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Energy Conservation and Commercialization Project

A Program of USAID, Ministry of Power and ICICI

Assessment Report on The Capabilities of Indian Institutions in Performing Energy Auditor Certification in an Organized, Consistent and Sustained Manner

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Preface

This report is part of the deliverable for Milestone 7A, submit report identifying candidate institutions to certify energy auditors and assessment of abilities and needs to create and sustain a certification program, of the ECO project. The report covers work done under this Milestone from August 2000 through December 2000.

The ECO project is being implemented by Bechtel National Inc (Nexant Inc) under a USAID contract, LAG-I-00-98-0000. This contract has been issued by the USAID Mission in New Delhi as a part of the IQC (Indefinite Quantity Contract) currently in place through USAID's Global Bureau. The project contract was signed on February 29, 2000, and continues through December 2003.

EXECUTIVE SUMMARY

As a vital component in capacity building initiatives in Energy Efficiency in India, survey for assessing institutional capabilities to undertake Energy Auditor/Manager Certification was undertaken. The basis purpose of the survey was to bring out the present competence status of institutions with a view to identify likely Candidates for administering the Energy Auditor/Manager Certification in India. The survey was also aimed at identifying the capability gaps that need to be addressed to make the identified in the institutions undertake energy auditor/manager certification work in an organized and sustained manner. Structured questionnaire were sent to about 55 institutions, out of which nearly 40 institutions responded. Responses from these 40 institutions were analyzed and about 11 institutions were short-listed (refer annex III for details) for detailed assessment of their capabilities to undertake the accreditation and certification activities.

Detailed assessment

Detailed assessment of the short listed institutions was carried out with respect to four parameters – i) Competencies, both at the institutional as well as personnel (managerial / technical) levels; ii) institutional infrastructure; iii) systems of work, and iv) financial status of the institutions. Multiple indicators were used as proxy for assessing each of these parameters. For example, indicators used for assessing the competency level of institutions were: nature of organizational structure; types of activities Such as consultancy, training, educational, research & promotional; year of establishment and commencement of energy audit/energy management activities; training experience and academic profile of resource persons involved in energy audit and training activities; spread of training activity devoted to energy efficiency areas; number of years of experience of the institution in carrying out energy audit and training activities; number of full-time auditors on rolls; exposure to energy auditing in the designated sectors.

Primary data on these four parameters was collected from all the 11 short listed institutions. Mode of data collection was a structured questionnaire, which was developed and then refined based on the discussions and feed-back obtained from certification program and training and workshops on energy auditor instructions.

Analysis of the data was carried out by assigning suitable marks (numerical values) to each of the four parameters, and to each of the indicator within a particular parameter. The total of all the marks for all the four parameters and indicators, taken together was 100 (refer annex V for details). This being simple arithmetic addition of all the marks. Responses received from various institutions were than evaluated by awarding marks against each indicator, with higher score indicating higher capability. A simple arithmetic addition of scores against all the indicators then provided the total marks scored (out of a maximum possible of 100) by various institutions. Award of the marks was based on the suitable criteria, developed for the purpose (refer annex V for details). The criteria for the award of marks, though subjective, was based on the collective wisdom of experts in the

1.0 INTRODUCTION

The Energy Conservation and Commercialization (ECO) project of USAID, in the main, aims to promote widespread commercialization of energy efficiency technologies and services in India by assisting stakeholders and institutions that are involved in developing, designing, constructing, implementing and operating energy efficiency projects ("Markets" component of ECO project), and by assisting government agencies and institutions in creating a supportive market environment for the commercialization of energy efficiency ("Policy" component of the ECO project).

One of the important and an integral part of the "policy" component of the ECO project involves providing assistance to Government of India (GOI) agencies in developing market oriented programs and policies that enable the commercialization of energy efficiency in the context of the proposed Energy Conservation Bill, including providing support for putting in place a system or a program for energy auditor accreditation and energy manager certification.

In the context of energy audits, Clauses 14(h), 14(i), 14(l), and 14(m), of the proposed energy efficiency bill empower the GOI to:

- Direct any designated consumer to get energy audit conducted by an accredited energy auditor,
- Direct designated consumer to appoint energy manager in charge of activities for conservation of energy, and
- Prescribe minimum qualification for appointment of energy manager

The Bill, therefore, brings forth the need, not only for accredited auditors and certified mangers, but also to identify, define and evolve institutional arrangements and procedures for accreditation and certification of individual energy auditors, energy mangers and auditing firms. Besides, the bill also brings forth the need to evolve methodology for selection, and to identify (based on the methodology selected) institutions which can accredit/certify as well as provide attendant/required training to auditors and managers.

The present report, entitled "assessment report on the capabilities of Indian institutions/agencies in performing energy auditor certification in an organized, consistent and sustained manner", is based on a study undertaken by Nexant and National Productivity Council (NPC) to addresses the second of the above mentioned issues.

Following broad steps were involved in the conduct of the study:

- Identification of a set of suitable parameters and attributes to be used for institutional capability assessment

energy auditing and energy efficiency training areas, including feed-back obtained in the workshops referred to above.

