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India's Power Distribution Sector Needs Further Reform

More Accountability of State Governments To Address Discom Woes

Roadmap To Sound Fiscal Management

The Fifteenth Finance Commission (XV-FC) was established with the objective to evaluate the state of finances of the Union and State Governments, recommend the sharing of taxes between them and lay down the principles determining the distribution of these taxes among states.[1]

The mandate of the Commission is to review the finance, deficit, debt and fiscal discipline efforts of the Centre and the States and recommend a roadmap for sound fiscal management, guided by the principles of equity, efficiency and transparency. In order to boost economic growth and channel public investment, it is necessary that expenditure undertaken by the government should fully adhere to the letter and spirit of the Fiscal Responsibility and Budget Management (FRBM) Act, 2003 (as amended in 2018).

State Governments Face Widening Revenue Gaps

Analysis of state government finances reveals that many of the state governments in India face revenue gaps which are increasing year on year. There are systemic issues in lending to some sectors which, unless addressed, will increase state governments' liability in the coming years.

The key points below highlight why fiscal management and responsibility is a must for state government finances.[2]

- A large part of state revenue comes from the fixed allocation from the Goods & Service Tax (GST) compensation cess, which will end in 2022. A few states, even after receiving their share of the GST compensation cess, face revenue deficits which will widen after 2022.
- States are required to maintain their fiscal deficits within 3% of their Gross State Domestic Product (GSDP). In the period 2015-20, 14 states crossed this limit, indicating an increased level of borrowing and overdrawing – and leading to higher fiscal deficits.
- Market borrowings have increasingly become the major source of funds for financing fiscal deficit over the years. Share of market borrowings in gross fiscal

[1] Finance Commission of India. Terms of Reference.
[2] PRS. State of State Finances. December 2019.

deficit increased from an average of 48.5% during 2005-10 to 70.4% during 2015-18.

- In the five years to 2019-20, states have spent 23% of their revenue receipts on debt servicing (half interest, half for capital repayment). Higher debt servicing costs constrain other spending priorities.
- States are required to maintain 25% of GSDP as a limit on the outstanding liabilities. 19 states are expected to cross the 25% limit at the end of 2019-20. In addition, there are state guarantees over and above the outstanding liabilities.

Within this, energy is 6.2% of state spending – the third largest sector behind agriculture and education. Yet ongoing discom sector reforms have not delivered full transparency, nor consolidation of debts on state balance sheets, nor a sustainable business model given underfunding of subsidies. State accountability has been eroded, and the discoms' operating losses and debts are mounting as a result.

Objective: Create Better Fiscal Management Discipline

As per the State of State Finances report, the energy sector saw higher expenditure than budgeted for due to the implementation of Ujwal DISCOM Assurance Yojana (UDAY) by certain states between 2015-2017.

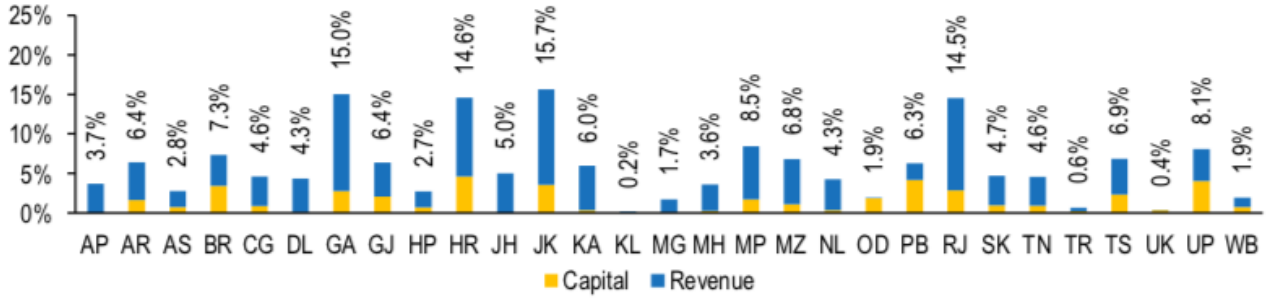
During the 2015-20 period, states spent on average 6.2% of their budgets on the energy sector, consisting of 1.8% on capital outlay and 4.4% on revenue expenditure. However, some states – such as Goa, Haryana, Jammu and Kashmir and Rajasthan – spent on average 14-15%, with 10-12% on revenue expenditure.

