

# Energy Sector, Evolution, Energy Crisis, Dynamic Change in Energy Source Destination and Performance: Evidence from India

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**Abstract – Aim of the paper is to read the past, present and future of the energy scenario in India. Study takes into account India's ongoing requirement of energy, its domestic generation potentiality and its changing pattern of energy source destinations. Research output depicts that growing economic activities demanded huge supply of energy. India met its energy demand since 1940 onwards from various destinations. Simultaneously the difference between energy demand and supply is not only met from imports but also by constant energy policies. It has been identified that over the years the power generation in India increased at CAGR of 5.69 Percent. However India's major electrification is done from coal, currently the total installed coal thermal power capacity registered about 191.09GW.**

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## INTRODUCTION

Energy is one of the most core factor of infrastructure which is inevitable for the economic growth and benefit of the nation. Indian power sector remains as an example of diversified energy sector in the world. Since independence India has been changing its energy source destination to cope up with the growing economic activities at different sectors. Sources of power generation ranges from non-renewable to renewable energy. As population grows, economic growth and development takes the shape there is a huge demand for the energy. This is expected to rise further year on year. In order to suffice the increasing demand for the energy the country needs to mount the installed capacity in the nation. Hence from the beginning energy accumulation has been the central concern of the government.

## OBJECTIVES OF THE STUDY

- To evaluate historical policy development
- To understand the growth of the power generation
- To find out the structural change in the sources of power
- To find the dynamic change in energy source destination
- To evaluate the relationship between industrial expansion and power demand

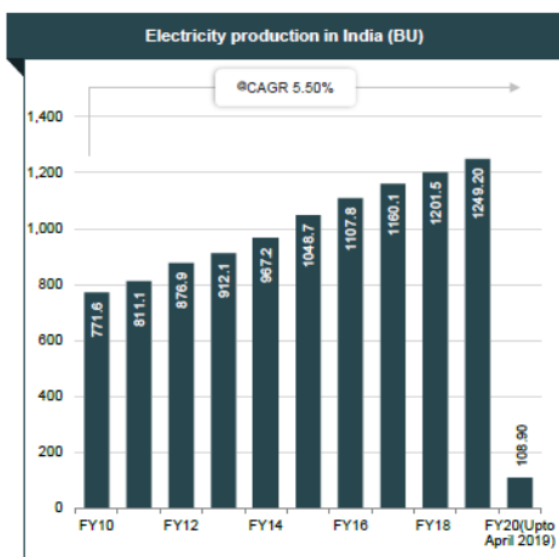
## ENERGY CRISIS AND HISTORICAL DEVELOPMENT OF POWER SECTOR IN RELATION TO INDIAN DEVELOPMENT

Around 1948 India was already having some degree of industrialization. Hence there was a need for Electricity (supply) Act 1948. This led to establishment of semi-autonomous state electricity Boards (SEBs). Energy crisis and dynamic changes in oil source destination was very much prevalent. From 1940 to 1960 India mostly imported oil from Iran, Saudi Arabia. However during these years a small amount of oil was imported from Kuwait and Indonesia. After 1960 Indian policy with regard to oil was inward looking. Policy like generation and distribution of power under state ownership was initiated. At the same time increase in the oil prices of Iran, Saudi Arabia and Kuwait led India in 1960 to look for oil import from USSR. Around this period to improve the oil security, to mitigate power losses, resource constraints and remove infrastructure bottlenecks India planned to have extraction of and refining oil in its own. However in 1991 with the collapse of USSR and of the Cold War USSR's oil supply stopped? This led to huge oil security enquiry in India. Nevertheless India's collective policy of liberalization, Globalization and Privatization brought many policy and physical development. Policy framework boosted private sector participation in generation. Policy formulation such as quick fast-track clearing mechanism of private investment proposals, electricity Regulatory commission act (1998) and rationalization of tariffs so on. On the other hand India spotted discovery of gas in (Krishna-Godavari) basin by reliance

industries. In 2001 Iraqi Oil export suspension led to an import loss of 2.1million barrels per day this led India to change its destination to Saudi Arabia for about 25 million metric tonnes of crude oil. Simultaneously India amended Electricity Act 2003, Implementation of Deen Dayal Upadhyay Gram Jyoti Yojana (DDUGJY) and Integrated Power Development Scheme for rural and urban areas respectively. On the other hand India continued to depend on Saudi Arabia due to war in Iraq in 2003 it imported about 25% oil requirement from Saudi Arabia. In the recent past after Saudi Arabia, Iraq and Venezuela it has been Kuwait that supplies more energy requirement since 2013-2014 (Source: Embassy of India, Kuwait, November, 2015, Report)

