

Training Workshop for ESCOs on Energy Efficiency (EE) Financing in India

















1. ABBREVIATIONS

SL. No	Abbreviation	Extended Form
1.	BEE	Bureau of Energy Efficiency
2.	СС	Climate Change
3.	DPR	Detailed Project Report
4.	EE	Energy Efficiency
5.	EEFP	Energy Efficiency Financing Platform
6.	ESCO	Energy Service Company
7.	ESPC	Energy Savings Performance Contract
8.	EU	European Union
9.	FI	Financial Institution
10.	GHG	Green House Gases
11.	Gol	Government of India
12.	IFC	International Finance Corporation
13.	IREDA	Indian Renewable Energy Development Agency
14.	IRR	Internal Rate of Return
15.	M&V	Measurement and Verification
16.	KREDL	Karnataka Renewable Energy Development Limited
17.	NBFC	Non-Banking Financial Corporation
18.	NDC	Nationally Determined Contribution
19.	PRGFEE	Partial Risk Guarantee Fund for Energy Efficiency
20.	RE	Renewable Energy
21.	SDA	State Designated Agency
22.	SIDBI	Small Industries Development Bank of India
23.	SME	Small and Medium Enterprises
24.	ТоТ	Training of Trainers
25.	VCFEE	Venture Capital Fund for Energy Efficiency
26.	WBG	World Bank Group





OVERVIEW

Energy Efficiency (EE) has emerged as one of the major resources, a viable and the most cost effective solution to meet escalating energy demand in India. EE measures helps in meeting the energy demand without further addition of generation capacities but instead exploring opportunities of doing demand side management. EE measures have three-fold benefits – they are cost-effective, increase energy security and mitigate greenhouse gas emissions.

In India, the Industries (Large and Small and Medium Enterprises (SMEs)), the Buildings (Commercial and Government) and the Municipalities consume around 50% of the total electricity consumption. There exists substantial energy saving potential in these sectors by adopting EE technologies. The Bureau of Energy Efficiency (BEE) estimates that more than INR 1,50,000 crores investment potential exists in EE implementation out of which INR 56000 crore of investment potential exists with the Industries, Buildings and Municipality sectors alone.

A significant EE potential is left untapped in India and ESCOs are the main vehicle to harness this potential, however the ESCO market is yet to take up. After consultation with various stakeholders, it has been identified that the ESCOs face many barriers like financing, Measurement & Verification (M&V) issues and contract disputes etc. In order to address these barriers, BEE has been taking various initiatives and had launched training programs for commercial banks under its Energy Efficiency Financing Platform (EEFP) in June 2015 (to address the supply side barriers of EE financing).

After taking many initiatives on supply side of EE financing, BEE with technical support from IFC is organizing out capacity building workshops for ESCOs on EE financing (demand side of EE financing) across 5 locations in India.





3. Training Workshop In Bangalore

BEE in collaboration with the Karnataka Renewable Energy Development Limited (KREDL) organized "Training Workshop for ESCOs on EE Financing" on 20 and 21 December, 2018 in Bangalore. IFC extended the technical support to the workshops, as part of IFC's Eco-Cities program in India, supported by the European Union (EU).

The two-day training workshop provided a broader perspective of the ESCO market dynamics, its assessment process, upcoming areas of the Energy Efficiency sector, Measurement and Verification (M&V) protocols, the recent initiatives of BEE and other organizations to support EE and technical and financial appraisal of an EE project.

In order to provide practical exposure to participants regarding EE projects executed through ESCO, visit to Infosys, Bangalore Campus was undertaken to showcase EE interventions .The workshop also included quiz, assessments and activity sessions for the participants to assess their knowledge of the subject. The following modules were covered as part of the workshop –

- Module 1: Introduction to ESCO Market
- Module 2: ESCO Assessment Process and ESCO Case Studies
- Module 3: Emerging areas in EE and M&V protocols
- Module 4: Introduction to EE financing
- Module 5: EE financing scheme BEE initiatives
- Module 6: EE financing scheme Other initiatives
- Module 7: EE Project- Technical Appraisal
- Module 8: EE Project- Financial Appraisal

The workshop conducted in Bangalore was attended by around 60 participants from different ESCOs, Energy Auditing companies, Accredited Energy Auditors, Certified Energy Auditors and professionals who wish to start their own companies to undertake EE interventions.

The workshop in Bangalore was third of the five workshops BEE intends to conduct for capacity building of the energy sector professionals especially ESCOs. BEE had conducted first workshop in New Delhi, the second one in Mumbai, third one in Bangalore and will conduct two more similar workshops in different cities across India over the course of next few months.