Expenditure under this category includes subsidies to consumers, allocation for power projects, paying for the inefficiencies of the discoms (including electricity theft), and assistance to the discoms under the 2015 UDAY scheme in certain states.[3]

And after several years of progress, the discoms' momentum has turned decisively negative again. The collapse in overall demand (down 19% year on year, fiscal year-to-date 2020/21[4]) due to COVID-19 has brought exceptional pressures, particularly in the high tariff commercial & industrial (C&I) sectors which bear an unsustainable burden of cross-subsidy to agriculture and residential customers.

[3] PRS. State of State Finances. December 2019.
[4] Power.carboncopy.info

Figure 1: Share of State Government Budget on Energy Sector



Source: PRS Report

This note highlights the need for state governments to take full responsibility and accountability for funding the state power sector. This involves limiting subsidies to the sector, unless coupled with improvement in the structural issues that have led to the discoms' huge and growing technical, commercial and financial losses. All state debts should be fully consolidated on the states' balance sheets, and subsidies funded on time by the states.

The financial health of the state electricity discoms remains precarious, thereby demanding more and more funds every year. This note expands on ideas that state governments should adopt to ensure the various forms of funding to the power sector are properly accounted for and consolidated together on state balance sheets. This will provide a holistic (and real) picture of the funds and grants provided to the power sector, and full and timely transparency will drive accountability. This is critical as funding to the power sector is crowding out spending on infrastructure development and building socio, economic and human development.

Full consolidation and timely disclosures will provide transparency which will drive accountability.

The COVID-19 crisis makes the issue of fiscal management of state government finances even more relevant, as lack of government revenue will force states to borrow more or curtail expenditure which will impact development in their state.

State of Power Distribution Sector

The electricity sector in India is under the concurrent list of the constitution and is administered both by the central and the state governments. The responsibility for distribution and supply of power to rural and urban consumers rests with the states.

Distribution is the weakest link in the value chain of the Indian power sector.

Power distribution is the weakest link in the value chain of the Indian power sector. The sector is saddled with various issues, including electricity

demand slowing in tandem with the deceleration in economic growth in 2019, exacerbated by the impact of COVID-19 in 2020 (demand down 19% year-on-year in the June 2020 quarter).

UDAY had a material positive impact in the first two years, but the failure to address cross subsidies, improve performance by reduction of technical and commercial losses and the lack of budget discipline in allowing tariffs to rise with inflation has led to under-funded losses and hence total debts are now increasing again. The ailing state-owned power discoms continue to hamper the efficient functioning of the generation and transmission sectors and also renewables.

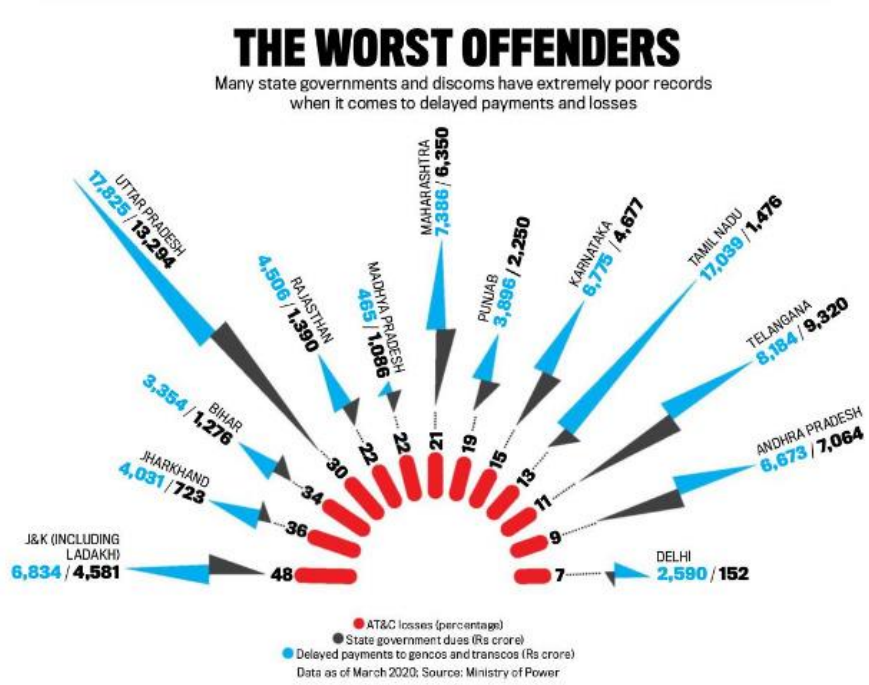
As of May 2020, the discoms had accumulated massive overdue payments to generators of Rs116,340 crore (~US$16bn), creating an immense liquidity crunch across India's entire power sector, which is in turn undermining India's banking system integrity and foreign investment inflows.

