Implementation of Energy Conservation Act and BEE Action Plan

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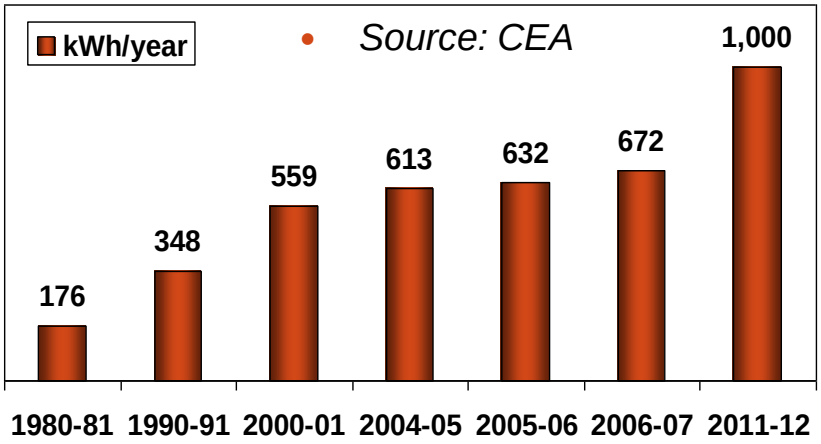
Outline of Talk

- Energy Use in India
- Sectoral Energy Consumption
- EC Act, 2001
- BEE Activities
- Designated Consumers
- Energy Manager and Auditors
- Accreditation Procedure
- PAT Scheme

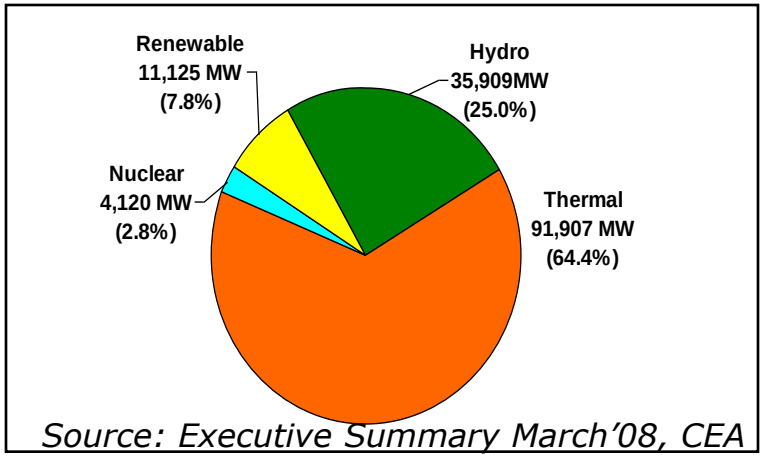
Energy Use in India

- Total primary energy supply of India has increased from about 350 Mtoe in 1990 to about 580 Mtoe in 2004; an increase of about 2.2% per year
- Energy demand is increasing due to accelerated industrialization, urbanization and population growth
  - 2003-04 : 572 Mtoe
  - 2016-17 : 842-916 Mtoe
  - 2026-27 : 1406-1561 Mtoe
- With installed capacity of over 143 GW and annual generation of over 700 Bus; INDIA ranks sixth largest electricity market.
- With per capita consumption of 672 kWh against world average of 2600 kWh; INDIA ranks much lower than other developed countries

Per Capita Consumption of India



Generation Capacity of India Mar'08



(Coal + Lignite – 76,049 MW, Gas – 14,656 MW, Diesel – 1,202 MW)

