

FINAL REPORT

Capacity Building Workshops For Practicing Energy Auditors

Submitted to



**Shakti Sustainable Energy Foundation,
New Delhi**

Prepared by



**Federation of Indian Chambers of Commerce and Industry,
New Delhi**

Disclaimer

The views expressed in this document do not necessarily reflect the view of Shakti Sustainable Energy Foundation. The organization also does not guarantee the accuracy of any data included in this publication nor does it accept any responsibility for the consequences of its use

Contents

1. Project Overview	6
2. Principal Activities and Output	7
3. Challenges to Achieving the Results	45
4. Lessons learned	46
5. Principal outcomes and Impacts	48

Annexure

Annexure 1: Survey Questionnaire	52
Annexure 2: Compiled responses received from energy auditors through online survey	53
Annexure 3: List of Identified Case Studies and Gadget providers	66
Annexure 4: List of Participants	68
Annexure 5: List of Speaker	76
Annexure 6: List of Table Top Exhibitors	79
Annexure 7: Program Schedule-New Delhi	80
Annexure 8: Program Schedule-Chennai	82
Annexure 9: Program Schedule-Mumbai	84
Annexure 10: Program Schedule-Chennai	86
Annexure 11: Program Schedule-Ahmedabad	88
Annexure 12: Program Schedule-Hyderabad	90

LIST OF TABLES:

TABLE NO. 1: TOTAL EXPERIENCE WISE BREAK UP IN THE FIELD OF ENERGY	8
TABLE NO. 2: NUMBER OF CERTIFIED ENERGY AUDITORS INTERESTED IN ATTENDING THE WORKSHOP	9
TABLE NO. 3: RESPONSE FOR WORKING IN THE FIELD OF ENERGY	10
TABLE NO. 4: NUMBER OF RESPONDERS WILLING TO ATTEND THE WORKSHOP	10
TABLE NO. 5: RESPONSE ON THE CAPACITY BUILDING NEED	11
TABLE NO. 6: PARTICIPATING STAKEHOLDER DURING THE 6 WORKSHOPS.....	14
TABLE NO.7: LIST OF ENERGY AUDITING ORGANISATIONS PARTICIPATED	14
TABLE NO.8: LIST OF SDA’S PARTICIPATED	17
TABLE NO.9: LIST OF GOVT. ORGANISATIONS PARTICIPATED	17
TABLE NO.10: LIST OF INDUSTRIES PARTICIPATED.....	18
TABLE NO.11: PROFILE OF PARTICIPANTS DURING THE 6 WORKSHOP.....	20
TABLE NO. 12: EXPERIENCE OF PARTICIPANTS IN THE FIELD OF ENERGY	20
TABLE NO. 13: DATE OF VENUE OF 1 ST SET OF WORKSHOPS	21
TABLE NO.14: DATE AND VENUE OF 2 ND SET OF WORKSHOPS	21
TABLE NO.15: NO OF RESOURCE PERSON DURING THE WORKSHOPS	21
TABLE NO.16: LIST OF SENIOR EXPERTS FROM VARIOUS FIRMS.....	22
TABLE NO.17: RESOURCE PERSONS FROM GOVT ORGANISATIONS AND ACADEMIC INSTITUTES	23
TABLE NO.18: LIST OF RESOURCE PERSON FROM TECHNOLOGY PROVIDERS AND INTERNATIONAL EXPERTS	23

List of Figures

FIGURE 1: EXPERIENCE WISE BREAK UP IN THE FIELD OF ENERGY	9
FIGURE 2: NO. OF INTERESTED PARTICIPANTS	9
FIGURE 3: NO. OF RESPONDERS LOOKING TO PURSUE CAREER IN THE FIELD OF ENERGY	10
FIGURE 4: BREAKUP WILLING PARTICIPANTS	11
FIGURE 5: RESPONSE ON THE CAPACITY BUILDING NEED	11
FIGURE 6: LOCATION PREFERENCE	12
FIGURE 7: STAKE HOLDERS DURING THE WORKSHOP	14
FIGURE 8: PROFILE OF PARTICIPANT	20
FIGURE 9: EXPERIENCE OF PARTICIPANT IN THE FIELD OF ENERGY EFFICIENCY..	20
FIGURE 10: PROFILE OF RESOURCE PERSON	22

1. Project Overview

To keep pace with the developments, the practicing energy auditors (EA) need to be geared up with additional knowledge on latest advancements in energy efficient technologies, best practices, success stories, etc to provide value added services to industries as well as government organization like BEE, SDA's, PSU's, DC's etc. Updation of knowledge and awareness about the latest advancements and practical experience is very much required for Energy Auditors to command respect and confidence; otherwise the credibility of EA's will be at stake. Incompetent Energy Auditors will have a difficult time in facing Industry Management. Unfortunately there are very limited avenues available to the EA's to build their capacity.

In view of the above, FICCI in association with Shakti Sustainable foundation, organized 6 numbers of "4 day non-residential capacity building programs" in various cities across the country.

The objective of these workshops was to build capacity of about 250 practicing energy auditors in the country to enable increase their knowledge and skill level and exposure to advancement in EE technologies, best practices, national/international case studies, etc to ensure value added services by the auditors to various industry sectors.

This report highlights the activities undertaken by FICCI, including conduction of six workshops at different locations. The 1st set of 3 workshops were organised during Nov – Dec 2013 at Delhi, Chennai and Mumbai. The 2nd set of 3 workshops were conducted during Jan – Feb 2014 at Chennai, Ahmedabad and Hyderabad.

2. Principal Activities and Output

2.1 Highlights of Work Plan :

Quarter	Tactics	Outputs	Notes
1	Survey of Energy Auditors through questionnaire/ interactions on Training need identification	Filled in questionnaire/ responses from BEE certified auditors	Survey was done through interaction with the auditors, filled in questionnaire survey and through other networking opportunities
	Prioritization of training need for the proposed program	Compilation of priority list comprising of training requirement equipment/utility wise	The priority list comprises of training needs in the area like thermal utilities, electrical utilities, industrial processes, training requirements for the operation of measuring instruments, software's, technology financing aspects, etc.
2	Identification of energy auditing global best practices, advanced energy efficient technologies & gadgets/ instruments, for inclusion of relevant information for training program	Compilation of information on Success stories (National/International), EE technologies, gadgets, best practices, etc.	Past workshops organized by FICCI on energy efficiency, efficient technologies etc and network contacts were utilized.
	Selection of participants for imparting training	List of about 250 probable participants/organizations for the six workshops	Participants profile like age group, their active current involvement in EE activities for industries, type of employer (PSU's, consulting organization, free lancers etc.) were considered for selection of appropriate participants
	Lining up / fixing of venues, dates, resources persons	Details of the venues and dates. List of resource persons.	Suitable venues were selected based on participant's geography distribution, resource person's availability, industry visit possibility etc.
3	Conduction of 3 programs of four days each.	List of participants, their registration details. Proceeding of the workshop, feedback of participants	Copy of presentations by various speakers and information on indentified technologies, success stories, etc.
	Conduction of remaining 3 programs of 4 day each.	List of participants, their registration details. Proceeding of the workshop, feedback of participants	Copy of presentations by various speakers and information on indentified technologies, success stories, etc.
	Final report preparation and submission	Feedback from participants, faculties, results of discussion & tests during program will indicates the knowledge update of energy auditors	Report highlights outcomes of workshops. The highlights maybe submitted to MoP, outcome may lead to policy change on up gradation of knowledge of energy professionals for ensuring meet targeted energy savings at national level under EC act.

2.2 Training Need Assesment Survey

An online survey questionnaire was prepared to understand the training needs of energy auditors using the Google Application (on the google form). The sample of the survey form is enclosed in the [annexure 1](#)

Emails were sent to the identified Energy Auditors informing them about the proposed capacity building workshops objective and coverage of the program. The EA's were requested to give their input on their Capacity building needs by following the link mentioned in the mail. The link provided in the emails is as below:

<https://docs.google.com/forms/d/1xKLlBm8vDuRbolIVwqb1CXTpnojs9DA7YvVBq2hR6o/viewform>

The details of the response are compiled as per the following attributes and summary is also enclosed in the [annexure 2](#):

- Name
- Organisation
- Designation
- Email Id
- Total Experience in the Field of Energy
- BEE Certified Energy Auditor
- Involvement in the Energy Audits
- Total number of energy audits conducted
- In which field of energy responder will be
- Would you like to attend a Capacity Building training to upgrade your knowledge in the field of Energy?
- Is there anything in particular you would like us to be address in this Capacity Building training?
- Preferred location

In total, 84 energy professionals responded to the survey questionnaires, the response to the questionnaire is summarized to understand the need of the Energy Auditors.

- **Experience of the respondents in the Field of Energy**

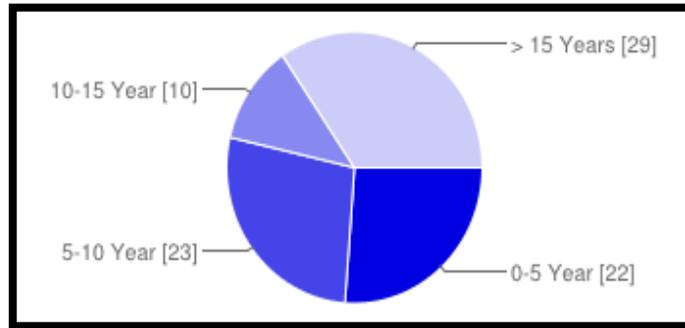
The responders were given the range from 0-5 to more than 15 years of total experience in the field of energy. The experience wise breakup of EA's given in the table below:

Table No. 1: Total experience wise break up in the field of Energy

Experience in the Energy Field	No. of People	Percentage
0-5 Year	22	26%
5-10 Year	23	27%
10-15 Year	10	12%
> 15 Years	29	35%

Most of the Certified Energy Auditors shown interest are having experience more of more than 15 years. The same is depicted in the pie chart below:

Figure 1: Experience wise break up in the field of Energy



- **Number of respondents who are BEE Certified Energy Auditors :**

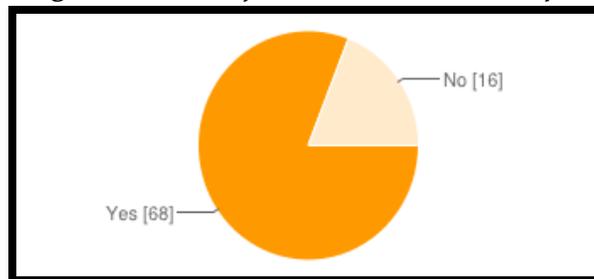
Out of the total of about 84 responders 68 numbers of responders were Certified Energy Auditors, while the others were about to write the exam.

Table No. 2: Number of certified Energy Auditors interested in attending the workshop

Response	No. of People	Percentage
Yes	68	81%
No	16	19%

As the online survey was sent to the empanelled energy auditing firms with various SDAs, some of the responders were not certified Energy audit but are working in the core field of energy audit. The non certified energy auditors are mostly with the experience less than 3 year in the field of energy.

Figure 2: No. of Interested Participants



- **Where do they see themselves after 5 years in the field of Energy?**

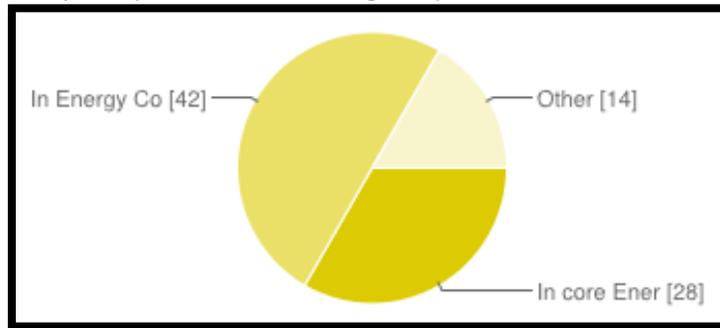
As the target participants for the capacity building workshop are the CEA (certified Energy Auditors) planning to pursue their career in the field of core energy audit or consultancy. The responders were given the option to choose one of them or mention if any other.

- a) In core Energy Auditing Field
- b) In Energy Consultancy Field
- c) Other

Table No. 3: Response for working in the field of Energy

Preference of Field	No. of People	Percentage
In core Energy Auditing field	28	34%
In Energy Consultancy	42	49%
Other	14	16%

Figure 3: No. of responders looking to pursue career in the field of Energy



The other relevant field mentioned by the responders was also related to Energy such as:

1. ISO 50001
2. ESCO Project Implementation
3. Energy Costing
4. Energy performance contracting
5. Energy Training, etc

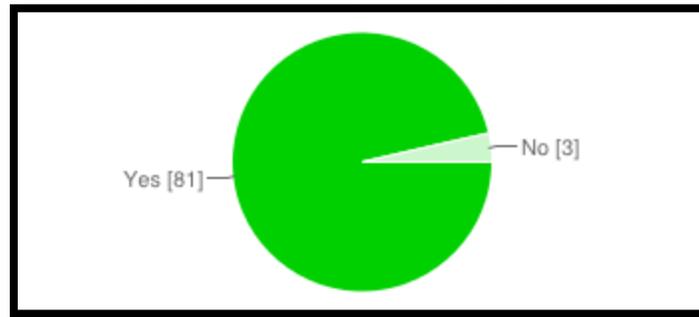
- **Response towards their interest in attending the Capacity Building workshops :**

More than 96% of the responders were willing to attend the workshop. Table below shows the people interested in attending the workshop out of total 84 responded consultants.

Table No. 4: Number of responders willing to attend the workshop

Response	No. of People	Percentage
Yes	81	97%
No	3	3%

Figure 4: Breakup willing participants



The no responders were either partially involved in the field of energy or restricted due to time constraints and other commitments. However, they have answered the next question asking about the capacity building need.

• **Topics of interest for inclusion in the Capacity Building workshops :**

To understand the capacity building need of the energy auditors and consultants few suggestions were given to be included in the workshop and were asked to mention what is needed to be addressed during the workshop. The session’s options given the online survey forms are:

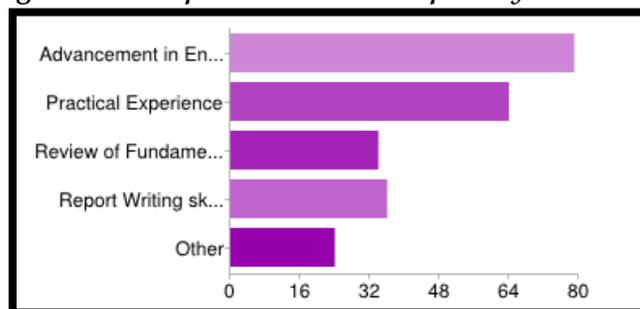
- Advancement in Energy Efficient Technologies
- Practical Experience
- Review of Fundamentals (Thermal/Electrical)
- Report Writing skills
- Other (ISO 50001, EE Financing schemes, M&V aspects, PAT etc)

The table below shows interest by responder for particular session/topic

Table No. 5: Response on the Capacity Building Need

Session/Topic	Percentage
Advancement in Energy Efficient Technologies	33%
Practical Experience	27%
Review of Fundamentals (Thermal/Electrical)	14%
Report Writing skills	15%
Other	10%

Figure 5: Response on the Capacity Building Need



The maximum response is received against the Advancement in Energy Efficient Technology followed by Practical experience.

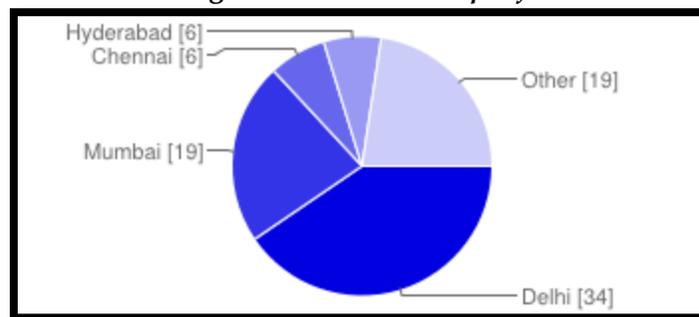
The other capacity building needs mentioned by responder are:

- ISO 50001
 - M & V Protocol used with case studies
 - Financial analysis knowledge to enable writing IGDRs
 - Discussion on Policies framed by BEE, upcoming Laws, expected tariff changes, commercial opportunities
 - Basic Low cost / No Cost Measures
 - Software Programs for Energy Metering
 - Renewable Energy Sector
 - PAT cycle implementation with cases
- **Preferred locations to attend the workshop :**

The responders were given the option to choice from the following location as their preferred location:

- Delhi
- Mumbai
- Chennai
- Hyderabad
- Other (if any)

Figure 6: Location preference



The maximum response is received for Delhi followed by Mumbai. The other preferred locations were Kolkata, Pune, Baroda , Raipur etc.

2.3 Prioritizing of Training Need and Designing of Workshops

On the basis of questionnaire response, training needs in the areas like thermal utilities, electrical utilities, industrial processes, training requirements for the operation of measuring instruments, softwares, technology financing aspects, etc were identified and prioritized. The broad areas for including in the workshops were :

- Brushing up/ revising the basic knowledge acquired by energy auditors through BEE certification.
- Exposure to various successful energy audit case studies in various sectors
- Update on advancements in energy efficient utility technologies
- Exposure to International case studies of energy audits
- Exposure to energy management system standard ISO 50001.
- Exposure to international best practices of energy auditing
- Update on PAT scheme, need & importance of M& V
- Overview of Financing related issues of EE projects and schemes of financial institution
- Group exercise on energy audit of a live industry case study

To create awareness about the latest development of EE technologies, key technology providers were identified from various sources. For an Energy Audit, Auditing gadgets play a vital role, the key Energy Audit instruments and instrument providers were identified. The list of EE technologies and best practices identified through various sources and list of identified Energy Audit gadget providers are given in [annexure 3](#).

2.4 Identification of Participants

There is no single consolidated list available covering all the agencies/organizations involved in Energy Auditing across the country in various states. Some are registered with only one or more state, while some are registered as ESCO's. By clubbing various available lists, an attempt made to prepare a consolidated list of "energy auditing agencies" across the country. The source of certified auditing agency is:

- SDA Websites for list of energy auditors/ agencies empanelled
- Accredited Energy Auditor List of BEE
- AIP –NPC Website,
- BEE Website,
- Energy Manager training website,
- List of empanelled ESCOs

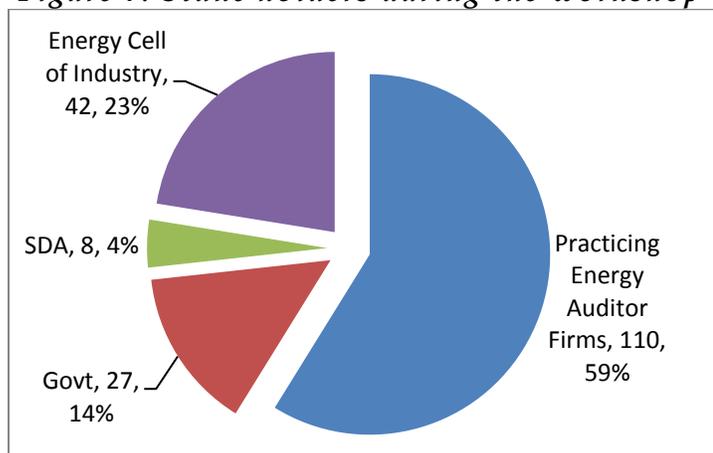
2.5 Selection of Participants

The participants during the workshops were primarily from practicing energy auditing organizations. Also, a few government organizations, academic institutes, state designated agencies, and energy cell of industry, etc participated in the workshops. The table below gives the number of stakeholders from different segment. List of participants is enclosed in the [annexure 4](#).

