ENERGY MANAGEMENT TECHNIQUES

ENERGY INTENSITY IN INDIA

- Energy Intensity is an indicator of Energy efficiency level of a country
- Energy Intensity is the energy consumed per unit of G.D.P
- India Energy Intensity is 3.7 times of Japan, 1.55 times of U.S.A., 1.47 times of Asia and 1.5 times of World average (source B.E.E GOI)
- India is one of the most inefficient energy users in the world
- Per capita consumption of energy in India is 592 Kwh.

WHY ENERGY CONSERVATION ?

- To save one MW of Electricity, we need an investment of Rs. one crore whereas to generate 1 MW of energy through new power plant, we need about Rs. 4.50 Crore.
- Efficient use of Energy would lead better utilisation of existing energy sources and therefore would provide energy security for the country
- It would help in improving local environment and reduction in global warming
- India has potential to save 25,000 MW of electricity, through energy conservation with an expenditure of Rs. 25,000 crores & in a time span of just two years. Otherwise this capacity addition would need approx. Rs. 1,12,500 crores investment and it will also come up after 5 years time gap.

CENTRAL GOVT. INITIATIVES ON ENERGY CONSERVATION

- The Government of India has enacted Energy Conservation Act, 2001 (No.52 of 2001, 29th September, 2001) with the objective to provide a regulatory framework for formulation and implementation of energy conservation strategies in the country.
- The Act provides mainly for efficient use of energy and its conservation and for matters connected therewith or incidental thereto.
- Under the Act, powers have been provided to the Central & State Government to enforce the various provisions of the Act in the area falling under its jurisdiction.
- At Government of India, the implementation of the said Act is coordinated and supervised by the Bureau of Energy Efficiency (BEE) Ministry of Power GOI.
- The said Act has commenced w.e.f 1st March, 2002.
- State Designated Agencies to regulate & enforce the EC Act-2001

WHAT IS ENERGY MANAGEMENT ?

- The fundamental role of Energy Management is to produce goods & provide services with least cost and least environment effect.
- To reduce the energy requirement per unit of output.

OUR GOALS

- To enforce the Energy Conservation Act, 2001 comprehensively
- To aggressively target the Designated Consumers under the Act
- To demonstrate energy efficient technologies among the masses in public and private sector;
- Energy audit & implementation of recommendations through ESCO mode for public buildings;
- Fix the norms & standards of energy consumption by defining Energy Conservation Building Codes;
- Promotion of energy efficient equipment & standards/ labeling ;
- To promote the design of the energy efficient buildings specially in the Govt. sector so that it has a significant demonstration effect.

INDUSTRIES
WHAT IS A DESIGNATED CONSUMER ?

- As per the Energy Conservation Act, 2001, it is mandatory for all the Designated Consumers to get energy audit conducted by an Accredited Energy Auditors [Under Clause 14(h) and 14 (I)] and to designate or appoint an Energy Manager [under Clause 14(1)]

WHO ARE DESIGNATED CONSUMERS UNDER E.C. Act ?

1. Aluminum
2. Fertilizers
3. Iron & Steel
4. Cement
5. Pulp & Paper
6. Chlor Alkali
7. Sugar
8. Commercial buildings or establishments.
9. Textile
10. Chemicals
11. Railways
12. Port Trust
13. Transport Sector
14. Petrochemicals, petroleum refineries
15. Thermal Power Stations, hydro-power Stations, electricity transmission & distribution Co.

ENERGY SAVING POTENTIAL OF DESIGNATED CONSUMERS

Sr.No.	Industry Sector	%age saving potential
1.	Aluminum	8-10
2.	Cement	10-15
3.	Ceramics	15-20
4.	Chlor-alkali	10-15
5.	Ferro-alloys	8-10
6.	Fertilizer	10-15
7.	Foundry	15-20
8.	Glass	15-20
9.	Iron & Steel	8-10
10.	Petro-chemicals	10-15
11.	Pulp & Paper	20-25
12.	Refineries	8-10
13.	Sugar	25-30
14.	Textile	20-25

STEPS FOR ENERGY EFFICIENCY IN INDUSTRIAL SECTOR

Steps required for boosting energy efficiency in Industrial Sector

- Data base of designated industries
- Mandatory Energy Audit
- Enforce Energy Efficiency Measures
- Prepare EC Management Plan
- Time frame for EC measures implementation
- Fiscal incentive to the new industry for Energy Efficient plant
- Labeling of Energy Efficient Industries on the pattern like ISO 9000,9001 etc.
- Develop Voluntary Energy Efficiency agreements model for India

ENERGY EFFICIENCY

Steps taken:

- Instituted Energy efficiency award for industries.
- The use of solar water heating systems has been made mandatory in Industries (where hot water is required for processing), Hospitals and Nursing homes including govt. hospitals, Hotels, Motels and banquet halls, Jail Barracks, Canteens, Housing Complexes (set up by Group Housing Societies / Housing Boards).
- Data base of designated industries is being prepared.

SCHEMES ON PROMOTING ENERGY EFFICIENCY & DEMAND SIDE MANAGEMENT

State Awards for Excellence in Energy Conservation.

