100% Electrification: Assessing Ground Reality

The objective of providing Power for All (24x7 PFA) has been a good initiative by the Government of India. The big question now is whether DISCOMs will be able to service these increased connections 24x7, given that they are already under so much stress. Separation of carriage and content, phasing out cross subsidies and hiking tariffs could have an impact on PFA, writes **Swati Dsouza**.

The past five years have seen a significant flux in India's electricity sector. A number of policies have been adopted that have fundamentally transformed the sector. On the upstream side, renewable energy is not a pipe-dream with the sector seeing the fastest growth amongst all other competing energy sources, auction-based processes have replaced allocation, schemes to promote solar-based solutions (rooftop, pumpsets etc.) abound. On the downstream side, initiatives like Ujwal DISCOM Assurance Yojana (UDAY) to cut debt of distribution companies (DISCOMs), Power for All under which schemes like 100% village level electrification under Deendayal Upadhyaya Gram Jyoti Yojana (DDUGJY) and 100% household electrification under Saubhagya were launched.

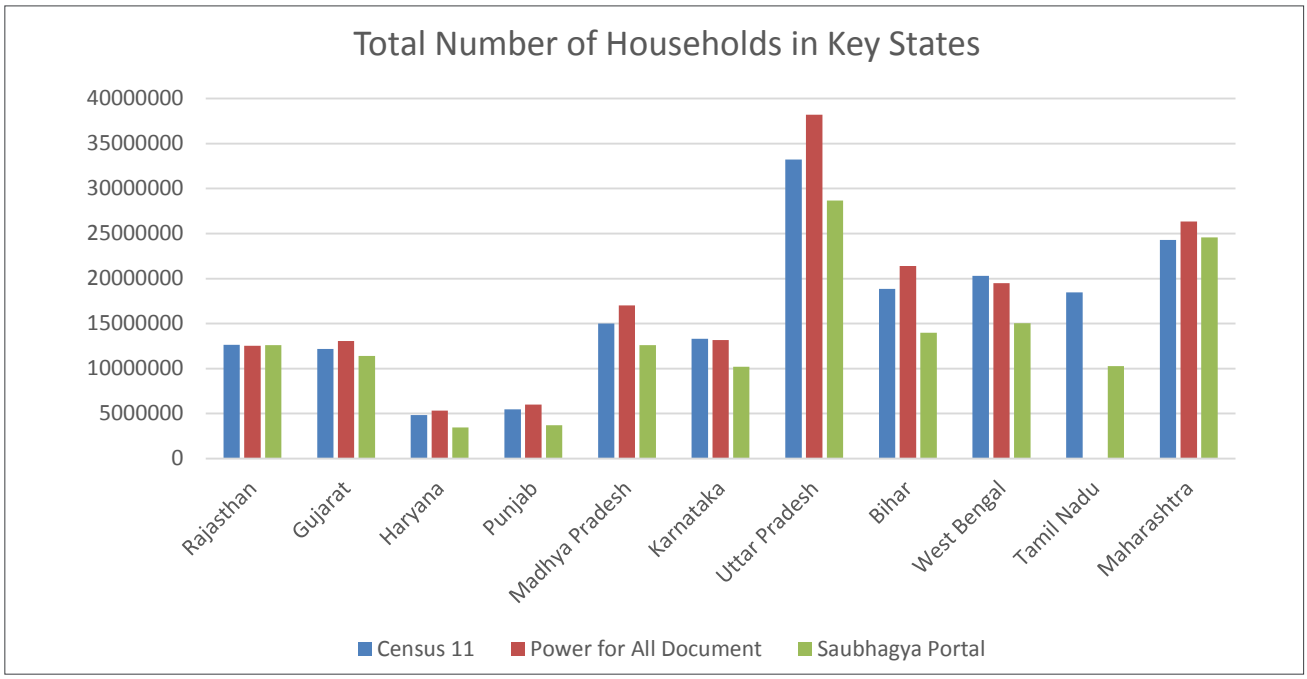
When it comes to supply of power to the end consumer, there is an overarching linkage between the policies at the generation and distribution end and the initiative that deals with electrification. Power for All mandates grid-based 24x7 electricity supply to all consumers, with a focus on domestic electrification. Given limited incomes (especially amongst the newer consumers), it becomes necessary to supply electricity at lower rates to further India's development objective. Thus, what becomes necessary is to integrate the policies on electrification and the ones on improving the financial health and technical capacity of DISCOMs as well as improving the generation supply chain. However, there has been limited progress on the latter, which may have a cascading impact on the agenda to provide 24x7 power.

