



# Study of Smart Grids , Its components, Key benefits and challenges

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**Abstract :** Smart Grid facilitates efficient and reliable end-to-end intelligent two-way delivery system from source to sink through integration of renewable energy



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sources, smart transmission and distribution. In this way Smart Grid technology shall bring efficiency and sustainability in meeting the growing electricity demand with reliability and best of the quality.

Smart Grid also enables real time monitoring and control of power system as well as helps in reduction of AT&C losses, demand response and demand side management, power quality management, outage management, smart home energy system etc. Smart Grid will act as a backbone infrastructure to enable new business models like smart city, electric vehicles, smart communities apart from more resilient and efficient energy system and tariff structures. Recognizing the importance, POWERGRID has taken pioneering steps in bringing Smart Grid technology to all facets of power supply value chain & developed smart grid pilot project at Puducherry through open collaboration covering all attributes of smart grid in distribution.

Smart Grid is an evolving set of various technologies, especially information and communication technologies, working together to improve the present grid. Being an evolving technology, it is difficult to define it. Further, the applications of smart grid shall depend on the location and the requirements, henceforth its definition.

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