Table No. 6: Participating Stakeholder during the 6 workshops

Practicing Energy Auditor Firms	Government organizations and Academic Institutes	SDA	Energy Cell of Industry
110	27	8	42

Figure 7: Stake holders during the workshop



- Practicing Energy Auditing organisations:** The stakeholders for the workshop were largely the practicing Energy Auditing organisations, Energy Managers, Energy Auditors, Accredited Energy Auditors, Energy consultants etc participated in these 6 workshops. Few ESCO (Energy Service Companies) also participated.

Table No.7: List of Energy Auditing Organisations Participated

S. No	Name of Organization	Location
1	Abacus Infrastructures Pvt. Ltd.	Hyderabad
2	ABB India Ltd.	Bengaluru
3	Aditya Birla Mgmt Corp Pvt Ltd	Maharashtra
4	ADS Associates	Chennai
5	Alliance For Energy Efficient Economy	New Delhi
6	Allied Boston Consultants India Pvt Ltd	Ghaziabad
7	Apcp, Abudhabi	Surat
8	Assist	Chennai
9	Astha Dal Services Pvt Ltd	New Delhi

S. No	Name of Organization	Location
10	Athul Energy Consultats	Palakkad
11	Athul Engineering Systems and Energy Consultants	Thrissur
12	Automation System Engineers Pvt. Ltd.	Ahmedabad
13	Avant-Garde Engineers and Consultants (P) Ltd.	Chennai
14	C&S Electric	New Delhi
15	Cauvery Marketing Company	Secunderabad
16	Cbalance & Solutions Pvt Ltd	Mumbai
17	Centre for Entrepreneurship Development(CED)	Chennai
18	Centre for Sustainable Development (CSD)	Bangalore
19	Consultant	Coimbatore
20	Consulting Engineer	Solapur
21	CTES, Aditya Birla Group	Dist Raigad
22	Danfoss Industries Pvt. Ltd.	Bangalore
23	Ex-Divisional Engineer	Visakhapatnam
24	Dynamic Consultant	Surat
25	ECIL	Thane (West)
26	EDAC Engineering Ltd.	Chennai
27	EDGE Technologies	Hyderabad
28	EESSI	Panchkula
29	Electrical Consultant & Contractor	Ahmedabad
30	Electronics and Quality Development Centre	Gandhinagar
31	EM Project Services	New Delhi
32	Encon Energy Management Services Pvt Ltd	Mumbai
33	Encon Envirotech Engineers	Secunderabad
34	Encon Expertise Pvt Ltd	Kalyan
35	Energy and Energy Efficiency	Chennai
36	Energy Conservation & Project Management Consultant	Chennai
37	Energy Engineers	Faridabad
38	Energyca	Thane
39	Enmar GB Power Systems Projects Ltd.	Chennai
40	Envision Educate & Energize	Chennai
41	Euphoria Green Technologies	Chennai
42	Focus-5	Hyderabad
43	Free Lance	Visakhapatnam
44	GMR Airport Developers Ltd.	Hyderabad
45	Godrej & Boyce Mfg. Ltd	Mumbai
46	IKN India	Chennai
47	Intelesco	Mumbai
48	IntelliDecs	Hyderabad
49	Jacobs Engineering	Mumbai
50	Jaiprakash Associates Ltd.	Sonebhadra
51	Jay Pumps Pvt. Ltd.	Ahmedabad
52	Jone & Lang Lasalle	Jaipur

S. No	Name of Organization	Location
53	K.R.Bedmutha	Maharashtra
54	Kirloskar Brothers Ltd	New Delhi
55	Kirloskar Brothers Ltd	Pune
56	Kirloskar Brothers Ltd	Hyderabad
57	Kittiwake Proactive Technologies Pvt. Ltd.	New Delhi
58	KV Plant Engineering & Allied Services	Hyderabad
59	L&T, IES	Vadodara
60	L&T-S&L	Vadodara
61	LCG Energy Consultants Pvt. Ltd.	Bhopal
62	LRV Engineering Solutions Pvt. Ltd.	Chennai
63	MDS Consultants	Chennai
64	Milind Joshi & Associates	Thane
65	MM Associates	Nagpur
66	Mohan Marketing Associates	Secunderabad
67	Nagreeka Exports Ltd	Dist Kolhapur
68	Nouveau Blue Ocean Consultants	Noida
69	ODC Standards Certifications (India) Pvt. Ltd.	Hyderabad
70	Ohm Tech Services	Chennai
71	Oris	New Delhi
72	Ottotractions	Thiruvananthapuram
73	Penta India Cement & Mineral Pvt Ltd	Mumbai
74	Pima Controls Pvt. Ltd.	Ahmedabad
75	Pima Energy Pvt. Ltd.	Ahmedabad
76	Power House	Chennai
77	Projects & Development India Ltd	Noida
78	Reliable Electro Instrument Services	Thane
79	RINA	Chennai
80	RITES Ltd.	Ahmedabad
81	RM Mayileru & Co.	Coimbatore
82	RSM GC Advisory Services Pvt. Ltd.	Chennai
83	SAM Engineers & Consultant	Hyderabad
84	Sandvik Asia Pvt Ltd	Pune
85	Saurabh Engineering Services	Nagpur
86	SGS India Pvt. Ltd.	Hooghly
87	Sharda Electronics & Co.	Sangli
88	Shreenidhi Green Services	Pune
89	Siemens Ltd.	Ahmedabad
90	Siemens Ltd.	Hyderabad
91	Sitra (The South India Textile Research Associate)	Coimbatore
92	SKF India Ltd	Haridwar
93	Sonel Instruments India Pvt. Ltd.	Chennai
94	Sree Veedha Services	Hyderabad
95	Stenum Asia Sustainable Development Society	Gurgaon

S. No	Name of Organization	Location
96	Suzlon Energy Ltd.	
97	Synergy Infra Consultants Pvt Ltd	Hyderabad
98	Tata Consulting Engineers Ltd	Mumbai
99	Technip India Ltd	Chennai
100	Technocrat Alliance Engg Pvt Ltd	Ghaziabad
101	Techspine International	Mumbai
102	TERI	Bangalore
103	TERI	New Delhi
104	The Energy & Resources Institute (TERI)	Pune
105	The Institution of Engineers (India)	Hyderabad
106	Transgear Electrical Services	Bangalore
107	Transqean Electrical	Bangalore
108	Usha Management Consultant	Jaipur
109	UV Krishna Mohan Rao Associates	Chennai
110	Voltech Engineers Pvt. Ltd.	Chennai

- **State Designated Agency:** The state designated agencies (SDAs) responsible in implementation of the energy conservation Act in their respective states also participated. During the 6 number of workshops 8 State designated agency participated.

Table No.8: List of SDA's Participated

S. No	State Designated Agency	Location
1	Chhattisgarh State Renewable Energy Development Agency (CREDA)	Chhattisgarh
2	HPSEBL	Shimla
3	Electrical Inspectorate, SDA/TN	Chennai
4	Gujarat Energy Development Agency	Gujarat
5	M.P. Urja Vikas Nigam Ltd.	Jabalpur
6	MEDA	Pune
7	State Energy Conservation Mission (SECM) Govt. Of A.P., Hyd.	Hyderabad
8	UPNEDA	Lucknow

- **Government Organisations:** Energy professionals working in govt organizations, PSU's and academic sector participated in the workshop. PCRA, the nodal agency for petroleum conservation also participated considering the importance of these workshops. PCRA Chennai, Mumbai and Delhi participated in the workshops.

Table No.9: List of Govt. Organisations Participated

S. No	Name of Organization	Location
1	A.P. Transco	Hyderabad
2	Airports Authority of India	Chennai
3	Airports Authority of India	Coimbatore
4	Andhra Pradesh Productivity Council	Hyderabad

S. No	Name of Organization	Location
5	Anna University	Chennai
6	APITCO Limited	Hyderabad
7	Chamundeshwari Electricity Supply Corporation Ltd.	Mysore
8	CSIR	Hyderabad
9	CSIR-Central Leather Research Institute	Chennai
10	EESL	New Delhi
11	Electrical, Southern Railway	Chennai
12	EIL	New Delhi
13	Goa Electricity Department	Goa
14	Indian Railway	New Delhi
15	Indian Railway	Ghaziabad
16	Indian Railway	Chennai
17	Indian Railway	Maharashtra
18	Indian Railways Institute of Electrical Engineering	Nashik
19	IISWBM	Kolkata
20	IIT	New Delhi
21	Indian Institute of Chemical Technology	Hyderabad
22	Maulana Azad National Institute of Technology	Bhopal
23	Military Engineer Services	New Delhi
24	National Institute of Secondary Steel Technology	Punjab
25	Nirma University	Ahmedabad
26	North Central Railway	Jhansi
27	North Central Railway	Allahabad
28	PCRA	Delhi
29	PCRA	Mumbai
30	PCRA	Chennai
31	PDA Colege of Engineering	Karnataka
32	Rajagopal Polytechnic College	Tamil Nadu
33	SC Rly	Vizag
34	SIDBI	New Delhi
35	South Western Railway	Bangalore

- **Energy Cell of Industry:** Senior management and middle management responsible for energy efficiency in their industries participated in these 6 workshops.

Table No.10: List of Industries participated

S. No	Name of Organization	Location
1	Adani Power	Ahmedabad
2	Bharti Airtel Ltd.	Chennai
3	Birla Corporation Ltd.	Chittorgarh
4	Coromandel International Ltd	Chennai
5	Deepak Nitrite Ltd.	Vadodara
6	Deepak Nitrite Ltd.	Raigad

S. No	Name of Organization	Location
7	Delta Paper Mills Ltd.	Andhra Pradesh
8	GACL, UPL	Dist Vadodara
9	Godawari Power & Ispat Ltd	Chattisgarh
10	Grasim Bhiwani Textiles Ltd	Haryana
11	Hartex Rubber Pvt. Ltd.	Medak
12	Hospira Healthcare India Pvt. Ltd.	Chennai
13	Hotel Parkland	New Delhi
14	Indian Metals & Ferro Alloys Ltd.	Odisha
15	Jai Prakash PowerVentures Ltd.	Kinnaur
16	Jaypee Group	Uttarpradesh
17	JK Cement Works	Karnataka
18	JK Tyre & Industries Ltd	Kanchipuram Dist
19	Kozhikode dairy	Calicut
20	KRIBHCO	Kribhconagar
21	Mahindra Research Valley, Mahindra & Mahindra Ltd	Chengalpattu
22	Nirma Limited	Bhavnagar
23	NTPC Ltd.	Lucknow
24	NTPC, SIPAT	Bilaspur
25	Oil & Natural Gas Corporation Ltd.	Ahmedabad
26	Penna Cement Ind. Ltd.	Anantapur
27	Penna Cement Industry Ltd.	Rangareddy
28	Penna Cement Industry Ltd.	Hyderabad
29	Reliance Industries Ltd.	Nashik
30	Reliance Industries Ltd.	Gujarat
31	Reliance Industries Ltd.	Jamnagar
32	Reliance Infrastructure Ltd.	Chennai
33	RCM, Chembur	Mumbai -
34	Sesa Sterlite Ltd, Vedanta, (SSL, Vedanta), IPP (4X600MW)	Odisha
35	Sterlite Copper	Tuticorin
36	Synthite Industries Ltd.	Kerala
37	Tamilnadu Newsprint and Papers Ltd.	Kagithapuram
38	Tata Power Co. Ltd	Mumbai
39	Thirumalai Chemicals Ltd.	Vellore Dsitric
40	Ultratech Cement Ltd	Mumbai
41	Ultratech Cement Ltd.	Amreli
42	Ultratech Cement Reddipalyan	Aniyalur

2.6 Analysis of Stakeholders in the Workshops:

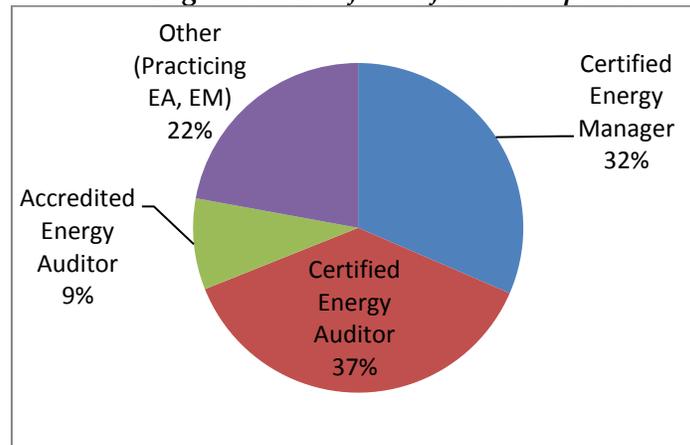
Total 312 delegates (235 participants and 77 speakers) attended the 6 workshop. The 235 participants during workshop were either Energy Auditors or Energy Managers or Accredited Energy Auditor or practicing energy auditors. The table and chart below gives the number of Certified Energy Auditors or Manager or Accredited Energy Auditors attended the workshop.

Out of the total 235 participants, major share of 78% were practicing BEE certified Energy auditors/managers & Accredited Auditors. The rest 22% participants were in the process of appearing BEE exam (or waiting for the 14th exam result) or participants from SDA's and other non-certified energy consultants working actively in field of Energy Efficiency.

Table No.11: Profile of participants during the 6 workshop

Certified Energy Manager	Certified Energy Auditor	Accredited Energy Auditor	Other (Practicing EA, EM)
74	88	21	52
32%	37%	9%	22%

Figure 8: Profile of Participant

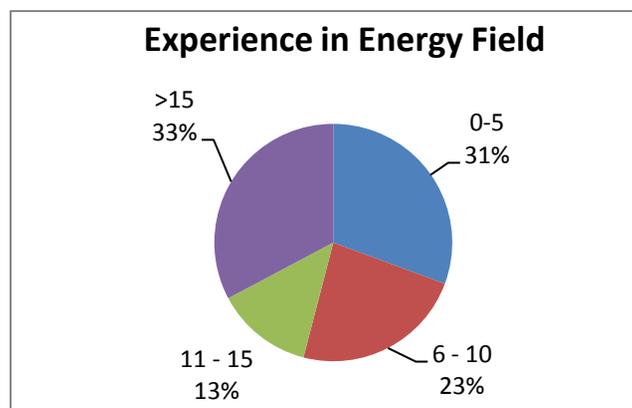


During the 6 number of workshop it is observed that more than 33% of participants had more than 15 years of experience and 31% of the participants were with less than 5 years of experience.

Table No. 12: Experience of participants in the field of Energy

0-5 year	6 – 10 year	11 – 15 year	>15 years
72	55	31	77
31%	23%	13%	33%

Figure 9: Experience of Participant in the field of Energy Efficiency



2.7 Venue and Dates

The locations and dates are finalized on basis of questionnaire response. As opined by some of the energy professionals, due to the work commitment and target to complete ongoing assignments, it is difficult for an energy auditor to spare four working days to attend this workshop. It is therefore, the weekends are clubbed in the workshop duration.

The venues and dates are as below :

Table No. 13: Date of Venue of 1st set of Workshops

Location	Date (Thursday to Sunday)
FICCI, Federation House, Delhi	21 st Nov to 24 th Nov 2013
The Residency Tower, Chennai	28 th Nov to 1 st Dec 2013
Hotel VITS, Mumbai	5 th Dec to 8 th Dec 2013

Table No.14: Date and Venue of 2nd set of Workshops

Location	Date
Hyatt Regency, Chennai	29 th Jan - 1 st Feb 2014
The Pride, Ahmedabad	12 th Feb – 15 th Feb 2014
Taj Deccan, Hyderabad	18 th Feb – 21 st Feb 2014

During the 1st set workshop at Chennai, one day visit was organized to the **Centre of Excellence for Training in Energy Efficiency (CETEE)** of NPC, which was well appreciated by the participants. It was therefore, on the basis of feedback received from the participants and to provide a practical experience to the participants, the workshop at Chennai was repeated including the visit to the **CETEE**.

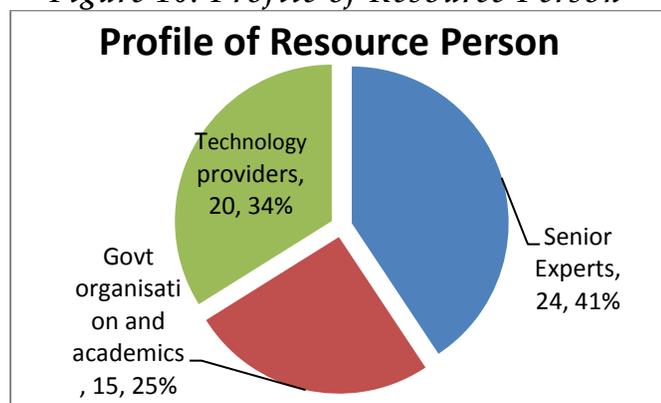
2.8 Resource Persons :

The speakers for the workshop were drawn from the pool of resource persons of FICCI networks. In all, 77 resource persons (from 59 organisations) were invited during the six workshops. They were senior energy auditors, experts from academic institutes, government organizations, technology providers and international experts. The detail list of speakers is enclosed in the [annexure 5](#). The summary of speakers profile is given in table below:

Table No.15: No of Resource Person during the workshops

Senior Experts	Government organisation and academics	Technology providers
24	15	20

Figure 10: Profile of Resource Person



- **Senior Energy Experts:** Senior energy auditors who have conducted more than 100 audits were invited to share their experiences and case studies. The list of senior Energy Expert is given below

Table No.16: List of Senior Experts from various Firms

S. No	Name of Organization	Location
1	Academy of Industrial Management	Delhi
2	Devki Energy Consultancy Private Limited	Gujarat
3	EDAC Engineering Ltd.	Chennai
4	Ener'G Consulting	Gujarat
5	Energetic Consultant	Mumbai
6	Energy and Energy Efficiency	Chennai
7	FICCI	New Delhi
8	GIZ	New Delhi
9	ICF International	New Delhi,
10	IntelliDecs	Hyderabad
11	International Copper Promotion Council India	Mumbai
12	K.R.Bedmutha	Maharashtra
13	M K Raju Consultants Pvt. Ltd.	Chennai
14	M/s Kavoori Consultant	Chennai
15	Milma Dairy	Kozhi
16	NPC	Chennai
17	NPC	Maharashtra
18	RCF	Mumbai
19	Sudnya Industrial Services Pvt. Ltd.	Pune
20	TERI	Delhi
21	The Institution of Engineers (India)	Hyderabad
22	Usha Management Consultant	Jaipur
23	UV Krishna Mohan Rao Associates	Chennai
24	Yajna Fuel	Thane

- **Government organizations and academic Institutes:** Advisor (Energy), Ministry of Planning commission, Govt of India inaugurated the Workshops on 21st Nov at Delhi. BEE, being the nodal

agency for conducting Energy Auditors and Managers certification examination, participated in the workshops and delivered the special address to Practicing Energy Auditors and provided answers to various questions.

