Energy Efficiency Policy Planning & Development in India.

By
H.R. Raja Kumar
AEE, BESCOM
Bangalore, India.

Scope for Energy Efficiency and Conservation

- There is scope to save 23% of Energy by conservation or Energy efficiency i.e, 125 BUs or 23000 MW.
- Energy saving potential in some identified industries is

Iron & Steel -	10%	Sugar	20%
Fertilizer -	15%	Petrochemical	15%
Textile -	25%	Glass & Ceramics	20%
Cement -	15%	Refineries	10%
Paper -	25%	Pump sets	30%
Aluminum-	10%	Lighting	76%

- Further fossil fuels in India are going to be depleted as under

  Coal -195 Years

  Oil - 17 Years

  Gas- 66 Years
- We have to conserve these.
- To conserve fossil fuels.

  To increase energy efficiency Government of India enacted energy conservation Act-2001.

Objectives of the Act

- To Lay down norms for equipments.
- To enforce mandatory labelling of equipments
- To establish consumption Standards.
- Mandatory energy audit (for 15 category of consumers)
- To create BEE.
- To establish energy conservation fund.
- To require SERCs to co-ordinate, regulate and enforce measures to implement ECA 2001.

Bureau of Energy Efficiency

- Under ECA 2001, Bureau of Energy Efficiency was established (On 1-3-2002)
- **Objectives of BEE**
- To Reduce energy intensity
- To create awareness and energy conservation
- Professional certification and accreditation.
- Energy efficiency policy.
- Section 4 :- Governing Council shall have not less than 10 and not more than 25 members.
- BEE can constitute Advisory committee.
- BEE Website. < www.bee-india.com>

BEE - Functions

- To recommend to the Govt. regarding energy consumption standards.
- To prescribe guidelines for energy conservation in buildings.
- To create awareness and to diseminate information for efficient use of energy and its conservation.
- To promote research and development in the field of energy conservation.
- To develop testing and certification procedures.
- To formulate and facilitate implementation of pilot projects.
- To promote use of energy efficient equipments, processes, devices and systems.

BEE - Functions

- To promote innovation.
- To give financial assistance to the institutes.
- To maintain a list of accredited energy auditors.
- To Specify qualifications for the accredited energy auditors.
- To specify manner and intervals of energy audit.
- To specify certification procedure for energy managers.
- To prepare educational curriculum for institutions.
- To implement international co-operation programs.

Penalties & Adjudications

- If any person fails to comply with sections 14 (c), (d), (h), (i), (k), (l), (n), (r), (s) or sections 15 (b), (c), (h) he shall be liable to a penalty which shall not exceed Rs. 1 Lakh for such each failure and in case of continuing failure, with an additional penalty of Rs. 10,000- for every day.
- The penalty amount can be recovered as arrears of land revenue.
- Regulatory Commission shall appoint one of its members as an adjudicating officer in such cases.
- Any person aggrieved by any decision of adjudicating officer may file an appeal to the High Court within 60 days.

Energy Conservation Fund

- Central Govt. has constituted a Fund called Central Energy Conservation Fund.
- Each State Govt. will constitute a Fund called State Energy Conservation Fund.
- These funds shall be used for the following purposes.

  a) Salary allowances of officers & Employees of BEE.

  b) Expenses on the objectives and purposes, authorized under this Act.

ESCOS

- Energy Saving measures are proposed to be implemented through Energy Services companies. These are funded by Energy conservation fund.
- They will develop or sell energy services to energy end users
- They will conduct audit and recommend best possible options.
- They will arrange finances, execute projects, share profits, monitor, workout pay back period and do turnkey, works.

IREDA Assistance

(Indian Renewable Energy Development Authority)

- IREDA promotes energy efficiency and conservation.
- IREDAs Financing Norms.

a) Commercial /Industrial	75% Loan
b) Domestic	75% Loan
c) Agriculture	75% Loan

- **Note :-**

  Grant up to 10 Lakh for energy audit/DPR preparation.

Energy Auditors & Energy Managers

- Every designated Industry should nominate one officer as Energy Manager.[Section, 14(m)] He should obtain Manager Certificate issued by National Productivity Council who are authorized by Bureau of Energy Efficiency to conduct Exam and issue certificate.
- Energy Auditors are accredited Energy Experts, who are authorized to conduct independent energy auditing [Section 14(b) & (i)] NPC, conducts exams for them on behalf of BEE and issues certificates.
- ECA 2001 has listed industries where annual energy audit should be conducted compulsorily.

