

Promoting Energy Efficiency through Regulatory Framework and Financing Options- Experience from India

Ajay Mathur
Director General
Bureau of Energy Efficiency, Government of India

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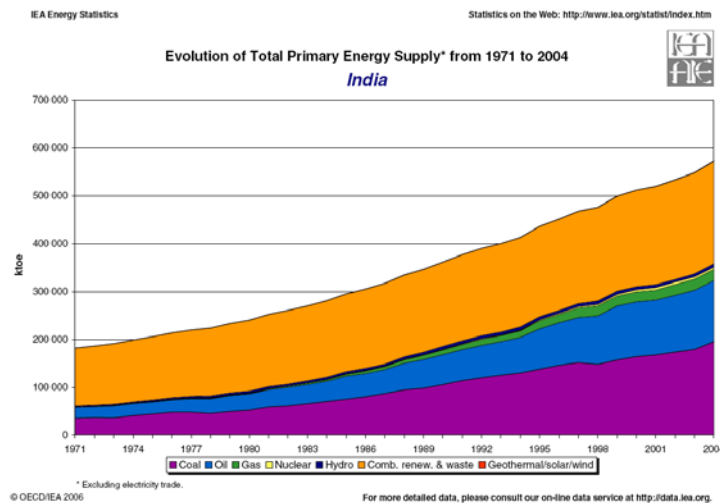
Energy Use in India

- Energy demand is increasing due to rising incomes, accelerated industrialization, urbanization and population growth
 - 2003-04 : 572 Mtoe
 - 2016-17 : 842-916 Mtoe
 - 2026-27 : 1406-1561 Mtoe
- Meeting the increasing demand only through increases in supply will lead to:
 - Reduced energy security due to volatility in availability and prices of imported fuels
 - Adverse environmental impacts
 - Strain on balance of payments
- Energy conservation and energy-efficiency are an essential part of national energy strategy

Energy use transitions hold key to future trajectory

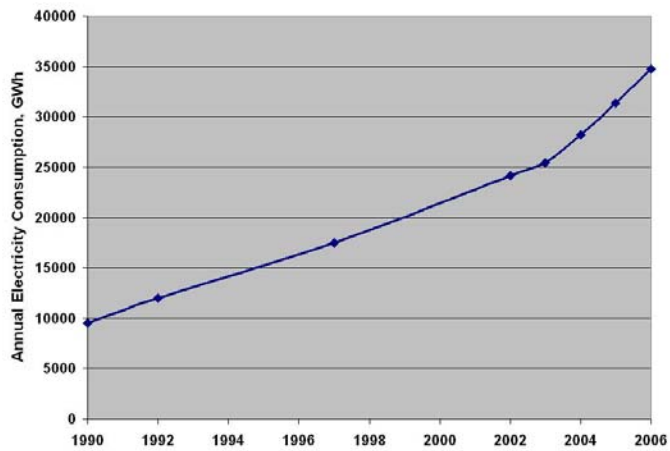
- Household energy mix is rapidly moving from inefficiently-utilized biomass to gas and electricity
- Commercial space is increasing; and energy use in commercial space is increasing at a faster pace
- Industrial energy intensity is declining, but there is a wide bandwidth of specific energy consumption within industrial sectors

Fuel Mix is changing

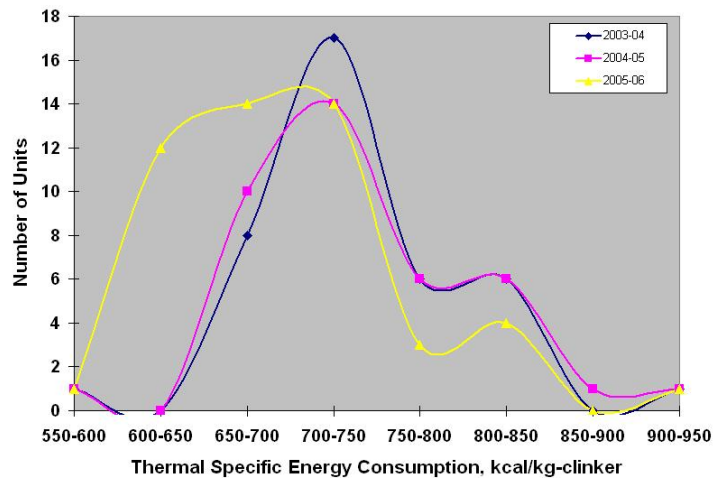


- Energy use has grown at 2.2% per year; marked by a transition from inefficiently-used biomass fuels to cleaner fossil fuels