Category	Ist. Prize	2nd prize	3rd prize
H.T. Consumer/ Industry	Rs. 2.0 lac and a certificate & with shield	Rs. 1.00 Lac a certificate & with shield	Rs. 50,000 a certificate & with shield
L.T. Consumer/ Industry	Rs. 1.0 lac and a certificate & with shield	Rs. 50,000 a certificate & with shield	
Buildings			
Government	Rs. 1.00 Lac	Rs. 50,000	
Commercial/ Hotel, Hospital	Rs. 1.00 lac & a certificate & with shield	Rs. 50,000 a certificate & with shield	Rs.25,000
Educational	Rs. 1.00 lac & a certificate & with shield	Rs. 50,000 a certificate & with shield	Rs.25,000

STEPS TAKEN FOR ENERGY EFFICIENCY IN AGRICULTURE

Steps taken:

- For all new tubewell connections, the use of ISI marked pump sets and accessories made mandatory
- Scheme on providing financial incentives on the purchase of ISI marked Pump-sets launched.
- Under this scheme, 50% of the cost difference between an ISI and non-ISI marked Pump-sets is provided to the farmer on installation of new pump-set or upgrading existing pumps @ Rs. 400/- per HP of pump with max. ceiling of Rs. 5000/- per farmer.
- During the Year 2006-07, Rs. 40 Lac is being spent for upgrading at least 10,000 HP capacity of pumps.
- Awareness and education compaign in coordination with power utilities, HAU and Agriculture deptt. launched

INITIATIVES ON ENERGY EFFICIENCY

Steps required for boosting energy efficiency in Agriculture Sector:

- Implementing a mix of mandatory and promotional measures.
- Metered power supply.
- Drip irrigation, sprinkle irrigation system to be promoted and linked with energy efficiency.
- Continuous learning programme for farmers be initiated in Agriculture Universities, K.V.Kendra.
- Promoting correct agricultural practices like sowing paddy in rainy season and zero tillage etc.

ENERGY EFFICIENCY IN DOMESTIC & COMMERCIAL SECTOR/ GOVT. SECTOR

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Domestic / Commercial /Govt sector:

- Second highest energy consumption sector-32.70%(Aggregate)
- Energy efficiency potential - 20%

Steps Taken:

- All residential buildings built on a plot of size 500 sq.yds and above falling within the limits of municipal committees/ corporations & HUDA sectors installation of SWHS made mandatory.
- Haryana Govt. has approved rebate in electricity bills for users of SWHS in domestic category @ of Rs.100 per month per 100 LPD capacity up to 300 LPD capacity for three years.
- Financial incentives provided on energy efficient tube lights & Energy efficiency motors introduced in rural area.
- Awareness campaign through media, Schools & mass mobilisation activities launched.

PROGRAMMES INITIATED ON ENERGY EFFICIENCY

Steps Taken:

- Instituted State awards for energy efficiency.
- All Govt. buildings, residential Schools, Educational Colleges, Hostels, Technical/Vocational Education Institutes, DIETs, Tourism Complexes and Universities etc. installation of SWHS is made mandatory.
- All the new buildings to be constructed in the Govt./Govt. Aided sector will incorporate energy efficient building design concepts including Renewable Energy Technologies with effect from 30.6.2006 – an Inter-departmental Monitoring Committee set up to enforce and monitor the progress.
- Building bylaws amended for mandatory use of SWHS

ENERGY EFFICIENCY MEASURES UNDERTAKEN

Govt./Commercial Sector:

- **Steps Taken:**
- The use of incandescent lamps in all new buildings/institutions constructed in Govt. sector/Govt. Aided sector/Board and Corporation/Autonomous bodies has been banned
- It has been made mandatory that in existing buildings the defective incandescent lamps when replaced, would be replaced by only compact fluorescent lamps (CFL).

- The use of 40 watt conventional tube lights with blast in all new buildings/ institutions constructed in Government sector / Government aided sector/ Boards and Corporations / Autonomous Bodies has been banned and the use of T-5 28 watt retrofit assembly has been made mandatory.

Plan for Implementation of the Recommendations of Energy Audit

- The Energy audit shows that with a nominal investment a substantial energy can be saved in the govt. buildings by use of energy efficient and Renewable energy technologies.
- The average investment is about Rs. 7.00 lac per building with a pay back period of just 3 years.

Steps required for boosting energy efficiency in Domestic/ Commercial/ Govt. sector

- Mandatory Energy Audit.
- Labeling of energy efficient electrical appliances.
- Awareness campaign on large scale.
- Energy efficiency to be added in school syllabus from 5th standard onwards.
- Mandatory energy efficient building design.
- Labeling of Energy Efficient organizations on the pattern like ISO 9000,9001 etc

Steps required for boosting energy efficiency in Domestic/ Commercial/ Govt. sector

- Govt. to play leaders role- significant demonstration effect.
- Expenditure on RE devices qualify for I-Tax exemptions.
- Mandatory Energy Audit for Govt./semi Govt.sector including municipalities.
- To prepare comprehensive Energy conservation plan for the state
- Adopt ESCO mode for Energy Efficiency projects .
- Awareness campaign on large scale.
- Develop voluntary Energy Efficient agreements model/ program for India
- Mandatory Energy Efficient building design.
- Energy efficiency Capacity building like manpower infrastructure,technology R&D etc.

Efficiency should not be an "add on" but a key determinant in economic decision making.

- THANK YOU