India’s Private Power Market
Expanding Private Sector Electricity Distribution

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Executive Summary

Improving access to electric power is critical for India to meet human development and economic growth priorities. Persistent underperformance by most state-run electric power utilities has been a significant obstacle to meeting these goals, and it has also been slowing India’s interest in decarbonizing the economy. Given the failure of government reforms, private sector distribution has proven to be a promising solution to improve the operational and financial performance of electricity distribution companies (discoms). This report provides a road map for energy officials looking to introduce private participation in the distribution sector.

A June 2022 Reserve Bank of India Bulletin put discom health as a significant financial risk to state finances. States such as Punjab and Rajasthan have a staggering total debt-to-GDP ratio of 51 percent and 39 percent, respectively. Discom debt inhibits the states’ ability to spend on other key areas such as health and education.

While accruing massive losses, discoms are unable to provide reasonably priced and reliable electricity to meet growing industrial demands. Industrial consumers in India often pay tariffs that are 50 percent higher than residential consumers, due to the provision of cross subsidies, where commercial and industrial (C&I) consumers pay higher tariffs to subsidize residential and agricultural consumers. Prices are also not competitive when compared with other countries—Indian C&I electricity tariffs are respectively 30 percent and 37.5 percent higher than in the United States, when adjusted on a purchasing power basis.

Cognizant that welfare redistribution policies (such as the provision of free electricity) and a complex regulatory environment have affected discom health, the government has attempted
to reform the sector, but this has had limited impact. Even in 2022, states like Uttar Pradesh had a massive aggregate technical and commercial (AT&C) loss rate of 30 percent. As per the annual ratings of discom performance released by the Power Finance Corporation (PFC), most public sector discoms rank low.

As underlined by the consistent high performance of private discoms in India, private sector participation is a promising solution for reforming the distribution space. However, state governments often promise free or low-cost electric power as a political tool—which limits the effective operation of public sector discoms. The political economy considerations during tariff setting often overshadows the actual economics. Given how politicized the electricity sector is, privatization has its challenges. But newer experiments with private electricity distribution continue to improve the model and present new opportunities for states that are otherwise unable to make significant, enduring improvements to their state-owned utilities.

This report proposes a road map for state governments interested in undertaking discom privatization. The authors interviewed various government and private sector officials to identify challenges and opportunities based on their experiences. Discom privatization is also politically sensitive, since there is an underlying belief that it has a negative impact on electoral performance. The authors analyzed election data to test this, finding that contrary to popular belief, privatization has no effect on average voting patterns: the average percentage of incumbents voted out of power remains largely consistent in constituencies with private distribution when compared to the state average.

Indian states have been called “laboratories for reform.” With discom privatization, models are adapting, improving, and succeeding on a range of critical measures, such as reduced AT&C losses and improved billing and collection. These lessons need to be shared and further improved to ensure that every Indian citizen and business has access to reliable, clean, and reasonably priced electric power.
India’s path to a $5 trillion economy will be paved with significant developments in its ability to expand manufacturing and accommodate continued urbanization. Additionally, India’s leadership in climate change mitigation will be important for ensuring a low-carbon future for the world. To promote equitable growth, India will also need to pay attention to social development. India’s power distribution sector is the common thread combining all three of these key priorities.

However, the power distribution sector is rife with challenges—including political interference, unreliable supply, fiscal mismanagement, and lack of capital expenditure. Despite various government attempts, accumulated discom deficit grew from $45.8 billion in 2016 to $74.4 billion in FY 2022. However, government efforts have led to positive momentum. The total amount that discoms owe to power generation companies has gone down from $12 billion in May 2022 to $2.7 billion in October 2023. Despite progress, there is still a long way to go. Private sector discoms have shown merit and could be part of a state government’s tool kit to bring sustainable reforms to the distribution sector.

Through this report, the authors present a road map for state officials interested in pursuing discom privatization. The road map is compiled through interviews with private and government stakeholders and is meant to guide officials at various stages of discom privatization, including the pre-bidding, bidding, and post-bidding phases. Learning from the experiences of stakeholders who have been involved in the privatization process can be beneficial to other state governments.
Overview

India is the third-largest electricity producer in the world, producing 1.6 million gigawatt hours (GWh) of electricity in 2022. However, this is modest compared to China’s 8.8 million GWh and the United States’ 4.5 million GWh. India’s per capita consumption conveys a more dire scenario. In 2021–2022, India’s per capita consumption of 1,255 kilowatt hours (kWh) was a third of the global average, just 11 percent of the United States’ 11,756 kWh.

India ranks low even among peer developing nations. For instance, Brazil’s per capita consumption is 2,524 kWh, South Africa’s per capita consumption is 3,406 kWh, and Mexico’s per capita consumption is 2,110 kWh. Tariffs for commercial and industrial (C&I) users are high—Indian C&I users are charged 30 and 37.5 percent higher tariffs than their counterparts in the United States, when adjusted for purchasing power parity. Industrial consumers also pay 12.5 percent higher than the global average. Transmission and distribution (T&D) losses in India stand at 19.2 percent as of 2022—four times higher than the United States.

Despite challenges, India’s generation capacity has grown from 160 GW in 2006 to 425.4 GW as of September 2023, with renewable energy generation being a significant component of this growth. To continue along this pathway, the sector must become more financially viable.

Challenges

Discom health in the country has been a hindrance to India’s growth story. Rather than providing a much-needed enabling infrastructure, the sector has stressed Indian states’ finances and caused problems for large-scale manufacturing development. A Reserve Bank of India bulletin from June 2022 put discom health as a major financial risk to state finances. Practices such as providing free and low-cost electricity to agricultural consumers are theoretically funded by the cross-subsidization of industrial consumers, thereby increasing the latter’s electricity rates—which sometimes reach as high as 15 times the price of agricultural tariffs. Industrial consumers also pay 12.5 percent higher than the global average, which jumps to a striking 37.5 percent higher when contrasted to consumers in the United States. Despite this, cross-subsidization is a half measure, and most state discoms lose money—reducing fiscal space for capital investments and resulting in intermittent power losses and reduced investment in modernizing generation capacity. Even after multiple rounds of government subsidy and debt restructuring, discoms need to rely on fresh tranches of borrowing from the state and central governments to cover operational and debt servicing expenses.

The central government has introduced several initiatives to help state discoms improve operations and commercial performance. These include the Accelerated Power Development & Reforms Programme (APDRP), the Revamped Accelerated Power Development & Reforms Programme (R-APDRP), and the Ujjwal DISCOM Assurance Yojana (UDAY). The results of these programs have been mixed. A 2019 report from NITI Aayog and CRISIL notes that even as UDAY directed states to assume 75 percent of discom debt, discoms did not improve their operational efficiency substantially. In a 2018 assessment of the UDAY scheme conducted by the National Institute of
Public Finance and Policy (NIPFP), authors further noted that the scheme failed to bring down the AT&C rates or the ACS-ARR gaps to the desired levels.\textsuperscript{17} The AT&C rates for state-owned discoms covered under the UDAY scheme have gone down from 26 percent in 2015 to 20.8 percent in 2023.\textsuperscript{18} The scheme envisaged to reduce AT&C losses to 15 percent by 2019.\textsuperscript{19} Additionally, the ACS-ARR gap in UDAY states has increased from ₹0.54 ($0.0065) in 2015 to ₹1 ($0.012) in 2023.\textsuperscript{20} The scheme aimed to bring it down to 0 by 2019.\textsuperscript{21}

**Discom Privatization**

Opening up the sector to private players has shown merit and should be seriously considered by a larger number of state governments. This report looks at India’s experience with private distribution of electricity, compiling findings from surveys of existing stakeholders to assess the privatization model and provide a road map for states wishing to open their distribution sectors.

Significant state-level reforms must be viewed through a political lens, as well as through their impact on socioeconomic development. The authors consequently looked at voting trends in the states, cities, and districts that have shifted toward private electricity distribution to scan for patterns that may be related to this reform.
Access to reliable, reasonably priced electric power is critical for India’s national economic development. This is underlined by the stark differences in energy consumption between developed and developing countries. For instance, in 2019, North America’s per capita energy consumption was 5.6 tons of oil equivalent (toe), as opposed to 1.5 toe per capita for the Asia-Pacific region, 1.4 toe per capita for South and Central America, and 1.3 toe per capita for Africa. Consumption of countries in the Organization for Economic Cooperation and Development (OECD) is 4.1 toe per capita as opposed to non-OECD countries’ 1.6 toe per capita. Additionally, the energy consumption in developed countries is 2.6 times higher than in developing countries. For reference, India’s energy consumption in 2021 was 0.7 toe per capita.

Figure 1: Regional Energy Consumption per Capita (Tons of oil equivalent)

Source: Authors’ research based on multiple sources.
Energy consumption and electrification are causally proven to have a direct impact on several economic and social development metrics. Growth is led by an increase in productivity, profitability, job creation, and macroeconomic growth.²⁴ For instance, a study published by the University of Mannheim in 2018 ascertained that increased electrification led to industrial growth in Indonesia between 1990 and 2000.²⁵ Additionally, an extension of grid networks to new locations attracted new firms to that location, thereby stimulating local economies and promoting job growth.

Research from the World Bank shows that electricity outages also reduce the likelihood of a skilled individual gaining employment by 35 to 41 percent and being self-employed by 32 to 47 percent.²⁶ Evidence also indicates that the increased cost of electricity hurts the profit margins of small and medium-sized businesses.²⁷

Electricity access has a direct, positive impact on human development. A study published by the American Economic Association looked at the impact of electrification on employment in South Africa. The study found that electrification leads to the development of microenterprises by releasing women from home production. This leads to higher female employment within five years.²⁸ A case study conducted in northwestern Madagascar further noted that electrification allows students to complete their schoolwork in the evenings and thereby perform better.²⁹ This leads to improved educational outcomes.

A review of low- and middle-income countries (LMIC) found that household electrification significantly improves health outcomes, as residents can replace biomass fuels for cooking with electricity.³⁰ A study of 750,000 households in Ecuador that replaced gas with electric stoves found that electric stoves led to a decline in hospitalization due to respiratory illnesses.³¹ Given that currently 2.5 billion people do not have access to clean cooking fuels around the world, electrification for cooking can have substantial health and environmental effects.³²

**India Overview**

Despite a significant expansion of electricity generation in India, distribution poses significant challenges. Electricity consumption in India has grown threefold since 1991 and is expected to triple again by 2050.³³ Yet, studies from the World Economic Forum (WEF) indicate that per capita electricity consumption in the country remains lower than in Africa.³⁴ Additionally, estimates show that despite massive gains in the number of households with access to grid electricity, consistent and reliable supply remains a challenge.³⁵ A research study conducted by the Council on Energy, Environment and Water (CEEW) in 2020 indicated that 76 percent of households in India faced unanticipated power supply interruptions, and up to 66 percent of rural households and 40 percent of urban households faced outages at least once a day.³⁶ Improving reliable electricity access requires investments aimed at improving the technical capabilities of the distribution network. Therefore, it is crucial to invest in a healthy distribution network to ensure reliable electricity access.
Improved electricity distribution and access in India would positively affect three areas: industrial growth, renewable energy adoption, and social development.