Electricity Use in the Commercial Sector is increasing



Energy Intensity in Cement Sector



Barriers to Energy Efficiency

- Lack of information about comparative energy use – especially of appliances bought by retail consumers
- Perceived risk due to lack of confidence in performance of new technologies – in appliances, building design, industrial technologies
- Higher cost of energy-efficient technologies
- Asymmetry in sharing of costs and benefits – especially in the buildings sector

Energy Conservation Act, 2001 Objects and Reasons

- Reduction of energy consumption using efficiency and conservation measures.
- Reduce the need to create new capacity thereby saving resources and green house gas emissions.
- Secure environmentally benign and sustainable growth
- Stimulate market transformation in favour of energy efficient products and appliances.
- Created Bureau of Energy Efficiency (BEE) as the nodal agency at the center and State Designated Agencies (SDAs) at the state level to implement the Act.

Key regulatory interventions

- Provide energy use information
 - Labeling of appliances
 - Energy use information by units within industrial sectors
- Reduce perceived risk
 - Bulk procurement
 - Utility-driven Demand side management
 - Performance guarantee contracting, through ESCOs
- Mandate standards
 - Building Codes
 - Sectoral energy consumption norms in industry

Enabling Regulatory and Financing Framework

- Labeling Scheme launched
 - Fluorescent tubelights, refrigerators air conditioners and distribution transformers are currently covered
 - Labels for motors, transformers, fans, LPG burners, standby power under preparation
- Energy Conservation Building Code prepared and launched
 - Design of ECBC-compliant buildings being encouraged
 - Training of architects, designers and certifiers underway
- Market for ESCOs being created
 - Government buildings being upgraded through ESCOs
 - Risk-guarantee fund being considered to promote lending to ESCOs
- DSM interventions being launched
 - CDM based CFL scheme
 - Ag DSM

Standards & Labeling Programme

- Programme launched by Minister of Power in May, 2006 under the legal and regulatory environment of Energy Conservation Act. Initially launched as a voluntary programme.
- Refrigerators, Tube Lights, Air conditioners and Distribution Transformers covered till now. Others to be added in a phased manner.
- Programme to be made mandatory after giving lead time to industry for preparation.
- Targets energy consumption reduction potential 18 billion kWh/ year by 2012
- Impressive results in the voluntary programme for 3 equipments so far.
- Prepare Indian industry for international markets that have made/ are making such standards mandatory eg. US or EU

Energy Conservation Building Code (ECBC)

- Covers commercial buildings in 5 climatic zones of the country.
- Potential of 25%-40% savings of energy consumption
- Like other such codes, it includes building components like.
 - Building Envelope (Walls, Roofs, Windows)
 - Lighting (Indoor and Outdoor)
 - Heating Ventilation and Air Conditioning (HVAC) System
 - Solar Water Heating and Pumping
 - Electrical Systems (Power Factor, Transformers)

ECBC launched by Minister of Power on 27.6.2007

Energy Efficiency in Existing Buildings

- 8 Government buildings (including President House, PMO, Shram Shakti Bhawan) have been audited. Implementation of energy conservation measures in 4 buildings completed and remaining are on their way.

- Impressive Energy savings achieved in Rashtrapati Bhawan

| Month | Estimated savings, kWh | Actual Savings achieved, kWh |
|-----------------|------------------------|------------------------------|
| August, 2006 | 93080 | 124466 |
| September, 2006 | 97549 | 142597 |
| October, 2006 | 97549 | 169179 |
| November, 2006 | 105642 | 222567 |

- 17 additional Central Government buildings undertaken for second phase through ESCO mode.

- Energy Audit study in 15 Government buildings completed

Designated Consumers (DCs)

- EC Act mandates Government to designate consumers who consume electricity beyond a benchmarked limit.
- The DCs are required to
 - appoint Energy Manager
 - adhere to energy efficient consumption norms stipulated
 - submit annual energy consumption information
- 9 sectors notified as DCs in March, 2007
- Web based e-filing of energy consumption returns to be mandated soon- **first of its kind initiative**

SDA Strengthening Programme

- Statutory bodies set up by states under section 15 (d) to implement energy conservation measures
- 30 SDAs already established till now
- Inadequate capacity and resources to effectively implement the Act.
- Capacity building to play the roles of regulator, facilitator and enforcing body under the Act.
- Financial assistance to provide necessary resources required for effective functioning
- Ensure balanced implementation of the Act in all states of the country.
- Facilitate development of deliver 5 year Energy Conservation Action Plan

