Library Progress International *Print version ISSN 0970 1052*
Vol.44, No.4, December 2024: P. 890--894 *Online version ISSN 2320 317X*

Original Article *Available online at www.bpasjournals.com*

Foreign Direct Investment as a Boon for Power Generation in India

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How to cite this article: Dr. Rajesh Kumar, (2024) Foreign Direct Investment as a Boon for Power Generation in India. Library Progress International, 44(4), 884-888.

Abstract:
FDI in Power sector is an important issue especially in the context of developing countries like India. The paper showed inter-relationship between Foreign Direct Investment (FDI) and Generation of power in India. On the basis of secondary data Interrelation between FDI in power sector and the development in power sector has been analysed and examined that how these both are inter-related. The data is taken for the financial year 2016-17 to 2022-23. This paper has been divided in four sections, first section presents the introduction second section presents the status of foreign direct Investment in the power Utilities in India. Third section, presents the improvement in power generation after FDI and forth Section draws the conclusions.

Keywords: FDI, Power Generation, Renewable Energy

Introduction

In current era Indian power sector, is the backbone of infrastructure development. It plays a very crucial role in the promoting the socio-economic growth of India. Availability of power in India has increased overtime, however, still there is need to increase it further. Historically India depended upon the conventional sources of energy. However, during the last two decades it has focused on non-conventional sources of energy such as hydro power, wind power, bio-waste energy, solar energy, nuclear energy etc. As after China and US, Indian power Utilities also became a leader in the production and consumption of energy, therefore the investment in power sector is a issue of concern for the Economists.

Foreign Direct Investment (FDI) is that investment which takes funds with transfer of technology. Therefore, this is a crucial source of employment generation in order to absorb the abundant labour in developing counties like India. It is very helpful to arrange the funds that can be used for the productive investment. It has a positive impact on building and strengthening the relationship among nations. With the help of that investment needy countries can arrange funds to increase the energy production for their use and for boosting up the exports. FDI is also helpful in increasing the trade and economic development of any country.

Electricity is very crucial energy input in order to fulfil of the productive need of any economy. As all the three sectors of economy-agriculture sector, industrial Sector and service sector, is used the electricity as an intensive energy input. At the same time the developing countries has lack of funds and facing the problems of advanced technology. Hence, we can say that Foreign Direct Investment (FDI) not only fulfils the capital needs but also required to bridge the technological gaps in developing countries. Therefore, FDI in power sector is very useful for the development process and they have a positive role in promoting overall growth of developing countries like India.

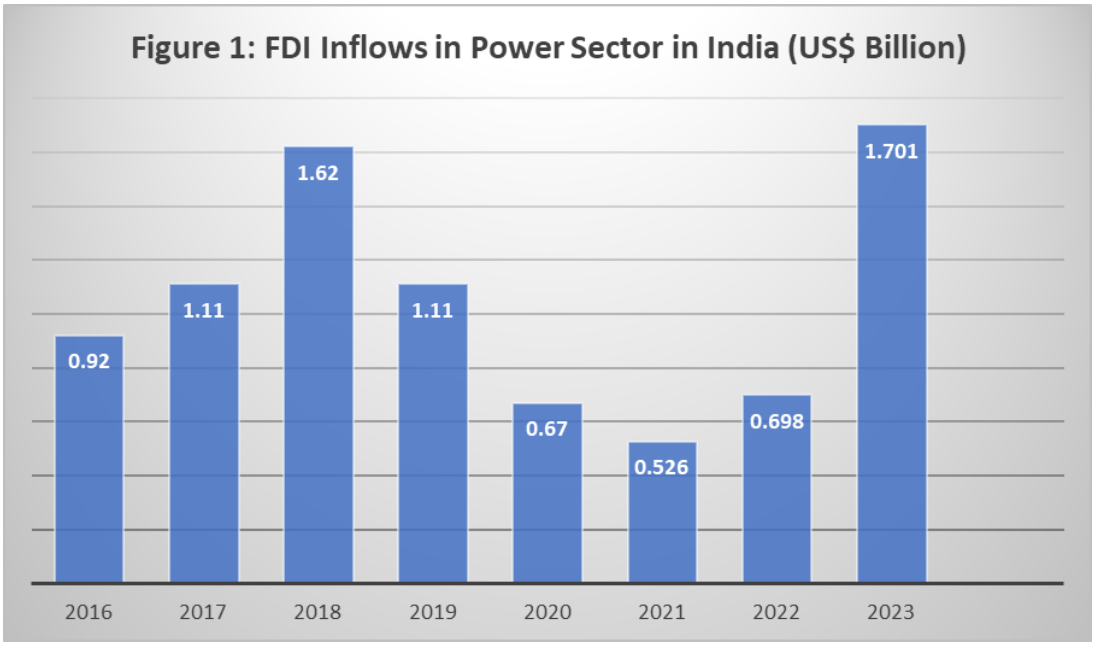
Power as a secondary source of energy presents a lot of opportunities for the development of a developing countries. Given the role of FDI, India has allowed FDI upto the limit of 100% into power generation sector. Similarly, in transmission sector also, FDI has been allowed. Electricity Act 2003 made a positive support for promoting the role of private sector players and motivate them for the investment in green energy for rebutting the environment. Government of India, has also supported non fossil energy and initiated the