The total marks scored by various institutions, out of a maximum possible of 100, varies from a low of 26 (Federation of Indian Chambers of Commerce and Industry) to a high of 81 (National Productivity Council - NPC). Apart from NPC, institutions like Tata Energy Research Institute, Indian Institute of Technology-Delhi, Confederation of Indian Industry, Petroleum Conservation Research Association, and Anna University have relatively higher scores, and are hence good candidates for undertaking certification and training work, in the first instance. Organizations like Indian Institute of Technology – Mumbai and Devi Ahilya Vishwavidyalaya, who have moderate scores, could also undertake certification, but after they have been able to up-grade their capabilities.

Gap analysis

The detailed analysis of the short listed institutions which could take up the certification/accreditation of the Energy manager / Energy auditor, have revealed the following areas where the institution's capabilities need to be augmented:

- Most of the identified agencies, with few exception's, do not have the experience in sufficient number of sectors mentioned as designated consumers in the proposed Energy Conservation Bill. This would render the training imparted by them ineffective. These institutions need to collaborate with sector specific association / research institutions to enhance their practical exposure in these sectors. eg-power management institute of NTPC/CPRI for the power sector.

  A large number of institutions were found to emphasize too much on the theoretical aspects of Energy Management & Conservation. This gap needs to be bridged through more project works in the curriculum and by availing the services of guest faculty from industries. The subject of Energy Management is undergoing rapid changes and it is felt that retraining of the faculty is required in more frequent intervals than what is being presently practiced. The syllabus for this purpose may be expanded to involve sector specific subject/topics, certification procedures, project management, financial management and very importantly advances in the area of Information Technology useful for the profession. Considering the insignificant contribution of renewable energy and Non Conventional energy sources in energy intensive industries, the emphasis on renewable energy and Non conventional energy needs to be diluted in the syllabus for training of Energy managers / auditors.

2.0 ENERGY EFFICIENCY & AUDIT SCENARIO IN INDIA

India is faced with growing energy needs for economic development. The demand for electricity is increasing at a compound annual rate of 9%. The present installed capacity of over 93,000 MW notwithstanding, energy shortage is estimated at 10%, peaking shortages at over 15%. The growth in power sector is constrained by two factors. First, concern of capital availability to meet the demands and second, the growing environmental impacts. End-use efficiency improvements offer new hope to Indian economy to balance the increasing demand supply gap.

Requirement of Accreditation of energy auditors

Accreditation of energy auditor's is basically done to offer the clients a choice of energy auditors who can do the job satisfactorily. At present there are few agencies and some state electricity boards who do the accreditation process. The criteria for accreditation by the different agencies are different as there is no standard procedure for the same. This creates a lot of confusion as an auditor enrolled to one agency may not be able to do the energy audit in some other state as they may fail in the criteria set by SEBs/agencies. The major draw back of the existing system are as given below:

- The mandatory energy audit stipulations by some of the SEBs has created a new job market and there is a sudden phenomenal spurt of energy consultants in the market and their capabilities are suspect in respect of conducting a professional energy audit exercise as many do not possess the requisite skills viz., experience, education, instruments etc.

- As the skills of the auditors are varied, the professional charges quoted by them are wide ranging, with promises of ultimate deliverance and many of the industry may prefer consultants whose quotation are the least.

- Once an unskilled auditor does a job badly, it leaves bad impression with the industry and next time they will shy away from employing an energy auditor as they have doubt about the credibility of the auditors and they do not have any basis by which one can check the capability of an energy auditor.

The other problems faced in the existing system are

- The Mandatory Energy audit stipulations by some of the SEB's seem to only address electricity consumers, presumably, as the apex regulatory organizations are focused towards electricity use and conservation alone, for mitigating electricity shortfalls and thermal energy conservation is not given importance.

- Many a time, the submission of the report and timing becomes more important and the whole exercise becomes a ritual.

- Preparing a list of institutions / agencies / bodies that envisage interest in undertaking energy auditor certification and / or which, based on past experience, appear to be good prospective candidates
- Assessment of their existing capabilities (using the parameters and attributes identified)
- Identification of gaps between needs and existing capabilities
- Data analysis and preliminary identification / indication about possible candidate institutions for energy auditor certification

The report is organized is five sections. Section 2 describes the energy efficiency and energy audit scenario in India. Section 3 describes the methodology, data collection, and data compilation. Section 4 presents results and conclusions. Section 5 includes various appendices.

3.0 METHODOLOGY

3.1 Overview of the Steps

Step 1

Preparation of a list of Indian institutions/agencies/bodies that are to be assessed for their capabilities for undertaking energy auditor accreditation and energy manager certification.

- Prepare a comprehensive list of Indian institutions who would be studied for their capabilities to undertake energy auditor/manager certification
- Developing a preliminary screening criteria and preparing a preliminary questionnaire to capture the screening criteria
- Primary data collection through questionnaires about their activities, infrastructure, managerial & technical capabilities etc.
- Short listing of institutions who could be studied further to ascertain their capabilities to undertake the accreditation/certification program.

Step 2

Development of criteria for assessing the capability of institutions for undertaking energy auditor accreditation and energy manager certification in an organized consistent and sustainable manner.