Figure 2: Snapshot of Discoms' Financial Performance

	Unit	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19
Discom Loss on subsidy received basis	Rs Crore	71,621	68,257	56,939	65,718	38,080	15,132	28,036
Subsidy received	Rs Crore	36,100	36,758	45,584	55,283	60,341	63,796	63,778
Gap (ACS-ARR) on subsidy received basis	Rs/kWh	0.84	0.78	0.58	0.65	0.42	0.17	0.27
Accumulated Losses as per Balance Sheet	Rs Crore	253,700	306,317	358,581	413,933	na	173,000	na
Total Outstanding Debt	Rs Crore	304,228	365,066	403,816	421,978	190,000	185,000	228,000
AT&C losses	%	25.48	22.62	25.72	23.98	20.28	18.80	18.19
Outstanding dues by Discoms (As on last month of FY)	Rs Crore	NA	NA	NA	NA	31,704	42,063	66,652

Source: PFC Report on SEBs; MOP FRP Scheme; UDAY portal; PRAAPTI; LiveMint 2019; Mercom India 2018. Data for 2019/20 is not yet available, reflective of the lack of timely disclosure.

Figure 3: Snapshot of Performance of Some of the Worst Performing States



Source: Ministry of Power

The central government has repeatedly initiated various reforms – such as Integrated Power Development Scheme (IPDS), Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY) and UDAY – to improve the sector's operational and commercial performance, but they have yet to make a sizeable or sustained impact. Discoms continue to incur huge financial losses – a clear reflection of their poor performance coupled with the political necessity of massive subsidies that are largely off-balance sheet and only partly funded by the state governments.

In order to help state-owned discoms pare back mounting financial losses, the central government has offered financial packages to bail them out from time to time. However, the success of these measures has been limited.

In 2012, the Government of India (GoI) approved the Financial Restructuring Plan which aimed to improve the long-term financial viability of state discoms.

Then in 2015, the GoI's Ministry of Power launched the UDAY scheme to improve the transparency, operational and financial performance of discoms with the clear objective of reducing technical and commercial losses. It took a carrot and stick approach to getting states to consolidate their discom debts.

Recently another partial bailout package was approved of Rs90,000 crore (~US$12bn) of subsidised debt funding for the discoms from GoI-owned lending agencies, Power Finance Corporation (PFC) and Rural Electrification Corporation (REC), which will allow discoms to cover some of their current dues and effectively infuse liquidity into the sector.

Absence of political will, competition and cost-reflective tariffs, inefficient performance due to corruption and red tape, the unsustainable cross-subsidies, economically inefficient tariff-setting processes, expensive thermal power PPAs, and lack of modern technology and infrastructure development are adding to discoms' losses.

Discoms need to identify the high-loss and high-volume zones in their state and focus on improving their performance to yield faster and better results. The key reform measures that need to be prioritised in such areas are:

- Privatisation or adoption of a hybrid franchisee model
- Metering of all consumers though deployment of operational prepaid or smart meters
- Regulatory discipline by timely revision of tariffs, handling of regulatory asset and subsidy delivery, corporate governance etc.
- Power sector reforms by creating a National Pool Market

While there is no silver bullet to improve the financial sustainability and viability of discoms, Annex 1 contains the list of key broad-level recommendations that discoms need to undertake.

Improving Accountability and Tightening of State Government Budget Exposure To Power Sector

The state governments can borrow up to 3% of their GSDP to fund their fiscal deficits. This limit has now been increased to 5% in light of shrinking revenues on account of the COVID-19 pandemic.[5]

The state governments have been lending to the power sector specially to fund capital expenditure of transmission and discoms, plus to cover the mounting financial losses accrued by them. In addition to direct lending, the state governments have been providing support to the state discoms in the form of grants and subsidies. The state governments also provide guarantees for the borrowings of state discoms from financial institutions. The Reserve Bank of India (RBI) has noted that these contingent liabilities are a risk to state governments owing to the large outstanding debt and rising losses of discoms, given the state governments act as guarantor for them.