The Case of Missing Households

Before delving into the issues surrounding electricity supply, it becomes necessary to understand if the Power for All policy has been a success and if all households in the country are electrified. How does one define a household? The census defines a household as "a group of persons who normally live together and take their meals from a common kitchen, unless the exigencies of work prevent any of them from doing so". Further, these persons may or may not be related, but the key to determining what constitutes a household is a common kitchen. As per census 2011, India's population was 1,21,08,54,977 and the number of normal households were 24,84,08,494 or approximately 4.8 people per household.

A closer look at different policy documents shows that the number of households differ across states. The Saubhagya portal lists the total number of households in India at 21,29,40,837 as accessed on 9th March, 2018. These numbers don't tally with the Census 2011 numbers or with the Power for All documents submitted by the states as available on the Ministry of Power website **(Figure 1)**. Despite an increase in India's population, across the ten states, the total number of households have decreased according to the Saubhagya Portal as compared to Census 2011. To compare, as per the United Nations estimates, India's population in 2018 stood at ~1.35 billion or 27 crore households (using 2011 assumptions of 4.87 persons per household). In almost every state, barring West Bengal, the Power for All documents estimate an increase in households rather than a decrease based on actual numbers.

Figure 1: Number of households across key states as given in the Census 2011, Power for all document prepared by the states and the Saubhagya Portal as on 9th March 2018.



> *While electrification may not be 100%, the number of household connections have increased*

Given the dynamic nature of the portal itself, it has been difficult to estimate the changes in the number of unelectrified households, but several newspapers and website reports have given an indication that most states including Haryana, Bihar, Karnataka, Andhra Pradesh, and Uttar Pradesh have reduced the number of unelectrified households. In a statement, the Ministry of Power stated that the reason for reduction in unelectrified households is that many census households were living together and availing electricity services with a single connection and that many households have already availed connections under the village electrification programme and other state schemes.

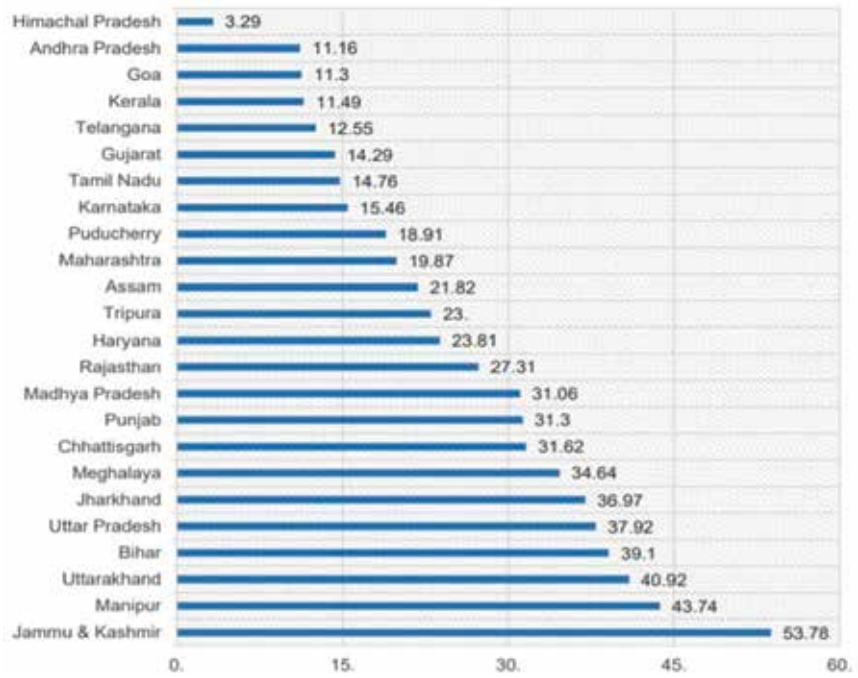
One plausible explanation for the reduction in the total number of households could be that state DISCOMs have accounted for homeless families. As per the National Housing Board estimates in 2012, India had a housing gap of ~6.24 crore houses. Therefore, even with an increase in population, the total number of households in India has gone up from 18.5 crores in 2011 to 21.2 crores in 2019. Another possibility is that the definition of a household varies across different DISCOMs and states. But most Power for All documents and statements by the government officials state that the definition of households is taken as per the census. Further, the base case for the number of households within these documents is also taken from Census 2011. Thus, while electrification rates have been improving rapidly, there may be some merit to the argument on reducing unelectrified households. However, reduction in absolute number of households with lack of clarity on the definition means that there are some households which are being left out of the electrification drive.

Power for All households: Gujarat and Punjab based on actual data as on FY15; Rajasthan based on actual data as on 2014; Uttar Pradesh estimated as on FY17; Bihar and West Bengal estimated as on FY15; Data for households for Tamil Nadu was not available.

