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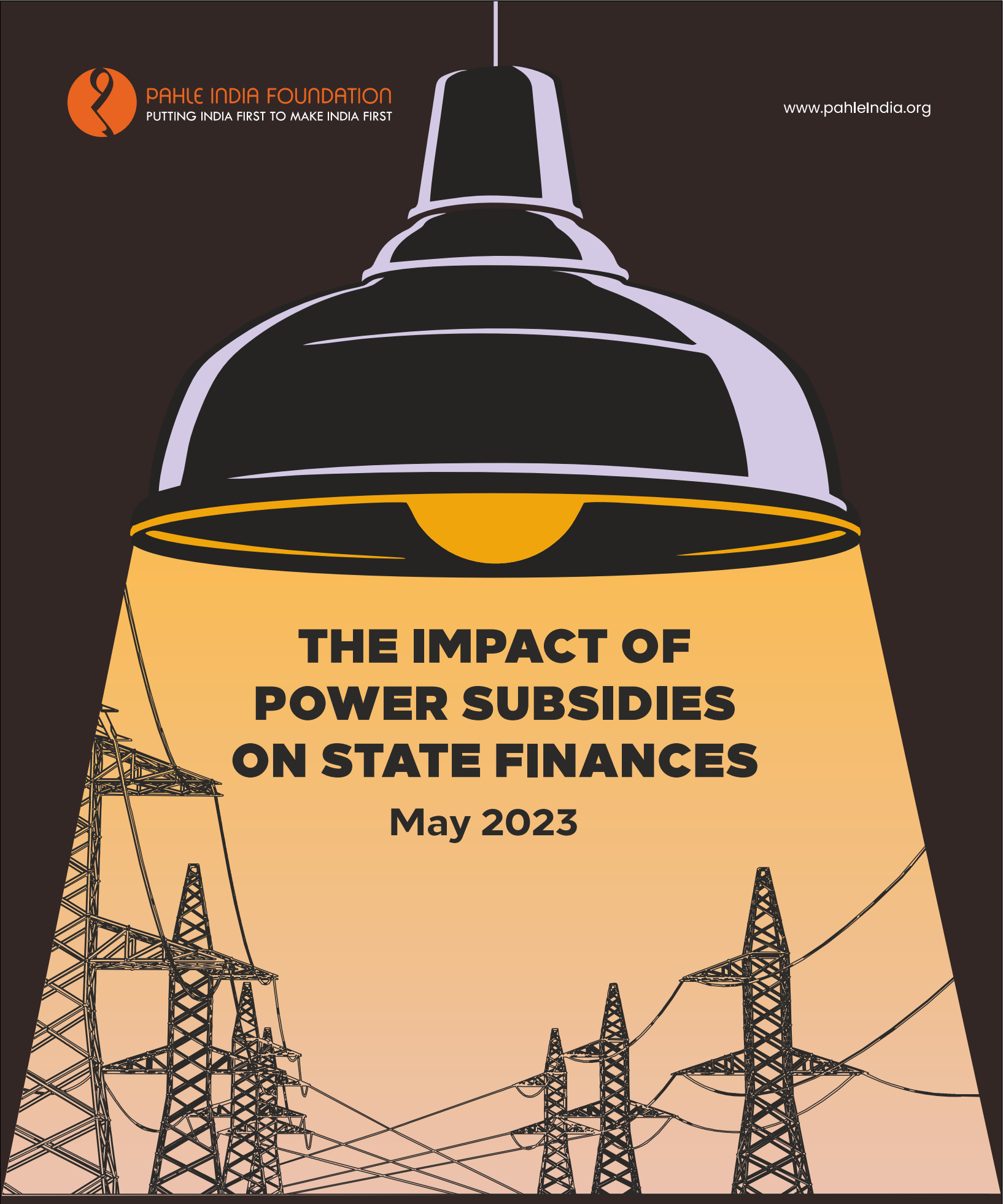

THE IMPACT OF POWER SUBSIDIES ON STATE FINANCES

May 2023

Shreya Ganguly, Pahle India Foundation

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Authors

Shreya Ganguly

Research Associate

Foreword

Subsidies to the power distribution sector form a high proportion of state budgets and continue to increase year on year. There is an ongoing discourse around the legitimacy of these subsidies, debating whether they constitute genuine welfare of the citizens as enshrined in the directive principles for state policies in the Constitution of India, or are non-merit "freebies" for short-term electoral gains at the cost of long-term development.

Irrespective of whether these power subsidies constitute social welfare, they certainly have serious impact on the financial status of the states. The subsidy by a state must be based on the ability to raise financial resources and thus the financial strength of the state. Providing undeserved and non-targeted subsidies in an already financially weak state makes it even weaker and specially diminishes its capacity to give additional support to the power sector.

> High electricity tariffs for industrial and commercial consumers undermine the competitiveness of energy-intensive industries, slowing down India's dream of becoming a manufacturing hub

In a June 2022 report, the Reserve Bank of India linked the precarious state of state finances to high power subsidies. In August 2022, the Supreme Court referred the matter to a three-judge bench for examination of the question whether the grant of subsidies by the state governments is a wasteful and unlawful expenditure and whether the Court can set some guidelines on the nature and extent of such subsidies. The matter is still pending.

In this context, this study examines the link between power sector subsidies and the financial health of states that offer them. The study focuses on a sample of six "fiscally compliant" states and six "fiscally non-compliant" states, classified as compliant based on their ability to remain in Fiscal Responsibility & Budget Management (FRBM) Act's targeted fiscal deficit of 3% of the GSDP by March 31, 2021. It finds that fiscally compliant states provide lower power subsidy and have lower AT&C losses in power distribution. The health of the power sector is inextricably linked with the financial health of the state. The study notes that the power subsidy regime in its current form fails to target the poorest households optimally and recommends smarter beneficiary targeting to reduce the fiscal burden of the state.

The poor performance of the power distribution sector has ripple effect on the overall economy of the state. Unprofitability in the power sector prevents investment in renewable energy generation, hindering India's transition to net zero emissions. High electricity tariffs for industrial and commercial consumers undermine the competitiveness of energy-intensive industries, slowing down India's dream of becoming a manufacturing hub. Moreover, the subsidy regime distorts the incentive structure for efficiency improvements and rational electricity consumption.

We hope this study by Pahle India Foundation will be germane to many studies on power sector specially on climate change and sustainability. There are many insights in this report that we hope you will find interesting. We look forward to receiving your feedback.

Mr. Ashish Kumar
Distinguished Fellow,
Pahle India Foundation
Former Director, **UN Statistical Institute for Asia and the Pacific**
Former Director General, **Central Statistics Office, Government of India**

Acknowledgements

Without the help of several people, this report would not have been possible.

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All errors are the author's sole responsibility.

Content

Glossary

Discoms: Power Distribution Companies.

Gencos: Power Generation Companies.

Billing Efficiency: Total energy billed to consumers by discoms as a proportion of total energy input.

Collection Efficiency: Revenue collected by discoms from consumers as a proportion of billed amount.

AT&C Losses: Aggregate Commercial & Technical Losses, an indicator of discoms' ability to recover the cost of power sold. AT&C Losses = [1 - (Billing Efficiency x Collection Efficiency)] x 100.

ACS-ARR Gap: The gap between aggregate cost of supply (ACS) and aggregate realisable revenue (ARR). A higher ACS-ARR gap implies a higher monetary loss incurred by discoms.

Gross Fiscal Deficit: The excess of total expenditure over the total revenue of the government, or the borrowings of the government used to finance expenditure.

Revenue Deficit: The excess of revenue expenditure over revenue receipts, used to fund government expenditure that does not generate returns.

Fiscally Compliant States: States in relatively good fiscal health, as indicated by their compliance with the gross fiscal deficit and debt targets set by the Fiscal Responsibility and Budget Management (FRBM) Act in FY 21, which recommends that gross fiscal deficit be lower than 4.5% of GSDP and debt be lower than 33.1% of GSDP in FY 21.

Fiscally Non-Compliant States: States in relatively poor fiscal health, as indicated by their non-compliance with the gross fiscal deficit and debt targets set by the Fiscal Responsibility and Budget Management (FRBM) Act in FY 21.

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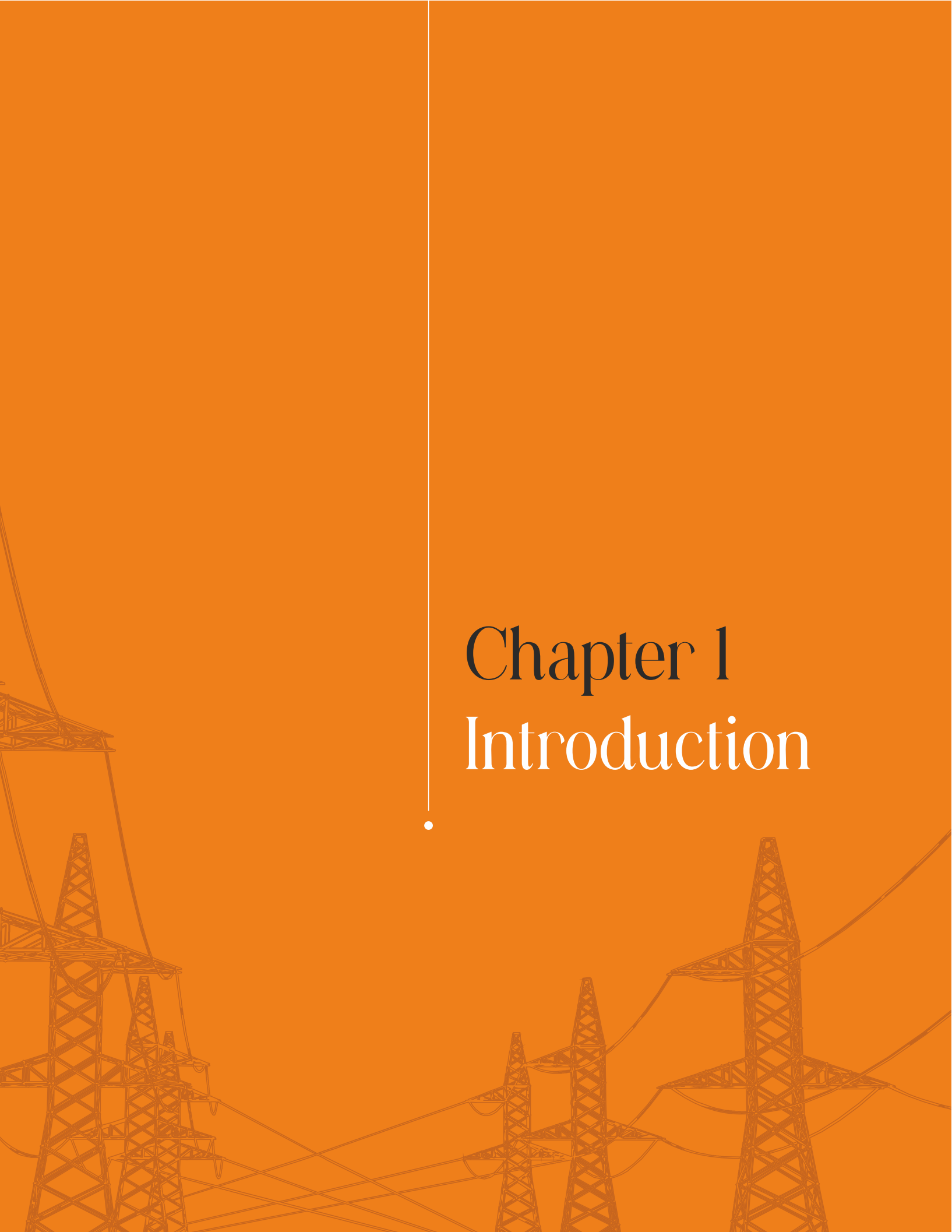
Chapter 1
Introduction



Sustainable Development Goal 7 sets the global target of providing universal access to affordable energy services by 2030. Access to electricity plays a pivotal role in accelerating the socio-economic development of a country, as it affects a wide range of indicators, including health, education, and poverty reduction. Towards the goalpost of energy accessibility, India has historically subsidised electricity to maintain affordable tariffs for consumers and support the growth of energy-intensive industries including agriculture. Extended by state governments and billed by state-owned power distribution companies (discoms), subsidies on electricity consumption represent the largest of the government's fiscal contributions towards the energy sector.[1]

However, these subsidies impose a considerable burden on state budgets. Not only do they have direct fiscal effects, they draw state resources away from revenue-yielding and development-oriented activities. According to the Reserve Bank of India (RBI), state subsidies have grown by an average of 12% in FY '21 and FY '22.[2] Their share in revenue expenditure (for all states combined) has risen from 7.8% in FY '21 to 8.2% in FY '22.[3]

In particular, the poor financial performance of operationally inefficient, loss-making discoms has presented a persistent challenge to state finances. The power distribution sector relies heavily on subsidies and frequent bailouts to meet revenue requirements and remain financially solvent. Tongia (2003) calls power subsidies the single largest drain on public expenditure by Indian states.[4] Direct tariff subsidies billed by power distribution utilities increased from INR 1,20,828 crore in FY 20 to INR 1,32,416 crore in FY 21.[5] The aggregate losses of power distribution utilities rose from INR 30,203 crore to INR 50,281 crore between FY 20 and FY 21.[6] In January 2023, discoms owed INR 59,539 crore to power generation companies (Gencos),[7] perpetuating a negative domino effect on the power sector and the economy as a whole.

> "Several Indian states are in a fiscally vulnerable position in the aftermath of the COVID-19 pandemic"

At the same time, several Indian states are in a fiscally vulnerable position in the aftermath of the COVID-19 pandemic, at risk of failing to meet aggregate fiscal policy objectives or falling into debt traps. For example, Punjab is estimated to have a debt-to-GDP ratio of 53.3 per cent and a fiscal deficit of INR 24,240 crore in FY 22.[8] Despite this tight fiscal position, the incumbent state government

[1]Aggarwal, P., Viswamohanan, A., Narayanaswamy, D. and Sharma, S., 2020. Unpacking India's electricity subsidies: Reporting, transparency, and efficacy, p. 4.
[2]State Finances: A Risk Analysis, June 2022. RBI Bulletin.
[3]Ibid.
[4]Tongia, R., 2003. The political economy of Indian power sector reforms. Program on Energy and Sustainable Development Working Paper, 4(1), pp.1-10.
[5]Power Finance Corporation Report, 2020-21.
[6]Ibid.
[7]PRAAPTI Portal, Government of India. http://praapti.in/

made pre-poll promises of a scheme to provide free electricity up to 300 units, which was implemented by Punjab's power utility PSPCL in July 2022.[9] With political parties continuing to announce power subsidies that are electorally rewarding but fiscally imprudent, there is an ongoing discussion around the “freebie” culture in electoral politics and its adverse effects on the financial health of states.

The rationale behind power subsidies is often questioned. A popular argument calls subsidies to the power sector 'non-merit freebies', doled out to appease voters during election campaigns at the cost of long-term development. This effectively masks inefficient discom operations and distorts the incentive structure to improve their performance. Others refute this argument, insisting that power subsidies are extended to meet legitimate social welfare objectives within the larger fabric of activities undertaken by a welfare state to meet the basic needs of the people. Tongia (2017) notes that the crux of this debate is whether electricity is a commodity amenable to markets or a public good, a basic right.[10] But whether they achieve social welfare objectives or not, power subsidies affect the financial status of the state. The ability to offer subsidies is constrained by the financial strength of the state. Disbursing subsidies in an already financially weak state makes it even weaker, and the capacity of a fiscally fragile state to include the power sector in its welfare programme is limited.

Power subsidies encourage wasteful use of energy. This in itself militates against the government's avowed commitment to rationalise energy consumption and reduce the overall carbon footprint in coming years. Cross-subsidising electricity consumption by charging higher tariffs to commercial and industrial consumers renders our industries uncompetitive and unable to enter global and regional supply chains. This negatively impacts the country's export performance.

“With political parties continuing to announce power subsidies that are electorally rewarding but fiscally imprudent, there is an ongoing discussion around the “freebie” culture in electoral politics and its adverse effects on the financial health of states.”