- Based on the outcome of the workshop on "Voluntary energy auditor accreditation and energy manager certification program", requirements of the proposed EE Bill, and using NPC's experience, identify a set of parameters and attributes which could be used to assess the capability of short listed institutions.
- Define indicators to be used as proxy for each of the identified parameters
- Assigning weights to each parameter and indicator

Step 3

Collection and analysis of information/data from selected institutions with respect to the parameters and attributes identified, and carry out the evaluation of institutions giving weights.

- Development of a suitable questionnaire to collect primary data with respect to parameters/indicators from short listed institutions
- Developing a criteria for awarding marks/scores against each parameter/indicator
- Consolidation of marks/scores and ranking of the candidate institutions, according to their suitability for conducting energy accreditation and or energy manager certification program.

- The basic and necessary instrumentation for equipment performance evaluation is rarely available in-house. The typical energy auditor in thus more concerned with a quick study, more like a ritual.

- Many of the energy audit reports are very strong on historical energy data and past statistics such as specific energy consumption etc but short of qualitative recommendation and are silent on practical implementable energy saving opportunities and schemes.

- Absence/lack of trained energy managers in industry, leave alone dedicated professionals, leads to delays in preparatory efforts, ineffective co operation/support for auditors. Skilled manpower to manage energy-efficiency is hard to come by in small industry. Even reliable and proven technologies are likely to fail in the absence of technical and operational maturity and literacy.

Need for a proper system

The process of energy auditor accreditation is varying from utility to utility and calls for refinements and institutionalization towards the national agenda of BEE. The talent pool of energy auditors and energy managers needs to be strongly augmented in quantity as well as quality given the mammoth task of energy efficiency administration at the national level.

It is estimated that initiating and sustaining in house energy audit & conservation activities in the bulk and HT industry, requires around 43,000 energy managers and for conducting energy audits in bulk and HT industry services once a year the trained energy auditors pool needed is 8600. It is felt that to have such a strong pool of energy auditors, a proper and systematic accreditation process is required which will offer the user/client a panel of energy auditors with standard qualification and who can do the energy audits to their satisfaction.

The study has revealed that there are few institutions who can do the energy auditors certifications in an organized, consistent and sustained manner. There exist some gap that has to be addressed and the same is elaborated in the gap analysis.

3.2 Identification Of Indian Institution/Agencies To Be Assessed

To identify Indian institution/agencies to be assessed, a comprehensive list of energy auditors were collected from different sources such as Petroleum Conservation Research Association (PCRA), Depart of Science & Technology (DST), Energy Management Centre, New Delhi and the data base available with NPC. Besides, few other institutions which were regularly conducting post-graduate courses in Energy Management were also included in the list. The institution's registered under state electricity boards have not been considered because either they have a very small infrastructure or their exposure is limited only to electrical energy conservation. The preliminary list contained 55 institutions.

A preliminary screening of these 55 institution listed in the comprehensive list was carried out with regard to the following criteria.

i. Institution having sufficient number of manpower that can meet the requirement of designated consumers given in energy conservation bill.
ii. Sufficient exposure of the available manpower in thermal as well as electrical energy conservation aspects.
iii. Institutional infrastructure, financial status and competencies both at institutional as well as personnel level.

A preliminary questionnaire was prepared to capture the above criteria and sent to all the 55 identified institutions. A copy of the preliminary questionnaire is enclosed in annexure I. Forty-two institutions furnished the data for preliminary assessment. Annexure II provides a listing of these 42 institutions.

The data obtained from preliminary assessment questionnaire was scrutinized and 11 institutions were short listed. A list of short listed institutions is given in annexure III.

3.3 Methodology for Assessing the Capability of Short-Listed Institutions

3.3.1 Identification of assessment parameters

Detailed assessment of the short listed institutions was carried out with respect to four parameters:

- Competencies, both at the institutional as well as personnel (managerial / technical) levels
- Institutional infrastructure
- Systems of work, and
- Financial status of the institutions.

Multiple indicators were used as proxy for assessing each of these parameters.

- Percentage of operating budget devoted to energy management training activities.

3.3.2 Data Required, Sources of Data and Mode of Data Collection

Since the indicators and parameters identified in 3.3.1 were to be used in assessing the capability of short-listed institutions, data had to be collected with respect to these indicators for all the 11 short-listed institutions. No data was available from secondary sources, and hence it was decided to resort to primary data collection. Mode of data collection was a structured questionnaire, which was developed and then refined based on the discussions and feed-back obtained from certification program and training and workshops on energy auditor instructions. A copy of the questionnaire used is given annexure IV.

The questionnaire was sent to the short-listed 11 institutions. Through consistent follow-up by telephone, fax, e-mail and personal visits, the required data was collected from all 11 institutions.

3.3.3 Analysis Procedure

Suitable marks (numerical values) were assigned to each of the four parameters, and to each of the indicator within a particular parameter. The total of all the marks for all the four parameters and indicators, taken together was 100. This being simple arithmetic addition of all the marks. The marks given to each parameter were:

Parameter		Marks
Competency issues	-	40
Institutional Infrastructure	-	30
System of Work	-	20
Financial Status	-	10
Total	-	**100**

The marks assigned indicate the relative importance assigned to each parameter in the assessment of the capability. Thus, in the analysis procedure that has been developed and used in this study, competency issues have twice as much importance as 'system of work' parameter, or four times as much importance as 'financial status' parameter.

