

Energy Auditor/ Energy Manager Practitioner Course

At CETEE

The ONLY place offering Practical Training in
Energy Efficiency Techniques and Practices



Electrical Module

Thermal Module

**Intensive Course
To Make
YOU Effective and
Confident Energy Auditor/
Energy Manager**

Recently released
Book **The Energy Audit Manual
The Practitioner's Guide**
ABSOLUTELY FREE
If you attend the Course



National Productivity Council

NATIONAL PRODUCTIVITY COUNCIL
(Under Ministry of Commerce & Industry, GoI)
Dr. Ambedkar Institute of Productivity,
Chennai - 600 098

CENTRE OF EXCELLENCE FOR TRAINING IN ENERGY EFFICIENCY (CETEE)

There is a big gap between theory and practice of energy auditing. Newly qualified energy managers and auditors have acquired relevant theoretical knowledge, but they find it difficult to translate theory into practice and conduct energy audit in industries without support from experienced auditors.

There is a need to strengthen energy auditing expertise among new and qualified energy auditors to meet the growing demand of the industries. The Centre of Excellence for Training in Energy Efficiency (CETEE) is a world-class, hands-on training centre in the NPC conceived with the purpose of bridging the gap between theory and practice in energy efficiency. It was set up with assistances from Government of Japan, Bureau of Energy Efficiency (BEE), and Government of India.

The facility was built, operated, and handed over to NPC after extensive training to Indian energy auditors by Japanese experts. Here, practical industrial-scale models of energy equipment are available and participants conduct trials and verify for themselves how energy savings is being achieved. This approach will raise participants' level of confidence in recommending practicable energy efficiency measures in sites where they are conducting energy audits.



WHY ATTEND THIS ENERGY PRACTITIONER'S COURSE?

Energy intensity in almost all industrial sectors in India is higher compared with its counterparts in the developed countries. Following globalisation of economy, Indian industries can no longer ignore the urge of improving energy productivity. One of the major hurdles for energy efficiency programme has been the lack of training and expertise by practicing energy auditors in conducting effective energy audits. There is an urgent need to strengthen efforts through a tailor-made training programme for energy conservation and efficiency.

The two-week Practitioner's Course for Energy Auditors/Managers will develop competencies and skills of both aspiring as well as experienced energy auditors and managers. Normally, it takes 3-5 years for new energy auditors to emerge out of shadows of experienced ones and conduct energy audit independently. No longer will that be the case! After attending this training programme, they will be equipped with all possible tools to conduct a purposeful energy audit for any type of facility—small, medium or large.

This Practitioner's Course will have themes oriented towards electrical energy, thermal energy, and general energy management. The approach for energy auditing for various utility systems will be clearly explained, by experienced faculty, starting from the first principles to include things like what data to collect, what to look for during field audit, how to analyse data, and how to report the findings. To further aid in this, a menu of all possible energy conservation options will be presented with measures categorised as housekeeping and operational, medium-cost and retrofit.

As part of this course, practitioner's guide book will be given to participants. Equipped with this book, a novice, but attentive and focused, energy auditor can do a reasonably good energy audit. For an experienced auditor, it will ensure that no energy-saving opportunity is missed out as an oversight.

This Practitioner's Course and its supporting book will be a very good

supplement to BEE-prescribed books used in the National Certification exams for energy managers/energy auditors. High failures in BEE exams are attributed to lack of knowledge of basic concepts. The practitioner's course book prepared by NPC professionals involved also in BEE-prescribed guide books preparation will definitely improve participants readiness in taking the BEE exams.

The practitioner's course will also be useful to organisations who have already implemented the Energy Management System: EnMS ISO 50001: 2011 or is in the process of implementing them. An ISO 50001 system comprises of both technical and system components. This course will help internal and external auditors to focus on technical parts where real improvement opportunities are possible.

GOAL

The overall goal of this course is to raise the professional standards of energy auditing professionals- both experienced and new.



OBJECTIVE

Participants will understand concepts of various thermal and electrical utilities.

Participants will be able to apply to evaluate performance of any electrical and thermal equipment.

Participants will upgrade the quality of their energy auditing skills.

Participants will be competent to identify implementable energy savings.

Participants will be able to gather relevant data and information quickly, analyse and discuss on potential energy efficiency measures with client.

Participants will be able to conduct effective energy audit in shorter duration.