Sectoral Energy Consumption

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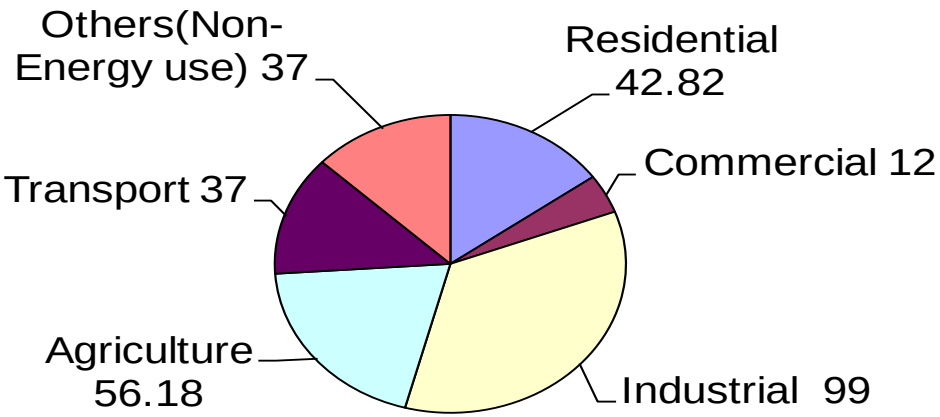


Total Energy Consumption 356 Mtoe – (2005)

Source: IEA

Saving Potential in different Sectors

Sectoral Intervention	Potential Energy Savings
Agriculture	60 b KWh
Municipalities	3.7 b KWh
Buildings	3.52 b KWh
Industry	98 b KWh
Lighting	70 b KWh

Source: BEE

Importance of Energy Conservation

- Energy efficiency/conservation measures can reduce peak and average demand.
- One unit saved avoids 2.5 to 3 times of fresh capacity.
- Also avoids investment in fuel, mining, transportation etc.
- Keeping the above factors in view and also to provide a policy guidance, Government of India enacted the Energy Conservation Act,2001

Energy Conservation Act 2001

- An Act to provide for efficient use of energy and its conservation and for matters connected therewith or incidental thereto.
- Enacted in Oct 2001, became effective from 1st March 2002 onwards.
- It extends to the whole of India except the state of Jammu and Kashmir.
- Under the provisions of the act, the Bureau of Energy Efficiency (BEE) came into force from March 2002.

Contents of EC Act 2001

Chapter No	Contents
1	Short title, extent and commencement
2	Establishment and incorporation of Bureau of Energy Efficiency
3	Transfer of assets, liabilities and employees of Energy Management Centre
4	Powers and functions of Bureau
5	Power of Central Government to enforce efficient use of energy and its conservation
6	Power of State Government to enforce certain provisions for efficient use of energy and its conservation
7	Grants and loans by Central Government
8	Penalty
9	Establishment of Appellate Tribunal
10	Power of Central Government to issue directions to Bureau

BUREAU OF ENERGY EFFICIENCY

- The Bureau of Energy Efficiency (BEE) was established on 1st March 2002, under the Energy Conservation (EC) Act, 2001.
- The Mission of 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.

BEE - Scope of Activities

- BEE is responsible for spearheading the improvement of energy efficiency in the economy through various regulatory and promotional instruments
  - Plan, manage and implement provisions the EC Act
    - Appliance standards and labeling
    - Industrial energy benchmarks
    - Energy Conservation Building Codes
    - Monitor energy use in high energy-consumption units
    - Certify and accredit energy auditors and energy managers
  - Provide a policy framework and direction to national energy conservation activities
  - Disseminate information and knowledge, and facilitate pilot and demonstration projects
  - Take necessary measures to create awareness and disseminate information for efficient use of energy and its conservation.
  - Establish EE delivery systems through Public-Private Partnerships (PPP)

Designated Consumers (DCs)

