

Prospectus

**3rd National Certification Examination
for Energy Managers and Energy Auditors - 2006
(under The Energy Conservation Act, 2001)**

22-23 April 2006
Saturday, Sunday

BUREAU OF ENERGY EFFICIENCY (BEE)
(A Statutory body under Ministry of Power Government of India)



National Certifying Agency
NATIONAL PRODUCTIVITY COUNCIL, INDIA
(Under the Department of Industrial Policy & Promotion
Government of India)





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Under the provisions of the Act, Bureau of Energy Efficiency has been established with effect from 1st March 2002. The Bureau would be responsible for spearheading the improvement of energy efficiency of the economy through various regulatory and promotional instruments. The Mission of Bureau of Energy Efficiency (BEE) is to develop policy and strategies with a thrust on self-regulation and market principles, within the overall framework of the Energy Conservation Act (EC Act), 2001 with the primary objective of reducing energy intensity of the Indian economy. This will be achieved with active participation of all stakeholders, resulting in accelerated and sustained adoption of energy efficiency in all sectors.

Director-General heads Bureau of Energy Efficiency. Union Minister of Power heads the Governing Council and it consists of Secretaries of various line Ministries, heads of various technical agencies under the Ministries, members representing industry, equipment and appliance manufacturers, architects, and consumers, and members from each of the five power regions representing the states of the region.

Thrust areas of BEE:

01. Indian Industry Programme for Energy Conservation
02. Demand Side Management
03. Standards and Labeling Programme for notified equipment and appliances
04. Energy Efficiency in Buildings and Establishments
05. Energy Conservation Building Codes
06. Professional Certification and Accreditation
07. Manuals and Codes
08. Energy Efficiency Policy Research Programme
09. School Education
10. Delivery Mechanisms for Energy Efficiency Services

Various promotional and mandatory provisions of the Act have been initiated by the Bureau of Energy Efficiency. The voluntary program of sharing of best practices, undertaking of specific energy consumption targets has full acceptance in the 8 sectors of industry. On the mandatory provisions front, energy managers and energy auditors capacity is being developed and the first and second certification examinations have been successfully conducted. The programme of fixation of norms under EC Act has also been initiated for cement and pulp & paper sectors. Energy audit study of 9 prestigious Government buildings in Delhi has been completed and implementation of the findings is presently underway in Rashtrapati Bhawan, Shram Shakti Bhawan and Transport Bhawan through ESCO route. This has encouraged other Building owners to undertake similar efforts. Further, significant progress has been made in the Standard and labeling program for household refrigerators, window air conditioners, distribution transformers, lighting systems, motors and agriculture pump sets. This program once in place will improve energy efficiency in the unorganized sectors such as domestic, commercial and agricultural sector.



V.S. Verma
Director General



महानिदेशक
ब्यूरो ऑफ एनर्जी एफिशिएन्सी
भारत सरकार
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BUREAU OF ENERGY EFFICIENCY
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Foreword

India has made rapid strides towards economic self-reliance over the last few years. Impressive progress has been made in the fields of industry, agriculture, communication, transport and other sectors necessitating growing consumption of energy for developmental and economic activities. In the power sector alone, we need to add over 100,000 MW of additional generating capacity to meet the power demand by 2012. This would necessitate mobilization of nearly Rs.8000 million investments in the next decade, which is a daunting challenge before the country.

Our dependence on imported oil is likely to further increase, which will be a huge burden on our foreign exchange reserves. Expanding energy supplies for an enhanced economic development and simultaneously managing the associated environmental impacts as well as social concerns and energy security have become a challenging task for our country.


Intensifying national and international competition compels industrial sector managers to minimize production and capital costs. A wealth of studies has identified the many technical options for making manufacturing processes more energy or resource efficient. Despite the widespread recognition among the energy users of realizing greater efficiencies in energy use, technical and non-technical barriers continue to inhibit them from encashing on the huge potential that is prevalent. On the positive side there have been oases of excellence with many progressive organisations reporting significant achievements in energy efficiency.