4. Bangalore – Workshop Proceedings







4.1. INAUGURAL SESSION

The workshop was inaugurated by Mr. Arijit Sengupta, Director, BEE; in the presence of Mr. A. B. Basavaraju, Managing Director, KREDL; Mr. Srinivasappa, General Manager, KREDL and Mr. Hari Govindarajan, Consultant, International Finance Corporation.







Mr. Arijit Sengupta, Director Bureau of Energy Efficiency



Mr. Arijit Sengupta, Director, BEE welcomed the distinguished guests, eminent speakers, ESCOs, Energy Auditing firms, Energy Auditors and other stakeholders to the workshop. He shared that there is significant energy efficiency potential in India which is yet to be tapped and ESCOs are the main vehicle to harness this huge potential. He shared various initiatives of BEE for promoting ESCO market in India and he also briefed the participants about various EE financing schemes available in India. He shared Global ESCO market scenario and key lessons which can be utilized for promoting ESCO market in India. He requested energy auditing companies to get empaneled with BEE and shared the benefits of empanelment.

He shared the details of the workshop and requested the participants to take this opportunity to enhance their knowledge on EE financing.

Mr. Hari Govindarajan, Consultant, International Finance Corporation (IFC)



Mr. Hari shared insights on WBG investments in Climate Change initiatives and their future plan. He cited example of some of the successful ESCO model globally, especially how China ESCO market has been successfully harnessing EE potential in China. He also stressed on the fact that, such global success can also be replicated in India as well and hoped that the workshop will help them have better understanding and prepare them better for their business as well as for their financing requirement. Mr. Hari discussed about the Eco-Cities program which is being implemented in partnership with European Union (EU) and narrated various initiatives taken by IFC on EE financing.

Mr. A. B. Basavaraju, Managing Director, Karnataka Renewable Energy Development Limited (KREDL)



Mr. A. B. Basavaraju, Managing Director, Karnataka Renewable Energy Development Limited (KREDL) thanked BEE and International Finance Corporation for conducting the workshop in Bangalore. He appreciated participants from ESCOs, Accredited and Certified Energy Auditors and Energy Efficiency professionals for taking out their valuable time for the workshop. He shared various initiatives taken by KREDL for promoting ESCO market in the state. He assured that KREDL would provide all possible help to ESCOs and professionals in EE sector in developing ESCO market in the state.





Sri Srinivasappa, General Manager, KREDL

Mr. Srinivasappa General Manager (Tech Incharge), KREDL acknowledged the valuable information shared by all the dignitaries. He also praised the efforts of BEE and IFC in developing the ESCO market. He thanked the dignitaries for the highly useful insights on ESCO market. He appreciated participants from ESCOs, Accredited and Certified Energy Auditors and Energy Efficiency professionals for taking out their valuable time for the workshop.







4.2. TECHNICAL SESSION

Day 1:

Module 1: Introduction to ESCO Market: National and International Experience

By - Mr. Arijit Sengupta, Director, BEE



The first module "Introduction to ESCO Market: National and International Experience" presented by Mr. Arijit Sengupta, Director, BEE. He stressed on the importance of ESCOs in harnessing the EE potential and how EE initiatives will play a significant role in achieving the NDC goals set by India. Further, he discussed in detail on how ESCO model is working successfully in other countries e.g US, China, South Korea and shared types of projects being implemented in those markets. He also discussed in detail the key lessons (on ESCO market promotion) from these countries. Mr. Sengupta also highlighted different policy initiatives by BEE and initiatives under Framework for Energy Efficiency Economic

Development (FEEED) for promoting ESCO market in India.

Module 2: ESCO Assessment Process and ESCO Case Studies

By - Mr. Gowtham Sivabalan, Associate Director, Frost & Sullivan



Mr. Sivabalan initiated the discussion with the audience on benefits of ESCOs getting empanelled with BEE. As part of his presentation, he appraised on the ESCO empanelment process and frameworks that are getting used for the empanelment which will help aspiring ESCOs to get the empanelment.

He also highlighted on the different criteria that the rating agencies apply which assessing ESCOs and grading them.





Module 3: Emerging areas in EE and M&V protocols

By – Mr. Bali Singh, CEO, Namdhari Eco Energy

The technical session on "Emerging areas in EE and M&V protocols" was presented by Mr. Bali Singh, CEO, Namdhari Eco Energy. Mr. Singh started the session by providing insights on various market opportunities for ESCOs in sectors like Large industries, MSMEs and Buildings. He discussed in detail few successful ESCO case studies.

Mr. Singh further shared details on M&V protocols for ESCO projects and highlighted the importance of M&V. He highlighted different aspects of M&V like key M&V activities pre and post installation phase, setting baseline, M&V methodologies etc. He concluded the session by sharing details on M&V plan and associated risks (financial, operation & performance).