Participants will be able to strengthen preparation of energy managers/energy auditor exams

Participants will be able to take up challenging assignment and projects related to energy management

TARGET GROUP

Designated energy manager

State Designated Agencies Engineers

Energy auditors seeking Certification and Accreditation

Energy managers in Designated consumers

Certified/Accredited energy manager/energy auditor seeking professional competency

Newly appointed energy auditors in energy consultancy companies

Plant and facility engineers

ESCO professionals

Auditors/Lead auditors in ISO 50001/ISO 14001

Organisations considering energy projects

Managers/Engineers from Operation/Maintenance

College Faculty engaged in teaching PG courses in Energy and Thermal Engineering

Students aspiring for career in energy management and sustainability

PROGRAMME COVERAGE

The participants will undergo intensive, comprehensive and practice oriented classroom training in Centre of excellence for Training in Energy Efficiency at the institute lasting about two weeks. First week will be oriented towards Energy Efficiency in Electrical System and Second week for Thermal Engineering.

The curriculum prescribed for the course is a product of blending experiences of all training and consultancy work that NPC has accumulated for about forty years. The broad coverage of topics **Week-wise** is given below:

WEEK-1 ELECTRICAL MODULE

Energy Auditing

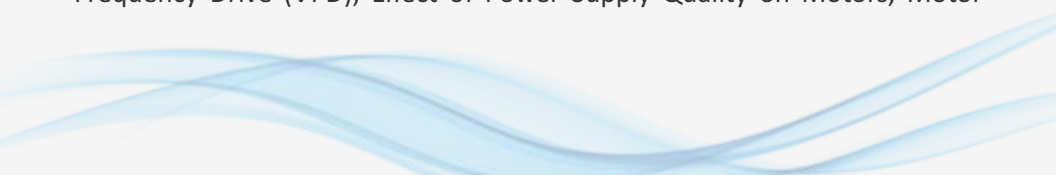
Introduction, Scope of Energy Audit, Types of Energy Audit, Detailed Energy Audit Methodology, Implementing Energy Efficiency Measures, Detailed Project Report (DPR), Measurement & Verification.

Electrical System

Introduction, Main Components of Electrical System, Load Management, Power Factor, Electricity Tariff, Distribution Transformers, Voltage Drop Survey, Cable Losses, Inverter/UPS, Power Quality, Energy Auditing Approach for Electrical Distribution System and Transformers, ENCON Opportunities in Electrical System.

Electrical Motors

Introduction, Types of Motors, Selection of an Electrical Motor, Motor Loading, Energy Efficiency Motors, Power Factor Correction for Motors, Avoiding Idle Running of Motors, Efficient Belt Drives, Application of Variable Frequency Drive (VFD), Effect of Power Supply Quality on Motors, Motor



Application in Material Handling, Energy Auditing Approach for Motors, ENCON Opportunities in Motors, Demo of Energy Efficiency Practices in Motor Laboratory.

Harmonics

Introduction, Current Distortion, Voltage Distortion, Power Factor Distortion, Effects of Harmonics, Harmonics Measurements, Measurement Parameters, Measuring Locations, Harmonic Report, Harmonic Mitigation Solutions, Harmonics Limits

Diesel Generators

Introduction, DG Set Efficiencies, Specific Fuel Consumption, Guidelines for Energy Efficient Operation of DG Set, Energy Audit Approach for DG sets, ENCON Opportunities in DG Sets.

Pumping System

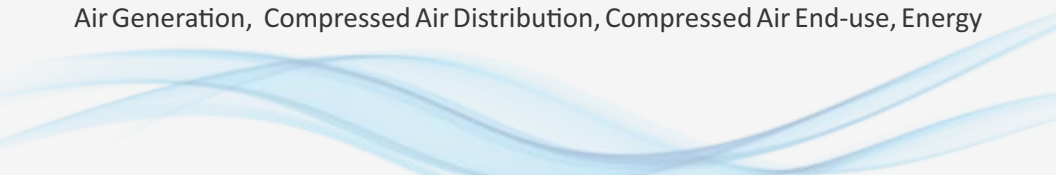
Introduction, Pump Performance Curves, System Curve, Pump Performance Assessment, Flow, Balance, Control Valve Operation (Throttling), By-pass Valve Operation, Optimum Pipe Sizing, Impeller Trimming, Reducing Number of Stages, Variable Speed Operation, Energy Auditing & Approach for Pumping System, ENCON Opportunities in Pumping System, Demo of Energy Efficiency Practices in Pump Laboratory.

Fan System

Introduction, Types of Fans, Fan Selection, Fan Performance Curve, Fan System Resistance, Curve, Flow, Control Devices, Energy Auditing Approach for Fan System, ENCON Opportunities in Fan Systems, Demo of Energy Efficiency Practices in Fan Laboratory.