Further, the state governments are providing off-budget financing directly or through specially incorporated entities. Given the state governments are not directly borrowing this money it is not reflected in their budgets and is not therefore

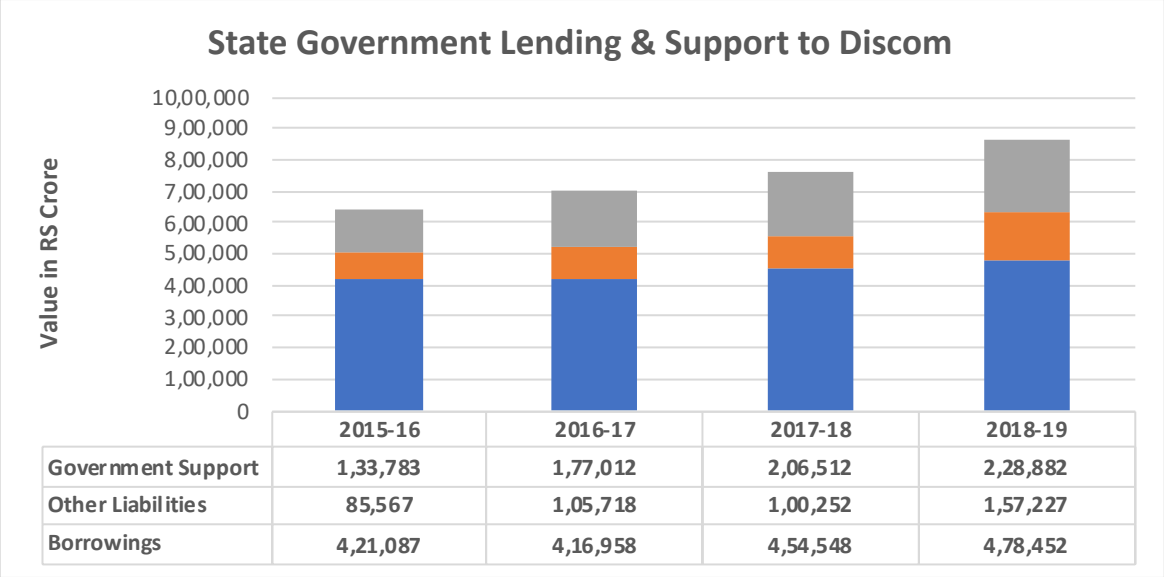
[5] LiveMint. Govt raises states' borrowing limits for FY21 to 5% of GSDP from 3% now. 17 May 2020.

included in the states' debts and fiscal deficits. However, the state governments provide guarantees which make them liable if the discoms fail in their repayments.

Debt takeover from the state discoms under UDAY is one example of trying to enforce this liability. As per the current discom analysis, states have not been able to substantially cut their losses under the UDAY scheme, thereby increasing the fiscal risk for the state governments.

The figure below provides a snapshot at an all-India level of how government lending and support in the form of grants and subsidies have increased over the years. The data reveals that if consolidation of government support in the form of loans, grants, subsidies etc. is done, state government liabilities are almost twice as much as reported in the form of direct lending.

Figure 4: Consolidation of Discom Liabilities at National Level from 2015/16 To 2018/19



	2015-16	2016-17	2017-18	2018-19
Government Support	1,33,783	1,77,012	2,06,512	2,28,882
Other Liabilities	85,567	1,05,718	1,00,252	1,57,227
Borrowings	4,21,087	4,16,958	4,54,548	4,78,452

Source: PFC, Praapti

In the last two years, lending and support to the power sector has increased further on account of the poor performance of state discoms, thereby increasing the fiscal risk of the state governments. The COVID-19 pandemic has further accentuated this risk, with state discoms demanding more funds from the state governments to deal with the current cash flow issues.

While the permissible borrowing limit is 3% (or 5% for the FY2020/21) of GSDP and some of this budget is allocated to the energy sector (allocation varies from state to state as shown in Figure 1), there are additional ways in which state governments have increased financial exposure to state discoms and thereby fiscal risk. The above data at national level reveals that discoms are supported in various forms, not just state government lending. This indicates that most of the states have breached their permissible limits if all government support in the form of loans, grants, subsidies etc. is consolidated.

