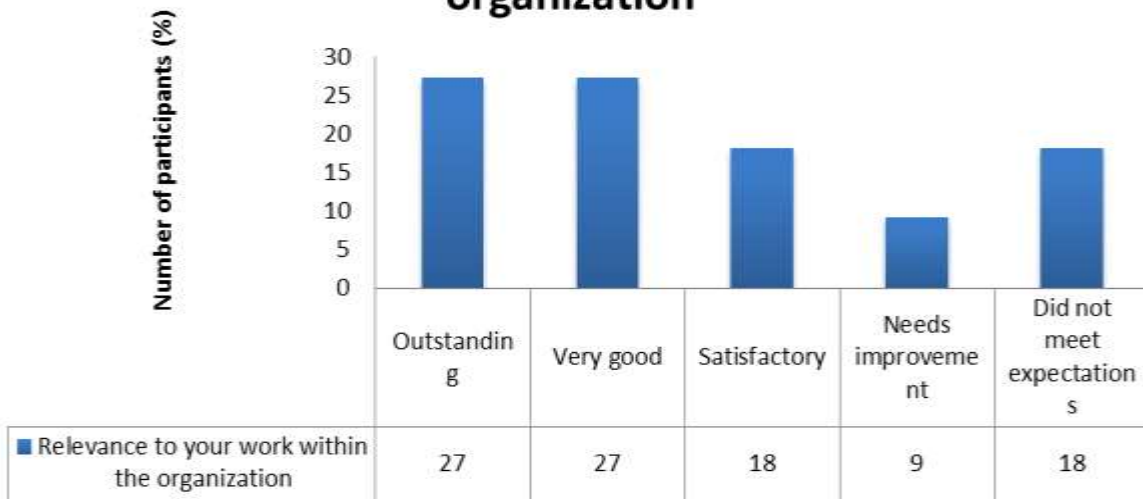


¹ Either "Outstanding" or "Very Good"

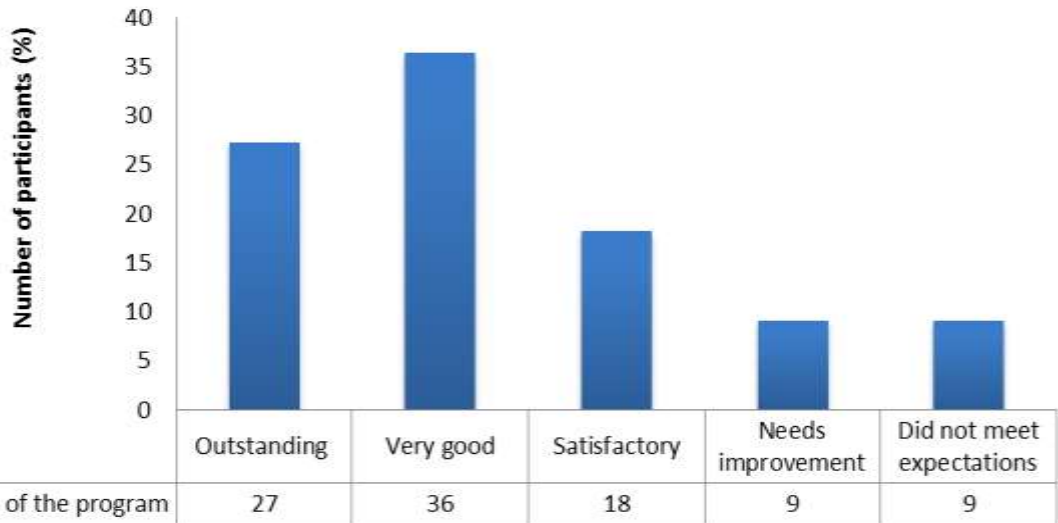
2. Relevance to your organisation's work area



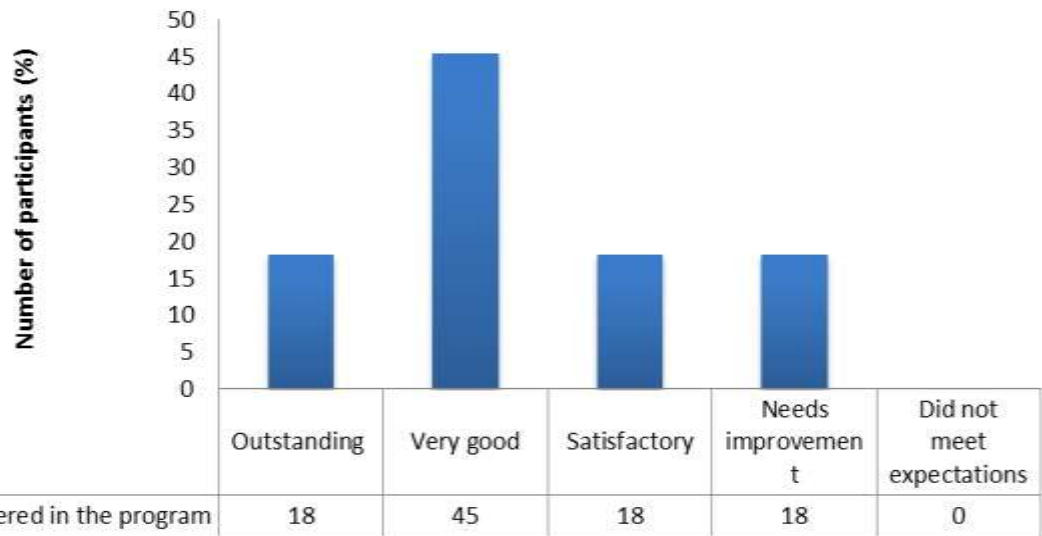
3. Relevance to your work within the organization