Use of legislation to improve end use energy efficiency in all sectors of the economy resulted in the enactment of Energy Conservation Act 2001. As per the Act it is mandatory for designated consumers to have Energy Managers and also periodically get an energy audit conducted by an Accredited Energy auditor. To meet these requirements a breed of energy managers and energy auditors have to be created in the country for which a National Certification Examination for Energy Managers and Energy Auditors is being conducted. In the first National Certification Examination held in May 2004, **468** candidates have successfully qualified as Certified Energy Auditors and **350** candidates have successfully qualified as Certified Energy Managers. In the second examination held in May 2005, 1725 candidates had registered for Energy Auditor and 463 for Energy Manager. The certified energy managers will play an important role in establishing energy management organization structure in the energy intensive industry and commercial establishments.

The Bureau of Energy Efficiency has designated National Productivity Council (NPC) as the National Certifying Agency for the conduct of the National Certification Examination for Energy Managers and Energy Auditors. National Productivity Council has also prepared the guidebooks for the examination, which will be supplied to candidates registering for the examination.

I hope that, by appearing and qualifying in this examination, you would be contributing in a big way towards realising our mission of achieving an energy efficient economy.

September, 2005


(V.S. Verma)

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01. Background

The Government of India has enforced **The Energy Conservation Act, 2001** (No 52 of 2001, 29th September 2001) with effect from 1st March 2002. The Act provides mainly for efficient use of energy and its conservation and for matters connected therewith or incidental thereto. As per the Energy Conservation Act 2001, it is mandatory for all the **designated energy consumers** to get energy audit conducted by an **Accredited Energy Auditor** [under clause 14(h) and 14(i)] and to designate or appoint an **Energy Manager** [under clause 14(l)]. The designated energy consumers as covered in the Schedule to the Energy Conservation Act are given in item No.17 of this prospectus.

Bureau of Energy Efficiency (BEE), Ministry of Power, Government of India, is empowered to specify the regulations and mechanism to meet the above objectives. BEE has retained the **National Productivity Council (NPC)** as the National Certifying Agency, which would conduct the National Level Certification Examination for Energy Managers & Energy Auditors under the aegis of Bureau.

02. Need for National Level Certification Examination

The essential qualification for a Certified Energy Manager and Certified Energy Auditor would be the passing of a National Level Certification Examination, which will be conducted under the aegis of Bureau of Energy Efficiency. The national level certification examination, conducted by a National Certifying Agency, will establish a uniform criterion for the certification of energy managers/energy auditors and will also ensure that services of qualified persons, having the requisite knowledge on the subject, are available to the industry.

The certification examination will be conducted based on the syllabus/curriculum approved by the Bureau. The proposed syllabus will go under modifications from time to time based on the feed back received and future developments. The requisite modifications will be incorporated by the national level certification agency in the syllabus in consultation with the Bureau from time to time.

03. Energy Auditor – Role and Importance

Energy audit involves a systematic study undertaken on major energy consuming sections and equipments including construction of heat and mass balance with a view to identify the flow of energy, efficient use of energy in each of the steps and pin-point wastage of energy. A well-conducted energy audit would reveal the areas of wastage of energy and it would lead to suggestions for possible energy savings in all sectors.

The Energy Conservation Act requires the energy audit report to contain recommendations for improving energy efficiency with cost benefit analysis and an action plan to reduce energy consumption [Clause 14(i)]. The conduct of energy audit and implementation of its recommendations on cost-benefit basis through accredited energy auditors is expected to help the designated energy consumers to achieve significant reduction in their energy consumption levels.

For accreditation of energy auditors, certification of energy auditor may be one of the prerequisites besides other criterions before an energy auditor is considered for accreditation. It will be the accredited energy auditor who will be allowed to conduct the mandatory energy audit under the Energy Conservation Act 2001 and not the certified energy auditor

Responsibilities and Duties of Accredited Energy Auditor are highlighted below:

- Carry out a detailed energy audit
- Quantify energy consumption and establish base line energy information
- Construct energy and material balance
- Perform efficiency evaluation of energy & utility systems
- Compare energy norms with existing energy consumption levels
- Identify and prioritization of energy saving measures
- Analyse technical and financial feasibility of energy saving measures
- Recommend energy efficient technologies and alternate energy sources
- Report writing, presentation and follow up for implementation

04. Energy Manager – Role & Importance

Energy manager occupies an important position and is a focal point of all the activities pertaining to energy management in the organization. The energy manager provides leadership in the development of policy on Energy Management Action Plan and plays a key role in the formulation of corporate energy policy. Energy managers also perform the activities related with Energy Management, Project Management, Personnel Management and Financial Management at the plant level. He also prepares the information to be submitted to the Designated Agency with regard to the energy consumed and action taken on the recommendation of the Accredited Energy Auditor [Clause 14(k)].