Outsourced Energy Model

By - Dr. R Sethumadhavan, Sr. Director, GSG India Pvt. Ltd



Dr. Sethumadhavan introduced his company GSH India Pvt Ltd to the audience and highlighted on the type of work they do in the space of energy efficiency. He shared his experiences on the unique "Outsourced Energy Model". He highlighted how the company has evolved the concept of Energy (Steam as well Heat) supply service through ESCO contracting. This concept articulates that "end - to - end responsibility of steam generation will be taken care solely by ESCO and for the same the client shall pay a pre agreed unit cost against their actual consumption". He highlighted several benefits that clients can achieve through the model both from a technical and commercial side. He also highlighted that how usage of biomass residues like turmeric waste, saw dust etc. will also help the clients in reducing the GHG footprint.





Visit to EE projects implemented by Infosys, Bangalore

During the visit, Infosys show cased various initiatives taken in energy efficiency, renewable energy, water and waste front. The participants actively interacted with Infosys team to understand the technical and financial aspects of various initiatives. Infosys team also shared their goal to make their company carbon neutral one. The participants visited Central chilling plant, DG set area and Solar power plant to understand the technical aspects and financial benefits.







Day 2:

4.2. TECHNICAL SESSION (CONTINUED)

Module 4: Introduction to EE Financing

By - Mr. Joseph Prakash, Associate Director, Meghraj Capital Advisors Private Limited



The technical session on "Introduction to EE Financing" was presented by Mr. Joseph Prakash, Associate Director, Meghraj Capital Advisors Private Limited. He started the session highlighting different global instruments for ESCO financing. He discussed in detail on various Loan instruments such as Soft loans, infrastructure funds, leasing, EE funds, Risk Sharing funds etc., Bond instruments such as Green Bonds and Secondary market Bonds and also Maintenance instruments like Energy Service Agreements, On-bill financing, Property Assessed Clean Energy Financing (PACE) etc. He also provided details of various EE financing options for Indian ESCO market in terms of its

availability and maturity level.

Module 5: EE financing schemes – BEE's initiatives

By - Mr. Amresh Ray, Project Engineer, BEE

The technical session on "EE financing schemes -BEE's initiatives" was presented by Mr. Amresh Ray, Project Engineer, BEE. He discussed in detail about the Partial Risk Guarantee Fund for Energy Efficiency (PRGFEE) highlighting its objectives. benefits. application process, eligibility criteria, guarantee claim etc. Further, he explained the fund features viz. the institutional structure of the fund (lenders, implementing agency, verifier and borrower), and projects/sectors which are eligible to apply for risk fund. He also elaborated on the size and feature of EE loans that can be guaranteed by PRGFEE and discussed on technical



& financial evaluation process of PRGFEE. The session was quite interactive as he replied to various queries of the participants on PRGFEE and also requested ESCOs to utilize PRGFEE scheme.





Module 6: EE financing - Other initiatives

By - Mr. K V Kiran Kumar, Senior Technical Expert, SIDBI



The technical session on "EE Financing – Other Initiatives" was presented by Mr. K V Kiran Kumar. He discussed about Partial Risk Sharing Facility (PRSF) scheme for EE projects wherein he shared the objective of PRSF, its components, risk coverage offered under PRSF. He detailed out the Institutional Framework of PRSF highlighting roles of Project Execution Agency (PEA), Participating Financial Institutions (PFIs), ESCOs and the host. He also provided details of minimum eligibility criteria of projects, Guarantee Fee structure & tenure under PRSF. He concluded the session by sharing two successful case studies of ESCO projects implemented under PRSF.

New initiatives of IFC and BEE for ESCO market development

By - Mr. Hari Govindarajan, Consultant, International Finance Corporation



Mr. Hari Govindarajan, IFC, enlightened the participants by highlighting the importance of Climate Change- the opportunities and the associated climate risks which are becoming more apparent. He discussed on various programs/ activities carried out by IFC on energy efficiency. He informed the participants about their collaboration with BEE for improving the accessibility to EE finance, creating the necessary awareness and training of FIs, providing technical assistance to FIs for supporting EE projects like developing EE financing toolkit. He mentioned that India has great potential as almost 22% of total GHG emission reduction opportunities exist in India. He explained in detail IFC initiatives for promoting ESCO market in India.





Module 7: Technical Appraisal of EE Projects

By – Mr. Sunil Agrawal, Vice President, Tata Cleantech Capital Ltd.



Mr. Sunil Agrawal, VP, Tata Cleantech Capital Ltd presented the module on "Technical Appraisal of EE projects". He started the session depicting the general framework for project appraisal and discussed a case study on technical appraisal for energy efficiency in building. Further, he highlighted some key aspects of a technical appraisal covering technology evaluation, energy saving estimate, and implementation plan. He discussed in detail about the various documents/ information sources like DPR, Investment Grade Audit Report (IGAR), Technology/Equipment specifications, and Operations and Maintenance manuals, which should be referred for carrying out technical appraisal. He highlighted that the technical appraisal of EE projects should include a detailed evaluation of the products and technologies, assessment of energy savings calculation and consideration of

risks and uncertainties and project implementation plan. He reiterated that it was important to comply with legal and environmental regulations. He explained in detail about different types of risks at different project phase and corresponding mitigation measures with a relevant case study. In a thoroughly interactive session, he mentioned the challenges and ways of addressing it during technical appraisal of EE projects.

