

POWER SECTOR POLICIES IN INDIA : HISTORY AND EVOLUTION

Vasant Surdeo

Power or electricity is an essential component of infrastructure development as it affects a country's economic growth and welfare. Until the decade of nineties, Indian public sector utility companies controlled the production, distribution and transmission of electricity. Since 1991, several regulatory changes were introduced to enhance the participation of private players and which has transformed the sector's performance. This article traces the history and evolution of reforms in the electricity sector and its impact, with a specific focus on two government schemes- UDAY and Deen Dayal Upadhyay Gram Jyoti Yojana (DDGJY). The article concludes that although there has been a significant improvement in the production, transmission and distribution of power, challenges still persist in terms of distribution companies' (DISCOM's) ability to procure the power on offer and supply it at an affordable price to consumers.

"Deregulation requires regulation."

— Anonymous

HISTORY AND EVOLUTION OF POWER SECTOR POLICIES IN INDIA

The power sector is one of the largest consumers of finite resources and forms the fundamental input in any growth industry. Be it a household or an industry, it impacts everyone. Currently, the sector is at a crucial juncture of its evolution, with the sector now being prioritised as one of the key policy areas. Power or electricity is an essential component of infrastructure development, affecting economic growth and the welfare of the country. The Indian power sector has been regulated for almost a century and the Electricity Act, 1910 was the first act that was introduced to govern the Indian power sector. The Electricity (Supply) Act 1948 was introduced after independence, but it did not achieve the desired results as the sector's performance started to deteriorate and a need was felt to restructure the sector. Hence, several regulatory

changes were made in the year 1991 and since then various changes have been made, which has transformed the industry's performance. This was done because it was perceived that the sector required substantial investments in the face of resource constraints (which we will talk about as we move further); private participation in electricity generation was allowed, thus, paving the way for independent power producers (IPPs). Previously, some private sector licensees were operating in few urban areas; the power sector was mostly in the hands of the State Electricity Boards (SEBs) or the central government-owned utility companies.

Apart from tracing the history and evolution of these reforms, this paper also discusses the impact of these reforms, various challenges faced by the sector and way forward with emphasis on two government schemes- UDAY and Deen Dayal Upadhyay Gram Jyoti Yojana (DDGJY)

PRE-INDEPENDENCE (1910-1947)

In the modern world, the key progress of a nation is the availability of electrical energy. The Indian power sector has been regulated for almost a century and the Electricity Act, 1910 provided the basic framework for electric supply industry in India. It primarily set up licensing rules for generating electricity for private as well as public operators and a provision to obtain a license for the supply of electricity in a specified area. The Act mostly dealt with the safety concerns and the technical functionality of electricity, and laid down the legal framework for laying of wires and other works, and contained provisions mentioning the relationship between the licensee and the consumer.

POST-INDEPENDENCE (1947-CURRENT)

When India gained independence from the British in 1947, private companies or local authorities supplied more than four-fifths of the total generation capacity in the country. Electrification so far was only limited to cities or urban areas controlled by different private producers like the Calcutta Electric Supply Corporation (CESC), which was handling the generation and distribution in the then Calcutta.

Post-independence, the Government of India made electricity as a concurrent subject in which laws can be made both by the Union and the State governments and decided to entrust the development of the electricity sector to respective states through the creation of State Electricity Boards (SEBs) under the Electricity Act, 1948. SEBs were

expected to develop networks of transmission lines which till then had been quite underdeveloped, to add generation capacity, and to extend electrification (which was till then limited only to the cities) across the country. The Act subsequently brought into state purview all new power generation, transmission, and distribution facilities, thereby limiting some of the provisions of the Electricity Act, 1910. But SEBs fared miserably and by the 1970s, many of the SEBs started incurring losses because of many factors including direct political interference in SEBs operation by their respective governments, mismanagement, poor industrial relations, etc. However, the politics of agricultural subsidies during this period was the primary reason behind crisis-like situation of the SEBs. The Green Revolution led to an improvement in irrigation facilities and led to a windfall in agricultural production across the country. Groundwater pumping on individual farms using electrical or diesel pump-sets became increasingly popular. Irrigation had broad appeal because it seemed to be accomplishing two important political goals achieving food security while increasing the profits of farmers who could thereby be organised into large vote blocs. Politics was indeed crucial in determining events related to the power sector in this period and subsequently led to a type of institutional lock-in with profound impacts on the sector. The Congress party was also performing miserably during this period and hence, the idea of electricity subsidy as a political tool was considered and first used during the 1977 elections in Andhra Pradesh, when the party offered flat-rate tariffs (tariffs based on capacity of the pump rather than on measured consumption) to farmers as an election promise to help the Congress get re-elected. Like this, the power subsidies became routine political instruments all through the 1980s, especially in agriculturally rich states.