An analysis of the data of a few states reveals that while government is lending 6.2% of the budget to the energy sector, the outstanding liabilities of the energy sector as a proportion of the state GSDP are quite high. The fiscal deficit as a proportion of GSDP exceeds the permissible limit of 3% if just the energy sector is included.

A few state governments with better performing state discoms, such as Maharashtra, Gujarat and Karnataka, have less risk exposure. But for states like Rajasthan, Uttar Pradesh and Tamil Nadu it is high.

Figure 5: Consolidation of Discom Liabilities for a Few States in 2018/19

	Values in In INR Crore (2018-19)	Andhra Pradesh	Bihar	Delhi	Gujarat	Haryana	Jharkhand	Karnataka	Madhya Pradesh	Maharashtra	Rajasthan	Uttar Pradesh	Tamil Nadu
	Borrowing												
1	State Government Loans	9	386	0	187	3,294	9,863	552	31,857	2,004	16,037	2,780	17,101
2	Other Borrowings	18,014	4,666	4,995	486	9,726	286	17,469	14,195	33,192	38,501	56,432	96,337
3	**Total Borrowings (1+2)**	**18,023**	**5,052**	**4,995**	**673**	**13,020**	**10,149**	**18,021**	**46,052**	**35,196**	**54,538**	**59,212**	**1,13,438**
	Other Liabilities												
4	Regulatory Asset			21,082				7,094		8,984			
5	Losses Accruing to Discoms	11,934	2,409	(799)	(184)	(281)	751	(970)	7,159	(1,097)	(2,607)	6,032	12,623
6	Payment Owed to Generators*	2,570	245	922	168	1551	3572	2364	1031	1649	23090	4888	8473
7	**Total Other Liabilities (4+5+6)**	**14,504**	**2,654**	**21,205**	**(16)**	**1,270**	**4,323**	**8,488**	**8,190**	**9,536**	**20,483**	**10,920**	**21,096**
8	**Total Discom Outstanding Liabilities (3+7)**	**32,527**	**7,706**	**26,200**	**657**	**14,290**	**14,472**	**26,509**	**54,242**	**44,732**	**75,021**	**70,132**	**1,34,534**
	Government Support including subsidies & grants												
9	Tariff Subsidy Received	1,250	5,089	1,686	6,944	7,352	1,250	9,088	9,384	11,662	7,681	10,070	7,694
10	Revenue Grant under UDAY	95							753	992	12,000	465	5,339
11	Other Revenue Grants												
12	Grants towards Capital Assets	8,723	11,573	20	2,636	866	6,382	2,034	3,582	5,585	3,708	25,974	859
13	**Total Government Support (9+10+11+12)**	**10,068**	**16,662**	**1,706**	**9,580**	**8,218**	**7,632**	**11,122**	**13,719**	**18,239**	**23,389**	**36,509**	**13,892**
14	**Total Discom Liabilities including subsidy & grants (8+13)**	**42,595**	**24,368**	**27,906**	**10,237**	**22,508**	**22,104**	**37,631**	**67,961**	**62,971**	**98,410**	**1,06,641**	**1,48,426**
15	**State GSDP (2017-18)**	**6,07,388**	**3,61,504**	**5,56,800**	**9,84,453**	**4,34,608**	**2,03,358**	**9,77,994**	**4,69,393**	**19,59,920**	**6,41,940**	**10,36,149**	**10,90,802**
16	**Total Discom Liabilities including support /GSDP (14/15)**	7%	7%	5%	1%	5%	11%	4%	14%	3%	15%	10%	14%
17	**Outstanding Liabilities/GSDP (8/15)**	5%	2%	5%	0%	3%	7%	3%	12%	2%	12%	7%	12%

Source: PFC, Praapti

** As on March 2019 ** () means profit*

Below are some recommendations for improving state governments' accountability in lending to the state power sector and also for tightening the support linked to improvement in financial performance of state discoms. Discoms have been able to survive the financial mess they are in because state governments have bailed them out from time to time. The systemic issues in the distribution sector need to be addressed or else the discoms will continue to incur financial losses and thereby increase fiscal risk for the state governments.

The state governments must be at the centre of the reform process. Unless the state governments are made directly responsible and accountable for improving the financial mess in the distribution sector, the sector will continue to incur huge financial losses. The screws should be tightened on state government with penalties for non-performance of discoms. GoI funding should be tied to compliance and there should be a condition precedent for the release of any specific central government funds by way of grants, subsidy, loans etc.