Responsibilities and Duties of Energy Manager are highlighted below:

- Establish an energy conservation cell & prepare an annual activity plan
- Develop and manage training programme for energy efficiency at operating levels
- Develop integrated system of energy efficiency and environmental improvement
- Initiate activities to improve monitoring and process control to reduce energy costs
- Co-ordinate implementation of energy audit/efficiency improvement projects through external agencies
- Establish / participate in information exchange with other energy managers of the same sector through association
- Provide information to BEE and Designated Agency of the respective States as demanded in the Act

05. Eligibility Criteria for the Candidates.

The candidates appearing for this examination should have the following eligibility criteria and requisite work experience to write the Certification examination:

a) For Energy Managers:

Candidates appearing for Energy Managers certification examination should possess any one of the following qualifications: -

- i. **Graduate Engineer** (B.E / B.Tech) or equivalent with **3 years** of work experience.
- ii. **Post Graduate Engineer** (M.E / M.Tech) or equivalent with **2 years** of work experience
- iii. **Graduate Engineer with Post Graduate degree in Management** or equivalent with **2 years** of work experience
- iv. **Diploma Engineer** or equivalent with **6 years** of work experience
- v. **Post Graduate in Science** with **5 years** of work experience.

b) For Energy Auditors:

Candidates appearing for Energy Auditors certification examination should possess any one of the following qualifications: -

- i. **Graduate Engineer** (B.E / B.Tech) or equivalent with **3 years** of work experience.
- ii. **Post Graduate Engineer** (M.E / M.Tech) or equivalent with **2 years** of work experience
- iii. **Graduate Engineer with Post Graduate degree in Management** or equivalent with **2 years** of work experience.

c) For candidates without requisite work experience

- i. **The candidates possessing the requisite qualification but without required work experience** are also eligible to appear in the written examination for **Energy Manager** or **Energy Auditor** as applicable.
- ii. Energy Manager candidates shall be awarded the certificates only on successful passing of the examination and on acquiring required work experience and submission of the proof thereon.
- iii. Energy Auditor candidates on successfully passing of the written examination shall be eligible to appear for viva-voce only after acquiring required work experience and submission of the

proof thereon. Energy Auditor candidates shall be awarded certificates on successfully passing of the viva-voce examination.

- iv. The required work experience as applicable should be acquired within 6 years from the date of appearing in the first examination.

06. Examination Papers and Scheme

- a) The examination Papers for Energy Managers and Energy Auditors are given below:

Paper No	Name of the Paper	Duration	Max Marks
I	General Aspects of Energy Management & Energy Audit.	3 Hrs	150
II	Energy Efficiency in Thermal Utilities	3Hrs	150
III	Energy Efficiency in Electrical Utilities	3Hrs	150
IV	Energy Performance Assessment for Equipment and Utility systems (Open Book Examination)**	2Hrs	100
	Viva- Voce	15 Min.	50

- b) The candidate appearing for Energy Manager Examination has to pass all the above **THREE papers**, viz., Paper-I, Paper-II and Paper-III and obtain a minimum of 50% of the maximum marks in each paper.
- c) The candidate appearing for Energy Auditor Examination has to pass all the above **FOUR papers** viz., Paper-I, Paper-II, Paper-III & Paper-IV and obtain a minimum of 50% of the maximum marks in each paper. In addition, the candidate should also appear for a **Viva- Voce** Examination and obtain a minimum of 50% of the maximum marks.
- d) **Question Papers for Energy Manager and Energy Auditor are common for the first three papers viz. Paper-I, Paper-II and Paper-III. Energy Auditor candidate passing the above three papers shall be eligible for award of Energy Manager Certification.** This clause is **not applicable** to the supplementary candidates of the 1st National Certification Examination for Energy Managers and Energy Auditors conducted in 2004.
- e) **The degree of difficulty in Paper-IV as well as Viva-voce will be comparatively much higher than other papers.**
- f) Medium of examination is English.
- g) Paper-I, Paper-II and Paper-III shall consist of objective and descriptive type questions.
- h) The Paper-IV for Energy Auditors will be an open book examination and shall consist of descriptive and numerical questions.
** The candidates can refer only the guide books supplied during the paper IV examination. No other reference books and written material will be allowed.
- i) Viva-voce examination for Energy Auditors will be conducted only for those candidates who have obtained minimum of 50% of the maximum marks in all the papers viz. Paper-I, Paper-II, Paper-III & Paper-IV. Proposed date for Viva-voce examination to such candidates will be intimated later.
- j) The syllabus for all the papers is given in **Annexure – I**.

