ENPV NGY EFFICIENCY GOVERNANCE

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Background

- Energy demand is increasing because of:
  - accelerated industrialization,
  - urbanization, and
  - an emerging consumer society.

- Total primary energy supply has increased from about 350 Mtoe in 1990 to about 580 Mtoe in 2006; an increase of about 2.2% per year.

- Coal remains the main source of power generation. Unfortunately, there are limited coal reserves.

- Energy Intensity continues to decline;

- Energy demand is increasing due to rising incomes, accelerated industrialization, urbanization and population growth
  - 2003-06 : 572 Mtoe
  - 2016-17 : 842-916 Mtoe
  - 2026-27 : 1406-1561 Mtoe

- Fossil energy supply is expected to peak at about three times the current consumption;

- Vast fraction of infrastructure is yet to be built.

Source: IEA Key world energy statistics 2008
Energy Intensity continues to decline

Context

Data: IEA, various publications
Energy Efficiency is essential!

There we want to go!

This we like to avoid!

Here we are!

HUMAN DEVELOPMENT INDEX, a measure of human well-being, reaches its maximum plateau at about 4000 kWh of annual electricity use per capita.

A major global and geopolitical issue in the energy sector requiring both countries, Germany and India to jointly look for solutions in their respective country.

The HDI strongly links poverty alleviation to increased energy and electricity consumption.

Inclusive growth and poverty alleviation options.
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 1\textsuperscript{st} March 2002 onwards.
• Under the provisions of the act, the Bureau of Energy Efficiency (BEE) was established with effect from 1\textsuperscript{st} March 2002.
• The Mission of Bureau of Energy Efficiency (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.
Governance Approach for energy efficiency in India

- **Political Commitment** (national and international)
- **Legislative framework** (EC Act, 2001) centre + state + SERCs
- **Institutional framework** BEE Governing Council vested with the power of general superintendence; direction and management of BEE
- **Management** Director General – as Chief Executive and highest adviser to GoI re EE; Governing Council / Management Advisory Committee; Policy Advisory Cttee.; SDAs –as field agencies
- **Policies and Programs** GoI and BEE in consultation with ERCs and state govt.
- **Enforcement** State Designated Agencies vested powers to enforce the provisions of the EC Act in their respective
- **Capacity Building** internal and external
- **Collaborative Partnerships** Public-private; international
- **Knowledge management and information dissemination (3L Programs)**
Establishing BEE

• TWO CRITICAL DECISIONS TAKEN WHILE SETTING UP BEE
  - Need was to establish a dedicated central nodal agency with Legislative and Regulatory mandate;
  - Legislative Focus was not to create a new institutions with wide ranging powers rather to create - A Facilitator to promote energy efficiency --and provide coordination; with various existing concerned agencies such as Bureau of Indian Standards; central government and state government agencies; NGOs; consumer and manufactures and industry associations, etc. s. 13, EC Act

• Energy Conservation Act passed by Indian Parliament in 2001; created Bureau of Energy Efficiency. This was supported by stakeholder consultations with all key stakeholders i.e. major political parties; key industry stakeholders; market participants; industry associations; sector experts and academic institutions.
Resources for effective functioning of BEE and State Designated Agencies (SDAs) and Program Implementation

Independence of Bureau established by:

- Central Energy Conservation fund (salary; expenses etc. - INR 50 Cr. Or USD 10 Million Corpus Fund created)
- All fees received by the Bureau (Examination fee; S&L fee which can be levied for the services provided)
- For Program Implementation allocation of funds through; grants from the Government of India;

- Independence of SDAs - State EC Fund
Establishing institutional credibility - essential for nation wide acceptance of EE as way of life

- Energy Conservation Act, 2001 – a comprehensive legislation based on international experience; which came into force from 1st March, 2002 and set up BEE as Statutory Body under Ministry of Power;

- BEE is responsible for spearheading the improvement of energy efficiency in the economy through various regulatory and promotional instruments;

- Governance and Management of the Bureau - 26 member Governing Council (Minister of Power; six central line ministries; Seven professional bodies such as Central Electricity Auth.; Central Power Research Institute; five power regions of India; Industry experts; Equipment and Appliance Manufacturers; Architects and Consumer representative); two representatives from identified thrust areas; Director General of BEE as Member Secretary – Office of DG along with Management Advisory Cttee. serves link between the Bureau and Governing Council.