**Industrial Growth**

Easy access to reliable, reasonably priced electricity is important for industrialization. The price and access to power for industrial consumers remain a challenge in India, with Indian business consumers paying 50 percent higher tariffs than residential consumers on average due to the practice of cross-subsidization. According to a report by the International Energy Agency, the annual average wholesale electricity prices in India are comparable to those in the United States, despite the stark difference in the size of the economies and the per capita GDP. This hinders the competitiveness of Indian firms, as well as India’s ability to attract international companies to set up manufacturing units.

High price, however, is just one piece of the puzzle. Other factors such as outages, low voltage, and lack of access also pose challenges to industrial growth. Research indicates that power outages lead to lower productivity, cost competitiveness, and investment decisions for small and medium-sized enterprises (SMEs). Given that SMEs form a significant chunk of Indian firms, this has dire impacts. Additional research also indicates that electricity consumption leads to growth in manufacturing in the short run and ultimately leads to GDP growth.

**Renewable Energy Adoption**

A report from the International Energy Agency titled *India Energy Outlook 2021* shows that between 2019 and 2040, India could account for a quarter of global energy demand growth. This, combined with the fact that India’s carbon emissions have grown faster than its energy demand since 2000, underlines the importance of green energy growth. The government has made several reforms to promote renewable energy and has announced a target of adopting 450 GW of renewable energy by 2030, not counting additional generation required for the National Green Hydrogen Mission. India has also announced a commitment to reach “net zero” carbon emissions by 2070. However, renewable energy adoption does not solely rely on installed generation capacity. Reliable storage infrastructure, as well as distribution and transmission mechanisms, are fundamental to the deployment of the renewable energy generated. Renewable energy adoption requires the integration of renewables into the national grid, which in turn can only be achieved through substantial capital investments. Given the poor financial health of discoms, this is a challenge.

A report by the Energy and Resources Institute (TERI) posits that India failing to integrate renewables into the grid could lead to a situation like in Germany—where, despite hefty renewable production investment, the cost of electricity for residents grew and 78 percent of total primary energy demand was still being met by fossil fuels as of 2020. The TERI report underlines three major challenges to grid integration: the seasonal nature of renewables, storage systems, and variability in energy generation.
At the root of it, India’s current infrastructure is not equipped to deal with frequent mismatches between energy supply and demand. Discoms need to be financially viable to be able to adopt better technology, assess demand and supply, and plan power purchases in advance.

**Social Development**

Energy access and efficient distribution is shown to affect various development parameters in India. For instance, the Economic Survey 2020 released by the Ministry of Finance noted that increased access to electricity positively impacts literacy rates in the country, which in turn increases household GDP. Another report by the Parliamentary Standing Committee on Human Resource Development for 2020–2021 noted that despite a significant increase in household access to electricity, only 56.5 percent of government schools had access. The lack of reliable electricity distribution is a deterrent to access in government schools.

Electricity access is also important for the provision of healthcare services. A systematic review of studies from African countries, Fiji, and India found that electrification has a positive impact on health outcomes in LMICs. The review found that electrification is associated with improvements in antenatal care, vaccination rates, emergency services, and primary health services. Additionally, better refrigeration also leads to improved pharmaceutical supply chains.

A World Bank and World Health Organization report from January 2023 notes the importance of electricity access for universal health coverage. Additionally, the report underlines that electricity access is necessary for vaccine storage, provision of pediatric care, and emergency services. A June 2022 report by EY and the SED Fund states that as per the Rural Health Statistics, 26.3 percent of rural sub-centers and 4.8 percent of primary health centers (PHCs) in India do not have access to electricity supply as of 2019.

A 2021 survey conducted by the Council for Environment and Energy Development and the Shakti Sustainable Energy Foundation found that 64.5 percent of health sub-centers in Bihar do not have proper access to electric supply. Moreover, 44 percent of health sub-centers suffer from problems with fluctuation, and 55 percent need to rely on backup power (through generator sets) for more than five hours daily. This adversely impacts health outcomes at the facilities. In line with this, a study conducted by the CEEW and Oxfam on the adoption of solar energy for primary healthcare centers in Chhattisgarh indicated that using solar energy significantly improved outcomes by providing health centers unhindered access to electricity. The study reported that facilities with solar energy treated 50 percent more outpatients monthly and had 50 percent higher deliveries than those without it.

Uninterrupted power supply also has a positive impact on improving irrigation. Currently, several states in India offer free electricity for irrigation. However, the timing of electricity supply is sporadic, and it is dependent on off-peak hour availability. This results in farmers employing flood irrigation techniques, which are both energy- and water-intensive. Studies in Tamil Nadu and Maharashtra have shown that using drip irrigation can result in saving 45 percent of the
electricity used for agriculture.\textsuperscript{51} Drip irrigation, in turn, is most effective with an uninterrupted electricity supply.

A systematic review of studies conducted by the Asian Development Bank in August 2020 also stated that improved access to electricity led to marginal improvements in decisionmaking powers and better individual agency for females in a household.\textsuperscript{52} Cognizant of the positive socioeconomic impacts of electricity access, the central government launched the “Saubhagya” scheme in 2017, aiming to achieve universal household electrification. As of 2023, over 28 million households have been electrified under the scheme.\textsuperscript{53}
India’s History with Electricity Distribution Reform

The government recognizes the importance of a strong electricity sector and discom health for India’s development. Therefore, there have been multiple attempts to reform the sector. These attempts have had mixed success at best (see Appendix 1 for details).

In 1995, in the face of consistently poor sectoral performance, the Odisha government introduced the Odisha Electricity Reforms Act. The act unbundled the State Electricity Board, aiming to promote corporatization and attract private investment. Soon after, in 1996, a meeting of all state chief ministers was convened. At the meeting, the group released the Common Minimum National Action Plan for Power, which sought to address the lack of transparency in tariff setting. In this context, the 1998 Electricity Regulatory Commission Act was introduced to create the State Electricity Regulatory Commission with the power to set tariffs.

The poor performance of state power utilities persisted, however, and in response the central government launched the Accelerated Power Development Programme Scheme (APDP) in 2001. Despite the scheme’s momentum, discom performance remained poor, leading to the government intervening and bailing out State Electricity Boards by infusing $7.4 billion. In 2003, the Electricity Act established central as well as state-level regulatory bodies for the rationalization of tariffs and subsidies. The act also introduced the concept of distribution franchising, leading to several states introducing the model. The same year, the government introduced the Accelerated Power Development Reforms Programme to tie subsidy disbursal with reform progress—in vain. This was followed by the Restructured Accelerated Power Development Reforms Program (R-APDP), which focused on urban areas. This also had limited success.
Prime Minister Modi took office in May 2014. His government’s first scheme addressing power sector reforms was the Ujwal Discom Assurance Yojana (UDAY) 2015, which aimed to reduce AT&C losses to 15 percent and the ACS-ARR gap to 0. The scheme had limited success: the AT&C losses did go down but only to 20 percent, and the ACS-ARR gap reduced to ₹0.3 paise by 2019. In 2022, the government launched the Revamped Distribution Sector Scheme (RDSS) with a total outlay of $37 billion. The scheme aims to bring down the AT&C losses to 12-15 percent, and it sets a new target for bringing the ACS-ARR gap to 0 by 2027.
Despite government measures, poor discom performance in India has remained a major hindrance to growth. According to a recent report, over 15 years (through 2021), public discoms in India suffered a cash-basis loss of approximately $120 billion. As noted above, dismal discom performance stresses state finances and affects economic and social development. While there has been some improvement in the past few years, this remains marginal.

Notable reforms brought in by the Modi government include the aforementioned UDAY and RDSS programs and the more recent Late Payment Surcharge Rules. Additionally, the government has introduced the Draft Electricity Amendment Bill, 2022, which seeks to ease the entry of private players in the distribution sector and rationalize energy tariffs to reflect actual incurred costs. The bill has not passed the houses yet. The government has also made several efforts to promote corporate governance through guidelines for management and energy accounting. Dashboards such as Payment Ratification and Analyzing Power Procurement for Bringing Transparency in Invoicing of Generators (PRAAPTI) and UDAY have made data on discom performance accessible for stakeholders.

This has yielded positive yet limited results.

The current performance of the distribution companies can be assessed through the Annual Integrated Rankings and Ratings of Discoms published by the Power Finance Corporation. The 11th edition of the report highlights discom performance during FY 2022. According to the report, AT&C losses have come down from 25.48 percent in 2012 to 16.5 percent in 2022, and 25 Indian states improved their AT&C rates between 2020 and 2022 (see Appendix 2 for details). Specifically, the AT&C rates for state-owned discoms have gone down from 26 percent in 2015 to 20.8 percent in
Additionally, the ACS-ARR gap has come down from $0.01 per unit in 2012 to $0.0049 per unit in 2022 for all discoms. State-owned discoms have an ACS-ARR gap of $0.012, which is holding steady through 2023.

India’s total power generation capacity grew from 156 GW in 2010 to 425.4 GW as of September 2023. During this time, the total power deficit went down from -10.1 percent to -0.4 percent. Out of this, 169 GW came from renewable energy sources as of March 2023. Notably, access to electricity in India grew to 97 percent by 2023, comprising 95 percent access for rural households and 99 percent access for urban households, according to the National Family Health Survey 5. In comparison, as of 2018, in the United States and China 100 percent of households have access to electricity; 99.6 percent of households in Brazil have access to electricity; and for neighboring Bangladesh and Sri Lanka, household electrification stands at 76.5 percent and 100 percent respectively.
India’s Tryst with Private Electricity Distribution

Overview
There are 70 power distribution companies in India. Of these, 54 are public sector units and 16 are privately owned and are given private licenses for operations. Additionally, there are eight operational power distribution “franchises” that are technically owned by the public sector units but are operationally run by private sector companies on contract.

The licensed private distribution companies are spread across eight states and union territories including Dadra and Nagar Haveli, Daman and Diu, Delhi, Gujarat, Maharashtra, Odisha, Uttar Pradesh, and West Bengal. Out of this, six utilities are run by Tata Power, four utilities are run by Torrent Power, two are run by Reliance Infrastructure, two are run by the RP Sanjiv Goenka group-owned Calcutta Electrical Supply Corporation Limited (CESC), and one each is run by Adani Electricity and India Power Corporation Limited. Pockets in Mumbai and Kolkata have had private sector distribution predating state electricity boards.

