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A study on Power Sector with role of NTPC Limited in India

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Abstract

With the rapid process of Industrialization, India in recent time has emerged as one of the fastest developing country in the world. With the overall growth of the country, power has become uttermost need to pump the process. The present study examines the key features of power in India, estimated demand and supply position of power, consumption pattern and the role of NTPC Ltd. in overall power production in the country. Data collected in the present study were only from the secondary sources. Data analysis was through the means of comparison drawn from year wise collected information and data on power function in India.

Keywords: Power, consumption, NTPC Ltd., demand and supply.

Introduction

India is the fifth largest power producing country in the world. India's growing population in a geometric means has broadened the challenges for providing sufficient electricity to the consumers at large. As on January 2013 the total power generation capacity in India stands at 211.766 GW[1]. Plants running through non-renewable energy sources accounts for 87.55% of the total power producing capacity where as those using renewable energy sources accounts for 11.45% of the total production capacity in India[2]. Power consumers in India can be generally categorized into Industrial, agricultural, domestic and commercial consumers. An industrial consumer consists of all the firms or an organization which uses power for the manufacture of utility goods. Agricultural consumers include all the cultivation activities done by the Indian farmers for producing valuable food stuff necessary for survival. A domestic consumer consists of the households who use electricity for their day to day activities. Commercial consumers are those who use power for their business activities. In terms of consumption industries in India accounts for 39% of overall power consumption which is highest followed by agriculture sector which accounts for 19% of the overall consumption. 24% consumption is accounted for the domestic consumers and least of 10% which is under the head of commercials (source: Ministry of statistics and programme implementation 2012). The per capita consumption of electricity in India stands at 813.30 units in 2010-11 and that of the world stands at 2807 units in 2009. In comparison it can be said that the individual Indian is consuming approximately 3 times less electricity than the rest of the individuals in the world. Further it is understood that Indian power consumers are facing shortage in terms of Power availability. Therefore sufficient production and optimum utilization of power has been the need of the time. NTPC Ltd. is playing a vital role in power production in the country. It is the biggest state-owned electric company in India. NTPC was formulated on November 7, 1975 as private limited company. Initially the company was named as National Thermal Power Corporation Private Limited. The conversion of the same into a public limited company was on September 30, 1985. With the issue of new incorporation certificate the company was renamed as National Thermal Power Corporation Public Limited. It is one among the five companies who have gained Maharatna status in recent times. It is scheduled in Forbes Global 2000 and for the year 2011 it was positioned 348th in the world. NTPC Limited has head office located in New Delhi. NTPC has vision of becoming the top power producer in the globe which will lead to India's development.

Objectives of Study: Following are the broad objectives of study, i. To study the key features of power sector in India. ii. To study the demand and supply position of power in India. iii. To study the consumption pattern of power by various sectors in India. iv. To examine the role of NTPC in overall power production.

Literature review: Akpabio and Akpan in their study at Nigeria found that the Government was incapable in providing adequate electricity to the public thereby leading to unhealthy climate in the state. It can cause adverse affect to economy, situation and general public[3]. D.P. Sharma et al. in their study in Indian power sector found that despite of the rapid reformation practices which was started in 1991 could not bring about the overall effectiveness in the power sector in india. Power sector is still missing technological competence, be short of appropriate funding, high wastage, lack of enhanced buyer contentment etc.It has only ensured consistency, affordability and convenience to the public. Therefore there is a need of reformation in terms of purpose and tactic to bring in development[4]. Report on Power Sector in India describes the importance of power availability for development of

nation. It emphasizes on the fact that requirement and delivery criteria must be met for continuous economic growth. Mismatch in demand and supply leads to hindrance in economic progress. Country India must go with effective production, diffusion and supply of power in order to meet the future challenges and to achieve the planned targets[5]. Navroz and Sudhir in their article described about Power sector policy in India. They argued power sector policy have protected itself into poor measures. They pointed the first was when farming consumption was de-metered and widespread funding in power were presented to the farmers; the second instance was when IPP agreement with key fiscal insinuation were made by SEBs., it may result in unfavorable situation for development[6]. Bhattacharya and Patel in their paper tried to build an Index that capture the movement in income orientation of individual utilities between the years 2001-05. They studied different factor which are the marker of power sector reform scheme. They arranged the data on various parameters like regular revenue comprehension, collection efficiency, composition of demand, duty change, cost of delivery, physical losses etc to get an analytical justification of the transformation plan. They indicated the unevenness in performance of power sector has amplified in the last few years[7]. Atsushi in his Working Paper indicated the factors which lead to constant scarcity of power in India. Reasons like lack of allocative efficiency, lack of feasibility and trustworthiness from investors point are the reasons for the same. He suggested the opening of aggressive extensive electricity markets can be anticipated to somewhat solve these problems and recover market[8].

Methodology

Methodology adopted in the study is based on collection of secondary data's available from various sources. The sources of data include published and unpublished articles from internet, data from Central Electricity Authority (CEA) and Central Electricity Regulatory Commission (CERC), Statistical survey of India, Annual report of NTPC etc.