  If not, penalty will be imposed.(List on Slide No 21 & 22)
- Details are available on <www.energymanagertraining.com>

Role of Energy Manager

- To establish an energy conservation cell and prepare annual activity plan.
- To develop and manage training program for energy efficiency at operating levels.
- To Initiate activities to improve monitoring and process control to reduce energy costs.
- To Co-ordinate implementation of energy audit / efficiency improvement projects through external agencies.
- To provide information to BEE & Designated Agency of the respective States.

Eligibility Criteria of Energy Managers

- Graduate Engineer (BE / B.Tech) or equivalent with 3 years Work experience.
- Post graduate engineer (ME / M.Tech) or equivalent with 2 years Work experience.
- Graduate Engineer with Post graduate Degree in Management or equivalent with 2 years Work experience.
- Diploma Engineer or equivalent with 6 years of Work experience.
- Post graduate in Science with 5 years Work experience.

Examination for Energy Managers.

- Exam is conducted by National Productivity Council. They have to pass in following 3 papers.

  (a) General Aspects of Energy Management & Energy Audit.

  (b) Energy Efficiency in Thermal Utilities.

  (c) Energy Efficiency in Electrical Utilities.

Role of Energy Auditors

- To carryout detailed energy audit.
- To Quantify energy consumption and establish base line energy information.
- TO Construct energy and material balance.
- To Perform efficiency evaluation of energy and utility systems.
- To Compare energy norms with existing energy consumption levels.
- To identify and priorities energy of saving measures.
- To Recommend energy efficient technologies and alternate energy sources.

Eligibility Criteria for Energy Auditors

- Graduate Engineer (BE / B.Tech) or equivalent with 3 years of Work experience.
- Post graduate Engineer (ME / M.Tech) or equivalent with 2 years of work experience.
- Graduate Engineer with post Graduate Degree in Management or equivalent with 2 years of Work experience.

Examination for Energy Auditors.

- National productivity Council conducts exams for Energy Auditors. They have to pass in following 4 papers.

  (1) General Aspects of Energy Management and Energy Audit.

  (2) Energy Efficiency in Thermal utilities.

  (3) Energy efficiency in Electrical utilities.

  (4) Energy performance assessment for equipment and utility systems (open Book Examination)

Financial Package

Energy Efficiency projects have the following cost components.

- Energy Audit charges.
- Consultancy fees for a detailed project report.
- Consultancy charges for implementation of project.
- Cost of machinary, including cost of retrofitting/renovating, modification of existing items, Miscellaneous assets for establishing a monitoring system and
- Charges for monitoring the energy efficiency on long term basis.

- **Mandatory Annual Energy Audit for following industries.**

1	Aluminum
2	Fertilizers
3	Iron & Steel
4	Cement
5	Pulp & Paper
6	Chlor- Alkali
7	Sugar
8	Textile
9	Chemicals
10	Railways
11	Port Trust

12	Transport Sector (Industries and Services)
13	Petrochemical, Gas Crackers, Naphtha Crackers and Petroleum Refineries.
14	Thermal Power Stations, Hydel Power Stations, Electricity Transmission Companies & Distribution Companies.
15	Commercial Buildings or Establishment.

IMPACT OF ECA 2001

a) General public including stake holders, architects and engineers will become aware of the need if energy conservation.

b) Panel of accredited energy auditors will be available and Energy Audit will be as common as ISO 9000.

c) Energy conservation standards for various equipment would be promulgated.

d) Manufacture, sale and import of equipment not conforming to the standards would be prohibited.

e) Test facilities for energy labeling would be available and the testing agencies would be trained.

f) Guide lines for “energy conservation building codes” will be promulgated by BEE.

g) Each state would promulgate building codes taking in to account local conditions.

h) State level energy conservation fund would be established.

i) Incentives for energy conservation.

j) Implementing agency for energy conservation will be in both places at central and state level.

k) Energy Conservation will be included in the Syllabi for Engineers, Architects and Economics.

Energy Efficiency and Conservation Organizations

1) The Secretary, Ministry of Power,201,Sharma Shakthi Bhavan, New Delhi-110011.

   www.powermin.nic.in

2) Director General, Bureau of Energy Efficiency
   Ministry of Power, NBCC towers Hall No-IV , 2nd floor,15Bhjikaji Kama Palace,
   New Delhi-110066.

3) Managing Director Indian Renewable Energy Development Authority Indian Habitat Centre Complex Core 4A, East Court, First , floor Lodhi road
   New Delhi-110003.

   www.ireda.nic.in

Thank You