Module 8: Financial Appraisal of EE Projects

By - Mr. Sunil Agrawal, Vice President, Tata Cleantech Capital Ltd.

An interactive session on "Financial Appraisal of EE projects" was presented by Mr. Sunil Agrawal.He started the session by explaining the key elements in financial appraisal like project costs, financial parameters, financial structure, ESPC etc. and also shared about the investment opportunities in EE sector. He highlighted to the ESCOs that comprehensive review of various agreements such as ESPC are carried out by the bankers while appraising projects and various financials risks and the mitigation measures that bankers undertake. He also shared the different types of loans (technology based and project based) available for EE projects. He also provided an overview of the loan security conditions of EE projects. He further shared insights on the typical challenges that bankers face during financial appraisal of ESCO projects. The session was quite interactive and he answered queries asked by the participants. Mr. Agrawal concluded the session by highlighting the details ESCOs should ensure while applying for financing of their projects.





Energy Efficiency initiatives by Discom

By - Ms. G Sheela, DGM (DSM), BESCOM



Ms. G Sheela as part of her presentation highlighted the demand side management activities conducted by BESCOM. She mentioned about BELP (BESCOM Efficient Lighting Program). The program was run as a pilot in India through funding from USAID. She mentioned that through the program, a reduction in residential demand to an extent of 10.46MW and formulation of Bachat Lamp Yojana in the country were achieved. She also shared details on energy efficient pump projects under Agricultural demand side management, solar water heater and roof top solar projects where BESCOM has been actively involved. She also highlighted on different awareness programs ran by BESCOM to promote energy efficiency.

ESCO Case Studies

By - Mr. I. Thanumoorthi, Sr. Principal consultant, Enzen Global Solutions Pvt Ltd



Mr. Thnaumoorthi as part of his presentation highlighted about different energy efficiency services undertaken by the company. He also shared some case studies on different EE projects implemented on ESCO model and how the same benefitted clients.

He specifically focused on how energy efficient motors could be used in Demand side management like in buildings or in agricultural practices.





4.3 QUIZ

All the participants actively participated in the quiz round. The quiz questionnaires covered the learning on overall session and modules presented during the workshop. All the participants performed well in the quiz. The quiz results were announced at the end of the workshop and the top performers were honored with prizes.







4.4 CONCLUDING SESSION

Distribution of Certificates

The workshop concluded with Certificate distribution to all the participants.

Vote of Thanks

Mr. Amresh, BEE, thanked the participants for sparing their time to be part of the workshop, and speakers for taking the time to share their experiences with the participants.





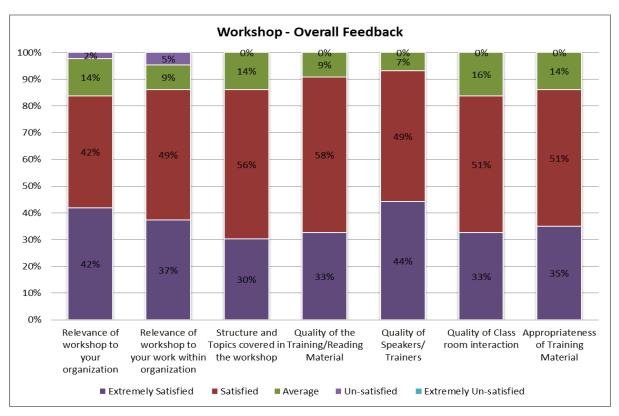
ANNEX A - BANGALORE WORKSHOP - FEEDBACK EVALUATION

The workshop in Bangalore was attended by 59 participants from different ESCOs, Energy Auditing Companies, EE consultants, DISCOMS etc.