Among 15 Energy Intensive Industries,

9 industries have been notified as Energy Intensive Industries,

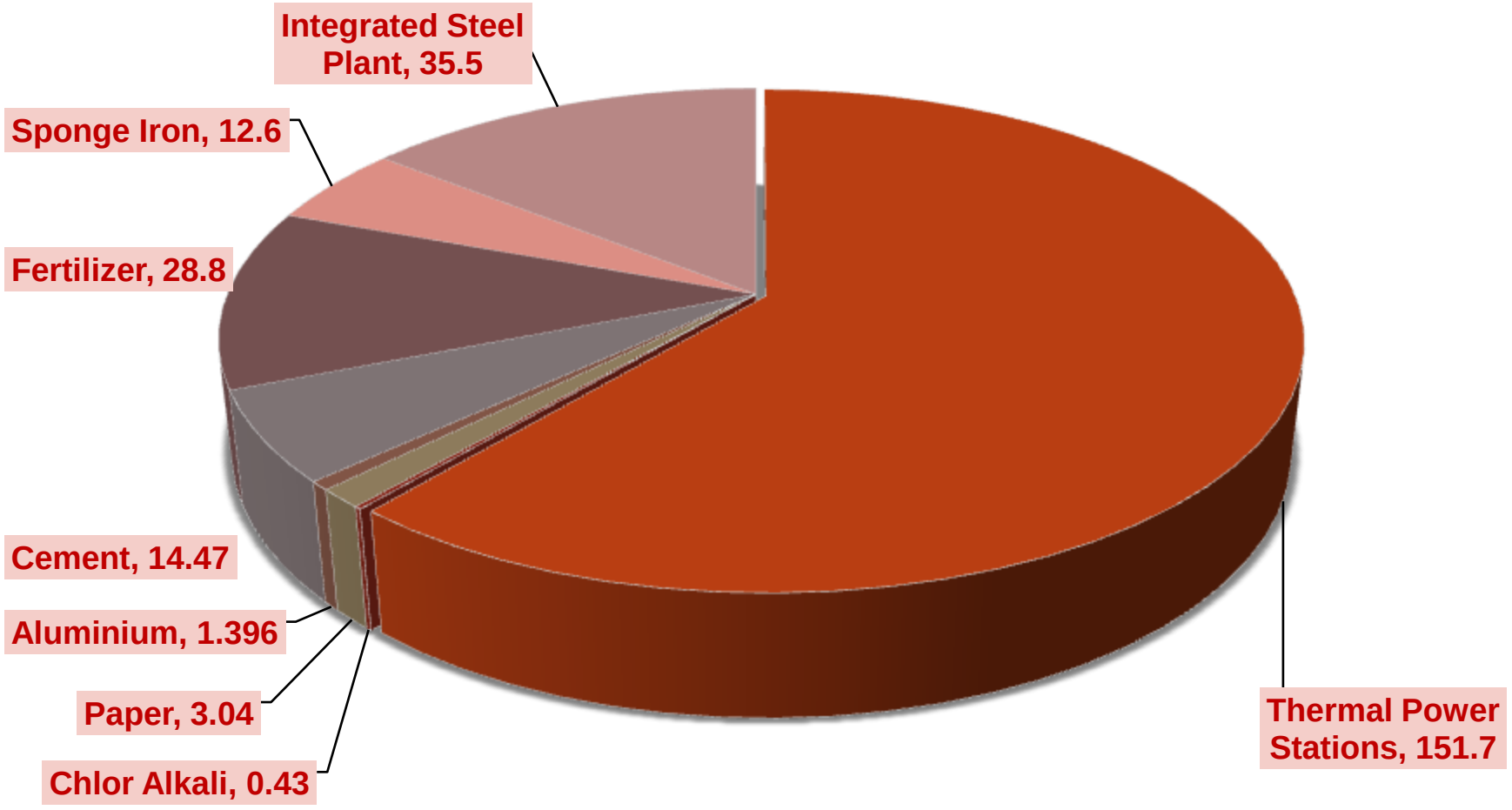
as specified in the Schedule to the Energy Conservation Act, 2001 having annual energy consumption as indicated against each industry as Designated Consumers (DCs) for the purposes of the EC Act

List of Energy Intensive Industries and other establishments specified as designated consumers

- 1. Aluminium;
- 2. Fertilizers;
- 3. Iron and Steel;
- 4. Cement;
- 5. Pulp and paper;
- 6. Chlor Akali;
- 7. Railways
- 8. Textile;
- 9. Chemicals;