sector reforms by increasing privatization in the sector and also allowed FDI in the power sector to reduce the aggregate transmission losses.

A positive impact of these private investments had been seen in all the parts of the country which provide a crucial economic environment and make a positive change in economic stability all over the world. This effort is a part of an initiatives taken by Indian Govt. to promote FDI. It has made its best efforts and implemented several policies to enhance Foreign Direct Investment in various sector in India. For example, "Make in India" campaign, is also a very applicable effort which focuses on a favourable investment climate and simplifying procedures of Investment and promoting this private investment across all the sectors which include power sector also. It has been observed in the World Investment Report for the year 2023 that India was one of the top choice of investors for FDI. During the financial year 2021-22 about one third of total investment was made* in India. The accumulative amount that was invested in India estimated to be approximately US$ 650 billion during the last seven year. A total number of more than 170 countries made this investment. It includes all the states and union territories (UTs). There was a manifold increase in the FDI in various sector where power sector was one of the top sectors. In the next section, we will concentrate FDI inflows in the power sector and it impact on the power availability in the country.

Status of Foreign investment in Indian Power Sector

Because of high growth in consumption, the demand for electricity power is showing a continuous increase trend. This ever increase in demand of power sector, creating the opportunities for power generation companies. That is why the generation business is the most preferred segment for the foreign investors. The industrial and commercial users are the main consumers of power sector. The consumption made by alone industrial sector was more than 2/5 share of total energy demand in finical year 2019-20. It may be noted that average tariff paid by industrial sector was on higher side in compassion to other consumers of the power sector. Status of Foreign Direct Investment (FDI) inflows in power sector during different years is presented by that Figure 1.



It can be seen from the Figure 1 that initially for the COVID 19, the FDI flow in power sector was higher side it was above 1 billion. However, during the post COVID-19 period, a slowdown was reported in the FDI. As there was a litter progress in power sector projects. However, in the recent years, 2022 onwards a rapid increase is reported in the FDI in power sector. Consequently, it was reported USD 1.701 Billion in 2023.

Generation Capacity of Power Utilities in India

Historically, Indian dependent on the conventional sources of energy such as thermal power stations using coal, natural gas, oil etc. as source of fuel for generation of power. Hydro and Nuclear energy are other important sources of power generations that was used by India. However recently there

was trend of increasing the non-conventional or renewable sources of energy. These sources included solar power, wind power, biomass-agricultural and domestic waste used to generate power. Installed generation capacity in India is shown in the Table-1.