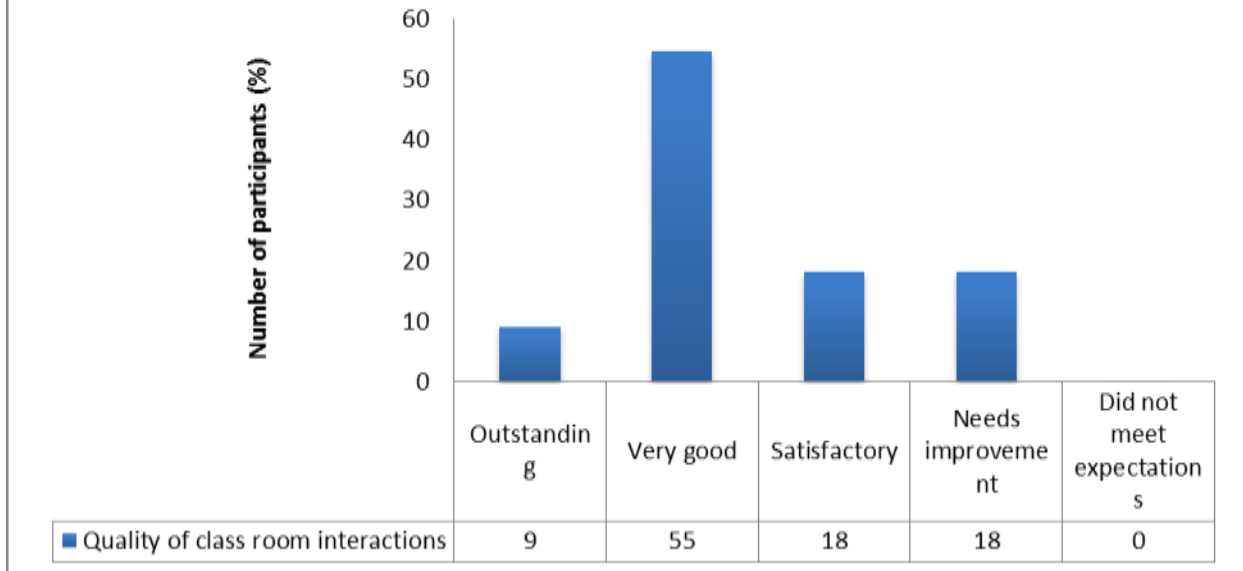
4. Structure of the program



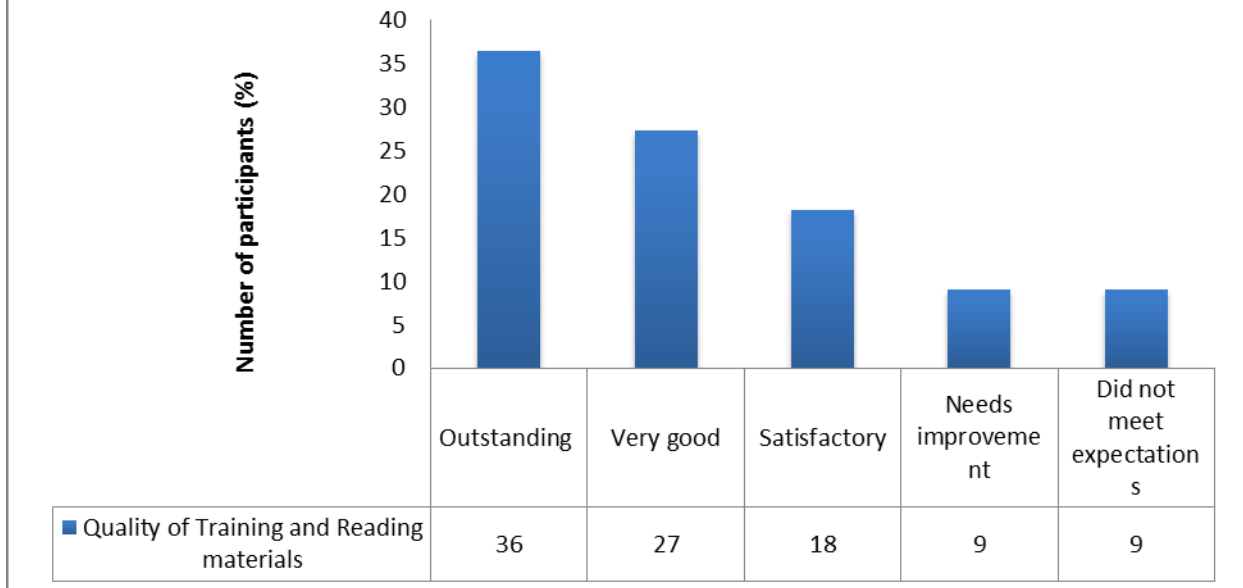
5. Topics covered in the program



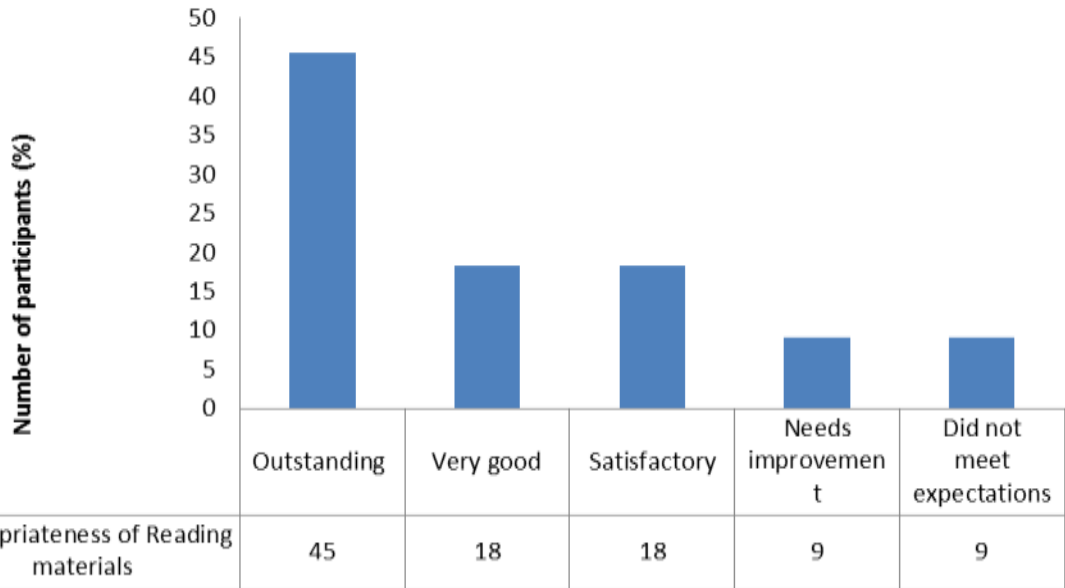
6. Quality of class room interactions



7. Quality of Training and Reading materials



8. Appropriateness of Reading materials



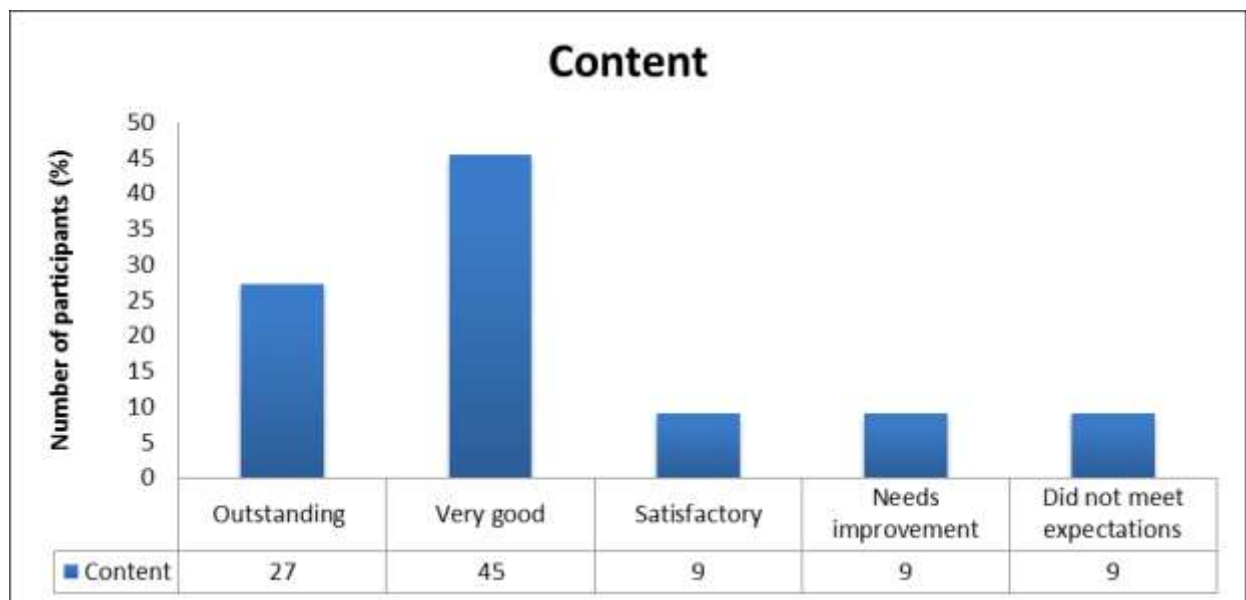
SESSION-WISE FEEDBACK

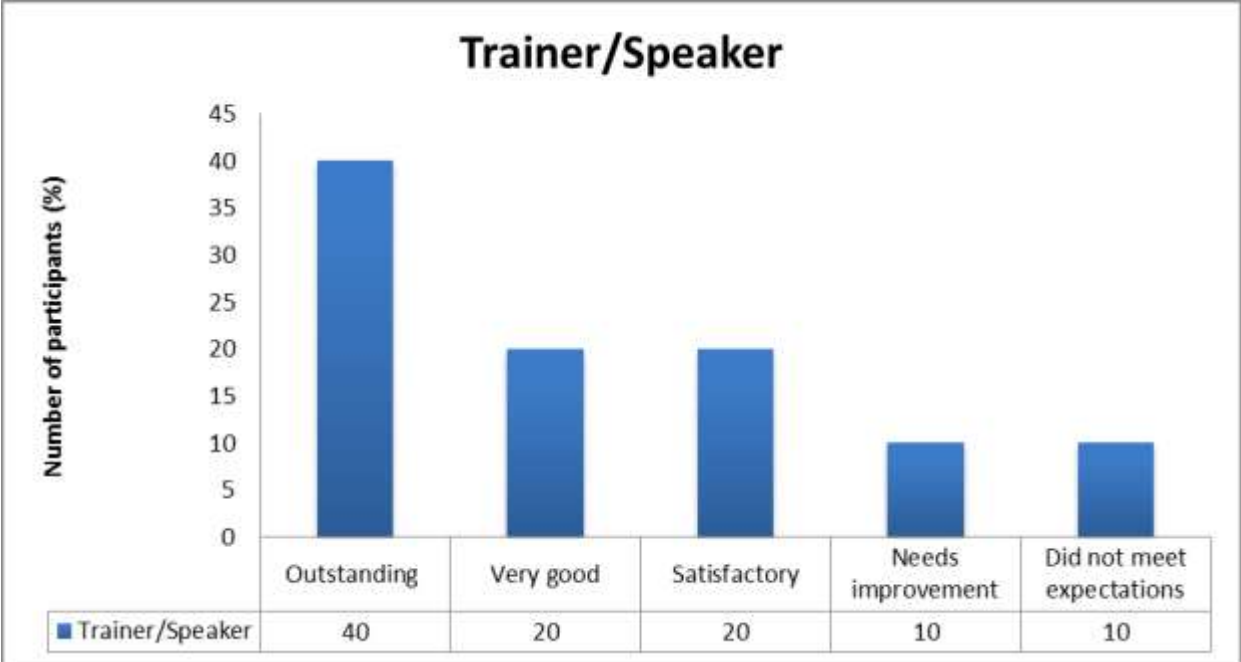
The summary of the feedback provided by the participants on all the training sessions delivered by the trainers / speakers is given below:

- More than 60% of the participants have given a high rating to the content and to the speakers/trainers for the technical Module 1
- More than 60% participants have given a high rating to the content and to the speakers/trainers for the technical Module 2
- More than 65% participants have given a high rating to the content and to the speakers/trainers for the technical module 3
- More than 65% participants have given a high rating to the content and more than 60% participants have given a high rating to the speakers/trainers for the technical module 4
- More than 70% participants have given a high rating to the content and more than 55% participants have given a high rating to the speakers/trainers for the training module 5
- More than 70% participants have given a high rating to the content and more than 55% participants have given a high rating to the speakers/trainers for the training module 6
- More than 60% participants have given a high rating to the content and more than 65% participants have given a high rating to the speakers/trainers for the training module 7

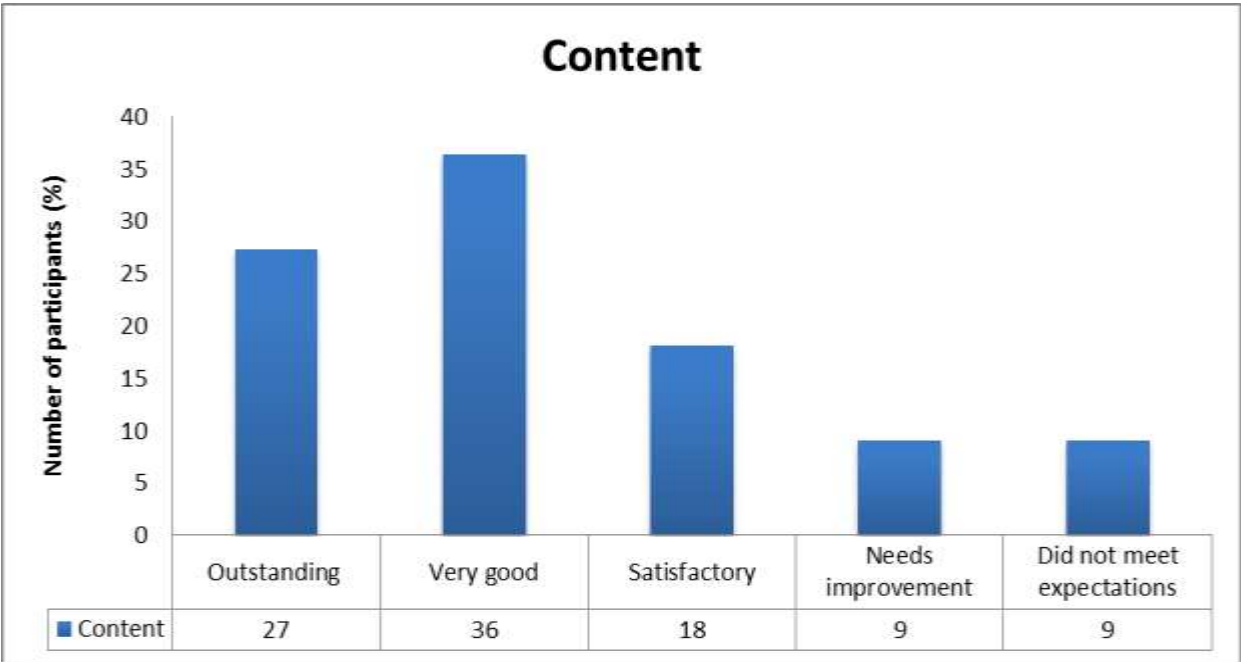
The feedback summary charts for the training sessions (7 modules) are presented below :