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

- ⇒ 84% of the participants rated the program high¹ on "Relevance of workshop to the organization"
- ⇒ 86% of the participants rated the program high on "Relevance of workshop to their work within the organization"
- ⇒ 86% of the participants rated the program high on "Structure of topics covered in the workshop"
- ⇒ 91% of the participants rated the program high on "Quality of training and reading materials"
- ⇒ 93% of the participants rated the program high on "Quality of Speakers/Trainers"
- ⇒ 84% of the participants rated the program high on "Quality of classroom interaction"
- ⇒ 86% of the participants rated the program high on "Appropriateness of training material"

A summary chart of the above parameters are presented below

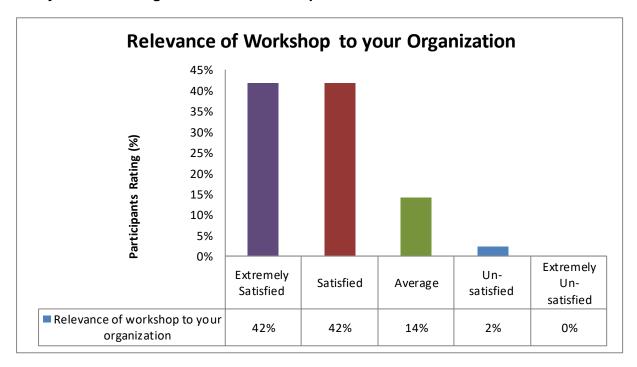


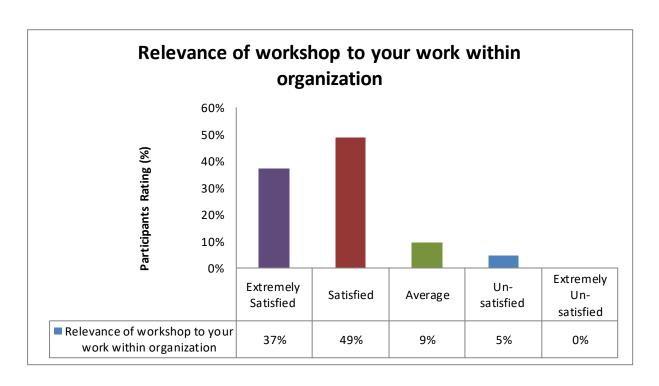
¹ Either "extremely satisfied" or "satisfied"