As the Indian economy grows and the consumption of electricity rises, the power subsidy bill will be pushed up even further. The fiscal burden placed by them on state budgets may be unsustainable in the long run. To assess whether power subsidies in

[8]RBI Handbook of Statistics on Indian States, 2021-22.
[9]Punjab State Power Corporation Limited Commercial Circular, July 23 2022. https://docs.pspcl.in/docs/cecommercial2220220723125018137.pdf
[10]Tongia, R, 2017. “Delhi's Household Electricity Subsidies: High and Inefficient.” Brookings, Brookings. Available at: https://www.brookings.edu/research/delhis-household-electricity-subsidies-highly-generous-but-inefficient/.

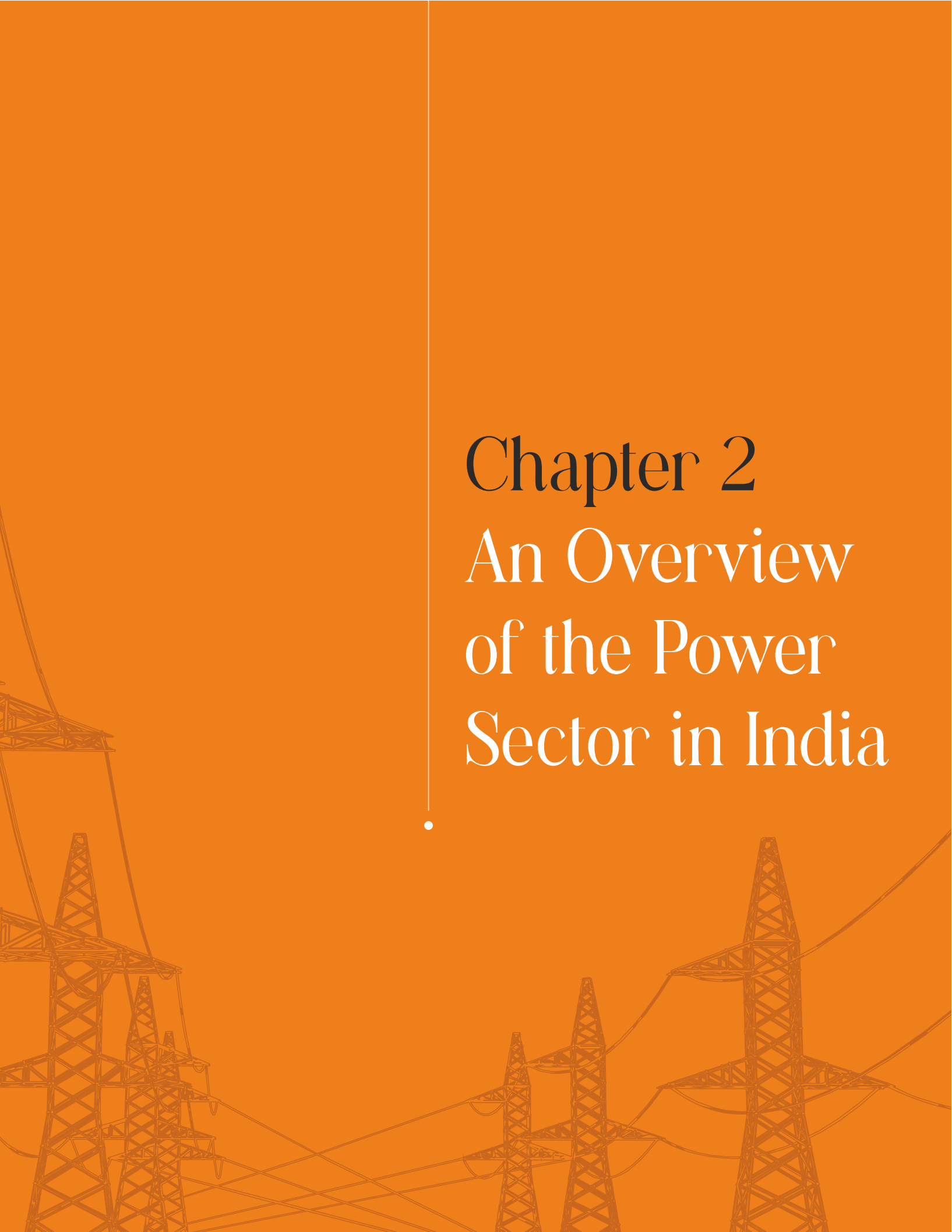
their current form are the right policy tool to enable access to electricity, we must determine the extent of its adverse impact on states' fiscal health, and weigh this against the achievement of their intended social welfare objectives. This report undertakes a detailed study on the issues above, covering 18 major states between 2015-16 and 2020-21. The start date chosen allows us to observe the effects of the Ujjwala Discom Assurance Yojana (UDAY) on discoms' financial health, while the end date reflects the last year the Power Finance Corporation's annual report was issued (the principal source of data on state-wise power sector performance).

This study has the following research objectives. First, it assesses the impact of subsidies on the financial health of states using various state-level fiscal indicators such as the fiscal deficit, revenue deficit, public debt, outstanding liabilities, etc. Secondly, it analyses the feasibility and viability of the power subsidy regime in its current form. Third, it makes recommendations regarding the design of the power subsidy regime for better beneficiary targeting and to achieve its intended welfare objectives with a minimal fiscal burden.

Our analysis looks at major states across the country with a diverse range of fiscal performances. As a benchmark of fiscal performance, we refer to the gross fiscal deficit and debt targets set by the Fiscal Responsibility and Budget Management (FRBM) Act for FY '21, which recommends that the gross fiscal deficit be lower than 4.5% of GSDP and public debt be lower than 33.1% of GSDP in FY '21. Our selection includes the following states that overshot the FRBM targets: Punjab, Rajasthan, Bihar, Andhra Pradesh, West Bengal, Kerala, Jharkhand, Madhya Pradesh and Tamil Nadu. We dub these “fiscally non-compliant” states. As a control measure, our analysis also includes the following states that were fiscally compliant in meeting the FRBM's targets in FY '21, viz., Uttar Pradesh, Haryana, Himachal Pradesh, Gujarat, Karnataka, Odisha, Maharashtra, Assam and Delhi. The performance of the power distribution sector has been compared for the two sets of states.

Data has been obtained from the RBI's Handbook of Statistics on Indian States, the residential tariff schedules published by the State Electricity Regulatory Commissions (SERCs), and the Power Finance Corporation's (PFC) annual reports on the performance of power utilities.

Chapter 2
An Overview of the Power Sector in India



2.1
The Three Verticals of the Power Sector

The power sector may be divided into three verticals: generation, transmission, and distribution. The Indian power sector has broadly shifted towards vertical unbundling and private participation over the past two decades, following substantial market-oriented reforms induced by the Electricity Act, 2003 – a major turning point in the evolution of the industry. Power generation was almost completely delicensed in the Act, inviting large scale private investment in the process. Power transmission capacity has also been strengthened through increased capital expenditure on infrastructure.[11] While significant progress has been made in the generation and transmission sectors, the distribution sector continues to be largely-state owned and has often been dubbed the weakest link in the power sector supply chain.

Generation: The total installed generation capacity at the all-India level was 4,10,339 MW on December 31, 2022, representing a three-fold growth since the 2011-12 period. In FY 22, the peak load demand was 2,03,014 MW while the peak load met was 2,00,539 MW, indicating a gap of only -1.2%. While the power supply position was worse than in the three years before FY'22 (when the peak load deficit was -0.4%, -0.7% and -0.8% in FY 21, FY 20 and FY 19 respectively),[12] it still represents a tremendous improvement over the situation in the past decade (-9.0%, -10.6% and -9.8% in FY 13, FY 12 and FY 11 respectively). The issue of inadequate generation capacity that previously plagued the sector has largely been addressed. India was declared a power surplus nation in March 2021, as its installed generation capacity was around 379 GW while peak electricity demand was 190 GW.[13]

Transmission: India's transmission capacity is also fairly robust, with the cumulative inter-regional transmission capacity of the national grid standing at 1,12,250 MW on January 31, 2022, an increase of 212% since 2014.[14] With the addition of new transmission lines, India now has one of the largest synchronous interconnected electricity grids in the world at 4,63,758 ckm (circuit kilometres).[15]

Distribution: Power Distribution Companies or discoms, are responsible for the final, and arguably most critical, stage of the power supply process in terms of the overall viability and efficiency of the sector. As the interface between power producers and consumers, they purchase energy supplies from generators to distribute to consumers in exchange for payment, which provides the cash flow necessary for the other sectors of power generation and transmission to operate. As such, not only do discom operations directly impact the end user of power services, the entire power sector's financial and operational

[11]Union Budget 2021, https://www.indiabudget.gov.in/.
[12]Ministry of Power, Government of India. Available at: https://powermin.gov.in/en/content/power-sector-glance-all-india. Accessed 24 January 24, 2023.
[13]https://www.pib.gov.in/PressReleasePage.aspx?PRID=1706925
[14]"National Grid has inter-regional transmission capacity of 1,12,250 MW, providing seamless power transfer throughout the Electricity Grid." (February 8, 2022). Press Information Bureau, Government of India, Ministry of Power. Available at: https://pib.gov.in/Pressreleaseshare.aspx?PRID=1796530#:~:text=India%20has%20robust%20Transmission%20Grid,power%20in%20the%20Electricity%20Grid. Accessed 24 January 24, 2023.

viability hinges upon them. However, the financial state of the power distribution sector is dire. Distribution utilities' aggregate losses stood at INR 30,203 crore in 2019-20 and increased to INR 50,281 crore in 2020-21.[16] The combined net worth of all discoms was negative in March 2021, at minus INR 44,160 crore.[17]

Discoms face poor financial health for many reasons, including their operational inefficiencies, the failure of state governments to disburse the subsidies they owe to discoms, the lack of commercial principles followed in tariff determination, expensive long-term power purchase agreements, and relatively weak private sector participation in the distribution sector. The following sections discuss these issues in detail.

2.2
Operational Inefficiencies within the Distribution Sector

A large part of the power distribution sector in India continues to be highly inefficient in its operations. The distribution sector suffers from high aggregate technical and commercial (AT&C) losses. AT&C losses include energy lost during transmission and distribution due to poor or inadequate infrastructure, electricity theft due to hooking and rigging of meters, errors in estimation due to faulty or non-existent metering, and billing and collection inefficiencies. Billing efficiency indicates the proportion of energy that has been billed to consumers with respect to the energy supplied to an area, which is low in the case of unissued or unpaid bills. Collection efficiency reflects the proportion of revenue collected from consumers with respect to the amount billed to them, which is low when there are payment delays or defaults from customers. As a result of their high AT&C losses, discoms are unable to adequately recover the cost of power sold from operations alone.

This financial shortfall is met through short-term borrowings at high interest rates and government subsidies. Eventually, it is reflected in lower levels of investment on infrastructure than is required in the long run, which contributes to operational inefficiency and continuing dependence on subsidy. Left to absorb losses on their own, discoms lose creditworthiness and cannot borrow the capital required to meet universal supply obligations, augment their load-bearing capacity, or prepare for the transition to renewable energy. Their persistent cash flow shortage renders discoms unable to make timely payments to gencos, who

[15]Ministry of Power, Government of India. Available at : https://www.powermin.gov.in/hi/node/154#:~:text=With%20the%20above%20transmission%20capacity,22). Accessed 24 January 24, 2023.
[16]Power Finance Corporation Reports.
[17]Ibid.

charge them penal interest rates after a grace period of 45 days. A vicious cycle is created from which it is difficult for discoms to extricate themselves. This negatively affects the financial health of the entire power sector and creates a domino effect on the whole economy.

Ultimately, the end user of electricity bears the consequences as discoms may pass their financial distress on to consumers in the form of limited hours of supply and voltage fluctuations. As a result, taxpayers who ultimately bear the burden of paying for the subsidies, are not rewarded with a reliable service. This also includes industrial and commercial consumers who carry the burden of cross subsidies in the form of higher tariffs. The benefits of vast improvements in the other verticals of the power sector cannot fully reach end users of electricity until the distribution sector becomes operationally efficient and financially viable.

The current national targets for the power sector include a reduction in pan-India AT&C losses to 12-15% by 2024-25. According to the Financial Restructuring of State Distribution Companies (2012), a reduction of 1% of AT&C loss at an all-India level would save about INR 1500 crore per year.[18] Table 2A reflects the average figures for billing efficiency, collection efficiency and AT&C efficiency in our chosen set of states.[19]

Billing Efficiency, Collection Efficiency and AT&C Loss between FY 16 and FY 21

	Billing efficiency (%)	Collection efficiency (%)	AT&C loss (%)
FY 16	80.06	94.62	24.12
FY 17	81.13	94.45	23.22
FY 18	82.43	95.10	21.55
FY 19	82.78	94.73	21.52
FY 20	84.70	92.50	21.26
FY 21	83.14	93.25	22.33

[18]Financial Restructuring of State Distribution Companies, 2012. P. 7. Available at: https://powermin.gov.in/sites/default/files/uploads/Financial_restructuring_of_State_Distribution_Companies_discoms_Oct2012.pdf
[19]Collected from Power Finance Corporation reports.

Table 2A

Source: Power Finance Corporation Reports

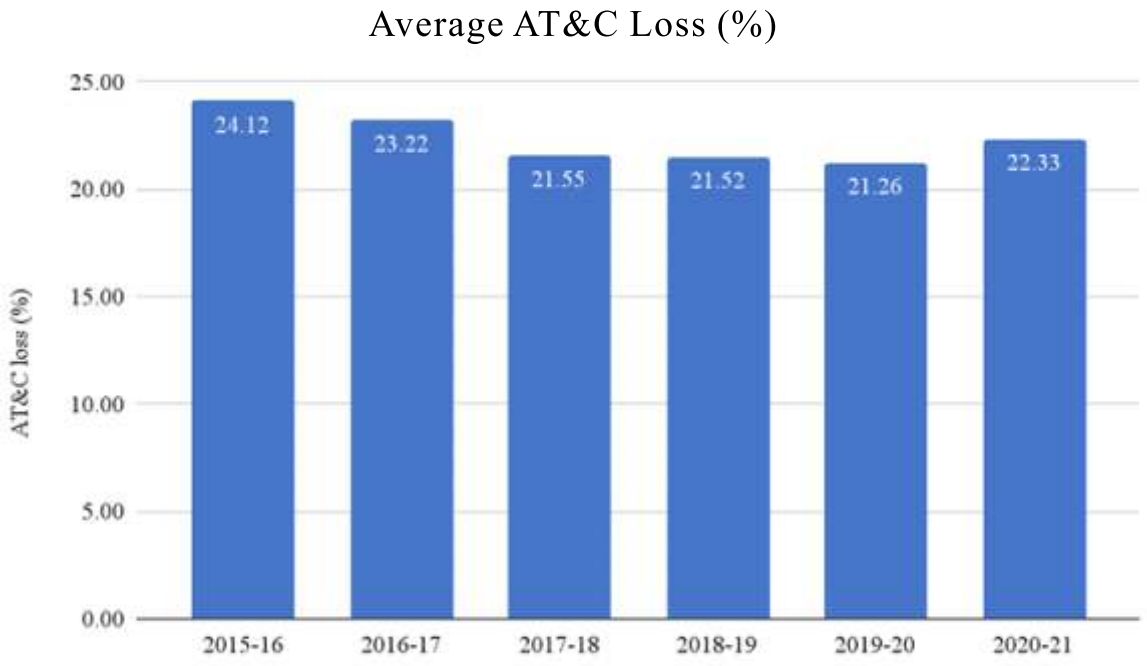
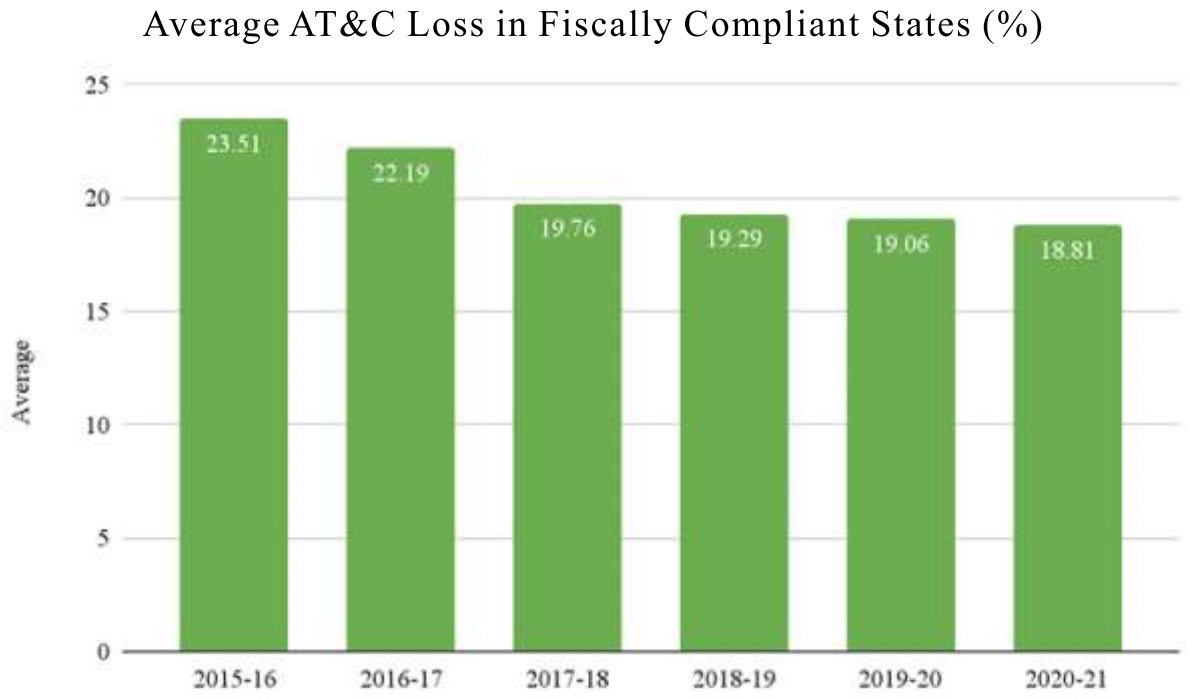