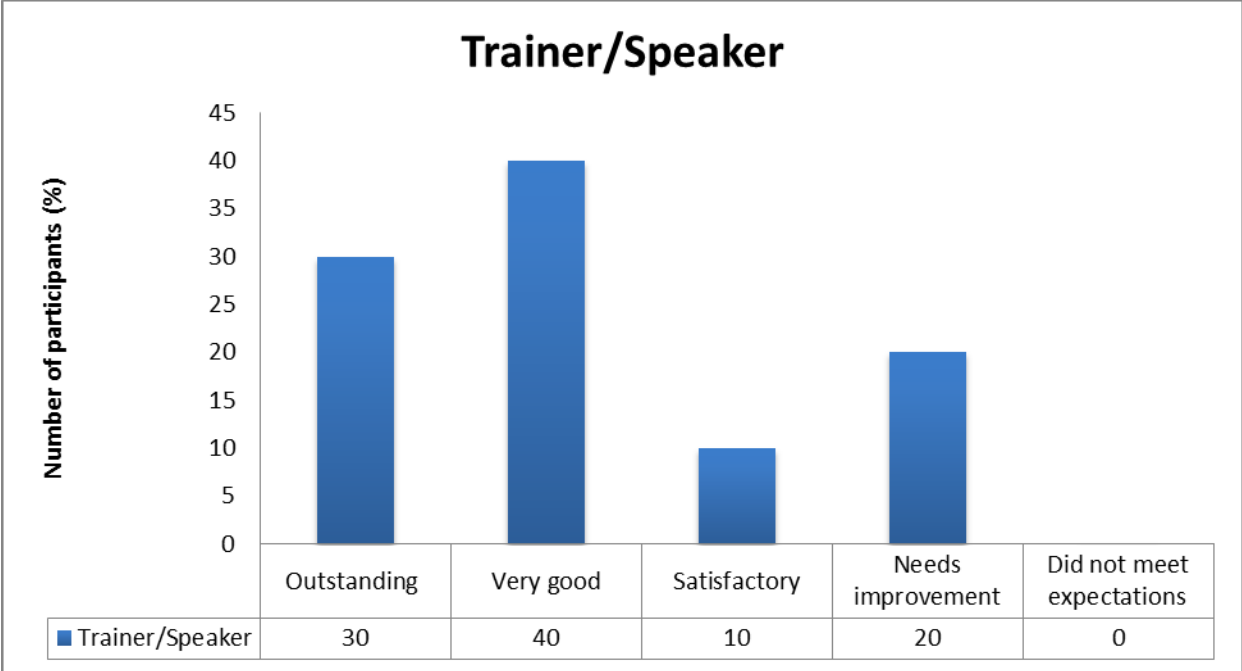
TECHNICAL MODULE-1



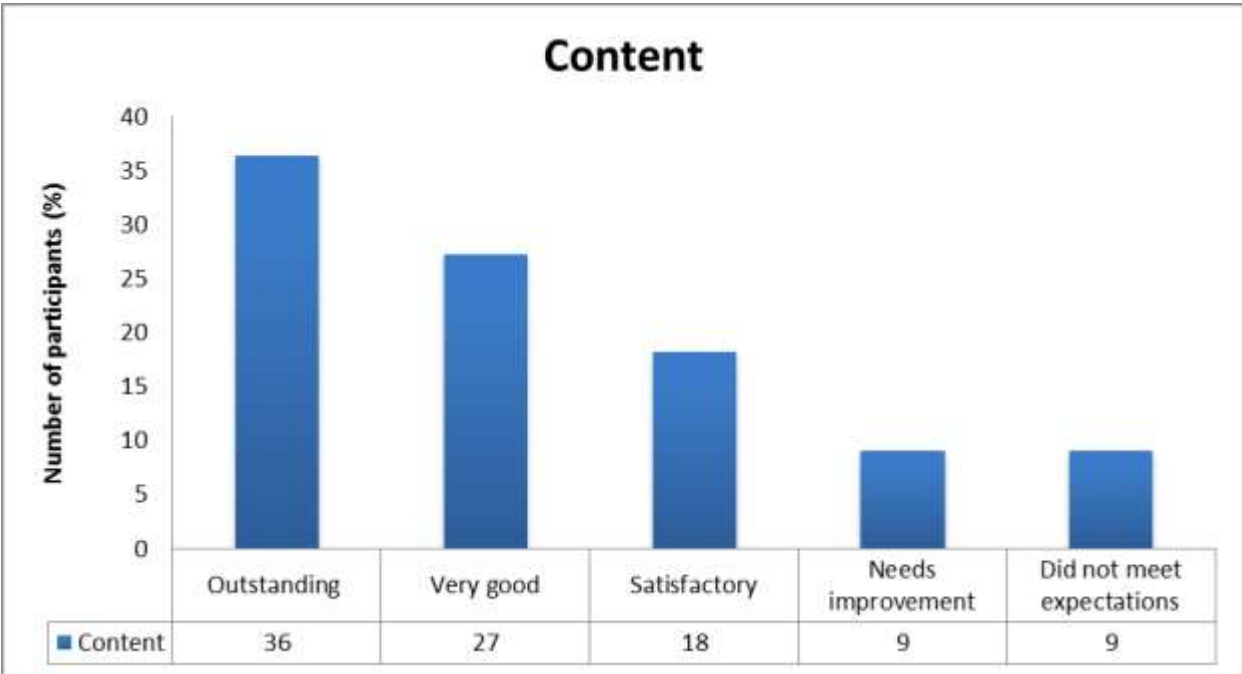


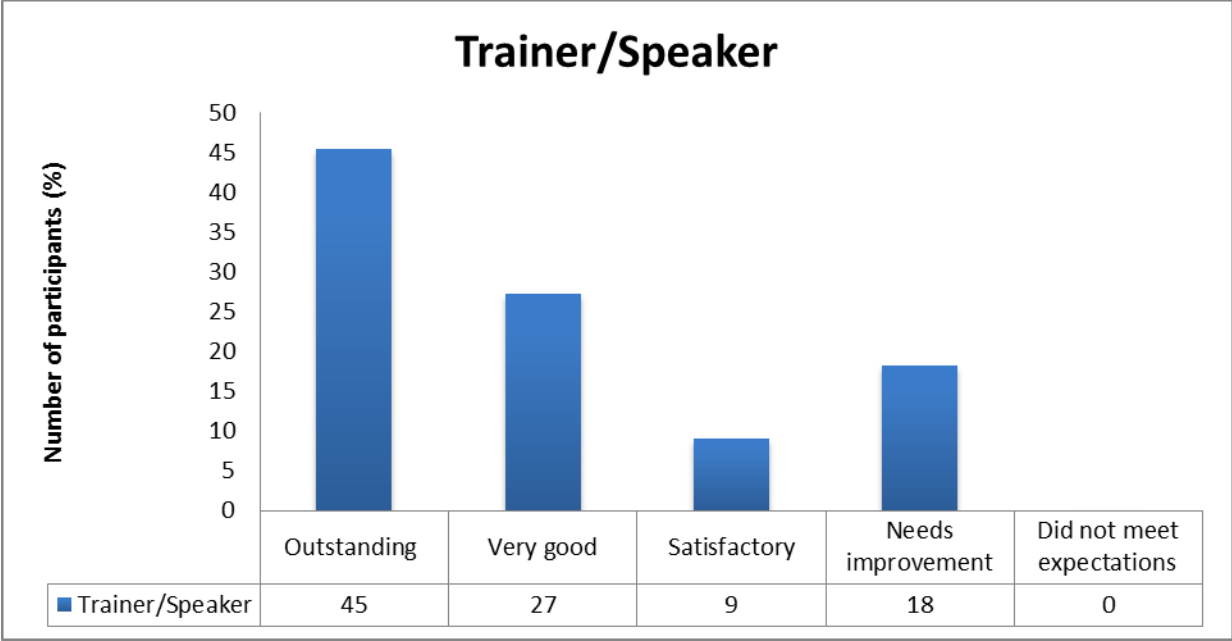
TECHNICAL SESSION-2



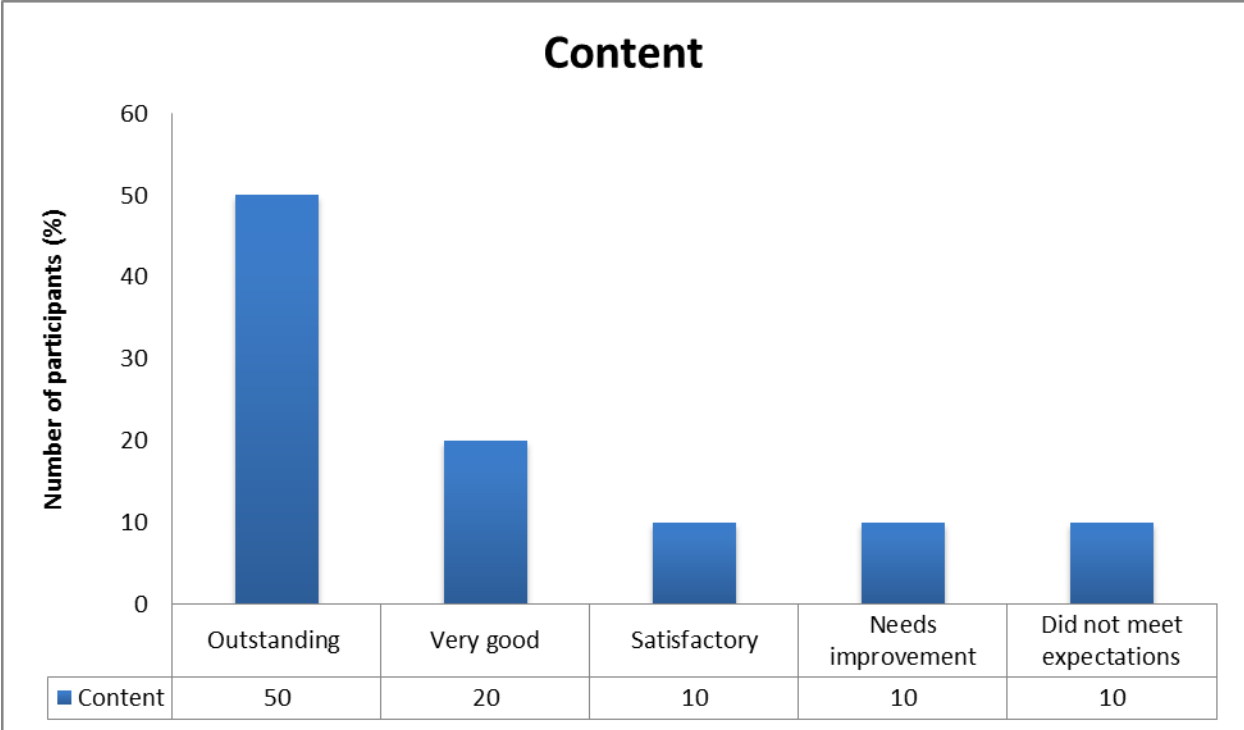


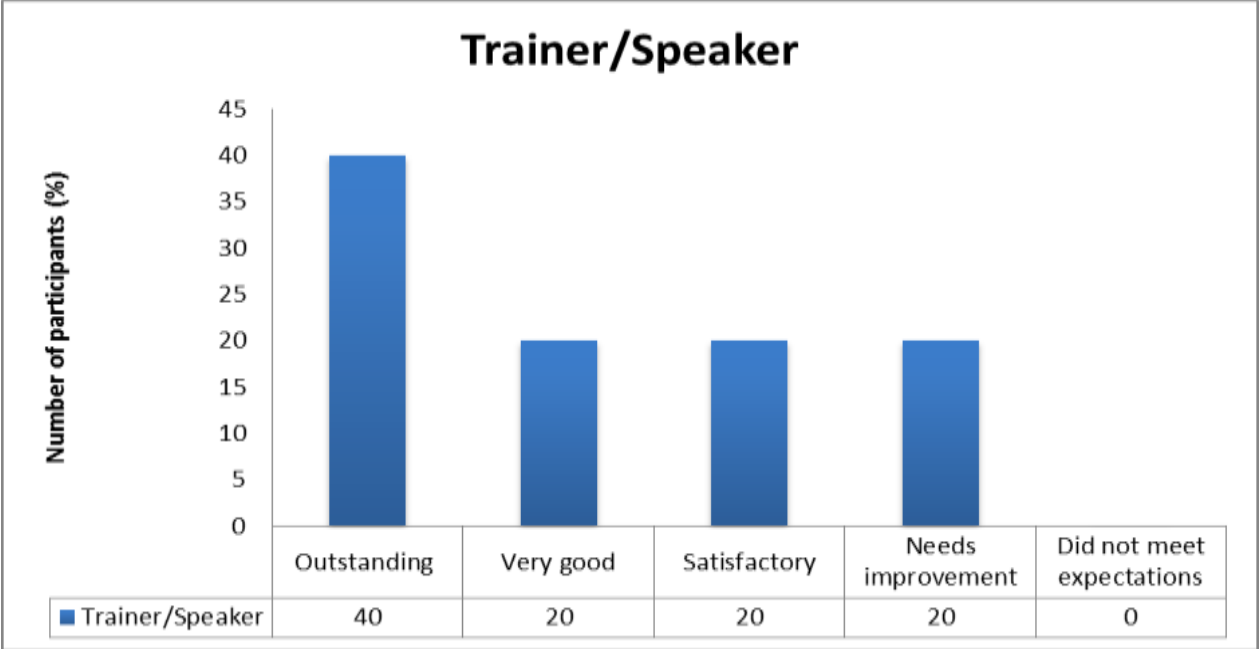
TECHNICAL SESSION-3



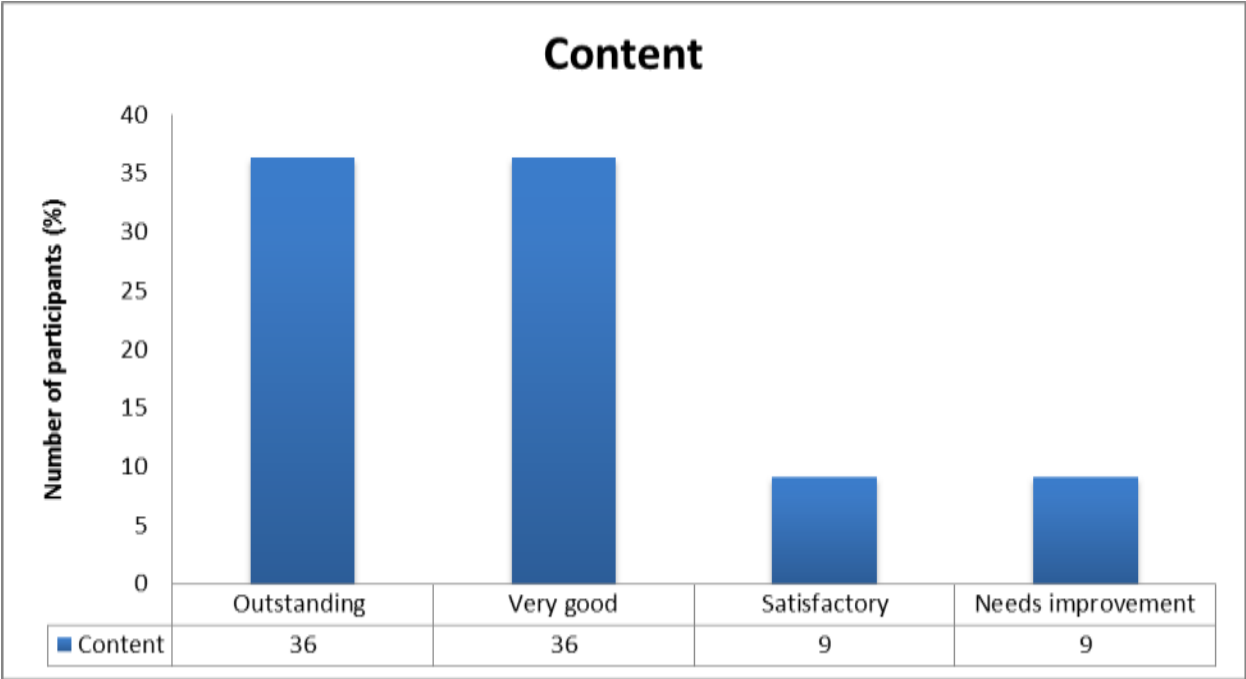


TECHNICAL SESSION-4



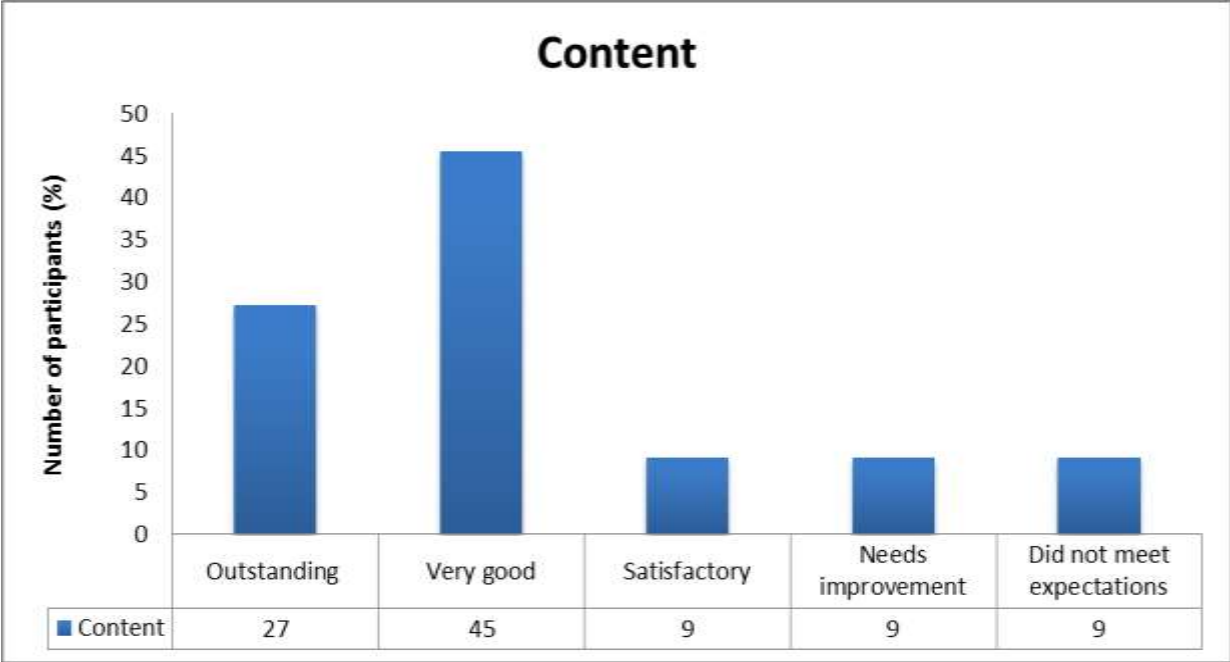


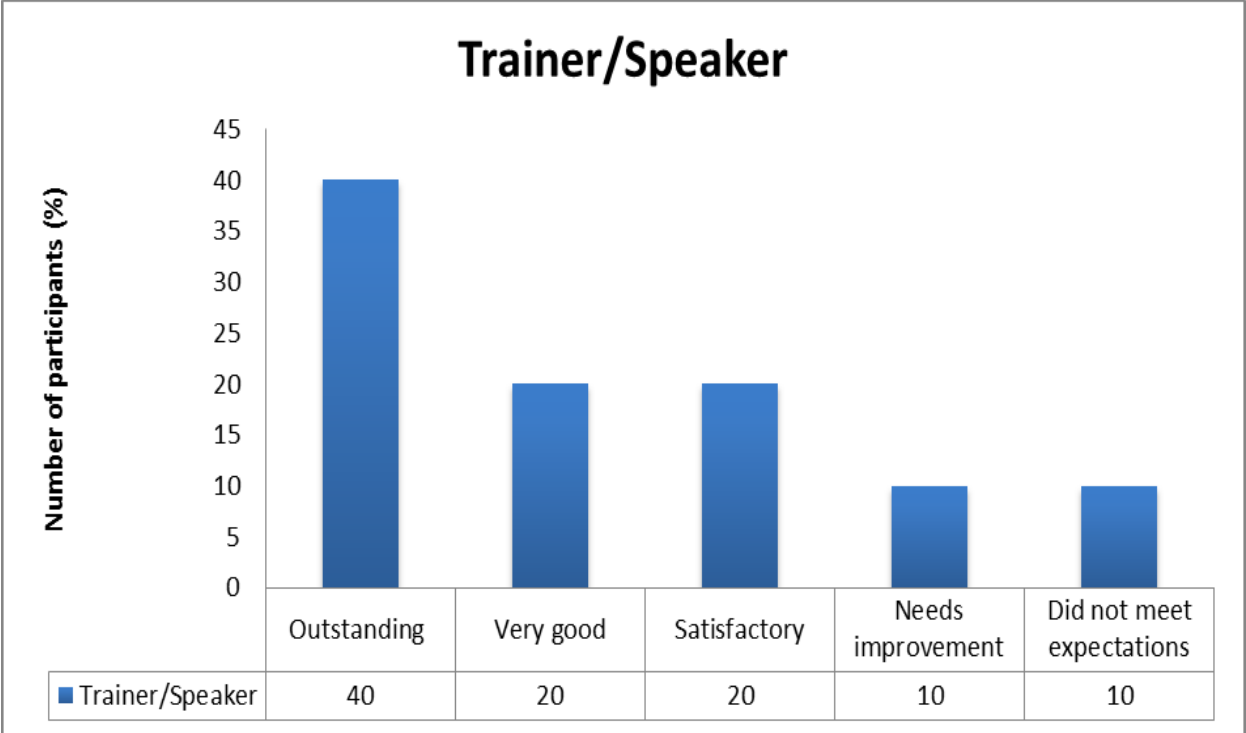
TECHNICAL SESSION-5



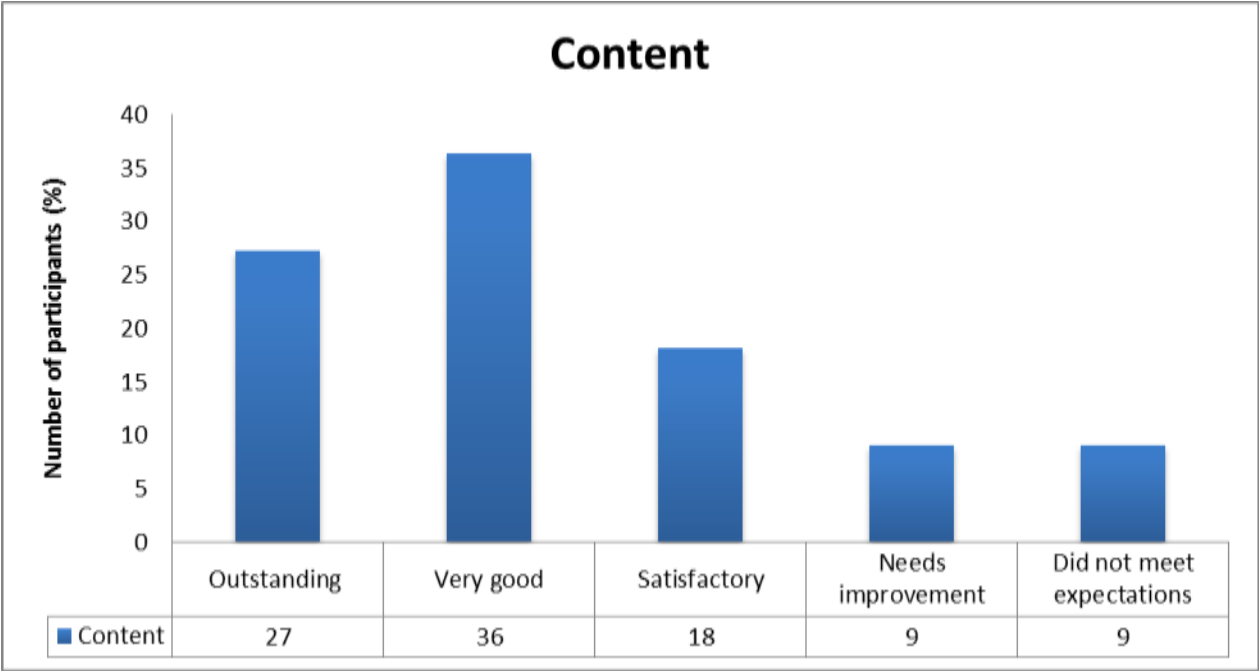


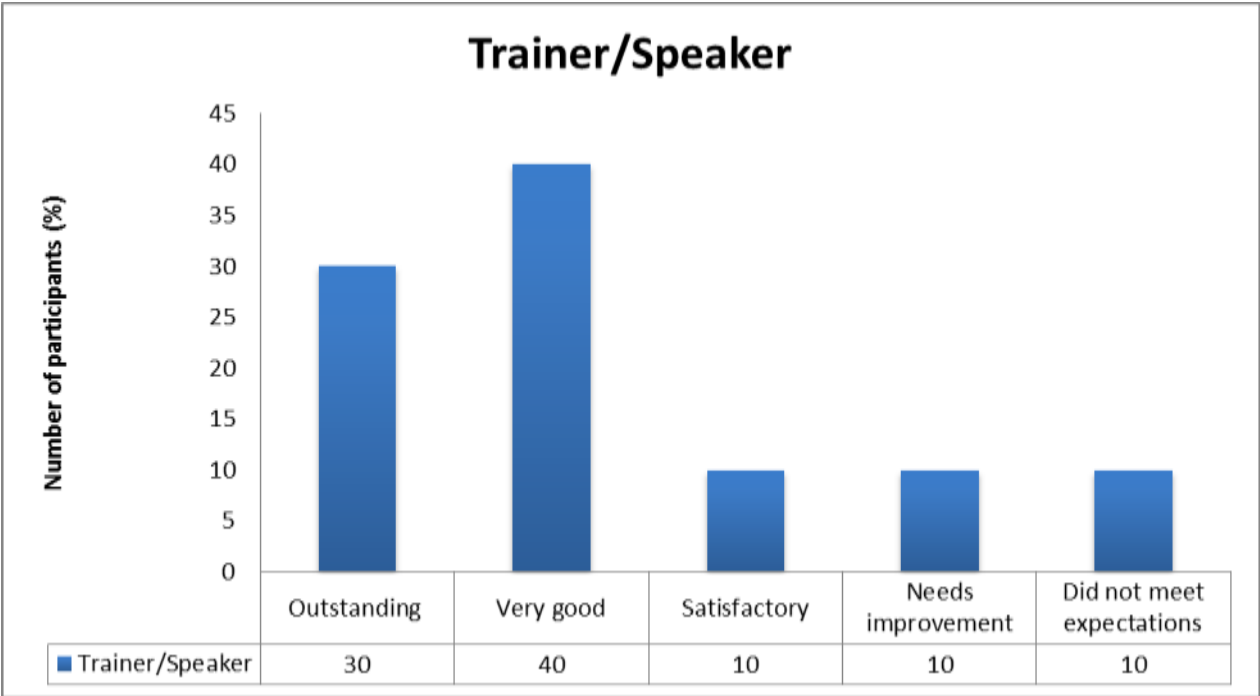
TECHNICAL SESSION-6





TECHNICAL SESSION-7





SHORT TERM IMPACT

The program would help in effectively planning ESCO-SME training on EPC construct & ESCO financing

Help in understanding the significance of energy efficiency across industries

The program would helped in building up on existing knowledge in the SME-financing space

MEDIUM TERM IMPACT

- This would help in implementing the PRGFEE scheme and Design / roll-out of similar work programs
- The program will help in participants keeping pace with the evolution of energy efficiency market
- The program will help to better redesign AEEE Programs

SUGGESTIONS: AREAS OF IMPROVEMENT IN ORGANIZATION OF TRAINING PROGRAMS

- Program duration: the program duration will be revisited considering the no of presentations and case studies to be included.
- More financial topics such as settling loans can be included
- Presentations can be shortened, more case studies can be included
- More on-board discussions, to get more insights on understanding and problems faced by ESCO's & FI's