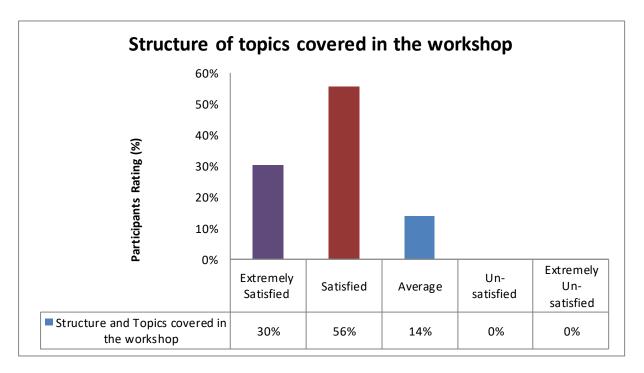
Analysis of the Bangalore ESCO Workshop

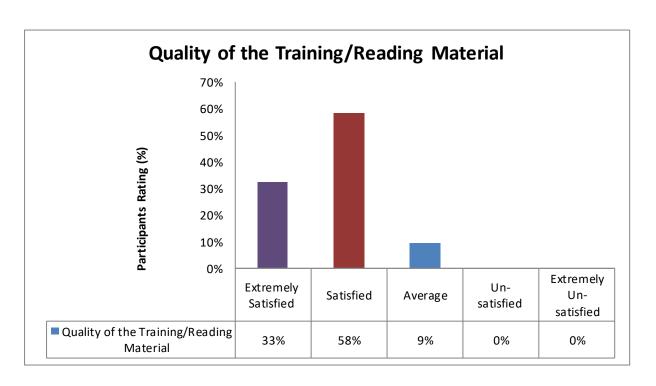






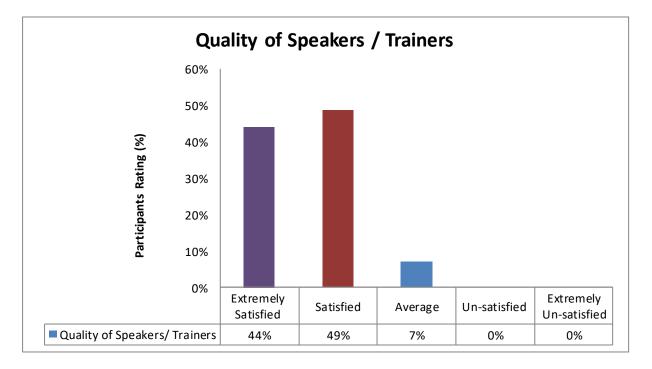


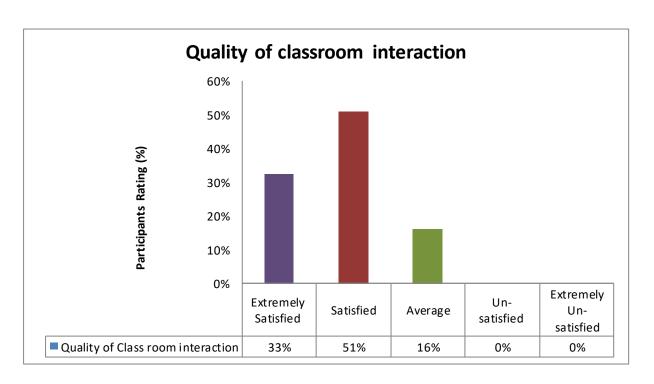






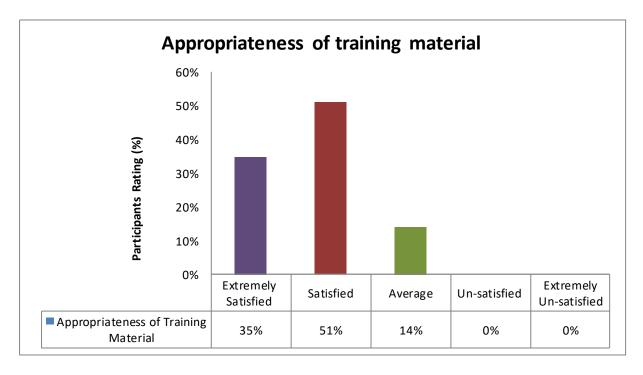












The workshop was imparted through 8 module sessions, covering -

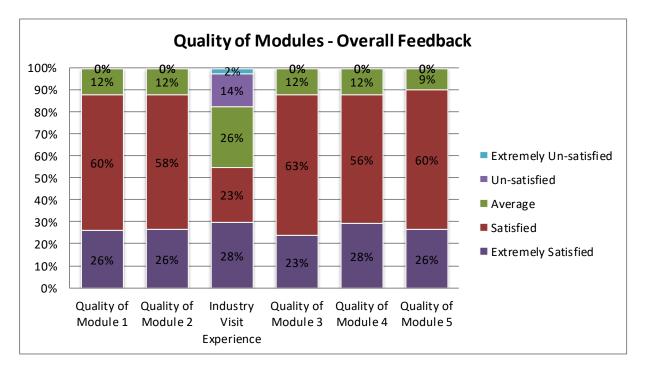
- 1. Module 1: Introduction to ESCO Market
- 2. Module 2: ESCO Assessment Process and ESCO Case Studies
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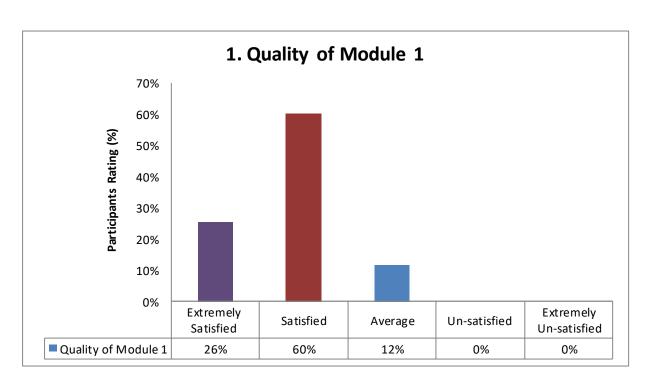
Apart from the 8 sessions, the participants were presented with Experience of undertaking EE projects by DISCOMS, EE consultancy firm and also experience of SME financing.