07. Minimum Marks for Award of Certificates

a) For Certification of Energy Managers:

- i. 50% of the maximum marks in each paper in Paper-I, Paper-II and Paper-III

b) For Certification of Energy Auditors:

- i. 50% of the maximum marks in each paper in Paper-I, Paper-II, Paper-III & Paper-IV.
- ii. A candidate appearing for Energy Auditor examination is also required to appear for a **Viva Voce** Examination and obtain a minimum of 50% of the maximum marks.

Note: A candidate qualifying as Certified Energy Auditor automatically qualifies for Certified Energy Manager as well. Such persons can be considered for appointment or designated as Energy Manager under the EC Act, 2001 by the Designated Consumers.

08. Supplementary Candidates

A registered candidate, who fails or fails to appear in any one or more papers or viva-voce in his first National Examination, shall be eligible to re-write the same paper(s)/ appear in the viva-voce examination in the next three successive National Examinations, by paying prescribed supplementary examination fee. On the basis of his results of the re-written paper(s), the candidate shall be declared to have passed the examination, provided he secures minimum of 50% marks in each of the re-written papers / viva-voce examination, as applicable. In case, he does not secure minimum of 50% marks in each re-written paper(s)/ viva-voce in the next three successive National Examinations, he shall be deemed to have failed in the said National Certification Examination for which the candidate has registered. The candidate, however, shall have the option to apply and register himself as a fresh candidate in subsequent National Certification Examinations.

However, as stated above at 6 (d), **Energy Auditor candidates passing the paper I, II and III shall be eligible for award of Energy Manager Certification.** This clause is **not applicable** to the supplementary candidates of the 1st National Certification Examination for Energy Managers and Energy Auditors conducted in 2004.

09. Validity of the Certificate

The certificate shall be valid until it is cancelled, subject to the condition of attending of an authorized refresher training course of short term duration by the candidate in a designated /approved institute or organization (to be announced by the Bureau) once in a 5 year time period, commencing from the date of award of certificate. A six- month's grace period will also be provided to the certified energy manager and energy auditors after the expiry of 5 year period.

10. Revocation of Certificate

The Certificate can be revoked on the ground of proved instances of unprofessional / unethical practices followed by a Certified Energy Manager and Certified Energy Auditor. The Bureau shall constitute a Committee for this purpose, which will investigate the matter. The concerned Certified Energy Manager and Energy Auditor will be informed of the charges against him and given a reasonable opportunity of being heard in respect of such charges.

11. Examination Centres

- a) The proposed centres for conduct of the written examination are: –

Ahmedabad, Bangalore, Bhopal, Bhubaneswar, Chandigarh, Chennai, Cochin, Dehradun, Delhi, Goa, Guwahati, Hyderabad, Jabalpur, Jaipur, Kanpur, Kolkatta, Mumbai, Nagpur, Patna, Pune, Raipur, Thiruvananthapuram and Vadodara.

- b) Proposed centres for Viva-voce examination for Energy Auditors are:

Delhi, Mumbai, Kolkatta & Chennai

- c) The applicant will have to give three choices of examination centres in the order of preference.
- d) If the number of applicants for a particular centre is found to be less than the minimum required number, the examination centre for those applicants can be shifted to next preferred centres.

12. Examination Schedule

Paper No	Examination Paper	Examination Date	Time
I	General Aspects of Energy Management & Energy Audit.	22 April 2006	0930-1230 Hrs
II	Energy Efficiency in Thermal Utilities	22 April 2006	1400 –1700 Hrs
III	Energy Efficiency in Electrical Utilities	23 April 2006	0930-1230 Hrs
IV	Energy Performance Assessment for Equipment and Utility systems (Open Book Examination)	23 April 2006	1400 –1600 Hrs
	Viva Voce	*	*

- * The date, timings and venue for viva-voce examination will be intimated later on to the successful Energy Auditor candidates of the written examinations.