Table-1: Total Generation Capacity in India (MW)

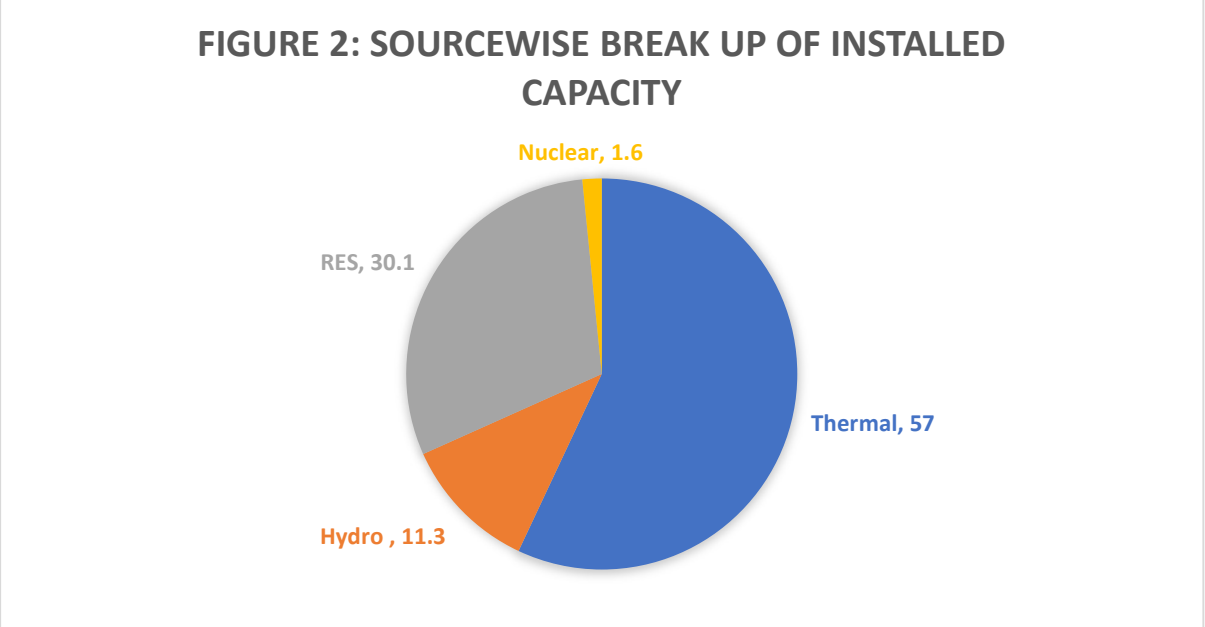
Year	Thermal	Hydro	Nuclear	RES**	Total
2016	210680	42780	5780	45920	305160
2017	218330	44480	6780	57240	326830
2018	222910	45290	6780	69020	344000
2019	226280	45400	6780	77640	356100
2020	230600	45700	6780	87030	370110
2021	234730	46210	6780	94430	382150
2022	236110	46720	6780	109890	399500
2023	237270	46850	6780	125160	416060

Source: CEA, Growth of Electricity Sector in India, various issues.

RES includes Small Hydro Project having a generating capacity of 25MW or less

Table-1 shows that thermal generation shows increasing trend through the period of study. Whereas the hydropower showed increasing tend up to 2021. After this year there was no any significant increase in the installed capacity from Hydro Power Stations. However, nuclear power shows a constant trend. At the same time, RES sources showed increasing trend continuously throughout the period under study. The RES capacity which was reported to be 45920 MW in year 2016 has increased to 125160 in the Year 2023. This shows a reasonably high growth of power from renewable sources. It also indicates that there was a positive relation between Foreign Direct Investment (FDI) and installed generation capacity in power sector.

Fuel source wise share in Generation Capacity



In the recent years, the share of renewable generation capacity has increased. The governments-centre as well states, are taking lot of initiatives in increasing the share of renewable energy. However, the current scenario of installed generation capacity is given in the Figure 2.