Table 2B

Source: Power Finance Corporation Reports

Table 2C

Source: Power Finance Corporation Reports



There was no consistent downward trend in AT&C losses between FY '16 and FY '21 (Figure 2A). There were large inter-state variations and certain regions performed significantly worse than others. In FY '21, the highest AT&C losses occurred in Madhya Pradesh (41.47%), Jharkhand (41.36%), and Bihar (35.33%). The lowest AT&C losses occurred in Kerala (7.76%), Delhi (8.87%) and Gujarat (11.91%). Andhra Pradesh, Himachal Pradesh, Madhya Pradesh, and Punjab experienced a rise in AT&C losses over time. Bihar, Jharkhand, Rajasthan, Maharashtra and Odisha have had consistently high AT&C losses. On the other hand, Assam, Gujarat, Haryana, Karnataka, Kerala, Tamil Nadu, West Bengal and Delhi all achieved a commendable reduction in AT&C losses over this period. While Uttar Pradesh's AT&C losses remained high, it also achieved a laudable reduction.

Average AT&C loss is still significantly high across the board, even in fiscally compliant states. When average AT&C loss is calculated separately for fiscally non-compliant states (Figure 2B) and fiscally compliant states (Figure 2C), it emerges that the non-compliant group has experienced consistently high AT&C losses on average, with an overall rise from 24.73% in FY '16 to 25.84% in FY '21. Fiscally compliant states have always demonstrated lower AT&C losses, and achieved a clear decrease on average from 23.51% in FY '16 to 18.81% in FY '21.

As such, the poor operational efficiency of discoms in fiscally non-compliant states and consequent subsidy dependence is likely to

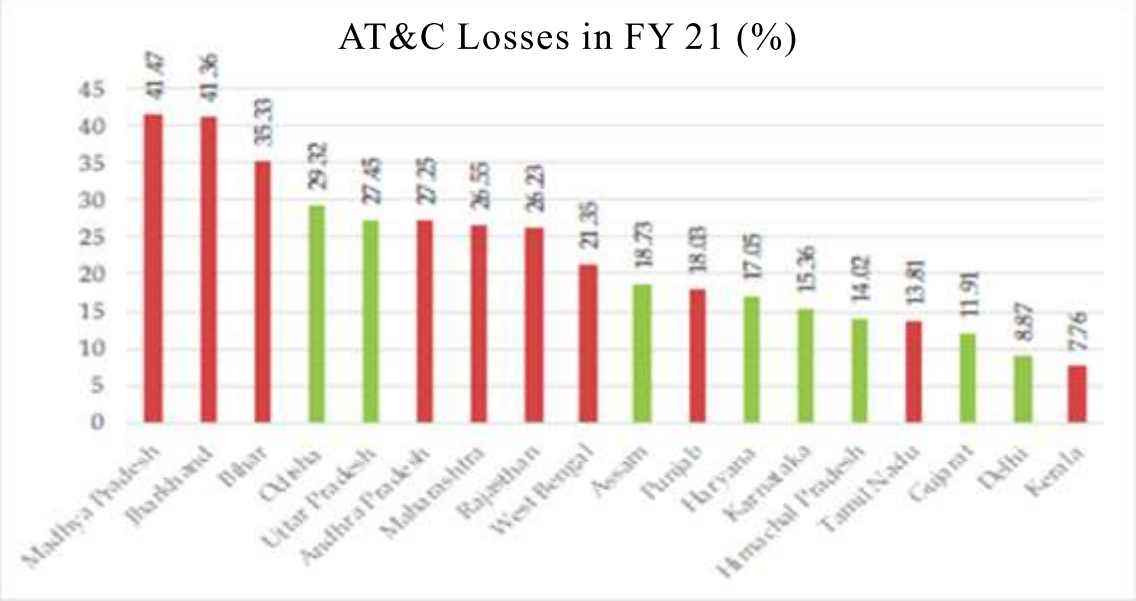
be a major contributor to their high fiscal deficits. States' fiscal health is evidently linked to the operational efficiency of their power sector. The exceptions are Kerala (7.76%) and Tamil Nadu (13.81%) – fiscally non-compliant states with low AT&C losses – and Odisha (29.32%) and Uttar Pradesh (27.45%) – fiscally compliant states with high AT&C losses. Figure 2D displays AT&C losses in FY '21 in the selected set of states.

Note: States shaded in red were fiscally non-compliant, while states shaded in green were fiscally compliant in FY '21.

It must be noted that discoms' financial situation has improved dramatically over the last fiscal year as a result of recent reforms. A Ministry of Power Press Release stated that according to a preliminary analysis of 56 discoms, national AT&C losses have fallen to 17% in FY '22.[20] (State-wise data

Table 2D

Source: Power Finance Corporation Reports



remains unavailable as the relevant Power Finance Corporation report has not been released.) Discoms' outstanding dues have almost halved over the last fiscal year. As of January 2023, the total outstanding discom dues stand at INR 70,213 crore, including an overdue amount of INR 23,642 crore. The same figure in January 2022 was INR 1,21,030 crore, including an overdue amount of INR 1,01,357 crore. Rajasthan, Karnataka, Telangana, Andhra Pradesh, Tamil Nadu, and Tripura are the only states with overdues of over 1 month but less than 2 months, while the remaining states do not have overdues. The ACS-ARR (aggregate cost of supply and aggregate realisable revenue) gap has fallen from INR 0.69 per kWh in FY '21 to INR 0.22 per kWh in FY '22.

However, discoms are still far from financially sustainable on their own, and

stated national operational efficiency targets have yet to be reached. Even though the financial health of the distribution sector has improved significantly in the last fiscal year, there is still a long way to go to resolve structural issues within the functioning of discoms.

2.3 The Indian Power Subsidy Regime

2.3.1. Direct Tariff Subsidies

In India, states are responsible for setting and distributing power subsidies, guided by principles outlined at the national level. Electricity is listed as a concurrent subject in the Constitution of India, meaning that it may be considered by both the union and state governments. Section 65 of the Electricity Act, 2003, provides that state governments can grant subsidies to any consumer or class of consumers in the tariff determined by the State Commission to the extent they consider appropriate. Under Section 62, the tariffs of state power distribution companies are determined by the respective State Electricity Regulatory Commissions (SERCs) or Joint Electricity Regulatory Commissions (JERCs), in accordance with the Act and the policies framed under it.

As per Section 65 of the Electricity Act, states are required to pay subsidies to discoms in advance. In practice, subsidy payments from states to discoms are often delayed or incomplete, with the actual subsidy released by the end of the fiscal year frequently being lower than the amount billed. In FY '21, direct tariff subsidies received nationally amounted to INR 1,11,949 crore, 15% or INR 20,467 crore short of billed subsidies.[21] Tariff subsidy released by state governments as a percentage of tariff subsidy billed by distribution utilities decreased from 95% to 86% between FY '20 and FY '21.[22]

Based on Power Finance Corporation data, within our selected set of states, Andhra Pradesh, Karnataka, and Rajasthan regularly default on subsidy payments, in that the total subsidy received in these states has been significantly lower than the subsidy billed five times or more in this six-year period. Figure 2E demonstrates the difference between subsidy received and subsidy billed in INR crore in these states from FY 16 to FY '21. In FY '21, the

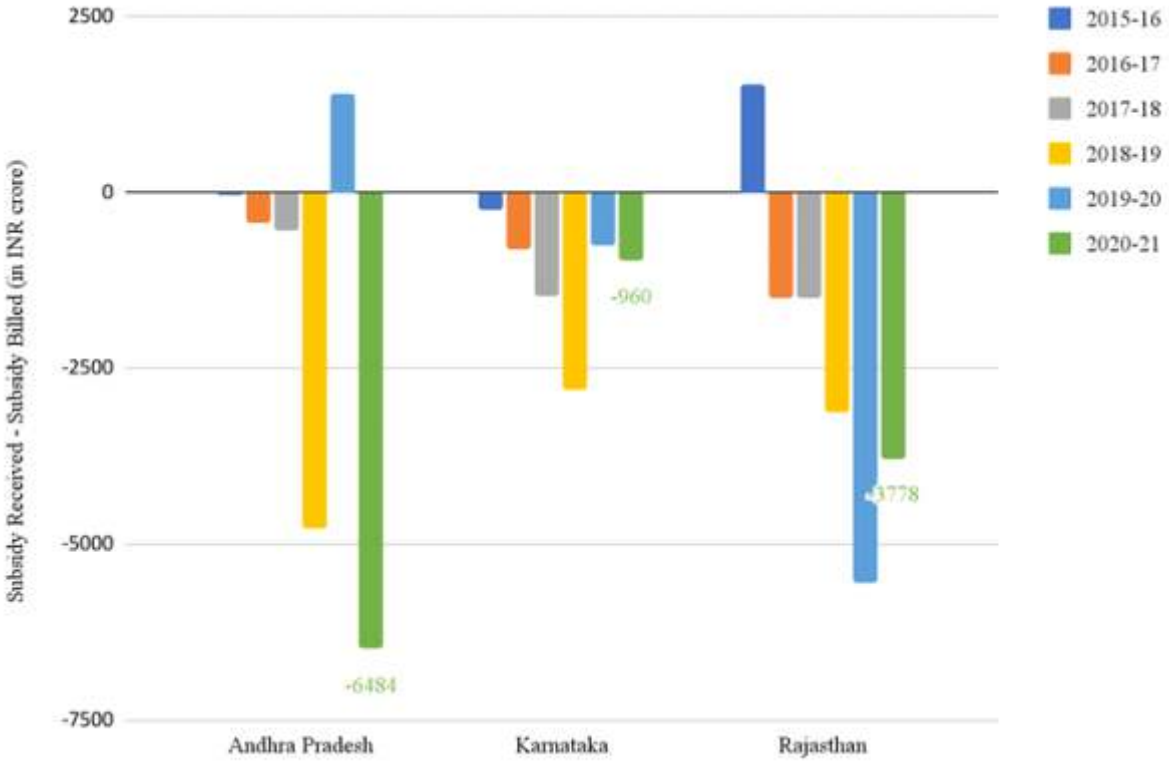
[20]Marked Reduction in Aggregate Technical and Commercial losses of Discoms in FY22, Press Release. December 2022. https://pib.gov.in/PressReleseDetailm.aspx?PRID=1880911

Andhra Pradesh state government paid discoms a whopping INR 6484 crore less than was originally promised.

Table 2E

Source: Power Finance Corporation Reports

Regular Defaulters



At a presentation made at the All India Chief Secretaries Conclave' in June 2022, it was observed that state governments owed their discoms a total of INR 1.39 lakh crore in subsidy receivables (comprising INR 76,337 crore) and unpaid bills of government departments (comprising INR 62,931 crore).[23] The presentation also stated that total discom overdues towards gencos was around INR 1 lakh crore at the time. According to these figures, discoms could clear their dues to gencos and still have around INR 39,000 left over if state governments paid what they were owed on time.

[21]Power Finance Corporation Reports.
[22]Ibid.

2.3.2. Cross-Subsidies

Cross-subsidies refer to discoms charging certain consumer categories higher tariffs to cover subsidised rates for others. These subsidies are built into tariff schedules released by state governments. Tariffs are typically lower for domestic and agricultural consumers and higher for commercial and industrial consumers. While cross subsidies are not reported at a national level, the CEEW's (Council on Energy, Environment and Water) report "Unpacking Electricity Subsidies" (2020) makes estimates based on 31 states with available data. In FY '19, the revenue surplus from charging industrial and commercial users higher tariffs stood at approximately INR 75,027 crore, while the revenue deficit from subsidising domestic and agricultural consumers was INR 1,74,391 crore. Industrial and commercial users were charged over 120% of supply costs, while domestic and agricultural users were charged less than 80%.

The CEEW finds that while the revenue deficit from subsidising domestic and agricultural users has grown by 48% since FY '16, the revenue surplus from charging industrial and commercial users has increased only by 11%. This is because artificially high prices disincentivise industrial and commercial consumers from buying power from discoms altogether. As these groups of consumers face the burden of cross-subsidies, they increasingly prefer to generate their own electricity or migrate to open access provision, such as through the market or group-captive power plants. Mandal et al. (2020) find that migration to open access has been as high as 20% of sales in Maharashtra, Rajasthan, and Gujarat.[24] Migration to captive power plants represents between 20% and 30% of total sales in Odisha, Chhattisgarh, and Jharkhand.

Cross-subsidies should be a zero-sum game in theory, as some consumers pay more to compensate underpayment by others in the system, but discoms have lost out on revenue from many high-paying consumers while continuing to cater to low-paying consumers. This increases the gap between aggregate cost of supply (ACS) and aggregate

[23]Times of India. https://timesofindia.indiatimes.com/business/india-business/unpaid-power-subsidy-govt-department-bills-keep-discoms-in-red/articleshow/93120067.cms

realisable revenue (ARR). A higher ACS-ARR gap implies a higher monetary loss for discoms.

According to the CEEW, the state most affected is Andhra Pradesh, where the ACS-ACR gap has increased by INR 1.87 per kWh between FY '16 and FY 2019. Karnataka, Madhya Pradesh, Odisha, Tamil Nadu, Telangana, and Uttar Pradesh have also suffered, with increases in the ACS-ARR gap ranging from INR 0.20 to 0.65 per kWh within four years in these states. Nationally, on a tariff subsidy billed basis, this gap increased from INR 0.24 per kWh to INR 0.41 per kWh from FY '20 to FY '21.[25] On a subsidy received basis, the gap increased from INR 0.50 per kWh to INR 0.71 per kWh from FY '20 to FY '21.[26] Government policy documents have aimed for a zero ACS-ARR gap by 2024-25, which appears to be a distant goal.