Table No.17: Resource Persons from Govt Organisations and Academic Institutes

S. No	Name of Organization	Location
1	Anna University	Chennai
2	BEE	Delhi
3	EIL	New Delhi
4	EESL	New Delhi
5	Gujarat Energy Development Agency	Gujarat
6	IIT	New Delhi
7	MEDA	Pune
8	Planning Commission	Delhi
9	Nirma University	Ahmedabad
10	PCRA	Chennai
11	PCRA	New Delhi
12	SIDBI	New Delhi
13	State Energy Conservation Mission (SECM) Govt. Of A.P., Hyd.	Hyderabad
14	TNSDA	Chennai
15	Indian School of Busiess	Hyderabad

- **Technology Providers & international experts:** To update the knowledge of Energy professionals about the latest advancements in technology and international practice of energy saving. A few ESCO (Energy Service Companies) also participated and have offered to provide turnkey solutions on energy efficiency to industries.

Table No.18: List of Resource person from Technology Providers and international experts

S. No	Name of Organization	Location
1	Amtech Electronics (India) Ltd.	Gandhinagar
2	AMTL	Noida
3	Atandra Energy Pvt Ltd	New Delhi
4	Atandra Energy Pvt Ltd	Chennai
5	Danfoss Industries Pvt. Ltd.	Bangalore
6	Dantech Engineers Pvt. Ltd.	New Delhi
7	First Esco	Vijayawada
8	Fives	France
9	Fives Combustion Systems Pvt. Ltd.	Gujarat
10	Fluke	Bangalore
11	Grundfos Pumps India Pvt. Ltd.	Ahmedabad
12	Grundfos Pumps India Pvt. Ltd.	Chennai

S. No	Name of Organization	Location
13	IGES	Japan
14	Lloyd Insulations (India) Limited	New Delhi
15	Naltn Technologies Pvt Ltd	Ahmedabad
16	Paharpur Cooling Tower	Various Location
17	Rockwell Automation India Pvt Ltd	Noida
18	Testo India Pvt. Ltd.	Pune
19	TTL Technologies Pvt Ltd (A Fluke Company)	Maharashtra
20	Vigven Tech Mark Pvt. Ltd.	Bangalore

2.9 Highlights of the Workshops :

2.9.1 New Delhi Workshop (21st – 24th Nov 2013)

2.9.1.1 New Delhi Program Inaugural Session:

The 1st workshop in Delhi was organized during 21st -24th Nov 2013. Shri I A Khan, Adviser (Energy), Planning Commission delivered the keynote address. He discussed about the current energy scenario in India. He said “78% households are now have electricity in comparison to 10 years back which was 50%”.



Shri I A Khan, Advisor (Energy), Planning Commission, Gol, Delivered the Keynote Address



Mr. Krishan Dhawan, CEO, SSEF, Delivering the Welcome Address

Mr. Krishan Dhawan, CEO Shakti Sustainable Energy Foundation (SSEF) delivered the welcome address. The highlights of his address are:

a. Energy Efficiency:

He said “Energy efficiency is obviously an area of great importance to individuals, companies, industries and country as whole. In country’s context, we are a growing economy with growing energy need but with limited/finite source of energy, which forces us to import a lot of fuel and still a large part of our country’s population doesn’t get the energy they need to meet their basic needs”.

b. Identifying opportunities of Energy Efficiency

During his address to energy auditors, he emphasised on identifying the opportunities of energy efficiency. He said “We have found with our past experience that it doesn’t always requires huge change in technology or whole paradigm shift, the companies which work on incremental basis can manage to reduce their energy consumption by 10-20%

On 23rd Nov **Dr. Ajay Mathur, DG BEE, MoP**, delivered the Special Address to Energy auditors. He gave a presentation on “Industrial Energy Efficiency – Challenges and Initiatives” followed by interactive session to address the issues and concerns of the participating Energy Auditor

The highlight of Dr. Mathur’s speech is presented below:



1. Bipolar pattern of energy use in industry:

The energy consumption in large industries (designated consumers) has been increased by 45% during the 11th Plan (2006-07 to 2011-12), and 25% in SME during this period whereas energy consumption in other industries remained constant in absolute terms, and it declined as percentage of energy consumption by the industrial sector

2. Current Status of PAT: SEC reduction targets have been notified for 478 units in 8 energy intensive sectors notified as Designated Consumers under EC Act. The sectors are: Aluminum, Cement, Iron & Steel, Chlor Alkali, Thermal Power Plants, Fertilizer, Pulp & Paper, and Textiles. The targets have to be accomplished in 2014-15. The normalization formulae will be notified in December 2013. The list of Accredited Energy Auditors has been released.

3. Role of Energy Auditors in PAT data requirements and verification: The first cycle of PAT will end in 2014-15, but there will be second cycle, third cycle and so on. As the SEC for a plant is based on the records of quantum of energy going into the plant and quantity of products shipped out of plant, the cross checking of records such as invoices, payment receipts, and excise paid, etc play a vital role. The verification of DC data during PAT M&V will be carried out by independent BEE-designated energy auditors.

2.9.1.2 Highlight of few Presentations at Delhi

Mr. R Paraman, was the core faculty during the delhi workshop. He is associated with Devki Energy Consultancy Pvt. Ltd., Baroda, India since 1986. He has conducted more than 600 Energy Audits in Aluminium, Steel, Fertilizer, Power Plants, Chemicals, Refineries, Petrochemicals, Synthetic yarn, Pharmaceuticals, Paper, Engineering, Distillery, Plastics, Infrastructure projects, Commercial Buildings etc. He has conducted various training programmes for industrial associations and Govt. Organisations.



During the workshop he discussed about:

- Combustion concept, Factors affecting combustion calculations
- Losses in combustion and techniques to reduce losses
- Efficient use of furnaces and Oven
- Various case studies covering combustion aspects, boiler, furnaces and ovens



Mr. A K Asthana, Senior Technical Specialist, GTZ discussed about the current status of PAT, challenges under the PAT cycle 1, etc.

He along with Mr. Vikash Ranjan also gave presentation on the target setting of Thermal power plant and cement, normalization and factors of normalisation, methods of normalization. He also discussed various other factors which will be considered during monitoring and verification of the PAT cycle - 1.

Mr. S.P.Garnaik, Head-Energy Efficiency, ICF International holds 19 years of experience in Energy Management area in various sectors of Indian Economy. Prior to ICF he was associated with Bureau of Energy Efficiency (BEE), Ministry of Power, Govt. of India as Energy Economist

Mr. Garnaik gave presentation on “**New Opportunities in Energy Auditing**”. He discussed new avenues of Energy Auditing supported by various case studies. He encouraged the participants to expand their horizon and think beyond Conventional Energy Audting. The new avenues he discussed during his presentation were:

- PAT Scheme : Way Ahead



- State Energy Conservation Plan
- Utility DSM
- Standards for Industrial Equipment
- International Programs
 - Partnership of Market Readiness (PMR)
 - LEED, PACE-D

Mr. Yogesh Gupta, AMTL, is Electrical Engineering from IIT-BHU, Varanasi and BEE

Accredited Energy Auditor & Lead Auditor–ISO 50001 (Energy Management Systems), 14001 (Environment Management Systems), 9001 (Quality Management Standards). He is having more than 22 years of experience in field of energy auditing of various industries and buildings.



During the workshop he delivered the presentation on ISO 50001 with Energy management prospective and importance of calibration of energy audit instruments.

The detailed program schedule is enclosed under the [annexure 7](#)

GLIMPSES OF WORKSHOP



2.9.2 Chennai Workshop (28th Nov – 1st Dec 2013)

2.9.2.1 Chennai Workshop Inaugural Session:

The second workshop was organized at Chennai during 28th Nov – 1st Dec 2013. The Keynote Address was delivered by Shri Appavoo, Chief, State Designated Agency, Government of Tamil Nadu, and Vice President EDAC Engineering was also present during the opening session. Mr. P Dharmalingam, Director NPC Chennai, during his special address discussed about “**Global Energy Issues and Need for Energy Efficiency & Renewable Energy**”



Mr. Appavoo, Chief SDA (TN)



Mr. P Dharmalingam, Director, NPC



The program schedule is provided in the [annexure 8](#)

2.9.2.2 Highlight of few Presentations at Chennai :



Mr. Nagesh Kumar was core faculty during the Chennai Capacity building workshop. He is currently Director at Nation Productivity Council – Chennai. He is mech. Engg and currently pursuing PHD from Anna University. He has over 25 years of rich experience in energy auditing. He has also been the co-author of guide books for BEE EM/EA certification examination as the core faculty.

During the workshop he gave presentation on:

- Combustion Optimisation Aspects
- EE issues in boilers
- EE issue in cooling towers, HVAC and AHU's

Visit to Centre of Excellence for Training in Energy Efficiency (CETEE), AIP-NPC

The participants were taken for a one day visit to CETEE. CETEE is a unique world class facility in NPC with the objective of bridging the gap between energy efficiency theory and practice using the state-of-the-art technology from Japan. The facilities provided in the center aim to impart practical hands-on training in the field of energy efficiency.



During the visit the participants were giving the practical experience to operate the equipments and change the operating parameters to lean the impact of efficient operation, change to energy saving mode, conduct testing for performance evaluation of following systems.

- Pump Training Facility
- Compressor Training facility
- Fan Training Facility

GLIMPSES OF WORKSHOP



2.9.3 Mumbai Workshop (5th – 8th Dec 2013)

2.9.3.1 Mumbai Workshop Inaugural Session:

The third workshop was organized at Mumbai during 5th – 8th Dec 2013. The Keynote Address was delivered by Mr. Hemant Patil, Manager (Environment & Energy Efficiency) State Designated Agency, Maharashtra and Mr. Shashank Jain, delivered the welcome address during the opening session at Mumbai.



Mr. Hemant Patil, Chief SDA (MEDA)



**Mr. Shashank Jain, Programme Manager
(Industry)
Shakti Foundation**



Welcoming Mr. Hemant Patil from MEDA

The program schedule is provided in the [annexure 9](#)

2.9.3.2 Highlight of few Presentations at Mumbai



Mr. S B Sadananda, Director National Productivity Council, Mumbai. He is a qualified fuel efficiency engineer and qualified ISO 50001 (EnMS) Energy Management Systems Auditor. He has over 30 years experience as a consultant and trainer in the field of energy conservation and management. His professional experience cover the areas of energy efficiency, energy auditing, GHG reduction measures and energy auditing

of medium and large manufacturing and service industries, steam & power optimization, co-generation, heat recovery and technology evaluation & probing studies. He gave presentation on:

1. Combustion Optimization
2. Cogeneration Opportunities And Case Study
3. Waste Heat Recovery

Mr. Tsukasa Saito, Senior Engineer, Air Compressor System Division, Hitachi Industrial Equipment System Co.,Ltd.

He has more than 40 years of abundant experience with air compressor, including design, quality assurance (warranty), after-sale service, business consultation, etc. He has also been working to disseminate the concept of energy-saving by giving lectures, as well as applying energy saving methods and making energy-saving proposals for more than 10 years. He delivered the lecture on:



- Energy Saving and Environmentally Friendliness of Air Compressors
- Energy saving of the air pressure system



Mr. T.S. Narayanan, Director, National productivity council, RPMG - Mumbai has more than 27 years of experience in the field of energy audit. His experience cover the areas of energy efficiency, energy audit of electrical systems, compressor, blowers, etc.

During the workshop he delivered the excellent presentations on

- Electrical Energy Efficiency Issues In Industries – covering electrical network systems in industry, electrical end use equipments, common electrical equipments, industry specific equipments, electricity vs other energy sources, electricity monitoring & reporting
- Energy Efficiency Issues In Furnaces/Heaters/Dryers

Group Exercise: Case Study

On the 4th day of the workshop, a group exercise was conducted to give better practical exposure. The participants were divided into 6 groups (A to F) with 5-6 participants in each group. A case study of Chemical industry focusing on “Energy Audit of the flash dryer unit” was given to each group with specific question:

- The methodology or step by step approach that you would follow
- Details of measurements to be conducted & locations, with justifications
- Trials if any that you may like to conduct?
- Energy saving options, potential identified
- Any other suggestions, to improve overall productivity & reduce air pollution?



The participants were allowed to present their solution and their solutions were evaluated by other groups. Later, the solutions by FICCI were also discussed.

GLIMPSES OF WORKSHOP



2.9.4 Chennai Workshop (29th Jan – 1st Feb 2014)

On the basis of feedback from the participants of 1st three workshops, the next set of workshops were designed. The next of 3 numbers of workshops were conducted at Chennai, Ahmedabad and Hyderabad during the Jan – Feb 2014 period.

2.9.4.1 Chennai Workshop Inaugural Session:

The forth workshop (first workshop of phase – II) was organized at Chennai during 29th Jan – 1st Feb 2014. The Keynote Address was delivered by Mr. Janaki Ram, Addl. Director and CRC, PCRA, during the opening session on 29th Jan 2014. Mr. P Dharmalingam, Director NPC Chennai, during his special address discussed about “**Global Energy Issues and Need for Energy Efficiency & Renewable Energy**”



Mr. A Janaki Ram, Addl. Director & CRC, PCRA

Mr. P Dharmalingam, Director, National Productivity Council, Chennai



The program schedule is enclosed in [annexure 10](#)

2.9.4.2 Highlight of few Presentations at Chennai



Dr. R Sethumadhavan, is Professor in Dept. of Mechanical Engineering, Anna University. He is bachelor of Technology (Chem Engg) from University of Madras – 1979 and did his Doctorate in Heat & Energy from Indian Institute of Technology (IIT), Bombay in 1983.

Dr. R Sethumadhavan, gave presentation on “Co-generation opportunities – Case study” covering principle of co-generation, types of co-generation and various industrial co-generation case studies. During his case study presentation, he covered various industries such as cement, sugar mill, power plants , etc. He also discussed the feasibility of co-generation in India.

Mr. K R Govindan, is Electrical Engineer with 56 years of experience serving organisations such as in Tamil Nadu electricity board, Surgical Instruments Plant, Madras Fertilizers limited, Petroleum Ministry of Kingdom of Saudi Arabia.

During the workshop, Mr. Govindan shared his experience in the field of Energy and electrical system distribution through a presentation.



Dr. Vijay Kumar Kunche, is Phd in Energy Econometrics from Andhra University. He holds 27 years of experience in in a large Public sector Oil & Gas company, M/s Hindustan Petroleum Corporation Limited in various senior positions handling design, engineering, projects, Energy. Currently he is Managing Director of First ESCO India Pvt. Ltd. From past 6 years.

He gave presentation on “Low temperature waste heat recovery options”

GLIMPSES OF WORKSHOP



2.9.5 Ahmedabad Workshop (12th – 15th Feb 2014)

2.9.5.1 Ahmedabad Workshop Inaugural Session:

The fifth workshop was organized at Ahmedabad during 12th – 15th Feb 2014. The Keynote Address was delivered by Mr. Raju Pandya, Senior Executive, Gujarat Energy Development Authority (GEDA), during the opening session on 12th Feb 2014. Mr. Alpesh Pandya, Chairman, SEEM – Gujarat Chapter delivered the special address.



Mr. Raju Pandya, Sr. Executive – GEDA



Mr. Alpesh Pandya, Chairman, SEEM – Gujarat Chapter



The program schedule is enclosed in [annexure 11](#)

2.9.5.2 Highlight of few Presentations at Ahmedabad



Mr. Shishir Athale heads Sudnya Industrial Services Pvt. Ltd., an Energy Services Company. Prior to starting Sudnya Shishir was with Thermax Ltd where he was in the Combined Heat and Power Systems Division (now Cogen Division) and with Thermax Energy Performance Services Ltd.

He was one of the core faculty, he handled following topics during the workshop:

- EE issues in Boilers and Steam systems
- Co-generation: Case Study
- ENCON opportunities focus on Compressors, Fans and Blowers

He was also the core speaker during the Hyderabad workshop.

Mr. Govind Patel, is CEO – ener'G Consulting, Surat. He has more than 15 year of experience in the field of energy and energy efficiency both nationally and internationally.

During the workshop he gave presentation on:

- Exposure to International case studies and best practices of energy auditing
- Case Study Implementation of Energy Management System ISO 50001 - 2011 at Diamond Factory



Half day demonstration of Mobile Energy Conservation Van

For half day GEDA was requested for the Mobile Energy Conservation Demonstration Van, with the objective to provide the practical knowledge and to demonstrate the actual saving.



The EC Demonstration Van is equipped with working demonstration kits based on some of the vital energy consuming systems, which have a good potential for promoting energy conservation. These include Water Pumping, Lighting and Thermal Insulation Demo kits. The van is also equipped with energy efficient appliances like star rated air-conditioner, ceiling fan and energy monitoring instruments used in the energy auditing process.

GLIMPSES OF WORKSHOP



2.9.6 Hyderabad Workshop (18th – 21st Feb 2014)

2.9.6.1 Hyderabad Workshop Inaugural Session:

The sixth workshop was organized at Hyderabad during 18th – 21st Feb 2014. The Keynote Address was delivered by Mr. P N Rao, Chairman – ECM, The Institution of Engineers (India) and Mr. Shashank Jain, Programme Manager (Industry) delivered the welcome address during the opening session on 18th Feb 2014.



Mr. P N Rao, Chairman – ECM, The Institute of Engineer (India)



Mr. Shashank Jain, Programme Manager, Shakti Foundation

On 19th Feb 2014, **Mr. Chandra Shekara Reddy, CEO, State Energy Conservation Mission, Govt of AP**, delivered the special address to Energy Auditors. He discussed about the current and prospective initiatives taken up by SECM in Andhra Pradesh.



Mr. Chandra Shekara Reddy, CEO, State Energy Conservation Mission, Govt of AP

The program schedule is enclosed in [annexure 12](#)

2.9.6.2 Highlight of few Presentations at Hyderabad

Mr. J Srinivasan, International Copper Association, has over 33 years of industry selling/testing experience on induction motors v-belts & flat belts, lubrication bearing application and condition monitoring. He conducts training & audits on motor driven system & power quality.