13. Fee

Prospectus and application fee (for Sponsored and Self-Sponsored individual candidate) = Rs.500/-

- * Self-sponsored candidate (individual in the category of SC/ST/OBC & having annual income not more than Rs. 1.0 Lakh/annum) = Rs. 250/-
- * The candidate will be required to submit the copies of the necessary supporting documents as per the format given in annexure-2 or 3.

Certification Fee for Energy Managers & Energy Auditors (Non-refundable)

- a) Sponsored candidate by the company = Rs.20, 000/- (Twenty Thousand only)
- b) Self-sponsored candidate (individual) = Rs.10, 000/- (Ten Thousand only)
- *c) Self-sponsored candidate (individual in the category of SC/ST/OBC & having annual income not more than Rs. 1.0 Lakh/annum) = Rs. 5, 000/- (Five Thousand only)
(The certification fee includes the cost of Course Books, examination fee, viva-voce fee & Certification.)
- * The candidate will be required to submit the copies of the necessary supporting documents as per the format given in annexure-2 or 3.
- ◆ Application and Prospectus can be downloaded from the website also. However, filled up application form should be sent along with the application fee of **Rs.500/-** (Five Hundred only) in addition to applicable **Certification Examination Fee** as mentioned above.
- ◆ **Certification Examination Fee** is to be paid by DD drawn in favour of “**Bureau of Energy Efficiency**” payable at “**Chennai**” along with Application Form for Registration.

Fee for Supplementary Candidates:

Fee for each paper (written examination)

- a) Sponsored candidate by the company = Rs.3, 000/- (Three Thousand only)
- b) Self-sponsored candidate (individual) = Rs.2, 000/- (Two Thousand only)
- *c) Self-sponsored candidate (individual in the category of SC/ST/OBC & having annual income not more than Rs. 1.0 Lakh/annum) = Rs. 1, 000/- (One Thousand only)

Fee for Viva-voce examination

- a) Both for company & self-sponsored candidates = Rs.1, 000/- (One Thousand only)
- *b) Self-sponsored candidate (individual in the category of SC/ST/OBC & having annual income not more than Rs. 1.0 Lakh/annum) = Rs. 500/- (Five Hundred only)

14. Guide Books

The following Guide Books are specially developed for the candidates appearing for the examination.

- Paper-I: General Aspects of Energy Management & Energy Audit
- Paper-II: Energy Efficiency in Thermal Utilities
- Paper-III: Energy Efficiency in Electrical Utilities
- Paper-IV: Energy Performance Assessment for Equipment and Utility Systems.

The Guide Books will be sent to all the registered candidates within 15 days period of their registration.

15. Registration and Certification Process

- Registration for the certification Examination will be done on receipt of the filled up application form along with requisite fees from the candidates
- Registration No. will be allotted on scrutiny of application form and the same will be intimated through Acknowledgement Card.
- Guide Books will be dispatched by post or courier to all the registered candidates.
- Hall Tickets will be issued to the candidates one month before the commencement of the examination.
- The results of the written examination will be communicated to all the candidates
- Intimation letters for viva-voce examination will be sent separately to the successful candidates of the Energy Auditor written examination.
- Certificates and credentials will be awarded to the successfully passed eligible candidates.

16. Role of NPC as the National Certifying Agency

The Bureau of Energy Efficiency has retained the National Productivity Council (NPC) as the National Certifying Agency, which would conduct the National Level Certification Examination for Energy Managers & Energy Auditors.

NPC will carry out the following activities as a National Certifying Agency:-

- 1) Dr. Ambedkar Institute of Productivity (AIP), NPC, Chennai will receive and process the applications from the candidates and register them as per the laid down procedures.
- 2) NPC will send all necessary instructions in respect of the Certifying Examination and other details such as the Venue of examination, timings, code of conduct for the candidates who are registered for the examination for Energy Managers and Energy Auditors.
- 3) NPC will administer the examination in all the centres.
- 4) NPC would issue the Certificates and Credentials under the seal of Bureau of Energy Efficiency, a statutory body under Ministry of Power, Government of India to the successfully passed eligible candidates.