At the same time, wasteful overconsumption of electricity by domestic and agricultural consumers, who underpay for electricity, results in negative externalities in the form of long-term environmental impacts. India still relies heavily on fossil fuels to produce electricity, which generates greenhouse gas emissions. In 2021, coal accounted for 67.5% of India's power generation, while solar accounted for merely 4.8%.[27]

Additionally, artificially low tariffs for agricultural consumers aggravates groundwater overuse by farmers seeking to produce more output, and results in distorted cropping patterns. When farmers pay little or nothing at the margin for electricity, virtually all available electricity is expended on pumping from common-pool groundwater basins. This has negative environmental implications; each farmer has little incentive to conserve groundwater; extraction exceeds the rate of replenishment and water tables are lowered in the long run. Around 70% of wells in Gujarat and Punjab, 62% of wells in Haryana and 56% of wells in Maharashtra recorded falling groundwater levels in 2013.[28]

The relationship between low electricity pricing and groundwater overuse has

[24]Mandal, M., Nhalur, S. and Josey, A., 2020. The critical role of state government revenue subsidy in electricity supply. State of Finance in India Report, p.153. Prayas Energy Group.
[25]Power Finance Corporation Reports.
[26]Ibid.

been explored by many scholars. Badiani and Jessoe (2011) find that a 10% decrease in electricity subsidies would reduce groundwater extraction by 4.3%.[29] Badiani, Jessoe and Plant (2012) note that while power subsidies to agricultural consumers increase agricultural yields and food security in the short run, climate change is expected to reduce agricultural yields in India by 9% to 25% in the long run.[30] Strand (2010) recommends that optimal electricity pricing for groundwater conservation must cover not only the full economic cost of electricity, but include an additional charge for the externality costs of groundwater pumping.[31]

As such, cross-subsidies increase the overall costs in the system and result in the misallocation of resources. Consumers receive poor signalling of true economic costs, with those who underpay consuming in wasteful excess and those who overpay choosing not to source electricity from discoms at all. The government already recommends that commercial principles be followed in tariff determination. Clause 8.3 of the Tariff Policy, 2016, specifies that electricity tariffs should reflect the cost of supply and that tariffs should progressively be brought within 20% above or below the average cost of supplying electricity.[32] However, this stipulation has largely not been implemented.

If cross subsidies are reduced over time, the burden on state governments on tariff subsidies to supplement discom revenues will only increase. The International Institute for Sustainable Development (2020) calculated that if cross subsidies had been eliminated in FY '19, the subsidy burden on states would have increased by 68% to INR 1.85 lakh crore. discoms, therefore, must raise revenue by increasing operational efficiency and implementing a rational price regime rather than rely continually on cross subsidies or direct tariff subsidies.

2.3.3. Bailouts and Reforms

Accumulating discom losses are usually addressed by large bailout packages every few years. In 2003, a state electricity board bailout of INR 41,473

27India Energy Outlook 2021, World Energy Outlook Special Report.
28Central Groundwater Board (2013, Annex XIII)
29Badiani, R. and Jessoe, K.K., 2011. Electricity subsidies for agriculture: Evaluating the impact and persistence of these subsidies in India.
30Badiani, R., Jessoe, K.K. and Plant, S., 2012. Development and the environment: the implications of agricultural electricity subsidies in India. The Journal of Environment & Development, 21(2), pp.244-262.
31Strand, J., 2010. The full economic cost of groundwater extraction. World Bank Policy Research Working Paper, (5494).
32Tariff Policy, 2016. Available at: https://cea.nic.in/wp-content/uploads/legal_affairs/2020/09/Tariff%20policy.pdf. Accessed January 24, 2023.

crore took place, in which state governments cleared the outstanding dues of state electricity boards (SEBs) to central power sector undertakings (CPSUs) by issuing power bonds. In 2012, there was a financial restructuring plan of INR 1.19 lakh crore to enable discoms to meet short-term debt obligations.[34]

In November 2015, the ambitious Ujjwal Discom Assurance Yojana (UDAY) scheme was introduced with the intention of making discoms financially stable. UDAY had a two-pronged strategy. First, 75% of discom debt was transferred to their respective state government's books. Low-interest bonds were issued to pay off the remainder. Secondly, discoms were given a target date of 2017-19 to meet the parameters of operational efficiency that involved reducing AT&C losses to 15% and completely eliminating the ACS-ARR gap by FY 2019. To achieve these targets, state governments were asked to ensure smart metering, set up feeders and map loss-making regions. Garg and Shah (2020) note that UDAY disbursed INR 74,228 crore in FY '16 and FY '17 respectively INR 92,113 crore in FY '19.[35]

While discoms were largely able to bring down their book losses with the UDAY debt restructuring, the progress in meeting operational targets was inconsistent across states and less than satisfactory on the whole. The national average AT&C loss remained high at 22% in FY '19. Billing, collection, and metering inefficiencies remained, as did delays in subsidy disbursal in many states.[36]

Central and state governments have also provided indirect assistance, such as capital grants or loans to discoms at below-market rates. In May 2020, the government announced an INR 90,000-crore liquidity infusion for discoms, under which these utilities got loans at economical rates from the Power Finance Corporation (PFC) and REC Ltd. The liquidity infusion package was then increased to INR 1.2 lakh crore and later to INR 1.35 lakh crore. The government had also given a breather to discoms on paying dues to gencos during the Covid pandemic, and waived penal charges for late payment

[33]Mandal, M., Nhalur, S. and Josey, A., 2020. The critical role of state government revenue subsidy in electricity supply. State of Finance in India Report, p.153. Prayas Energy Group.
[34]Ibid.
[35]Garg, V., Shah, K., 2020. The Curious Case of India's Discoms: How Renewable Energy Could Reduce Their Financial Distress. The Institute for Energy Economics and Financial Analysis.
[36]Soundararajan, N., Kumar, K., Shrawan, A., 2022. Resurgent India Ujwal Discom Assurance Yojana: Reviving the Discoms, Pahle India Foundation. Available at: https://pahleindia.org/resurgent-india-ujwal-discom-assurance-yojna-reviving-the-discoms/

of dues.

In 2021, the Ministry of Power (MoP) revised prudential norms to be followed by lending agencies for the power sector, mandating that discoms draw up an action plan to reduce losses within specified deadlines to avail financing. The MoP also decided that any future assistance for discoms under any scheme will be available only if it agrees to bring down AT&C losses and ACS-ARR gaps to specified levels within a specific timeframe. In October 2021, the MoP issued regulations requiring energy accounting and auditing for all discoms. In June 2022, the MoP issued the Late Payment Surcharge Rules, which mandated that discoms must promptly pay for power to avoid their access to the power exchange being cut off. In September 2022, the government converted the total outstanding dues of discoms towards GENCOs into equated monthly instalments (EMIs). These EMIs have a maximum tenure of four years. The total outstanding dues of discoms would thus be zero by 2026.[37]

The most recent bailout took place in FY '22, when the Ministry of Power launched the "Revamped Reform linked Result-based Distribution Sector Scheme" with an outlay of INR 3,03,758 crore to be disbursed from FY '22 to FY '26, on the condition that discoms commit to an agreed-upon loss reduction trajectory.[38]

While bailouts have protected discoms and the power sector from insolvency in the short run, they have not managed to sustainably resolve the structural issues that plague the distribution sector. This has led to a never-ending cycle of dependence, placing a heavy burden on state budgets.

2.4. Political Economy Constraints to Hiking Tariffs

Implementing a rational price regime is easier said than done. CEEW (2021) notes that Tamil Nadu, Telangana, and West Bengal had not issued tariff orders approving a tariff hike for at least four years prior to 2021. In FY 2021, among the 22 states that issued tariff orders, only 8 hiked tariffs upwards.[39] Moreover, the Investment Information and Credit Rating Agency (2021)

[37]https://pib.gov.in/PressReleasePage.aspx?PRID=1879920
[38]https://powermin.gov.in/en/content/overview-5

observes that the tariff hikes proposed by discoms and approved by SERCs between FY '16 and FY '21 across states were typically lower than what was agreed upon in the MoUs signed during UDAY. According to Tongia (2015), in Delhi in 2015, the marginal tariff for households consuming less than 200 units a month was INR 2 per kWh compared to the notified average cost of supply of INR 7.3/kWh.

Political economy factors render states unable to hike tariffs or implement a rational price regime that would keep discoms profitable. Low electricity pricing has long been used as a campaign tool to capture votes, particularly from agricultural consumers of electricity. Badiani, Jessoe and Plant (2012) write that the 1970s saw political competition between state parties in India increase at the same time that farmers began organising themselves into a powerful political coalition, bolstered by the growth of agricultural profits. Although state electricity boards were officially responsible for setting electricity tariffs, state politicians seeking to attract rural voters would set them in practice, promising low electricity tariffs during election campaigns. In particular, large farmers who derive greater benefits from power subsidies tend to hold more political power and are more likely to oppose reducing power subsidies than small and marginal farmers. (Chapter 5 discusses the failures of power subsidy targeting in detail.)

According to Dubash and Rajan (2001), an Andhra Pradesh political party's 1977 campaign on the ticket of free electricity is the first known link between power subsidies and political capture. By the 1980s, the government was spending 25% of its total expenditure on power subsidies.[40] Dubash (2007) writes that power subsidies had become routine political instruments by the 1980s.[41] As political parties reap electoral benefits from offering these freebies, they function as the "rent" they must pay to win elections or stay in power, at the cost of other kinds of public expenditure that may be more beneficial in the long run.

Ebeke and Ngouana (2015) at the IMF

[39]In Dire Straits: How the Pandemic Added to Discoms' Financial Woes, and How to Fix Them? Prateek Aggarwal, Bharat Sharma, CEEW, 26 April 2021
[40]Dubash, N.K. and Rajan, S.C., 2001. Power politics: Process of power sector reform in India. Economic and Political Weekly, pp.3367-3390.
[41]Dubash, N.K., 2007. The electricity-groundwater conundrum: Case for a political solution to a political problem. Economic and Political Weekly, pp.45-55.
[42]Ebeke, M.C. and Ngouana, M.C.L., 2015. Energy subsidies and public social spending: Theory and evidence. International Monetary Fund.

ask why the poor would support energy subsidies, a form of redistribution that disproportionately benefits high-income groups that consume more electricity.[42] They argue that the elite exploit imperfect information to set subsidy rates that are sub-optimally high, crowding out public social spending. Indeed, public spending on education and health were on average 0.6 percentage points of GDP lower in countries where energy subsidies were 1 percentage point of GDP higher. However, the poor continue to support energy subsidies because they provide a small but certain consumption benefit.

This points to the need for public communication and awareness on how raising power tariffs may, counterintuitively, benefit the poor. A rational tariff regime would create more equitable subsidy distribution, lower the cost of the subsidy regime and subsequently redirect expenditure towards social schemes that achieve better targeting. Higher tariffs affect the poorest consumers negatively, but so do financially insolvent discoms. Covering the cost of supplying power is essential to expanding and improving the quality of electricity services, which will ultimately benefit consumers.

2.5. Long-Term Power Purchase Agreements

An additional source of losses is the expensive long-term power purchase agreements (PPAs) discoms are locked into with gencos. Unsurprisingly, the distribution sector's revenues worsened during the COVID-19 pandemic as industrial and commercial activity halted during the lockdown. However, discoms still had to pay fixed capacity charges irrespective of their low power requirements. Aggarwal, Rao, and Agarwal (2022) find that Delhi discoms would have saved INR 650 to 690 crore in FY '20 if they had exited their PPA with the National Thermal Power Corporation's Dadri-I plant.[43] Discoms have the option of purchasing energy from power exchanges or round-the-clock renewable energy projects instead, which would reduce their fixed cost burden in non-peak months of the year.

[43]Aggarwal, Dhruvak, Harsha V. Rao and Disha Agarwal. 2022. How can Discoms Optimise Power Procurement Costs? New Delhi: Council on Energy, Environment and Water.

2.6. Lack of Private Participation in Distribution

According to NITI Aayog's 2021 report "Turning Around the Power Distribution Sector," while 47% of power generation was privately done in March 2021, private distribution licensees served only about 10% of India's population and have largely been limited to urban centres and townships. Private participation in the power distribution sector takes two main forms: the distribution franchisee model and the distribution licensee model. In the franchisee model, the private party has no ownership over the distribution grid assets. The state-owned discom maintains the wires and infrastructure, while the private party supplies electricity to consumers (like Torrent Power in Bhiwandi, Maharashtra). In the licensee model, the private party holds part or full ownership of the distribution grid assets (like Tata Power in New Delhi).

Higher private participation in distribution has been able to improve discom efficiency and bring down losses successfully in certain cases but not in others. In Delhi, where the Delhi Vidyut Board (DVB) sold majority stakes to Tata Power and BSES in 2002, AT&C losses came down from about 55% in 2002 to 8.87% in 2021.[44] In 2018, the peak demand of 7016 MW was met, and load shedding was as low as 0.055%.[45] This transition has allegedly helped discoms save at least INR 1.2 lakh crore.[46] Private licensees also run discoms fairly efficiently in Surat, Ahmedabad, Kolkata and Mumbai. However, Odisha did not experience significant improvements to the distribution sector after four discoms were privatised in 1999. One of the private companies abandoned the attempt, and the licences of the other three were revoked by the state regulator.[47] The state continues to face high AT&C losses, which stood at 29.32% in 2021.[48]

India has also seen several cancellations of franchisee contracts, including in Maharashtra, Madhya Pradesh, Uttar Pradesh, Rajasthan and Jharkhand. Uttar Pradesh withdrew its electricity distribution privatisation plans in 2020, following protests against potential job

[44]Power Finance Corporation Report 2020-21.
Delhi Power Department. http://web.delhi.gov.in/wps/wcm/connect/DOIT_Power/power/home/about+us
[45]Ibid.
[46]Hindustan Times. https://www.hindustantimes.com/cities/delhi-news/privatisation-of-power-helped-save-delhi-1-2-lakh-crore-since-2002-say-discoms-101628015973757.html
[47]Privatisation of Electricity Distribution in Orissa: A Case Study, TERI. https://www.teriin.org/sites/default/files/2018-02/2001ER63%20Case%20study.pdf
[48]Power Finance Corporation Report, 2020-21.
[49]The Economic Times. https://economictimes.indiatimes.com/industry/energy/power/uttar-pradesh-government-withdraws-privatisation-plan-for-electricity-distribution-companies/articleshow/78518442.cms?from=mdr

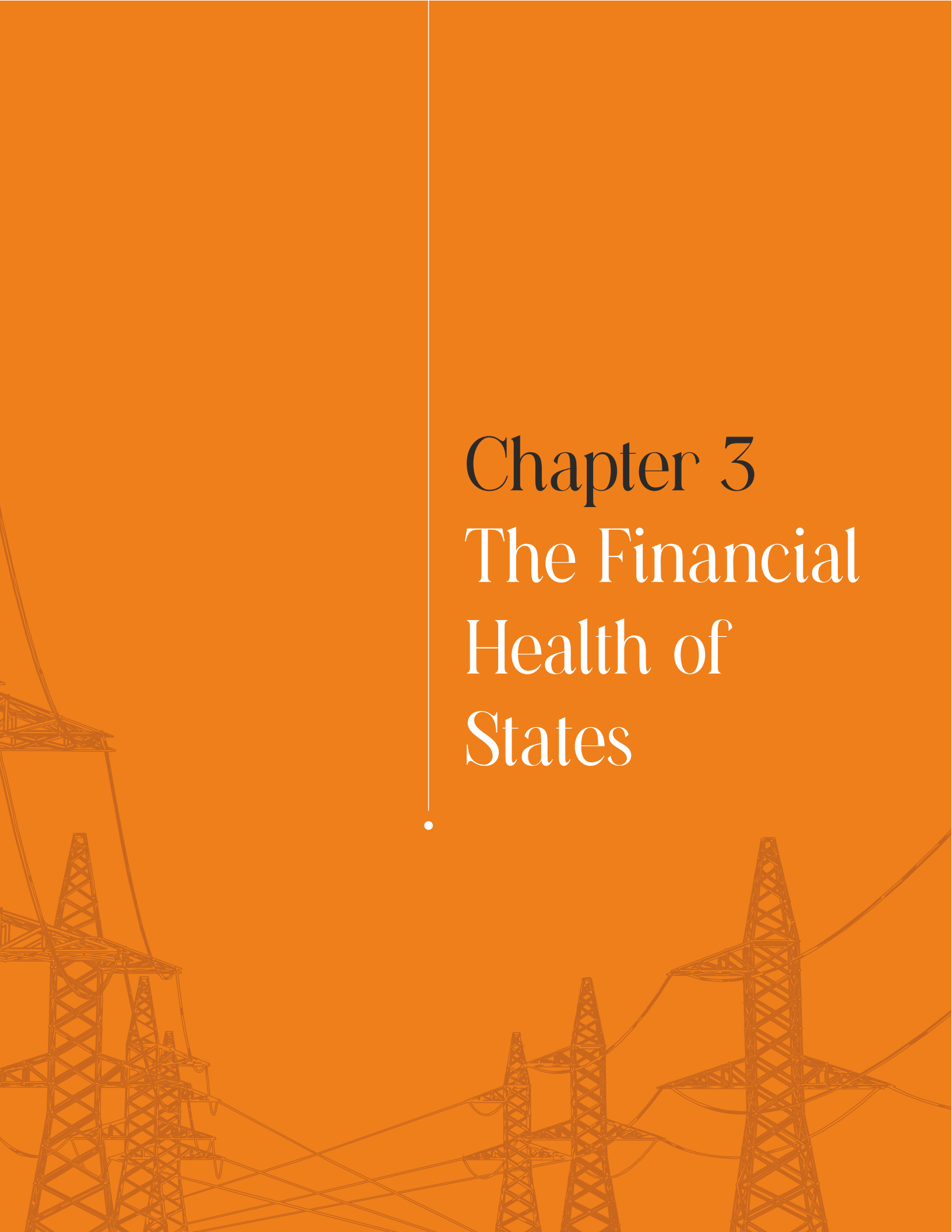
losses by employees of Purvanchal Vidyut Vitran Nigam Ltd (PVVNL).[49]

While Delhi is seen as a model of successful privatisation, its circumstances are not representative of the rest of the country. The consumer mix of the area is relatively homogeneous, largely comprising an urban, middle-class residential sector with a high demand for efficiency. The NITI Aayog report highlights that privatisation is more commercially challenging when the consumer mix comprises more agricultural consumers, given that they pay low tariffs and billing, collection, and metering are more difficult in rural areas. Moreover, the transition to private distribution in Delhi was supported by a government subsidy, and all Delhi Vidyut Board employees were transferred to the new companies with benefits.