The low tariffs for agricultural sector were sought to be covered through higher tariffs on industrial and commercial consumers (cross-subsidization). But the distortions of such a high magnitude in cross-subsidization, increasing theft and leakages, lack of accountability, loss of revenue and misreporting and mounting losses of the SEBs made them increasingly dependent on budgetary allocations from their respective governments reducing their ability to add generating capacity, and most importantly to carry out the periodic maintenance and upkeep of their distribution assets.

Given the deteriorating financial performance and poor operating performance of SEBs, the onus of setting up new generation capacities fell increasingly on the Union Government. It was in such a situation

that the central government set up two central public sector utilities: NTPC (National Thermal Power Corporation Limited) for thermal generation and NHPC (National Hydro Power Corporation Limited) for hydropower. This was done because the Union government believed that there was a need for an integrated policy for the power sector, and as electricity was a concurrent subject, the Union Government took advantage of it as they were free to frame laws. One of the reasons for the need of an integrated policy was that the Union Government observed that there was an imbalance as some states were rich in resources and some were not. It was also noticed by the government that there were difficulties in the interconnection between states (a plant in one state providing electricity to two or three states).

The economic growth was also sluggish during this period due to less generation capacity. For a country to grow, electricity must grow. If electricity does not grow, then the economy will not grow as the industry will not grow. Companies like NTPC and NHPC were created with a mandate to provide power to at least multiple states. Thereby, the transmission network associated with each of these power plants would automatically get extended into other states. And that's how the concept of regional grids came into existence. Thereafter, the growth rate increased. However, the downside to it was that the central generating companies were not being paid the exact rate at which electricity was generated as the SEBs were unable to pay.

Over the 1980s, energy shortages and poor financial condition of SEBs continued and the cascading effect of agricultural subsidies caught successive governments as subsidies amounted to the majority part of their revenue. This was slowly spiralling into a crisis and the government thought that something needs to be done and there was a global phenomenon of electricity reforms slowly emerging in the scene. Many economists started advocating for the free market. Their contention was basically that the government had no business to do business as for them if the demand-supply around a product is good enough to enhance its market share, then the government should have nothing to do with it. This type of economic thought was emerging globally and to de-regulate, regulation was brought in. Currently, the governments across the world are trying to move away from things that can be managed by market forces. This combined with the need to control fiscal deficit due to the balance of payments crisis led to the initiation of reforms in the Electricity Sector in the early 1990s, with the opening of sector for private Independent Power Producers (IPPs). This happened because the Gulf War led to skyrocketing of fuel prices

and to meet the demand, the government had limited foreign exchange reserves which had dried out meeting the previous demand. At that time, the imports were also exponentially higher than exports, leading to an imbalance of trade. This forced the government to approach the World Bank and the International Monetary Fund for bailing them out from this balance of payments crisis. The World Bank and the IMF put out certain conditions in lieu of giving funds. One of the conditions was opening the power sector to private participation. Hence, the power sector reforms in 1991 started because of the socio-economic conditions that prevailed at that time. Although, it must be said that there were other factors responsible as well.

