

## **SUSTAINABLE DEVELOPMENT IN ENERGY SECTOR ENERGY EFFICIENCY AND ENERGY CONSERVATION- NEED OF AN HOUR**

### **ABSTRACT**

Energy is a crucial input required for economic and social development. It is a vital ingredient to ensure the well being and prosperity of the people. Electricity is the most versatile form of energy and strategic input providing a source of strength for various segments of the society. Today it is impossible for a country to grow or prosper without continued supply of requisite power to meet the needs of industrial and economic activities. The power sector is a prime mover and an effective engine for economic growth. With assured and reliable supply of power, the wheels of major sectors like agriculture, industry and infrastructure etc will roll continuously. In addition to augmenting the capacity of energy supply, its efficient use and conservation are essential to ensure sustainable development in the energy sector. The present paper focuses on Energy efficiency and Energy conservation schemes, which is the need of an hour.

**KEY WORDS** Energy Sector, Energy Efficiency, Energy conservation, Economic and Social development, Sustainable development, Capacity addition.

### **INTRODUCTION**

For any country, Power is a critical input for economic development and for improving the quality of life. The Indian power market is evolving rapidly from an opening market phase to a developing phase. Indian's power demand is estimated to increase from the present 120 Gw to 335 Gw by 2017. At present the country which has posted 9.4% GDP growth last fiscal has an installed capacity of 132110 mw. Today we are generating 1,50,000 mw from all sources. This is clearly not adequate to meet our developmental goals to attain a GDP growth of 9%. India ranks sixth globally in terms of electricity consumption with about 3.5% of the world's total annual energy consumption, but percapita consumption of energy is very low at 631KWH, which needs to be increased to meet the goals of economic and social development.

To mitigate shortage of energy in general and electricity in particular in addition to augmenting the capacity of energy supply, its efficient use and conservation are essential. Moreover there is a need to exploit alternative sources of energy like solar, wind as well as nuclear to overcome the country's power shortage. However the sustainable economic and social development is possible by encouraging energy efficiency and optimal use of natural resources. At present the Government of India to ensure sustainable development in the energy sector has initiated different energy conservation programmes in the large scale.

Keeping these facts in mind an attempt has been made by the researcher to study the current position of energy sector in India and a focus is made to present the energy conservation and energy efficiency schemes adopted by the Government for sustainable development of the Energy sector.

### **Objectives of the study**

The study aims at fulfilling the following objectives:

- To study the current position of energy sector in India.
- To study the role of Energy Sector in sustainable Socio- Economic development of a country.
- To understand Energy conservation and Energy efficiency measures.
- To know the schemes of Government of India in promoting Energy efficiency tools.

### Methodology

It consists of both primary data and the secondary data. Primary data is the first hand data which is collected through sample survey by questionnaires and through observation.

Secondary data is published data which is gathered from Journals, Periodicals, Reports generated from sources.

In the present study, the researcher focused on secondary sources of data, as it is a conceptual study and its main emphasis is on published data from different sources of Energy Departments of India.

### Current Position of Energy Sector

The Indian economy continues to surge ahead. Its power sector has been expanding concurrently to support the growth rate. India's investment requirement for power generation and transmission will be to the tune of \$200 billion to be able to fulfill the projected demand by 2012. The Indian power sector has made giant strides in the past six decades by increasing the installed capacity from about 1300MW at the time of independence to about 155859MW today. The Indian economy continues to surge ahead. Its power sector has been expanding concurrently to support the growth rate. The demand for power is growing exponentially and the scope for the growth of this sector is immense.

The GDP Energy Elasticity Index, a measure of the energy intensity of an economy is 1.2 for India. This means that with 1% growth in GDP, The Energy Demand goes up by 1.2%. The National Electricity policy 2005 had stated that India's power generation requirement would grow to over 1038 billion units by the end of 2012, and to meet this demand power generation should grow at a rate of 9%p.a. The Government admitted that about 30% of the country's total energy needs are met through imports. Coal accounts for more than half of India's total energy consumption followed by oil, which comprises 31% natural gas and hydroelectric power accounts 8% and 6% of consumption respectively.

Today we are generating 1, 50,000 MW from all sources. This is clearly not adequate to meet our developmental goals to attain a GDP growth of 9%. At present we burn one million tones of coal per day. In three years we would have to step up our power generation efforts to produce 2, 50,000 MW.

There is a demand shortage of about 15% and energy deficit of about 9% in the country. To mitigate shortage of energy in general and electricity in particular in addition to augmenting the capacity of energy supply, its efficient use and conservation are also essential.

### Capacity Addition Programme in Five-Year Plans:

Electricity falls in the concurrent list and had primarily been the responsibility of the central and state governments till about 1991. In terms of resources the power sector has received a major share and from the fifth plan onwards, more than 18% of the public sector outlay has been allocated for the power sector. Under the current plan, however the share of the power sector has come down to about 14.5%. With the objective of meeting the rising demand of our growing economy and to provide electricity to all by 2012 an ambiguous target of 78700MW has been set for the 11<sup>th</sup> five year plans.

As per the latest assessment made by the central electricity authority (CEA) against planned capacity addition of 78700MW a capacity of 18,325MW was commissioned with a high level of certainty during the remaining period of 11<sup>th</sup> plan. Thus a total capacity of 62,374MW is likely with a high level of certainty. In addition a capacity of 12590MW may materialize on best effort basis during the 11<sup>th</sup> plan remaining capacity may be slipping in 12<sup>th</sup> plan.