Full State Consolidation of Various Lending To State Discoms

As highlighted above, state governments have been lending to state discoms in multiple ways that are not accounted for in the books of state government. Thus, overall lending exceeds the limit as prescribed by FRBM. State governments should be directed to consolidate overall lending to the state discoms through various forms including guarantees of loans to such entities, bailout packages etc. This should also factor in grants and subsidies given by state governments – which is government support to the power sector despite being hidden and not accounted for when deciding the lending limit.

A borrowing limit for the power sector should be determined based on the overall share of GSDP after accounting for all the forms of state government support to the sector. This is critical as funding to the power sector is crowding out funds for infrastructure development and building of socio, economic and human development.

Improve Transparency and Timely Reporting of Data

Improving transparency and the timely reporting of data and accounts is must for the monitoring and evaluation of state discom finances and state government lending to the power sector.

Timely data transparency in compliance with Indian Accounting Standards (Ind-AS) will enable the formulation of a timely action plan for the state governments to restrict their exposure to the loss-making power sector and instead utilise funds in sectors which can help achieve social, economic and equity goals for the government.

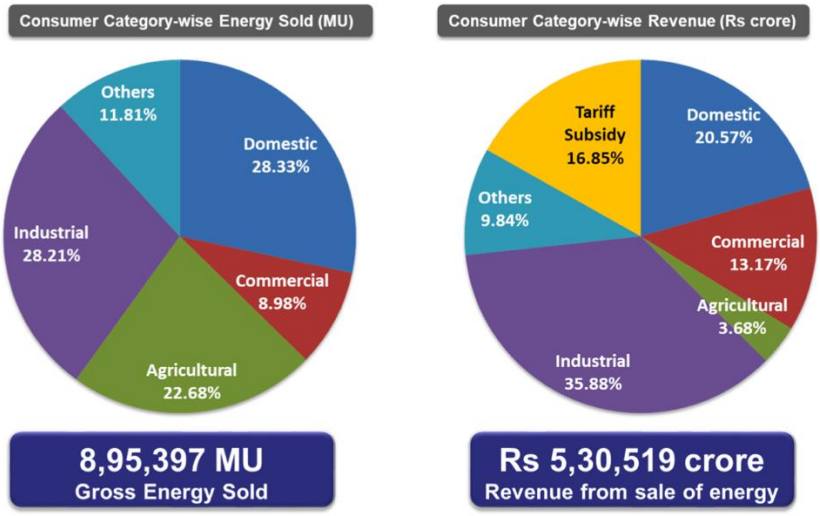
The Power Finance Corporation's Performance Report of State Power Utilities was last published for 2017-18. Even then, out of 104 utilities covered in the report only 70 reported their financials as per Ind-AS, with 14 utilities not reporting at all.

Absent timely transparency and full consolidation of losses and debts, state governments lack accountability for this key sector.

Subsidising India's Agriculture Sector Is Necessary – but Is an Unsustainable Burden for Discoms and the C&I Sector (Via the Cross-Subsidy)

The combination of exceptionally high AT&C losses (~18.8% in 2019/20), the fact that the discoms on average nationally sell electricity materially below their cost of delivery and the massive cross-subsidy from the C&I sectors to the agricultural sector (agriculture uses 22.68% of electricity volume but pays just 3.68% of the cost) creates an entirely unsustainable discom business. When anything is subsidised and provided virtually for free, the business case for many solutions for energy efficiency and cost-competitive distributed solar (e.g. solar ag pumps) is undermined. India has long considered Direct Benefit Transfer (DBT); it might be one of the keys to making the country's energy system financially sustainable.

Figure 6: Percentage of Energy Sold in Each Category and the Corresponding Revenue in 2017/18



Source: Power Finance Corp Report on Performance of State Power Utilities 2017-18

Creating Incentives For Improvement

The Ministry of Power's Integrated Ratings of State Power Distribution Utilities are based on:

- Operational and reform parameters such as AT&C losses, efficiency of power purchase cost, digital payment facility etc.
- Financial parameters such as ratios, payables, receivables and availability of audited accounts

- Regulatory environment and subsidy support forms

An index could be created for lending exposure in different forms – direct borrowing, grants, subsidies, guarantees etc. – and linked to state discoms' credit ratings.

The fiscal debt limit should be linked to the performance rating of discoms. All access to central government funds by way of grants, subsidy, loans etc. should be linked to improvement in the discoms' ratings. If a state discom fails to improve its rating, fiscal access should be restricted.