Mr. J. Srinivasan is was one of the expert speakers during the workshop. He gave an excellent presentation on “Energy Efficiency issues in Motors and Selection Criteria”



Mr. R. Gopala Krishna, IntelliDecs Private Limited, has about 35 years of experience in the field of maintenance management in reputed organizations like BHEL, HAL, SKF, HMT and SRI up to the year 1991. For the past 20 years he has been associating and carrying out energy audits along with MK. Raju Consultants -Chennai, UVK Associates-Chennai, Center of Plant engineering services- Secunderabad, PCRA - Chennai. He is also an accredited Energy Auditors.



His Specialization is utilities as Compressed air, water pumps, water measurement systems, lubrication, air conditioning equipment. He gave presentation on “Energy Conservation in Compressor and Compressed

Air System” and discussed related case studies.

Mr. Rajesh Rama is Associate Director (Operations & Sustainability) at ISB, Hyderabad. He is Post graduate in Mechanical Engineering with 17 years of industrial experience with various corporate’s like Genpact, Wipro Ltd, JLL, Johnson controls, Voltas Ltd.

Mr. Prem kumar Krishnan is Senior Manager Operations and Sustainability at ISB, Hyderabad. He is an Electrical Engineer; Certified Energy Auditor; and Certified Measurement and Verification Professional (CMVP). Prior joining to ISB he was working with U V Krishna Mohan Rao Associates (UVKA) and his Energy Management consulting experience spans over 100 facilities globally including UAE, Thailand, Indonesia, Nepal, Maldives, Bangladesh and Sri Lanka. During the workshop they discussed the several initiatives taken by ISB, Hyderabad to converse energy in their college.



GLIMPSES OF WORKSHOP



3. Challenges to Achieving the Results

- *Last minute drop-out of speakers* – Qualified and experienced alternative speakers were identified and communicated for their availability in case confirmed speaker not able to make his presence.
- *Dropping of Participants* – To make sure of the participation by energy auditors, a nominal fee was charged which ensured their interest and also confirmed their participation.
- *Organising the workshop clubbed with weekends*: As opined by some of the energy professionals, due to the work commitment and target to complete ongoing assignments, it is difficult for an energy auditor to spare four working days to attend this workshop. It was therefore, the weekends were clubbed in the workshop duration.
- *Selection of Venue*: To provide the practical experience to the energy Auditors at the CETEE, the workshop was repeated at Chennai. And at the other locations either group exercise was conducted or GEDA was requested to bring to venue their Mobile Energy Conservation van for demonstration.

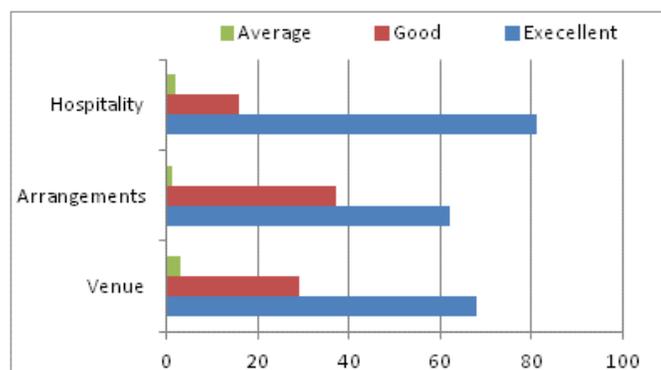
4. Lessons learned

4.1 Participant Feedback

4.1.1 General Feedbacks :

From the analysis of filled in feedback forms the majority of the participants rated the program as excellent. The further break up of analysis shows

- Hospitality : 81 % Excellent and 16 % Good
- Arrangements : 62 % Excellent and 37% Good
- Venue : 68 % Excellent and 29 % Good



4.1.2 Some “Quotes” from the participants:

“Good job of putting this together. Good coverage of topics. It should be conducted in Pune”

“The program of capacity building was an opportunity for me to enhance my skill and learn about many other Energy related field”

“Arranging such workshops yearly”

“Overall the program achieved its objective, giving dimension and perspective to Energy Auditors”

4.1.3 Other Views expressed by Participants :

- **Developing an Energy Auditor Forum:** A forum may be created wherein Energy Auditors, Managers and Accredited Energy Auditors can share their experience, discuss their issues, etc.
- **Energy auditor training and accreditation:** Training should not only cover energy estimating methods, but also technical aspects of improvements, estimating installed costs, and the importance of comprehensiveness. Adequate funding of energy audits

and energy audit programs, to ensure adequate quality and quality control. Measurement and verification of actual energy savings, and feedback to energy auditors about savings

4.1.4 Suggestions for improvement :

The suggestions by the participants about the workshop are as below:

- The participants were also of the opinion of having more such programs in future in tier – II and tier – III cities also.
- Inclusion of a half or full day visit to a Energy Saving Industry or building.
- Some practical aspects, Energy Audit methods and reports may be incorporated
- Presentation on renewable energy and related case study can be included.
- One day visit to conduct Energy Audit with accredited energy auditor in field to some industry may be included.
- Case study of ECBC shall be added.
- Workshop may also be conducted in institutes like IIT, NIT, etc for creating awareness amongst the budding engineers.
- Including the presentation to improve energy efficiency in the field of Transmission and Distribution sector.
- Some presentation on M&V, Policy/regulations may be included in future program.

5. Principal outcomes and Impacts

As desired, these workshops have greatly benefitted 235 participants in updating their knowledge in Energy Efficiency, which also created networking platform with several technology providers and senior energy experts.

5.1 Principal Outcomes

- ***Brushing up/ revising the basic knowledge acquired by energy auditors.***

Few speakers from academic institutes and senior experts were invited to revise basic knowledge on electrical aspects, thermal aspects and financial aspects

- ***Exposure to various successful energy audit case studies in various sectors***

Exposure was provided on various success stories of substantial energy reduction achieved in energy intensive industries, buildings, MSME, etc.

- ***Awareness about various new technologies which could be suggested to achieve further energy reduction***

Exposure was provided on various emerging technologies with lower specific energy consumption which may be suggested to Indian Industries for further reduction on Energy consumption. Technology providers made presentation on their energy efficient technology during the 6 workshops. Some of the technologies were new and innovative for which many interactions happened between the participants and the technology providers.

- ***Exposure to energy management system standard ISO 50001.***

Awareness about Energy Management system standard ISO 50001 was provided during the workshops as per the availability of suitable speaker and various national and international case studies were discussed.

- ***Exposure to international best practices of energy auditing, including use of various softwares.***

Few Energy Auditors conducting international Energy Audits were invited to share international case studies, best practices and methodology followed in developed countries. Few International technology providers were also invited to present international best practices.

- ***Group exercise on energy audit of a live industry case study.***

The group exercise based on live industry case study was run during the workshop and an alternative one day visit to CETEE was included during the Chennai workshops and GEDA, Mobile Energy conservation van was demonstrated at the workshop venue.

- ***Awareness about various new Energy Auditing gadgets.***

Exposure was provided on new Energy Auditing gadgets to conduct Energy Audit which may be adopted by Energy Auditors to conduct Energy Audit with ease and can deliver value added services.

- ***Updation of the PAT scheme current status and expectation from Energy Auditors***

Exposure to PAT current status and increasing the understanding of PAT scheme will help the auditors to fulfill the expectation of DC industry and BEE, MoP and deliver the value added services.

- ***Bridging the gap between senior Energy experts and budding Energy auditors***

In all there were about 20 senior energy experts, who are working in the field of energy auditing for more than 25 years. After these workshops budding energy auditors can discuss their queries and issues with senior Energy Experts.

5.2 Success Indicator

- In all, 312 delegates (235 participants and 77 speakers) participated in the workshop, against the 250 planned delegates.

- More than 90 % of the delegates has rated the workshop as either Good or excellent.

5.3 Impact of the Workshops

Immediate Impact

- The workshops would bring in some sort of uniformity in energy auditing practices followed by different agencies.
- This will help improve the deliverables, especially for projects on energy efficiency which are of importance for the success of energy conservation efforts on a larger scale in the country

Issues evolved requiring policy change:

- **More numbers of Centre of Excellence for Training in Energy Efficiency (CETEE):** CETEE in Chennai developed by National Productivity Council in association with NEDO, Japan is a unique facility bridging the gap between energy efficiency theory and practice using the state-of-the-art technology from Japan. Developing more such facilities in other states of India will help the Energy professionals and auditors get hand-on training and learn from live demonstration of Energy Saving Techniques and Technology.
- **Tax exemptions on Energy Auditing Gadgets:** For the procurement of energy auditing gadget, **Tax exemption** may be given to Energy Auditors.

In nutshell the broader objective of conducting these workshops to help build the capacity of Energy Auditors has been achieved, which ensures the success of these workshops.

Many participants have expressed their views that more numbers of such workshops are required to be conducted regularly to refresh and enhance the knowledge and to cover more number of Energy Auditors.

ANNEXURE

Annexure 1: Survey Questionnaire

Capacity Building Program for Energy Auditors - Online Survey Form

Name _____ Designation _____
Contact No. _____ Email Id _____
Organization _____

1) Experience in the field of:

- a. Energy _____
b. Non Energy _____

2) Total Number of Core Energy Audits conducted?

3) How is your involvement in Energy Audits?

a) Active b) Partial

4) Are you BEE Certified Energy Auditor/Manager?

a) Yes b) No

5) Where do you see yourself after 5years?

a) In core Energy Auditing Field b) In Energy Consultancy Field

6) Would you like to attend a Capacity Building training to upgrade your knowledge in the field of Energy?

a) Yes b) No

7) Is there anything in particular you would like us to address in this Capacity Building training?

- a. Advancement in Energy Efficient Technologies
b. Practical Experience
c. Review of Fundamentals (Thermal/Electrical)
d. Report Writing skills
e. Other _____

8) What is your location preference?

- a. Delhi
b. Chennai
c. Mumbai
d. Hyderabad
e. Other _____

Annexure 2: Compiled responses received from energy auditors through online survey

Name	Organisation	Designation	Email Id	Total Experience in the Field of Energy	Are you BEE Certified Energy Auditor/Manager?	How is your involvement in Energy Audits?	Total Number of Core Energy Audit conducted	Where do you see yourself after 5 years?	Would you like to attend a Capacity Building training	Is there anything in particular you would like us to be address in this Capacity Building training?	Which is your preferred location to attend the workshop?
Pawan Tiwari	teri	fellow	erpawanktiwari@live.in	10-15 Year	Yes	Active	128	In Energy Consultancy	Yes	Advancement in Energy Efficient Technologies	Delhi
Ravikiran	Blue Star Ltd	Asst. Manager	ravikiranbamane@bluestarindia.com	5-10 Year	Yes	Active	over 120 numbers	In core Energy Auditing field	Yes	Advancement in Energy Efficient Technologies	Mumbai
Pramod N Daspute	ARS Energy Auditors	Senior consultant	pramoddaspute@rediffmail.com	0-5 Year	Yes	Active	10	In Energy Consultancy	Yes	Advancement in Energy Efficient Technologies, Review of Fundamentals (Thermal/Electrical)	Mumbai
SACHIN KUMAR VERMA	SIDBI	ENERGY EFFICIENCY EXPERT	sachinv@sidbi.in	5-10 Year	Yes	Partial	>20	In Energy Consultancy	Yes	Advancement in Energy Efficient Technologies, Practical Experience, Review of Fundamentals (Thermal/Electrical), Report Writing skills	Delhi
Rajneesh kumar	AMTL, Noida	Sr.Executive	rajneesh.rdipl@gmail.com	0-5 Year	No	Active	23	In core Energy Auditing field	Yes	Advancement in Energy Efficient Technologies, Practical Experience	Delhi
Yogesh	AMTL	AVP	yogesh.gupta@pkrgroup.in	10-15 Year	Yes	Active	60	In Energy Consultancy	Yes	Advancement in Energy Efficient Technologies	Delhi
Samir Dnyaneshwar	Honeywell Automa	energy analyst	samir.gaykar@gmail.com	5-10 Year	Yes	Active	50	energy performance contracting	Yes	Advancement in Energy Efficient Technologies, Practical Experience,	Mumbai

Name	Organisation	Designation	Email Id	Total Experience in the Field of Energy	Are you BEE Certified Energy Auditor/Manager?	How is your involvement in Energy Audits?	Total Number of Core Energy Audit conducted	Where do you see yourself after 5 years?	Would you like to attend a Capacity Building training	Is there anything in particular you would like us to be address in this Capacity Building training?	Which is your preferred location to attend the workshop?
Gaykar	tion India Ltd Pune									Review of Fundamentals (Thermal/Electrical), Report Writing skills, energy performance contracting case study	
PANDIYAR AJAN.S	ADVANCE METERING TECHNOLOGY LIMITED	ASSISTANT MANAGER	pandiyar ajan.s@p krgroup.in	0-5 Year	Yes	Active	37	In core Energy Auditing field	Yes	Advancement in Energy Efficient Technologies, Practical Experience	Delhi
Deepa S Kumar	UNDP	Asst.Program Manager	kumar.deepa@undp.org	5-10 Year	Yes	Partial	5	In Energy Consultancy	Yes	Advancement in Energy Efficient Technologies, Review of Fundamentals (Thermal/Electrical)	Delhi
SURESH BABU B V	OTTOTR ACTION S	ACCREDITED ENERGY AUDITOR	sureshbabubv@gmail.com	10-15 Year	Yes	Active	87	In core Energy Auditing field	Yes	Advancement in Energy Efficient Technologies, Practical Experience, Review of Fundamentals (Thermal/Electrical), Report Writing skills	Delhi
SANJEEV SARBAHI	INDIA GLYCOL S LTD	DGM (Tech serv.)	ssarbahi@yahoo.co.in	5-10 Year	Yes	Partial	N	In Energy Consultancy	Yes	Advancement in Energy Efficient Technologies, Practical Experience, Review of Fundamentals (Thermal/Electrical)	Delhi
Satvinder Singh	EM Project Services	Consultant	emprojec tservices@gmail.com	> 15 Years	Yes	Partial	Three	In Energy Consultancy	Yes	Advancement in Energy Efficient Technologies, Practical Experience, Review of Fundamentals	Delhi

Name	Organisation	Designation	Email Id	Total Experience in the Field of Energy	Are you BEE Certified Energy Auditor/Manager?	How is your involvement in Energy Audits?	Total Number of Core Energy Audit conducted	Where do you see yourself after 5 years?	Would you like to attend a Capacity Building training	Is there anything in particular you would like us to be address in this Capacity Building training?	Which is your preferred location to attend the workshop?
										(Thermal/Electrical), Report Writing skills	
ANIL	GOVERNMENT	Principal	anil9092003@yahoo.com	> 15 Years	Yes	Partial	Walk through Audit	In core Energy Auditing field	Yes	Advancement in Energy Efficient Technologies, Practical Experience	Mumbai
MANOJKUMAR BOREKAR	TUV NORD	HEAD	mborekar@tuv-nord.com	5-10 Year	Yes	Active	20	In core Energy Auditing field	Yes	Advancement in Energy Efficient Technologies, Practical Experience, Review of Fundamentals (Thermal/Electrical), Report Writing skills, ISO50001	PUNE
C K Sharma	Consulting Engineers	CEO	conengr@gmail.com	5-10 Year	Yes	Active	4	In Energy Consultancy	Yes	Why energy efficiency is important?	Delhi
PRAVIN VANAGE	RELIANCE INFRASTRUCTURE	Dy. G.M.	pravin.vanage@relianceada.com	> 15 Years	Yes	Partial	2	In Energy Consultancy	Yes	Advancement in Energy Efficient Technologies, Practical Experience, Review of Fundamentals (Thermal/Electrical), Report Writing skills	Mumbai
N Kiran Kumar	Shalivahana Green Energy Limited	Head-Energy Efficiency & Climate Change	nugurikiran@hotmail.com	10-15 Year	Yes	Active	20	In core Energy Auditing field	Yes	Advancement in Energy Efficient Technologies, Report Writing skills	Hyderabad
sateesh kumar	GAIL(India) Ltd	Sr Manager	sateeshk13@gmail.com	> 15 Years	Yes	Partial	1	energy saving ideas implementation in process plant	Yes	ISO 50001	Delhi
Shaikh	Sams	Consultant	sams586	10-15 Year	Yes	Active	45	ESCO Project	Yes	Practical Experience, M & V	Chennai

Name	Organisation	Designation	Email Id	Total Experience in the Field of Energy	Are you BEE Certified Energy Auditor/Manager?	How is your involvement in Energy Audits?	Total Number of Core Energy Audit conducted	Where do you see yourself after 5 years?	Would you like to attend a Capacity Building training	Is there anything in particular you would like us to be address in this Capacity Building training?	Which is your preferred location to attend the workshop?
Shamser Ali	Consultancy		@yahoo.co.in					Implementation		Protocol used with case studies	
Dr. V. Rajasekaran	PSNA Energy Management and Audit cell, PSNA CET	Professor and Head	rajasekaranvm@gmail.com	5-10 Year	Yes	Active	19	In Energy Consultancy	Yes	Advancement in Energy Efficient Technologies	Chennai
Shankar Halidar	InsPIRE Development Services Pvt. Ltd.	Managing Director	shankar@inspirenetwork.org	> 15 Years	Yes	Active	More than 100	In Energy Consultancy	Yes	Practical Experience, Review of Fundamentals (Thermal/Electrical)	Delhi
ANISHA KATAKI BHATTACHARYA	InsPIRE Development Services Pvt. Ltd.	Program Officer	anisha@inspirenetwork.org	5-10 Year	Yes	Active	more then 25 Energy Audit in buildings and Industries	In Energy Consultancy	Yes	Advancement in Energy Efficient Technologies	Delhi
Amit Kumar Singh Parihar	Inspire Development Services Pvt. Ltd	Sr. Program Officer	amitk@inspirenetwork.org	5-10 Year	Yes	Partial	2	In Energy Consultancy	Yes	Advancement in Energy Efficient Technologies, Practical Experience, Technologies for low grade waste heat recovery	Delhi
PIYUSH PATIDAR	CESR	Project Trainee	piyush.sees@gmail.com	0-5 Year	No	Partial	1	In Energy Consultancy	Yes	Review of Fundamentals (Thermal/Electrical), Report Writing skills	PUNE
ashok buva	TERI	Cluster Leader	an_buva@yahoo.	5-10 Year	Yes	Active	25	In core Energy Auditing field	Yes	Financial analysis knowledge to enable	Pune

