

## **ROLE OF POWER SECTOR (POWER PLANT PERFORMANCE OPTIMIZATION IN PARTICULAR) IN ACHIEVING ENERGY SECURITY FOR INDIA**

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*Synopsis: Energy is one of the major inputs for economic development of any country. In the case of the developing countries like India the energy sector assumes a critical importance in view of the ever-increasing energy needs requiring huge investments to meet them. India's per capita electrical energy consumption is targeted for 50% growth in the Eleventh five year plan from present level of 704 units per year. Electricity is one of the convenient, efficient, versatile forms of commercial energy and is therefore considered as backbone of industrial & agricultural growth. Presently India is facing serious challenges of energy security threat due to short fall of peak power supply by 16.6% & energy supply by 9.6%, Crude oil domestic source meets only 23% of demand, whereas shortfall in gas supply is up to 43%. Under the above scenario, coal based thermal power plant is being focused as major source of commercial energy. To meet the demand of future energy requirement, not only growth of power sector is required but optimum utilization of existing resources in the energy sector is more important. In power basket, hydel sector is considered for serving peak load only, causing decreasing trend of specific generation per unit of installed capacity. Renewable energy growth are given due importance with special emphasis given on wind power generation. Nuclear power though occupies only about three percent of energy basket, but it is targeted as one of the important source of power in the years to come.*

*In this paper an effort has been made to focus on energy resources, demand, supply, future growth plan, and present status on performance of power plant & optimization tools applied for improvement of power plant availability. Special focus is given on optimization approach of power plant unit performance and power sector as a whole to achieve energy security. Some of the key suggestion for implementation are like specific generation per unit installed capacity, for performance rating evaluation, implementation of condition based maintenance for ensuring availability, increasing share of higher size unit for improving national average of PLF, efficiency. Energy conservation approach is also focused as one of the powerful tool for achieving energy security.*

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