Professional Certification and Accreditation

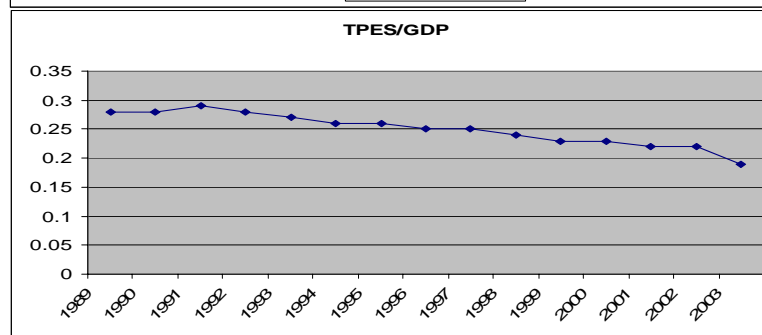
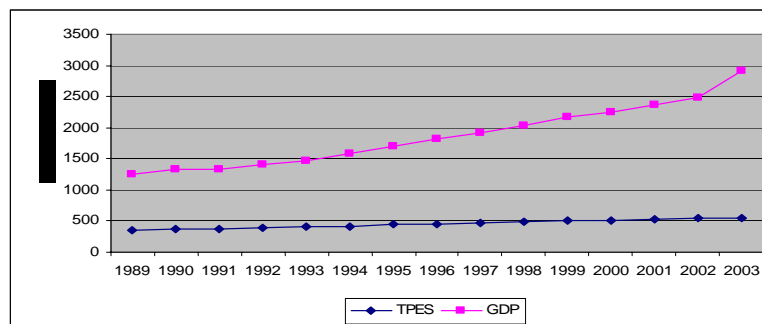
- To promote efficient use of energy and its con-servation in the energy intensive industries
- Bureau has conducted 4 National certification examinations for energy managers & energy auditors
- 713 Certified Energy Managers and 2023 Certified Energy Auditors are in place
- Over 2500 candidates appeared in the examination held in April 2007.

Demand Side Management (DSM)

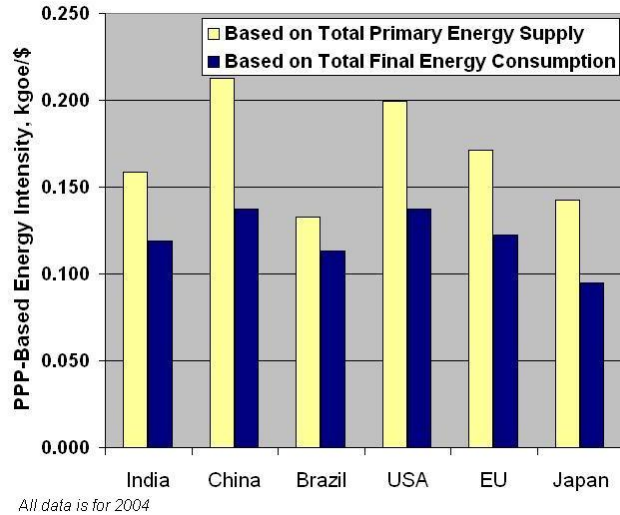
- Promotion of DSM measures in states
- CDM based lighting DSM projects
 - 400 million GSL points to be replaced by CFLs
 - Sales, at a reduced price, or donation of CFLs to households within a distinct geographical area
 - The households purchase or receive CFLs upon return of currently used and functioning light bulbs
 - The returned light bulbs must be destroyed
 - Energy reduction monitored and verified- CERs so generated used to recover cost of initial investments
 - 24 million CERs every year; 10,000 MW reduction in load

To be launched in two states shortly

INCREASING ENERGY EFFICIENCY



Energy Intensities of Six Large Economies



- Japan has best energy intensity; other economies have relatively comparable levels

Future Initiatives

- Transport sector
 - Considering introduction of labeling of 2-wheelers and 4-wheelers; however concern about limited impact because of rebound effect
 - Working on programs to promote affordable, reliable and comfortable public transport so as to increase its modal share
 - Working with Ministry of Urban Development to link support for urban upgradation to requirement to establish Bus Rapid Transit (BRT) systems

Tentative Lessons

- By far and large, “fresh” financing is not required; key seems to be to “redirect” finance, or “mainstream” energy efficiency
- Redirecting requires risk reduction through:
 - Capacity building – for project preparation; data collection, monitoring & verification; and project appraisal by FIs
 - Codes, Standards & Agreements – for appliances, buildings, transport, and manufacturing sectors
 - Risk guarantees for FIs – for lending to ESCOs, SMEs
 - Demonstration of, and training on EE technologies
 - Collaborative R&D – to adapt technologies
- Climate change financing – CDM – accelerates energy efficiency interventions
- Economic growth – and competition – promotes energy efficiency, and energy efficiency accelerates economic growth

THANK YOU