Within each parameter, marks were assigned to each indicator, and these have been depicted in the Table presented in annexure V. Within a particular parameter (say competency issues), the marks for different indicators figuring under that parameter have been assigned in such a way that simple arithmetic total of all the marks adds up to the marks assigned for that parameter (i.e. 40, in case of competency issue parameter)

Competencies

Indicators used for assessing the competency level of institutions were:

- Nature of organizational structure
- Types of activities Such as consultancy, training, educational, research & promotional.
- Year of establishment and commencement of energy audit/energy management activities
- Training experience and academic profile of resource persons involved in energy audit and training activities spread of training activity devoted to energy efficiency areas
- Number of years of experience of the institution in carrying out energy audit and training activities
- Number of full-time auditors on rolls
- Exposure to Energy Auditing in the designated sectors.

Institutional Infrastructure

Indicators used for assessing the competency level of institutions were:

- Nature, type and extent of training facilities
- Computer/information technology infrastructure
- Laboratory
- Library
- Instruments
- Availability of full-time faculty and number of institutional centre/networking with similar institutions in the country.
- Whether the institution is running a regular course in energy management and their details like prospectus and curriculum.

Systems of Work

Indicators used for assessing the competency level of institutions were:

- Nature of existing energy management programs/courses undertaken
- Duration of the courses
- Details of energy audits undertaken, particularly, whether institute is engaged in carrying out energy audit study particularly related to the designated consumer listed in energy conservation bill.
- Frequency of retraining of the resource persons
- The extent of emphasis placed on financial analysis in various audit reports prepared..

Financial Status

Indicators used for assessing the competency level of institutions were:

- The total operating budget of the institution
- Percentage of operating budget devoted to energy management activities

System for Marking/Award of Marks

While the marks assigned to each indicator show the maximum marks that can be awarded (scored by the institutions) against each indicator, the award of marks it self was based on suitable criteria developed for the purpose. For example, indicator under the parameter of competency - "training experience and academic profile of resource persons involved in energy audit ands training activity" has 12 marks assigned to it. A maximum of 12 marks, thus, can be scored against this indicator. Criteria for the award of marks, however, is that – 'one mark will be awarded for every 10 years of collective experience of resource persons in the field of energy efficiency". Thus, an institution having 70 years of collective experience of its resource persons, would be awarded 7 marks. Such criteria for award of marks was developed for each indicator and the same have been shown in the Table in annexure V. A simple arithmetic addition of marks scores against all the indicators then provided the total marks scored (out of a maximum possible of 100) by various institutions. Marks have been allotted in whole numbers only.

The criteria for the award of marks, though subjective, was based on the collective wisdom of experts in the energy auditing and energy efficiency training areas, including feed-back obtained in the workshop on voluntary energy auditor certification program and training, and workshops on energy auditor instructions. Details of the award criteria for each of the identified indicators have been shown in the Table in annexure V.

4.0 DATA ANALYSIS, RESULTS AND IDENTIFICATION OF GAPS

4.1 *Data analysis and results*

Responses received from various institutions were than evaluated by awarding marks against each indicator, in accordance with the marking system described in the previous section. A simple arithmetic addition of scores against all the indicators then provided the total marks scored (out of a maximum possible of 100) by various institutions. Wherever data was not available, zero marks have been allotted. Table in annexure VI depicts the marks scored by each of the 11 institutions.

The total marks scored by various institutions, out of a maximum possible of 100, varies from a low of 26 (Federation of Indian Chambers of Commerce and Industry) to a high of 81 (National Productivity Council - NPC). Apart from NPC, institutions like Tata Energy Research Institute, Indian Institute of Technology-Delhi, Confederation of Indian Industry, Petroleum Conservation Research Association, and Anna University have relatively higher scores, and are hence good candidates for undertaking certification and training work, in the first instance. Organizations like Indian Institute of Technology – Mumbai and Devi Ahilya Vishwavidyalaya, who have moderate scores, could also undertake certification, but after they have been able to up-grade their capabilities.

4.2 Identification of Gaps

The marks scored by institutions indirectly help in identifying deficiencies of different institutions. Since low indicator score indicates low capability, areas, where corresponding indicator scores are low, readily get recognized as basic areas where the capability of the institution is limited.

The detailed analysis of the short listed institutions which could take up the certification/accreditation of the Energy manager / Energy auditor, have revealed the following areas where the institution's capabilities need to be augmented:

- Most of the identified agencies, with few exception's, do not have the experience in sufficient number of sectors mentioned as designated consumers in the proposed Energy Conservation Bill. This would render the training imparted by them ineffective. These institutions need to collaborate with sector specific association / research institutions to enhance their practical exposure in these sectors. eg-power management institute of NTPC/CPRI for the power sector.