For the better performing utilities, state governments should not exceed the prescribed limit, including lending in various forms.

Annex 1: Suggested Remedies for Discoms' Financial Issues

(Which should be condition precedent for any financial support by Central Government to State Government)

National Level

1. Resolving issue of legacy contract and closure of inefficient plants

The distribution companies are saddled with huge losses on account of long-term PPAs with costly and inefficient thermal power plants. The discoms need to undertake remedial measures such as:

- Closure of inefficient, highly polluting, end-of-life coal plants that are surplus to need. This will result in huge savings from fixed-charge payment for such assets and will also reduce pollution and carbon footprints. Further, it will reduce coal requirement from such inefficient plants and improve plant load factor of the remaining, more efficient thermal power plants.
- Stop entering new long-term PPAs with costly new subsidised thermal plants which are on the drawing board or where financial closure has not been achieved.
- Write off stranded assets. Discoms are burdened with paying fixed charges for stranded capacity while the generators are protected. It is a festering issue for discoms which could go bankrupt if they have to continue paying for capacity which is stranded or under-utilised. A plan to either write-off and/or close such stranded capacity needs to be put in place through consultation. This could help ease the financial burden of discoms.

2. Reduce cross subsidies

Cross subsidy surcharges form one of the largest components of the overall charges levied by discoms on open access customers. According to the Council on Energy, Environment and Water (CEEW), the cross-subsidy burden on commercial and industrial (C&I) customers has only increased in the last few years despite policy directions to reduce it progressively.

Discoms need to address the issue of cross subsidies and reduce their reliance on recovering revenue from this class of consumers. Increasing cross subsidies has continued to undermine the competitiveness of industries in our country. This issue has become more precarious during the COVID-19 crisis, with drastically reduced demand from C&I consumers during the lock-down impacting the cash flow of discoms. The discoms need to undertake remedial measures such as:

- **Roll out of Direct Benefit Transfer (DBT-P)**. The current subsidies for under-pricing of electricity must be progressively restricted to better target certain categories of consumers who are most in need. DBT-P for subsidies

will be a more effective, better costed and targeted mechanism for subsidy disbursal. Prior to this occurring however, DBT-P needs to be carefully designed and road-tested in a few cities first to ensure the complexities surrounding the targeting of subsidies are resolved before widespread implementation.

- **Solar Irrigation Pumps**. Encourage adoption of solar pumps under the PM KUSUM scheme. This will help states alleviate losses by reducing the ag cross subsidy burden on other high-paying customer categories and bring down discoms' cost of power procurement and transmission losses by building out domestic distributed generation capacity at the end of the grid. It will also progressively reduce the Centre fiscal burden of the imported diesel subsidy schemes.

- **Solar Rooftop**. Sustained power demand growth will return into 2021, so states should encourage distributed solar rooftop deployments by increasing fixed charges. By creating policy certainty and an environment where self-generation is promoted this will help reduce total system AT&C losses and reduce the burden of funding massive grid T&D infrastructure that needs to be installed over the coming 1-2 decades as electricity demand doubles.

  States should encourage installation of smart meter grid-connected solar rooftop systems and prepare for rooftop solar with behind-the-meter storage as they are becoming increasingly viable economically and offer multiple benefits, despite the need to understand and count the perverse discom disincentive to prevent the loss of their highest tariff paying C&I customers.

3. Reduction in AT&C losses through digitalisation

There is a need to progressively replace existing electricity meters with operational smart meters, including smart prepaid meters. This will help discoms understand and manage their load better while also reducing metering and billing losses and theft, while facilitating distributed rooftop solar and storage.

Smart meters allow the introduction of a differentiated time-of-day tariff structure to proactively and better manage peak demand loads, which are expensive to meet. Their introduction would give consumers the freedom to choose and change their supplier and rate as per their requirements, as well as encouraging demand response management (DRM) and time-shifting electricity loads.

Given the high upfront cost of smart meters and split incentives involved, the central government needs to drive adoption of smart meters by states by providing subsidies, as well as enabling policies to promote domestic manufacturing of smart meters at scale that will help drive the per unit costs down. Given a strong push by Prime Minister Modi on digitalisation to stimulate the economy, the electricity sector also needs a step change and digitise its operation to sustainably reduce the losses.

