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DisComs post-COVID-19: Untangling the historical challenges, short-term needs, and long-term ambitions

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Key issues

COVID has unleashed a relatively unique global pandemic with economic, human, and institutional upheavals that haven't been seen in generations. Economies are in a tailspin, and employment has been one of the biggest casualties beyond direct human health. The collapse of both liquidity and economic activity hits DisComs harder than many other sectors.

India implemented the world's most stringent nationwide lockdown,[2] and as it enters the period of phased recovery, there will be enormous challenges summarised by two key issues:

1. How do we align the short term (immediate and urgent) needs with the long-term ambitions and visions, especially of economic viability and sustainability? If the largest challenge facing the energy sector was not just the transition but ensuring it is a just transition, what happens post-COVID-19?
2. In the short-term, what are the best actions needed to provide support that aren't either distortionary or foster moral hazard?

The government just announced enormous stimulus packages, perhaps in the order of 10% of GDP! In the first phase announced, Rs. 90,000 crores of stimulus is aimed at DisComs. Our initial analysis indicates this is welcome (and necessary). But it would likely be insufficient if we apply a long-term lens. Not because of the amount, but how it's structured. This is either a loan or changes to existing financing, and it isn't a grant or a write-off, and it's unclear how this addresses underlying issues. As details emerge, we will subsequently write more about the stimulus, rather, stimuli.

DisComs' historical challenges, exacerbated by COVID

Electricity distribution companies ("DisComs") are the linchpin of the electricity chain, but they have also been called the weakest link. Created starting in the late 1990s as part of electricity reforms, these were a part of the unbundling of the erstwhile State Electricity Boards (SEBs), which were the vertically integrated utilities. Most DisComs remain 100% owned by the state governments, but they do purchase or procure power from a range of generators that span state-owned, central, and private.[3]

Power procurement is ostensibly three-quarters of the cost structure of DisComs, who end up losing, on average, anywhere between half and one rupee per kilowatt-hour depending on how you do the accounting. Per official data for FY17-18,[4] the all-India cost was 5.60 Rs./kWh (kilowatt-hour), while the revenues were only 4.93 Rs./kWh. Using 820 billion units (kWh) sold, that translates to losses of Rs. 53.7 thousand crores (about 7.5 billion US$). While this sounds dangerously high, even this number is based on expected subsidies from the state governments which routinely do not materialise, especially not on time. Even before COVID, it's worth recognising that one of the worst defaulters for paying DisComs (who also subsequently delay payments upstream) was the government itself. How do we manage cash flows when the earlier equilibrium was of musical chairs, but the music has now stopped?

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[1] "Electricity DisComs in India Post-COVID-19: Untangling the Short-Run from the "New Normal", https://youtu.be/o-EfCvWadr0

[2] https://www.economist.com/finance-and-economics/2020/04/04/emerging-market-lockdowns-match-rich-world-ones-the-handouts-do-not

[3] Reforms began with opening up generation to the private sector post 1991, but few SEBs privatized – they overwhelmingly unbundled generation, transmission, and distribution. See R. Tongia, "The political economy of Indian power sector reforms", Chapter in "The Political Economy of Power Sector Reform:
The Experiences of Five Major Developing Countries", David Victor and Thomas Heller (Eds.), Cambridge University Press, 2007, DOI: https://doi.org/10.1017/CBO9780511493287.005

[4] Power Finance Corporation's "Report on Performance of State Power Utilities for FY 2017-18", https://www.pfcindia.com/DocumentRepository/ckfinder/files/Operations/Performance_Reports_of_State_Power_Utilities/Report_on_Performance_of_State_Power_Utilities_%202017_18.pdf

There's been much focus on reducing the operational losses of DisComs, measured through a hybrid term called aggregate technical and commercial losses ("AT&C"). A number of central government schemes aim to bring AT&C losses below 15%, from the estimated 19% reported today,[5] but this isn't the only challenge. Decades of energy policy centered around social welfare redistribution have led to not just in efficiency, but also distortions with particular implications for DisComs going forward. DisCom revenues were not aligned to their cost structures but kept afloat (forget operated profitably) through a combination of subsidies and cross-subsidies. So-called "paying customers", the commercial and industrial (C&I) users overpaid to partially offset tariffs set well below cost for residential and agricultural consumers. Electricity regulatory commissions, ostensibly independent, routinely relied on a second layer of cross subsidy within consumer categories, with telescopic slabs or tiers of progressive pricing.