- A large number of institutions were found to emphasize too much on the theoretical aspects of Energy Management & Conservation. This gap needs to be bridged through more project works in the curriculum and by availing the services of guest faculty from industries. The subject of Energy Management is undergoing rapid changes and it is felt that retraining of the faculty is required in more frequent intervals than what is being presently practiced. The syllabus for this purpose may be

5.0 ANNEXURES I to VI

expanded to involve sector specific subject/topics, certification procedures, project management, financial management and very importantly advances in the area of Information Technology useful for the profession. Considering the insignificant contribution of renewable energy and Non Conventional energy sources in energy intensive industries, the emphasis on renewable energy and Non conventional energy needs to be diluted in the syllabus for training of Energy managers / auditors. Some of the suggested topics/areas are:

1. Project/Hands-on Training internship component;
2. Project Management related coverage;
3. Financial Management related coverage;
4. Coverage on Methodology of Counseling/Consultancy/Report Preparation;
5. Exposure to Energy Audit Procedures/Energy Efficiency practices in designated sectors.
6. Project Management exposure.
7. Financial Management exposure.
8. Exposure to Thermal/Electrical/Renewable Energy Systems/ Technologies, (where necessary).
9. Exposure to Energy Audit Procedures, Energy Efficiency practices.

- As the designated consumers are mostly in the H.T. category the energy managers/auditors should be given adequate exposure in the usage of H.T. electrical instruments.

Annexure-I

PRELIMINARY QUESTIONNAIRE

1. Name of the Organization :

2. Address :

Telephone No. :

Fax No. :

Email :

3. Type of Organization :

4. i. Name of Chief Executive :
   ii. Designation :

5. i. Name of Energy Chief :
   ii. Designation :

6. i. Year of Establishment :
   ii. Year of Commencement of Energy Activity :

7. Areas covered

	Yes	No
a. Thermal	☐	☐
b. Electrical	☐	☐
c. Non-conventional	☐	☐
d. Others (Please specify)		

8. Number of consultant engaged in Energy Audit & Conservation Study
   a. Full Time
   b. Part Time :
   :

Annexure-I(a)

Industry Sectors

1. Aluminum
2. Thermal Power Stations
3. Commercial Buildings
4. Chlor-alkali
5. Iron & Steel
6. Sugar
7. Fertilizer
8. Chemicals
9. Engineering
10. Pulp & Paper
11. Petrochemical & Refineries
12. Textile
13. Electricity Transmission & Distribution system
14. Others (Specify)

Annexure-I(b)

Areas of Specialisation

1. Energy Audit Studies (both preliminary & detailed audits)
2. System improvement/equipment efficiency studies
3. Feasibility studies (specially for retrofitting and replacement of equipments)
4. Energy Norms/standardization studies
5. Policy related studies
6. Sectoral studies for energy consumption
7. Non-conventional energy sources related studies
8. Monitoring & implementation oriented studies
9. Energy awareness programme like training, seminar & workshops
10. Others (Specify)

9. Minimum Qualification of energy Consultants :

10. Whether consultants have undergone through any Energy Audit and Conservation Course — Yes ☐ No ☐

If yes, please give details

a. Course title :

b. Institute where training was imparted :

c. Duration :

11. Areas of Specialisation of the organization (list is given in annexure-I(a)) :

12. Services provided to industry sectors (list of sector is given in annexure-I(b)) :

13. Other related information, if any (Please give details)

Annexure II

LIST OF INSTITUTION CONSIDERED FOR ASSESSMENT FOR ENERGY AUDITOR AND ENERGY MANAGER ACCREDITATION PROGRAMME

Sl.No.	Name & address of the organization
1.	Andhra Pradesh Productivity Council Productivity House, Plot No.87, Banjara Hills, Hyderabad – 500 033
2.	Andhra Pradesh Industrial & Technical Consultancy Organisation Ltd. Parisarama Bhavanm, 8th floor, Basheerbagh Hyderabad – 500 004
3.	Tata Energy Research Institute Darbari Seth Block Habitat Place, Lodhi Road New Delhi – 110 003
4.	National Productivity Council 5-6, Institutional Area, Lodi New Delhi – 110 003
5.	Balmer Lawrie & Co. Ltd. Corporate Planning & Project Division 21, Netaji Subhash Road, Calcutta – 700 001
6.	Central Scientific Instruments Organisation CSIR Madras Complex Taramani, Chennai – 600 113
7.	DCM Shriram Consolidated Limited Energy Services Company 5th floor, Kanchenjunga Building 18, Barakhamba Road, New Delhi – 110 001
8.	Devki Energy Consultancy Pvt. Ltd., 405, Ivory Terrace, Alkapuri R.C. Dutt Road, Vadodara – 390 007
9.	Ecomet Energy Consultants B 206, Renuka Apartments, Anand Nagar Khairabad, Hyderabad – 500 004
10.	Energy Audit Services 1116, Sector-17, Faridabad – 121 002
11.	Energy Economy & Environmental Consultants, No.506, 15th Cross, Indira Nagar 2nd Stage, Bangalore – 560 038
12.	Energy & Fuel Users' Association of India 4B1, J.P. Tower, 7/2, Nungambakkam High Road, Chennai – 600 034
13.	Ernst & Young Pvt. Ltd., 36, Ganesh Chandra Avenue, Calcutta – 700 013