4. Increase in tariff

The Electricity Act 2003 mandates that tariffs should be cost reflective. However, due to several factors – including strong political vote-buying pressure for low tariffs, perceptions of discoms' inefficiencies and disagreements on the accuracy of subsidy claims – regulators have in general failed to allow prices to rise with the inflationary impact of rising total power supply costs over time.

There is a need for timely revision of tariffs by the states as few states have not increased their tariffs at all in the last few years. While a price shock is not desirable, particularly during the COVID-19 induced recession, regulators must require annual tariff revision to allow discoms to recover inflation, at least until AT&C losses are reduced and ever-lower renewable energy tariffs can come to the rescue at sufficient scale to allow some deflationary offsets on average cost of generation.

5. Increasing competition

To improve the performance of the distribution sector, increased private competition should be promoted. The GoI could mandate discoms with high losses to either privatise operations or allow the entry of suitably qualified/capitalised private distribution entities willing to invest in infrastructure upgradation. Increased competition would drive generators, distributors and electricity supply companies to develop technologies to increase efficiency, lower costs and increase the reliability of supply. Privatisation alone won't fix the problem but selling some discom areas could provide the capital infuse to help alleviate haemorrhaging cash deficits and repay otherwise out of control state off-balance sheet debts.

6. National Pool Market

The Indian electricity market should gradually move to a National Pool Market and optimise generation nationally, allowing the optimisation of the huge investment in the national generation fleet and drive ACS down, forcing the least efficient and outdated facilities to close, reducing the overcapacity clearly evident in the thermal power sector.

On 1 June 2020, the two power exchanges started their real-time market (RTM) trading platforms for electricity transactions. States should deploy analytical tools for projection and forecasting and make use of new products such as RTM. It will help the discoms to reduce dependence on deviation settlement mechanism (DSM), optimise generation resources nationally, sell surplus power efficiently with next day payment cycle, and efficiently manage renewable energy intermittency.

In July 2020, Central Electricity Regulatory Commission (CERC) and the Securities & Exchange Board of India (SEBI) reached a settlement to resolve regulatory conflicts over trade of electricity in the open market with forward and derivative contracts. Delivery-based long-term contracts are likely to be traded

on power exchanges under CERC's jurisdiction, while the derivative contracts are likely to be traded on commodity exchanges under SEBI.

This will allow discoms to have flexibility of longer-term contracts in the open market as opposed to the 11-day restriction in the current framework.

7. Renewable energy tariffs with indexation

In the last three years, renewable energy auctions by SECI, NTPC and other state discoms have delivered Rs2.36-3.00/kWh wholesale electricity tariffs in the first year, but then fixed at this rate over the life of the contract. These tariffs are somewhat globally unique in nature as they come with zero inflation indexation for 25 years. In other words, the tariffs are deflationary in real terms as there is no escalation mandated to account for indexation.

The discoms could procure new renewable energy capacity through design of new tariff structure in which the developer bids for levelised tariffs. The year one tariff could start from a lower base in the first year and allow inflation indexation over the period of the length of the contract in such a way that the developers' return on investment remain entirely unchanged from the current tariff structure with no indexation.

Although this has not been executed in the Indian market yet, this is an idea that could be explored. This will provide discoms with an option of 20-30% lower year 1 solar tariffs, which would immediately undercut even the variable charges of most thermal power plants today. The long term financial merits of zero indexation are extraordinary, but the discoms need financial relief now. Introducing renewable energy tariff inflation would see solar tariffs today below Rs2.00/kWh.

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The Institute for Energy Economics and Financial Analysis conducts research and analyses on financial and economic issues related to energy and the environment. The Institute's mission is to accelerate the transition to a diverse, sustainable and profitable energy economy. www.ieefa.org

About the Authors

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Tim Buckley, IEEFA's director of energy finance research, Australasia, has over 25 years of financial market experience covering the Australian, Asian and global equity markets from both a buy and sell side perspective. Tim was a top-rated Equity Research Analyst and has covered most sectors of the Australian economy. Tim was a Managing Director, Head of Equity Research at Citigroup for many years, as well as co-Managing Director of Arkx Investment Management P/L, a global listed clean energy investment company that was jointly owned by management and Westpac Banking Group.

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Vibhuti Garg, Energy Economist at IEEFA, has advised several private and public sector clients on commercial and market entry strategies, investment diligence on power projects, and the impact of power sector performance on state finances. She has worked in Nepal, Bangladesh, Vietnam and in the Caucasus.