- A policy Advisory Cttee provides policy inputs to the Governing Council.
Establishing international credibility

• To harness best practices in removing barriers.

• To disseminate technical expertise/assistance to evolve EE projects.

• To develop capacity in the field of EE and EC.

• To ensure convergence of goals of international agencies with the work plan of BEE.

• To develop a programmatic framework of technical assistance so as to ensure minimum overlap.

• Cooperation with Germany, France, USA, Canada, Japan, World Bank, ADB, GEF, APP and IEA.
## International Cooperation in Energy Conservation in Buildings

<table>
<thead>
<tr>
<th>Energy Conservation Building Codes &amp; Existing Buildings</th>
<th>Main Areas of Thrust</th>
<th>IBE</th>
<th>GTZ</th>
<th>USAID</th>
<th>Indo-Japan Energy Dialogue</th>
<th>APP</th>
<th>GEF (WB, UNIDO, UNDP)</th>
<th>ADEME/AFD France</th>
<th>IEA</th>
<th>ADB</th>
<th>SDC</th>
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<tbody>
<tr>
<td>Existing Buildings ESCO development</td>
<td>ECBC Technical Guides</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
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<td>✓ (TERI)</td>
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<tr>
<td></td>
<td>ECBC Model Designs</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>(WB)</td>
<td></td>
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<tr>
<td></td>
<td>Training and curriculum for Architects</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
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<td>(B to B)</td>
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<tr>
<td></td>
<td>Implementation Compliance tools</td>
<td>✓</td>
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<tr>
<td>Existing Buildings Baseline studies</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓ (WB-Partial risk guarantee fund proposed)</td>
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*Note: ✓ indicates cooperation.*
Getting basic Governance fundamentals right – Ten point approach

i) **Leadership** with public recognition

ii) **Innovative policies and** international best practices – that build upon Indian context and effective partnerships established;

iii) **Stakeholder** consultation and Participative approach

iv) Support and involvement of Ministry of Power and other relevant ministries;

v) **Capacity Building**

vi) **Self regulation** with provisions for penalty + public disclosure

vii) **Exemplary Performance**

viii) **Impact verification AND**

ix) **Awareness and Outreach**

x) **Credibility** – Today Bureau HAS A Brand equity – message Be Energy Efficient and Buy energy efficient Equipment
Programmatic experiences
to demonstrate sound Governance principles

• Establishing program credibility - e.g. Standards and Labeling Program (S&L Program) – initially on a voluntary basis and graduated to mandatory approach. This phased approach of transition (3 years) from voluntary and self regulated to mandatory approach in terms of provisions of the Act, being followed for other equipments and appliances.

• Extensive stakeholder consultation with manufacturers; vendors; technical experts; academia; public sector agencies etc.;

• Technical expert committee constituted with a mandate;

• Capacity building - setting up of check testing facilities; empanelment of national labs (CPRI); accreditation of energy managers and auditors; agency for random sampling; training of retail outlets; staff/personnel; public and media outreach; feedback mechanism;

• Consumer choice and branding promotion for ee appliances/equipments

• Create demand for ee goods & services and supply push for ee equipments

• Awareness and Outreach
Similarly; Industrial sector

Background: Designated Consumers --(Section 14 of EC Act)
-e.g. Power, Railways; Fertilizers; Cement etc.