The lockdown resulted in about a 25% reduction in load, which is probably closer to a steady 40 GW reduction as the weeks of lockdown have progressed,[6] but almost all the reduction has come from C&I. In fact, residential consumption may actually have gone up. But the financial hit upon the DisComs is vastly disproportional to the changes in total energy (kWh). Not only has there been a reduction in C&I demand in the short run, but the foreseeable future may involve a deep recession with lowered C&I output of goods and services. In the longer run, work from home may also reduce some commercial load. For example, India's largest IT company (TCS) expects 75% of its workforce to work from home by 2025.[7]

One last point is critical to understanding the challenges of DisComs. Their pre-COVID challenges were not any single failure but a drip, drip, drip (or sometimes steady stream!) built up over decades, which included politicisation of and poor tariff setting, failures to have regular consumer tariff revisions (simply to even match inflation, forget rising costs, especially of procurement of power), continued AT&C losses, failure to get paid by the government (as a consumer or for promised subsidies), and more. Being last in the cash chain, they face disproportional risks compared to generators but especially transmission companies, who get paid first (and make hefty returns).[8] While lack of funding was often a constraint, it would be naïve to expect these intertwined underlying issues can be untangled swiftly post-COVID-19 simply with an injection of enormous funds.

On the other hand, DisComs also deserve a lot of the blame, spanning inefficiency, continued high losses, and continued moral hazard failures. They also haven't lived up to their social contract. Many distortions, ostensibly in the name of the poor, don't help the most deserving. While almost all homes are electrified, rural areas often face mixed power supply quality. Agriculture is given free or almost free power, but who benefits? The majority of farmers are labourers, without their own land. Some fraction have canal-based supply, or use diesel. A large share relies on the rain only. It is the elite, land-owning and well-connected farmers that enjoy this power.[9]

A large number of pre-COVID-19 challenges were not due to technological limitations but due to choices in policy or political economy compulsions. Fixing them merely with financial stimuli is unlikely to be sufficient, even if requisite money were available.

[5] As the government's UDAY dashboard for AT&C losses shows (https://www.uday.gov.in/atc_india.php), the (virtually) all-India number of 19% as of May 12, 2020, is based on data as reported by the states, and thus may have limitations based on methodology and assumptions for things like unmetered consumption.

[6] Load has risen with rising temperatures, but the gap from the previous year remains roughly steady. See the Brookings India Electricity & Carbon Tracker (carbontracker.in) for real-time and historical electricity demand and supply by fuel all-India.

[7] https://www.businessinsider.in/business/corporates/news/tcs-ceo-says-the-business-model-is-20-years-old-and-its-time-to-go-employee-lite/articleshow/75243124.cms

[8] It's a detail, but sometimes important, that generators are heterogeneous, with disproportional risks and returns based on location and ownership; the public sector, especially central, often ends up a first among equals.

[9] Distortions in electricity and in farming are deeply intertwined. See R. Tongia, "India's Biggest Challenge: The Future of Farming", *The India Forum*, October 4, 2019. https://www.theindiaforum.in/article/india-s-biggest-challenge-future-farming

COVID's implications

While the lockdown may be easing gradually, the operational and financial implications will be long drawn. Few experts believe we will have a V-shaped recovery, or even that post-recovery we will come back to where we were due to enormous implications on employment and economic activity. How India (rather, the world) manages the period until widespread herd immunity or vaccine remains to be seen especially since this may be 12-24 months away.