- More participation from private equity player, FI's active in RE market can be included
- More financial topics such as loan sanctioning, getting proposals etc can be included

ANNEX – IIIA PARTICIPANTS FEEDBACK FORM



BUREAU OF ENERGY EFFICIENCY
(Ministry of Power, Government of India)



Training of Trainers under “Training Program For Scheduled Commercial Banks on Energy Efficiency Financing in India”

June 1-3, 2015

Venue: Isfahan Hall, Hotel Suba International, Plot 211, Chakala, Sahar Road,
Andheri East, Mumbai

Participants Feedback

Dear Participant,

We wish to thank you for your participation in the “Training of Trainers under “Training Program for Scheduled Commercial Banks on Energy Efficiency Financing in India” conducted by Bureau of Energy Efficiency with USAID/India’s PACE-D Technical Assistance (TA) Program. Your participation in this program is an important contribution for wide-scaling deployment of energy efficiency technologies.

The questions below are regarding this training program organized on June 1-3, 2015 at Mumbai. The information and comments on this form will be treated confidentially, but will be used to help plan and design future programs within the PACE-D TA Program. Should you consent, we would also like to contact you for conducting annual evaluation of effectiveness of PACE-D TA Training Programs covering a sample of participants. Thank you for your cooperation.

A. About You

| | | | | |
|---|-----------|---------------------------|----------|--|