Annexure III

LIST OF SHORT LISTED ACCREDITATION INSTITUTION

Code.No.	Name of the Organisation	Contact Person
01	Central Scientific Instruments Organisation (CSIO) CSIR Madras Complex Taramani, Chennai – 600 113	R.K.Mohan Roa, Deputy Director Ph: 044-2352061, 2352122 Fax: 044-2301026 Email: csiom@vsnl.com
02	School of Energy Studies, Jadavpur Unviersity, Calcutta – 700 032	Dr.S.Neogi Ph: 033-4732853 ; Fax: 033- 4725823, Email: sebju@giasel01.vsnl.net.in
03	Institute of Energy Studies, Anna University, Chennai – 600 025 (Ph. 044-2300121/2300875) Fax 044-2300875.	Dr.S.Renganarayanan, Director Ph: 044 -2351723 Extn.327 Email: renga@annauniv.edu
04	Energy Systems Engineering, Indian Institute of Technology, Powai, Mumbai – 400 076 (Ph. 5767883, Fax 5783480)	Prof. R.Banerjee, Convener Ph: 022 - 5767883,5782545 Fax:022 - 5783480, 5796875 Email: rangan@me.iitb.ernet.in
05	National Productivity Council, Utpadakata Bhavan, 5-6 Institutional Area, Lodi Road, New Delhi-110003	A.K.Asthana, Director(EM) Ph: 011 - 4697446(D), 4690331, 2,3 Fax: 011 - 4615002 Email: npcts@mantraonline.com
06	Federation of Indian Chamber of Commerce & Industry, Tansen Marg, New Delhi-110001	R.K.Ghosh, Energy Audit Consultant Ph: 011 - 3738360-70 Fax: 011- 3320714, 3721504 Email: inpd @ del3 vsnl net.in
07	School of Energy & Environmental Studies, Devi Ahilya Vishwavidyalaya, Takshashila Parisar, Khandwa Road, M.P	Dr. R.L.Sawhney, Professor-Head Ph: 0731-460309 Fax: 0731-470372 Email:btisdavv@x400.nicgw.nic.in
08	Petroleum Conservation Research Association, 1008, New Delhi House, 27, Barakhamba Road, New Delhi-110001	B.B.Mandan, sr. Manager(FA) Ph: 011- 3319288,3316566,3315829 Fax: 011- 3715244 Email: pcrad @ del2 vsnl.net
09	Tata Energy Research Institute, Darbari Seth Block Habitat Place, Lodhi Road New Delhi – 110 003	Somnath Bhattacharjee, Dean, Energy Tech Division Ph: 011 - 4682100,4682111, Fax: 0111- 4682144, 4682145 Email: mailbox @ teri.res.in
10	Confederation of Indian Industry, 35/1, Abhiramapuram 3rd street, Alwarpet, Chennai-600018	S.Raghupathy, Senior Adviser Ph: 044 4660430, 46600291, 660570, 4661311 4660773;Fax: 044 -4660312 Email:s.raghupathy@ciionline.org
11	Centre for Energy Studies, Indian Institute of Technology,Hauz Khas, New Delhi- 110016	Dr. S.C.Mullick, Professor & Head Ph: 011- 6591251,6591254 Fax: 011- 6862208, 6581121 Email:smullick@ces.iitd.ernet.in

Sl.No.	Name & address of the organisation
14.	Energy Management Centre (EMC) Government of Kerala Karamana PO Thiruvananthapuram – 695 002 (Kerala)
15.	ENVIRO Consultants & Enginers, R-5, GTB Complex New Market, Bhopal – 462 003
16.	M/s. Essen Energy Technologies (P) Ltd., (Formerly Engineers & Associates) 109, DH, IDA, Sch-74C Indore – 452 010
17.	FACT Engineering & Design Organisation Udyogmandal – 683 510 (Cochin)
18.	Industrial & Technical Consultancy Organisation of Tamilandu Ltd., 50-A, Greams Road Chennai – 600 006
19.	INTESCO Asia Ltd., Oakland, 114, Ulsoor Road Cross, Bangalore – 560 042
20.	Kerala State Productivity Council, Productivity House, Post Box No.8, HMT Road, Kalamasssery – 683 104 (Kerala)
21.	Maruti Consultants, 9-1-119, Aashiana Old Lancer Lane, SECUNDERABAD – 500 025
22.	MC Jain & Associates, 224, Zonal Market Sector –10, Bhilai, Madhya Pradesh
23.	MITCON Consultancy Services Ltd., Kuber Chambers, Shivajinagar, Pune – 411 005
24.	National Council for cement & Building Materials, 324 KM Stone, Delhi-Mathura Road (NH-2), Ballabgarh – 121 004 Distt. Faridabad (Haryana)
25.	National Experts Organisation, Block 2D, Deepa Complex, 10. I.P. Extension, Delhi – 110 092
26.	PHD Chamber of Commerce & Industry, Energy Management Cell PHD House, Opp. Asian Games Village, New Delhi – 110 016.