Impact on DISCOMs

While electrification may not be 100%, the number of household connections have increased. But will DISCOMs be able to service these households with 24x7 power,

Figure 2: State/UTs AT&C losses (%) as reported in October 2018



Source: (Kaur & Chakraborty, 2018)

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given that they are already under so much stress? The state-owned MSEDCL, for example, last turned a profit of INR 117 crores in FY08 despite having a healthy mix of industrial and commercial consumers (which accounted for ~50% of the total consumers). In the case of Uttar Pradesh, the distribution licensees booked a loss of INR 72,770 crores in FY16, where electricity sales to domestic consumers form the largest chunk of consumer category. Similarly, in Madhya Pradesh, the state-owned utilities had an accumulated loss of INR 28,777 crores in FY15 and Bihar DISCOMs had a loss INR 2125 crores in FY14.

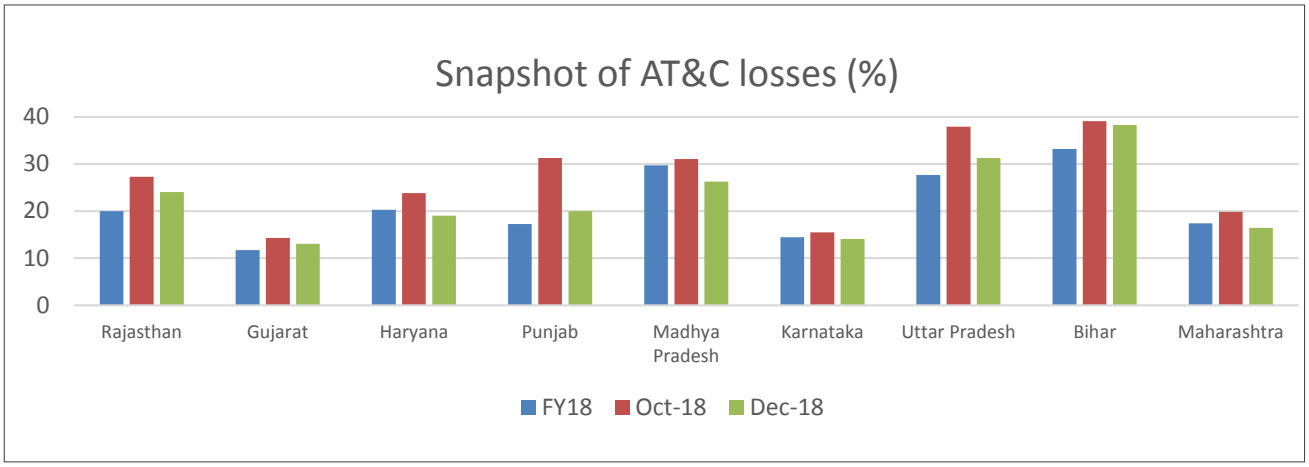
Given the addition of consumers, a number of measures were suggested under the UDAY scheme to improve the financial and technical health of the DISCOMs, including issuance of UDAY bonds, reduction in Aggregate Technical & Commercial (AT&C) losses, reduction in the gap between Average Cost of Supply (ACS) per unit of power and per unit average revenue realised (ARR), tariff revisions, feeder metering and DT metering, among others. The combined average AT&C losses of all the states in October 2018 stood at 25.41% and has seen an improvement to 19.72% as on December 2018. Under UDAY, all states and UTs are expected to reduce these losses to 15%. While the overall picture has kept getting better, fourteen states still have losses between 15-30%.

Moreover, if one is to compare the losses across different time periods, there are too many fluctuations to account for. As seen in Figure 3, if one is to compare the overlap between Saubhagya (25 states were declared electrified by December 2018) and the AT&C losses, then four states have shown a net increase in losses as compared to the previous year. Moreover, there is a spike in these losses in all the states barring Gujarat and Karnataka during October 2018 as compared to the previous fiscal or even later in the year, meaning that measures to reduce AT&C losses have not been standardised year-round.

Similarly, the ACS-ARR gap too has shown wide fluctuations. An analysis conducted by NIPFP showed that the overall gap ratio in May 2017 (for 23 states) stood at INR 0.45/unit which reduced to INR 0.29/unit in May 2018 (for 26 states) and increased to INR 0.55/unit (for 23 states) in October 2018. As of December 2018, this gap stands at an INR 0.35/unit (for 26 states) but was higher than the May 2018 numbers. Only the states of Gujarat, Himachal Pradesh, Maharashtra, and Karnataka have shown uniformity in reduction while states like Punjab, MP, and Bihar have reported a gap of between 0.50 and 1. North-Eastern states particularly have consistently reported an ACS-ARR ratio of greater than 1 through all four time periods. This suggests that while there has been some reduction in the ACS-ARR gap ratio, the fluctuations are too varied to suggest a standard reduction.

