



ENERGY MANAGEMENT CENTRE-KERALA

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ENERGY EFFICIENCY CAPACITY BUILDING

INVITATION FOR RESOURCE PERSONS

Energy Management Centre (EMC) - Kerala invites expression of interest from resource persons for programs aimed at industrial engineers on energy conservation and energy efficiency. The details of the programs are available in our website www.keralaenergy.gov.in. Interested resource persons may apply with detailed curriculum vita and synopsis of the topic(s) they wish to take. For more details please visit www.keralaenergy.gov.in. Last date for submission of application is 15 days from this advertisement.

Sd/-
Director

**COURSE DESIGN
FOR
TRAINING PROGRAMMES**

**ENERGY MANAGEMENT CENTRE
THIRUVANANTHAPURAM**

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1. ENERGY MANAGEMENT COURSE FOR OFFICERS OF GOVT. DEPARTMENTS, AGENCIES & PSU's:

Course Coverage:

- Global and Indian energy scenario, energy source & supply and demand, key initiatives in energy sector, electricity, gas, oil & coal, Kerala State Energy profile. Introduction to energy management (macro and micro perspective). Electricity tariff and regulatory measures, Energy Conservation Act 2001, energy management and auditing:
 - Mandatory audits for designated consumers
 - Perform Achieve and Trade scheme
 - Standards & Energy Labelling
 - Energy Conservation Building Code
 - Certification of Energy Managers & Accreditation of Energy Auditors
- Role of State Designated Agency in implementing EC Act 2001 and State energy conservation programmes.
- Energy auditing approach and methodology.
- Gas energy – Natural gas utilisation
- Renewable energy
 - Grid connected solar photo voltaic power
 - Wind energy
 - Small hydro power
 - Bio-mass energy
- Energy use and conservation in manufacturing industry.
- Energy use and conservation in service establishments.
- Energy conservation in public utilities, lighting and water pumping.
- Energy conservation in buildings.
- Innovative financing for energy efficiency projects, role of ESCO's in implementation of energy efficiency projects, case studies, plant visits and group exercises.

Participant Group:

Engineers from State Electricity Board (Generation & Distribution), Public Works Department, Electrical Inspectorate, Irrigation and Water Resources Department, Municipalities, Officers from State Industrial Development Corporations, Engineers and Managers from State and Central PSU's. Number of participants will be around 20 for effective participation and interaction.

2. ENERGY MANAGEMENT & AUDIT COURSE:

Course Coverage:

Day-1	Paper-1	General Aspects of Energy Management & Audit
Day-2	Paper-2	Energy Efficiency in Thermal Utilities
Day-3	Paper-3	Energy Efficiency in Electrical Utilities
Day-4	Paper-4	Energy Performance Assessment for Equipment and Utility Systems
Day-5	Tutorials and problem solving for Paper No.4	

The course coverage will be as per BEE prescribed syllabus and revised guide books on the above subject.

Participant Group:

Engineers and Managers from industry and Government Departments engaged in design, operation of utilities and energy, faculty from engineering colleges, who are interested to certification as Energy Managers and Auditors under National Certification Examination for Energy Managers and Auditors conducted by Bureau of Energy Efficiency. Number of participants will be around 20 to 25 for effective participation and interaction.

3. ENERGY EFFICIENCY & ENERGY MANAGEMENT FACULTY DEVELOPMENT PROGRAM:

Course Coverage:

- Global and Indian energy scenario, primary and secondary energy, commercial and non-commercial energy, commercial energy – coal, oil, gas and electricity.
- Energy basics, output input relationship, efficiency and losses, avoidable and inevitable losses, fixed and variable losses.
- Energy management and energy audit methodology, portable instruments for energy audit,
- State energy conservation program and EC Act 2001.
- Thermal energy utilisation and conservation
 - Boilers and steam systems
 - Fuel economy in furnaces
- Electrical energy conservation
- Plant electrical, pf improvement and demand management
- Energy efficient drives
- Energy efficient lighting
- Digital energy meter and smart meters
- Application of VFD's
- Refrigeration and compressed air systems
- Cogeneration
- Waste heat recovery and VAR systems
- Renewable energy technologies
- Energy efficiency and environment
- Case studies and group exercises
- Plant visit

Participant Group:

Faculty from engineering colleges from electrical, mechanical, chemical, metallurgical, architecture disciplines and also professional energy auditors interested to act as trainers. Number of participants will be around 20 for effective participation and interaction.