Name	Organisation	Designation	Email Id	Total Experience in the Field of Energy	Are you BEE Certified Energy Auditor/Manager?	How is your involvement in Energy Audits?	Total Number of Core Energy Audit conducted	Where do you see yourself after 5 years?	Would you like to attend a Capacity Building training	Is there anything in particular you would like us to be address in this Capacity Building training?	Which is your preferred location to attend the workshop?
			com							writing IGDPs	
arvind bhalerao	MSPGCL	executive engineer	arvbhale rao@gmail.com	> 15 Years	Yes	Active	5	In Energy Consultancy	Yes	Advancement in Energy Efficient Technologies, Practical Experience, Review of Fundamentals (Thermal/Electrical), Report Writing skills	Mumbai
RAJIV BHATNAGAR	JKTYRE & INDUSTRIES	GM QMS & TPM	rajivbhatnagar@ktp.jkmail.com	> 15 Years	Yes	Partial	one	auditing JK Tyres 6 plants 4 locations	Yes	Advancement in Energy Efficient Technologies, Practical Experience, Review of Fundamentals (Thermal/Electrical), Report Writing skills, interview skills with operatives	all above are ok
Murali Samala	Clariant Chemicals India Ltd	Head-Energy project	murali_samala@rediffmail.com	5-10 Year	Yes	Active	2	In Energy Consultancy	Yes	Advancement in Energy Efficient Technologies, Practical Experience, upcoming Laws, expected tariff changes, commercial opportunities	Mumbai
varun	Eid Parry India Ltd	Deputy Manager	jpvarun@gmail.com	0-5 Year	No	Partial	2	Costing	No	Advancement in Energy Efficient Technologies, Practical Experience	Chennai
SABYASACHI DHAR	BUREAU OF INDIAN STANDARDS	DEPUTY DIRECTOR	dharsabyasachi1@rediffmail.com	0-5 Year	Yes	Partial	1	In core Energy Auditing field	Yes	Advancement in Energy Efficient Technologies, Practical Experience, Review of Fundamentals (Thermal/Electrical)	Delhi
M Sivanesan	Grundfos Pumps	Manager - Energy Audit	sivanesan@grundfos.com	10-15 Year	Yes	Active	250	In Energy Consultancy	Yes	Advancement in Energy Efficient Technologies	Chennai

Name	Organisation	Designation	Email Id	Total Experience in the Field of Energy	Are you BEE Certified Energy Auditor/Manager?	How is your involvement in Energy Audits?	Total Number of Core Energy Audit conducted	Where do you see yourself after 5 years?	Would you like to attend a Capacity Building training	Is there anything in particular you would like us to be address in this Capacity Building training?	Which is your preferred location to attend the workshop?
	India Private Limited		fos.com								
gulshan kumar anand	self	consultant	gka999@hotmail.com	> 15 Years	Yes	Active	more than 10	In core Energy Auditing field	Yes	Advancement in Energy Efficient Technologies	Hyderabad
Dinesh	Grundfos Pumps (I) Pvt. Ltd	Dy Mngr - Energy Audit	dinesh@grundfos.com	10-15 Year	No	Active	200	In Energy Consultancy	Yes	Advancement in Energy Efficient Technologies, Review of Fundamentals (Thermal/Electrical), Report Writing skills	Mumbai
Shashibhushan Subhash Agrawal	AEEE Consultancy Services	Chief Energy Auditor	shashi@aeec.com	10-15 Year	Yes	Active	300	In core Energy Auditing field	Yes	Advancement in Energy Efficient Technologies, Practical Experience, Basic Low cost / No Cost Measures	Nagpur
VASIYANI BHAVESH THADHARAM	ELECTRICAL RESEARCH & DEVELOPMENT ASSOCIATION	ASST. MANAGER	gurpreet.grewal@erda.org; rakesh.patil@erda.org; erda@erda.org; vasiyani_bhavesh@yahoo.co.in	5-10 Year	Yes	Active	80	In Energy Consultancy	Yes	Practical Experience	Vadodara, Gujarat
RAJUBHAI SHAH	ESCON TECH	CHIEF CONSULTANT	rkescon@rediffmail.com	> 15 Years	Yes	Active	350	In core Energy Auditing field	Yes	Advancement in Energy Efficient Technologies, Practical Experience, Report	Mumbai

Name	Organisation	Designation	Email Id	Total Experience in the Field of Energy	Are you BEE Certified Energy Auditor/Manager?	How is your involvement in Energy Audits?	Total Number of Core Energy Audit conducted	Where do you see yourself after 5 years?	Would you like to attend a Capacity Building training	Is there anything in particular you would like us to be address in this Capacity Building training?	Which is your preferred location to attend the workshop?
										Writing skills	
PNBV CHALAPATHI RAO	MNRE	scientist	PNBV@REDIFFMAIL.COM	0-5 Year	Yes	Partial	60	In core Energy Auditing field	Yes	Advancement in Energy Efficient Technologies, Practical Experience	Delhi
Ravindra Datar	senergy Consultants Pvt Ltd	Director	ravindra.datar@gmail.com	> 15 Years	Yes	Active	850	In core Energy Auditing field	Yes	Advancement in Energy Efficient Technologies	Mumbai
P.NAGABHUSHAN RAO	PALADUGU ENGINEERS PVT.LTD	Managing Director	paladugu epl@gmail.com	5-10 Year	Yes	Active	One	In Energy Consultancy	Yes	Advancement in Energy Efficient Technologies, Practical Experience	Hyderabad
Laxesh Kumar Sharma	Grundfos Pumps India Private Limited	Engineer Energy Audit	laxesh@grundfos.com	0-5 Year	No	Active	60	In core Energy Auditing field	Yes	Advancement in Energy Efficient Technologies, Practical Experience, Review of Fundamentals (Thermal/Electrical), Report Writing skills	Delhi
Ameet	Ameet Jain & Associates	Energy Auditor	ameetjain07@gmail.com	5-10 Year	Yes	Active	15	In Energy Consultancy	Yes	Advancement in Energy Efficient Technologies, Practical Experience, Discussion on Policies framed by BEE	Raipur
Vishwas W. Naware	Energyc a	Proprietor	naware_vishwas@vsnl.net, info@energyc.a.in	5-10 Year	Yes	Active	Nil	Proprietary to a Ltd. company	Yes	Advancement in Energy Efficient Technologies	Mumbai
S P	IT	Director	ranadein	> 15 Years	Yes	Active	ten of SMEs	Training	Yes	Advancement in Energy	PUNE

Name	Organisation	Designation	Email Id	Total Experience in the Field of Energy	Are you BEE Certified Energy Auditor/Manager?	How is your involvement in Energy Audits?	Total Number of Core Energy Audit conducted	Where do you see yourself after 5 years?	Would you like to attend a Capacity Building training	Is there anything in particular you would like us to be address in this Capacity Building training?	Which is your preferred location to attend the workshop?
RANADE	Power Consulting P Ltd		dia@gmail.com				Foundry and Food			Efficient Technologies, Software Programs for Energy Metering;SCADA	
Vinay Mulay	Green Flame Private Limited	Director	greenflamecon@gmail.com	0-5 Year	Yes	Active	40	In core Energy Auditing field	Yes	Advancement in Energy Efficient Technologies, Practical Experience	Pune
SOM DERASHRI	Academy for Conservation of Energy	CEO	som_derashri@rediffmail.com	> 15 Years	Yes	Active	200	In Energy Consultancy	No	Advancement in Energy Efficient Technologies, CO GENERATION & NON CONVENTIONAL FEASIBILITY	BARODA
VINAY NEVE	L&T Powai Mumbai	Asst. Manager	neve.vinay@larsentoubro.com	0-5 Year	Yes	Partial	0	In Energy Consultancy	Yes	Advancement in Energy Efficient Technologies, Practical Experience	Mumbai
Jayant Jain	Stenum Asia	Sr. Project Engineer	jayant.jain@stenum-asia.org	0-5 Year	No	Active	30+	In core Energy Auditing field	Yes	Advancement in Energy Efficient Technologies, Practical Experience, Review of Fundamentals (Thermal/Electrical), Report Writing skills, Should be more practical oriented	Delhi
BHARAT PATEL	DYNAMIC CONSULTANT	PROPRIETOR	dynamic.india@gmail.com	> 15 Years	Yes	Partial	More than 300	In core Energy Auditing field	Yes	Practical Experience	Ahmedabad, Vadodara
Himanshu Shekhar	MITCON Consultancy	Project Consultant	himanshu.s@mitconindia.com	0-5 Year	No	Active	20	In Energy Consultancy	Yes	Advancement in Energy Efficient Technologies	Mumbai

Name	Organisation	Designation	Email Id	Total Experience in the Field of Energy	Are you BEE Certified Energy Auditor/Manager?	How is your involvement in Energy Audits?	Total Number of Core Energy Audit conducted	Where do you see yourself after 5 years?	Would you like to attend a Capacity Building training	Is there anything in particular you would like us to be address in this Capacity Building training?	Which is your preferred location to attend the workshop?
	and ENGINEERING Services Ltd.										
vrushali gore	solartech consultancy	dy ceo	solartechconsultancy@gmail.com	5-10 Year	Yes	Active	300	In Energy Consultancy	Yes	Advancement in Energy Efficient Technologies, Review of Fundamentals (Thermal/Electrical)	Nagpur
Kumar S. Pawar	STENUM Asia Sustainable Development Society	Sr. Project Engineer	kumar.pawar@stenum-asia.org	0-5 Year	No	Active	5	In Energy Consultancy	Yes	Advancement in Energy Efficient Technologies, Practical Experience, Report Writing skills	Delhi
Govind Patel	Axiom Global Services LLP	Director	saveenerg@gmail.com	5-10 Year	Yes	Active	more than 75	In Energy Consultancy	Yes	Advancement in Energy Efficient Technologies, Practical Experience, Review of Fundamentals (Thermal/Electrical), Report Writing skills	Mumbai
M.Somasekhararao	APGENCO	Divisional Engineer	soma_vtaps@yahoo.com	10-15 Year	Yes	Partial	Nil	In Energy Consultancy	Yes	Practical Experience	Hyderabad
ankush	great lakes	student	ankushvashisht1987@gmail.com	0-5 Year	No	Partial	0	In Energy Consultancy	Yes	Advancement in Energy Efficient Technologies, Practical Experience, Report Writing skills	Delhi
N.Ravi Shankar	N.RAVIS HANKA	CEO	ravishankar_ener	> 15 Years	Yes	Active	Total 16 Full Comprehensiv	En Ms 50001	Yes	Practical Experience, Report Writing skills, En Ms 50001	Chennai

Name	Organisation	Designation	Email Id	Total Experience in the Field of Energy	Are you BEE Certified Energy Auditor/Manager?	How is your involvement in Energy Audits?	Total Number of Core Energy Audit conducted	Where do you see yourself after 5 years?	Would you like to attend a Capacity Building training	Is there anything in particular you would like us to be address in this Capacity Building training?	Which is your preferred location to attend the workshop?
	R & ASSOCIATES		gyauditor@yahoo.co.in				e Energy Audits Conducted and in addition we are creating awareness by conducting Training to Employees where we conducted Audit . We are En Ms ISO 50001 Lead Auditor				
Bhaskar Raval	Soham Technologies	DIRECTOR	soham.technologies@yahoo.in	> 15 Years	Yes	Active	DURING THE SERVICE MORE THAN 500 AND AFTE RETIREMENT10 NOS	In Energy Consultancy	Yes	Advancement in Energy Efficient Technologies	Mumbai
DIGVIJAY NARAYAN SINGH	NTPC LTD	Dy SUPDT.	dnsingh_2007@rediffmail.com	10-15 Year	Yes	Active	25	In core Energy Auditing field	Yes	Advancement in Energy Efficient Technologies, Practical Experience, Report Writing skills	Delhi
mohamed batcha	UVKAssociates	Energy efficiency Implementation Specialist	batcha@uvka.net	> 15 Years	Yes	Active	5	In core Energy Auditing field	Yes	Advancement in Energy Efficient Technologies	Chennai

Name	Organisation	Designation	Email Id	Total Experience in the Field of Energy	Are you BEE Certified Energy Auditor/Manager?	How is your involvement in Energy Audits?	Total Number of Core Energy Audit conducted	Where do you see yourself after 5 years?	Would you like to attend a Capacity Building training	Is there anything in particular you would like us to be address in this Capacity Building training?	Which is your preferred location to attend the workshop?
R K JAIN	M/s Pranat Engineers Pvt Ltd	VP- TPIEA	rajesh492003@yahoo.com	> 15 Years	Yes	Active	30	In Energy Consultancy	Yes	Advancement in Energy Efficient Technologies, Practical Experience, Report Writing skills	Delhi
S Vikash Ranjan	GIZ	Technical Expert	svikashranjan@gmail.com	> 15 Years	Yes	Partial	10	In Energy Consultancy	Yes	Advancement in Energy Efficient Technologies	Delhi
Kamalesh K Jha	Ashta Dal Services P Ltd	CEO	kkjha65@gmail.com	> 15 Years	Yes	Active	100	In core Energy Auditing field	Yes	Advancement in Energy Efficient Technologies, Practical Experience, Report Writing skills	Delhi
SOMASHISH BISWAS	E-CUBE ENERGY TRADING PVT. LTD.	CONSULTANT - ENERGY ANALYTICS	somashishbiswas.86@gmail.com	0-5 Year	No	Partial	2	In Energy Consultancy	Yes	Practical Experience, Report Writing skills, humidification Systems	Kolkata
PRABIR CHATTORAJ	Ecotech Consultants Pvt Ltd	Director	prabir.chattoraj@gmail.com	> 15 Years	Yes	Active	20	In Energy Consultancy	Yes	Advancement in Energy Efficient Technologies, Review of Fundamentals (Thermal/Electrical)	KOLKATA
MANOJ JAIN	Renewable Energy Dept / HAREDA	Project Officer (RE)	pobhiwani@gmail.com	> 15 Years	No	Partial	0	In Energy Consultancy	Yes	Practical Experience, Renewable Energy Sector	Delhi
ANIL KUMAR KATRAGADDA	GVK ENERGY LIMITED	Assistant Manager (Operations)	sendanilk@yahoo.co.in	5-10 Year	Yes	Partial	3	In core Energy Auditing field	Yes	Advancement in Energy Efficient Technologies, Practical Experience	Hyderabad

Name	Organisation	Designation	Email Id	Total Experience in the Field of Energy	Are you BEE Certified Energy Auditor/Manager?	How is your involvement in Energy Audits?	Total Number of Core Energy Audit conducted	Where do you see yourself after 5 years?	Would you like to attend a Capacity Building training	Is there anything in particular you would like us to be address in this Capacity Building training?	Which is your preferred location to attend the workshop?
I V R Kumar	Maruti Consultants	Chief Executive	ivrkumar_hyd@dataone.in	> 15 Years	Yes	Active	more than 500	In Energy Consultancy	Yes	Advancement in Energy Efficient Technologies	Hyderabad
Binoy Krishna Choudhury	Indian Institute of Social Welfare and Business Management	Professor	binoykchoudhury@gmail.com	> 15 Years	Yes	Active	More than 16	In Energy Consultancy	Yes	Advancement in Energy Efficient Technologies, Practical Experience, PAT cycle implementation with cases	Kolkata
NEERAJ S MENSE	The Energy and Resources Institute (TERI)	Research Associate	neeraj.mense@teri.res.in	0-5 Year	No	Active	Three	In Energy Consultancy	Yes	Advancement in Energy Efficient Technologies, Practical Experience, Review of Fundamentals (Thermal/Electrical)	Delhi
pradeep singhvi	Pricewaterhousecoopers Pvt Ltd. India	Senior Consultant	pradeep.singhvi@gmail.com	0-5 Year	Yes	Active	10	In Energy Consultancy	Yes	Advancement in Energy Efficient Technologies, Practical Experience, Review of Fundamentals (Thermal/Electrical), Report Writing skills	Delhi
Anand Sadagopan	Self Employed	Independent Lead Auditor	anand.sadagopan@yahoo.co.in	5-10 Year	No	Active	2	In core Energy Auditing field	Yes	Advancement in Energy Efficient Technologies, Practical Experience, Review of Fundamentals (Thermal/Electrical)	Mumbai

Name	Organisation	Designation	Email Id	Total Experience in the Field of Energy	Are you BEE Certified Energy Auditor/Manager?	How is your involvement in Energy Audits?	Total Number of Core Energy Audit conducted	Where do you see yourself after 5 years?	Would you like to attend a Capacity Building training	Is there anything in particular you would like us to be address in this Capacity Building training?	Which is your preferred location to attend the workshop?
CHINMOY DUTTA	ENERVISION	PROPRIETOR	chinmoy.dutta@enervisiongroup.com	5-10 Year	Yes	Active	50	In Energy Consultancy	Yes	Advancement in Energy Efficient Technologies	Mumbai
arvind kumar singh raghava	Steag Energy Services India Ltd	Senior Advisor	arvind_raghava@yahoo.com	> 15 Years	Yes	Active	Five	In core Energy Auditing field	Yes	Practical Experience	banglore
ANIL MOHINDRU	NISST	DEPUTY DIRECTOR (E)	anil_mohindru@rediffmail.com	> 15 Years	Yes	Active	Eighty	In core Energy Auditing field	Yes	Advancement in Energy Efficient Technologies, Practical Experience, Report Writing skills, EE IN STEEL INDUSTRY	Delhi
Rakesh Yecho	TMCC	CEO	yechorakesh@gmail.com	> 15 Years	Yes	Active	more than 1000 nos	In core Energy Auditing field	Yes	Advancement in Energy Efficient Technologies	Delhi
Sandeep Pal Singh	National Institute of Secondary Steel Technology	Manager(Tech)	spinghweb@yahoo.co.uk	> 15 Years	Yes	Active	50	In core Energy Auditing field	Yes	Advancement in Energy Efficient Technologies, Practical Experience, Report Writing skills	Delhi

Annexure 3: List of Identified Case Studies and Gadget providers

S. No	Topic	Organisation	Source	Category
1	Life Cycle Cost Reduction in Operation and Maintenance of Air Compressor	Ingersoll Rand	FICCI Seminar on Advanced Air Handling Systems	Case Study
2	Operation & Troubleshooting Of Centrifugal Blowers	Wesman Thermal	FICCI Past Seminar	Case Study
3	Energy Saving Options Through Drive Control Mechanism Compressors And Fans	Bharat Bijli	FICCI Past Seminar	Case Study
4	Case Study on Compressed Air system	PCRA	FICCI Network	
5	Energy Efficient Induction motors for VFD applications	Prime Mover	FICCI Network	EE technology
6	High Energy Efficient Motors	ICPCI	FICCI Network	Case Study
7	Industrial Waste Heat Recovery	ENCON Thermal	FICCI past seminar	EE technology
8	Thermal Insulation System	Llyod Insulation	FICCI Network	EE technology
9	Energy Efficient cooling tower	Paharpur Cooling tower	FICCI past seminar	EE technology
10	Boiler Operation and Evaluation of Efficiency		FICCI past seminar	Case Study
11	ISO 50001, EMS	Amtech Technology	FICCI Network	

Sr. No.	Type of Instrument	Name Company
1	Power Analyzers	Manaco Energy Solutions Pvt. Ltd.
		Fluke
		Circutor
		Kusam Mecco
		Yokogawa
		Chauvin Arnoux