Thermal Power Stations- 30,000 metric tonne of oil equivalent (MTOE) per year and above
Fertilizer- 30,000 metric tonne of oil equivalent (MTOE) per year and above
Cement- 30,000 metric tonne of oil equivalent (MTOE) per year and above
Iron & Steel- 30,000 metric tonne of oil equivalent (MTOE) per year and above
Chlor-Alkali- 12,000metric tonne of oil equivalent (MTOE) per year and above
Aluminium- 7,500 metric tonne of oil equivalent (MTOE) per year and above
Railways-As notified.
Textile-3,000 metric tonne of oil equivalent (MTOE) per year and above
Pulp & Paper-30,000 metric tonne of oil equivalent (MTOE) per year and above

Energy Consumption Share (Mtoe)



Total Energy Consumption in Mtoe

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Designated Consumers - Compliance

1. File Energy Consumption returns to Designated Agencies and BEE.
2. Designate of Appoint Energy Manager for their industry
3. Energy Audits on a regular / periodic basis by accredited energy auditor
4. Capture of information related to energy consumption across various processes
5. Adoption of best practices in different industries.
6. Specific energy consumption norms and standards for the industrial sectors
7. Continuous improvement in the specific energy consumption of industries thereby reducing the bandwidth (gap between the best performers and the low performers among the specific energy consumption)
8. There are 98 DC in Iron and Steel Sector

Awareness of Energy Conservation among Children

- Participation by 4th,5th and 6th standard school children in painting competition.
- Participation by 6th,7th and 8th standard school children in Essay competition.
- Participation by 9th,10th, 11th and 12th standard school children in Debate competition.

Impact of Competitions

- Spreads awareness about conservation of energy among children
- Includes involvement of parents and teachers.
- Enhances imagination and creativity among children.

Certified Energy Managers and Energy Auditors

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 Bureau has successfully conducted Ten National Certification Examinations since 2004.

After 9th Exam

- 7766 persons have been qualified as energy managers out of which 5390 have been qualified as energy Auditors

- Over 3,000 energy audits have been carried out by the certified agencies over the past 3 years

Responsibilities and Duties of Energy Auditor

- Carry out a detailed energy audit
- Quantify energy consumption and establish base line energy information
- 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

Responsibilities and Duties of Energy Manager

- 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

Qualification of Accreditation

Bureau of Energy Efficiency (Qualifications for Accredited Energy Auditors and Maintenance of their List) Regulations, 2010, was notified on 31st March,2010 in the Gazette of India

Qualifications for accredited energy auditor.- An energy auditor shall be qualified to become an accredited energy auditor if, he/she-

•is a certified energy manager and has passed the examination in "Energy Performance Assessment for Equipment and Utility Systems" conducted by the Bureau

•has an experience of five years in energy audit out of which at least three years' shall be in any of the Energy Intensive Industries; and

•has been granted a certificate of accreditation by the Bureau

Application for grant of certificate of accreditation

A qualified person, possessing qualifications may apply for Accreditation and the application shall be made in Annexure-I (which is Form I of the Notified Regulation) and be accompanied by-

- five detailed energy audit reports in any of the Energy Intensive Industries undertaken by the energy auditor in an individual capacity or as a leader or associate or active team member of the energy audit team;
- feed back on energy audit received from Energy Intensive Industries;
- fee of rupees one thousand payable by demand draft drawn in favour of the Bureau of Energy Efficiency, New Delhi