India's experience with the privatisation of distribution has been varied, with success depending on the consumer mix and geography of the area of service. As such, privatisation alone is not the sole remedy for improved discom performance. The NITI Aayog report argues that state-owned distribution utilities can also achieve better performance through good corporate governance practices to maintain the separation between the utility and the state. A public-private partnership (PPP) model may also help loss-making discoms.

The Electricity Amendment Bill, 2022, is likely to bring about a legislative push towards greater private sector role in distribution. Discoms currently have a monopoly in their respective areas of functioning. Introduced in the Lok Sabha in August 2022, the Bill aims to give players open access to distribution networks. Under the amended Bill, discoms will no longer be required to distribute through their own network and must provide non-discriminatory open access to all other discoms in the same area in exchange for wheeling charges. This would supplement discom revenues, induce competitive pressure and create retail choices for consumers, which could be reflected in improved operational efficiency and better service for end users. The Bill is yet to be tabled.

Chapter 3
The Financial Health of States



3.1
Fiscally Compliant and Fiscally Non-Compliant States

Acharya (2016) writes that India's high and sustained fiscal deficit in the centre and the states since the 1980s indicates a tendency towards fiscal profligacy when compared to similar economies.[50] Nandy et al. (2020) attribute this tendency to competitive electoral populism; states resort to extravagant expenditures to increase re-election chances at the expense of the economy's fiscal health.[51] The power subsidy regime may be seen as a by-product of the competitive electoral populism displayed by Indian political parties.

Concerns over fiscal health were heightened in India after neighbouring Sri Lanka faced the worst economic crisis in its history, with a combined current account and fiscal deficit that led to the nation defaulting on its $51-billion foreign debt in April 2022. Caused at least in part by economic mismanagement, Sri Lanka's financial crisis serves as a warning to Indian states to prioritise fiscal consolidation before it is too late.

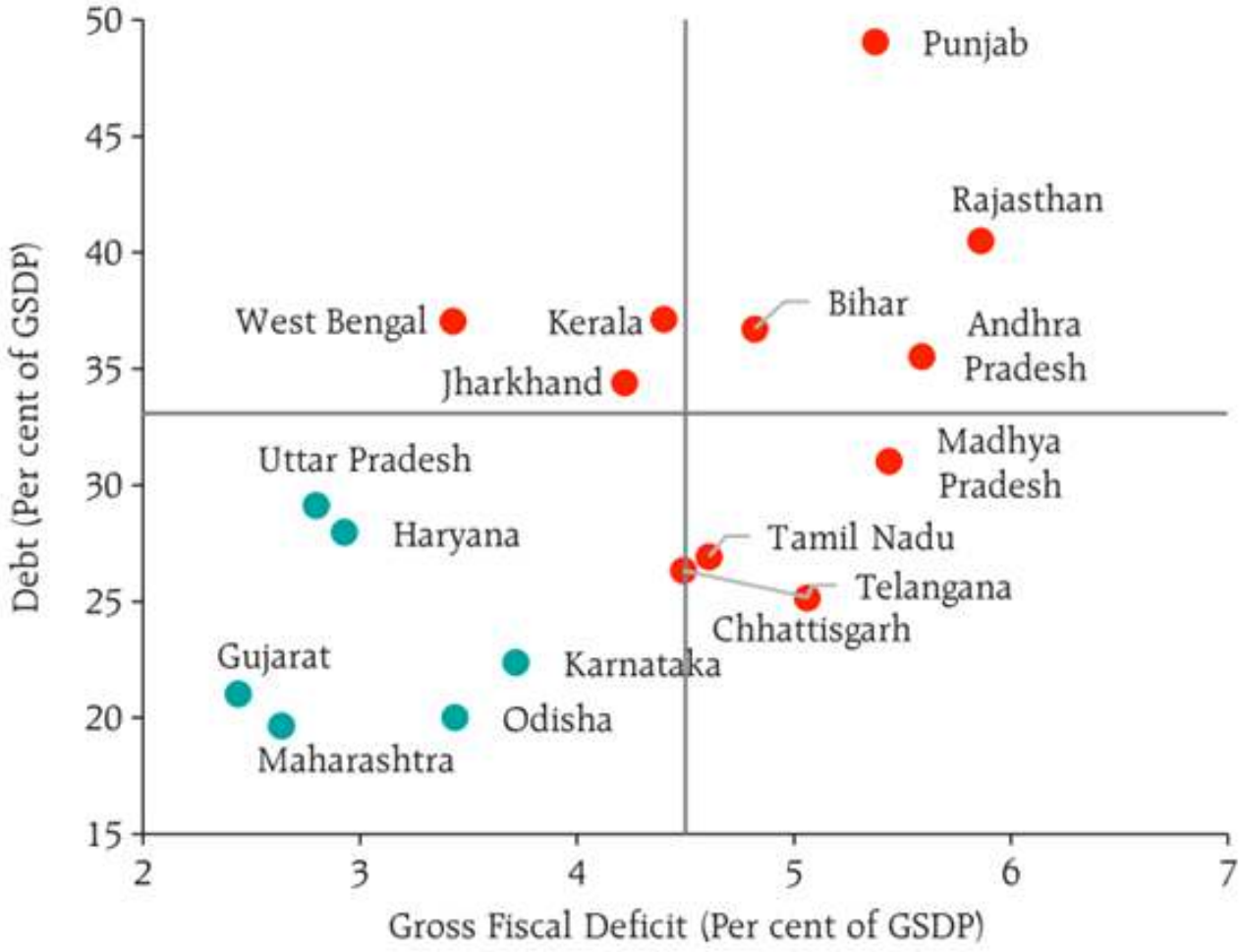
To encourage fiscal discipline, India adopted the Fiscal Responsibility and Budget Management (FRBM) Act in 2003, initially aiming to bring the fiscal deficits in the centre and states down to the limit of 3% by FY 21. This threshold was later relaxed. The 15th Finance Commission (FC) recommended that states' limit their fiscal deficit as a percentage of GSDP to 4% in 2021-22, 3.5% in 2022-23, and 3% during 2023-26. An extra annual borrowing worth 0.5% is allowed between 2021 and 2025 if power sector reforms – a reduction in operational losses, a reduction in the revenue gap, a reduction in the payment of cash subsidy by adopting direct benefit transfer, and a reduction in tariff subsidy as a percentage of revenue – are undertaken.[52] The 15th FC also observed that bringing down the fiscal deficit would result in a reduction of the total liabilities of states on aggregate from 33.1% of GSDP in 2020-21 to 32.5% by 2025-26.

Figure 3A demonstrates the position of states' fiscal indicators of debt burden and gross fiscal deficit (GFD) – both as a percentage of GSDP – with respect to FRBM targets in FY 21.

[50]Acharya, S., 2016. India's Fiscal Deficits: A Short History. Business Standard, https://www.business-standard.com/article/opinion/shankar-acharya-fiscal-deficits-a-short-history-117030801219_1.html.
[51]Nandy, A., Sur, A. and Kundu, S., 2020. Persistent fiscal deficits and political economy transitions in India: An empirical investigation. Economic and Political Weekly, 55(8), pp.34-41.

Table 3A

States' GFD/GSDP and Debt/GSDP ratios in FY 21 with respect to FRBM targets



Note: Horizontal and vertical lines inside the graph are the 15th FC's indicative targets for debt and GFD respectively.
Source: RBI State Finances, A Risk Analysis (2022), which is based on budget documents of state governments.

In FY '21, Uttar Pradesh, Haryana, Gujarat, Karnataka, Odisha and Maharashtra were in compliance with both GFD and debt targets. Himachal Pradesh, Assam and Delhi were not included in the RBI's analysis, but our calculations from RBI data indicate that their GFD/GSDP ratios were approximately 4.4, 3.3 and 0.9 in FY '21, making them compliant with the GFD target.

Punjab, Rajasthan, Bihar and Andhra Pradesh overshot both targets. West Bengal, Kerala and Jharkhand achieved the GFD target, but not the debt target. Madhya Pradesh and Tamil Nadu achieved the debt target, but not the GFD target.

[52]In FY 22, 10 states were given permission to borrow an additional INR 28,204 crore to undertake power sector reforms, namely Andhra Pradesh, Assam, Himachal Pradesh, Manipur, Meghalaya, Odisha, Rajasthan, Sikkim, Tamil Nadu and Uttar Pradesh. Monthly Summary Report, Finance Ministry, March 2022.
https://doe.gov.in/sites/default/files/Monthly%20Summary%20Report%20of%20March%2C2022.pdf

On the basis of their compliance with the 15th FC's targets in FY '21, we classify states as "fiscally compliant" and "fiscally non-compliant" (Table 3A).

Fiscally Compliant States (States Compliant with FRBM Targets in FY 21)	Fiscally Non-Compliant States (States Non-Compliant with FRBM Targets in FY 21)
Uttar Pradesh, Haryana, Himachal Pradesh, Gujarat, Karnataka, Odisha, Maharashtra, Assam and Delhi	Punjab, Rajasthan, Bihar, Andhra Pradesh, West Bengal, Kerala, Jharkhand, Madhya Pradesh and Tamil Nadu

Table 3A

Source: RBI State Finances, A Risk Analysis (2022), which is based on budget documents of state governments.

3.2. The State of State Finances

Like the rest of the world, Indian states experienced poor financial health as a result of the COVID-19 pandemic and the accompanying lockdown. Figure 3B and 3D display the trends in state-level fiscal indicators of gross fiscal deficit and own tax revenue as a percentage of GSDP in the chosen set of states between FY '16 to FY '22, based on RBI data. Figure 3C and 3E split these indicators into fiscally compliant and non-compliant states.

Table 3B

Source: RBI Handbook of Statistics on Indian States

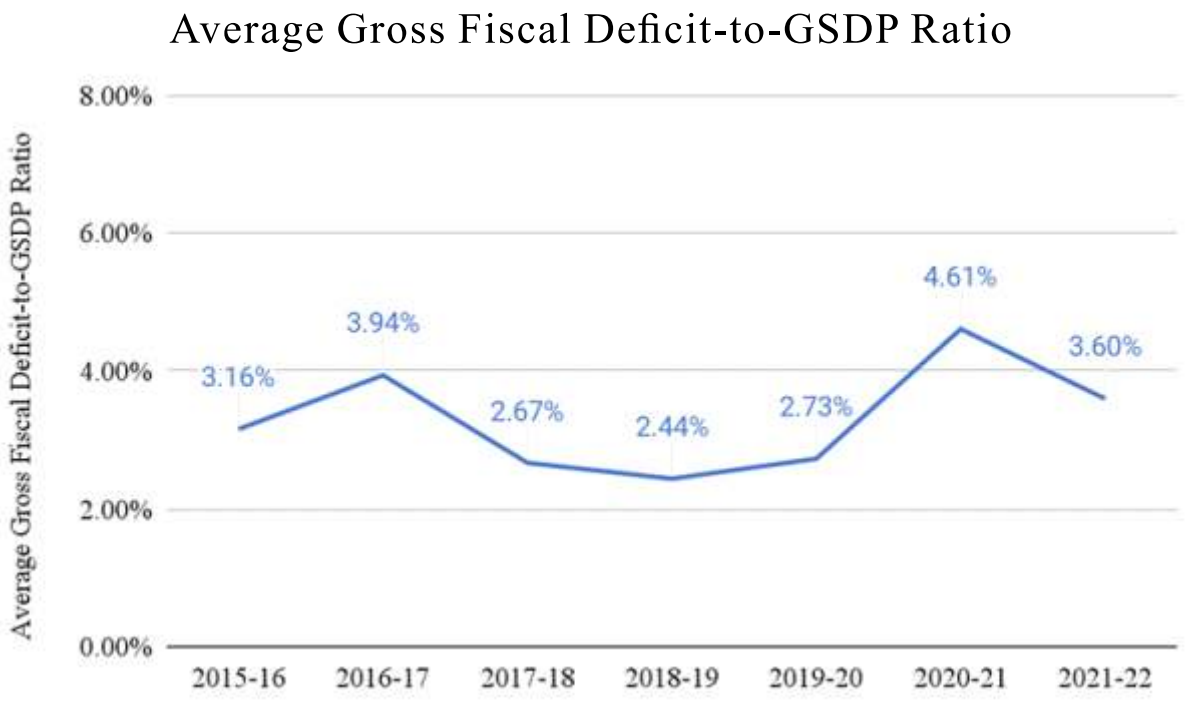


Table 3C

Source: RBI Handbook of Statistics on Indian States

Average Gross Fiscal Deficit-to-GSDP Ratio in Fiscally Non-Compliant vs. Compliant States

Table 3D

Source: RBI Handbook of Statistics on Indian States

Average Own Tax Revenue-to-GSDP Ratio

Table 3C

Source: RBI Handbook of Statistics on Indian States

Average Own Tax Revenue-to-GSDP Ratio in Fiscally Non-Compliant vs. Compliant States

The gross fiscal deficit indicates the excess of total expenditure over the total revenue of the government, or the borrowings of the government used to finance expenditure. Revenue deficit indicates the excess of revenue expenditure over revenue receipts and is used to fund government expenditure that does not generate returns. Although gross fiscal deficits as a percentage of GSDP in states were modest and falling in the pre-pandemic period, they rose sharply in the pandemic years from 2.44% in FY '19, to 2.73% in FY '20 and 4.61% in FY '21. Additionally, own tax revenue as a percentage of GSDP fell from 6.38% in FY 18 to 5.69% in FY '20.

