

Energy Conservation Act *Indian Example*

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Executive Knowledge Lines *English monthly*

24 Mar`10 Afghan/ USAID

Energy Conservation

The Need

Energy: The ability to do work

- ◆ In addition to using own physical energy, man has excelled in utilising the power hidden in other energy sources like coal, oil, gas etc. belonging to non-renewable type and solar, wind, water, biomass..., the renewable kind
- ◆ Energy needs are increasing day by day, warranting new power plants, with their associated perils
- ◆ Due to heavy use in such plants, the non-renewable sources are fast depleting
- ◆ Also, their massive consumption contributes to air and water pollution

And there is an urgent need to conserve energy to leave a better Earth for our children

Global Warming *alias* *Greenhouse Effect*

- Power stations, industries, automobiles and such others release carbon dioxide (CO₂) into atmosphere when they burn coal, gas, petrol, diesel
 - This CO₂ acts as a transparent blanket leading to global warming or greenhouse effect

Possible impacts:

- Threat to human health, environment...
- Rising sea levels damaging coastal areas, and changes in vegetation growth patterns, causing some plant and animal species to become extinct
- Sulphur dioxide (SO₂) emitted into the air when coal is burned causes "*Acid Rain*"

Energy Conservation *Significance*

- **Energy efficiency/conservation measures can reduce peak and average demand of electricity**
- **One unit of energy saved at the consumer end helps to avoid nearly 2.5 to 3 times of fresh generating capacity addition, due to improvement in PLF, reducing auxiliary consumption and T & D losses**
- **Investment in energy conservation activities is highly cost effective - less than Rs 10 million/MW**
- **For capacity addition, instead, Rs 40m/MW**
- **Also avoids investment in fuel, mining, transportation...**

Power for All by 2012

Indian Target

India has set an ambitious plan to make
power available to all by 2012

- At present there is a gap between demand and supply
- The strategy is to choose the least cost option - of promoting energy efficiency and its conservation in all sectors of human activity
- Nearly 25,000 MW of *virtual capacity* creation through energy efficiency measures in the electricity sector alone has been estimated in India
- Energy conservation potential for the economy as a whole has been assessed as 23% with maximum potential in industrial and agricultural sectors

Energy Intensity

A Comparison

Energy intensity per unit of GDP in India is higher, compared to Japan, US and Asia by 3.7, 1.55 and 1.47 times respectively

Seeing this as a great opportunity and to tap the substantial scope for energy saving, Govt of India enacted the
Energy Conservation Act, 2001

Designated Consumers

A Focussed Action

- Industry is the major energy consumer utilising about 50% of the total commercial energy use in India
- The six key industries – Aluminium, Cement, Fertilizers, Pulp&Paper, Petrochemicals and Steel - account for about 65% of the total energy use in India
- Energy intensity in some of these industries is higher than the industries in developed countries
- A major reason for this is the continued use of obsolete, energy gulping plants and processes of yesteryears
- To promote faster penetration of energy efficient technologies, they are classified as *Designated Consumers* under E C Act.

The designated consumers are expected to adopt energy efficiency measures - meet specific energy consumption norms, conduct regular energy audits, implement the recommendations, establish an energy management system through full time energy manager.

Energy Conservation

Whose Responsibility?

- Energy conservation is not to be considered as the duty of governments alone
- All have equally important roles to play - Consumers, equipment makers, utilities...
- Govt is only a facilitator and monitor

Think of a day in the foreseeable future when our children will be unwillingly blaming us for depleting the resources beyond redemption and handing down a barren Earth to them!

The responsibility is on us - the consumers of today
Let us behave!

Energy Conservation Act of India

Highlights

- **An act to provide for efficient use of energy and its conservation and for matters connected therewith or incidental thereto**
- **It extends to the whole of India except Jammu and Kashmir**
- **It was enacted by Parliament in the Fifty-second Year of the Republic of India on October 2001**
- **The Bureau of Energy Efficiency (BEE) came into force from March 2002 onwards, based on this Act**

Bureau of Energy Efficiency (BEE)

The Mission

- **Institutionalize energy efficiency services**
- **Promote energy efficiency delivery mechanisms**
- **Provide leadership for improvement of energy efficiency in all sectors of the economy**

BEE

Highlights of Responsibilities

- **Develop policies and strategies to reduce energy intensity of the Indian economy.**
- **To frame energy efficiency norms for electrical equipment and appliances**
- **Promote testing facilities**
- **Develop energy consumption standards for commercial buildings, and certify energy managers and energy auditors**
- **Encourage use of energy efficient processes, equipment, devices and systems**
- **Specify qualifications for the accredited energy auditors, frequency for energy audits, certification procedures for energy managers to be appointed by designated consumers**

Green Buildings

The Initiative

- **Green buildings are in lime light world over, justifiably because a major share of human activity and hence energy consumption takes place there**
 - **The Green Buildings envision a dedicated approach to save water, energy and materials during the construction of a building, subsequently for its maintenance and finally during the intended use**
 - **Based on the the Energy Conservation Building Code, buildings are certified as green or energy-efficient buildings, in various levels - Silver, Gold or Platinum**
 - **In LEED (Leadership in Energy and Environmental Design) Green Building Rating system, points are awarded for adopting green concepts in various stages of construction**
 - **Recently, to make green buildings more energy efficient, India has lowered their connected load to 100 kW from 500 kW now**
 - **Currently, there are some 50 structures in India, including the Reserve Bank of India building in Mumbai**

Energy Services Companies (ESCOs)

A Unique Model

- **ESCOs are single point providers of energy solutions to the industry**
- **They carry out energy audits, identify the avenues with maximum scope for saving energy, arrange finance and implement energy efficiency projects**
- **Financial risks of clients will be minimal**
- **The ESCO model can play a major role in energy conservation movement, if more serious players with long term commitment enter the arena**

Energy Scene in Afghanistan

Some Thoughts

- **Afghanistan is primarily driven by hydroelectric power with 74.5 % share, a boon from the environmental angle**
- **Fossil fuel share is 25.5% , with none from other sources**
- **Afghanistan Clean Energy Program (ACEP) initiated by USAID in Oct. 2009 focussing on off-grid renewable energy generation, demand side management, energy efficiency, micro-hydro, solar and wind energy and clean energy projects etc. is a great initiative**

For a country, bravely on a rebuilding drive, implementing clean energy measures along with, will help in ushering-in a new ecofriendly economy. Fortunately, there are best examples from world over, to emulate...

To Conclude...

From developed to developing countries, energy conservation drives with involvement of all stakeholders - *people, planners, industries, businesses and political leaders* - is the best example of our efforts to regain a green mother Earth, now dwindling away to be a desert, if not acted in haste.

I wish the Afghan sisters and the team all the best in their efforts to rebuild an enviable Afghanistan. Be assured that we will be with you in that resurrection exercise.

Wishing you all a fruitful time in India and a journey back with lots of useful inputs to put to practice in your land...

Thank you for your time ---- N T Nair