It is clear from the Figure 2 that despite lot of efforts have been taken, thermal sources contribute approximately 57% of installed generation capacity. The Renewable Energy Sources (RES) contribute more than 30%, hydro contribute more than 11% and nuclear contribute only approx 2%. It was seen that during the period of study, thermal generation capacity generation declined from 63.3% to 57% and hydro was 25% to 11%. Where

the showed a drastic increase in relative share and it increases from 9% to 30% within the total installed generation capacity in the same period
At the same time, it was observed that there was a positive relation between the Foreign Direct Investment (FDI) and energy generation capacity in the Indian States and State Utilities got higher amount of Foreign Direct Investment between 2000 to 2023 as Maharashtra received approx 30% and Karnataka is on the second position approximately 22% after that Gujarat 18% and Delhi 14%, and Tamil Nadu 5%.

Table-2: Sector wise growth in Generation Capacity

Year	Installed Generation Capacity (GW)			
	State	Central	Private	Total
2016	101.79	76.30	124.00	302.09
2017	103.97	80.26	142.62	326.85
2018	103.97	84.52	155.51	344.00
2019	105.08	86.60	164.43	356.10
2020	103.32	93.48	173.31	370.11
2021	103.87	97.51	180.77	382.15
2022	104.85	99.00	195.64	399.50
2023	105.73	100.05	210.28	416.06

Source: CEA, Growth of Electricity Sector in India, various issues

It is clear from the Table 2 that the role of private is increasing after the reform process. The contribution of state sector is almost constant. There was also some increase in the share of central sector as the total installed capacity in central sector increased from 76 GW in 2026 to 100 GW in 2023.Present It is clear from the Table CAGR of total installed generation capacity was about 38% from 2016 to 2023.

Table-3: Gross Electricity Generation in India (BU), 2016 to 2023

Year	Thermal	Hydro	Nuclear	RES	Bhutan Import	Total
2016	943.01	121.38	37.41	65.78	5.20	1172.78
2017	994.22	122.31	37.66	81.87	5.64	1241.70
2018	1037.06	126.12	38.35	101.84	4.78	1308.15
2019	1072.00	135.00	37.70	126.76	4.40	1375.86
2020	1044.45	155.67	46.38	138.32	5.81	1390.63
2021	1032.51	150.30	43.03	147.25	8.77	1381.86
2022	1114.71	151.63	47.11	170.90	7.49	1491.85
2023	1206.21	162.10	45.86	203.55	6.74	1624.47

Source: CEA, Growth of Electricity Sector in India, various issues

Thermal electricity generation (mainly coal) continues in playing a dominant role in the overall generation of power. The relative share of thermal power generation was 74% in the energy mix which is highest. However, gradually it has a declining trend over the last few years. This is because of increasing trend in renewable energy or environment friendly energy. It can be noted that electricity generated from RES increased from 6.4 % in 2016 to 12.5% in 2023 in the overall generation power.

Conclusions

Power sector is one of the crucial sectors of economy. Directly or indirectly, it is responsible for the current development shape of any economy. In India, in the pre-reforms period, the power sector was facing the crunch of financial resources as State Electricity Boards were not performing well. The internal management was very poor. Therefore, FDI was considered as a solution to ongoing problems of power sector. However, it was not feasible to invite FDI in power sector unless reforms are undertaken. Therefore, the power sector reforms were undertaken at the central as well state levels.

It was observed that after the reforms, an increasing trend was seen in the FDI and the power sector was evident in attracting the investment especially in the generation sector. There was a slowdown especially during the post Covid-19 period, however, in the recent year an increase was seen in FDI and it is likely to go up. It will be helpful in providing a boot to the power sector.

The role of power sector has increased significantly in the generation sector. At the same time. The private sector has also shown interest in the renewable energy sector. A boost was seen in the renewable energy sector especially in the wind and solar power. Therefore, it is a positive outcomes of

power sector reforms especially in the generation sector in India.

We can also compare the performance of renewable energy generation in overall power generation. Because, the Plant Load Factor (PLF) was low for renewable power plants. Hence, their relative share in power generation was lower in comparison to share in the power generation capacity.

There was also a positive outcome in promoting international co-operation in power sector. India is importing power from Bhutan that is good sign in the process of utilizing the renewable energy sources in South Asian Countries. However, India can do more on promoting the international trade of energy by promoting the trade between India and Other countries such as Nepal.

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