Cash will be king. This has implications for new investments, and a number of stakeholders will clamour for waivers or an attempt to cite force majeure. However, being an essential service, not only must electricity continue to flow, but we need a flow of cash up the stream from consumer to DisCom to generator to coal supplier. Many of these links already had enormous outstanding dues pre-COVID-19, such as the Rs. 82,073 crores government departments reportedly owed DisComs,[10] or the Rs. 77,445 crores owed by 65 DisComs to generators as of February 2020 (likely much more as this isn't a complete compilation; newspaper reports in May 2020 talk of Rs. 94,000 crores dues to generators).[11] While governments may insist on asking stakeholders to continue operations, at some point the challenges will percolate up from the electricity sector to the banking and financial sector. Government budgets will have many competing claims and no matter how important electricity is, healthcare, food, security, and livelihoods will probably demand more immediate attention.

This brings us to the real challenge which is attempting deep change when there is an ongoing crisis. One school of thought suggests one has to stabilise the patient before attempting radical surgery or new treatments. Another points out that when the situation is critical, one has to be willing to try experimental treatments. Either way, most analysts, scholars, and even government officials agree that the older problems are unlikely to be fixed through incremental tweaks or gradualism.

India's transition wasn't just one of decarbonisation but also of broader changes to market structures, digitalisation, etc. while these are unlikely to be shelved, there is a chance these may be slowed down instead of accelerated in the short run. There will be a larger focus on factors like employment and domestic security. Both of these seem to support coal, especially given solar modules are disproportionately imported, overwhelmingly from China, and have been more a financial play than an employment generator. On the other hand, RE is a purely upfront-investment, with virtually no recurring costs, or supply-chain uncertainty. And, of course, its sustainability benefits (including local pollution, not just carbon) have been undervalued historically.

The role of the private sector also needs to be thought through carefully. It's not just about setting up the regulations to invite them, but will they have the appetite or cash to jump in to a space where a number of players have burnt their fingers as licensees (e.g., Orissa) or franchisees (e.g., Madhya Pradesh). This is before we attempt to address more subtler issues of geography, competition, and provider of last resort. If they had any say, private entities would prefer to take up operations only in areas more likely to be profitable (often urban) or where there is clear money on the table due to high losses plus the bidding incentives allow them to retain a large chunk of the improvements.

Recommendations – Manageable change instead of band-aids

While this may sound like a generalism, the goal should be to not throw good money after bad. In addition, government support other than existing promised funds (for subsidies, government schemes, investments, etc.) should align with long term targets of sustainability, cleaner power, quality supply, etc.

Funds will be king – choose where to inject support

While cash will obviously be in short supply, credible credit will need to be a new instrument that can maintain liquidity in the chain. There are already too many old dues for existing lines of credit to work, especially since many of them are well beyond the expected time periods for repayment. What makes a credit credible? When it's backed up by explicit guarantees or alternative instruments.

[10] Utpal Bhaskar, "Centre weighs EMI scheme for state govt depts to clear power dues, *Mint*, January 28, 2020. https://www.livemint.com/industry/energy/centre-weighs-emi-scheme-for-state-govt-depts-to-clear-power-dues-11580149758395.html

[11] The government's PRAAPTI portal shows procurement payment data but doesn't capture all DisComs or all dues (all generators). https://praapti.in/

The ultimate backstop for credit remains the government. Post-COVID-19, states will likely need to relax their deficit spending caps under the Fiscal Responsibility and Budget Management (FRBM) Act. It's worth noting that these caps were already under pressure from the UDAY scheme for the power sector, where 75% of loans were taken off the books of DisComs onto state books, with a temporary waiver of FRBM.