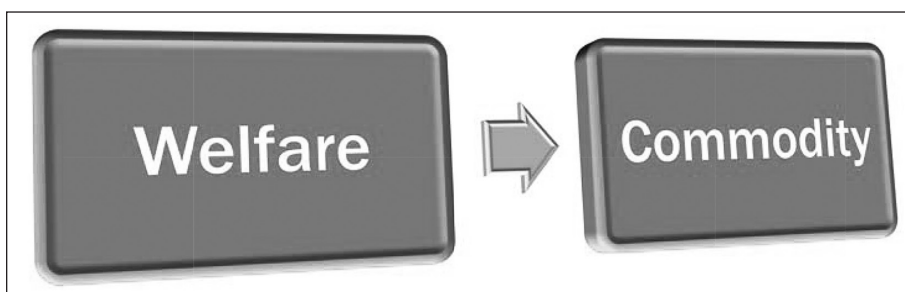
Investment by the private sector (including foreign capital) was allowed in electricity generation. Prior to this, save some private sector licensees operating in a few urban areas, the electricity sector was mostly in the hands of State Electricity Boards (SEBs) or central government-owned utilities created to supplement the efforts of SEBs in generation and transmission sub-sectors. The government had decided to open the generation aspect to private participation because it was the easiest decision that could be taken as they did not want to make the public angry by opening all the aspects to private participation. Private participation at that time and even now is seen in a negative sense. Also, the power to fix tariff was vested in the hands of the government via an amendment to the 1948 Act. Prior to this, the tariff was set through negotiations between the state electricity boards and the generation companies.

The government then decided to separate the generation, transmission, and the distribution aspects of the SEBs into three parts to isolate their growing problems in the mid-1990s. This process is called “unbundling”. The rationale behind this decision was that keeping them separate would lead to problems becoming focused and appropriate attention could be given to each aspect. It will also minimise the losses for utilities as they will only be focusing on a single aspect. Another reason was viewing of electricity from a commodity perspective. The focus was to sell electricity like businesses sell their commodities. The generation aspect became analogous to manufacturing, the transmission was analogous to warehousing in bulk and similarly, the distribution would become analogous to the retail sale. This was a sharp evolution from the welfare model to the business model where electricity was earlier seen more as a necessity rather than a commodity when free electricity and subsidies were given, and currently it has to be packed and sold like a commodity with chances of prices increasing as well.

In the late 1990s, a slew of incentives were offered to private investors, which elicited an overwhelming response from investors. However, the euphoria soon subsided, with no real action being taken on the ground and the experiment of private participation failed miserably as the government realised that the arrangements with these producers were not feasible. Additionally, there was a growing unrest against private producers, forcing the government to cancel their licenses. Till the end of 1990s, the contribution of Independent Power Producers (IPPs) to generation as well as the installed base was a dismal 5 percent. The near-bankrupt state electricity boards (SEBs) failed to pay their dues, giving a tough time to IPPs. With the unbundling of entities and the increasing private participation in the power sector, the need for independent regulators was becoming obvious.

EVOLUTION OF POWER SECTOR REFORMS IN A NUTSHELL

In 1998, regulatory commissions at the central and the state level called as Central Electricity Regulatory Commission (CERC) and



State Electricity Regulatory Commission (SERC) were established respectively under the Electricity Regulatory Commissions Act, 1998. Under this Act, the tariff was to be set by regulatory commissions rather than the government. The government distanced itself from tariff regulation as part of the reform strategy but primarily due to the fact that it did not want to be seen on the wrong side of the consumers. The functions of these commissions were to regulate tariff of generation and transmission utilities and the tariff determination for consumers.

However, the most important amongst all the policies announced by the government was the enactment of the Electricity Act. The year 2003 marked a new beginning of reforms in the Electricity Sector in India with the enactment of the Electricity Act replacing the legal framework

for the sector hitherto governed by the Electric Supply Act of 1948 and the ERC Act of 1998. Under the new Act, generation was de-licensed and the new producers could construct captive generation plants (plants serving electricity to a plant constructed by that same company to meet its energy needs). The Act also had a provision for private transmission licenses and the distribution licensee was free to undertake generation and vice-versa. In one stroke, it also removed the biggest obstacle in the path of IPPs-obligatory power sales to SEBs were disallowed. Companies had to follow a more formal structure by reorganising the companies into boards by appointing directors to supervise the functioning of the company. Appellate tribunals were created for disposal of appeals against orders of regulatory commissions. This led to a spurt in private sector participation as new private producers decided to invest in the sector.