- Over 50% commercial energy consumption
  (market based PAT mechanism -NMEE)

- Wide variation in energy performance
  (Bandwidth – gate to gate approach for individual plants) –single benchmark not applicable for Developing countries

- Lack of data about energy consumption in different industries – problem of benchmarking.
  (e-filing mandatory; industry consultation for target settings; dissemination of lessons learned from similar international programs)

- Shortage of quality energy professionals
  (training /examinations/ accreditation for energy managers and energy auditors; training workshops;
National Action Plan on Climate Change

• The National Action Plan on Climate Change (NAPCC) was launched by the Hon’ble Prime Minister of India on 30th June 2008

• NAPCC identifies measures that promote our development objectives while also yielding co-benefits for addressing climate change effectively

• The NAPCC will help in: bringing better planning, management and developmental strategies, and bringing cleaner technologies.

Eight National Missions which form the core of the National Action Plan –BEE has lead role for National Mission on Enhanced Energy Efficiency (NMEEE)

- National Solar Mission
- National Mission for Enhanced Energy Efficiency
- National Mission on Sustainable Habitat
- National Water Mission
- National Mission for Sustaining the Himalayan Ecosystem
- National Mission for a Green India
- National Mission for Sustainable Agriculture
- National Mission on Strategic Knowledge for Climate Change
Energy Efficiency in Industries: Perform, Achieve and Trade (PAT) Mechanism

- Every one wins and everyone gets energy efficient.
- A wide bandwidth of energy efficiencies occurs in almost all sectors.
- This creates a differentiated potential for energy savings.
- Each DC mandated to reduce its SEC by a fixed percentage, based on its current SEC within the sectoral bandwidth.
- Trading of savings allows maximum cost-effective savings as plants with “low-cost savings” exceed their “mandated“ savings for trade.

- A market based mechanism to enhance cost effectiveness of improvements in energy efficiency in energy-intensive large industries and facilities, through certification of energy savings that could be traded – *Perform, Achieve and Trade (PAT) Mechanism*
- Accelerating the shift to energy efficient appliances in designated sectors through innovative measures to make products more effective – *p-CDM Initiative*
- Creation of mechanisms that would help finance demand side management programmes in all sectors by capturing future energy savings – *Energy Efficiency Financing Platform (EEFP)*
- Developing fiscal instruments to promote energy efficiency – *Framework for Energy-Efficient Economic Development (FEEED)*
EE Programmes of BEE

- Standards & Labeling Programme
  - Manufacturers, Suppliers, Retailers

- Energy Efficiency in SME’s
  - SME’s, Local Suppliers, ESCO’s

- Energy Efficient Lighting-BLY
  - DISCOMS, Investors, Manufacturers, DOE, UNFCCC

- Capacity Building of State Designated Agencies
  - SDA’s

- Energy Efficiency in Buildings
  - ESCO’s, Banks, Architects, Builders

- Energy Efficiency in Industries
  - Industries, Industrial Associations, Power Exchange

- Agricultural & Municipal DSM
  - ESCO’s, Banks, Financial Institutions
Demand Side Management (DSM) Programs

3 KEY AREAS

• Bachat Lamp Yojana (*Lamp Savings Programme*)
• Energy efficiency upgrades in existing buildings
• Agriculture DSM & Municipal DSM
Markets are an important element to drive cost-effective technologies

Based on both supply “push” and demand “pull”

- **Coal-based generation**
  - Minimum efficiency requirements for new plant
  - Tariff-based bidding to sell electricity

- **Commercial buildings**
  - Energy conservation building code
  - Retrofits by ESCO-driven performance contracting
  - Energy performance labeling

- **Industry**
  - Sectoral energy consumption norms in industry
  - Market mechanisms to promote energy efficiency in industry

- **Equipment and appliances**
  - Minimum energy performance standards
  - Energy performance labeling
Creation of Energy Efficiency Services Ltd (EESL)

- EESL Main implementation arm of the National Mission for Enhanced Energy Efficiency – initial equity of USD 45 million.
- Lead in implementing energy efficiency projects as a ‘Super ESCO’
- Provide partial risk guarantee fund/venture capital fund to ESCOs
- Leverage multilateral and bi-lateral financing
- Enter into partnerships, JVs with other implementing partners like ESCOs, industry, etc. to promote energy efficiency.
- Provide consultancy services to private and public sector in the areas of energy efficiency, CDM, etc.
EESL- Opportunities