Sr. No.	Type of Instrument	Name Company
2	Flue Gas Analyzer	Testo
		ACE Gas Analyzers Pvt. Ltd.
		Vortex
		AMETEK Instruments India Private Limited/Land
		Anton Industrial Services Ltd
		Reeshoo E Systems
		Fluidyne Instruments Pvt Ltd
3	Fyrite	Coleparker
		Apex Instruments
		Medispec India, Ltd.
4	Contact Thermometers	Testo
		Fluke
		Thermometrics
5	Infrared Thermometers	Fluke
		Testo
		Krishna Scientific Works
		Elab Engineering
		Telelin Instruments
		Maxon Enginners
		Chetas Control System Pvt. Ltd
Toshniwal Systems and Instruments Pvt Ltd		
6	Tachometers	Kusam Mecco
		SKF
		Ambetronics Engineers Pvt. Ltd
		Testo
7	Ultrasonic Leak Detectors	BEKO
		Pulsecho
		Khushboo Scientific PVT. LTD
		SenSol Technologies Pvt. Ltd.
		Intratech Control Engineers
		Kusam Mecco
		Extech
8	Anemometer	Myko
		ACD Machine Control Company Pvt. Ltd.
		Ammonit

Annexure 4: List of Participants

S. No	Title	Name	Surname	Designation	Orgnisation
1.	Mr.	V.	Sreedhar		A.P. Transco
2.	Mr.	Sanjay	Gadhalay	Director	Abacus Infrastructures Pvt. Ltd.
3.	Mr.	C S	Prakash		ABB India Ltd.
4.	Mr.	Naveen	Bhutani	Scientist	ABB Ltd.
5.	Mr.	Nisarg	patel	AGM	Adani Power
6.	Mr.	Vijay	Bansal	Manager-Mechanical	Aditya Birla Mgmt Corp Pvt Ltd
7.	Mr.	Atul	Joshi	Dy. Manager	Aditya Birla Mgmt Corp Pvt Ltd
8.	Mr.	MD Vinoth	Kumar	Partner	ADS Associates
9.	Mr.	S.	Judson	Jt. General Manager Engg. (Elect.)	Airports Authority of India
10.	Mr.	R.	Mahalingam	DGM (Engg-Electrical)	Airports Authority of India
11.	Mr.	Ashwin	Jayaram	Research Associate	Alliance Foranenergy EfficientEconomy
12.	Mr.	Ambikeshwar Dayal	Saxena	Consultant	Allied Boston Consultants India Pvt Ltd
13.	Mr.	Paresh	Patel	AGM-Industry Solution	Amtech Electronics (India) Ltd.
14.	Mr.	Vamsi	Moham	Sr. Asst. Director	Andhra Pradesh Productivity Council
15.	Mr.	D. Santosh	Kumar	Asst. Director	Andhra Pradesh Productivity Council
16.	Mr.	AKP	Kovendar	Research Scholar	Anna University
17.	Dr.	C.	Sharmeela	Asst. Prof.(SR.)(Gr.) in EEE	Anna University
18.	Mr.	Vikas	Kumar	Sr.Executive Engineer	Apcp, Abudhabi
19.	Mr.	P. Ashok	Kumar	Consultant -Energy Mangement	Apitco Limited
20.	Mr.	D. Gopala	Rao	Sr. Consultant	Apitco Limited
21.	Mr.	VS	Parthiban	Jr. Technical Expert	Assist
22.	Mr.	P R	Rajkamal	Energy Engineer (Technical Expert)	Assist
23.	Mr.	Kamalesh Kumar	Jha	CEO	Astha Dal Services Pvt Ltd
24.	Mr.	Anti Kumar	Agarwal	Asstt Manager	Atandra Energy Pvt Ltd
25.	Mr.	P	Velavan	Manager-Sales	Atandra Energy Pvt Ltd
26.	Mr.	V.	Sridhar	Engineer -Projects	Atandra Energy Pvt. Ltd.
27.	Mr.	Ashok	KMP	Project Engineer	Athul Energy Consultats
28.	Mr.	Anoop M.	Kumar	Consulting Engineering	Athul Engineering
29.	Mr.	A	Santhosh	Energy Auditor	Athul Engineering Systems and Energy Consultants
30.	Ms.	Madhusmita	Beura		Automation System

S. No	Title	Name	Surname	Designation	Orgnisation
					Engineers Pvt. Ltd.
31.	Ms.	Bhrugen	Shah		Automation System Engineers Pvt. Ltd.
32.	Mr.	J. Gladstone	Evans	Senior Manager-Thermal	Avant-Garde Engineers and Consultants (P) Ltd.
33.	Mr.	C.	Damodaran	Senior Manager-Services	Avant-Garde Systems and Controls (P) Ltd.
34.	Mr.	Anthony D	Raj	Manager	Bharti Airtel Ltd.
35.	Mr.	S. K.	Choudhary	Sr. Manager(Electrical)	Birla Corporation Ltd.
36.	Mr.	Vivek	Mathur	Mgr. (TPP)	Birla Corporation Ltd.
37.	Mr.	SK	Sahni	Consultant C&S Electric	C&S Electric
38.	Mr.	M. P.	Ramakrishnan		Cauvery Marketing Company
39.	Mr.	Vivek	Gilani	MD	Cbalance & Solutions Pvt Ltd
40.	Dr.	G.	Ravikumar	Director	Centre for Entrepreneurship Development(CED)
41.	Mr.	Sanil	Kollara	Project Engineer (Energy)	Centre for Sustainable Development (CSD)
42.	Mr.	P.K.	Venkatesh	Executive Engineer (EI), Energy Billing	Chamundeshwari Electricity Supply Cororation Ltd.
43.	Ms.	Kanchan	Sharma	Assistant Engineer	Chhattisgarh State Renewable Energy Development Agency (CREDA)
44.	Mr.	A. D.	Thirumoorthy	Energy Consultant	Consultant
45.	Mr.	Er. Sunil (Suny) A.	Pedgaonkar		Consulting Engineer
46.	Mr.	S	Venkatesan	Manager-Electrical	Coromandel International Ltd
47.	Mr.	N Sasi	Kumar	Dy. Manager	Coromandel International Ltd
48.	Ms.	Rajeev	Gyani	Executive Engineer	CREDA
49.	Mr.	A. P.	Rudradas	Principal Technical Officer	CSIR
50.	Dr.	E.	Ravindranath	Senior Principal Scientist	CSIR-Central Leather Research Institute
51.	Mr.	Nikhil S	Joshi	Asstt Manager (Inst)	CTES, Aditya Birla Group
52.	Mr.	Manjunatha	Janekunte	Manager-Service	Danfoss Industries Pvt. Ltd.
53.	Mr.	Ankit	Tripathi		Dantech Engineers Pvt. Ltd.
54.	Mr.	A.Subrahamanya	Sarme	Sr.Manager (TechnicalServices)	Deepak Nitrite Ltd.
55.	Mr.	Rajendra D.	Shah	Sr. Manager Electrical	Deepak Nitrite Ltd.
56.	Mr.	Kumar S.	Gogate	Manager-Engineering	Deepak Nitrite Ltd.
57.	Mr.	M.R.K. Mohan	Roy	Dy. General Manager(Engg.)	Delta Paper Mills Ltd.
58.	Mr.	Niraj	Kapoor	Chief Engineer	Directorate of Energy
59.	Mr.	Er. R.V. Ramana	Rao	Lead Auditor	Divisional Engineer
60.	Mr.	Bharat	Patel		Dynamic Consultant
61.	Mr.	V.	Rajavelloo	Asst. Manager-Projects	EDAC Engineering Ltd.

S. No	Title	Name	Surname	Designation	Orgnisation
62.	Mr.	M.A. Sajjad	Ahmed	CEO	EDGE Technologies
63.	Mr.	Anil Kumar	Kohli	Sustainability Officer	EESSI
64.	Mr.	Alpesh	Pandya		Electrical Consultant & Contractor
65.	Mr.	G Sathes	Kumar	Asstt Electrical Inspector/Technical	Electrical Inspectorate
66.	Mrs.	R.	Rajalakshmi	Junior Electrical Inspector	Electrical Inspectorate
67.	Mrs.	R.	Sujatna	Junior Electrical Inspector	Electrical Inspectorate
68.	Mr.	Tal	Tenappan	Electrical Inspector	Electrical Inspectorate, SDA, Govt of India
69.	Mr.	P	Manohar	Electrical Inspector	Electrical Inspectorate, SDA/TN
70.	Mr.	G	Mani	Dy CEE/GS/HQ	Electrical, Southern Railway
71.	Mr.	Anil P.	Dange	Marketing Engineer	Electronics and Quality Development Centre
72.	Mr.	Satvinder	Singh	Consultant	EM Project Services
73.	Cdr. (Retd)	S	Kumar	Director	Encon Energy Management Services Pvt Ltd
74.	Mr.	S.R.	Varma	Certified Energy Auditor	Encon Envirotech Engineers
75.	Mr.	Yusuf	Bhetasiwala	Director	Encon Expertise Pvt Ltd
76.	Mr.	S. S.	Ali	Certified Energy Auditor	Energy Conservation & Project Management Consultant
77.	Mr.	PP	Mittal	Accredited Energy Auditor	Energy Engineers
78.	Mr.	Vishwas W	Naware	Proprietor	Energyca
79.	Mr.	K.	Aravinth	General Manager Engineering	Enmar GB Power Systems Projects Ltd.
80.	Mr.	N. Ravi	Shankar	Certified Energy Auditor	Envision Educate & Energize
81.	Mr.	P.	Elumalai	Chief Technical Officer	Euphoria Green Technologies
82.	Mr.	TM	Venkatesan	Chairman & Mentor	Focus-5
83.	Mr.	T M	Venkatesan	Chaiman & Mentor	FOCUS-5
84.	Mr.	R. V. Ramana	Rao		Free Lance
85.	Mr.	PN	Parikh	Consultant	GACL, UPL
86.	Mr.	A.	Devendram	Associate Manager- Technical Services	GMR Airport Developers Ltd.
87.	Mr.	Jack. Bernabe	Fernandes	Jr. Engineer	Goa Electricity Department
88.	Mr.	RK	Maheshwari	AGM (O&M-Powerplant)	Godawari Power & Ispat Ltd
89.	Mr.	R Ravi	Rao	Asstt Manager	Godawari Power & Ispat Ltd (Hira Group)
90.	Mr.	Tushar	Trimbake	Manager	Godrej & Boyce Mfg. Ltd
91.	Mr.	Vinayak N	Khot	Dy. Manager	Godrej & Boyce Mfg. Ltd
92.	Mr.	Ram Kumar	Upadhyay	DGM-Power Plant	Grasim Bhiwani Textiles Ltd
93.	Mr.	Subodh	Bhatt	Asst. Manager-Service	Grundfos Pumps India Pvt. Ltd.

S. No	Title	Name	Surname	Designation	Orgnisation
94.	Mr.	Md.	Ahmed	Deputy Managaer-Utility	Hartex Rubber Pvt. Ltd.
95.	Mr.	Vamsi S	Krishna	Senior Executive Engineering	Hospira Healthcare India Pvt. Ltd.
96.	Mr.	Jagdish C	Bhatt	Chief Engineer	Hotel Parkland
97.	Mr.	Ashish	Kapoor	Sr. Executive Engg	HPSEBL
98.	Dr.	Binoy Krishna	Choudhury	Professor	IISWBM
99.	Mr.	N	Soundararaj	Manager-Process & Proposals	IKN India
100	Mr.	VSR	Sastry	Sr. Tech. Officer	Indian Institute of Chemical Technology
101	Mr.	A. Madhava	Rao	Sr. Tech. Officer	Indian Institute of Chemical Technology
102	Mr.	Dibakar	Behera	General Manager-Electrical	Indian Metals & Ferro Alloys Ltd.
103	Mr.	AK	Singhal	Chief Electrical General Engg	Indian Railway
104	Mr.	Mahendra	Kumar	Sr. DEE/CHG/DLI	Indian Railway
105	Mr.	Sunil	Kumar	Director-Elect Engg/PS	Indian Railway
106	Mr.	Sumit	Garg	Sr. Divisional Electrical Engg/G/NER/Varan	Indian Railway
107	Mr.	CR	Harish	Dy. Chief Electrical Engg/Windmill	Indian Railway
108	Mr.	N Manohar	Rao	Asstt Professor	Indian Railway
109	Mr.	Deepankar	DE	Sr. Professor	Indian Railways Institute of Electrical Engineering
110	Mr.	R	Chandrasekar	Managing Director	Intelesco
111	Mr.	Prakash	Chandran	Value Engineering & Sustainability Lead	Jacobs Engineering
112	Mr.	Lalit	Mohan	Plant Er.	Jai Prakash PowerVentures Ltd.
113	Mr.	Vishwas	Sheode	Sr. ER	Jaiprakash Associates Ltd.
114	Mr.	Suketu	Trivedi	Sr. Manager	Jay Pumps Pvt. Ltd.
115	Mr.	Atanu	Panja	Plant Engr.	Jaypee Group
116	Mr.	I. B.	Chennal	Dy. GM Power Plant	JK Cement Works
117	Mr.	Nilkesh J	Patel	Sr. Engg (Electrical)	JK Tyre & Industries Ltd
118	Mr.	Rakesh	Chaturvedi	Dy. Chief Enginer (Manager)	Jone & Lang Lasalle
119	Mr.	Subrata	Baruah	Manager (Energy Assessment and Solution Cell)	Kirloskar Brothers Ltd
120	Mr.	Amol	Kashid	Associate Manager	Kirloskar Brothers Ltd
121	Mr.	Dharma Tej	Tummala	Asstt Manager	Kirloskar Brothers Ltd
122	Mr.	KM	Vijayakumaran	Sr. Manager	Kozhkkode Dairy (Milma)
123	Mr.	Pranay S	Shete	Asstt Manager (Tech)-Energy Projects	KR Bedmutha Techno Associates Pvt Ltd

S. No	Title	Name	Surname	Designation	Orgnisation
124	Mr.	Mukund V	Bhundare	Sr. VP-Energy	KR Bedmutha Techno Associates Pvt Ltd
125	Mr.	Ranjit	Daimary	Manager (P)	KRIBHCO
126	Mr.	K.	Viswanadham		KV Plant Engineering & Allied Services
127	Mr.	Ramanuj	Yadav	SME-Energy Cons Projects	L&T, IES
128	Mr.	Rakesh	Shah	AGM	L&T-S&L
129	Mr.	A. B	Bhalerao	Executive Director	LCG Energy Consultants Pvt. Ltd.
130	Mr.	T.	Udayakumar	Manager (Design & Business Development)	LRV Engineering Solutions Pvt. Ltd.
131	Mr.	L.	Ravichandran	CEO	LRV Engineering Solutions Pvt. Ltd.
132	Mr.	Prabhat Kumar	Kanoje	District Renewable Energy Officer	M.P. Urja Vikas Nigam Ltd.
133	Mr.	Vijay Singh	Chauhan	Executive Engineer	M.P. Urja Vikas Nigam Ltd.
134	Mr.	Brijesh Kumar	Vyas	DREO	M.P. Urja Vikas Nigam Ltd.
135	Mr.	M	Thangapushparaja	DGM-Maintenance	Mahindra Research Valley, Mahindra & Mahindra Ltd
136	Mr.	K	Sudhakar	Asstt Professor/Energy Centre	Maulana Azad National Institute of Technology
137	Mr.	AC	Verma	Jt. Director General (Utilities)	Military Engineer Services
138	Mr.	Rajeev	Sharma	Energy Auditor & Planner	MM Associates
139	Mr.	C. Indra	Reddy	Busienss Development Engineer	Mohan Marketing Associates
140	Mr.	Avinash	Haval	Manager Engineering	Nagreeka Exports Ltd
141	Mr.	Sandeep Pal	Singh	Manager (T)	National Institute of Secondary Steel Technology
142	Mr.	Anil	Mohindru	Dy. Director (E)	National Institute of Secondary Steel Technology (NISST)
143	Mr.	Nitinkumar Manorbhai	Patel	Production Manager	Nirma Limited
144	Mr.	L. M.	Mavani	Sr. Manager (Power Plant/Utility)	Nirma Limited
145	Mr.	Kamleshkumar V.	Raval	Manager	Nirma Ltd.
146	Mr.	Suresh Chandra	Tiwari	Sr. Divisional Electrical Engg/General/Jhansi	North Central Railway
147	Mr.	NK	Mishra	Divisional Electrical Engg/General	North Central Railway
148	Mr.	RS	Sanyal	National Manager	Nouveau Blue Ocean Consultants
149	Mr.	Raj Kumar	Ram	Sr. Manager	NTPC Ltd.
150	Mr.	Mrinal	Chakravorty	AGM (O&M-EEMG)	NTPC, SIPAT
151	Mr.	D	Karthikeyan	Electrical Inspector	O/o CEIG, SDA

S. No	Title	Name	Surname	Designation	Orgnisation
152	Mr.		Srinivas		ODC Standards Certifications (India) Pvt. Ltd.
153	Mr.	M	Muniyandi	Chief Executive	Ohm Tech Services
154	Mr.	Satinder	Singh	Chief Engineer (Drilling)	Oil & Natural Gas Corporation Ltd.
155	Mr.	Mukesh	Puri	Head of Deptt, MEP	Oris
156	Mr.	Suresh B V	Babu	Accredited Energy Auditor	Ottotractions
157	Mr.	S.	Venketraman	Asst. General Manager	Paharpur Cooling Towers Limited
158	Mr.	K. S. Pavan	Narayan	Dy. Manager-Services	Paharpur Cooling Towers Limited
159	Mr.	Ajith	Kumar K.R.	Addl. Director	PCRA
160	Mr.	Basanth	Kumar T.K.	Joint Director	PCRA
161	Mr.	Rajesh	Mohan	Asst Director	PCRA
162	Mr.	S.P.	Selvam	Additional Director	PCRA
163	Mr.	Sashank M	Herlekar	Addl. Director	PCRA -Petroleum Conservation Research Association
164	Mr.	Sangamesh G.	Sakri	Associate Professor	PDA Colege of Engineering
165	Mr.	M. Jayarami	Reddy	Sr. Manager	Penna Cement Ind. Ltd.
166	Mr.	K.	Ramesh	Energy Manager	Penna Cement Industry Ltd.
167	Mr.	M	Mahesh	Asst. Engineer	Penna Cement Industry Ltd.
168	Mr.	Sammi N.	Reddy	Dy. Manager (Projects)	Penna Cement Industry Ltd.
169	Mr.	Pavithran	Karatha	Asstt General Manager	Penta India Cement & Mineral Pvt Ltd
170	Mr.	Chintan	Patel	Application Engineer-Drive	Pima Controls Pvt. Ltd.
171	Mr.	Revin	Sojitra	Sr. Executive	Pima Energy Pvt. Ltd.
172	Mr.	V.	Karthick		Power House
173	Mr.	Anoop	Kumar	Sr. Engineer (Electrical)	Projects & Development India Ltd
174	Mr.	Yesh Kumar	Gautam	Engineer (Machinery)	Projects & Development India Ltd
175	Mr.	J	Varadarajan	Addl CE (Process)	Projects & Development India Ltd
176	Mr.	R	Rajaram	HOD EEE & Certified Energy Auditor	Rajagopal Polytechnic College
177	Mr.	Chandan B.	Changani	Partner (Electrical)	Reliable Electro Instrument Services
178	Ms.	Rupal	Kesharwani	Area Maintenance Manager	Reliance Industries Ltd.
179	Mr.	Pankaj R	Patel	Sr. Manager (SEZ OPP)	Reliance Industries Ltd.
180	Mr.	Jayesh L	Sakariya	Sr. Manager	Reliance Industries Ltd.
181	Mr.	Nishant	Dash	Manager	Reliance Industries Ltd.
182	Mr.	Rupal	Desharwani	Area Manager Maintenance	Reliance Industries Ltd.