There have been a slew of regulatory changes after the enactment of the Electricity Act in 2003 like the amendments to the bill in the year 2005 and 2014. The amendments in 2005 emphasised primarily on electricity safety, with the offences relating to theft of electricity, electric lines, and interference with meters as cognizable offences. It (the amendments) specified requirements for captive generation plants and distribution systems. The amendments also talked about setting up of grievance redressal cells or ombudsman by distribution licensee. The amendments of 2014 were also important in the regard that it gave glimpses of the future by including renewable energy in the ambit, by making it mandatory for entities to procure electricity from a market representing the renewable energy sources. It was also made mandatory to provide an open access to electricity to consumers with a load of more than 1 MW by default, thus, allowing them to enter into bilateral agreements for procurement. Currently, more than one supplier could operate in an area, with giving consumers the power to choose the supplier. The concept of “smart grid” and “smart meters” were also incorporated.

IMPACT OF REFORMS: GENERATION, TRANSMISSION, AND DISTRIBUTION

Generation

Earlier, there used to be a difficulty in coal availability and the process of capacity addition was also slow. After the reforms (where the focus was more on generation), there was a phenomenal growth in capacity

addition. In fact, the government now says that there is surplus electricity. In 1996-97, India's installed base stood at 84 GW approx. At that time, the sector had the dubious reputation of repeatedly falling short of its capacity addition targets. Since then, however, the installed capacity has more than tripled to reach over 319 GW. The private sector has played a huge role in capacity addition as it has added around 135,382 MW. The private sector's current share in the installed capacity is the highest with 42.6 percent. Renewable energy alternatives have come which has led to further increase in generation. Currently, the installed capacity from renewables has crossed more than 57 GW. With the government's aggressive target to quadruple the renewable capacity to 175 GW by 2022, the segment is expected to witness exponential growth over the next few years. Plant Load Factor(PLF) of plants are, however, declining which was not the case earlier as the electricity generated has not been bought leading to underutilization of power because if demand will be not there, then the plants will not work at their full potential. The widening gap between coal demand and supply, coupled with the gas supply shortage, crippled many power producers. By 2013-14, the PLFs had dropped to almost 66 percent and over the next two years, PLFs plummeted further to touch all-time low of 64 percent and 62 percent. This was a major decline from the record high of 91 percent achieved in 2008-09 by the private sector.

Transmission

Earlier, only the regional grids existed but in 1998, the transmission was officially recognised as a separate activity and private investment was invited. However, for a long time, not much came out of it. The situation is vastly different today as more than two dozen projects have been awarded to private sector players. There is a level playing field for private players and competition is intense with state's major Powergrid to win these projects. Also, the completion of national grid in 2014 led to an increase in power between the country's five regional grids. The current inter-regional power transfer capacity stands at around 59,650 MW.

Distribution

No change whatsoever, except in the fact that the AT&C (Aggregate Technical & Commercial) losses have come down from an estimation of around 37 percent in 2001-02 to 24.6 percent in 2014-15. This was possible due to the implementation of the restructured accelerated power development and reforms programme with the mandate to bring

down AT&C losses. But the losses from the distribution segment are still occurring which is bleeding the whole sector. The SEBs' aggregate losses have increased ten-fold since 1996-97, from 113 billion to 1.12 trillion rupees in 2014-15. This is because of the agricultural subsidies, pilferage, tampering of meters, electricity theft, inefficient and corrupt administration etc.

Successive governments have tried to fix the problem through three bailout packages out of which two failed miserably while the third one-UDAY scheme, holds hope for the time though, which is discussed later in this paper. Like earlier, the distribution segment remains largely in the hands of the States and is yet to see serious efforts. It is quite interesting that even after the Odisha and Delhi distribution reforms (the Delhi model was a successful one), no state has adopted the outright privatisation model. Political considerations and financially insolvent state of the SEBs have proved to be the key impediments in the privatisation process.