| Name: | | Designation/Organization: | | |
| Would you like to be contacted under PACE-D TA Training Effectiveness Evaluation? | | Yes/No | | |
| If Yes, please share your | Mobile No | | Email id | |





B. Rating the Program by ticking the appropriate box.

5 outstanding, 4 very good, 3 satisfactory, 2 needs improvement, 1 did not meet expectations

| <i>Aspect</i> | 1 | 2 | 3 | 4 | 5 |
|--|----------|----------|----------|----------|----------|
| I. Program Rating | | | | | |
| Relevance to your organization's work area | | | | | |
| Relevance to your work within the organization | | | | | |
| Structure of the program | | | | | |
| Topics covered in the program | | | | | |
| Quality of class room interactions | | | | | |
| Quality of Training and Reading materials | | | | | |
| Appropriateness of Reading materials | | | | | |
| Quality of Speakers/Trainers | | | | | |
| | | | | | |
| II. Program Content and Faculty | | | | | |
| Module 1 | | | | | |
| <i>Content</i> | | | | | |
| <i>Trainer/Speaker</i> | | | | | |
| Module 2 | | | | | |
| <i>Content</i> | | | | | |
| <i>Trainer/Speaker</i> | | | | | |
| Module 3 | | | | | |
| <i>Content</i> | | | | | |
| <i>Trainer/Speaker</i> | | | | | |
| Module 4 | | | | | |
| <i>Content</i> | | | | | |
| <i>Trainer/Speaker</i> | | | | | |
| Module 5 | | | | | |
| <i>Content</i> | | | | | |
| <i>Trainer/Speaker</i> | | | | | |
| Module 6 | | | | | |
| <i>Content</i> | | | | | |
| <i>Trainer/Speaker</i> | | | | | |
| Module 7 | | | | | |
| <i>Content</i> | | | | | |
| <i>Trainer/Speaker</i> | | | | | |