S. No	Title	Name	Surname	Designation	Orgnisation
183	Mr.	Brijesh	Kumar	Inspecting Engineer	RITES Ltd.
184	Mr.	RM	Mayileru	Principal Engineer	RM Mayileru & Co.
185	Mr.	A. Arun	Prakash	Senior Manager	RSM GC Advisory Services Pvt. Ltd.
186	Mr.	M P D	Sundar	Consultant	SAM Engineers & Consultant
187	Mr.	Yashwant Bhavrao	Yadav	Manager Mechanical	Sandvik Asia Pvt Ltd
188	Mr.	SD	Bhattad	CEO	Saurabh Engineering Services
189	Mr.	N Rajendra	Kumar	Executive Electrical Engineer	SC Rly
190	Mr.	Aadarsh		Associate Manager	Sesa Sterlite Ltd, Vedanta, (SSL, Vedanta), IPP (4X600MW)
191	Mr.	Padmanava	Banik	Asst. Manager (Inspection)	SGS India Pvt. Ltd.
192	Mr.	Girish	Majalicar	Regional Manager-South India	Sharda Electronics & Co.
193	Mr.	Ravinder	Vannam	Consultant	Shreenidhi Green Services
194	Mr.	Chinmay	Dave	Senior Executive-Sales	Siemens Ltd.
195	Mr.	Paresh	Prajapati	Senior Executive-Sales	Siemens Ltd.
196	Mr.	Sathya Prashant	Suri	Senior Executive-Sales	Siemens Ltd.
197	Mr.	G	Ilango	Energy Manager, Mech Engineer	Sitra (The South India Textile Research Associate)
198	Mr.	Rajeev	Sharma	Maintenance Head & Energy Manager	SKF India Ltd
199	Mr.	Prasanna	Babu	Regional Sales Manager	Sonel Instruments India Pvt. Ltd.
200	Mr.	Devendra Dutta	Mishra	Sr. Divisional Electrical Engg	South Western Railway
201	Mr.	Alagam Srinivasa	Rao	Certified Energy Auditor	Sree Veedha Services
202	Mr.	Kumar Subhash	Pawar	Technical Expert & Sr. Project Engg	Stenum Asia Sustainable Development Society
203	Mr.	Jayant	Jain	Sr. Project Engg	Stenum Asia Sustainable Development Society
204	Mr.	R.	Deepanraj	Associate Manager	Sterlite Copper
205	Mr.	Sumit N.	Maheshwari	Dy. Manager	Suzlon Energy Ltd.
206	Mr.	T Rama	Krishna	Director-Projects	Synergy Infra Consultants Pvt Ltd
207	Mr.	Shaji K.	Jacob	Lead Technical services	Synthite Industries Ltd.
208	Mr.	G.	Chandramowleeswaran	Sr. Manager(Energy)	Tamilnadu Newsprint and Papers Ltd.
209	Mr.	Bharat S	Yadav	DGM-Electrical	Tata Consulting Engineers Ltd
210	Mr.	Deepak Sadashiv	Bhise	Manager	Tata Power Co. Ltd
211	Mr.	RM	Avadiappan	Chief Engineer Technology	Technip India Ltd
212	Mr.	Naveen	Gupta	Director	Technocrat Alliance Engg Pvt Ltd
213	Mr.	Suvin	Nambiar		Techspine International

S. No	Title	Name	Surname	Designation	Orgnisation
214	Mr.	Atul Kumar	Auti	Research Associate	TERI
215	Mr.	P.	Raji	Asst. Area Sales Manager	Testo India Pvt. Ltd.
216	Mr.	Satish	Kumar S	Research Associate	The Energy & Resources Institute (TERI)
217	Mr.	Rahul Raju	Dusa	Research Associate	The Energy & Resources Institute (TERI)
218	Mr.	Sabreen	Ahmed	Research Associate	The Energy & Resources Institute (TERI)
219	Mr.	Vivek	Sharma	Research Associate	The Energy & Resources Institute (TERI)
220	Mr.	H	Balasubramanian	Scientific Assistant	The South India Textile Research Association (SITRA)
221	Mr.	Mubin V	Desai	Executive Engineer	The Tata Power Co. Ltd
222	Mr.	A. Kishor	Kumar	Senior Engineer -Energy	Thirumalai Chemicals Ltd.
223	Mr.	M U	Thippeswamy	Energy Auditor (DGM-Quality & Test)	Transgear Electrical Services
224	Mr.	Hanumantha	Kumar S	Energy Auditor	Transqean Electrical
225	Mr.	C H Govardan	Reddy	Area Sales Manager	TTL Technologies Pvt. Ltd.
226	Mr.	Akashneel	Banerjee	Asstt Manager	Ultratech Cement Ltd
227	Mr.	Rajesh P.	Soun	Manager (Elec.)	Ultratech Cement Ltd.
228	Mr.	Nikunj B.	Patel	engineer-TPP	Ultratech Cement Ltd.
229	Mr.	SC	Samantaray	DGM (HOD-Technical Service & WCM)	Ultratech Cement Reddipalyan
230	Mr.	Ashok Kumar	Srivastava	Project Officer	UPNEDA
231	Mr.	Manoj Kumar	Jain	Certified Energy Auditor	Usha Management
232	Mr.	V	Prabakaran	Energy Efficiency Implementation Specialist	UV Krishna Mohan Rao Associates
233	Mr.	M.	Vijayakumar	Chartered Engineer	Voltech Engineers Pvt. Ltd.
234	Mr.	Pramod N	Daspute	Energy Auditor	Yajna Fuel Services
235	Mr.	Shailesh Sharan	Srivastava	Program Manager	

Annexure 5: List of Speaker

S. No	Title	First Name	Last Name	Designation	Organisation
1	Mr	S K	Varshney	Director	Academy of Industrial Management
2	Mr.	Jignesh	Patel	Dy. Manager	Amtech Electronics (India) Ltd.
3	Mr	Yogesh	Gupta	AVP-Energy Audit	AMTL
4	Dr	R	Sethumadhavan	Professor i/c, Syndicate	Anna University
5	Mr	Narendra	Babu	Manager	Danfoss Industries Pvt. Ltd.
6	Mr.	Dilip	Varma	Application Engineer	Dantech Engineers Pvt. Ltd
7	Mr.	Harshvardhan	Rai		Dantech Engineers Pvt. Ltd
8	Mr	R	Parman		Devki Energy Consultancy Private Limited
9	Mr	Shishir	Despande		ECIL
10	Mr	Venkatesh	Dwivedi	Senior Manager (Technical)	EESL
11	Mr	P P	Lahiri		EIL
12	Mr.	Alpesh	Pandya		Electrical Consultant & Contractor
13	Mr.	Govind	Patel	CEO	Ener'G Consulting
14	Mr	S.	Mahadevan	Consultant	Energy and Energy Efficiency
15	Mr.	Tarun	Tayal	Senior Manager (BD)	Energy Efficiency Services Ltd.
16	Mr	M A	Patil	Director	FICCI
17	Dr	Vijay Kumar	Kunche	Managing Director	First Esco
18	Mr	P	Athreyan		Fives
19	Mr	Bahadur Shah	Sheik	Manager - Marketing	Fives Combustion Systems Pvt. Ltd.
20	Mr	Girish	Ramamoorthy	Technical Support Specialist	Fluke
21	Mr	A K	Asthana	Senior Technical Specialist	GIZ
22	Mr	Vikas	Ranjan	Technical Expert - PAT	GIZ
23	Mr	Sivanesan	M	Manager - Energy Audit	Grundfos Pumps India Pvt. Ltd
24	Mr	R.	Rangarajan	Director - Service & Training	Grundfos Pumps India Pvt. Ltd.
25	Mr	Raju	Pandya	Sr.Project Executive (EnCon)	Gujarat Energy Development Agency
26	Mr	S P	Garnaik	Head - Energy Efficiency	ICF International
27	Mr	Tsukasa	Saito	Visiting Researcher	IGES
28	Mr	Rabhi	Abdessalem	Senior Policy Researcher	IGES
29	Dr	Bhim	Singh	Head-Electrical	IIT
30	Mr.	K.	Premkumar	Senior Manager – Operations and Sustainability	Indian School of Busienss
31	Mr.	Rajesh	Rama	Associate Director-Operations	Indian School of Busienss
32	Mr.	Er. R. CEA	Gopalakrishana	Adviser	IntelliDecs
33	Mr.	Mohammed	Mohtasib	Consultant	International Copper Promotion Council India
34	Dr	Mukund V.	Bhandare	Sr. Vice President-Energy Projects	K.R.Bedmutha
35	Mr.	Deepak	Sharma		Kittiwake Proactive Technologies Pvt. Ltd.

S. No	Title	First Name	Last Name	Designation	Organisation
36	Mr	Vijayakumaran	K M	Sr.Manager	Kozhikode dairy
37	Mr	B J	Kuppuswamy	(Sr. General Manager)	Lloyd Insulations (India)
38	Mr.	K K	Mitra	Vice President	Lloyd Insulations (India) Limited
39	Mr	Srinivas	N	Technical Director	Lloyd Insulations (India) Ltd.
40	Mr.	G	Sivakumar	Manager-Marketing & Technical	Lloyd Insulations (India) Ltd.
41	Mr	M.V	Ananthakrishna	Director	M K Raju and Consultants
42	Mr	K.R.	Govindan		M/s Kavoori Consultant
43	Mr	J	Srinivasan	CEO	MDS Consultants
44	Mr	Milind	Joshi		Milind Joshi & Associates
45	Mr	Deepak	Jain	Director-Technical	Nalturn Technologies Pvt Ltd
46	Dr.	V J	Lakhera	Professor Mechanical Engineering Dept.	Nirma University
47	Mr	Nagesh	Kumar		NPC
48	Mr	Dharmalingam			NPC
49	Mr	S B	Sadananda	Head & Director	NPC
50	Mr	Shankar	Narayanan		NPC
51	Mr	Mahesh	Kumar	Sr V. P	Paharpur Cooling Tower
52	Mr.	Kunal	Mukherjee	Vice President (South)	Paharpur Cooling Towers Limited
53	Mr.	J. Subhash Chandra	Bose	AGM-Sales (AP)	Paharpur Cooling Towers Limited
54	Mr	Rajeev	Saxena		Paharpur Cooling Towers Ltd.
55	Mr.	Vivek	Gaonkar	AGM - Marketing	Paharpur Cooling Towers Ltd.
56	Mr	Rajendra	Singh		PCRA
57	Mr.	A.	Jankiram	Addl. Director	PCRA
58	Mr	Pushkarraj	Wad		RCF, Chembur
59	Mr.	S	Babu	DGM	Reliance Infrastructure Ltd.
60	Mr	Reghu	Kumar	Area Manager-Certification/GHG services	RINA
61	Mr	Vijay K	Bhatt		Rockwell Automation India Pvt Ltd
62	Mr.	Paresh	Paranjape	Area Manager-Drive	Rockwell Automation India Pvt. Ltd.
63	Mr	Rajiv	Kumar		SIDBI
64	Mr.	A. Chandra Sekhara	Reddy	Chief Executive Officer	State Energy Conservation Mission (SECM) Govt. Of A.P., Hyd.
65	Mr.	Shishir	Athale	Director	Sudnya Industrial Services Pvt. Ltd.
66	Mr	Chetan kumar	Sangole	Fellow Industrial Energy Efficiency Division	TERI
67	Mr.	M. V.	Prasoonan	Branch Incharge-South	Testo India Pvt. Ltd.
68	Mr.	Anand	Patankar	Product Manager-Gas & Particles	Testo India Pvt. Ltd.
69	Mr	Piyush	Patel	Area Manager - West	Testo India Pvt. Ltd.
70	Mr	P N	Rao	Chairman - Energy Conservation Mission	The Institution of Engineers (India)
71	Mr	P	Sridharan	Business Unit Head - Power Quality (IG Division),	TTL Technologies Pvt Ltd

S. No	Title	First Name	Last Name	Designation	Organisation
72	Mr	Rajesh	Tawani	Sr. Product Manager (Inst & TI)	TTL Technologies Pvt Ltd (A Fluke Company)
73	Mr	Vinod	Ludiya		Usha Management Consultant
74	Mr	U V K	Rao	Chief Executive	UVK Rao Associate
75	Mr.	Srihari	K		UVK Rao Associates
76	Mr.	B R Prasanna	Kumar	General Manager-Technical	Vigven Tech Mark Pvt. Ltd.
77	Dr	M G	Gharpore	Director	Yajna Fuel

Annexure 6: List of Table Top Exhibitors

1. Atandra (Krycard)
2. Sonel Instruments India Private Limited
3. TTL Technologies Pvt Ltd (A Fluke Company)
4. TESTO

Annexure 7: Program Schedule-New Delhi

An initiative supported by



Four Day Capacity Building Workshops

for

Practicing Energy Auditors

November 21 – 24, FICCI, Federation House, Delhi



Program Schedule

Day – 1		
	Registration	9:00 hrs- 10:00 hrs
A	Inaugural Session	10:00 hrs – 11: 00 hrs
	Tea Break	11:00 – 11:15
B	Technical Session: B	11:15 hrs – 13:00hrs
B1	<ul style="list-style-type: none"> • Combustion Optimisation aspects • Energy and Mass Balance Mr. R Parman, Devki Energy	11:15-12:45
	Q&A/Discussion	12:45 – 13:00
	Lunch Break	13:00– 14:00
C	Technical Session: C	14:00hrs – 17:30hrs
C1	<ul style="list-style-type: none"> • EE issues in Boiler Turbine Generator • Case Study Mr. Rajendra Singh, PCRA	14:00 - 15:00
	<i>Q&A and Tea Break</i>	15:00 – 15:30
C2	<ul style="list-style-type: none"> • EE issues in Furnaces, Heaters and Dryers • Waste Heat recovery opportunities Mr. R Parman, Devki Energy	15:30 – 16:30
C3	Enhancing Heat Exchanger Effectiveness Mr. S K Varshney, Varshney Academy	16:30 -17:15
	Q&A	17:15 - 17:30
Day – 2		
D	Technical Session-D :	09:30 - 13:00
D1	Role of EESL and ESCO Mechanism Mr. Venkatesh Dwivedi, EESL	09:30 – 10:00
D2	<ul style="list-style-type: none"> • Electrical Aspects in various Industries • Transformer, Maximum Demand Mr. R Parman, Devki Energy	10:00-11:00
	<i>Q&A and Tea Break</i>	11:00 – 11:30
D3	Best Practices and Case study for various sectors Mr. R Parman, Devki Energy	11:30-13:30
	<i>Q&A and Lunch</i>	13:30 – 14:30
E	Technical Session-E:	14:30 - 17:30
E1	<ul style="list-style-type: none"> • EE issues in Cooling Tower • Latest Advancements 	14:30 – 15:30

	Mr. Mahesh Kumar and Rajiv Saxena, Paharpur Cooling Towers	
	Q&A and Tea Break	15:30 – 16:00
E2	EE issues in Motors and Selection criteria for Induction Motors Mr. Srinivasan, Prime Mover	16:00 – 17:15
Day – 3		
F	Technical Session: F	10:00-13:00
F1	Special Address to Energy Auditors Dr. Ajay Mathur, DG-BEE	10:00-11:00
	Q&A and Tea Break	11:00 – 11:15
F2	Latest advancements in Thermal Insulation Mr. K K Mitra, Llyod Insulation	11:15 – 12:00
F3	Issues in preparing bankable DPRs for Energy Efficiency Implementation Projects & related SIDBI schemes Mr. Rajiv Kumar, SIDBI	12:00 – 12:45
	Q&A and Lunch	12:45 – 14:00
G	Technical Session G	14:00 – 17:30
G1	<ul style="list-style-type: none"> • Importance of calibration in EA • Relevance of measurement locations Mr Y C Gupta, AMTL	14:00 - 15:00
G2	Low cost Energy saving potential in MSME's Mr. Vinod K Luhadiya, Usha Management Consultants	15:00 – 15:30
	Q&A and Tea Break	15:30 -16:00
G3	Advancement in VFD for Energy conservation Mr. Vijay K Bhatt, Rockwell Automation India Pvt Ltd.	15:30 – 16:30
G4	Recent Development in Refractory Mr. PP Lahiri, EIL	16:30 – 17:30
	Q&A	16:30 – 17:3 0
Day – 4		
H	Technical Session: H	09:00-13:00
H1	Power Quality improvement and Energy Conservation Dr. Bhim Singh, IIT Delhi	09:00 – 10:00
H2	PAT Target Setting methodology and PAT Normalisation factors to be considered for M&V Mr. A K Asthana and Mr. Vikash Ranjan, GIZ	10:00-11:30
	Q&A and Tea Break	11:30 – 12: 00
H2	Group Exercise and discussions Mr. A K Asthana and Mr. Vikash Ranjan, GIZ	12:00 – 13:00
	Lunch	13:00 – 14:00
I	Technical Session I	14:00 - 17:00
I1	Overview of ISO 50001 and Linkages to M&V Mr Y C Gupta, AMTL	14:00 - 15:00
I2	New opportunities in Energy Auditing Mr. S P Garnaik,ICFI India	15:00 – 16:00
	Certificate Distribution Valedictory Address Mr. M A Patil, FICCI	16:00 – 16:30
	Tea/Coffee	16:30 – 17:00

Annexure 8: Program Schedule-Chennai

An initiative supported by



Four Day Capacity Building Workshops

for

Practicing Energy Auditors

(Non Residential)

28th Nov – 1st Dec, The Residency Tower, Chennai



Program Schedule

Day – 1		
	Registration	09:00 hrs- 10:.00 hrs
	Welcome Address : Mr M.Nandakumar, Senior Vice President – EDAC ENGINEERING LIMITED and Convenor - Energy Panel, FICCI, TN State Council Special Address : Mr P Dharmalingam, Director, Dr. Ambedkar Institute of Productivity, National Productivity Council Keynote Address : Mr S Appavoo, Chief Electrical Inspector, & State Designated Agency for Energy Conservation, Govt of Tamil Nadu Vote of Thanks : Mr M N Girish, Joint Director, FICCI	
	Tea Break	10:45 – 11:00
B	Technical Session: B	11:00 hrs – 13:00hrs
B1	<ul style="list-style-type: none"> • Combustion Optimisation aspects • Energy and Mass Balance • Importance of process Flow diagram in EA Mr. Nagesh Kumar, NPC	11:00-12:45
	Q&A/Discussion	12:45 – 13:00
	Lunch Break	13:00– 14:00
C	Technical Session: C	14:00hrs – 17:30hrs
C1	<ul style="list-style-type: none"> • EE issues in Boilers • EE issues in Steam systems Mr. Nagesh Kumar, NPC	14:00 - 15:00
	<i>Q&A and Tea Break</i>	15:00 -15:30
C2	Co-generation opportunities – Case study Dr R Sethumadhavan, Anna University	15:30 – 16:30
C3	EE issues in Furnaces, Heaters and Dryers Mr. Dharmalingam, NPC	16:30 – 17:30
	Q&A /Discussion	17:30: 17:45
Day – 2		
D	Technical Session-D :	10:00-13:00
D1	Electrical Aspects in Industries, Energy Efficiency issues in Transformers Mr. Govindan, Kavoori Consultant	10:00-11:45
	<i>Q&A and Tea Break</i>	11:45 - 12:00