Process	Then	Now
Generation	Slow growth in capacity addition. Difficulties in coal availability.	Phenomenal growth in capacity addition. Surplus electricity. Renewables have grown. Declining PLF's however.
Transmission	Monopoly. Regional grids	Competition. National grid implemented
Distribution	Alarming losses	Restructuring. Losses minimised

CHALLENGES AND GOVERNMENT SCHEMES

Ujwal DISCOM Assurance Yojana (UDAY) and Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY)

The changes in the electricity production, transmission and distribution process have opened the power generation sector to private players and has driven the sector on a high growth trajectory. However, the fault lines in the sector lies elsewhere i.e. in the distribution sector. Thus, in the last decade and a half, it was a case of misplaced priorities as the government focused more on capacity addition rather than improving the distribution segment or improving the last mile connectivity when it comes to electrification. The government realises that the key to removing all the inefficiencies in the sector is by improving the distribution aspect. It is the weakest link in the entire power value chain, as even after the availability of surplus electricity and inter-

connectedness of the transmission network, more than half of India's population does not receive electricity. This is primarily the reason behind the government prioritising revival of DISCOM's ((Distribution Companies), commitment to renewables and rural electrification as the key areas in the sector. To achieve these objectives, the incumbent government is taking some steps, one of which is the UDAY scheme, where the government has decided to take another shot at the revival of DISCOMs. The scheme is a financial turnaround package for DISCOMs, in which the State will pay 75% of the debt of DISCOMs by selling bonds, while the DISCOMs will pay the remaining 25% by issuing securities.

This scheme represents a significant improvement over the government's past attempts at the financial restructuring of the DISCOMs as it has taken a more comprehensive approach. Besides stipulating a phased takeover of discom debt by the state governments as mentioned above, the scheme has also targeted improving the operational efficiency of the DISCOMs, reducing the cost of power purchase and enforcing fiscal discipline on DISCOMs through alignment with state finances.

As of now, twenty-six States and one Union Territory are part of the UDAY scheme and state bonds worth Rs 2.09 lakh crore and DISCOM bonds worth Rs 0.24 lakh crore have been issued till date. As per REC estimates, Rs 3.82 lakh crore is the total debt of States/UTs participating in the UDAY scheme. This amounts to 97 percent of the country's total debt of DISCOMs as the total debt of all the state DISCOMs was Rs 3.96 lakh crore as on September 30, 2015. Under this scheme, States like Andhra Pradesh, Bihar, Assam, Haryana and Jharkhand reduced their power purchase cost up to 35 paise, 16 paise, 12 paise, 10 paise and 8 paise per unit respectively in October-December quarter this fiscal compared to 2015-16. Also, the AT&C losses of state discoms under UDAY scheme have reduced to 22.5 percent in April-December this fiscal, from 24 percent in FY' 16.

Even though the UDAY scheme has taken off well but uniformity and consistency across all the states hold the key to UDAY becoming a successful scheme and this is where some concerns still remain. The major concern relates to a moral hazard, which involves all such schemes where there is structuring of debt. Will there be an incentive to continue doing what they are doing, knowing fully well that there will be a resuscitation package awaiting them at some point in time? Because till now massive bailouts have been organised for state-run utilities thinking that they will fall in line but the losses have kept

mounting and this is probably why there has been no fiscal discipline on their part as they keep on anticipating bailout packages from the government at the Union level. The UDAY scheme has tried to plug this loophole by aligning DISCOM's losses with the state finances. States now are responsible for the actions of the DISCOMs, as future losses will have to be progressively taken on by the state. Hence, DISCOMs have to necessarily become efficient and cut down on their Aggregate Technical & Commercial (AT&C) losses and revise tariffs. But State governments generally hesitate when it comes to increasing tariffs due to political compulsions. Therefore, there still remains a risk that the second part of the equation will not be fulfilled. Thus, UDAY scheme has taken a good start, but still, a lot of ground remains to be covered.

Another area of the sector which has been prioritised is rural electrification and in this regard, a major drive is currently underway to provide quality power to rural areas by separating agricultural and non-agricultural feeders, as well as to increase rural electrification under Deen Dayal Upadhyay Gram Jyoti Yojana (DDUGJY). The programme was launched in December 2014 with the aim to electrify the 18,452 remaining unelectrified villages by May 1, 2018.

