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## Demand side management in India: Action plan, policies and regulations

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## ABSTRACT

The paper introduces the approach and concept for DSM in India. A comprehensive methodology for implementing a DSM programme in India has been outlined. Detailed step wise action plan formulated for planning and implementing of DSM programme in India is presented. Various policies and regulations framed by India for promotion of DSM activities targeting different sectors are studied. The deficiencies in the existing regulatory and policy framework which have withheld deployment of DSM programmes on a large scale in India have been identified. A number of barriers and challenges that are needed to overcome for realizing the potential of DSM in India are also discussed.

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**1. Introduction**

India is home to more than 17% of the world's population [1], with a rapidly growing economy at an annual rate of 8–9% [2]. India is the fourth largest energy consumer in the world after the United States, China, and Russia [4] and is poised to become the world's third largest economy by 2030, only after China and United States [3]. It has the fifth largest electricity grid in the world [7] and the world's third largest transmission and distribution network [8].

India's power industry is facing challenges of supply shortfalls, high T&D losses, power theft, and inefficiency in metering and revenue collection. India's transmission and distribution losses are of very high magnitude in the world, averaging 26% of total electricity production. Taking into account energy theft, total losses are as high as 50% [9].

*1.1. Electric power scenario in India*

Over the years, India has achieved a steady increase in its electric power installed capacity. However, growth in demand for electric power has outweighed the growth in installed capacity, which has led to a situation of energy and peak shortages of 9.3% and 10.6%, respectively during 2012–13 [10]. The peak demand and energy deficits of India from 2007–08 to 2012–13 is shown in Table 1 [63].

Increased demand is directly related to the per capita consumption of electricity which is shown in Fig. 1, over a period of 8 years.

In order to reduce the gap between the demand and supply of electricity in India, adequate actions or measures are taken to manage electric power both at the supply side and also at the demand side. Supply side measures include building new power plants, reducing T&D losses, diversifying fuel-mix, energy storage

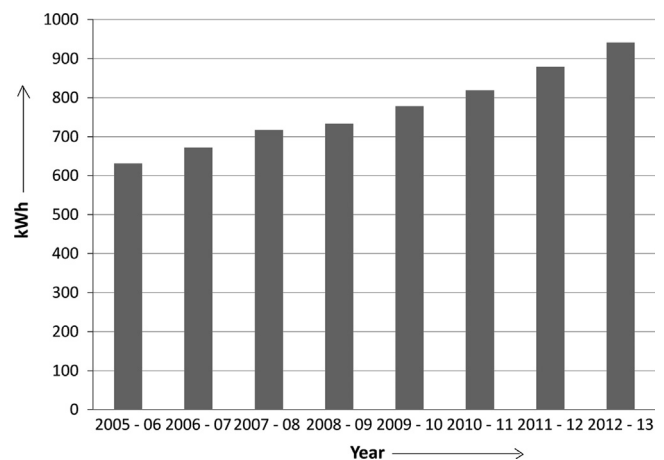
**Table 1**  
Peak demand and energy deficit in India for last five years [63].

Period	Peak demand (MW)	Peak met (MW)	Peak deficit/surplus (%)	Energy requirement (MU)	Energy availability (MU)	Energy deficit/surplus (%)
2007–08	108,866	90,793	–16.6	739,343	666,007	–9.9
2008–09	109,809	96,785	–11.9	777,039	691,038	–11.1
2009–10	119,166	104,009	–12.7	830,594	746,644	–10.1
2010–11	122,287	110,256	–9.8	861,591	788,355	–8.5
2011–12	135,453	123,294	–9.0	995,500	908,574	–8.7
2012–13 <sup>a</sup>	149,619	136,312	–8.9	1,129,609	1,028,993	–8.8

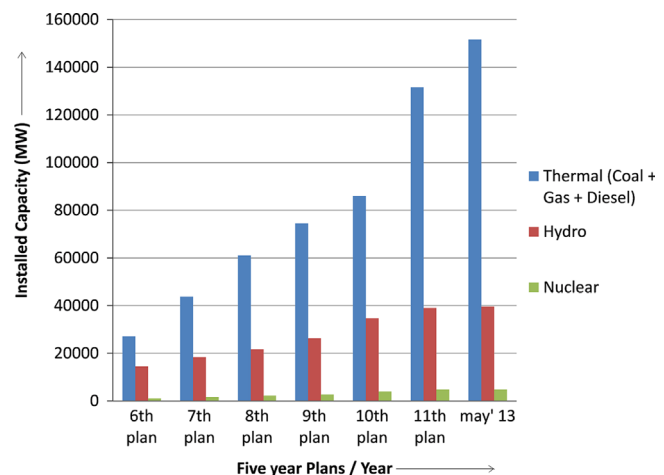
<sup>a</sup> Anticipated.

technologies, thermal storage and so on [11]. The total installed capacity for electricity generation in India rose from 112 GW as on March 2004 to 229 GW as on December 2013 [5,12]. Capacity additions require high capital investments, timely approvals to build new power plants and there has been increasing inflation problem and decreasing availability of capital [13,55,56]. The growth of installed capacity since 6th five year plan (i.e., 31.03.80–31.03.85) is shown in Fig. 2.

An increase in electricity supply has a substantial tax revenue benefit to the government [14]. But adequate revenue collection by the electric utilities to cover their costs of supply is lacking as large



**Fig. 1.** Growth of per capita consumption of electricity [63].



**Fig. 2.** Growth of installed capacity upto 2013 [63].

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