ESCO

• Implementation of EE in buildings,
  • municipality,
  • agriculture,
  • SMEs

ESCO

Monitor/Implement Govt.’s programs

EESL

Resource Centre

• Capacity building of SDAs
  • Training of Energy Managers
  • 3L Programmes

Consultancy Organization

• CDM Consultancy
  • Energy Efficiency Potential
  • Consultancy to SDAs/ Govt.
  • International Consultancy

S&L Programme
• National Examination
• PAT scheme
• PRGF/ VCFEE
AWARENESS
AND
OUTREACH OF
EE PROGRAMS
Awareness of Energy Conservation among children

- Participation by 4th, 5th and 6th standard school children in National level painting competition. In 2009, around 40,814 schools and 911,553 students participated.

- Participation by 6th, 7th and 8th standard school children in State level Essay competition.

- Participation by 9th, 10th, 11th and 12th standard school children in State level Debate competition.
National Energy Conservation Awards

- Recognition of innovation and achievements in energy conservation by industries, buildings, zonal railways, municipalities and SDAs.
- NECA function organized on 14th December, National Energy Conservation Day.
- Scheme is very popular.
MONITORING AND VERIFICATION OF EE PROGRAMS
## Energy Efficiency Potential and Outcome

| Energy Conservation potential assessed as at present (IEP) (15% by DSM and 25% overall) | 20000MW |
| Verified Energy Savings : | |
| - During X Plan period | 877 * MW |
| - During 2007-08 and 2008-09 | 2127 MW |
| - Target for 2009-10 | 2600 MW |
| - Target for XI Plan period (5% reduction of energy consumption) | 10000 MW |

* Only as indicated by participating units in the National Energy Conservation award scheme, for the previous five years.
Program Assessment and Evaluation

Baseline Potential Assessment Verification

• Provide program delivery services (e.g., energy audits, tech. assistance) to develop M&V guidelines;

• Through 3rd Part (National Productivity Council) – State wise energy savings potential – for respective program areas of BEE – measurement and assessment of target avoided capacity;

• Similarly through DoEs measurement for BLY;

• Energy audits for public buildings;

• Energy Savings verified through Independent Agency verification process
BEE VISION

To make India an energy efficient economy through –

- innovative policy framework;
- effective program design and implementation;
- innovative financing of energy efficiency projects;
- promote research and development in the field of energy conservation;
- develop testing and certification procedures; and
- promote use of energy efficient equipments; devices; systems; and processes, and
- Strengthen consulting services; arrange and organize training of personnel and techniques for efficient use of energy and its conservation
Thank you

Visit us at :
www.bee.gov.in
www.bee-india.nic.in
## Energy Savings

### Independent Agency verification

<table>
<thead>
<tr>
<th>Programme</th>
<th>BEE Electricity Saved (MU)</th>
<th>BEE Avoided Generation (MW)</th>
<th>NPC Electricity Saved (MU)</th>
<th>NPC Avoided Generation (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard &amp; Labeling</td>
<td>2106.16</td>
<td>567.63</td>
<td>2106.06</td>
<td>599.44</td>
</tr>
<tr>
<td>Industry EC Awards</td>
<td>1633.25</td>
<td>239</td>
<td>1633.25</td>
<td>239</td>
</tr>
<tr>
<td>SDA Reported</td>
<td>2807.05</td>
<td>667</td>
<td>2755.48</td>
<td>660.43</td>
</tr>
<tr>
<td>ECBC - Green Buildings</td>
<td>33.36</td>
<td>7.0</td>
<td>33.36</td>
<td>6.1</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>6759.82</strong></td>
<td><strong>1480.63</strong></td>
<td><strong>6528.15</strong></td>
<td><strong>1504.97</strong></td>
</tr>
</tbody>
</table>

Total for 2007-08 and 2008-09: 2128 MW