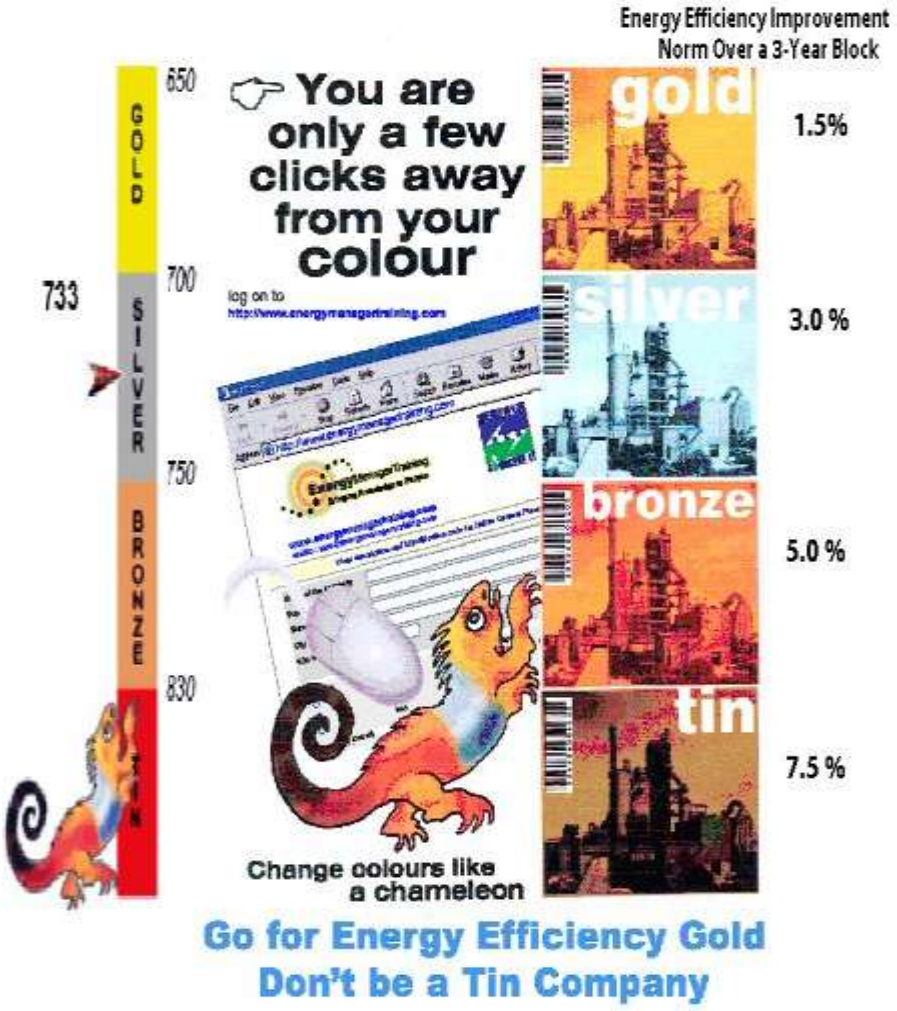
Evaluation Criteria

- evaluation of five detailed energy audit reports submitted alongwith the application;
- the number of and the kind of Energy Intensive Industries in which detailed energy audits have been made;
- association of applicant with number of and kind of experts including full time energy auditors or part time energy auditors or consultants with expertise in thermal, electrical utilities and processes and nature of such association;
- possession of at least four up-to-date basic instruments namely, clip-on-type, power measuring instruments, flue gas analyser, temperature and lux measuring instruments which are duly calibrated by a laboratory accredited by the National Accreditation Board for Testing and Calibration Laboratories and expertise in using such instruments for conduct of energy audit;
- manner of work followed in energy audit;
- training experience;
- quality of field studies including observations, probing skills, collection and generation of data, depth of technical knowledge and analytical abilities;
- quality of recommendations for improving energy efficiency or for conserving energy;
- capacity to undertake cost benefit analysis of recommended measures for improving energy efficiency or for conserving energy and preparation of action plan for implementation of recommendations for reduction of energy consumption; and
- quality of energy audit reports.