Several companies operate distribution utilities on behalf of public sector distribution companies on a contractual basis, as “franchises.” Three states have franchises: Maharashtra, Rajasthan, and Uttar Pradesh. There are eight existing franchises, out of which three are run by Torrent Power, four by CESC, and one by Tata Power. Additionally, Torrent Power has applied to get distribution licenses in Nagpur, Pune, and Thane in Maharashtra, whereas CESC has a pending contract to operate the distribution utility in Chandigarh.
Altogether, private sector companies serve a total of approximately 28 million customers across the country. Out of these, licensed operators serve about 26 million customers, whereas franchised providers serve the remaining 2 million customers.

Table 1: Private Distribution Companies with Ongoing Operations

<table>
<thead>
<tr>
<th>Company</th>
<th>State/Union Territory (UT)</th>
<th>Commencement</th>
<th>Customers</th>
<th>License or Franchise</th>
</tr>
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<tbody>
<tr>
<td>Torrent Power</td>
<td>Dadra and Nagar Haveli; Daman and Diu</td>
<td>2022</td>
<td>150,000</td>
<td>L</td>
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<td>BSES Yamuna</td>
<td>Delhi</td>
<td>2001</td>
<td>1,829,901</td>
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<td>2001</td>
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<td>Delhi</td>
<td>2001</td>
<td>1,885,578</td>
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<td>Gujarat</td>
<td>2010</td>
<td>1,000,000</td>
<td>L</td>
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Source: Authors’ research based on multiple sources.
History and Current Status

Private sector distribution is not entirely new for India. India’s first power distribution company, CESC, was established in 1897 as an electric light provider for Kolkata (then Calcutta). The company received a distribution license from the government of West Bengal in 1978.

However, the real impetus toward privatization came in 1995 through the Odisha Electricity Reforms Act. The act was ushered in due to mounting pressure from the World Bank in the face of consistently poor performance by the State Electricity Board. It initiated the corporatization and unbundling of the public sector utility, ultimately carving the distribution network into four zones that were licensed to two private distribution companies: Applied Energy Services (AES) and Bombay Suburban Electric Supply Limited (BSES).

Unfortunately, Odisha’s initial experiment with private discoms was short-lived. Firms reported higher losses after privatization. This was accredited to poor baseline accounting and weak operational data provided by the government. Notably, reform attempts such as curbing electricity theft, reforming agricultural tariff, and managing labor unions were contentious.

A catastrophic cyclone in Odisha in 1999 proved to be the final straw in the deteriorating situation of the state’s newly privatized central discoms. The cyclone caused massive infrastructural damage. World Bank funds earmarked for demand-side management and meter acquisition could not be repurposed for construction work. This ultimately led to the exiting of private firms from Odisha by early 2000.

Delhi decided to open the door to distribution privatization around the same time. By 2001, Delhi had divided its power distribution into three sectoral zones; two of these zones were awarded to BSES, with the third awarded to Tata Power. In 2003, Reliance Industries increased their 20 percent minority stake in BSES-held utilities to 58 percent to take full control of the company. Delhi decided to introduce privatization through a public-private partnership (PPP) model where the government would retain a minority stake. The three utilities still operate in Delhi and have considerably improved operational and financial efficiency.

Despite positive signs from privatized utilities, electoral considerations stemming from potentially higher power tariffs evoked a lukewarm response from the state governments.

This changed after the introduction of the Electricity Act, 2003. The Electricity Act paved the way for opening the power distribution sector to private players. Sensitive to the political considerations of state governments, it offered a third way wherein the governments could pass off the operations of running a distribution company to the private sector while still retaining ownership, thereby creating the franchising model.

In 2007, when giving a franchise for managing power distribution for Bhiwandi to Torrent Power, Maharashtra became the first state in the country to experiment with the franchise model. Torrent was able to dramatically reduce the AT&C losses in Bhiwandi from 58 percent in 2007 to 22.36 percent in 2014, and this was further reduced to 9.8 percent in 2022. The franchise is still operational.
Odisha’s experiment with franchising started in 2013, when the government gave franchising of five select zones to Shyam Indus, Feedback Energy Distribution Company (FEDCO), and Enzen Global. The experiment, however, was less successful. Since then, 17 other regions have opened power distribution operations to the franchising model. As of April 2023, out of the 23 cases total, 15 had ceased operations; mismatch between government expectations and outcomes, as well as labor unions, have been cited as the cause. States have experimented with different models of franchises such as input-based, investment-based, and input-based with incremental revenue (IBF-IRS); however, experiences have been widely varied.

**Table 2: Private Distribution Companies That Ceased Operations**

<table>
<thead>
<tr>
<th>Company</th>
<th>State/UT</th>
<th>Areas Served</th>
<th>Commencement</th>
<th>License or Franchise</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied Energy Services (AES)</td>
<td>Odisha</td>
<td>Central</td>
<td>1999</td>
<td>L</td>
</tr>
<tr>
<td>Bombay Suburban Electric Supply Limited (BSES) (later R-Infra)</td>
<td>Odisha</td>
<td>West, North, South</td>
<td>1999</td>
<td>L</td>
</tr>
<tr>
<td>India Power Corporation</td>
<td>Bihar</td>
<td>Gaya</td>
<td>2014</td>
<td>F</td>
</tr>
<tr>
<td>Essel Vidyut Vitan</td>
<td>Bihar</td>
<td>Muzaffarpur</td>
<td>2013</td>
<td>F</td>
</tr>
<tr>
<td>SPML Infra</td>
<td>Bihar</td>
<td>Bhagalpur</td>
<td>2011</td>
<td>F</td>
</tr>
<tr>
<td>Tata Power</td>
<td>Jharkhand</td>
<td>Jamshedpur</td>
<td>2012</td>
<td>F</td>
</tr>
<tr>
<td>CESC Limited</td>
<td>Jharkhand</td>
<td>Ranchi</td>
<td>2012</td>
<td>F</td>
</tr>
<tr>
<td>SMART Wireless</td>
<td>Madhya Pradesh</td>
<td>Gwalior</td>
<td>2012</td>
<td>F</td>
</tr>
<tr>
<td>SMART Wireless</td>
<td>Madhya Pradesh</td>
<td>Ujjain</td>
<td>2012</td>
<td>F</td>
</tr>
<tr>
<td>Torrent Power</td>
<td>Madhya Pradesh</td>
<td>Sagar</td>
<td>2012</td>
<td>F</td>
</tr>
<tr>
<td>Crompton Greaves</td>
<td>Maharashtra</td>
<td>Aurangabad</td>
<td>2011</td>
<td>F</td>
</tr>
<tr>
<td>Global Telesystems Limited</td>
<td>Maharashtra</td>
<td>Jalgaon</td>
<td>2011</td>
<td>F</td>
</tr>
<tr>
<td>FEDCO</td>
<td>Odisha</td>
<td>Puri, Khordha, Balugaon, Nayagarh</td>
<td>2013</td>
<td>F</td>
</tr>
<tr>
<td>Shyam Industries</td>
<td>Odisha</td>
<td>Cuttack</td>
<td>2013</td>
<td>F</td>
</tr>
<tr>
<td>Shyam Industries</td>
<td>Odisha</td>
<td>Dhenkanal</td>
<td>2013</td>
<td>F</td>
</tr>
<tr>
<td>Shyam Industries</td>
<td>Odisha</td>
<td>Nimapada</td>
<td>2013</td>
<td>F</td>
</tr>
<tr>
<td>Enzen Global</td>
<td>Odisha</td>
<td>Paradeep</td>
<td>2013</td>
<td>F</td>
</tr>
</tbody>
</table>

Source: Authors’ research based on multiple sources.
**Private Sector Distribution Performance**

Barring a few exceptions, private sector companies have consistently been able to improve operational efficiency as noted by decreasing AT&C losses.

The list below compiles the AT&C losses of private sector distribution companies. The first year (Y1) is the base year and indicates the losses when the utility was taken over by the private sector distribution company. For comparison, the authors have provided the AT&C losses after five years of the company taking over operations (Y5). In places where applicable, they have also listed the latest data on AT&C losses for FY 2022. Additionally, in relevant cases, the table presents the state average AT&C losses to provide a baseline comparison.