Compressed Air System

Introduction, Types of Air Compressors, Compressed Air System, Compressed Air Generation, Compressed Air Distribution, Compressed Air End-use, Energy



Auditing Approach for Compressed Air System, ENCON Opportunities in Compressed Air System, Demo of Energy Efficiency practices in Compressed Air System laboratory.

Chilled Water Air-Conditioning System

Introduction, Components of Chilled Water System, Air Delivery System, Chiller Performance Assessment, Chiller Efficiency and Life Cycle Cost in Chiller Selection, Sizing and Configuration, Dedicated Chiller for Night Operation, Chiller Sequencing, Reset of Chilled Water Temperature, Reset of Condenser Water Temperature, Maintaining Surfaces of Condenser Tubes, Use of Absorption Chillers, Thermal Storage Systems, Energy Auditing Approach in Air Conditioning Systems, ENCON Opportunities in Air Conditioning and Central Chiller System.

Air Handling and Distribution System

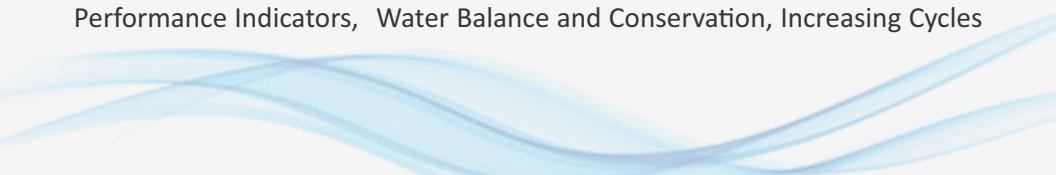
Introduction, Ducting System Design, Fan Discharge and Inlet System, Filter Losses, Coil Losses, Fan Efficiency, Excess Air Flow, Constant Air Volume (CAV) versus Variable Air Volume (VAV), Air Distribution and Balancing, Fresh Air Control, Energy Auditing Approach in Air Handling & Distribution System, ENCON Opportunities in Air Handling and Distribution System.

Industrial Refrigeration Systems

Introduction, Overview of Typical Industrial Refrigeration System, Performance of Refrigeration System, Examples of Applications in small and medium-sized enterprises (SMEs), Energy Auditing Approach for Refrigeration Systems, ENCON Opportunities in Refrigeration System, Energy Auditing Approach in Ice Plant, ENCON Opportunities in Sea-food Processing Industries.

Cooling Towers

Introduction, Key Cooling Tower Terms and Definitions, Cooling Tower Performance Indicators, Water Balance and Conservation, Increasing Cycles



of Concentration (COC), Cooling Tower Operation at Part Load through Capacity Control, Resetting Condenser Water Temperature, Optimising Condenser Water Flow Rate, Proper Cooling Towers Installation, Checking Condition of Cooling Tower, Improving Water Treatment, Switching off Cooling Tower Fans, Side Stream Filtration, Energy Auditing Approach for Cooling Towers, ENCON Opportunities in Cooling Towers

Lighting System

Introduction, Lighting Terminologies, Types of Lamps, Ballast, Use of Day Lighting, Light Pipes, Occupancy Sensors, Integration with Renewable Energy, Energy Auditing Approach for Lighting Systems, ENCON Opportunities in Lighting System, Demo of Energy Efficiency practices in Lighting Lab.



WEEK-2

THERMAL MODULE

Boiler System

Introduction, Boiler Efficiency, Boiler System Energy Savings, Thermic Fluid Heaters, Energy Auditing Approach for Boiler and Thermic Fluid Heater System, ENCON Opportunities in Boiler System, ENCON Opportunities in Thermic Fluid Heaters, Demonstration of energy-efficient boiler operating practices.

Steam System

Introduction, Steam Survey, Surface Heat Loss, Steam Leaks, Steam Losses through Steam Traps, Condensate Recovery, Blowdown Heat Loss, Heat Recovery from Flash Steam, Energy Auditing Approach for Steam Systems, ENCON Opportunities in Steam System. Demonstration of different steam traps, applications and good practices.

Industrial Furnaces

Introduction, Fuel-fired Furnaces, Induction Furnaces, Electric Arc Furnaces, Furnace Application- Steel Re-rolling Mill, Energy Auditing Approach for Industrial Furnaces, ENCON Opportunities in Oil-fired Furnaces, ENCON Opportunities in Induction and Arc Furnaces, ENCON Opportunities in Steel Re-rolling Mill, Demonstration of Combustion Control for Optimum Excess Air.

Waste Heat Recovery

Introduction, Waste Heat Sources, Overview of Waste Heat Recovery Technologies, Examples of Waste Heat Recovery Applications, Energy Auditing Approach for Waste Recovery Assessment.