BUREAU OF ENERGY EFFICIENCY
(Ministry of Power, Government of India)



C. Program Impact

| How will you benefit in the short to medium term from participation in this training program? | |
|---|--|
| Short-term | |
| Medium-term | |

D. Suggestions

| | |
|---|--|
| Areas of improvement in organization of training programs | |
| Suggestions for future training | |



ANNEX – IV QUIZ

Workshop for Training of Trainers under
'Training Program for Scheduled Commercial Banks on Energy Efficiency Financing in India'
June 1-3, 2015 | Mumbai



MODULE 1: MARKET OPPORTUNITY

Name: _____ Organization: _____

Time: 10 minutes

1. What is the most cost effective solution for enhancing energy security, reducing energy demand/supply gap and mitigating climate change impacts? *(circle/tick the right answer)*
 - a. Energy Efficiency
 - b. Energy Storage
 - c. Energy Conservation
 - d. Energy Supply
2. What mission of the National Action Plan for Climate Change focuses on energy efficiency? *(circle/tick the right answer)*
 - a. Mission to save Energy
 - b. National Solar Mission
 - c. National Mission for Enhanced Energy Efficiency (NMEEE)
 - d. National Mission on strategic knowledge for climate change
3. Which component of NMEEE requires capacity building of banks and financial institutions? *(circle/tick the right answer)*
 - a. Performance, Achieve and Trade (PAT)
 - b. Market Transformation for Energy Efficiency (MTEE)
 - c. Framework for Energy Efficient Economic Development (FEEED)
 - d. Energy Efficiency Financing Platform
4. What is the role of government in enhancing long term opportunity for financing energy efficiency projects? *((circle/tick the right answer)*
 - a. Provide incentives
 - b. Develop policies & programs
 - c. Stimulate market development
 - d. All of the above
5. What has been estimated from studies conducted by World Bank, CII-IREDA, National Productivity Council and Planning Commission? *(circle/tick the right answer)*
 - a. Energy conservation methods

- b. Energy Efficiency Market Potential
 - c. Energy Consumption data
 - d. None of the above
6. With a determined effort, which organization estimated the EE market potential to be 124 billion kWh?
(circle/tick the right answer)
- a. Finance Department
 - b. National Productivity Council
 - c. The Energy Research Institute
 - d. Planning Commission
7. What is the key barrier to energy efficiency? (choose one)
- a. End users
 - b. Equipment/ service providers
 - c. Financing institutions
 - d. All of the above
8. Fill in the blanks specifying how to manage risk in EE projects?
- Using proven _____ (Technologies)
- Project _____ (bundling)
- Customized _____ products (Financial)
- Rigorous project _____ (Appraisal)
- Innovative ways to _____ project assets (Collateralize)
- _____ security mechanisms (Payment)
- _____ contracts and agreements (standard)
- Formal third-party _____ (measurement and Verification)



MODULE 2: EE PROJECT CHARACTERISTICS

Name: _____ Organization: _____

Time: 10 minutes

- Street lighting and water pumping are key sub-sectors of which key energy efficiency sector?
 - Municipalities
 - Industries
 - Housing
 - All the above
- What are energy users' motivations?
 - 1 down: energy users _____ efficiency (Achieve)
 - 2 across: energy users _____ with regulations (Comply)
 - 4 down: energy users need _____ systems (Upgrade)
 - 4 across: energy users _____ living conditions (Improve)
 - 7 across: energy users _____ equipments (Replace)
 - 9 down: energy users _____ waste heat (Recover)

| | | | | | | | |
|----------------|---|----------------|----------------|---|---|---|----------------|
| ¹ A | | | ⁴ U | | | | |
| ² | O | M | | | | | ⁹ R |
| | | | G | | | | |
| ⁴ I | | | | O | | E | |
| | | | | | | | |
| E | | ⁷ R | E | | L | | E |

- What technical term is used to describe insulation of roof, walls, windows and doors? (*circle/tick the right answer*)
 - Building envelope
 - HVAC
 - Lighting insulation
 - Building cover.
- Energy efficiency projects are small in size- up to Rs. 1 crore in investments; what is the maximum payback period for these projects? (*circle/tick the right answer*)

- a. 7 years
 - b. 8 years
 - c. 10 years
 - d. 5 years**
5. What report prepared after a facility walk through and review of energy usage data is used as a project screening tool as it scopes savings and costs? *(circle/tick the right answer)*
- a. Energy survey report
 - b. Energy consumption report
 - c. Energy Efficiency Report (EER)**
 - d. Energy Savings report
6. Which report is prepared after the client accepts the Letter of Intent for an energy efficiency project? *(circle/tick the right answer)*
- a. Detailed Energy Study (DES)**
 - b. Energy Survey report
 - c. Energy compliance report
 - d. Energy Savings report
7. How many ESCOs are empanelled with BEE? *(circle/tick the right answer)*
- a. 100
 - b. 125**
 - c. 50
 - d. 200
8. What services are provided by ESCO? *(circle/tick the right answer)*
- a. energy analysis
 - b. financing
 - c. maintenance
 - d. all of the above**
9. Match the EE measures with sectors.

| | Measures | | Sectors |
|---|--------------------------|---|--------------|
| a | Variable Frequency Drive | 1 | Building |
| b | Street lighting | 2 | Industry |
| c | HVAC | 3 | Agriculture |
| d | Pumps | 4 | Municipality |

a-2; b-4; c-1; d-3



MODULE 3: IMPLEMENTATION BUSINESS MODELS

Name: _____ Organization: _____

Time: 10 minutes

- 1. What are the energy efficiency implementation models?
- 2 down: requires support from BEE certified professional (Audit)
- 4 down: Also called the outsourced energy management model (Energy Supply)
- 4 across: model in which host has a contract with ESCO and financial institution on savings (Guaranteed)
- 7 across: no investment made by host in this model (supply)
- 9 across: model based upon balance-sheet (Corporate)
- 9 down: model in which government or utility pays the ESCO (Demand)

| | | | | | | | | | |
|----------------|----------------|--|----------------|---|--|--|--|----------------|---|
| | | | ⁴ E | | | | | | |
| | | | | | | | | ⁹ D | |
| | ² A | | | | | | | E | |
| ⁴ G | | | | | | | | | D |
| | | | | | | | | | |
| | | | Y | | | | | | |
| | T | | ⁷ S | H | | | | | |
| | | | | | | | | | |
| ⁹ C | | | | | | | | E | |
| | | | | | | | | | |
| | | | Y | | | | | | |

- 2. What can be given to the auditor upon achievement of energy cost savings under the audit model? (circle/tick the right answer)
 - a. Survey fee
 - b. Service fee
 - c. Guaranteed Fee
 - d. Success fee

3. Who implements performance contracts? *(circle/tick the right answer)*
 - a. Financial Institution
 - b. Energy Services Company (ESCO)**
 - c. Technology Supplier
 - d. Host

4. What is the payment security mechanism under the shared service model? *(circle/tick the right answer)*
 - a. Escrow account**
 - b. Trust and Retention Account
 - c. Savings Account
 - d. Current Account

5. Under which model does the ESCO sell the output (e.g., steam, heating/cooling, lighting) to the host facility customer at an agreed price generally fixed over a long period of time? *(circle/tick the right answer)*
 - a. Guaranteed savings model
 - b. Outsourced energy management model**
 - c. Deemed Savings Model
 - d. Shared Savings Model



MODULE 4: TECHNICAL APPRAISAL

Name: _____ **Organization:** _____

Time: 10 minutes

1. Fill in the blanks to identify key components of the general framework of project appraisal.

| | | | | | | | | | | | | | |
|--|---|--|--|---|--|---|--|---|--|---|--|---|---|
| | R | | | O | | E | | | | | | | |
| | E | | | N | | C | | L | | | | | |
| | C | | | O | | I | | | | | | | |
| | I | | | N | | I | | L | | | | | |
| | E | | | L | | | | | | | | | |
| | N | | | R | | N | | E | | T | | L | |
| | S | | | | | | | | | | | | |
| | I | | | M | | T | | G | | T | | O | N |

- Promoter
- Technical
- Economic
- Financial
- Legal
- Environmental
- ESCO
- Risk mitigation