As per the definition of electrification notified by the Ministry of Power (MoP) in February 2004, 98.7 percent of the total inhabited villages have been electrified till now. Ten states- Andhra Pradesh, Telangana, Goa, Gujarat, Haryana, Kerala, Maharashtra, Punjab, Sikkim and Tamil Nadu, have achieved 100 percent electrification. As of March 2015, around 18,452 villages across 19 states were yet to be electrified. Significant progress in rural electrification has been made since the launch of DDUGJY. During 2015-16, 7,108 new villages were electrified under the programme. This represents a 405 percent improvement over the previous year where only 1,405 villages were electrified. As of today, only 4,086 villages are left to be electrified (13,432 villages have been electrified) and states like Tripura and Himachal Pradesh have achieved 100 percent rural electrification in this process.

To track the progress of implementation, close monitoring is being done through GramVidyut Abhiyantas (GVAs). GVAs have been appointed at the block and district levels and are responsible for carrying out regular field visits, submitting progress reports and ensuring timely completion of all works. The progress is being reviewed on a regular basis through monthly review, planning and monitoring meetings by the Ministry of Power.

As the government is nearing the 100 percent electrification mark, it has

shifted its focus to 100 percent household electrification. Currently, at a 75 percent level, the government plans to meet the target by March 2019. Even though this scheme has led to an increase in rural electrification levels, some issues and concerns persist. For example, 2233 villages out of 2892 total unelectrified villages have been deemed to be electrified in the state of Assam, yet as per the data given by the government of Assam, at least half of the rural households are still without any access to electricity. Similar is the case with states like Bihar and Uttar Pradesh where the number is even high.

Now, the question arises, why is it so? The answer to this question probably lies in the way 'village electrification' is defined. As per the definition, a village is deemed electrified even if it gives electricity to only 10% of the households in the village through the basic infrastructure such as electricity transformers established. Nowhere, it talks of the

State	Total Unelectrified Villages	Electrified	Uninhabited	Yet to be electrified	Village Delayed Milestones
Arunachal Pradesh	1578	354	0	1224	03
Assam	2892	2233	110	549	120
Bihar	2747	2345	77	325	40
Chattisgarh	1080	759	0	321	21
Himachal Pradesh	35	28	7	0	0
Jammu and Kashmir	134	32	0	102	0
Jharkhand	2525	1900	54	571	62
Karnataka	39	14	0	25	03
Madhya Pradesh	472	373	47	52	05
Manipur	276	210	0	66	01
Meghalaya	912	688	0	224	01
Mizoram	58	40	0	18	0
Nagaland	82	77	03	02	0
Odisha	3474	2417	515	542	31
Rajasthan	495	426	68	01	04
Tripura	26	26	0	0	0
Uttar Pradesh	1529	1470	53	06	08
Uttarakhand	76	23	0	53	07
West Bengal	22	17	0	05	03
G-Total	18452	13432	934	4086	309

Source: GARV Dashboard (as on May 10, 2017).

actual electricity connectivity to the households. This definition leaves a lot to be desired when it comes to rural electrification. Additionally, there have been delays in meeting the targets of number of villages to be electrified. For instance, there has been a delay in providing electrification to at least 120 villages out of the 549 villages yet to be electrified in Assam.

Other states like Jharkhand, Bihar and Odisha are also in the front rung when it comes to village delayed milestones. In some of these cases, the delay can be attributed to the time lag in obtaining forest, railway and other relevant clearances. The other issues being faced include slow progress in remote and Naxal -affected villages, unsatisfactory performance of some implementing agencies and delays in the submission of detailed project reports by the states.

The progress under DDUJGY has been much faster, however, while all the villages may be electrified soon, there is still a long way to go before India achieves electrification in the true sense. With more than a third of rural households still without access to electricity, the government has a mammoth task ahead of it.. Continued efforts and regular monitoring will be important for the achievement of the goal of 100 percent village as well as household electrification. Apart from the electrification of households, greater focus is also required on improving the quality and reliability of electricity supply. These schemes along with the government's commitment of 175 GW of renewables by 2022, even if extremely ambitious, show that the power sector is moving in the right direction as of now.