States will have to fund some of the recovery, maybe with central government help, but where should they direct funds in the chain of consumers to DisComs to generators to fuel? Giving cash to consumers will not suffice since they will have competing needs. Paying the ultimate upstream, the banks, also won't suffice because it's not clear that just paying off such past dues will open up the spigot for new loans and credit (forget investments). The real need is for continued operations as a going business. A multi-stakeholder task force should quickly examine where best and in what form to inject financial support. It's worth noting that if paying off past debts were sufficient, then one "simple" solution would have been for state governments to pay their dues and subsidy obligations – they are, after all, probably the biggest source of poor cash flows to DisComs. The figure written above was only government consumption dues – delayed subsidies could be more significant on a recurring basis.

If one had to play favorites, the industrial sector, followed by commercial, would need disproportional help to recover. Not only do these provide goods and services, but they are also responsible for a large fraction of employment (only agriculture is ostensibly higher). C&I already pay more for electricity – they could be given a waiver from the cross-subsidy they pay today. Within industrial, there is disproportional value to supporting MSMEs as these smaller entities both provide much of the employment plus they have traditionally had lower cash reserves or options available to raising funds.

India announced Rs. 90,000 crores stimulus for DisComs on May 13, 2020. While public details are limited, this appears to be in line with our views discussed during the Brookings India Panel Discussion on May 7th, 2020, that (1) DisComs are the appropriate lowest rung of the chain; and (2) the benefits should disproportionately go to industrial consumers. What we understand thus far is (1) some of the funds would be routed through REC and PFC, the PSU financing entities under the Ministry of Power, and (2) PSUs would also forgo some returns to lower costs to DisComs, to be "passed on to final consumers (industry)."[12]

Two immediate possibilities are: (1) this funding helps states pay off dues to DisComs, and ultimately becomes a new "liability" for states, but it does help keep the system afloat. We'd need more detailed numbers about cash flows, obligations, deferments (which come back!), etc. across the chain to fully unpack. (2) The savings to industrial consumers could be in the form of fixed costs reductions, which might fit nicely with addressing part of underlying distortions. Of course, this change may be time-limited, and we'd need a longer-term fix as well.

While it's too early to comment further, any system that isn't infusing "new" cash but provides paper funds only (that too asymmetrically, e.g., paying off old dues, which may temporarily clean up a balance sheet) may not help with raising more capital or provide sufficient multiplier effect down the road. A similar issue was a post-facto criticism of UDAY – while it may have helped immediately, did it result in lenders giving new funds at low rates going forward? In this particular case, we address the immediate liquidity problem, but we are still relying on a combination of the DisComs and/or the states to pay back or backstop at least some of the headline money. In the worst case, this helps short-run, but causes more fiscal or financial challenges long-run. Some of the ~haircut is also upon PSUs, which raises questions of minority shareholder views. On the other hand, a haircut from lower returns may be superior to going bald with no returns, or worse!

Separate the future from the past

While many support schemes to DisComs (dubbed bailouts by many) have tried to clean up balance sheets, they haven't sufficiently solved the solvency problem. On the other hand, immediately post-COVID-19 it may be too much to ask for the system to both be "viable" going forward plus settle past sins (such as poor tariffs that left unpaid dues, as IOUss, given the fancy term Regulatory Assets).

An intermediate step is improved transparency by segregating true costs from either past failures or policy choices such as cross-subsidies. This means creating Line Items in bills (consumer, genco, etc. all the way across the chain) that properly separate not just fixed versus variable costs (often muddled together) but also cross-subsidies, unreasonably high AT&C losses,[13] regulatory asset carrying costs, etc. By being individual line-items, not only will there be higher awareness, this will make it easier to issue bonds or use alternative or new instruments to take over the older cost centers.

[12] PIB tweet: https://twitter.com/PIB_India/status/1260533495438311425/photo/1
[13] Some amount of technical losses is inevitable, for wire (I^2R) and transformer losses, varying by geography and grid design.

Of course, the dual of this is that DisComs (effectively, the states) cannot treat such Line Items as a black hole of infinite capacity. In fact, they shouldn't be allowed to add to these after a point, and failure to get the rest of the clean sheet (portions excluding such Line Items) financially viable within a strict timeline should result in them declaring bankruptcy or going into receivership. Milestone-based approaches have been tried with prior bailouts, but these lacked hard fiscal constraints, and often had unrealistic financial models and operational targets. Simply stating, "thou must reduce AT&C losses from 30% to 20% in one year" was unrealistic, and someone, somewhere, was left holding the bag.