Understandably, fiscal prudence took a backseat during the pandemic to extend much-needed budgetary support for health, education, food security and employment. To aid pandemic recovery, the Indian government announced a fiscal stimulus package amounting to INR 1.7 lakh crore, or 0.8 per cent of the GDP.[53] Moreover, states' revenue collections declined on account of the pandemic-induced economic halt. In particular, states' goods and services tax collection (under own tax revenue) and earnings from general services (under non-tax revenue) fell significantly.[54] However, even as the economy recovered in FY '22, the average GFD-to-GSDP ratio still

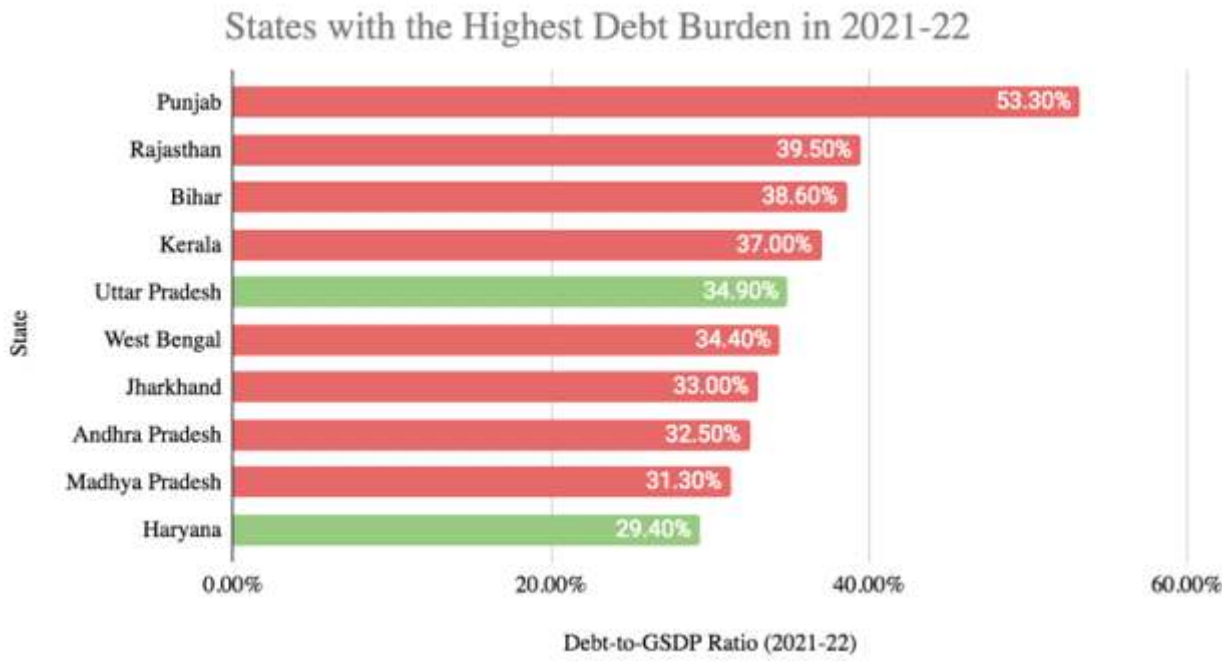
[53]Balajee, A., Tomar, S. and Udupa, G., 2020. Fiscal Situation of India in the Time of COVID-19. Indian School of Business.
[54]RBI State Finances: A Study of Budgets 2020-21.

remained greater than 3% (the original Fiscal Responsibility Legislation ceiling) and 4.5% (the revised target for FY 21). On the whole, the fiscal health of Indian states remains precarious.

Running fiscal deficits for extended periods has led to rising debt burdens. The RBI undertook a detailed assessment of the fiscal health of states in its June 2022 Bulletin "State Finances: A Risk Analysis." On the basis of their debt-to-GSDP ratios in FY '21, the RBI identified Punjab, Rajasthan, Kerala, West Bengal, Bihar, Andhra Pradesh, Jharkhand, Madhya Pradesh, Uttar Pradesh, and Haryana as the states with the highest debt burden in FY '22 (Figure 3F). These states account for approximately half the total expenditure of all states in India. Their GFD-to-GSDP ratios were greater than or equal to 3% in FY 22, the original FRL ceiling. They all had deficits in their revenue accounts, except Uttar Pradesh and Jharkhand. For the five most indebted states, the debt stock is no longer sustainable; the RBI calculates that their debt growth has outpaced their GSDP growth in the last five years.

Table 3C

Source: RBI Handbook of Statistics on Indian States

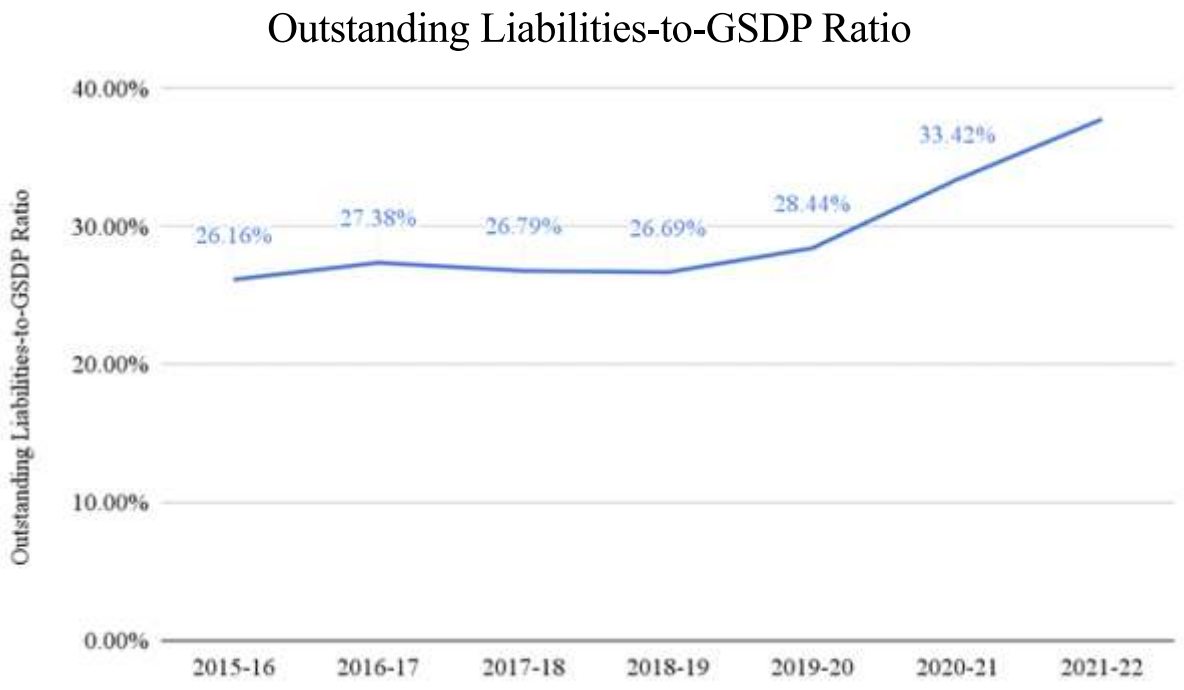


Note: States shaded in red were fiscally non-compliant, while states shaded in green were fiscally compliant in FY 21.

The reliance on borrowing during the pandemic led to rising outstanding liabilities-to-GSDP ratio across states, as seen in Figure 3G.

Table 3G

Source: RBI Handbook of Statistics on Indian States



In particular, the poor financial performance of discoms has been a persistent challenge for state finances. Loss-making, state-owned distribution utilities have required state governments to provide them with subsidies, bailouts and guarantees on market borrowings to remain financially solvent. Despite the ongoing perilous fiscal situation, the tendency towards handing out subsidies has not diminished. The average subsidy billed by discoms as a percentage of GSDP is rising across states (Figure 3H). This figure is higher and rising faster in fiscally non-compliant states (Figure 3I).

Table 3H

Source: RBI Handbook of Statistics on Indian States

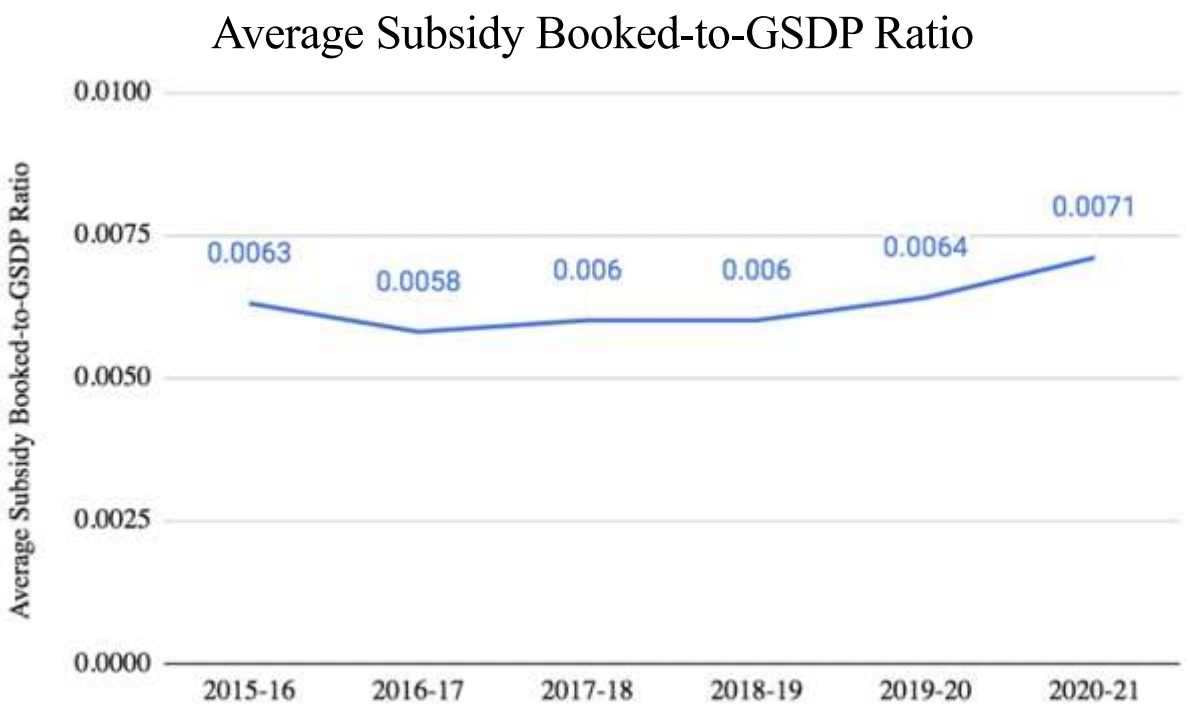
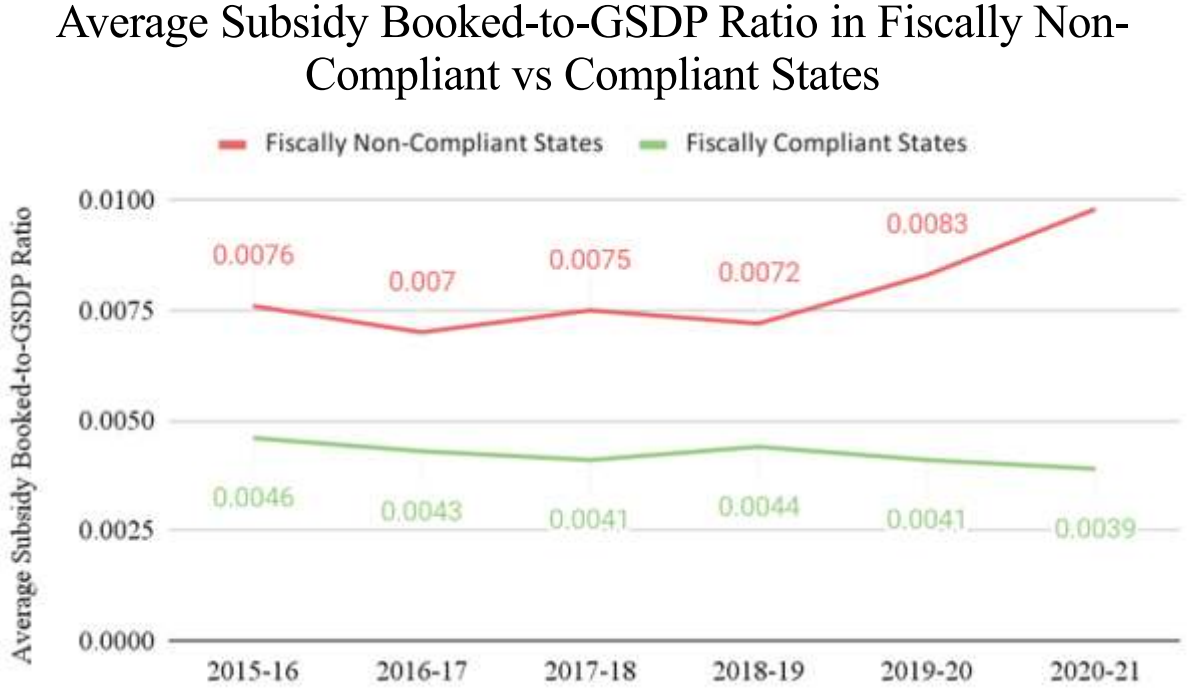


Table 3I

Source: RBI Handbook of Statistics on Indian States



Power subsidies alone comprised around 50% of total subsidies between FY '19 and FY '21.[55] CRISIL (2022) finds that off-budget borrowings by states, or loans raised by state-owned entities like discoms and guaranteed by state governments, have reached around 4.5% of GDP in 2022.[56] The power sector accounts for 40% of these guarantees.

Alongside continued handouts of power subsidies, state governments have also returned to old pension schemes to guarantee defined returns for retiring government employees. As a result of these outflows, the share of committed expenditure in our selection of states has averaged at the high figure of 32% from FY '20 to FY '22, leaving limited fiscal space for expenditure on development. Birner et al. (2007) note that power subsidies impose substantial opportunity costs, as they limit the funding available for other social programmes in sectors like education or healthcare.[57]

Given that state finances have already been stretched thin by the COVID-19 pandemic, imprudent expenditure on non-merit freebies and large discoms losses pose a significant threat to fiscal sustainability. According to the RBI, Tamil Nadu, Madhya Pradesh, Rajasthan, and Punjab are most vulnerable to a possible discom bailout while Gujarat, Assam, Haryana, and Odisha are relatively insulated from this risk (Figure 3J).

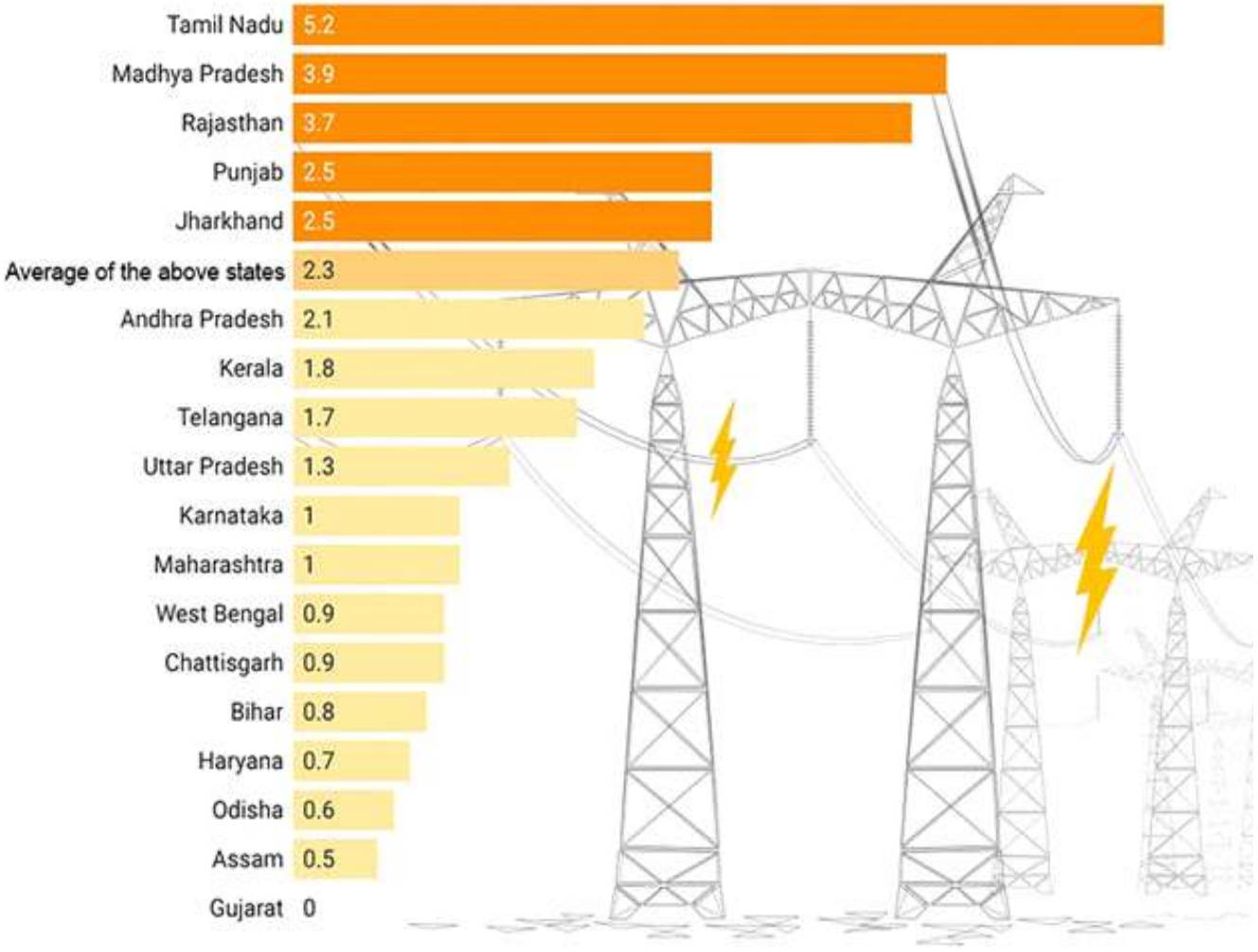
[55]Based on data from the RBI Handbook of Statistics on Indian States and Power Finance Corporation Annual Reports on the Performance of Power Utilities.
[56]CRISIL, 2022. "Off-balance-sheet borrowings of states may have reached a decadal high of ~4.5% of GSDP." Available at: https://www.crisilratings.com/en/home/newsroom/press-releases/2022/05/off-balance-sheet-borrowings-of-states-may-have-reached-a-decadal-high-of-4-point-5-percent-of-gsdp.html
[57]Birner, R., Gupta, S., Sharma, N. and Palaniswamy, N., 2007. The political economy of agricultural policy reform in India: The case of fertilizer supply and electricity supply for groundwater irrigation. New Delhi, India: IFPRI.