Perform, Achieve and Trade (PAT) Mechanism

Market-based mechanism to enhance energy-efficiency in industry

- This creates a differentiated potential for energy savings
- Trading of savings allows maximum cost-effective savings as plants with "low-cost savings" exceed their "mandated " savings for trade



NATIONAL MISSION ON ENHANCED ENERGY EFFICIENCY (NMEEE)

- The National Action Plan on Climate Change was released by Honorable Prime Minister of India in June 2008

- The Action Plan Outlines **8 Missions** including National Mission on Enhanced Energy Efficiency (**NMEEE**)

NMEEE.... 4 new initiatives

- **The market based mechanism to enhance cost effectiveness of improvements in EE in energy intensive industries through certification of energy saving which can be traded.**
  (Perform, Achieve & Trade)

- Accelerating the shift to energy efficient appliances in designated sectors through innovative measures to make the product more affordable

- Creation of a mechanism that would help finance DSM programs in all sectors by capturing future energy saving

- Developing fiscal instruments to promote energy efficiency

Industry Sector	Annual Energy Consumption Norm to be DC (mtoe)	No. of Identified DCs
Aluminum	7500	11
Cement	30000	92
Chlor-Alkali	12000	23
Fertilizer	30000	22
Pulp & Paper	30000	70
Power	30000	154
Iron & Steel	30000	110
Textiles	3000	197

Estimated Consumption in DCs

Sector	MTOE
Power (Thermal)	160.3
Integrated Steel	26.98
Cement	14.47
Fertilizer	11.95
Sponge Iron	9.1
Textile	3.5
Aluminium	2.42
Paper	1.38
Chlor-Alkali	0.43
TOTAL	**230.53**