Sl.No.	Name & address of the organisation
27.	Projects & Development India Ltd., CIFT Buildings, P.O. Sindri Distt. Dhanbad, Bihar – 828 122
28.	M.K. Raju Consultants Pvt. Ltd., 16, Shri Nagar Colony, Chennai – 600 015
29.	Ramani Chemagea Systec. Pvt. Ltd., No.5, 11th Cross Street, Indra Nagar, Chennai – 600 020
30.	Saket Products Ltd., Saket House, 1, Panchsheel Usmanpura Ahmedabad – 380 013
31.	SEE Tech Solutions Pvt. Ltd., H 001, Sanchayani Prestige Swavalambi Nagar, Nagpur – 440 022
32.	Seperation Engineers (P) Ltd., No.5, Masilamani Colony, Sir P.S. Sivasamy Salai Palur Kanniappa Street, (Near Vivekananda College) Mylapore, Chennai – 600 004
33.	SGS India Limited 210, Okhla Industrial Estate, Phase-III New Delhi
34.	Spectrum Energy Services, 3, Shreeniketan Pandurang Wadi, Goregaon (East), Mumbai – 400 063
35.	Swapan K.Dutta PE, 12-B, Amrita Lal Bose Street, Calcutta – 700 005
36.	Yajna Fuel Services, Shop No.5, Jay Shri Siddhivinayak CHS B Cabin, THANE – 400 062
37.	School of Energy Studies, Jadavpur Unviersity, Calcutta – 700 032
38.	Institute of Energy Studies, Anna University, Chennai – 600 025
39.	Energy Systems Engineering, Indian Institute of Technology, Powai, Mumbai – 400 076

Sl.No.	Name & address of the organisation
40.	School of Energy & Environmental Studies, Devi Ahilya Vishwavidyalaya, Takshashila Parisar, Khandwa Road, M.P
41.	Confederation of Indian Industry, 35/1, Abhiramapuram 3rd street, Alwarpet, Chennai-600018
42.	Federation of Indian Chamber of Commerce & Industry, Tansen Marg, New Delhi-110001

Annexure IV

CANDIDACY SURVEY QUESTIONNAIRE FOR ACCREDITATION AGENCIES

For Energy Auditor/Manager Certification

Please tick in the relevant boxes or append additional information where required

Phone No. (O): 011-4697446/ 4625447/ 4690331-3 (R) 0120-4758893; Fax : 011-4615002; Email : npcts@mantraonline.com

1.0 NATURE & BACKGROUND OF ORGANISATION

1.1 Your institution can be categorized as :

a) Government ☐

b) Autonomous /Society ☐

c) Educational ☐

d) Private ☐

e) Industry Association ☐

1.2 What are your main activities (one or more)

a) Consultancy ☐

b) Training ☐

c) Research ☐

d) Promotional ☐

e) Educational ☐

f) Any other (please append notes) ☐

1.3 Year of establishment ☐☐☐☐

1.4 Year of commencement of

a) Energy audit activities ☐☐☐☐

b) Energy management activities ☐☐☐☐

2.0 INSTITUTIONAL INFRASTRUCTURE

2.1 *Available infrastructure features are*

i) Training center | YES | NO |

a) IF you have a separate training center, please give details, *such as* (append details)

- *Conference hall facilities* ☐
- *Library* ☐
- *IT infrastructure* ☐
- *Audiovisual aids* ☐
- *Laboratory* ☐
- *Instruments* ☐
- *Number of full time faculty availability* ☐

c) No. of your institutional centres / networking in the country.

2.2 ***What is your annual operating budget*** | *Rs.* *Lakhs* |

2.3 **Percentage of operating budget devoted to energy audit activities** ☐

2.4 **Percentage of operating budget devoted to energy management training activates** ☐

2.5 **Nature of your Energy Management (EM) programs**

a) Full time direct contact ☐

b) Distance / correspondence course ☐

c) Web based course ☐

2.6 **Typical Duration of your Energy Management programs**

a) Upto 15 days ☐

b) 6 months ☐

c) 1 year ☐

d) 2 years ☐

2.7 **Is Your Organisation**

a) Profit making ☐

b) Non-profit making ☐

2.8 ***Training, experience and academic profile of resource persons involved in Energy Audit & Training activity***
(please attach a brief curriculum vitae of resource persons)

2.9 **Percentage of Training Activity (work days) devoted to**

a) Thermal ☐

b) Electrical ☐

d) Renewable ☐

e) Core-industry sectors ☐

f) Management related ☐

g) Others (*specify*) ☐

2.10 ***If you are running a regular course please attach the prospectus and curriculum details*** ☐

3.0 **ENERGY AUDITING** ☐

3.1 ***No. of years of energy auditing experience of your institution*** ☐

3.2 ***No. of full time energy auditors presently on rolls*** ☐

3.3 ***Exposure to energy auditing in the following sectors***

a) Cement ☐

b) Power plants ☐

c) Paper ☐

d) Aluminum ☐

e) Fertilizer ☐

f) Petrochemical ☐

g) Integrated steel plants ☐

h) Distribution & transmission systems ☐

i) Commercial building ☐

j) Sugar ☐

3.5 ***Explain the Energy Audits you undertake (append if necessary)***

3.6 ***List of energy auditing instruments and equipment available with you - (please append separately)***