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



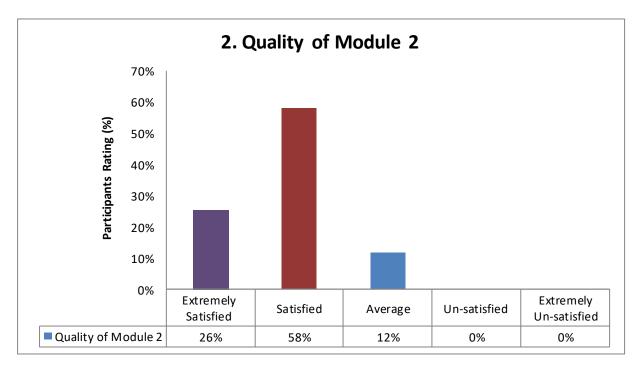


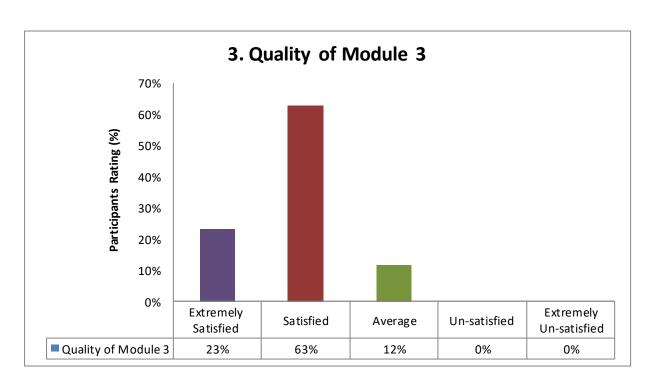






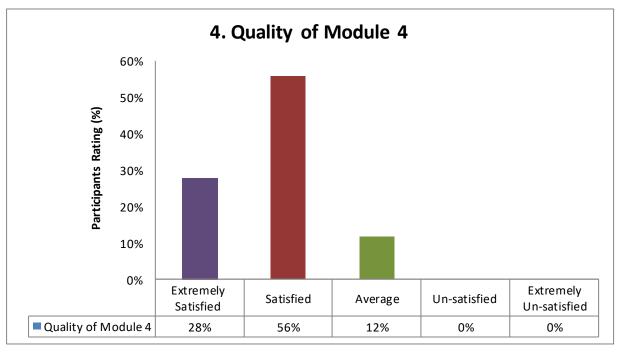


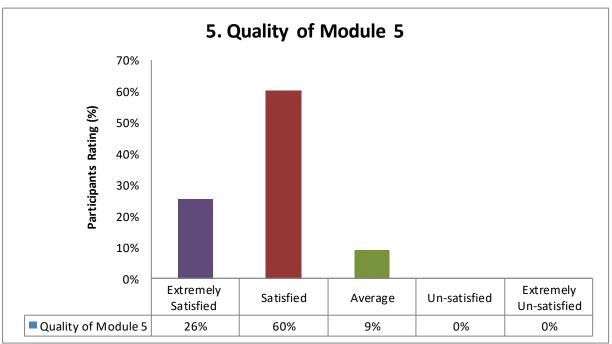






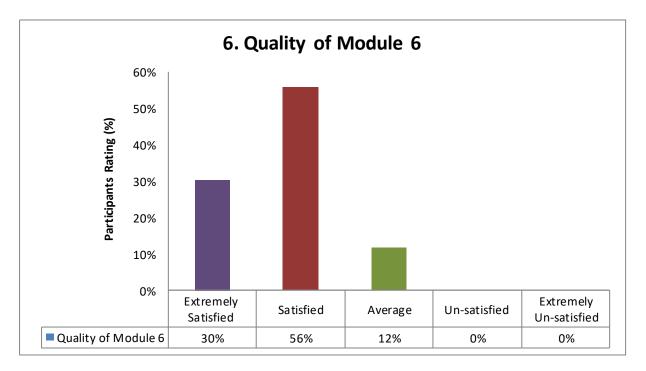


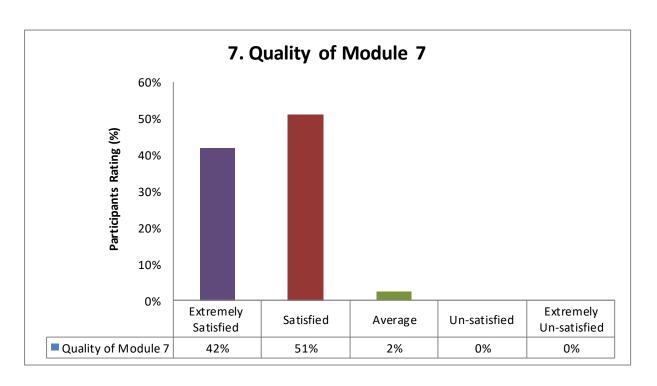






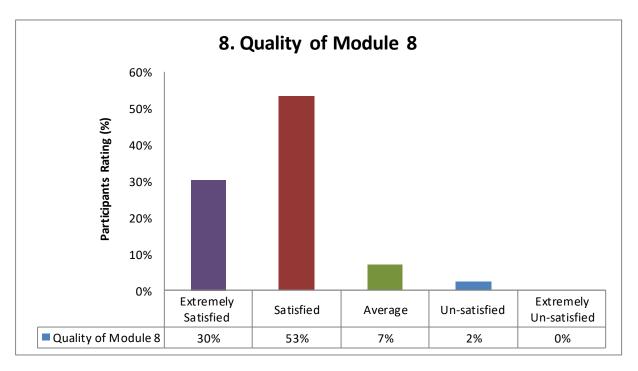
















Annex B – Bangalore Workshop

"Training Workshop for ESCOs on Energy Efficiency financing" 20-21 December 2018

<u>Agenda</u>

Day-1 : 20 December 2018

Venue: Gokulam Grand, Gokula – I,115, Gokula Extension, HMT Road, (Near BEL Circle)