About 55% of DCs Contribute 96% of Total Consumption

About 45% of DCs contribute rest 4% of Total Consumption

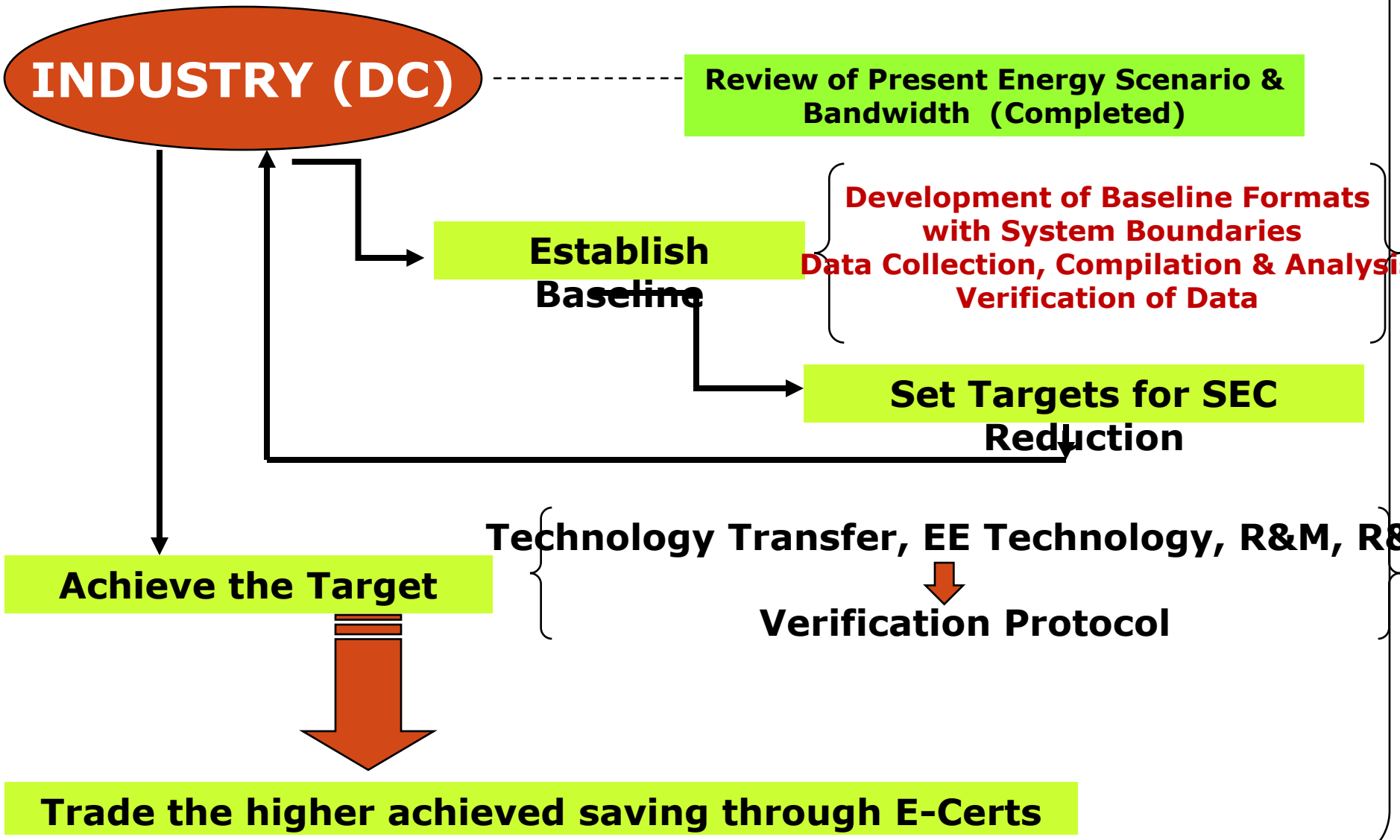
Large Energy Usage Bandwidth

The energy usage pattern varies widely in industries of a particular sector due to various **diversities** like

-Scale of Production (Installed Capacities)
- Use of Raw Material
- Process Technology
- Vintage of Technology
- O & M Practices
- Type of Product Output etc.

Factors of Diversity	Most Affected Sectors
a) Raw Material Input	Pulp & Paper, Fertilizer, Power Plant, Textile
a) Quality of Raw Material / Fuel	All sectors
a) Process & Technology	Aluminium, Iron & steel, Chlor-Alkali, Paper
a) Final Product output	Textile, Iron & Steel, Aluminium
a) Vintage	All Sectors
a) Capacity Utililization	All sectors

THE PAT SCHEME ..... Approach



PAT - Approach

- Specification of specific energy consumption (SEC) norm for each designated consumer in the baseline year and in the target year- *Statutory requirement for designated consumers under EC Act (section 14 (g) read with section 56(2)(g))*
- Verification of the SEC of each designated consumer in the baseline year and in the target year by an accredited verification agency
- Issuance of Energy Savings Certificates (ESCerts) to those designated consumers who exceed their target SEC reduction
- Trading of ESCerts with designated consumers who are unable to meet their target SEC reduction
- Checking of compliance, and reconciliation of ESCerts

PAT – Institutional Framework

- Creation of demand for the commodity e.g. compliance requirement for energy savings ESCerts over a pre-specified period (**Regulatory Framework**)
  - MOP, in consultation with BEE to set individual targets
  - Penalty for non-achievement under EC Act to be increased (section 26 – Maximun of Rs. 10,000 and Rs. 1,000 for every additional day of default)
  - Fiscal incentives for ESCerts- IT Exemption, pass-through in tariff
  - BEE/ EESL to take up capacity building
- Ensuring supply of the commodity (ESCerts) (**Issuance of ESCerts**)
  - EESL to be the nodal agency for issuance
  - Synergise the activity with BEEnet- Standard forms, elctronic submission, etc.
  - Proper authentication of claim by EM of DC
  - Independent authentication by certified agencies like CEAs

PAT – Institutional Framework (2)

- **MNV for ESCerts (Resp.- BEE and EESL)**
  - Energy use and production verification protocol for each DC
  - Verification agencies which could be accredited energy auditors under the EC Act to assume liability for verification alongwith other credible certification agencies
  - Utilisation of services of certified agencies, CEAs by DCs

- **Trading of ESCerts (Resp. EESL)**
  - Maintain compliance with set energy efficiency benchmark by the DCs
  - Create efficient and transparent market for trading by the exchanges by taking measures to safeguard market integrity and enhance transparency in operations and also maintain data of traded prices, traded volumes and trends.
  - The Transfer Agents/ Depositories must hold the ESCerts under each industry in electronic form and provide client services in relation to ESCerts.


THANK YOU

Question & Answers

- For any Query contact ndhingra@beenet.in