Integrated planning – future needs flexibility

In addition to extensive uncertainty over both demand (kWh) and payments (since rupees and kWh don't align today), we have an energy transition underway with a rise in Renewable Energy (RE), EVs, storage, edge-based and third party generation, etc. Many of these threatened the incumbent, or today's equilibrium of cross-subsidies. India will have to move towards flexible planning and operations to harness the most cost-effective generation mix possible.

During the lockdown, power exchange prices were down, but their transacted volumes didn't rise much. For starters, overall demand was down, but from a DisCom perspective, they didn't have the flexibility to ignore their existing payment obligations to generators under power purchase agreements (PPAs). PPAs, which don't differentiate time of day, were almost 90% of grid power in FY2018-19. A large fraction of PPA costs are fixed costs, regardless of offtake.

One of the complaints C&I users had during the lockdown was they were unable to consume power. While this reduced energy (kWh) charges, their high fixed (capacity, or kW) charges meant that on average, the per-unit consumed costs actually went up! More importantly, part of their overpayment for cross-subsidising other users was in the form of much higher fixed charges than for most other users. A temporary fix for this distortion is underway, but a waiver (or at least deferment) of fixed charges upon consumers must be matched with similar waivers (or deferments) for generator fixed charges payable by DisComs. The fixed cost chain wasn't symmetric before, and without purposeful effort, many fixes will make the asymmetries much worse.

The long-term reality is that the old equilibrium of payments that both lacked time-of-day granularity as well as properly allocated fixed and variable charges will not sustain as those on the wrong side of the payment balance will exit the system, in a few cases via theft or in others via self-generation (especially renewable) or from third parties and markets. This imbalance of fixed versus variable costs across the chain (generation versus consumers) will only get worse over time unless tariff mechanisms change because, with renewables, which are the vast majority of expected growth in capacity in the coming decade, virtually all costs are fixed costs.

In the very short run, DisComs and all stakeholders are trying to exit some of their obligations of payments under the framework of Force Majeure. These have to be symmetric and propagate fairly. Instead of relying on contract law alone, a stakeholder (like the Regulator) may have to step in. Part of the reason is many legal options including arbitration are infrequently invoked[14] but there are also supplies lacking a strict commercial contract, such as in-state generators to state-owned DisComs.

Better data leads to better signaling

A more nimble and flexible grid is just part of the functionality a smart grid enables, and smart metering is a need for DisComs to work through – one unfortunate aspect is the benefits accrue over time, and these are front-heavy capital intensive. These also needs a lot of "homework" by the DisComs to be able to harness their potential.[15] Without proper databases (consumers, billing, assets, GIS, etc.), we risk expensive hardware that is underutilsed, akin to a computer without software, broadband, peripherals, training, etc. Blanket rollouts are also risky for other reasons, and deployments should be driven by bottom-up needs. What top-down (central government) support can do is help those who are ready and have a viable (and perhaps regulator approved) business case.

[14] R. Tongia, "No such thing as a perfect renewable energy contract", *Mint*, February 21, 2017, https://www.livemint.com/Opinion/JkEdX92CpjzrfOOlnTAO4M/No-such-thing-as-a-perfect-RE-contract.html

[15] R. Tongia "Can smart meters solve India's electricity problem?" *Hindustan Times*, March 10, 2020. https://www.hindustantimes.com/analysis/can-smart-meters-solve-india-s-electricity-problem-opinion/story-yOR2TEBTW3zPOm0knXBdPK.html

While the data for the grid of the future will take time, we urgently need operational data on a granular level across the electricity chain. Without such data, which resides with disparate stakeholders in the chain, we don't even know the details of post-COVID-19 changes in energy (or rupees) across the chain, especially immediately and with granularity. We have limited or incomplete data at best today. Even a simple query like how much is the shortfall in the grid is poorly answered today at best.[16] Instead of answering such questions via surveys and recall (which is subject to not just errors but gaming), these can easily be instrumented if there were very modest funding (possibly just Rs. 100 crores rupees all-India) but, more importantly, political will. With such data live and real-time, we could ensure we (a) meet the social contract of quality supply; and (b) learn and signal with granularity for adding the right type of fuel for future capacity growth (with "fuel" a loose term that encompasses storage, demand response, etc.)