**Table 3: AT&C Rates of Private Distribution Providers**

<table>
<thead>
<tr>
<th>Company</th>
<th>State/UT</th>
<th>Commencement</th>
<th>License or Franchise</th>
<th>Y1</th>
<th>Y5</th>
<th>AT&amp;C (2022)</th>
<th>State Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Torrent Power</td>
<td>Dadra and Nagar Haveli; Daman and Diu</td>
<td>2022</td>
<td>L</td>
<td>3.5</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>BSES Yamuna</td>
<td>Delhi</td>
<td>2001</td>
<td>L</td>
<td>60.6</td>
<td>45.6</td>
<td>8.9</td>
<td>N/A</td>
</tr>
<tr>
<td>BSES Rajdhani</td>
<td>Delhi</td>
<td>2001</td>
<td>L</td>
<td>49.6</td>
<td>37.8</td>
<td>8.3</td>
<td>N/A</td>
</tr>
<tr>
<td>Tata Power Delhi</td>
<td>Delhi</td>
<td>2001</td>
<td>L</td>
<td>46.4</td>
<td>26.5</td>
<td>8.1</td>
<td>N/A</td>
</tr>
<tr>
<td>Torrent Power Surat</td>
<td>Gujarat</td>
<td>2010</td>
<td>L</td>
<td>9.7</td>
<td>3.6</td>
<td>5.6</td>
<td>N/A</td>
</tr>
<tr>
<td>Torrent Power Ahmedabad</td>
<td>Gujarat</td>
<td>2010</td>
<td>L</td>
<td>14.3</td>
<td>6.3</td>
<td>6.7</td>
<td>11.1</td>
</tr>
<tr>
<td>Torrent Power Bhiwandi</td>
<td>Maharashtra</td>
<td>2007</td>
<td>L</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Adani</td>
<td>Maharashtra</td>
<td>2018</td>
<td>L</td>
<td>11</td>
<td>6.7</td>
<td>8.8</td>
<td>18.4</td>
</tr>
<tr>
<td>Tata Power Mumbai</td>
<td>Maharashtra</td>
<td>2014</td>
<td>L</td>
<td>2.1</td>
<td>1.1</td>
<td>0.7</td>
<td>20.1</td>
</tr>
<tr>
<td>CESC</td>
<td>Maharashtra</td>
<td>2020</td>
<td>L</td>
<td>56</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Torrent Power SMK</td>
<td>Maharashtra</td>
<td>2020</td>
<td>F</td>
<td>73.9</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Tata Power West</td>
<td>Odisha</td>
<td>2020</td>
<td>L</td>
<td>28.5</td>
<td>N/A</td>
<td>18.3</td>
<td>18.1</td>
</tr>
<tr>
<td>Tata Power South</td>
<td>Odisha</td>
<td>2020</td>
<td>L</td>
<td>36.3</td>
<td>N/A</td>
<td>22.8</td>
<td>20.2</td>
</tr>
<tr>
<td>Tata Power Northern</td>
<td>Odisha</td>
<td>2021</td>
<td>L</td>
<td>26</td>
<td>N/A</td>
<td>11.4</td>
<td>18.1</td>
</tr>
<tr>
<td>Tata Power Central</td>
<td>Odisha</td>
<td>2020</td>
<td>L</td>
<td>30.4</td>
<td>N/A</td>
<td>20.4</td>
<td>18.1</td>
</tr>
<tr>
<td>CESC</td>
<td>Rajasthan</td>
<td>2016</td>
<td>F</td>
<td>29.7</td>
<td>20.4</td>
<td>N/A</td>
<td>20.2</td>
</tr>
<tr>
<td>CESC</td>
<td>Rajasthan</td>
<td>2016</td>
<td>F</td>
<td>27.4</td>
<td>18</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>CESC</td>
<td>Rajasthan</td>
<td>2017</td>
<td>F</td>
<td>24.5</td>
<td>17</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Tata Power</td>
<td>Rajasthan</td>
<td>2017</td>
<td>F</td>
<td>9</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>India Power Corporation</td>
<td>West Bengal</td>
<td>1932</td>
<td>L</td>
<td>3.2</td>
<td>16.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------------</td>
<td>------------</td>
<td>------</td>
<td>---</td>
<td>-----</td>
<td>------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CESC</td>
<td>West Bengal</td>
<td>1978</td>
<td>L</td>
<td>11.3</td>
<td>7.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CESC (NPCL)</td>
<td>Uttar Pradesh</td>
<td>1993</td>
<td>L</td>
<td>58</td>
<td>10.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Torrent</td>
<td>Uttar Pradesh</td>
<td>2010</td>
<td>F</td>
<td>58.7</td>
<td>43.5</td>
<td>13.3</td>
<td>27.5</td>
</tr>
</tbody>
</table>

Source: Authors’ research based on multiple sources.

Clearly, licensed private distribution companies have been able to dramatically reduce AT&C losses. For instance, BSES Yamuna has reduced AT&C losses from 60.6 percent in 2001 to 7.06 percent in 2022. BSES Rajdhani reduced losses from 49.6 percent at the time of takeover in 2001 to 7.7 percent in 2022. The most impressive loss reduction, however, has been led by Tata Power Delhi, which went from 48.1 percent in 2001 to merely 6 percent in 2022.

Additionally, all franchised operations have also been able to reduce AT&C losses. The most impressive performance was by Torrent Power in their Shil-Mumbra Kalwa franchise in Maharashtra. Over three years of operation, AT&C losses have reduced at an average rate of 17.5 percent per annum. Torrent Power’s Bhiwandi franchise follows closely, as it was able to reduce losses by 9.7 percent per annum over the first five years of operations.
Politics of Discoms

In India, politics and electricity are deeply intertwined. In the early 1970s, then prime minister Indira Gandhi created a power tariff that provided virtually free electricity to farmers. In the 1977 Andhra Pradesh state elections, Congress introduced flat tariffs and electricity subsidies for farmers. The All-India Anna Dravida Munnetra Kazhagam (AIADMK), which had just come to power in a highly contested election in Tamil Nadu, followed suit. In 1989, Dravida Munnetra Kazhagam (DMK)–a competing party in Tamil Nadu–promised free electricity to farmers in its election manifesto. After coming to power, the DMK issued an order to provide free electricity for agricultural pumps. This was followed by a series of power subsidies to different categories by both parties.

Thereafter, the promise of free or cheap electricity gained momentum as a political platform. With the emergence of the farming classes as a voter bloc in the country, Maharashtra and Punjab soon adopted the strategy, precipitating a nationwide cascade. In 2004, Andhra Pradesh announced free electricity to farmers. Additionally, research from the University of Michigan has shown that electricity is used as a political plank to influence voters in Uttar Pradesh. There was a resurgence of using free electricity as an electoral tool in 2015, when the Aam Aadmi Party (AAP) slashed power tariffs by 50 percent for consumers using up to 400 units per month in Delhi. In 2019, electricity was made free for users utilizing up to 200 units per month. AAP swept the 2020 Delhi state election polls. In the 2019 Lok Sabha election, the Bharatiya Janata Party in Haryana used electricity price as a tool to appease voters—prices were slashed in the year leading up to the elections. In 2022, AAP came to power in Punjab on the promise of free electricity up to 300 units per month. Even as recently as 2023, Congress promised free electricity up to 200 units per household in Karnataka. The party won a remarkable majority. Karnataka has now introduced the “Gruha
India’s Private Power Market

Jyothi” scheme to implement the promise. Congress has promised free electricity in the run-up to the upcoming state elections in Rajasthan in 2023.\(^8\) AAP has also promised free electricity up to 300 units in Chhattisgarh in the lead-up to the 2023 state elections.\(^9\)

Several past experiences such as in Andhra Pradesh and Delhi have shown that if governments increase the price of electricity, they face voter repercussions in the following election.\(^9\) Given that licensed distribution gives private companies more control than the government, distribution privatization becomes politically unfeasible. Even franchised private players attempt to increase collection and billing efficiency, thereby potentially creating a cost for voters when there might have previously existed none.

On the other hand, allowing private players to enter the market has consistently shown to improve the performance of distribution companies. A 2018 survey conducted by the Association for Democratic Reforms (ADR) showed that electricity remains one of the top concerns for rural voters.\(^8\) Similarly, a 2017 survey in Uttar Pradesh indicated that electricity supply was one of the leading political issues during the elections.\(^2\)

It is feasible that improved electric supply has appeal to voters—after all, not facing multiple outages is valuable to residential as well as industrial consumers. Therefore, it is important to explore whether voting behavior is affected by distribution privatization.

**Methodology**

To assess whether discom privatization leads to political parties being voted out, the authors looked at all instances where currently operational private companies (both license and franchise operators) were brought in. They then checked whether the incumbent candidate won in their constituencies in the election immediately after the private companies’ entry.

The authors calculated the percentage of candidates who did not retain their seats after the introduction of the private companies. Since private companies have a limited geography, the assessment is limited to the “Vidhan Sabha” (state assembly) seats of the concerned areas; the focus is on state rather than national seats since discoms—as well as most electricity sector governance—come under the ambit of state governments. Therefore, their electoral fortunes are assumed to be closely tied with the electricity sector in general and with electricity tariffs specifically.

To prove that distribution privatization leads to being elected out of office, the average percentage of candidates being voted out in areas with recent discom privatization should be higher than the state average. Therefore, the total average percentage of incumbents retaining their seats for all states for the specific election cycles was compared with the average percentage of specific areas with private distribution.

The authors further compiled all their findings from various election cycles, calculated the percentage that an incumbent candidate lost elections, and compared this with the percentage for entire states (party in power is replaced by a contender). Additionally, they ascertained if the findings were different for private licensed distributors as opposed to franchised companies.
Since all the data is qualitative, the assessment relies on indicator variables. A change in incumbents is denoted with “1,” while instances where the incumbents retain power are denoted by “0.”

**Data**

In all, the report assesses 3,600 data points. This comprises data from 218 Vidhan Sabha elections from constituencies that were served by private distribution companies. Additionally, data from 3,364 state-level elections across six states is analyzed to provide a comparative analysis.

**Limitations**

Election results can be affected by multiple factors, and the authors do not claim causality. However, for the initial hypothesis—that privatization leads to incumbents being voted out of power—to be true, it must be proven that areas are more likely to replace the incumbent once a private distribution company enters.

The report has excluded six utilities that started operations in 2020 or later and therefore do not have instances of pre- and post-election scenarios to compare. The authors have also excluded one utility since it took over the license of a pre-independence utility.

**Table 4: Private Distribution Providers with Year of Commencement and Years of Prior and Subsequent State Elections**

<table>
<thead>
<tr>
<th>State</th>
<th>Utility</th>
<th>License or Franchise</th>
<th>Commencement</th>
<th>Previous Election</th>
<th>Next Election</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delhi</td>
<td>BSES Yamuna</td>
<td>L</td>
<td>2001</td>
<td>1998</td>
<td>2003</td>
</tr>
<tr>
<td></td>
<td>BSES Rajdhani</td>
<td>L</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tata Power Delhi</td>
<td>L</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gujarat</td>
<td>Torrent Power Ahmedabad</td>
<td>L</td>
<td>2010</td>
<td>2007</td>
<td>2012</td>
</tr>
<tr>
<td></td>
<td>Torrent Power Surat</td>
<td>L</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Torrent Power Gandhinagar</td>
<td>L</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maharashtra</td>
<td>Torrent Power Bhiwandi</td>
<td>F</td>
<td>2007</td>
<td>2004</td>
<td>2009</td>
</tr>
<tr>
<td>Rajasthan</td>
<td>CESC Kota</td>
<td>F</td>
<td>2016</td>
<td>2013</td>
<td>2018</td>
</tr>
<tr>
<td></td>
<td>CESC Bharatpur</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CESC Bikaner</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tata Power Ajmer</td>
<td>F</td>
<td>2017</td>
<td></td>
<td></td>
</tr>
<tr>
<td>West Bengal</td>
<td>CESC</td>
<td>L</td>
<td>1978</td>
<td>1977</td>
<td>1982</td>
</tr>
<tr>
<td>Uttar Pradesh</td>
<td>Torrent Power Agra</td>
<td>F</td>
<td>2010</td>
<td>2007</td>
<td>2012</td>
</tr>
</tbody>
</table>

Source: Authors’ research based on multiple sources.
Observations

Private sector (licensed and franchised): Out of all 109 Vidhan Sabha constituencies served by private sector distribution companies, across states and time, 41 saw the incumbent being removed from power after a private distribution company commenced operations—an average of 37.6 percent. For corresponding elections at the state level, the incumbent government was replaced three out of seven times—an average of 42.8 percent. There was a modest positive correlation between distribution reform and electoral success when comparing the constituency and state percentages.