Without reviving the DISCOMs financially, it will not be possible for them to service the existing and new consumers continuously. As per the Uttar Pradesh state projections, with the increase in the number of domestic connections, the estimated sales to these consumers is expected to be the highest at ~77000 MU in

Figure 3: Snapshot of AT&C losses (%) across selected states across three time periods



Source: UDAY portal and (Kaur & Chakraborty, 2018)

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FY22. Similarly, in Bihar and MP, the energy requirements to domestic and irrigation categories are expected to be ~50% of all energy requirements. Every state government document on Power for All maintains that the commercial viability of DISCOMs to service consumers hinges mainly on tariff increase, reducing ACS-ARR gap and AT&C losses. Projections in these documents assume that by FY19 AT&C losses will be 15% and the ACS-ARR gap ratio will be 0. For example, the only scenario in which DISCOMs in UP turn a net profit is if tariffs are hiked every year (between 3-7%) and if AT&C losses reach 19%. In Bihar, even with government support, the DISCOMs are expected to book a loss of INR 2682 crores if tariffs are not revised. For MP, almost all the scenarios consider an AT&C loss reduction to 17%. Despite this, the accumulated total loss is projected between INR ~41,000 crores and INR ~61000 crores, even with a tariff hike of 8.09% every year from FY17. In the current financial year, 17 states have increased tariffs as compared to 22 states in FY18 and 25 states in FY17. Moreover, many states have not increased tariffs as envisaged under UDAY, such that many DISCOMs have had to be funded through borrowings.

Impact of draft Electricity (Amendment) Act, 2018

Among several changes highlighted in the draft Electricity (Amendment) Act, 2018, two changes could have an impact on the PFA objective, namely carriage and content separation and phasing out cross-subsidies. The draft amendment proposes the introduction of Distribution Licensees (DL) and Supply Licenses (SL), thus unbundling distribution into wire (carriage) and supply (content). This is expected to increase competition in the retail segment and reduce prices, by allowing consumers to choose from a host of companies. As mentioned by a Brookings India discussion paper, this amendment while not new (it was first proposed in 2014) does not resolve the systemic issues of the distribution sector, but rather shifts the risks to another layer. There is a fear of cherry-picking by the SL who would prefer to provide services to urban households with higher recovery rate. Traditional DISCOMs would be faced with the task of providing services to remote/rural areas without the added income from urban households/industries/commercial segments. This will lead to further deterioration of their financial health, thus impacting services.

Another amendment is the issue of limiting cross-subsidy to 20% in a distribution area and elimination within three years. The issue of cross-subsidy has been a contested one in the electricity sector. Today, we are already seeing migration of large consumers to captive consumption or open access sales since the current tariff design mandates DISCOMs charge these consumers higher tariffs (due to cross-subsidy). The 2018


Representational Image

> *Phasing cross-subsidy out completely within three years will mean consistent and substantial hikes in tariffs across all segments*

amendments make open access an even more attractive proposition and limit the income of DISCOMs via these services. Phasing cross-subsidy out completely within three years will mean consistent and substantial hikes in tariffs across all segments. Tariff hikes in India are political in nature and even when mandated (as with UDAY), states prefer to defer them (as seen earlier). Phasing this out completely will lead to a tariff shock among small consumers. This will be especially worse for households with limited income and who have just received a connection, given that they may not have more options (SLs) to choose from as compared to wealthy geographical areas. There is a possibility of households cancelling their connection or switching back to non-grid-based energy on account of expensive and unreliable supply.

Conclusion

The objective of providing Power for All has been a very good initiative by the Government of India, and it has been undertaken with limited success. The fear with the narrative that all households now have electrical connections is that those that are left out will find it difficult to get a connection, especially once the interest or target has been achieved on paper as per DISCOMs. What also needs to be studied in detail is the impact of these increased connections and load on DISCOMs, given the already existing issues in the sector. Current evaluation shows that DISCOMs have not been able to reduce systemic issues of higher losses, low revenue generation and gaps in monitoring connections despite a targeted policy. This will have an impact on the PFA objective of 24x7 power. Plus, given the changes in the draft Electricity (Amendment) Act, 2018, there is a possibility that we may be sweeping existing issues under the rug which may ultimately affect the end consumer.

The author currently manages a project at Brookings Institution India Center focussing on framing a long-term policy for natural gas in India. Her research focuses on fossil fuel transition in India, climate change mitigation and geopolitics of fossil fuel flows.

The views in the article of the author are personal.

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