**Capacity Addition – Targets and Achievements**

S.No	Five Year Plan	Year	Target	Achievement
1	Eighth Plan	1992-1997	30588	16423
2	Ninth Plan	1997-2002	40245	19015
3	Tenth Plan	2002-2007	41110	21180
4	Eleventh Plan	2007-2012	78577	NA

(Source: Infrastructure leasing and Financial Services, Mumbai.)

There is also need to exploit alternative sources of energy like Solar, Wind as well as Nuclear to overcome the country’s power shortage. The cost of generating electricity from these sources may be higher, but today consumers are ready to pay better price provided the power supply is in uninterrupted and of good quality. Further to achieve the mission of power for all, transmission and distribution networks needs to be laid across the remotest corners of the country with emphasis on curbing the loss of energy as well as enhancing energy efficiency and conservation measures. Which seeks to upscale efforts to create a market for energy efficiency, which is estimated to be Rs740 billion.

**Emphasis on Energy Efficiency**

Energy conservation refers to efforts made to reduce energy consumption. Energy conservation can be achieved through increased efficient energy use, in relation with the decreased energy consumption or reduced consumption from conventional energy sources.

Energy conservation is as important as energy generation. It can be done by various means of reducing consumption of resources or products, improving efficiency, reusing items and even recycling used materials.

In India it is estimated that every year 3, 82,979 tonnes of electronic waste (World level 50 million tonnes) are generated.

In view of tremendous scarcity of natural resources like Coal, Gas etc Government of India suggested all states to implement energy conservation measures to bridge the gap between demand and supply to some extent and to meet the challenges of power utilities for the next 5years to meet the ever increasing demand in various sectors like Industry, Commercial transport, Domestic and agriculture.

**Potential for Energy Conservation**

Energy conservation can result in increased financial capital, environmental quality national security, personal security and human effort. Individuals and organizations that are direct consumers of energy choose to conserve energy to reduce energy costs and promote economic security. It is estimated that one unit of power saved is equivalent to 1.2 units of power generated and conservation of the energy is the need of the hour. Hence it is important that energy resources are consumed rationally and economically, thereby eliminating wastages and losses to the extent possible.

According to a recent study conducted at National Productivity Council, total energy saving potential was 75,360 million units. The five largest potential energy savers are

STATE	ENERGY SAVED
Andhra Pradesh	8209MU
Gujarat	7928MU
Tamilnadu	7822MU
Maharashtra	7757MU
Karnataka	6290MU

**Source :** { Facts for you, the Industrial Journal)

The government of India has taken a positive step in enacting the Energy Conservation Act, 2001 which may remove major constraints in the implementation of energy conservation programmes. The National Mission on Enhanced Energy Efficiency was implemented. This mission seeks to achieve an energy saving of 19000MW over the next five years. To ensure sustainable development, more emphasis has been given not only on capacity addition as well as energy efficiency and renewable energy.

#### **Schemes for Promoting Energy Efficiency in India**

To enhance the efforts to promote energy efficiency during the 11<sup>th</sup> plan and to achieve the target of reducing consumption by 5% (equivalent to 10,000MW of avoided capacity)The Energy Conservation Act has set up Bureau of Energy Efficiency(BEE),which has started several programmes and schemes targeting the following areas:

1. House holds Lighting
2. Commercial buildings
3. Standards and labeling of appliances
4. Demand-side management in agricultural/municipalities
5. SME's and large industries.

#### **Summary of these initiatives**

- **Bachat Lamp Yojana(BLY)**

It is a scheme to promote energy- efficient lighting in India, by distributing long life, quality lights to consumers. It is estimated that through this scheme an estimated 6000MW of electricity demand and reduction of about 24 million tones of CO<sub>2</sub> every year.

- **Standards & Labeling Scheme(S&L)**

This is one of the major thrust areas of BEE. A key objective of this scheme is to provide the consumer an informed choice about the energy saving and thereby cost saving potential of the relevant marketed product. The appliances included under this scheme are motors, colour TVs, ceiling fans, geysers, and agricultural pumps.

- **Energy Conservation Building Coders(ECBC) and energy efficiency in existing buildings**

It sets minimum energy standards for new commercial buildings having connected loads of 500kw or contract demand of 600KVA.

- **Strengthening institutional capacity of state-designed agencies(SDAs):**

The scheme seeks to build institutional capacity of the newly created SDAs to perform their regulatory, enforcement and facilitative functions in the respective states.

- **Agricultural and municipal measures**

The scheme targets replacement of inefficient pump sets, street lighting, etc.

- **Energy efficiency in small and medium enterprises (SMEs)and designated consumers:**

To stimulate energy efficiency measures in 25 high-energy consuming small and medium enterprise clusters, BEE in consultation with designated state agencies has developed different energy-efficiency manuals or booklets and other documents to enhance energy conservation in SMEs. (Source: kaleidoscope magazine)

## CONCLUSION

Sustained growth of Energy sector is critical for enabling the high economic growth targets of India. If all the potential challenges and constraints confronting industry have met successful, it leads to sustainable development of energy sector and socio-economic well being of more than a billion people. However adoption of energy conservation measures is necessary to reduce effective demand. This would not only save huge investments and also reduces environmental pollutants. Hence individuals and organization can adopt conservation of energy to reduce energy costs and promote economic security.

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