Results and Discussion

Analysis and Interpretation: Power production and Control: Table-1 represents the year wise power generation under the control of central, state, private and other agencies. The data shown in the table ranges from year 2006-2012.

It is observed from the table-1 that major portion of electricity generation are under the control of state and central government. However private and other agencies also play part in the generation of electricity.

Power generation by fuel type: Table-2 shows the sources of power generation in India. The generation of power can be from exhaust able energy or non-renewable energy sources like coal. The plants operated by coal are called as thermal power plants and those operated by using kinetic energy of free flowing water are called as hydro power plants. Nuclear sources include sources from uranium. The data is given for all this form of energy sources utilized by plants from the year 2006 to 2012.

Table-1
Power production and Control in Billion Units

Sector	2011-12	2010-11	2009-10	2008-09	2007-08	2006-07
Central	364	346.09	324.284	304.033	298.949	275.339
State	367.95	343.3	348.274	344.975	338.052	325.221
Private	139.65	116.14	93.634	68.887	62.16	58.859
Others	5.28	5.61	5.359	5.899	5.29	---
Total	876.89	811.14	771.551	723.794	704.451	659.419

Source Secondary data compiled from NTPC annual report 2006-12.

Table-2
Power generation by Fuel type in Billion Units

Fuel	2011-12	2010-11	2009-10	2008-09	2007-08	2006-07
Thermal	708.81	665.01	640.876	590.101	558.815	527.499
Hydro	130.51	114.26	106.68	113.081	123.57	113.315
Nuclear	32.29	26.27	18.636	14.713	16.776	18.605
Others	5.28	5.61	5.359	5.899	5.29	-----
Total	876.89	811.14	771.551	723.794	704.451	659.419

Source: Secondary data compiled from NTPC annual report 2006-12

It can be observed from the table-2 that during 2011-12 approximately 80%of the total power generation was contributed by Thermal sources. Followed hydro, Nuclear and other sources which are accounted by 15%, 3%and 0.6%respectively.

Plant Load Factor of power producing sector: Efficiency of power production is measured in terms of overall capacity utilization of the plant which in other words is called as the plant load factor (PLF). Measurement of PLF is a significant factor since it can be known how well the resources are utilized. The higher the plant load factor the better will be the operating efficiency of the plant.Table-3 shows the plant load factor of different power sectors in India from year 2006-2012.

It can be observed from the table-3 that the plant load factor of the power sector under the control of central government is highest followed by private and state level. However overall PLF in India ranges from 73.32 to 77.68.

Demand and Supply position of power in India: Table 4 shows the overall requirement of power (year wise in Mega units) and the actual power supply available for final use for the consumers in India. Power Percentage surplus or deficit is shown in the last column.

It can be observed from the table-4 that India since year 2001 is facing power shortage in terms of availability or use. From 2002 to 2012 financial year the shortage in power varies from 7.5% minimum to 11.1% maximum. Year 2008-2010 was significantly marked by huge power shortage where the anticipated deficit was 11.1% and 10.1% respectively. However, as per last two years the deficit percentage was found to be 8.5%.

Electricity consumption: Table-5 below shows the consumption of electricity by different sectors in India from 2001 to 2009.

Table-3
Plant Load Factor of power producing sector in percentage

Sector	2011-12	2010-11	2009-10	2008-09	2007-08	2006-07
State	68	66.75	71.13	71.2	71.1	71.1
Central	82.12	85.12	85.64	84.3	86.7	84.2
Private	76.19	76.7	82.41	91	90.8	86.35
All India	73.32	74.97	77.68	77.3	78.6	76.8

Source: Secondary data compiled from NTPC annual report 2006-12

Table-4
Demand and supply position of power in India

Year	Requirement	Availability	Deficit	Percentage
	Mega Units	Mega Units	Mega Units	(%)
2001-02	522,537	483,350	-39817	-7.50%
2002-03	545,893	497,890	-48,093	-8.80%
2003-04	559,264	519,398	-39,866	-7.10%
2004-05	591,373	548,115	-43,258	-7.30%
2005-06	631,554	578,819	-52,735	-8.40%
2006-07	690,587	624,495	-66092	-9.60%
2007-08	737,052	664,660	-72,392	-9.80%
2008-09	777,039	691,038	-86,001	-11.10%
2009-10	830,594	746,644	-83,950	-10.10%
2010-11	861,591	788,355	-73,236	-8.50%
2011-12	937,199	857,886	-79,313	-8.50%

Source: Secondary data compiled from NTPC annual report 2006-12

Table-5
Electricity Consumption by different sector in India in Mega Units

Year	2008-09	2007-08	2006-07	2005-06	2004-05	2003-04	2002-03	2001-02
Industry	209474	189424	171293	151557	137589	124573	114959	107296
Agriculture	109610	104182	99023	90292	88555	87089	84486	81673
Domestic	131720	120918	111002	100090	95660	89736	83355	79694
Commercial	54189	46685	40220	35965	31381	28201	25437	24139
Traction and Railways	11425	11108	10800	9944	9495	9210	8797	8106
Others	37577	29660	23411	24039	23454	22128	22564	21551
Total	553995	501977	455749	411887	386134	360937	339598	322459