CONCLUSION

There is little doubt that the power sector has come a long way in the last two decades. The power sector has opened doors to private participation, increasing competition and transparency in the process and greater certainties in the policy-level interventions today. Record capacities are added each year in electricity generation, the transmission system is more robust and tariff petitions and revisions have become more regular, AT&C (Aggregate Technical and Commercial) losses have come down and rural electrification levels have improved significantly. Yet, two persistent problems over the past two decades have undermined the sector's true potential. One, DISCOMs continue to be in a bad shape and are unable to procure the power on offer and two, tariffs are still not viable. This along with finding efficient ways of energy storage, finding clean coal technologies to drastically reduce

CO₂ emissions and improving electricity and data safety in this age of rampant hacking is where the challenges lie and the growth of the sector will depend on how fast they can mitigate those challenges and move ahead.

REFERENCES

- Upadhyay, A.K. 2000, Power Sector Reforms: Indian Experience and Global Trends, *Economic and Political Weekly*, vol. 35, no. 12, pp.1023-1028.
- Baijal, P. 1999, Restructuring Power Sector in India, *Economic and Political Weekly*, vol. 34, no. 39, pp. 2795-2803.
- Dubash, N.K and S.C. Rajan 2001, Power Politics: Process of Power Sector Reforms in India, *Economic and Political Weekly*, vol. 36, no. 35, pp. 3357-3390.
- Rao, S.L 2001, Electricity Reform and Regulation: Some Issues, *Economic and Political Weekly*, vol.35, no.26, p 2231.
- Parikh, K.J. and K.S Parikh 2002, *Reforms in the Power Sector*, India Development Report (ed), Oxford University Press, New Delhi.
- Ranganathan. and D. Narasimha Rao 2004, Power Sector Reforms in India, *IIM-B Management Review*.
- Pathak, A. and R Chawla 2014, Reforms of Power Sector, *SVIM E-Journal of Applied Management*, vol. 2, Issue. 1
- Tongia, R. 2003, The Political Economy of Indian Power Reforms, Working Paper. 4 (Revised), *Program on Energy and Sustainable Development*, Stanford University.
- Indian Power Sector.com 2011, *Electricity Legislation*. Available from: <http://indianpowersector.com/home/electricity-regulation/> [9 May 2017]
- Open-Access 2015, *Analysis of the Changes Proposed in the Electricity Act*. Available from:
<http://reconnectenergy.com/blog/2015/01/analysis-of-the-changes-proposed-in-the-electricity-act/> [accessed on 9 May 2017]
- Wikipedia 2016, *Ujjwal Discom Assurance Yojana (UDAY)*. Available from:
https://en.wikipedia.org/wiki/Ujwal_DISCOM_Assurance_Yojana [9 May 2017]
- Government of India 2015, *Deen Dayal Upadhyay Gram Jyoti Yojana (DDUGJY)*. Available from: <http://www.ddugjy.in/> [accessed on 11 May 2017]
- GARV Dashboard 2016, *Rural Households Electrification*. Available from:
<https://garv.gov.in/garv2/dashboard/main> [accessed on 10 May 2017]
- Planning Commission 1999, *Annual Report on the Working of State Electricity Boards and the Electricity Department*. Available from:

<http://planningcommission.gov.in/reports/genrep/seb/seb1999/index.php?repts=chap3.htm> [accessed on 10 May 2017]

Ministry of Power, Government of India, *Power Sector at a Glance*. Available from: <http://powermin.nic.in/en/content/power-sector-glance-all-india> [accessed on 10 May 2017]

Press Trust of India 2016, *Over 13,000 Villages Now Have Electricity*, NDTV. Available from: <http://www.ndtv.com/india-news/over-13-000-villages-now-has-electricity-niti-aayog-tells-prime-minister-narendra-modi-1691564> [accessed on 10 May 2017]

Government of India, *Fact Sheet on Rural Electrification Programme*. Available from:

<http://pib.gov.in/newsite/backgrounders.aspx?relid=145582> [accessed on 9 May 2017]

Powerline Magazine 2016, *The Sector Then and Now*, pp. 20-21

Press Trust of India 2017, *Kerala, Tripura and Arunachal Pradesh join UDAY*, Economic Times. Available from: <http://economictimes.indiatimes.com/industry/energy/power/kerala-tripura-arunachal-pradesh-take-states-list-under-uday-to-26/articleshow/57893249.cms> [accessed on 9 May 2017]