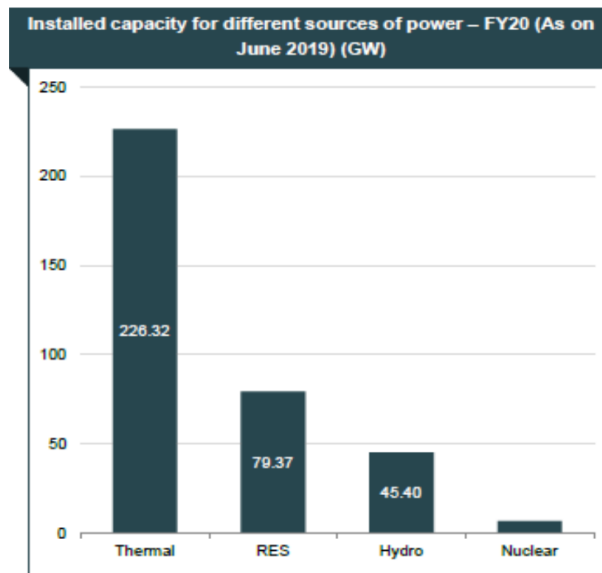
### GROWTH OF THE POWER SECTOR

Over the years the power generation in India increased at CAGR of 5.69 Percent. India which produced 771.6 Billion Units of power in the year 2010 currently produces 1050.30BU. Hence country progresses power generation growth of 55.72 in current fiscal year.



Source: BP Statistical Review, Ministry of Power

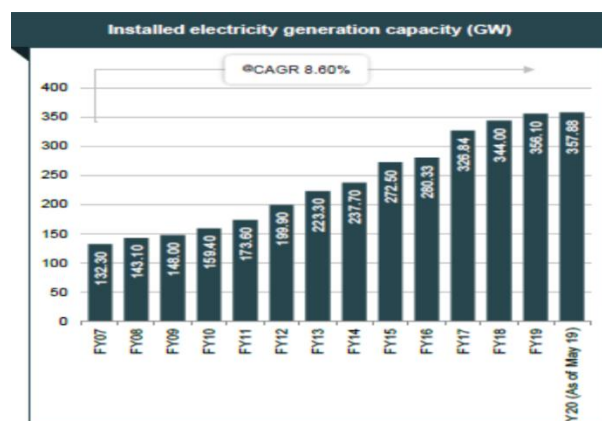
The total source wise installed capacity of power in India having upward trend. Among different sources of power thermal installed capacity accounts for 223.03GW, while that of Renewable Hydro, Nuclear energy stand 74,08GW, 45.40 GW, & 6.78GW respectively. The government targets to achieve total production of 175GW renewable energy, out of which 100GW will be produced from solar power. Government policy of “Green Corridor Project” aims at generation of power from 34 solar parks of various states about 20GW.



Source: Ministry of Coal, NHPC, Central Electricity Authority (CEA), Corporate Catalyst India,

India’s major electrification is done from coal, currently the total installed coal thermal power capacity registered about 191.09GW; by 2020 it is expected to touch a capacity addition of 47.86GW. Whereas power consumed from gas thermal power records about 24.94GW in Jan- 2019, it has the target to add about 0.41GW by 2022. Thermal, Renewable, Hydro and Nuclear sources of power with shares in total installed capacity in terms of percentage accounts 63.85%, 21.21%, 13.00% and 1.94% respectively.