While we're at it, not only should we standardise all data and pass these through a clearinghouse, a National Energy Information Agency[17] of sorts, such data should be made available for free. Consumer-level data needs privacy but individual data is rarely the level required for improved public policy – aggregation (and anonymisation where required) are enough.

A subtle but important reason better data (especially timeliness, consistency, and granularity) are key for the future isn't just signaling, or even understanding what works and what doesn't, but the fact that India has enormous heterogeneity across DisComs, spanning consumer mix, demographics (especially rural-urban), losses, grid legacy, generation mix, etc. A one-size-fits-all solution won't work for the long-term problems, and it's not just smart systems that need better data but even traditional systems that are flexible such as based on markets. On the other hand, especially post-COVID-19, a standard support mechanism can help ensure a common floor or baseline, i.e., a minimum performance standard. Stated another way, top-down can pull up the floor, but solving tomorrow's (non-COVID) challenges will require DisComs's bottom-up efforts, which will be accelerated through better data.

An opening for change

Proposed draft Amendments (2020)[18] to the Electricity Act 2003 offer a few changes to electricity, some of them substantial (especially relating to subsidies), but there are a number of shorter-term actions DisComs (and other stakeholders in the electricity chain) must consider.

Periodic economic downturns have been viewed in two ways by companies. Some wait and watch, and even let go of people (this is unlikely to happen in public sector companies in India). Others use this time to restructure, to learn new skills, to help them revamp or even pivot for the new future. For DisComs (and also Regulators, policy-makers, etc.), this downturn offers an opportunity for things that could or should have been done earlier but weren't because of day-to-day grid balancing and other immediate needs consumed all their efforts. With additional slack in the system due to COVID, we can do things such as: retrofit coal power plants for emissions control (staggering this process longer than before, with more learning and innovation); train staff on digital platforms for a smart grid; and model, simulate, and prototype new markets for buying and selling power.

This cross-roads also presents an opportune time to examine trajectories and lock-ins. With cash being scarce, expenditures should be towards investments instead of stop-gap measures that only get worse (after all, freebies in pricing are an arms race, one to the bottom). Desirable objectives include things like digitalisation, if not the full investments then at least multi-stakeholder planning. We also need to prioritise cleaner energy and quality supply. Quality means not only an improved social contract (no load-shedding) but even an end to the need for consumer-side back-up power.

Instead of chasing top-down targets, India should signal externalities like pollution or even carbon, and then find optimal solutions through the interplay of consumers (who can be more efficient), DisComs (who can shift which power they buy), and generators (who can improve the specs of their plants in terms of efficiency and emissions).

Ultimately, the changes needed will not be easy. They will require political will across improvements to pricing, subsidies, timely payments, risk allocation, etc. This is a space that tinkering won't solve. And one where we're now facing not just transition, not even disruptions, but upheavals. Why can't we have planned upheavals that are long-term positive as well?

[16] R. Tongia, "Re-thinking Access and Electrification in India: From Wire to Service", Brookings India Discussion Note, September 2014. https://www.brookings.edu/research/re-thinking-access-and-electrification-in-india-from-wire-to-service/
[17] V. Rai, et. al, "Data for development: The case for an Indian energy information administration", Energy Research and Social Science, March 2017. https://doi.org/10.1016/j.erss.2017.01.002
[18] https://powermin.nic.in/sites/default/files/webform/notices/Draft_Electricity_Amendment_Bill_2020_for_comments.pdf

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