Bengaluru-560054

Time	Торіс	Speaker				
09:30 AM - 10:00 AM	Registration					
	WELCOME SESSION					
10:00 AM - 10:10 AM	Welcome Remarks and Keynote Address	Mr. Arijit Sengupta, Director, BEE				
10:10 AM - 10:15 AM	Special Address	Mr. Hari Govindarajan, Consultant, IFC, World Bank Group				
10:15 AM – 10:25 AM	Inaugural Address	Mr. A. B. Basavaraju, Managing Director, KREDL				
10:25 AM – 10:30 AM	Address and Vote of thanks	Mr. Srinivasappa, General Manager, KREDL				
10.30 AM – 10:45 AM	Group Photograph follow	ved by Tea				
	TECHNICAL SESSION					
10:45 AM - 11:30 AM	Module 1: Introduction to ESCO Market – National and International Experience	Mr. Arijit Sengupta, Director, BEE				
11:30 AM - 12:00 PM	Module 2: ESCO Assessment Process	Mr. Gowtham Sivabalan, Associate Director, Frost & Sullivan				
12:00 PM - 12: 45 PM	Module 3: Emerging areas in EE and M&V protocols, Baseline, Risk Mitigation	Mr. Bali Singh, Associate Director - Namdhari Eco Energies Pvt. Ltd.				
12:45 PM – 01:00 PM	Outsourced Energy Model	Dr. R Sethumadhavan, Sr. Director, GSG India Pvt. Ltd.				
01:00 PM - 02:00 PM	1:00 PM - 02:00 PM					
02:00 PM – 05:30 PM	2:00 PM – 05:30 PM Visit to Infosys Campus					





"Training Workshop for ESCOs on Energy Efficiency financing" 20-21 December 2018

<u>Agenda</u>

Day-2: 21 December 2018

Venue: Gokulam Grand, Gokula – I, 115, Gokula Extension, HMT Road, (Near BEL Circle) Bengaluru-560054

Time	Торіс	Speaker	
10:00 AM - 10:30 AM	Module 4: Introduction to EE Financing	Mr. Joseph Prakash, Associate Director, Meghraj Capital Advisors Pvt. Ltd	
10:30 AM - 11:00 AM	Module 5 : EE financing schemes – BEE's initiatives	Mr. Amresh Ray, Project Engineer, BEE	
11:00 AM – 11:30 AM	Module 6: EE financing – Other initiatives	Mr. K V Kiran Kumar, Senior Technical Expert, SIDBI	
11:30 AM – 11:45 AM	Tea		
11: 45 AM -12:30 PM	Module 7: EE Financing –Technical Appraisal	Mr. Sunil Agrawal, TATA Cleantech	
12:30 PM – 01:15 PM Module 8: EE Financing - Financial Appraisal		Mr. Sunil Agrawal, TATA Cleantech	
01:15 PM – 01:30 PM	Quiz	Coordinated by BEE & IFC	
01:30 PM – 02:30 PM	Lunch		
02:30 PM – 02:45 PM	Energy Efficiency initiatives by Discom	Smt. G Sheela, DGM (DSM), BESCOM	
02:45 PM - 03:00 PM	New initiatives of IFC and BEE for ESCO market development	Mr. Hari Govindarajan, Consultant, IFC, World Bank Group	
03:00 PM - 03:20 PM		Mr. I.Thanumoorthi, Sr. Principal consultant, Enzen Global Solutions Pvt Ltd.	
03:20 PM - 03:30 PM	Distribution of Certificates & Quiz Prizes	Coordinated by BEE & IFC	
03:30 PM - 03:35 PM	Vote of Thanks	KREDL	





Annex B – Bangalore Workshop – Participants

SI. No.	Name	Organization	Designation	Email	Contact Number
1	Amitesh Bhaskar	iDeck	Deputy Manager	amitesh.bhaskar@idfc.co m	895422118
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15	Rujanna MS	KREDL	AAO	rajuskredl@gmail.com	9480691040
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17	Niraj Panchal	Atria Energy	Sr.	Niraj.panchal@atriapower	9428767266





SI.	Name	Organization	Designation	Email	Contact
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20	Rohit Pillai	Bosch Energy	Marketing Manager	rohit.pillai2@in.bosch.co m	884434579
21	Karthikeyan	ESD/ Ensparr	Sr. Technical Engineer	karthik@enspar.com	9900019161
22	Vimalraj	Enspar	Energy Analyst	vimalraj@enspar.co.in	9003437211
23	Sreekesh	ABFRL	Sr. Executive – Sustainabili ty	Sreekesh.pk@abfrl.aditya bira.com	8150989969
24	Girish M	ABFRL	Maintenanc e Officer	Girish.m@abfrl.adityabirla .com	
25	Keerthy C	ABFRL	Head Sustainabili ty	Keerthy.c@abfrl.adityabirl a.com	9743790358
26	Mukesh LV	eQube	Asstt. Design Engineer	mukesh@eqube.co.in	9980760954
27	Srinivas Tanuku	CEEP	Director		9686601696
28	Mathew	EESL	Engineer	Mathew@eesl.co.in	9868623108
29	Thiyagrajan G	JLL	Asstt Manager – Energy & Sustainabili ty		9717099019
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