Table 3J

Source: RBI Handbook of Statistics on Indian States

POWER DISCOM BAILOUTS MAY TAKE A HUGE TOLL ON STATE FINANCES

DISCOMs bailout in % of the state's GSDP



Note: DISCOM stands for Distributing Companies, GSDP- Gross State Domestic Product. GSDP data corresponds to 2020-21; discom debt data from 2019-20

Source: "RBI bulletin on state finances, a risk analysis", Power Finance Corporation of India

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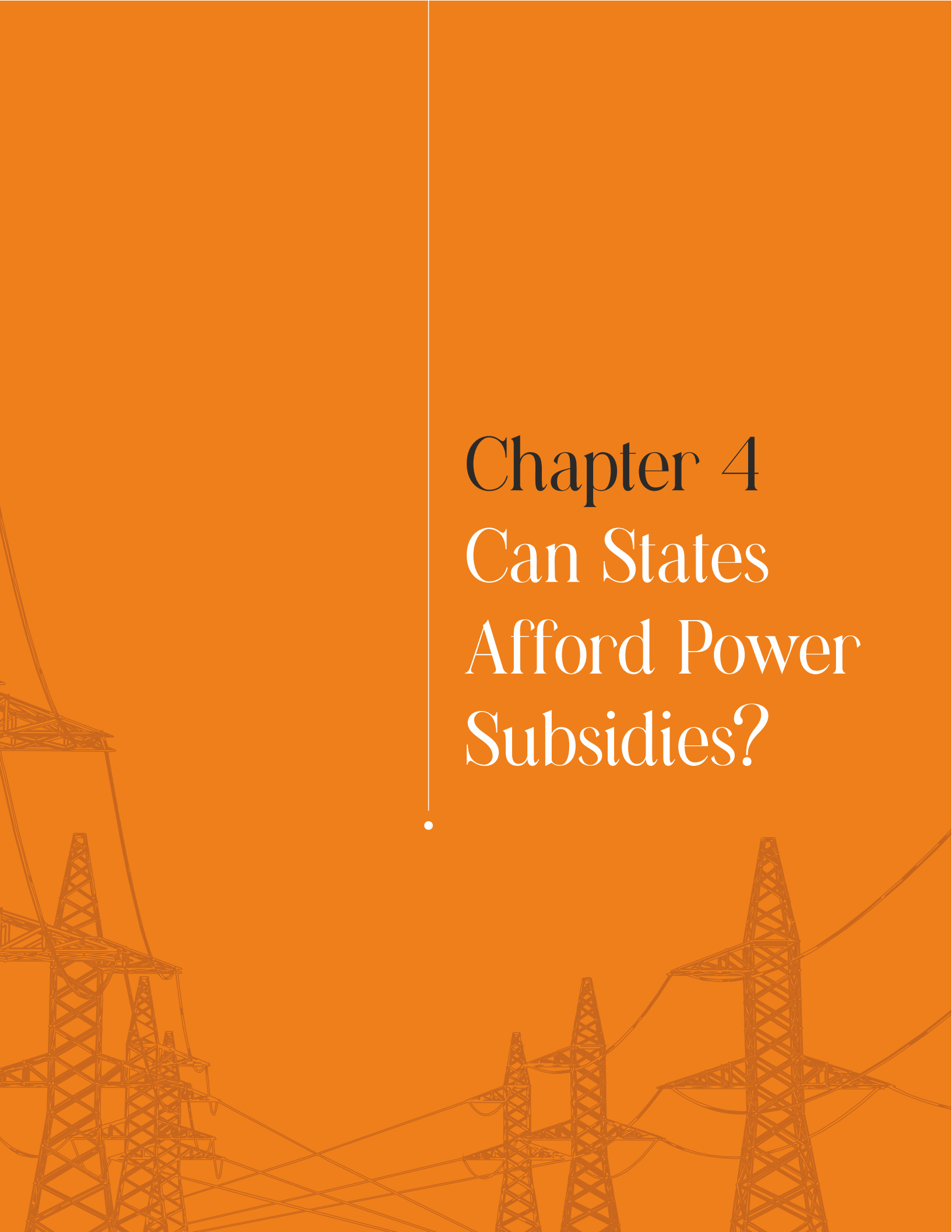
Chapter 4
Can States Afford Power Subsidies?



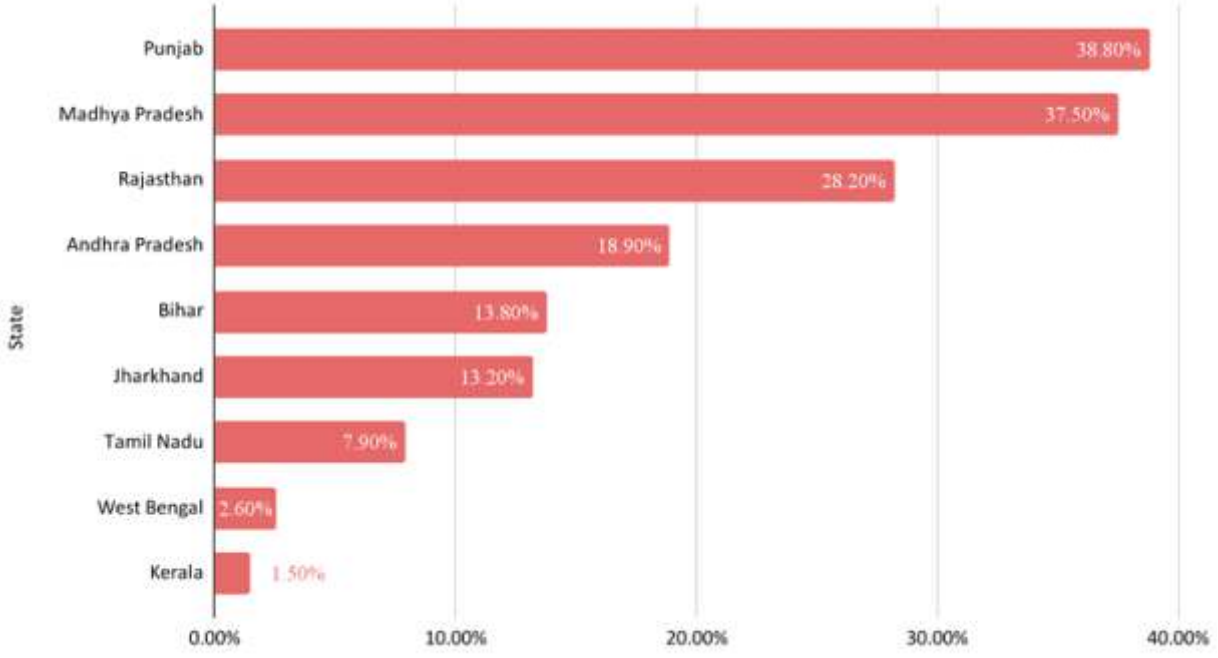
Power subsidies become a source of fiscal risk if they place an untenable burden on state finances. Handing out freebies could be justified in states that are in compliance with their Fiscal Responsibility and Budget Management Act (FRBM) targets, have the revenue to fund them, and are seeing proportional improvements in operational efficiency and the quality of service to the end user, which would diminish subsidy dependence over time. However, as the previous sections detail, many Indian states face a precarious fiscal position, falling own tax and non-tax revenues and high operational inefficiencies in the power distribution sector. Can these states then afford to give out power subsidies?

4.1. Will Reducing Power Subsidies Allow States to Achieve Fiscal Deficit Targets?

High power subsidies would be more manageable in states that are fiscally compliant, as they have the fiscal space to fund a generous subsidy regime. In many fiscally non-compliant states, power subsidies make up a significant portion of gross fiscal deficits (GFD). As depicted in Figure 4A, in Punjab, the power subsidy billed makes up 38.8% of the GFD. The equivalent figure is 37.5% in Madhya Pradesh and 28.20% in Rajasthan.

Table 4A

Subsidy Booked as a % of Fiscal Deficit in FY 21



Reducing or eliminating power subsidies in these states would bring them significantly closer to the FRBM target of maintaining a 4.5% GFD/GSDP ratio. In Table 4A, we calculate what these fiscally non-compliant states' GFD/GSDP ratios would be in FY '21 if the subsidy booked by discoms had been reduced to 75%, 50%, 25% and 0% of the original amount. Jharkhand, West Bengal, and Kerala would have achieved the 4.5% target with a 25% reduction in power subsidy, or the disbursal of 75% of the original subsidy amount. Punjab and Madhya Pradesh would have achieved it with a 50% reduction in power subsidy, or the disbursal of 50% of the original subsidy amount. Rajasthan and Andhra Pradesh would have achieved it with a 75% reduction in subsidy, or the disbursal of 25% of the original subsidy amount. Bihar and Tamil Nadu would not achieve this target even if they eliminated power subsidies completely.

Table 4A

Source: PFC Report (2020-21) and RBI Handbook of Statistics on Indian States.

Gross Fiscal Deficit/GSDP Ratio with Reduced Power Subsidies: A Scenario Analysis				
State	At 75% Subsidy Booked	At 50% Subsidy Booked	At 25% Subsidy Booked	Without Subsidy Booked
Punjab	4.83%	4.31%	3.79%	3.27%
Madhya Pradesh	4.85%	4.35%	3.85%	3.35%
Rajasthan	5.38%	4.97%	4.56%	4.15%
Andhra Pradesh	5.11%	4.85%	4.60%	4.35%
Bihar	7.19%	6.94%	6.68%	6.42%
Jharkhand	3.29%	3.18%	3.07%	2.96%
Tamil Nadu	5.66%	5.55%	5.44%	5.32%
West Bengal	4.00%	3.97%	3.94%	3.92%
Kerala	4.35%	4.34%	4.32%	4.30%

4.2

Are State Revenues Sufficient to Fund Power Subsidies?

Many states with generous power subsidy regimes do not have adequate revenue (from taxes or otherwise) to sustainably finance them. Table 4B ranks the power subsidy received by discoms as a percentage of the total revenue collected by the state from highest to lowest in FY '21. Total revenue here is defined by own tax revenue and non-tax revenue. The subsidy received is taken as the variable of interest rather than the subsidy booked, as this is the amount given in practice to discoms in the relevant fiscal year.

Table 4B

Source: PFC Report (2020-21) and RBI Handbook of Statistics on Indian States.

Rank	State	Power Subsidy/ Total Revenue of State*	Power Subsidy Received in FY '21 (in INR crore)	Total Revenue of State in FY '21 (in INR crore)
1	Punjab	28%	9,657	35,042
2	Madhya Pradesh	22%	13,864	62,862
3	Rajasthan	15%	12,767	84,609
4	Bihar	13%	5,494	42,589
5	Karnataka	11%	11,148	1,02,672
6	Haryana	10%	5,566	54,292
7	Delhi	10%	2,910	30,500
8	Gujarat	7%	6,911	96,221
9	Tamil Nadu	7%	8,270	1,22,652
10	Andhra Pradesh	6%	3,781	60,669
11	Uttar Pradesh	6%	7,661	1,35,679
12	Himachal Pradesh	5%	520	10,185
13	Maharashtra	4%	8,185	1,99,666
14	Assam	3%	603	23,409
15	Jharkhand	3%	1,000	33,557
16	West Bengal	2%	1,365	62,353
17	Kerala	1%	530	54,393
18	Odisha	0%	0	53,500

*Total Revenue = Own Tax Revenue + Non-Tax Revenue.
Note: States shaded in red were fiscally non-compliant, while states shaded in green were fiscally compliant in FY '21.

Punjab doled out the highest percentage of its revenue as power subsidies at 28%, followed by Madhya Pradesh at 22%, Rajasthan at 15% and Bihar at 13%. Odisha, Kerala and West Bengal discoms received the smallest subsidies as a percentage of their state revenue at 0%, 1% and 2% respectively.

Karnataka and Maharashtra gave out very high power subsidies in FY '21 at INR 11,148 and INR 8,185 crore respectively, but their revenues were high enough to support a large subsidy bill. As such, these high power subsidies represented no more than 11% and 4% of their respective state revenues. While the absolute value of power subsidies received by discoms was also relatively high in Uttar Pradesh at INR 7,661 crore, this only comprised 6% of its revenue. This presents a much smaller fiscal threat than states giving out a high share of their revenue as subsidies, such as Bihar's INR 5,494 crore at 13% of revenue. Haryana's revenue is relatively small at INR 54,292 crore, but the state kept its power subsidy outflow commensurately low at INR 5,566 crore.

Unsurprisingly, the four states doling out the highest percentage of their revenue as power subsidies are fiscally non-compliant. While Jharkhand, West Bengal and Kerala are also fiscally non-compliant, they likely owe their fiscal stress to factors other than power subsidies. Subsidy as a percentage of revenue is more relevant than the absolute value of the subsidy, as a generous power subsidy regime may be justified if the state's revenue is high enough to fund it. However, this is far from the case in Punjab, Madhya Pradesh, Rajasthan, Bihar, Tamil Nadu, and Andhra Pradesh – states that can ill-afford to keep up their current power subsidy regime.

4.3. Is Power Subsidy Dependence Decreasing in Distribution Companies?

Power subsidies could be justified if they induce lasting improvements in discom performance over time as subsidy dependence could then be expected to diminish in due course. Subsidy dependence may be measured through the share of power subsidies in total discom revenue. Power subsidies continue to form a high proportion of discom revenues year after year, indicating that discoms continue to be unable to recover the costs of supplying electricity through operations alone. Discoms' billing collections consistently need to be supplemented by subsidies in order to meet revenue requirements so that the power sector remains financially solvent.

Nationally, as a percentage of total revenue, the tariff subsidy billed by discoms increased from 16.52% in FY '20 to 18.53% in FY '21. Total discom revenue from operations fell from INR 6,43,881 crore to INR 6,32,543 crore, while tariff subsidy

billed rose from INR 1,20,828 crore to INR 1,32,416 crore in this period.

Figure 4B shows that in the selected set of states, the share of power subsidies received in total discom revenues increased between FY '17 and FY '20. This figure fell significantly between FY '16 and FY '17 from 16% to 7%, the year immediately after the introduction of UDAY. However, it began to rise again to pre-UDAY levels, reaching 17% in FY '20 and 16% in FY '21.

Figure 4B

Source: Power Finance Corporation Reports.