Private sector (licensed only): Out of 73 Vidhan Sabha elections in constituencies served by private sector licensed distribution companies, across states and time, 19 saw the incumbent being removed from power after the private distribution company commenced operations—an average of 26 percent. For corresponding elections at the state level, the incumbent government was replaced one out of four times—an average of 25 percent. There was no significant difference between the constituency and state percentages.

Private sector (franchised only): Out of 36 Vidhan Sabha elections in constituencies served by private sector franchised distribution companies, across states and time, 22 saw the incumbent being removed from power after the private distribution company commenced operations—an average of 61.1 percent. For corresponding elections at the state level, the incumbent government was replaced two out of three times—an average of 66.7 percent. There was no significant difference between the constituency and state percentages.

There is therefore no notable difference in the percentage of incumbents being voted out of power between state averages and for areas with licensed distribution and franchised distribution.

Figure 2: Rates of Incumbent Candidates Losing Reelections after Entry of Private Distribution Companies vs. Statewide Government Losing Reelections

Source: Authors’ research and analysis.
Delhi: Out of the 38 elections in constituencies served by private distribution companies, the incumbent was removed from power 9 times—an average of 23.6 percent. The statewide average among all constituencies was 24.2 percent in 2003. There was no considerable difference in the percentages.\textsuperscript{93}

Gujarat: Out of the 14 elections in constituencies served by private distribution companies, the incumbent was removed from power 2 times—an average of 14.2 percent. The statewide average among all constituencies was 35 percent in 2012. Incumbent candidates contesting elections from constituencies served by private power distribution companies were re-elected more than the state average.

Maharashtra: In the one election in a constituency served by private distribution companies, the incumbent was removed from power. The statewide average among all constituencies was 63.6 percent in 2009. The authors excluded Adani Power from the calculation since they took over an existing private license, rather than commencing private operations. Given the limited number of elections, the data is inconclusive.

Rajasthan: Out of the 27 elections in constituencies served by private distribution companies, the incumbent was removed from power 16 times—an average of 59.2 percent. The statewide average among all constituencies was 60.3 percent in 2018. There was no significant difference in the averages.

Uttar Pradesh: Out of the 9 elections in constituencies served by private distribution companies, the incumbent was removed from power 6 times—an average of 66.7 percent. The statewide average among all constituencies was 69 percent in 1993 and 62 percent in 2012. There was no significant difference in the averages.

West Bengal: Out of the 20 elections in constituencies served by private distribution companies, the incumbent was removed from power 7 times—an average of 35 percent. The statewide average among all constituencies was 26 percent in 1982. There was a 9 percent difference in the averages indicating a higher probability of being voted out of power if the candidate was an incumbent when a private distribution utility commenced operations.

Therefore, all in all, in three states (Delhi, Rajasthan, and Uttar Pradesh) it does not seem like switching to a private sector distribution company has any impact on the probability of an incumbent being reelected. In Gujarat, the probability of incumbents being voted out of power after distribution privatization is lower than the state average; in West Bengal, the probability of the incumbent being voted out of power after distribution privatization is higher than the state average. The data from Maharashtra is inconclusive.
Figure 3: Average Rates of Candidates Losing Reelection in Constituencies Served by Private Distribution

- **Average rates in areas with private distribution**
- **Average statewide rates in Election 1**
- **Average statewide rates in Election 2 (if applicable)**

Source: Authors’ research and analysis.
Despite promising performance in improving operational and financial efficiency, private sector companies face persisting challenges in terms of acquiring and operating utilities. While the report has already covered the major challenges vis-à-vis acquisition (i.e., political and electoral), this section looks at the experiences of various stakeholders involved in the privatization process. For a holistic review, the authors interviewed multiple stakeholders representing private sector utilities, government organizations, and independent regulators.

After examining perspectives on the profitability of private companies, this section presents a road map for achieving operational and financial efficiency.

On Profitability

Officials interviewed from private sector companies agreed that it takes between two and six years to turn around a distribution utility company. However, there are some caveats.

First, the time necessary for licensed distribution operators to financially turn around a utility company is less than what is needed for franchised operators. An official from BSES stated that it takes between three to five years to turn around a licensed distribution company, and Mr. Sanjay Banga, president for transmission and distribution of Tata Power, similarly put the number at two to five years. This is supported by Odisha’s example, as the ACS-ARR gap came down from ₹0.6/kWh ($0.0072/kWh) in 2018 (before Tata Power took over) to an average of ₹0.27/kWh ($0.0032/kWh) by 2022.⁴ On the other hand, Mr. Rajib Das, former senior official and currently consultant at CESC,
stated that it takes between five and six years to turn a franchised utility around. A major reason causing this difference in duration is the licensed companies’ greater participation in tariff setting.

Second, Mr. Banga stated that in PPP models, where the majority stake is held by the private partner, the partner is obligated to turn the utility around. And third, the share of rural consumers affects the time taken for a private firm to turn the firm around as well. This is because implementing technological changes such as metering can prove more challenging in rural areas.

**Road Map for Introducing Private Sector Participation in the Distribution Sphere**

The road map is designed to assist government officials looking to introduce private sector players in the state electricity distribution ecosystem. Drawing from interviews with various private sector stakeholders and government officials with experience in discom privatization, the authors have compiled the key areas that should be considered to ensure that privatization is successful. The road map is meant to act as a step-by-step guide for officials. It is broken down into three subsections: planning phase, post-takeover changes, and challenges to consider.

1. **Planning**

A. **Choosing Areas of Operation**

It is important for state governments to decide which areas in the state to open to privatization. In Maharashtra and Gujarat, privatizing predominantly industrial areas has meant improved electrical access for firms. This has also protected farmers and rural consumers—both important voter blocs—from increased tariffs. From private companies’ perspective, serving industrial customers can be comparatively easier than serving rural consumers, since the operational costs vis-à-vis collection and billing are lower for industrial consumers. Similarly, as Delhi and Mumbai’s successful experiment with privatization has shown, private companies can perform well in urban areas. However, from the government’s perspective, if the objective is to improve electricity access in rural areas, then privatization should be considered a priority in those zones.

Specifically, the licensing model that incentivizes companies to make long-term investments in the served areas can be beneficial for improving electricity access in rural areas. Mr. Gagan Swain, director of finance and corporate affairs at GRIDCO Ltd. Odisha, stated that power distribution in Odisha is operating under a licensee model where 51 percent share is with the private player and the remaining 49 percent is still with the state government. Odisha has been able to provide an average of 23.22 hours of electricity access in rural areas. He added that the Union Ministry of Power is impressed by this feat and that this model can be further explored for other state-owned discoms, which also have rural consumers.

That said, Mr. V.P. Raja, former chairman of the Maharashtra Electricity Regulatory Commission (MERC), stated that it will be difficult to find private companies willing to take over rural areas. Private companies would want to retain industrial and urban areas with high-paying consumers. It might thus be fruitful for the government to mandate private companies to take over certain rural areas along with potentially
profitable areas. He gave the example of the privatization of the aviation sector in India, wherein the government mandated airlines to take over some loss-making air routes along with profitable routes. Additionally, he added that state governments must assess the consumer mix for an area before deciding whether it should be privatized. An assessment of whether the consumers in an area are industrial, commercial, residential, or agricultural can be made using available district census handbooks.

A senior official with Adani Power highlighted that for all special economic zones (SEZ), distribution companies can avail a “deemed distribution license” which allows them install alternate distribution infrastructure, thereby ensuring reliable electric supply to industrial consumers. Easing the license procurement process in SEZs allows for greater competition and improved supply. This foresight from the government has certainly helped industrial electricity access.

A senior official from the Gujarat Electricity Regulatory Commission (GERC) added that it had historically been difficult to get existing utilities to take on the task of building infrastructure from the ground up in SEZs. Therefore, the decision to allow private players was driven by necessity. He added that there has been a renewed interest within the government to develop public-private models, which currently do not have access to electric networks.

GRIDCO’s Mr. Swain added that the size of the geography to be served with reference to the consumer mix under that geographical area should be considered while deciding between licenses or franchises. He gave the example of Rajasthan, where franchising is the prevalent model. He suggested that in places where the operational area is smaller, franchises can operate successfully. However, for larger areas, licensing allows for more holistic development and business ownership.

B. Choosing Models of Operation

The prevailing opinion among private sector stakeholders is that the licensed distribution model is superior to the franchised model. This is due to private companies’ increased operational, financial, and managerial control in the former. Mr. Banga of Tata Power underlined this by stating that the raison d’être of the franchised model was so that the government could maintain ownership of distribution while leaving the improvement of operations to the private sector. He added that this is reflected by the fact that since franchised operators are contractors, their incentive to invest in operational and capital expenditure is very low. This in turn means that the private players do not make long-term investments in creating assets or improving technology. To this end, Tata Power advocated to the Ministry of Power to modify minimum investment for franchisee models so that companies would not just come in, squeeze existing assets, and leave them in a worse-off state.

Mr. Das from CESC added that franchises’ disinterest in making capital expenditure investments leads to a situation where franchise companies focus on following government incentives for reducing AT&C. Since reducing transmission and distribution losses requires capital investment, they tend to focus on billing and collection efficiency. He stated that the core of the problem behind franchised companies not making capital expenditure is the tariff model that the companies need to follow. Franchised operators are not included in the tariff setting and are instead “given” a tariff. Therefore, franchised companies cannot pass on expenditure as “passthrough costs,” and
consequently minimize it. The official from Adani Power added that since franchise operators are interested in improving billing and collection, they do not focus on network capabilities.

Another senior official from CESC adds that the sense of “ownership” differs between franchised and licensed operators. He adds that a franchised unit is just a contract, and therefore the private company doesn’t have an incentive to make long-term operational changes.

C. Evaluating Existing Performance

Before a private company bids on and takes over a public distribution company, it evaluates the data provided by the company to measure the takeover’s financial feasibility. The companies’ financial projections are based on expected performance stemming from the initial data provided. However, often this data tends to be faulty, thereby putting the companies’ plans at risk. If a company doesn’t have a precise understanding of where it stands, then it becomes difficult for it to ascertain how it should proceed. Mr. Banga added that not having good baseline data also causes frictions with private investors, thereby adding problems for the company.

However, the experience varies across different states. The official from Adani Power stated that MERC has a very sophisticated and robust system to ensure that companies are undertaking assessment and due diligence prior to acquisition. Mr. Raja stressed the importance of companies conducting independent data collection prior to takeover.

A senior official from GERC stated that it has instituted specific regulations to ensure that the existing company is sharing larger regulatory information pertaining to its utility, once a new player is trying to take over. This allows the new company to have a clear picture of the operations and finances of the utility before they make their final decision vis-à-vis the takeover.

