

Energy Conservation in India: Challenges & Achievements

Rahul M. Kasare

Head of Department

Department of Mechanical Engineering

A.S.Polytechnic Pipri Wardha, Bharat

Abstract— Today our country has a population of more than 1000 million and which is increasing day by day. Most of peoples are living in rural areas. In order to have improving growth rate, it is essential to have sufficient energy for systematic development in various sectors. Energy and development are inter-related and therefore Energy conservation is today's need. The gap between supply and demand of energy is continuously increasing despite huge consumption of energy. The gap between supply and demand of energy can be bridged with the help of energy conservation which may be considered as a new source of energy which is environment friendly. The energy conservation is cost effective with a short payback period. There is a good scope of energy conservation in various sectors like industry, agriculture and domestic. This paper will give overview of energy conservation in Indian scenario.

Key words: Energy Conservation

I. INTRODUCTION

Today our country has a population of more than 1000 million and which is increasing day by day. Most of peoples are living in rural areas. In order to have improving growth rate, it is essential to have sufficient energy for systematic development in various sectors. Energy and development are inter-related and therefore Energy conservation is today's need.

The developing countries like India are obliged to maintain a certain growth rate for which energy is a basic ingredient. Failure to meet the energy demand for the basic needs of the economy will cause inflation, unemployment and socio-economic disorder. Energy efficiency and conservation in the past have been neglected on the assumption of continuous availability of fossil fuel. India has a vast scope in the field of energy conservation. Outdated technologies mixed with poor maintenance have made Indian systems highly energy inefficient.

Energy conservation is defined as the "Strategy of adjusting and optimizing energy using systems and procedures to reduce energy requirements without affecting socio-economic development". The principal effort should be directed at obtaining more work from the fuel already being consumed. Energy consumption does not mean going without. Developing country like India is either to live with frequent power cuts or to mitigate the shortage by energy efficiency and integrated utilization of non-conventional energy sources. In future the energy conservation would assume more significance globally on the basis of the effect of burning fossil fuel on environment, particularly the global warming rather than the depletion of fossil fuel reserves and other consideration.

II. AREAS OF ENERGY CONSERVATION:

The main area where conservation was possible is as given below:-

- 1) Improvement in power factor would result in reduction in actual maximum demand on the system.
- 2) Improvement in plant load factor results in optimum utilization of plant capacity and increasing production.
- 3) In industries various equipment and components operating at higher temperature are found to have inadequate insulation. Higher surface temperature means loss of electrical form of energy by radiation.

III. APPROACHES AND CHALLENGES:

A. Approaches:

The various approaches of energy conservation are divided into short-term, medium-term and long term measures. All the short-term and medium-term measures may be taken up immediately. The efforts in energy efficiency should be done with full of dedication. Followings are some of the features of energy efficiency programme approach.

- 1) Software components include promotion, motivation, education, dissemination of information, data bank, and promotion of Research and development activities, studies on demand management.
- 2) Hardware components include energy efficient projects, models of efficient technologies
- 3) Stages of energy efficiency includes several activities resulting in various degree of energy saving and investments like.
- 4) Soft or Managerial solutions requiring little or no investment. It is obvious that, the savings are 10% to 15%, require cooperation from all concerned for immediate benefits.
- 5) Modest investments investment for replacing some parts of the existing system leading to reduction of higher 15% to 30% savings.
- 6) Using new or alternative technologies.

B. Challenges:

An important factor of in achieving energy efficiency and conservation target is the response of the end-user. Proper information, data base on consumption, efficiencies of energy in various end users play effective role in energy education. Some of the challenging factors are as below.

- 1) Energy auditors and managers have technological support of accurate measurement techniques since the quantization is the primary step towards conservation.
- 2) In India the tariff of electricity is not a true indicator of the cost of production of electricity. The tariffs are highly subsidized particularly for agriculture and domestic sectors. This is due to the fact that the energy is under Central, State and Public sectors.
- 3) Motivating the masses toward energy efficiency and energy conservation has given very less results. Efforts from the agencies have been half hearted, isolated and lacked coordination.

C. Government of India's approaches for energy conservation:

Government of India has initiated several measures of energy conservation and focused on the following key features in Energy Conservation Act 2001. It has identified pulp and paper, chloralkali, cement, fertilizer, steel and power plants as energy intensive plants.

- Bureau of Energy Efficiency
- Energy Conservation Target saving 400 Crores
- Identification of energy intensive building codes
- Labeling of Appliances
- Energy Efficient technology for pumps and motors
- Energy Audit of Government Buildings
- Professional certification and Accreditation
- School Education and Energy Conservation

These programs are showing good results but more promising new approaches need to be tested with the angle of global warming Carbon Dioxide, environmental issues. Energy is in short supply in India and expensive for industries. With use of more energy efficient technologies, many businesses could cut their energy consumption by up to 20 %. Energy efficient technologies can help protect the global climate, especially since fossil fuels, which are responsible for the greenhouse effect, will almost certainly continue to generate a large percentage of our energy for a long time to come.

IV. CONCLUSION:

In today's energy dependent times, the needs for ensuring energy conservation and energy efficiency have become more crucial. Some of the important conclusions are listed as below;

- 1) The energy efficiency and conservation should be viewed as new source of energy and it is the energy produced at very low cost. Having short payback period, it will help in reducing the gap between demand and supply.
- 2) It is absolutely necessary to bring attitudinal change in all energy users in respect of energy efficiency. This can be achieved to a large extent by imparting energy education in school level itself.
- 3) Energy efficiency is to be given due importance at the planning stage itself of the new industries.
- 4) Government, Industries and public participation can form -
 - Immediate measures -with small direct investment and lower payback periods.
 - Medium term measures- slightly higher investments, minimum gestation period, moderate pay back periods.
 - Long term measures- Heavy investment, high gestation period, prolonged pay back periods.
- 5) The government should provide more attractive incentives in terms of soft loans for purchasing energy efficient machineries and subsidies for employing energy conserving measures.
- 6) A national movement for energy conservation can significantly reduce the need for fresh investment in energy supply systems in coming years. It is imperative that all-out efforts are made to realize this potential. Energy conservation is an objective to which all the citizen in the country can contribute. Whether a household or a factory, a small shop or a large commercial building, a farmer or an office worker, every user and producer of energy can and must make this effort for his own benefit, as well as that of the nation. Energy conserving is the need for better future.
- 7) A systematic study and action plan approach for energy efficiency and energy conservation, augmenting the electrical energy generation from conventional and renewable resources will address the increasing energy demands of future India. Time has come to define and act in this direction.

REFERENCES:

- [1] Khan, A.Z. "Electrical energy conservation and its application to a sheet glass industry", IEEE Transactions on Energy Conversion, Vol 11, pp666-671, Issue 3 Sept 1996.
- [2] Conroy, G.H. "Modern cement plant design with a view to efficiency and the environment" 36th IEEE Cement Industry Technical Conference Record 29 May-2 June 1994 pp 359-393.

- [3] Murthy, S.S. and others “Energy conservation aspect of induction motors using improved design and power controllers” 1989 IE- CEC-89 Proceedings of the 24th Inter society Energy Conversion Engineering Conference 6-11, Aug 1989, vol 2 pp677-682.
- [4] Electrical Energy conservation in India- Challenges and Achievements by Kamalapur G D and Udaykumar R Y.
- [5] Energy Conservation in India: Challenges & Achievements by Anjna N. Singh and Jagrati Sharma Chemistry Deptt, MPCT, Gwalior ,IndiaInternational Journal of Mechanical and Industrial Engineering. Volume 1Issue 4 Article 4.