

Energy Efficiency in India

Introduction:

With rapid growth of the economy and increase in demand for energy, issues of energy security, efficiency of the entire energy system, and the effects of energy production, conversion, and consumption on the environment require policies that optimize these variables on an integrated basis, rather than by fuel or by specific source of energy. India being the third largest energy consumer in the world, its energy use pattern has a greater impact on the country as well as the world. Emerging economy like India is faced with the dilemma of planning for a robust energy sector to provide access to energy to all its citizens at the same time honour its international commitments to low carbon economy.

Although India is home to 18% of world's population, its consumption is only 6% of world's primary energy and its per capita energy consumption is only one-third of global average. Hence there will be a greater demand for energy as the country progresses with rising income and better quality of life.

India is trying to meet its demand on both the supply and demand side by encouraging investments in renewable energy on the supply side and increasing energy efficiency and conservation on the demand side.

Regulatory Framework

The Government of India (GoI) enacted The Energy Conservation Act (EC Act) in 2001, with the overall objective of reducing the energy intensity of Indian economy. GoI set up Bureau of Energy Efficiency (BEE) on 1st March 2002 under the provisions of The Energy Conservation Act, 2001. The mission of the BEE is to assist in developing policies and strategies with a thrust on self-regulation and market principles, within the overall framework of the Energy Conservation Act, 2001 with the primary objective of reducing energy intensity of the Indian economy.

In order to achieve a sustainable development path, India launched its National Action Plan for Climate Change (NAPCC) in 2008, with eight National Missions. National Mission for Enhanced Energy Efficiency is one such mission which outlines market based initiatives to enhance energy efficiency. National Mission on Sustainable Habitat is another mission under which energy efficiency in buildings is covered as one of the initiatives.

Under the overall ambit of EC Act 2001 and the NAPCC, BEE has launched several programmes and schemes to promote energy efficiency in Industries, Buildings, appliances and also capacity building programmes for all the stakeholders associated with energy efficiency.

BEE has initiated several programmes targeting the following areas:

- Household Lighting
- Perform, Achieve and Trade Scheme (PAT) for Large Industries

- Commercial Buildings
- Standards & Labelling of Appliances
- Demand Side Management in Municipalities
- Agriculture Demand Side Management Scheme
- SMEs Scheme
- Capacity Building of DISCOMs
- Capacity Building of SDAs
- State Energy Conservation Fund (SECF)

Energy Efficiency Saving Potential

As per World Bank estimate, India's market potential for energy efficient products is Rs. 1.6 lakh crore. As per their estimate, residential end use appliances, agriculture/irrigation pumps, and municipal infrastructure are the top three demand side management (DSM) market contributing to this potential. There is a potential to save 178 billion units of electrical energy per annum with renewed focus on DSM and hence reduce 150 million tonne of CO₂ emissions annually.

UJALA (LED replacement programme) is one such flagship programme that has been implemented successfully driven by market mechanism. The scheme has helped to save more than 35 million kWh of energy savings per day and 2667 MW of avoided generation capacity.

As accelerating urbanization takes urban population to 600 million plus by 2030, demand for electricity will rise. In order to improve energy efficiency in the buildings sector, the BEE has introduced Energy Conservation Building Code (ECBC) which is under voluntary phase right now and planned to be made mandatory after capacity building and implementation experience. ECBC provides minimum performance standards for Building Envelope (Walls, Roofs, Windows), Lighting (Indoor and Outdoor), Heating Ventilation and Air Conditioning (HVAC) System, Solar Hot Water Heating and Electrical Systems

The industry sector presents a significant opportunity for energy savings. To target this sector, BEE under the National Mission on Enhanced Energy Efficiency (NMEEE), has introduced the Perform, Achieve and Trade (PAT) scheme, which has achieved a cumulative energy saving of 8.67 million toe against the target of 6.686 million toe in the first cycle of PAT that was from 2012-13 to 2014-15. A total of 478 designated consumers (DC's) across eight sectors were covered in PAT-1 cycle. In the PAT-2 cycle, a target of 8.869 million toe has been fixed, that will cover 621 DC's under 11 sectors with the addition of three new sectors (Refinery, Railways and Electricity Discoms) between 2016-17 to 2018-19.

The BEE has also initiated the Standards & Labelling programme for equipment and appliances in 2006 to provide the consumer an informed choice about the energy saving and thereby the cost saving potential of the relevant marketed product. The program is mandatory for some appliances and voluntary for others. Comparative star labelling system is provided for appliances. More the number of stars, more is the energy efficiency of the appliance. As per a study by Dr. Kirit S. Parikh and Dr. Jyoti K. Parikh, estimated savings in household electricity consumption from just four appliances ACs, refrigerators, TVs and Ceiling Fans

range from 52 bkWh to 145 bkWh in 2030 with corresponding CO2 reductions of 42 Mt to 116 Mt in 2030.

Role of NITI Aayog

The key to effective roll out of all these energy efficiency policies and programmes would be effective coordination across all the different stakeholders in the process of developing, rolling out and enforcing, all of which happens at different levels. This would include different Ministries of Government of India, State Governments, Industries, Citizens, etc, all of whom would have to take joint ownership.

While many states have already shown leadership and been innovative in drawing up their strategies for implanting these norms for their states, other states are in the process. NITI Aayog will facilitate more conversation and dialogue between the states to share and learn from the mistakes and best-practices of leaders. We would be supporting this effort by providing a platform to the states to exchange their ideas and identify the best course of action that they can take to quickly adopt and implement in their states.