D. Assessing Sociopolitical Factors

It is important to assess the sociopolitical factors involved in this debate in order to understand the public sentiment vis-à-vis privatization. Overwhelming negative sentiment can be detrimental to company operations, and private companies have had a mixed experience interacting with labor unions and customers. Torrent Power, for instance, has had various bad experiences dealing with both. In 2012, massive blackouts in Agra precipitated widespread protests and the kidnapping of company employees; in 2013, tariff increases in Bhiwandi caused massive protests. In 2015, Samajwadi Party (SP) leaders accused the company of harassing customers and forced it to shut down one of its offices in the city. The same year, after widespread protests by the Kanpur Electricity Supply Corporation (KESCO) staff, Torrent’s agreement to work in Kanpur was canceled by the Uttar Pradesh government. In 2021, Maharashtra Navnirman Sena (MNS) workers vandalized company offices in Bhiwandi, and in 2022, company offices in Agra saw widespread agitation. Adani Power also faced agitation from power sector workers in 2022.

The official from CESC stated that the company had a negative experience in its attempt to begin operations in Chandigarh due to resistance from existing employees. On the other hand, their transition in Rajasthan was very smooth—which he credited to customers’ previous experience
interacting with private power distribution companies. Another source from CESC stated that the company has past experiences where customers have removed smart meters, thereby posting additional costs for the company.

Mr. Banga from Tata Power mentioned that the response from customers and labor unions also depends on the reputation of the company. He stated that during Odisha’s first experience with privatization in 1999, the companies faced pushbacks from both labor unions and customers. However, when Tata Power started operations in 2020, there was virtually no pushback. He based this response on the company’s reputation. He added that customers often don’t care about where their electricity comes from if they have reliable supply and good customer service.

E. Contract Negotiation

Setting clear terms of operations between the government and private sector companies is crucial for the healthy operation of the firms. Certain pain points that exist include investment burdens of each party, tariff setting, performance assessment, and government incentives.

Mr. Raghav Kanoria, managing director of IPCL, stated that the company’s experience taking over franchised operations in Bihar wasn’t fruitful since there was a misalignment of expectations vis-à-vis investments between the government and the company. Specifically, IPCL expected government support in terms of capital expenditure investments to supplement their own, per their agreement. However, the government did not provide the assured investments. Prior agreement on the repercussions of non-adherence of clauses could hence be beneficial. Mr. Swain stated that deciding which areas each party needs to invest in is also crucial for a good government-company relationship. He stated that there are multiple “social investments” that might not be feasible for the private sector to make unless they are mandatory. Here, the government may consider assisting PPP licensees in some non-remunerative areas. For instance, in Odisha, distribution infrastructure passing through forest areas was causing the electrocution of animals. The government spent roughly ₹600 crores ($70 million) to raise the height of electricity poles, insulate conductors, add spikes on poles, and take other measures to improve animal safety. The government also invested in shifting lines and transformers from the premises of schools and anganwadis for safety purposes. Since this was not a commercially oriented investment, the government did not expect the private sector to undertake it. Other areas that the government has made investments in include rural household electrification, cyclone-resilient infrastructure, and support in the energy transition process. Setting clear expectations on the areas of investments, thus, can inspire confidence.

Interactions with regulators are rife with friction caused during tariff setting. Prior discussions can help in managing expectations and ease some friction among stakeholders. The regulators are responsible for setting the energy tariffs that all other stakeholders—such as generators, distribution companies, and transmission companies—must abide by. The official from BSES stated that the Electricity Regulatory Commission’s (ERC) practice of setting tariffs for the entire segment—including generation, transmission, and distribution companies—and not providing a revenue-sharing breakdown for different stakeholders can be problematic. Distribution companies, as the last link in the chain of electricity provision, are at a disadvantage in securing part of the revenue for themselves. Power purchase comprises approximately
80 percent of the total costs. Cross-subsidy charges also tend to be unreasonable. For franchises, this problem gets further aggravated since they do not have any say in this process. In 2022, Torrent Power had pending undisputed claims worth ₹1,344 crores (about $160 million) and disputed claims worth ₹604 crores (about $72 million). On tariff setting, Mr. Banga added that in some cases, well-performing private sector companies are pushed to the verge of poor performance due to government interference. He gives the example of Tata’s Delhi distribution network. He stated that since the chief minister won the elections on the plank of free electricity, he is averse to raising power tariffs. Due to this, the company hasn’t been able to raise the tariffs, despite petitioning for the past eight to nine months. Governments should therefore attempt to address private sector fears over tariff setting.

Additionally, there are tensions vis-à-vis proper auditing and performance assessment. Mr. Banga mentioned that the center and state regulators emphasize getting data auditing done properly. However, often data recording simply doesn’t exist at the level of various public sector as well as private utilities. Often, companies don’t report the data and regulators don’t ask for it. The lack of proper auditing and assessment is underlined by Mr. Kanoria of IPCL. He stated that despite a contractual obligation, regulators did not seek an independent performance assessment from them and the public sector distribution company, thereby making it impossible for his firm to be able to benchmark their performance and mark it against their initial agreement. The respondent from BSES stated that private discoms are exempted from receiving benefits from government programs and schemes for discom improvement. This means that private sector companies do not receive government-allocated funds for improving the distribution sector. While this is acceptable in principle, Electricity Regulatory Commissions need to consider that this impacts costs and tariffs. The problem is more acute for franchise operators. Mr. Banga stated that whenever new funds come for modernization, discoms do not pass on the funds for areas being served by franchises. The companies wish to spend the money on the areas they directly serve. This is incongruent since, as per the franchise model, the government ultimately owns the utilities being run by the private companies as well.

2. Post-takeover

Immediate Changes
A. Initial Assessment

As stated in the section above, having access to good baseline data is crucial to creating realistic projections about a company’s operational and financial performance. Mr. Rajib Das from CESC underlined the importance of having good baseline data and stated that companies should not only rely on government sources but also undertake a survey themselves soon after taking over the utility. This allows companies to have their own verified baseline data on which to formulate their projections. It could be beneficial for the government to mandate private companies to undertake a baseline data assessment soon after they take over; several regulators already do this. Government incentives such as financial support for the assessment can go a long way.
B. Human Resources and Management

Due to political and employment considerations, most private sector takeovers of distribution companies in India include an employee retention clause. This is done to provide safeguards or employment options for existing government employees, but it can be challenging for a private firm trying to bring in a new institutional culture in the organization. Therefore, it becomes important to set a vision for the company and ensure that all employees—new and old—are in sync with the company agenda. A senior official from CESC noted that even though there is an option for previous employees to stay on at the new company, several choose not to do so. Giving the example of an operation takeover in Maharashtra, he stated that the inability to seek rents once the private companies take over disincentivizes middle- and senior-level managers to remain. On the other hand, in Rajasthan several managers stayed but workers left. The official added that there is a dearth of talented power sector employees in the country, and therefore the company must aim to create a conducive environment to attract this talent.

The official from Adani Power stated that the company took a different approach in Mumbai and retained as much talent as it could. He stated that rather than bringing new employees, the company focused on providing better key performance indicators (KPIs) for existing employees and helping them achieve their productivity. The company only hired new talent in areas where there was no existing capability.

Additionally, the company also must ensure that there is no friction between the new management and employees, as well as between the company and government stakeholders. Mr. Banga from Tata Power stated that when the company took over utilities in Odisha, the Odisha Electricity Regulatory Commission (OERC) set up a four-member board and made a government secretary its chairman. This allowed better coordination between the government and private stakeholders.

The official from GERC mentioned that the success of a utility ultimately depends on cost recovery. To ensure that companies are maintaining their financial hygiene, GERC has instituted a quarterly mechanism for reviewing retail tariffs. This eases the way for private sector companies.

C. Managing Existing Customers

When there is a change in the management of a distribution company from public to private, there can be consumer anxiety over potential tariff increases, or fears about private sector apathy to operational issues. The private companies must address these as soon as possible.

Mr. Banga from Tata Power stated that in his experience consumers don’t care whether their electricity is being provided by government or private sector players. They do, however, care about tariffs. Assuring consumers that the private company will not raise tariffs for five years helps assuage these concerns. In the meantime, the private company gets an opportunity to improve the supply. Consumers also get accustomed to improved delivery, and hence they have a propensity to accept higher tariffs. He added that Tata’s brand image as a trusted 100-year-old firm does certainly help.
Another way to ensure that customer anxieties are being addressed is through opening call centers and advertising them heavily. An official from CESC stated that this is a low-cost, high-visibility measure. Torrent Power launched its fully digitalized trademark “Plugpoint” call centers since 2016. Adani Power has been able to improve customer service by leveraging two technologies. First, they have introduced an AI chatbot, which can help customers with basic services. Second, they also developed a video contact center, through which concerned customers can speak to an agent over video call. Speaking to a person helps assuage customer anxieties. On the other hand, the customer agent has access to a dashboard with information on the customers, which they can use to provide better customer service.

D. Quick Fixes

The rationale behind implementing fast, highly visible operational improvements is twofold. First, it allows the private company to build a positive image that it can leverage to improve customer relationships. Second—and more importantly—making low-cost operational improvements allows the private company to improve its cashflows and develop a corpus of capital that it can then utilize for making large capital investments.

The immediate operational improvements that were most frequently mentioned during interviews surround billing and metering. Often, when private companies take over, they realize that the previously operating public sector utility was underbilling consumers or not billing them at all. While sometimes this is due to faulty billing, often it is due to consumer firms securing unapproved preferential pricing due to a lack of proper oversight and transparency. Mr. Banga from Tata Power stated that the company must ensure that it is regularly billing consumers, sending them the bills, and providing them with electricity access 24/7. Only then, if a consumer refuses to pay, it is fair to cut their connections. Giving the example of areas where the company has been able to increase its collection efficiency from under 50 percent to 99 percent, he added that consumer education, and creating a mindset that electricity is a service that people need to pay for, goes a long way. The official from Adani Power concurred on the importance of consumer education. However, he argued that companies cannot take a “one size fits all” approach, and for certain areas better enforcement and coordination with local authorities can help. He added that building small customer care kiosks in multiple areas, where employees can assist customers with adopting digital tools, combined with rapid digitization, can help ease the way.

The respondent from CESC stated that they once found that large industrial consumers were being underbilled by a factor of 15 to 20. This was presumably due to collusion between the consumers and previous officials. While effective metering offers a solution for this, it can be very expensive to adopt cutting-edge smart meters. There has also been some level of consumer pushback against smart meters. He stated that the company has been able to move to a new, low-cost technology for meter reading which consists of a $0.80 port that can be installed on any smartphone. Using a mobile app, the port can provide meter readings within seconds.
Long-Term Changes

A. Operational Improvement through Capital Expenditure

Once a private company has been able to make the discom profitable, it can start making long-term capital expenditures. Long-term capital expenditure is critical to the sustainability of long-term plans for the firm to remain profitable and ensure that the distribution technology is keeping pace with industry requirements. The optimization of capital expenditure takes time and firms cannot expect to seek quick returns from this.