3.7 ***Frequency of retraining your energy auditors for updating skills***

a) 1 year ☐ c) 3 years ☐

b) 2 years ☐

3.8 ***Explain the kind of financial analysis used in you energy audit report (please append separately)***

Annexure V

PARAMETER AND INDICATOR WEIGHS & SYSTEM FOR AWARDING MARKS

1.0 PARAMETER: COMPETENCY

Total Weight: 40

Item No	Indicator	Indicator Weights	System for Awarding
1.1	Institute category	2	1 mark for B, D and E 2 mark for A and C
1.2	What are your main activities (one or more)	5	1 mark each A, B, C, D
1.4	**Year of commencement**	3	1 mark for institutiona 2 marks for experience 3 marks for experience
2.8	Training, experience and academic profile of resource persons involved in energy audit & training activity	12	1 mark for every 10 y resource persons in the
2.9	Percentage of training activity (work days) devoted	3	1 mark if thermal = >2 1 mark if electrical = > 1 mark if core indus activity = > 25 %
3.1	No of years of energy auditing experience of your institution	3	1 mark upto 10 years 2 marks between 10-2 3 marks for over 20 ye
3.2	No. of full time energy auditors presently on rolls consultants round off to higher number	4	1 mark for 10 consulta
3.3	Exposure to energy auditing in the designated sectors	8	Each sector carries 1 n

2.0 PARAMETER: INSTITUTIONAL INFRASTRUCTURE

Total Weight: 30

Item No	Indicator	Indicator Weights	System for Awarding
2.1	b. If you have a separate training centre please give details	10	2 marks for IT infrastru 2 marks for more than 2 marks for library

	c. No of your institutional centres/networking in the country	5	2 marks for instrument 1 mark for conference 1 mark for laboratory 1 mark for 5 centres 2 marks for 5-10 centr 3 marks for over 10 ce
2.10	If you are running a regular course please attach the prospectus and curriculum details	10	4 marks for coverag renewable systems, tec 3 marks for coverage consultancy methodol 2 marks for project/on 1 mark for examinatio
3.6	List of energy auditing instruments and equipment available with you	5	2 marks for A Thermal 2 marks for B Electric 1 mark for C Flow Me

3.0 PARAMETER: SYSTEM OF WORK

Total Weight: 20

Item No	Indicator	Indicator Weights	System for Awarding
2.5	Nature of your energy management programs	6	3 marks for A, 2 marks
2.6	Typical duration of your energy management programs	6	1 mark for A, 2 marks
3.5	Explain the energy audits you undertake mandatory/diagnostic/preliminary	5	1 mark for Prelin mandatory, 4 marks f marks for Detailed, w Guidance
3.7	Frequency of retraining your energy auditors for updating skills	2	2 marks for A, 1 mark
3.8	Financial analysis used in energy audit reports	1	1 marks if DCF m analysis factoring inter

4.0 PARAMETER: FINANCIAL STATUS

Total Weight: 10

Item No	Indicator	Indicator Weights	System for Awa System)
2.2	What is your annual operating budget	4	1 mark for Rs 25 lakh 2 marks for Rs 1 crore 3 marks for Rs 5 crore 4 marks for over Rs 1
2.3	Percentage of operating budget devoted to energy audit activities	3	1 mark for less than 2 2 marks for 25-50% 3 marks for over 50%
2.4	Percentage of operating budget devoted to energy management training activities	3	1 mark for less than 2 2 marks for 25-50% 3 marks for over 50%

Annexure VI

COMARTIVE PERFORMANCE OF SHORTLISTED ACCREDITATION INSTITUTIONS

CRITERIA	MAX. MARKS	ORGANISATION CODE							
		01	02	03	04	05	06	07	08
I.COMPTETENCY									
1.1	2	1	2	2	2	1	1	2	1
1.2	5	4	4	5	3	4	4	4	5
1.4	3	1	2	2	1	3	1	2	3
2.8	12	-	-	6	10	7	NA	4	5
2.9	3	-	-	2	-	3	3	2	2
3.1	3	-	-	1	-	3	1	2	3
3.2	4	-	-	-	-	3	-	-	4
3.3	8	3	-	8	4	7	3	-	8
II.INFRASTRUCTURE									
2.1(a&b)	10	10	9	10	10	10	7	10	7
2.1(c)	5	-	-	-	2	5	NA	-	5
2.10	10	-	10	10	10	6	-	10	-
3.6	5	-	-	5	2	5	NA	5	5
III.SYSTEM OF WORK									
2.5	6	3	3	3	3	5	3	3	3
2.6	6	1	2	3	4	6	1	3	1
3.5	5	-	-	3	-	5	-	-	5
3.7	2	2	-	2	-	1	1	-	2
3.8	1	1	-	1	1	1	1	1	1
IV.FINANCIAL STATUS									
2.2	4	1	1	1	4	4	NA	-	4
2.3	3	1	1	2	1	1	NA	-	1
2.4	3	1	1	2	1	1	NA	3	1
TOTAL	100	29	35	68	58	81	26	51	66