D2	EE issues in HVAC, cooling tower and AHU Plants Mr. Nagesh Kumar, NPC	12:00-13:00
	Q&A and Lunch	13:00 – 13:40
E	Technical Session-E:	13:40 – 17:30
E1	EE issues Fans and Blowers Mr. Dharmalingam, NPC	13:40 - 14:15
E2	EE issues in Motors, Applications of VFDs Mr. Srinivasan, Prime Mover	14:15 – 15:45
	Q&A and Tea Break	15:45 - 16:00
E3	EE issues in Pumping systems Energy Conservation Opportunities in Pumps Mr. Sivanesan M, Grundfoss Pump Ltd	16:00 – 16:45
E4	Test tools for Effective Energy Audit Mr. P Sridharan, Fluke	16:45 -17:30
	Q&A	17:15 – 17: 30
Day – 3		
F	Technical Session: F	10:00-17:00
	Departure from The Residency tower to AIP-NPC	10:00 hours
	VISIT TO AIP-NPC Ambettur, Chennai Energy Audit Case of Dairy Industry Mr. K.M.Vijayakumaran, MILMA	11:30 – 16:00
Day – 4		
G	Technical Session: H	10:00-13:00
G1	A structured Approach to achieve Energy Savings Mr M.V Ananthakrishna, M K Rao and Consultants	10:00-11:00
	Q&A and Tea Break	11:00 – 11: 30
G2	Latest advancements in Thermal Insulation Mr. B J Kuppuswamy, Llyod Insulation	11:00 – 12:00
G3	Low temperature waste heat recovery options Dr. Vijaykumar Kunche, First ESCO	12:00 – 12:45
	Q&A and Lunch	12:45 – 14:00
H	Technical Session I	14:00 – 16:00
H1	ISO 50001 and Energy Management Mr. Reghu Kumar, RINA	14:00 - 14:30
H2	Renewable Energy Scope In Southern Region with Focus On Bio Energy Mr. S.Mahadevan, Energy and Energy Efficiency	14:30 – 15:15
H3	Q&A and Tea Break	15:15 – 15:30
	Certificate Distribution and Valedictory Remarks, FICCI	15:30 -16:00

Annexure 9: Program Schedule-Mumbai

An initiative supported by



Four Day Capacity Building Workshops

for

Practicing Energy Auditors

(Non Residential)

5th – 8th Dec, Hotel VITS, Mumbai

Program Schedule



5 th Dec (Day – 1)		
	Registration and Tea	10:00 – 11: 00
A	Welcome Address : Mr Shashank Jain, Shakti Sustainable Energy Foundation Keynote Address : Mr. Hemant Patil, Maharashtra State Designated Agency Vote of Thanks : Mr M A Patil, Director, FICCI	11:00 hrs – 11: 30 hrs
B	Technical Session: B	11:30 hrs – 13:00hrs
B1	Combustion Optimisation aspects Mr. S B Sadananda, NPC	11:30 - 13:00
	Q&A/Discussion	13:00 – 13:15
	Lunch Break	13:15– 14:00
C	Technical Session: C	14:00hrs – 17:30hrs
C1	<ul style="list-style-type: none"> • Co-generation opportunities – Case study • Waste Heat recovery opportunities Mr. S B Sadananda, NPC	14:00 - 15:00
	<i>Q&A and Tea Break</i>	15:00 – 15:15
C2	PAT Target Setting methodology and PAT Normalisation factors to be considered for M&V in Thermal Power Plant Mr. A K Asthana, GIZ	15:15 – 16:15
C3	PAT Target Setting methodology and PAT Normalisation factors to be considered for M&V in Cement Plant Mr. Vikash Ranjan, GIZ	16:15 – 17:15
	Q&A	17:15 - 17:30
6 th Dec (Day – 2)		
D	Technical Session-D:	09:00-13:30
D1	Test tools for Effective Energy and power quality Audit Mr. P Sridharan, Fluke	09:00 – 10:00
D2	Energy saving options in compressed air systems Mr Tsukasa Saito, Japan	10:00 - 12:00
	<i>Q&A and Tea Break</i>	12:00 – 12: 15
D3	Secure Power for Industry-Addressing Power Quality issues Mr Shirish M. Deshpande, Energetic Consulting	12:15 – 13: 00
	Q&A and Lunch	13:00 – 14:00

E	Technical Session-E:	14:00 - 17:30
E1	Energy efficiency in Furnaces , heaters, dryers ENCON opportunities in Electrical systems Mr. Shankar Narayanan, NPC	14:00 - 16:00
	Q&A and Tea Break	16:00 – 16:15
E2	Advance Auditing Gadgets, relevance of measurement locations, data interpretation Mr Chetankumar A Sangole, TERI	16:15 – 17:15
	Q&A	17:15 – 17: 30
7th Dec (Day – 3)		
F	Technical Session: F	10:00-13:00
F1	Latest Advancements in Thermal insulation Mr. Abhijeet P Kale, Llyod Insulation	10:00-11:00
F2	Expectation of DC Industry from Energy Auditor Mr. Alkesh Takpere, RCF Chembur	11:00 – 11:45
	Q&A and Tea Break	11:45 – 12:00
F3	Fuel Switching Aspects and Conversion of Boiler to Briquette Fired Dr. M G Gharpure, Yajna Fuels	12:00 - 13:00
	Q&A and Lunch	13:00 – 14:00
G	Technical Session G	14:00 - 16:00
G1	Issues in preparing bankable DPRs for Energy Efficiency Implementation Projects & related SIDBI schemes , SIDBI	14:00 - 14:45
G2	Low cost/No cost energy conservation proposals Mr. Mukund V. Bhandare	14:45 – 15:00
	Q&A and Tea Break	15:00 – 15:30
G3	Situational Analysis Case Study of a Cooling Tower Mr. M A Patil, FICCI	15:30 – 16:00
G4	Simplified MRV methodologies to evaluate emission reduction of installing gas heat pump and electric heat pump in Indian industries- a case study Mr Rabhi Abdessalem, IGES Japan	16:00 – 17:15
	Q&A	17:15 – 17:30
8th Dec (Day – 4)		
H	Technical Session: H	09:00-13:00
H1	EE issues in Motors and Selection criteria for Induction Motors Mr. Srinivasan, Prime Mover	09:00 – 11:00
	Q&A and Tea Break	11:00 – 11: 30
H2	Situational Analysis in Boilers and Group Exercise on DT Boiler Mr. M A Patil, FICCI	11:30 – 13:00
	Lunch	12:45 – 13:30
I	Technical Session I	13:30 - 16:00
I1	Group Exercise on DT Boiler and Presentation by Delegates Mr. M A Patil, FICCI	13:30 - 14:30
	Certificate Distribution and Valedictory Remarks	16:00

Annexure 10: Program Schedule-Chennai

An initiative supported by



Four Day Capacity Building Workshops

for

Practicing Energy Auditors

29th Jan – 1st Feb 2014, Hyatt Regency, Chennai



Program Schedule

Day – 1 : 29 th Jan 2014		
	Registration	09:00 hrs- 10:00 hrs
	Opening Session	10:00 – 10:30
	Tea Break	10:30 – 10:45
Session	Topics	Duration
A 1	Combustion Optimisation EE issues in Boilers and Steam systems Mr. Nagesh Kumar, NPC	10:45-12:15
A2	Innovative Energy Saving technologies for Cement and Iron & Steel Sector Mr. P Athreyan, Fives	12:15 – 13:15
	Lunch Break	13:15– 14:00
B 1	Co-generation opportunities – Case study Dr R Sethumadhavan, Anna University	14:00 - 15:00
	Tea Break	15:00 -15:30
B 2	Energy Saving Opportunities in CCPP Mr. S. BABU, Reliance infrastructure ltd	15:30 – 16:45
B 3	Total Energy Management in Commercial Buildings – Award Winning Case Studies Mr. U.V. K Rao, U V K Associates	16:45 – 17:30
Day – 2 : 30 th Jan 2014		
C 1	Energy Saving in Electrical Utilities: Distribution System and Transformers Mr. Govindan, Kavoori Consultant	09:30-10:45
	Tea Break	10:45 - 11:00
C 2	Case Study focusing on HVAC and AHU Mr. Nagesh Kumar, NPC	11:00-12:00
C3	VFD: Applications, Limitations and Advancements Mr. Narendra Babu, Danfoss	12:00 – 13:00
	Q&A and Lunch	13:00 – 14:00
D 1	Energy Conservation Mr. M Prasoonan, Testo India Pvt. Ltd.	14:00 – 14:30
D 2	Energy Efficiency issues in Motors and Selection Criteria Mr. J Srinivasan, International Copper Association	14:30 - 16:00

	Tea Break	16:00 – 16:15
D 3	Nansulate - Nanotechnology based insulating and protective coatings - A New Concept Mr. Deepak Sharma, Dantech Engineers Pvt. Ltd	16:15 – 17:00
Day – 3: 31st Jan 2014		
Visit To Centre of Excellence for Training in Energy Efficiency		
	Departure for Visit (Assemble at Hyatt Regency, T Nagar)	09:00 hours
E 1	Practical Exposure at Centre of Excellence for Training in Energy Efficiency, Ambattur Industrial Estate, Chennai	10:00 – 17:00
Day – 4: 1st Feb 2014		
F 1	Upgraded Insulation System - Recent Developments In Thermal Insulation System In Industry Mr. G Sivakumar, Lloyd Insulation	09:30 - 10:45
	<i>Tea Break</i>	10:45 – 11:00
F 2	Energy Conservation Strategies In Cooling Towers Mr. Kunal Mukherjee, Paharpur Cooling Towers	11:00 – 12: 00
F 3	A structured Approach to achieve Energy Savings Mr. M.V Ananthakrishna, M K Rao and Consultants	12:00 – 13:00
	Q&A and Lunch	<i>13:00 – 14:00</i>
G 1	Low temperature waste heat recovery options Dr. Vijaykumar Kunche, First ESCO	14:00 - 15:00
	Concluding Remarks and Certificate distribution	15:00 -16:00
	Tea and Networking	16:00

Knowledge Partner



during



JANUARY 16-31, 2014

Annexure 11: Program Schedule-Ahmedabad

An initiative supported by



Capacity Building Workshops

for

Practicing Energy Auditors

12th – 15th Feb 2014, The Pride, Ahmedabad

Program Schedule



12th Feb (Day – 1)		
	Registration	09:00 – 10:00
	Welcome Address : FICCI Keynote Address : Mr. Raju Pandya, Sr. Project Executive, GEDA (State Designated Agency, Govt of Gujarat) Special Address : Mr. Alpesh Pandya, Chairman, SEEM Gujarat - Ahmedabad Vote of Thanks : FICCI	10:00 hrs – 10:45hrs
	<i>Tea Break</i>	10:45 – 11:00
A1	EE issues in Boilers and Steam systems Mr. Shishir Athale, Sudnya Industrial Services Pvt Ltd	11:00 – 12:15
A2	Burner Optimisation and specialised burners Mr. Bahadur Shah Sheik, Fives combustion Systems Pvt Ltd	12:15 – 13:00
	<i>Lunch Break</i>	13:00 – 14:00
B1	Co-generation: Case Study Mr. Shishir Athale, Sudnya Industrial Services Pvt Ltd.	14:00 – 15:30
	<i>Tea Break</i>	15:30 – 15:45
B2	Latest advancements in Thermal insulation Dr. Vikas Lakhera, Nirma University	15:45 – 16:45
B3	Nansulate - Nanotechnology based insulating and protective coatings - A New Concept Mr. Harshvardhan Rai, Dantech Engineers Pvt. Ltd	16:45 – 17:15
13th Feb (Day – 2)		
B1	ENCON opportunities focus on Compressors, Fans and Blowers Mr. Shishir Athale, Sudnya Industrial Services Pvt Ltd	10:00 – 11:15
	<i>Tea Break</i>	11:15 – 11:30
B2	New Avenue for Energy Auditing: Thermography Mr. Rajesh Tawani, Fluke	11:30 – 12:15
B3	Latest Instruments Technology for Energy Conservation Mr. Piyush Patel, Testo	12:15 – 13:00
	Q&A and Lunch	13:00 – 14:00
C1	EE issues in Motors , Selection criteria for Induction Motors Mr. Srinivasan, International Copper Association	14:00 - 16:00
	Q&A and Tea Break	16:00 – 16:15
C2	VFD: Applications, Limitations and Advancements	16:15 – 17:15

	Mr. Paresh M Paranjape, Rockwell Automation	
14th Feb (Day – 3)		
D1	Exposure to International case studies and best practices of energy auditing Mr. Govind Patel, Ener'G Consulting	10:00-11:00
D2	Innovative Energy Saving technologies for Cement and Iron & Steel Sector Mr. P Athreyan, Fives	11:00 – 12:00
	Tea Break	12:00 – 12:20
D3	Magnadrive Mr. Vinod Malhotra, AVJ Engineering	12:20 - 13:00
	Lunch	13:00 – 14:00
E1	Energy Performance Analysis of Pumping system Mr. R. Rangarajan, Grundfos	14:00 - 15:00
E2	Energy Saving with Coal Gasification Technology Mr. Deepak Jain, Nalern Technologies Pvt Ltd	15:00 – 16:00
	Tea Break	16:00 – 16:30
E3	Case Study Implementation of Energy Management System ISO 50001 - 2011 at Diamond Factory Mr. Govind Patel, Ener'G Consulting	16:30 – 17:15
	Q&A	17:15 – 17:30
15th Feb (Day – 4)		
F1	PQ: Cause, effect and Mitigation Mr. Jignesh Patel, Amtech	09:30 – 10:30
F2	PAT Target Setting methodology and PAT Normalisation factors to be considered for M&V in Thermal Power Plant Mr. A K Asthana, GIZ	10:30 – 11:30
	Tea Break	11:30 – 12:00
F3	PAT Target Setting methodology and PAT Normalisation factors to be considered for M&V in Cement Plant Mr. Vikash Ranjan, GIZ	12:00 – 13:00
	Lunch	13:00 – 14:00
G1	Group Exercise of Chemical Industry FICCI	14:00 – 14:30
G 2	Presentation by Delegates and Solution discussion FICCI	15:30 – 16:00
	Certificate Distribution and Valedictory Remarks	16:00 onwards

Annexure 12: Program Schedule-Hyderabad

An initiative supported by



Four Day Capacity Building Workshops

for

Practicing Energy Auditors

18th – 21st Feb 2014. Taj Deccan, Hyderabad

Program Schedule



18 th Feb 2014: Day – 1		
	Registration	09:00 hrs- 10:00 hrs
	Welcome Address : Mr Shashank Jain, Programme Manager Shakti Sustainable Energy Foundation	10:00 – 10:45
	Special Address : Mr. P N Rao, Chairman - ECM The Institution of Engineers (India)	
	Vote of Thanks : Mr. Akhilesh Mahurkar, Director , FICCI	
	Tea Break	10:45 – 11:00
Session	Topics	Duration
A1	EE issues: Boilers and Steam systems Furnaces and Dryers Mr. Shishir Athale, Sudnya Industrial Services Pvt Ltd	11:00 - 13:00
	Lunch Break	13:00 – 14:00
B 1	Energy Saving Opportunities in CCPP Mr. S Babu, Reliance Infrastructure Ltd.	14:00 - 15:30
	Tea Break	15:30 – 15:45
B 2	Co-generation opportunities – Case study Mr. Shishir Athale, Sudnya Industrial Services Pvt Ltd	15:45 – 17:15
19 th Feb 2014: Day – 2		
C 1	Financial Aspects in ENCON Calculations Mr. Shishir Athale, Sudnya Industrial Services Pvt Ltd	09:30-10:30
C2	Special Address by Mr. A Chandra Shekara Reddy, CEO, State Energy Conservation Mission, Govt of AP	10:30 – 11:15
	Tea Break	11:15 - 11:30
C 3	Test tools for effective energy audit Mr. Girish Ramamoorthy, Fluke	11:30 – 12:15
C4	Energy Saving opportunities in T&D: Case Study Mr. R V Raman Rao, Energy Consultant	12:15 – 13:00
	Q&A and Lunch	13:00 – 14:00
D1	ENCON opportunities in Fans and Blowers Mr. Shishir Athale, Sudnya Industrial Services Pvt. Ltd	14:00 - 15:00
	Tea Break	15:00 - 15:15
D 2	Energy Efficiency issues in Motors and Selection Criteria Mr. J Srinivasan, International Copper Association	15:15- 17:15

20th Feb 2014: Day – 3		
E1	Energy Conservation in Compressor and Compressed Air System Mr. R. Gopala Krishna, IntelliDecs Private Limited	10:00 - 11:00
	Tea Break	11:00 – 11: 30
E2	Energy Conservation Strategies In Cooling Towers Mr. Jalkam Subhash Chandra Bose, Paharpur Cooling Towers	11:30 – 12:30
E3	Latest Instruments Technology for Energy Conservation Mr. Anand Patankar, Testo	12:30 - 13:00
	Lunch	13:00 – 14:00
F1	Cement Sector Case Study Mr. Srihari, UVK Rao Associates	14:00 - 15:30
	Tea Break	15:30 - 16:00
F2	Energy Conservation Case Study of ISB, Hyderabad Mr. K. Premkumar and Mr. Rajesh Rama, ISB	16:00 – 17:15
21st Feb 2014: Day – 4		
G 1	Role of EESL, Various DSM Schemes and ESCO Mechanism Mr. Tarun Tayal, EESL	09:30 – 10:30
G 2	Power Quality and Energy Efficiency linkages Mr. Mohammed Mohtasib, ICA	10:30 – 11:15
	Tea Break	11:15 – 11: 30
G3	Nansulate - Nanotechnology based insulating and protective coatings - A New Concept Mr. Dilip Varma, Dantech Engineers Pvt. Ltd	11:30 – 12:15
G4	Energy Optimization Solutions Mr. Prassana, VigVen Tech Mark Pvt Ltd	12:15 - 13:00
	Lunch	13:00 – 14:00
H1	Low temperature waste heat recovery options Dr. Vijaykumar Kunche, First ESCO	14:00 – 15:00
	Group Photograph, Certificate Distribution Vote of Thanks	15:00 – 16:00
	Networking tea	16:00