Apart from moving away from regulatory assets, the emphasis of capital expenditure needs to be on technology adoption. Two areas were highlighted during conversations: improving cyber infrastructure, including data and security, and modernizing physical infrastructure.

Mr. Banga from Tata Power stated that there are two reliable data points that the private firms have access to: input cost of energy and money entering the companies’ bank accounts. Metrics such as billing and collection efficiency, as well as AT&C, can be manipulated using accounting techniques. However, better data can allow for improved collection, management, and analysis of the data. Mr. Raghav Kanoria from IPCL added that the company has benefited from making advances in smart metering and billing.

Torrent Power has made strides in tech adoption for data management, and as of 2022, it has digitized all its documents and customer details and implemented Geographical Information System (GIS) technology for mapping consumers. Additionally, it has achieved 60 percent digital payments from its consumers. Torrent has also been able to develop advanced National Accreditation Board for Testing and Calibration Laboratories (NABL) for improving meter testing and billing. The company has also focused on strengthening cybersecurity measures, including developing multi-factor authentication at its facilities, privileged access mechanisms, endpoint detection and response, cyber crisis management plans, and a dedicated cybersecurity cell.

The official from Adani Power stated that the company has benefited from adopting artificial intelligence and machine learning to better forecast energy demands. Additionally, creating digital payment mechanisms for payments has increased digital payment from 30 to 75 percent in the past five years. The company has also improved data collection and management infrastructure.

Mr. Swain from GRIDCO added that technology adoption in the private sector is usually quicker. This is because the private sector tends to be more agile in comparison to public companies, and it often doesn’t need to operate through the same processes as the government does.

Modernizing physical infrastructure includes improving transmission and distribution networks. This includes investment in improving load centers as well as the cable networks. For instance, Torrent Power in Ahmedabad was able to bring down the transformer failure rate to 0.3 percent as of 2022—compared to the national average of 15 percent—by installing 12,000 distribution transformers in the service region. Additionally, it has modernized the cable infrastructure by replacing the old and obsolete networks—including paper-insulated lead-covered (PILC) cable—with cross-linked polyethylene (XLPE) cable networks in the city.
B. Cost Optimization

While improving operational performance is beneficial for the financial health of a firm, interviewees from private discoms report that approximately 80 percent of their total operational cost is the price of procuring electric power. Given that private companies have little to no control on setting power prices, they must try to reduce all other redundant expenditure. One way of doing that and remaining lean is to outsource all “non-core” operations. The respondent from BSES mentioned that outsourcing tasks such as technology adoption and non-core manpower allows the company to leverage existing expertise without having to build its verticals. This ensures that management remains focused on the core tasks of the firm.

3. Opportunities and Challenges

A. Renewable Energy

From the interviews, there is consensus among private sector stakeholders that renewable energy adoption is a significant opportunity. On the supply side, there is impetus from the government to incentivize renewable energy procurement through mechanisms such as renewable purchase obligations (RPOs). The respondent from BSES estimated that the organization should be able to move to 20 or 30 percent renewable energy generation over the next few years. One of the respondents from CESC stated that at the root of it, renewable energy procurement is a financial decision for firms. The good news is that after taking multiple factors into account, such as aging thermal plants and the penalties for not including renewable energy in the mix, procuring renewable energy is cost-effective for firms. This is also reflected in several firms’ expansion of renewable energy assets. For instance, as of 2022, Torrent Power’s renewable energy generation mix has reached 25.6 percent, and it is currently in the process of acquiring 1.1 GW capacity from ReNew Power. The official from Adani Power stated that the company has increased renewable energy penetration, from 3 percent at the time of takeover to 30 percent in 2023; they further intend to increase it to 60 percent by 2027.

On the supply side, Maharashtra Electricity Regulatory Commission (MERC) has provided its consumers with the ability to choose where their energy comes from. For instance, in Mumbai, companies have offered consumers the ability to pay a premium tariff to ensure that their electricity is being procured from green energy sources. Odisha Electricity Regulatory Commission (OERC) has also offered a green tariff in Odisha. It must be noted that the first company to offer green tariffs in India was a public sector company—the Bengaluru Electric Supply Company (BESC), in Karnataka.

Distribution companies sit at a unique intersection where they both demand and supply renewable energy. Allowing them to gain freedom from legacy power purchase agreements (PPAs) could further incentivize them to procure renewable energy. In 2019, Tata Power advocated to MERC for consumers’ right to choose a green tariff, albeit at different prices. MERC agreed and allowed all electricity utilities in the state to raise the price by ₹0.66 (about $0.008) per unit for electricity sourced from renewable energy plants. MERC has reported an enthusiastic response from domestic and corporate consumers alike. Currently, Tata Power has 20,000 green customers consuming approximately 200 million units a month, with about 1,000 consumers being added each month. Adani Power in Mumbai has over 50,000 green tariff consumers. However, even as the central government has introduced the
Electricity (Promoting Renewable Energy Through Green Energy Open Access) Rules, 2022, several states have not accommodated for these regulations. Mr. Raja stated that promoting open access is crucial for discom reforms. He added that promoting open access, while progressively reducing cross subsidies, can go a long way in the development of retail electricity markets.

The respondent from GERC stated that there is increasing interest in allowing franchisee companies to develop renewable energy microgrids in rural areas. Additionally, he added that private companies can be incentivized to install renewable energy by allowing for price differentiation between different consumers.

Mr. Swain from GRIDCO provided the perspective of government-owned generation companies. He stated that there has been progress in expanding renewable energy generation capacity, due to support from both the central and state government. For instance, due to a low available solar/wind gradient, the cost of solar and wind production in Odisha is high. The government has been offering incentives in the form of waiving off wheeling charges, electricity duty, and transmission charge concessions to keep the price low. However, grid stability remains a challenge, and the state wishes to have investments in renewable energy storage technologies, especially pumped hydro storage.

B. Institutional Challenges

Several institutional challenges can be addressed through effective policy interventions. These include land acquisition, limited institutional capacity, and regulatory awareness. The official from BSES stated that the type of city and land availability for infrastructure improvements is a key consideration when companies are deciding to bid for areas, since the cost of building infrastructure is difficult in certain places due to differences in population density and land availability. The government can ease the process of land acquisition to incentivize companies to work in such areas.

Corporate disputes between regulatory bodies and companies often lead to a capital crunch for the firms. These are accentuated by limited institutional capacity and the existing regulatory model. For instance, in 2016, Torrent Power filed a case before the Appellate Tribunal for Electricity (APTEL) challenging GERC’s order for revising the regulatory charge down by roughly 60 percent. APTEL in turn referred the case back to GERC, which maintained its original position. While Torrent Power reserves the right to appeal to the Supreme Court, an expansion of institutional capacity would allow quicker reprieve to potential private sector partners.

Another example of limited institutional capacity is the delay by state regulators in implementing the “Automatic Pass-Through Model.” Torrent Power states in its 2022 annual report that even as the Ministry of Power came up with the Automatic Pass-Through Model to enable distribution companies to pass on the increase in fuel prices through tariffs, the Gujarat Electricity Regulatory Commission (GERC) had yet to come up with guidelines to implement it. Mr. Kanoria added that the central government was taking steps in the right direction. For instance, he mentioned that the 2022 Draft Electricity (Amendment) Rules require utilities to revise tariffs monthly to reflect a change in power purchase costs. However, it remains to be seen whether the bill will pass and, if so, how states will respond to it.
The official from Adani Power stated that both the government and companies should focus on increasing competition in the sector. He argued that it is imperative for customer centricity that different companies be allowed to set up their own infrastructure and allow customers to choose—akin to airlines and telecom providers. He highlighted that there is increased interest from the central government in increasing competition in the sector. The respondent from GERC concurred, adding that the commission values competition over efficiency. He added that the government tries to bring in private players in areas where there might be a natural government monopoly, such as infrastructure development. Ultimately, the goal is to increase competition and create supply-based tariffs.

Finally, the respondent from BSES claimed that there is a lack of regulatory awareness. The government in Delhi makes promises such as 24/7 power and consumer protection; however, discoms are often left out of the loop, and this can be a problem. More interaction between the government and private providers can thus be beneficial.

Table 5: Checklist for Discom Privatization

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<th>Phase</th>
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<td>Choosing models of operations</td>
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<td>Evaluating existing performance</td>
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<td>Assessing sociopolitical factors such as labor unions</td>
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<td>Bidding considerations</td>
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<td>Laying clear operational expectations during contract negotiations</td>
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<td>Post-bidding considerations</td>
<td>Running mandatory performance assessments of utility</td>
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<td>Supporting easy transition with employee unions</td>
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<td>Managing existing customers through confidence building</td>
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<td>Supporting collection and billing efforts through help in enforcement</td>
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<td></td>
<td>Providing incentives for long-term capital expenditure investments</td>
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<td></td>
<td>Supporting renewable energy integration through green tariff approvals and other means</td>
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About the Authors

**Richard Rossow** is a senior adviser and holds the Chair in U.S.-India Policy Studies at the Center for Strategic and International Studies (CSIS). In this role, he helps frame and shape policies to promote greater business and economic engagement between the two countries, with a unique focus on tracking and engaging Indian states. He has been working on U.S.-India relations for over 25 years. He joined CSIS in 2014 after a long career in a range of private sector roles focused on India. Prior to CSIS, he served as director for South Asia at McLarty Associates, leading the firm’s work for clients in India and the neighboring region, and he retains his affiliation with the firm. From 2008 to 2012, Mr. Rossow was with New York Life Insurance company, most recently as head of international governmental affairs, where he developed strategic plans for the company’s public policy and global mergers and acquisitions work and helped manage the firm’s policy issues in India. From 1998 to 2008, Mr. Rossow served as deputy director of the U.S.-India Business Council (USIBC), the world’s leading advocacy group on behalf of strengthening economic ties between the United States and India. While at USIBC, he managed the council’s policy groups in the energy, information technology, insurance, media and entertainment, and telecommunications sectors. Mr. Rossow received his BA from Grand Valley State University in Michigan.

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Appendix 1

India’s History with Discom Reforms

1995: ODISHA ELECTRICITY REFORMS ACT
The Odisha Electricity Reforms Act in 1995 marks the first significant structural reform undertaken by a government in India. The reforms were initiated against the backdrop of consistently poor performance by the Orissa State Electricity Board (OSEB). AT&C rates hovered around 50 percent in the state between 1991 and 1992, and the board required regular capital infusions by the state government. When subsidy disbursals were delayed, the gap between peak demand and supply grew to 45 percent. Due to the poor performance of the OSEB, the World Bank withdrew support from a pending hydropower project in 1991, contingent on significant power reforms.