Source: Secondary data compiled from Central Electricity Authority (CEA) 2012

Table-6
Role comparison of NTPC Ltd. to Rest of India

	NTPC				Rest of India			
Year	**Generating Capacity (in Megawatt)**	**Percent Share**	**Electricity generated (in Billion Units)**	**Percent share**	**Generating Capacity (in Megawatt)**	**Percent Share**	**Electricity generated (in Billion Units)**	**Percent share**
31-03-06	24249	20%	171	28%	100038	80%	446	72%
31-03-07	26350	20%	188.67	29%	105979	80%	470.74	71%
31-03-08	27350	19%	200.863	29%	115711	81%	503.588	71%
31-03-09	27850	19%	206.939	29%	118729	81%	506.64	71%
31-03-10	28840	18%	218.84	28%	130558	82%	552.712	72%
31-03-11	30830	18%	220.54	27%	142796	82%	590.60	73%
31-03-12	32650	16%	222.07	25%	167227	84%	654.82	75%

Source: Secondary data compiled from NTPC annual report 2006-12

The above table-5 shows the year by year total consumption of power by different sources. It is observed that in India Industries are the main consumers of electricity followed by Domestic sectors, Agriculture sector, commercials and railways. Comparing the yearly data it can be concluded that the overall requirements of the entire sector in increasing every year. Due to increasing demand of all these sectors India faces challenges for increasing the production capacity of electricity.

Role of NTPC Ltd. in Power Generation: Table-6 below shows a brief comparison of Power generation dimension by NTPC Ltd. and rest of India from year 2006 to 2012. The dimension includes the actual generating capacity and the actual electricity generated shown in terms of percentage of NTPC and rest of India's Power sector.

Result and Discussion: NTPC is one of the major power producing companies in India. It can be seen from the table-6 that NTPC is generating 25% of the overall power in India in the year 2012.Hence it can be said that NTPC is contributing for one-fourth of power production in the country. The overall installed capacity accounted for only 16% of the total capacity of India. This is a significant figure which says NTPC plants are working in high efficiency. This is due to increased level of plant load factor and use of advanced tools and technologies. With increasing terms of power requirements in the country NTPC will be having major role to play in enlightening India in the future years to come.

Conclusion

Power sector in India is characterized by shortage. Therefore there exists huge challenge in front of power companies to produce, regulate and integrate power system in India. Thermal power production in India still exists to be highest contributor in power sector. But with exhausting resources in the form of coal country must look forward for likely substitution in near future to come. In terms of efficiency power sector under the control of central government have the greatest PLF followed by private and state sectors. Indian Industries are the major consumers of electricity followed by Domestic sectors, Agriculture sector, commercials and railways. The role of NTPC Limited in power production is significant. Every fourth bulb lit in India is gifts of NTPC Ltd. NTPC have a major role to play in the power generation in India in upcoming times to come.

References

1. All India Region wise generating installed capacity of Power, Central Electricity Authority, Ministry of Power, Government of India, January **(2013)**
2. http://www.renewindians.com/2012/12/Renewable-energy-contribution-in-india.html **(2012)**
3. Emmanuel M. Akpabio and Nseabasi S. Akpan, Power supply and environmental sustainability in the University of Uyo: An agenda for full-blown research in Nigeria, *Journal of African Studies and Development,* **2(6),** 132-143, September **(2010)**
4. Sharma P.S., Nairb C. and Balasubramanianc R., Performance of Indian power sector during a decade under restructuring: a critique. *Energy Policy*, **33**, 563-576 **(2005)**
5. Power Sector in India, Energy Summit, Nagpur, January **(2010)**
6. Navroz K.D. and Sudhir C.R., The Politics of Power Sector Reform in India, *World Resources Institute*, April 2**(2001)**
7. Bhattacharya S. and Urjit R.P., The Power Sector in India: An Inquiry into the Efficacy of the Reform Process, Presentation at the Brookings-NCAER India Policy Forum., New Delhi.,17-18, July **(2007)**
8. Iimi A., Power Market Architecture in India, *JBIC Institute*., 15 April **(2004)**
9. www.ntpc.co.in **(2013)**
10. NTPC Ltd., 36th Annual Report, New Delhi, 17-43,**(2011)**
11. NTPC Ltd., 35th Annual Report, New Delhi, 16-45, **(2010)**
12. NTPC Ltd., 34th Annual Report, New Delhi, 16-45, **(2009)**
13. NTPC Ltd., 33rd Annual Report, New Delhi, 20-44, **(2008)**
14. NTPC Ltd., 32nd Annual Report, New Delhi, 34-41, **(2007)**
15. NTPC Ltd., 31st Annual Report, New Delhi, 32-40, **(2006)**
16. NTPC Ltd., 30th Annual Report, New Delhi, 22-40, **(2005)**