4. ENABLER PROGRAM ON ENERGY MANAGEMENT FOR ENGINEERING COLLEGE STUDENTS:

Course Coverage:

- Indian energy scenario, production and supply of commercial energy coal, oil, gas and electricity.
- Electricity generation and supply
- Energy input – output relationship, loss & efficiency
- Avoidable and inevitable losses
- Fixed and variable losses
- Loss reduction and efficiency improvement
- Energy management practices
- Concept of energy auditing & loss accounting
- Identifying opportunities for energy savings
- Energy conservation in industry
- Energy efficiency in buildings
- Technologies for improving energy use efficiency
- Renewable energy
- Industry case studies
- Quiz and group exercise
- Films on energy conservation

Participant Group:

7th semester students from disciplines of electrical, mechanical, chemical, electronics, metallurgy and architecture discipline. Interested students from 6th semester will also be admitted.

5. APPRECIATION PROGRAMME ON ENERGY CONSERVATION FOR SCHOOL TEACHERS:

Course Coverage:

- Energy requirements of India – a growing nation
- Production and consumption of various forms of energy
- Energy use in homes, offices and industry
- How energy use affects environment
- Promoting efficient use of energy and energy conservation for environment preservation
- Renewable energy
- Energy consumption in domestic appliances
- Star labelled appliances and devices
- Use of energy calculators
- School energy programme
- Making energy leaders and champions – motivating student groups
- Films on energy conservation

Participant Group:

Secondary school teachers teaching in 6th, 7th & 8th standard

6. ENERGY EFFICIENCY IN INDUSTRIAL FURNACES AND KILNS:

Course Coverage:

- Introduction to furnaces and kilns
 - Reheating furnaces
 - Melting furnaces
 - Ceramic kilns

- Fuel economy in reheating furnaces
 - Combustion and draft control
 - Heat distribution
 - Temperature control
 - Furnace capacity utilisation
 - Reduction of losses

- Energy efficiency improvements in Induction and Arc furnaces
 - Input power control
 - Optimal loading
 - Holding energy consumption and reduction of losses
 - Effective scheduling and minimising delay time

- Energy economy in ceramic kilns
 - Firing and temperature control
 - Optimising ceramic ware charge and kiln car size
 - Utilising kiln exhaust gases

- Waste heat recovery
 - Recuperators
 - Regenerators
 - Recuperative burners

Participant Group:

Engineers and Managers and also energy managers from ferrous and non-ferrous metallurgical industries, refractory and ceramic industry and also energy auditors interested in this field.

7. ENHANCING ENERGY EFFICIENCY IN REFRIGERATION AND AIRCONDITIONING SYSTEMS:

Course Coverage:

- Basics of refrigeration and its applications
 - Industrial refrigeration for process cooling
 - Air conditioning of buildings
 - Cold storage application
- Selection – Application of energy efficient refrigeration and air conditioning equipments
- Energy saving measures in refrigeration system
- Building air conditioning
 - Cooling load review
 - Optimization measures
 - Controls
- Energy efficient cold storages
- Vapour absorption refrigeration system and heat pumps
- Cold insulation
- Case studies and check list for energy saving

Participant Group:

Engineers and Managers and also energy managers from industries covering process, food& beverages, dairy, pharma, rayon& polyester yarn, hotels, hospitals, cold storages, IT parks and commercial buildings. The program is also of benefit to energy auditors interested in this field.

8. PINCH TECHNOLOGY FOR PROCESS INTEGRATION AND HEAT EXCHANGER NETWORKING:

Course Coverage:

- Heat exchanger basics and heat exchanger applications in industry
- Heat exchanger network and heat exchange operations in a continuous process (hydro carbon processing) industry.
 - Requirement for hot and cold utility
- Introduction to pinch analysis audits underlying principles
- Step by step approach in pinch analysis
 - Generating composite curves
 - Locating pinch
 - Setting targets
 - Problem solving
- Case studies in heat and process integration
 - Retrofits
 - New designs
- Process to process heat recovery in food / dairy and power industry
- Technological development in heat exchangers
- Heat integration and power recovery

Participant Group:

Practising engineers and managers, certified energy managers from refinery, fertiliser, petrochemicals, power, food & beverages and dairy industry and energy auditors interested in this field.

9. IDENTIFYING AND IMPLEMENTING ENERGY CONSERVATION PROJECTS:

Course Coverage:

- Identifying sound energy conservation projects
 - Through energy audit
 - Equipment suppliers' proposals
 - Plant teams experiences and initiatives
- Management appraisal and concurrence- enablers
 - Effective communication and presentation
 - Getting message across, clear and concise
 - Simple appraisal note
 - DPR preparation
 - Financial viability
 - Profitability analysis
 - Funding
- Implementation through
 - In-house expertise
 - Through principal equipment supplier
- Implementation through performance contracting by Energy Service Company (ESCO)
 - Model ESCO contract
 - Monitoring and verification protocol
- Case studies in implementation investment oriented energy conservation projects

Participant Group:

This programme is intended for practising engineers and managers and also project managers from industries, Government Departments and service establishments, municipalities and equipment suppliers interested in implementing energy conservation project.