2. Which component of project appraisal should include an evaluation of products & technologies?

- a. Economic
- b. Technical**
- c. Financial
- d. All the above

3. Technical, financing, commissioning and performance are types of what?

- a. Benefit
- b. Safety
- c. Risks**
- d. Possibility

4. What approach works best for energy efficiency financing?

- a. Benchmark
- b. DSCR method
- c. Cash flow**
- d. All the above

5. What structure of payment obligation is performance based?

- a. Standard
- b. Continuous
- c. Partial
- d. Variable**

6. What methods should be used for measuring a performance based contract? (circle/tick the right answer)

- a. Measurement & verification procedures
- b. Changes to the “Baseline”
- c. Energy price risks
- d. All of the above**

7. Fill in the blanks on aspects covered during a technical appraisal.

_____ of the products and technologies **(Evaluation)**
 Assessment of _____ procedures **(Savings Calculation)**
 Consideration of _____ in the savings estimates and project implementation plan **(Risk and Uncertainties)**

8. Match the information source to contents.

| | Source | | Content |
|---|--------------------------------------|---|---|
| A | DPR or Investment Grade Audit Report | 1 | Supplier track record |
| B | Technology/Equipment | 2 | Ease of operating and maintaining the equipment |
| C | Operations and Maintenance | 3 | Procedure for measurement of savings |

A-3; B-1; C-2

9. Which risk is assessed and mitigated by confirming that a baseline has been established for M&V? (circle/tick the right answer)

- a. Technical
- b. Performance
- c. Financial
- d. Commissionin



MODULE 5: FINANCIAL APPRAISAL

Name: _____ **Organization:** _____

Time: 10 minutes

1. Fill in the blanks to identify key ratios considered during financial appraisal.

| | | | | | | | | | | | | | | | |
|--|--|--|---|--|---|--|--|---|---|--|--|---|---|---|---|
| | | | R | | N | | | | | | | | | | |
| | | | T | | R | | | U | R | | | V | | R | |
| | | | E | | T | | | | | | | | | | |
| | | | T | | E | | | I | C | | | | | | |
| | | | E | | E | | | C | O | | | R | | G | E |
| | | | U | | N | | | E | Q | | | | T | | |

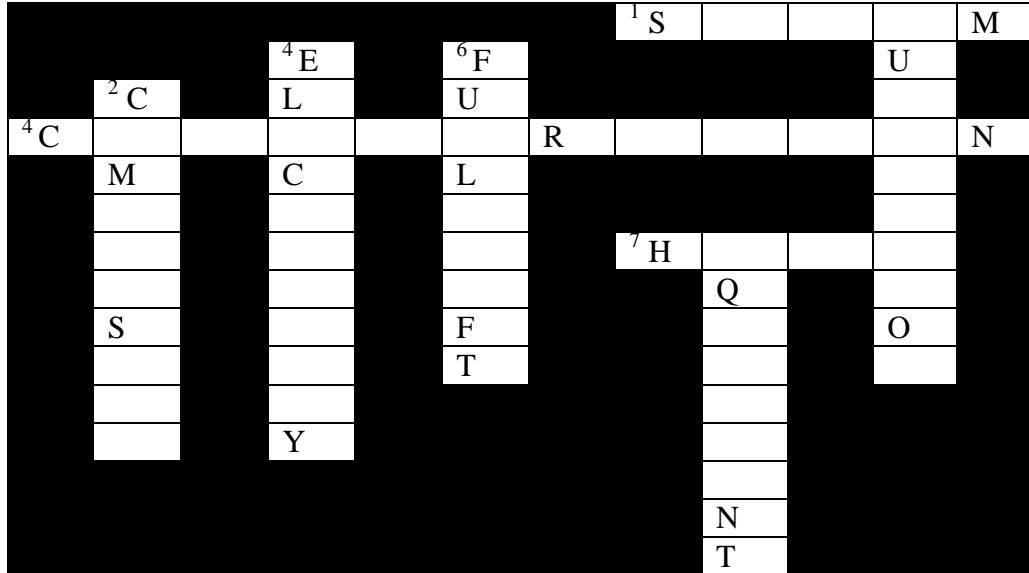
- Current Debtors Turnover
- Inventory Debt Service
- Interest Coverage
- Return on equity

2. Features of energy efficiency projects?

- 1 across: In this project, what is recovered from condensate/flash and distributed? (steam)
- 2 down: In this project, a change from reciprocating to screw or centrifugal chiller is made. (Compressor)
- 4 across: In this project, higher the % of back pressure steam; lower is the pay back (Cogeneration)
- 4 down: In this project, what is distributed after power factor improvement or transformer loss reduction (Electricity)
- 6 down: In this project, there is a change of energy source (Fuel shift)
- 7 across: In this project, which waste is recovered from boilers and gensets? (heat)

9 down: Constituting 60-65% of the cost, what can be considered collateral in an energy efficiency project? **(equipment)**

11 down: In this project, a VFD or an O2 analyser in boiler is analyzed **(Automation)**



3. On what is the finance security is mainly dependent upon for energy efficiency projects? *(circle/tick the right answer)*
 - a. **end-user credit**
 - b. equipment asset value
 - c. measurement & verification
 - d. technology

4. In case of shared savings model, cost savings are shared between whom? *(circle/tick the right answer)*
 - a. **ESCO and host**
 - b. ESCO and bank
 - c. Host and bank
 - d. All of the above

5. What considers a project in best and worst case scenario while conducting a feasibility assessment? *(circle/tick the right answer)*
 - a. IRR analysis
 - b. **Sensitivity analysis**
 - c. NPV analysis
 - d. DSCR analysis

6. Which of these is a loan security consideration when borrower is end user? *(circle/tick the right answer)*
 - a. Equipment features
 - b. Recourse to ESCO
 - c. **Vendor Recourse**
 - d. None of the above



**MODULE 6: INTERNATIONAL BEST PRACTICES AND CASE STUDIES
AND
MODULE 7: M&V**

Name:_____ **Organization:**_____

Time: 10 minutes

1. M&V methodologies

1 down: In this method, utility bills before and after are compared to estimate savings **(Bill data)**

3 across: This method is used for complex systems where energy use is influenced by a range of factors. **(Modelling)**

3 down: In this method, actual energy consumption before and after installation of the equipment is collected through a recording device **(Metering)**

5 across: In this method, participants agree to unit energy savings from new equipment **(Deemed Savings)**

| | | | | | | | | | | | | | |
|----------------|---|----------------|--|--|--|---|--|---|--|--|--|--|--|
| ¹ B | | | | | | | | | | | | | |
| | | ³ M | | | | L | | | | | | | |
| | | | | | | | | | | | | | |
| | E | | | | | | | V | | | | | |
| | | R | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

2. Which organization manages International Performance Measurement and Verification Protocol (IPMVP)? *(circle/tick the right answer)*

- a. EPA
- b. EVO**
- c. UNFCCC
- d. All the above

3. Which M&V approach of IPMVP treats the entire building as a computer model? *(circle/tick the right answer)*

- a. Partial facility model
 - b. Section Model
 - c. Option D under Whole Facility Method
 - d. None of the above
4. Which M&V approach is used where the “potential to perform” needs to be verified but accurate savings estimation is not necessary? (circle/tick the right answer)
- a. Option B Periodic or continuous measurements
 - b. Whole Building or facility
 - c. Option A under Retrofit Isolation Method
 - d. Computer simulation of building process
5. Fill in the blanks with types errors required to evaluate saving uncertainty

| | | | | | | | | | | | | | |
|--|--|---|---|---|---|---|--|---|---|---|--|---|---|
| | | | R | U | M | | | T | A | T | | O | N |
| | | | | | | | | | | | | | |
| | | D | E | | | N | | | | | | | |
| | | | | | | | | | | | | | |
| | | M | P | | | | | G | | | | | |

Instrumentation

Modelling

Sampling

6. Why is measurement and verification conducted in energy efficiency projects? (circle/tick the right answer)
- a. Confirm energy savings
 - b. Provide risk measurement tool
 - c. Improves communication amongst implementing partners
 - d. All of the above
7. What percentage of project costs may be earmarked for measurement & verification? (circle/tick the right answer)
- a. 1-2%
 - b. 5-10%
 - c. 15-20%
 - d. 50-55%
8. Where are details of measurement and verification specified? (circle/tick the right answer)
- a. Loan Agreement
 - b. Energy Services Performance Contract
 - c. Equipment Purchase Agreement
 - d. Detailed Project Report
9. Which of these is not a measurement & verification parameter? (circle/tick the right answer)
- a. Utility bills
 - b. Cost Savings
 - c. Project Cost
 - d. Energy Meter Calibration

ANNEX – V PICTURES



ANNEX – VI PRESENTATIONS

All presentations are available at USAID PACE-D TA Program website:

<http://www.pace-d.com/wp-content/uploads/2015/07/All-Presentations-of-Mumbai.pdf>

U.S. Agency for International Development

1300 Pennsylvania Avenue, NW

Washington, DC 20523

Tel: (202) 712-0000

Fax: (202) 216-3524

www.usaid.gov