The government of Odisha responded to this by introducing the Electricity Reforms Act, which unbundled and corporatized OSEB. The objective of the reforms was threefold: first, removing government control from electricity boards; second, introducing competition in the sector; and third, attracting private sector investment. The assets, liabilities, staff, and statutory obligations of OSEB were transferred to successor companies as per OER Act, 1995. The verticals of generation, transmission, and distribution were separated. Hydropower generation stations were transferred to Odisha Hydro Power Corporation (OHPC). Transmission and distribution businesses were transferred to GRIDCO. OHPC and GRIDCO began operations on April 1, 1996, as government-owned entities. In 1998, the distribution business was broken down into four zones and given to two private distribution companies: Applied Energy Services (AES) and Bombay Suburban Electric Supply Limited (BSES).
1998: ELECTRICITY REGULATORY COMMISSION ACT
The Odisha reforms were followed by the 1998 Electricity Regulatory Commissions Act. A joint conference of all state chief ministers identified political interference as a major hindrance to the growth of the energy sector. To this end, the act sanctioned the creation of State Electricity Regulatory Commissions (SERC) with the power to set tariffs. Much before that, in August 1996, the Orissa Electricity Regulatory Commission (OERC) (later changed to Odisha Electricity Regulatory Commission) was established as the first Electricity Regulatory Commission in India.

2001: ACCELERATED POWER DEVELOPMENT PROGRAMME SCHEME (APDP)
Worried about the cumbersome performance by state utilities, the central government launched the APDP in 2001. The scheme had a corpus of ₹1000 crore ($121 million) which was to be disbursed as additional Central Plan Assistance to State Governments under the 2001 annual budget.

Even after disbursing three times the original intended amount, however, the plan was seen as a failure. High commercial losses, too many involved procedures, and a focus on input-based instead of performance-based disbursals were seen as challenges.

2001: STATE ELECTRICITY BOARDS (SEB) BAILOUT
In 2001, the central government decided to provide a bailout of roughly $7.4 billion to SEBs, with the presumption that a one-time package would allow the boards to start with a “clean slate.” The bailout converted 50 percent of the outstanding debt into state government bonds and waived off the remaining debt altogether. However, even as SEBs started the next financial year, the debt quickly accumulated again.

2003: ELECTRICITY ACT
The objective of the 2003 Electricity Act was threefold: first, to establish national and state-level regulatory bodies for the rationalization of tariffs and subsidies; second, to streamline the transmission and sale of power; and third, to introduce the concept of distribution “franchising.” While many of the intended reforms had mixed success, the concept of discom franchisees struck a chord with several governments. This opened the floodgate of governments implementing the franchising model, with Bhiwandi in Maharashtra taking the lead.

2003: ACCELERATED POWER DEVELOPMENT REFORMS PROGRAMME (APDRP)
The APDRP was initiated to overcome the challenges of the APDP scheme. The idea was to streamline the disbursal process and ensure that grants were strictly tied to reforms. It was noted that access to grants should only be provided to states once they clear past dues pending with the respective State Electricity Boards, thereby creating an incentive structure for reforms. However, the APDRP scheme did not yield substantial results either.
**2008: RESTRUCTURED ACCELERATED POWER DEVELOPMENT REFORMS PROGRAM (R-APDRP)**

The R-APDRP took the APDRP further and aimed to focus on select urban areas with a population of 30,000 people or more.\(^{115}\) The primary objective of the program was to reduce AT&C losses in the selected areas, with road maps for reducing the losses by 3 percent per annum for utilities with losses higher than 30 percent and by 1.5 percent for utilities with losses lower than 30 percent. R-APDRP did have an impact on improving the operational efficiency of discoms. However, it was limited.

**2012: FINANCIAL RESTRUCTURING PACKAGE (FRP)**

By 2012, the total short-term exposure of the banking sector to discoms attained an unprecedented level of approximately $18.6 billion. This was primarily being used by discoms to fund losses, and payment default seemed imminent.\(^{116}\) Defaults could have cascaded into a huge non-performing asset crisis for banks, and to avoid that, the government announced the Financial Restructuring Package (FRP).\(^{117}\)

Under the FRP, states took over 50 percent of pending short-term loans and converted them into government guarantee-backed bonds with a three- to five-year moratorium period and repayment over 10 years. The other 50 percent was restructured into long-term loans, with lenient repayment terms and waiver of penal interest.

**2015: UJWAL DISCOM ASSURANCE YOJANA (UDAY)**

Launched by the Ministry of Power in 2015, UDAY was the first major power reform undertaken by the Modi government after coming to power in May 2014.\(^{118}\) The scheme has five core objectives: financial turnaround, operational improvement, reduction in the cost of generating power, development of renewable energy, and energy efficiency and conservation. The objective was to reduce AT&C losses to 15 percent and the ACS-ARR gap to 0.

The scheme aimed to address the large-scale legacy debts of discoms, which had accumulated to approximately $52.4 billion by 2014. Under the scheme, states were expected to take over 75 percent of pending discom debt and reduce the interest cost from 14–15 percent to 8–9 percent. The remaining debt was converted by banks and financial institutions into loans with an interest rate of the banks’ base rate plus 0.1 percent. Sixteen states signed a comprehensive memorandum of understanding (MOU), whereas ten states and one union territory signed an operational MOU.\(^{119}\)

The program had mixed success. By January 2019, AT&C losses had decreased to 20 percent. The ACS-ARR gap came down to ₹0.3 per unit by January 2019. Other areas of work such as rural feeder metering, DT metering, smart metering, feeder segregation, and electricity access to unconnected households also showed limited success and missed original targets.\(^{120}\)

**2020–2021: STIMULUS PACKAGES**

In the face of the Covid-19 pandemic, discom health worsened. The backlog of payments owed to power generators reached $18 billion.\(^{121}\) To address this, the government announced $13 billion to provide increased liquidity to discoms.\(^{122}\) In 2021, the government announced the Revamped
Distribution Sector Scheme (RDSS), another results-oriented package for discoms to promote smart grid integration and the installation of smart meters.\textsuperscript{123}

**2022: REVAMPED DISTRIBUTION SECTOR SCHEME (RDSS)**

The RDSS was approved by the government in 2021, with a five-year outlay worth ₹3,03,758 crore (about $37 billion).\textsuperscript{124} The outlay includes government budgetary support of $11.8 billion. The objective of the RDSS is to improve the operational and financial performance of discoms by providing results-linked financial assistance.\textsuperscript{125} The scheme aims to reduce national average AT&C losses to 12–15 percent and the ACS-ARR gap to 0 by 2024–2025.

The RDSS has three components.\textsuperscript{126} The first is focused on providing financial support for prepaid smart metering and billing, the second focuses on the upgradation of distribution infrastructure, and the third involves building capacity and enabling the supporting activities of discoms. The scheme is being marketed as uniquely representative of states’ needs; however, it is too soon to measure its operational effects.

**2022: ELECTRICITY (AMENDMENT) BILL, 2022**

The Electricity (Amendment) Bill aims to further promote parallel licenses that were originally introduced in the Electricity Act of 2005. As per the bill, network-owning discoms will be required to provide open and non-discriminatory access to their networks to other discoms. The bill has not been passed yet.

**2023: ELECTRICITY (AMENDMENT) RULES**

Amending the Electricity Act of 2003, the rules include two parts relevant to discoms. The first clarifies the duration of contracts for licensed and deemed license distribution utilities. Additionally, it ensures that, in specific cases, licenses will automatically renew unless revoked. The second mandates that commissions will need to issue information surrounding the subsidy demands raised by distribution license holders and declare whether the subsidy requirements were met.
Appendix 2

Annual Integrated Rankings and Ratings of Discoms: Discom Operational and Financial Performance

OPERATIONAL PERFORMANCE
India’s discoms suffer from high AT&C losses and high ACS-ARR gaps. However, there has been improvement in most performance metrics.

AT&C losses have come down from 25.48 percent in 2012 to 22.33 percent in 2019, lowering further to 16.5 percent in 2022. Twenty-five Indian states improved their AT&C rates between 2020 and 2022. However, 52 percent of national AT&C loss is made up by five states: Uttar Pradesh, Maharashtra, Madhya Pradesh, Rajasthan, and Tamil Nadu. Uttar Pradesh continues to have a high AT&C loss rate of 30 percent, which the government aims to reduce to 12 percent by 2025. For reference, the global average for transmission-related losses is approximately 8 percent. China is at 5.3 percent, and the United States is around 5 percent. India’s transmission losses of 19 percent are comparable to other middle-income countries such as Brazil (15 percent) but substantially higher than neighboring Bangladesh and Sri Lanka (both 11 percent).

The ACS-ARR gap reflects the per unit gap between the cost of electricity procurement incurred by the distribution company and the revenue realized. Therefore, a positive ACS-ARR reflects higher cost than revenue, indicating that the distribution company is incurring a loss for supply per unit of electricity. India has consistently had high ACS-ARR gaps. While it has come down from $0.01 per unit in 2012 to $0.0049 per unit in 2022, the government aims to further reduce this to zero by 2025.

Collection efficiency reflects the rate of collection from people who receive electricity bills, whereas billing efficiency indicates the rate of customers who are billed for their consumption. The collection efficiency in India has decreased slightly from 99.1 percent in 2014 to 97.2 percent.
in 2022, whereas the billing efficiency has increased from 77.8 percent to 86 percent in the same duration. The drop in collection efficiency is not necessarily an indicator of decline—it possibly reflects lower collection because of significantly higher billing. States such as Uttar Pradesh and Bihar still lag in collection and billing.

**FINANCIAL PERFORMANCE**

The total sectoral debt for Indian discoms stands at $75 billion as of January 2023. Fifty-seven percent of this debt ($42.75 billion) is from four states: Tamil Nadu, Uttar Pradesh, Rajasthan, and Madhya Pradesh. The total cash adjusted gap for distribution companies has come down from $8.6 billion in 2014 to $6.4 billion in 2022. However, several states still lag.

In Tamil Nadu, the total debt owed by the Tamil Nadu Generation and Distribution Company (TANGEDCO) is $20.1 billion. As of 2023, this represents 25 percent of the state’s total debt of $79.1 billion and 5.8 percent of the state’s total gross state domestic product (GSDP) of $343 billion. Similarly, in 2022, Uttar Pradesh’s total discom debt of $3.5 billion was 3.45 percent of its total debt and 1.1 percent of its total GSDP of $296 billion.
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