Industrial Drying

Introduction, Types of Dryers, Energy Saving Opportunities in Drying,



Economic Benefits of Heat Recovery, Tea Drying, Factors Affecting Tea Drying Efficiency, Performance Assessment of Dryers, ENCON Opportunities in Industrial Drying.

Cogeneration

Introduction, CHP Configuration, Applications, Components of CHP, Choice of Fuel, CHP Technology Types, CHP Metrics, Cogeneration Feasibility Study.

Water Audit and Conservation

Introduction, Water Auditing Step-by-Step, Water Auditing Approach, Water Conservation Options

Buildings

Introduction, Energy Performance Index (EPI), BEE Star Programme for Buildings, GRIHA Green Rating System, LEED Rating System, Energy Mapping of Buildings, Energy Auditing Approach for Buildings, ENCON Opportunities in Buildings, ENCON Opportunities in Elevator System.

Renewable Energy Technologies


Introduction, Wind Energy Technology Overview, Small Hydro Power (SHP), Photovoltaic Power System, Solar Water Heating Systems, Biofuels, Site Tour of Renewable Energy Facility.

Monitoring & Verification

Introduction, Purpose, Certification, Guidelines for Verification Process, Process of Verification

Energy Management System (EnMS): ISO 50001:2011

Introduction, Top Management Commitment and Involvement, Scope and Boundaries, Energy Policy, Resources, Energy Planning, Energy Objectives, Targets, and Action Plans, Implementation and Operation, Checking, Management Review.



FACULTY

The Institute has its core faculty group. The Institute also invites the senior energy consultants from other offices of NPC as well as retired ex NPC professionals who possess advanced academic qualifications and vast practical experience.

COURSE EVALUATION CRITERIA (FULL MODULE)

Assignments	: 20%
Two Minor Tests	: 40%
Final Exam	: 40%

Successful participants will be awarded Energy Auditor/Manager practitioner certificate (Electrical & Thermal)

COURSE EVALUATION CRITERIA (ELECTRICAL OR THERMAL MODULE)

Assignments	: 10%
One Minor Test	: 20%
Final Exam	: 20%

Successful participants will be awarded Energy Auditor/Manager practitioner certificate (Electrical or Thermal)

BATCHES

BATCH 1:


19 – 23 JUNE 2017 - ELECTRICAL MODULE (5 DAYS)

BATCH 2:

17 – 28 JULY 2017- FULL MODULE (TWO WEEKS)

BATCH 3:

28 AUG. – 1 SEPTEMBER 2017 - THERMAL MODULE (5 DAYS)



COURSE FEE

A programme fee of Rs. 35,000/- (Rupees Thirty five Thousand only) will be charged per participant for the two-week long full module. This will include course workbook, practical training laboratory fee, lunch and refreshments, but excluding boarding and lodging.

If participant choose to attend only one 5-day module (Thermal or Electrical), in which case, the programme fee would be Rs.17,500/- (Rupees Seventeen Thousand Five Hundred Only) per participant.


Note: Service Tax @15% payable to Government of India will be in addition to the above course fee.

ACCOMMODATION CHARGES (OPTIONAL):

In case of prior booking, accommodation can be made available in a single AC room in the campus at the rate of Rs.1300/- (Rupees One Thousand Three Hundred Only) plus service tax @15%, per day per participant. The charges are inclusive of room rent, complimentary breakfast and dinner. Accommodation charges may be paid by cash at the time of check out after the training programme.

REGISTRATION

First Come first serve basis, limited to 25 per batch, registration closes seven working days prior to the schedule batch. The nominations may be sent via email: npcaipchn@gmail.com or physically in company letter head/registration form enclosed along with mentioning their names, designation and contact details (contact no. & email-id) along with the course fee to:



PRACTICAL JAPANESE HANDS-ON TRAINING FACILITY



Air Compressor



Open Burner



Pumping System



Fan System



Boiler



Steam traps



Combustion



Course Coordinator

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Website: www.aipnpc.in;

www.npcindia.gov.in

Payment Mode

1. Demand Draft: Payment to be made in favour of "National Productivity Council", payable at Delhi (or)

2. NEFT Transfer:

Name of the Bank	:	Indian Overseas Bank
Branch	:	Golf Links Branch, New Delhi
Nature of Account	:	Savings Bank
IFS Code	:	IOBA0000265
Bank A/c No	:	026501000009207
MICR Code	:	110020007

(Please intimate the payment details made through NEFT to this office through email ID: npcaipchn@gmail.com)