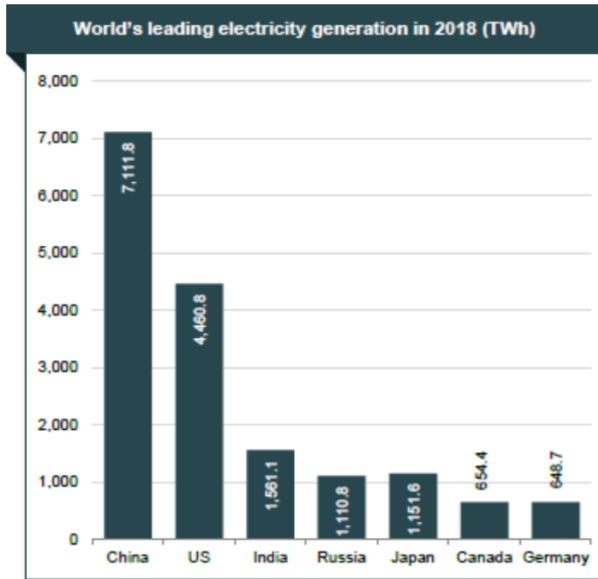
However India’s electricity generation capacity increased at a good pace. In the year 2007 the total installed capacity was about 132.30GW, which drastically increased to 349.29 GW. It indicates about CAGR of 9.08 percent. Energy generation from conventional sources recorded about 100.36 billion Units in 2019.



Source: CEA (Central Electricity Authority)

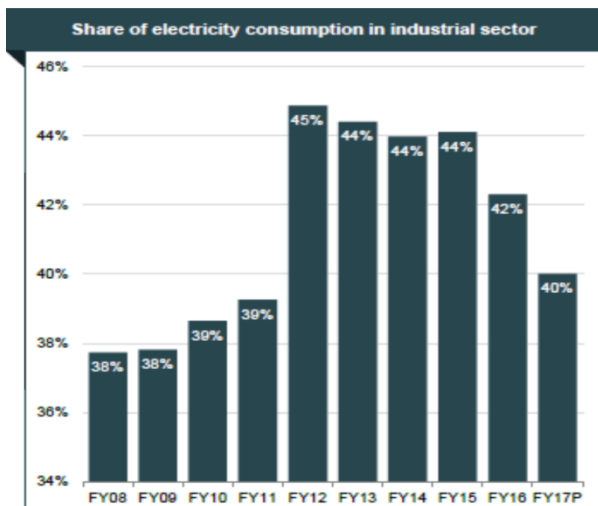
India being the 3<sup>rd</sup> largest producer of power after US and China, It generates about 1.497 TWh. Although electricity generation has grown more

rapidly year on year since the time of independence however growth of demand for electricity has been much higher due to ongoing rapid economic growth Standard and Poor rates Indian energy industries at the 10<sup>th</sup> place out of 250 industries.



**Source:** BP Statistical Review World Energy 2018

There many factor influencing demand for electricity. Drivers such as industrial expansion, growing per-capita income, growing consumption and increasing economic activities lead to substantial increase in demand for power. And this demand is going to increase further in the coming years. As India is becoming more economically free country for investment and a manufacturing hub it is going to expand the demand for consumption of electricity. From the below table it is clear that on an average industries consume about 40% of the total electricity.



**Source:** CEA (Central Electricity Authority),

**CONCLUSION:**

Demand for electricity is estimated to increase at a CAGR of 7 per cent. Hence government should

cautiously undertake measures to keep power requirement stable. For which India should adopt various strategies such as control generation costs, use more quality source of energy generation and diversifying energy technologies. India should welcome more FDIs in power sector. Moreover it needs to improve its production and dependent on energy towards Hydro , Solar, Wind and Nuclear based generation to minimize the gap between demand and supply of energy.

**REFERENCE:**

- 1) Ministry of Power, News articles
- 2) DPIIT
- 3) International Energy Agency (IEA), CEA, Demand estimates based on IEA forecasts,
- 4) NTPC presentation,, CEA
- 5) Ministry of New and Renewable Energy, Business Monitor International, CEA,
- 6) Media Reports, Press Releases, Press Information Bureau (PIB), PE Roundup-August 18 report by EY
- 7) Nandy D. (2016) Energy Crisis of India: In Search of New Alternatives. J Bus Fin Aff 5: 224.

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