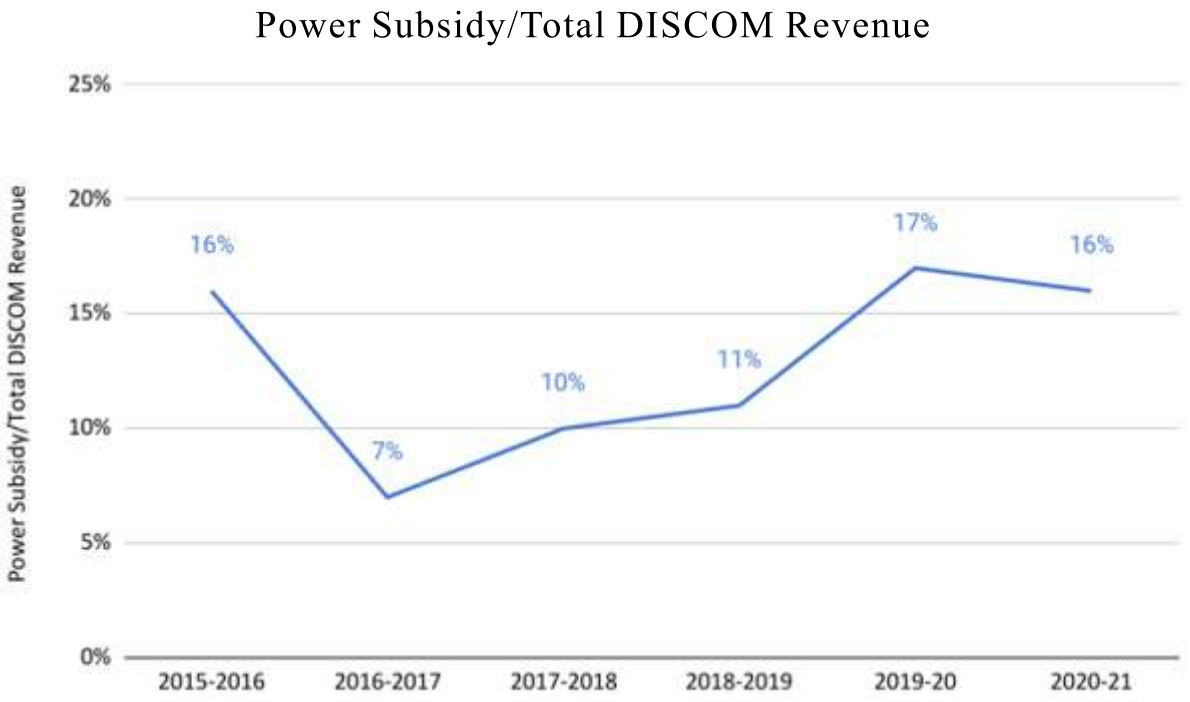
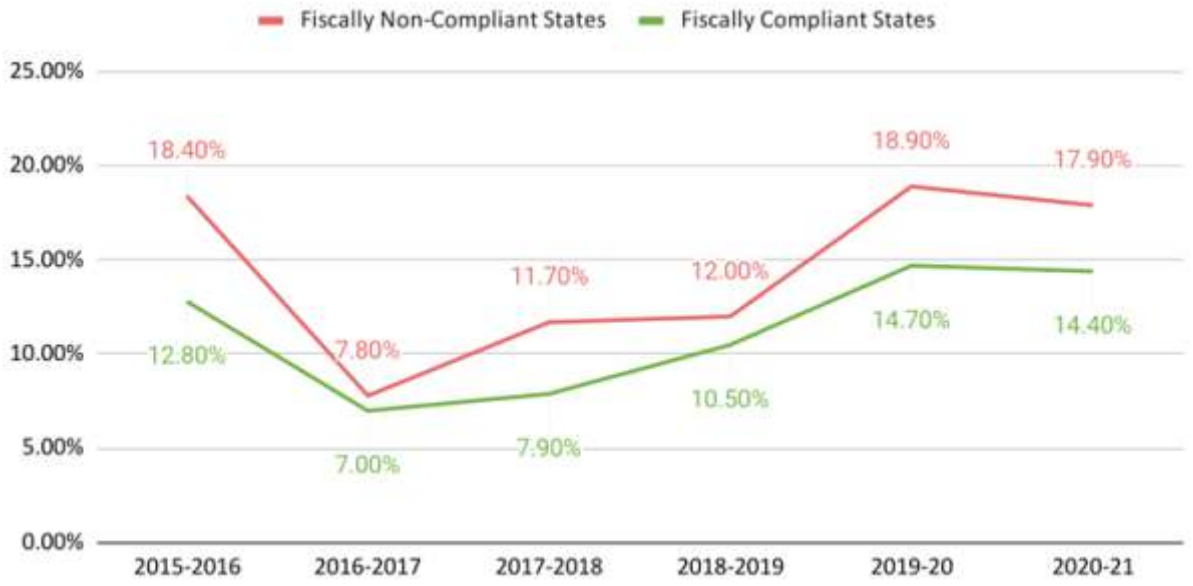


Figure 4C demonstrates that a similar trend occurred in both fiscally compliant and fiscally non-compliant states, but power subsidies have consistently formed a smaller percentage of total discom revenues in fiscally compliant states. Lower subsidy dependence across discoms is associated with better fiscal health. In FY '16, this ratio was 18.40% in fiscally non-compliant states and 12.80% in fiscally compliant states, while in FY '21, the ratios were 17.90% and 14.40% respectively. Surprisingly, subsidy dependence has risen over time in fiscally compliant states, although it still remains lower than that of fiscally non-compliant states.

Figure 4C

Source: Power Finance Corporation Reports.

Power Subsidy/Total DISCOM Revenue in Fiscally Non-Compliant vs Compliant States



Moreover, the compound average growth rate (CAGR) of power subsidies between FY '16 and FY '21 was 9.04%, while the CAGR of discom revenue was 5.80% in the selected states. Power subsidies have not induced long-term structural improvements in discoms, as their growth has outpaced that of discom revenues significantly. The largest growth rate differential was in West Bengal, where the CAGR of subsidy payments was 22.78% while the CAGR of revenue was 6.30% in this period. Madhya Pradesh, Delhi, Andhra Pradesh, Punjab, and Tamil Nadu also experienced faster growth in subsidy as compared to revenue. Of these states, only Delhi is a fiscally compliant state. On the other side of the spectrum, Assam's CAGR of subsidy payments was 3.76% while that of revenue was 9.69%. In Haryana and Jharkhand, the CAGRs of subsidy payments were -2.10% and -2.72% respectively, while the CAGRs of revenue

were 0.64% and 0.64% respectively. Of these states, only Jharkhand is a fiscally non-compliant state.

As such, there is a vicious cycle at play, where states hand out large power subsidies at the expense of the state's exchequer, fail to induce lasting improvements in operational efficiency and fiscal sustainability in the distribution sector, and then need to bail discoms out when they accumulate large losses over time.

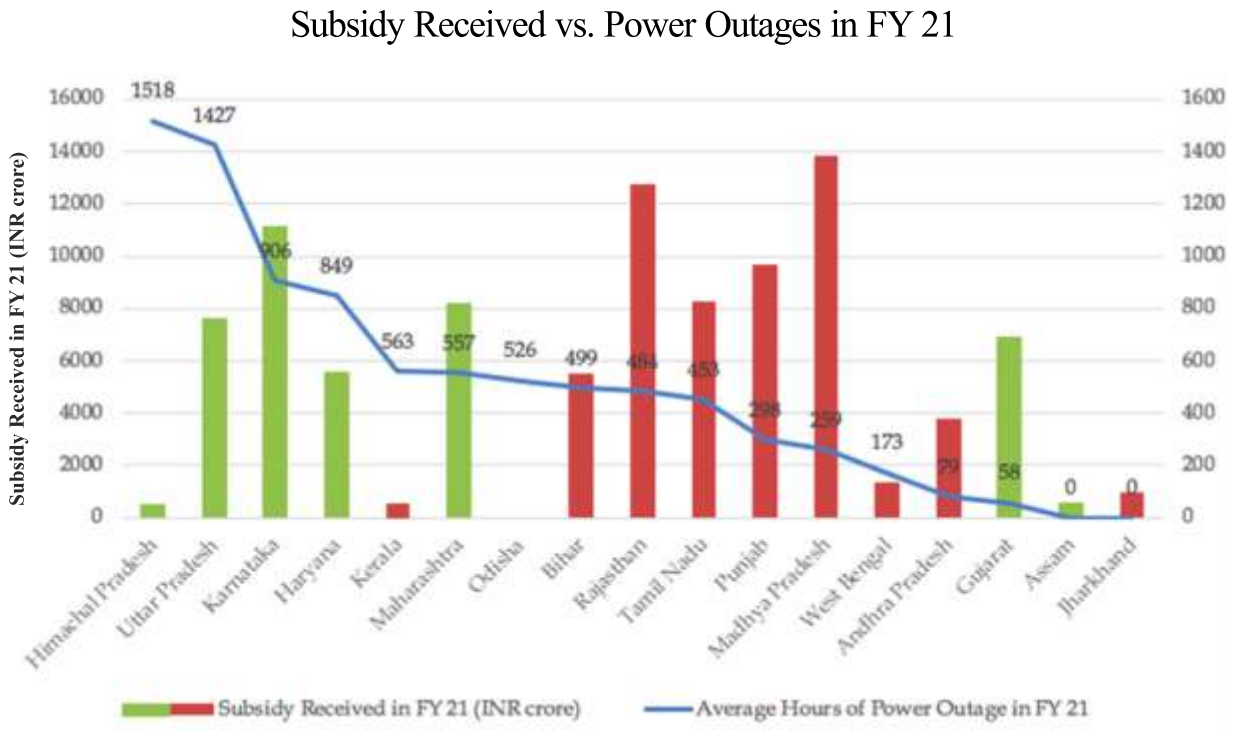
4.4

Do Power Subsidies Improve the Quality of Electricity Services?

Figure 4D depicts the average hours of power outage experienced in FY '21 in the selected set of states. This includes both planned and unplanned outages in rural and urban areas.

Figure 4D

Source: Power Finance Corporation Reports.



Source: Power Finance Corporation Reports and Parliamentary Question "Electricity Cut or Power Outage" (Unstarred Question No. 235 answered on 03.02.2022) based on outage data submitted by states on National Power Portal (NPP).
Note 1: States shaded in red were non-compliant with FRBM targets, while states shaded in green were compliant in FY '21.
Note 2: Data on Delhi is not available as it was on-boarded into the NPP in April 2021.

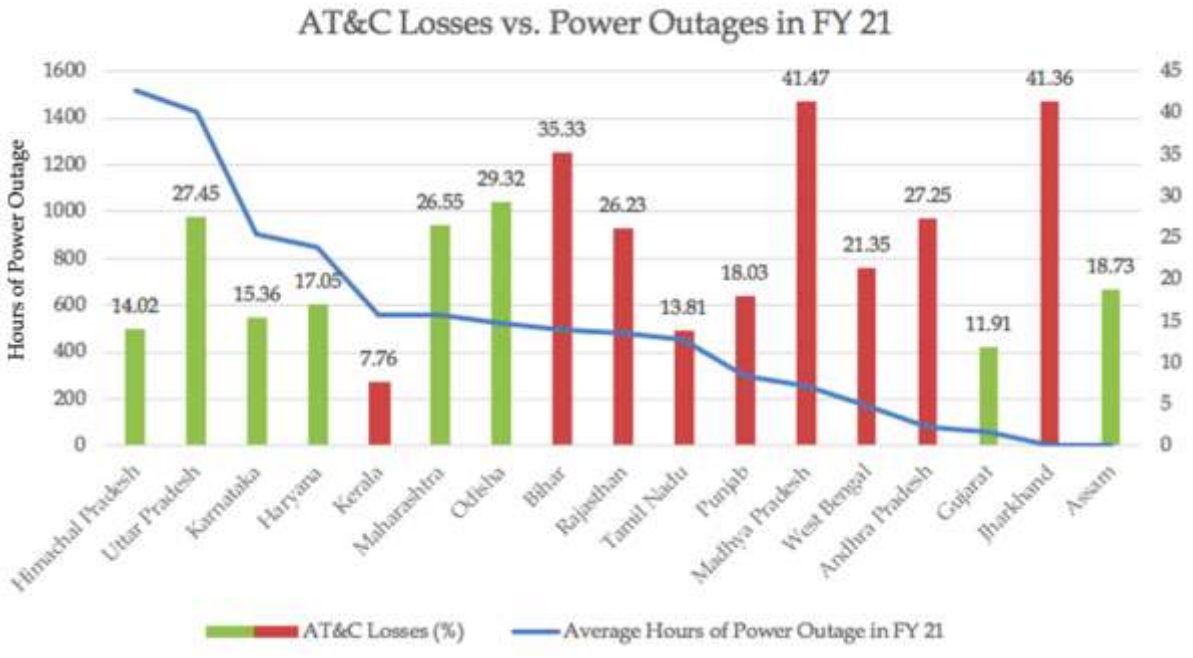
Notably, the highest power outages in FY '21 were experienced by fiscally compliant states. States that were fiscally non-compliant and doled out high power subsidies as a percentage of revenue (such as Punjab, Madhya Pradesh, Rajasthan, and Bihar) experienced fewer hours of power outage on average in FY '21 compared to fiscally compliant states. Most of the states at the top of the list, Himachal Pradesh, Uttar Pradesh, Karnataka, Haryana, and Maharashtra gave out reasonably low power subsidies that did not over-burden their state budgets in FY '21, and Odisha did not give out power subsidies at all. Consumers of electricity in Himachal Pradesh, a fiscally compliant state, experienced 1518 hours of power outages on average in FY '21, the highest across all states.

To some extent, power subsidies do seem to improve the quality of electricity services. One possible interpretation is that discoms in fiscally compliant states, given lower subsidy support, pass on losses to consumers in the form of power outages. High power subsidies in fiscally non-compliant states may enable discoms to meet supply obligations to a greater extent by supplementing their revenues in the short run. Ultimately, discom inefficiencies impose costs that must be borne by someone. Either the state exchequer bears them through generous power subsidies that prevent them from achieving fiscal deficit and debt targets, or the consumer bears them through an inconsistent supply of electricity.

While the distribution sector's financial situation is relatively less dire in fiscally compliant states, its operational and financial losses are still high and unsustainable. Figure 4E displays the AT&C losses across states alongside the power outages in FY 21. Among fiscally compliant states, Odisha (29.32%), Uttar Pradesh (27.45%) and Maharashtra (26.55%) had particularly high AT&C losses in FY '21.

Figure 4E

Source: Power Finance Corporation Reports.



Source: Power Finance Corporation Reports and Parliamentary Question "Electricity Cut or Power Outage" (Unstarred Question No. 235 answered on 03.02.2022) based on outage data submitted by states on National Power Portal (NPP).

These power outages are the result of an unreliable distribution network, rather than issues with the generation or transmission sector. While reliability has improved in the bulk power system (the generation and transmission systems), the same is not true for distribution networks, according to Athawale (2021). While regional, large-scale blackouts are rare, the end consumers continue to be subject to intermittent and frequent power outages, especially in rural and peri-urban areas. This is a sign of a poor distribution network. Moreover, many states that were expected to be power surplus states in FY '21, such as Himachal Pradesh, Haryana, Maharashtra, and Odisha, experienced high power outages (Table 4C). As such, inefficiencies in distribution rather than generation seem to be the cause of high power outages. Discoms' poor financial health renders them unable to invest in appropriate measures to improve the reliability of their networks, and their standards of performance remain poor as a result.

Table 4C

Source: The Central Electricity Authority's Load Generation Balance Report, 2020-21.

Rank	State	Average Hours of Power Outage in FY 21	Forecast Power Supply Position in FY 21	Actual Power Supply Position in FY 21
1	Himachal Pradesh	1518	Surplus	Deficit
2	Uttar Pradesh	1427	Deficit	Deficit
3	Karnataka	906	Deficit	Deficit
4	Haryana	849	Surplus	Deficit
5	Kerala	563	Surplus	Deficit
6	Maharashtra	557	Surplus	Deficit
7	Odisha	526	Surplus	Surplus
8	Bihar	499	Surplus	Deficit
9	Rajasthan	484	Surplus	Deficit
10	Tamil Nadu	453	Deficit	Deficit
11	Punjab	298	Surplus	Deficit
12	Madhya Pradesh	259	Deficit	Surplus
13	West Bengal	173	Surplus	Deficit
14	Andhra Pradesh	79	Surplus	Deficit
15	Gujarat	58	Surplus	Surplus
16	Assam	0	Deficit	Deficit
17	Jharkhand	0	Deficit	Deficit
18	Delhi	(unavailable)	Surplus	Deficit

Himachal Pradesh experienced the highest average hours of power outage in FY '21, although it is usually a power surplus state. Even though the state typically has an adequate supply of electricity, this has not resulted in reliable supply to the end user. This may be because state discoms are selling power to other states while indulging in load shedding when it comes to their state's consumers. Indeed, the centre has recently directed state discoms to first serve their own consumers before selling power at exorbitant rates in exchanges.[58]

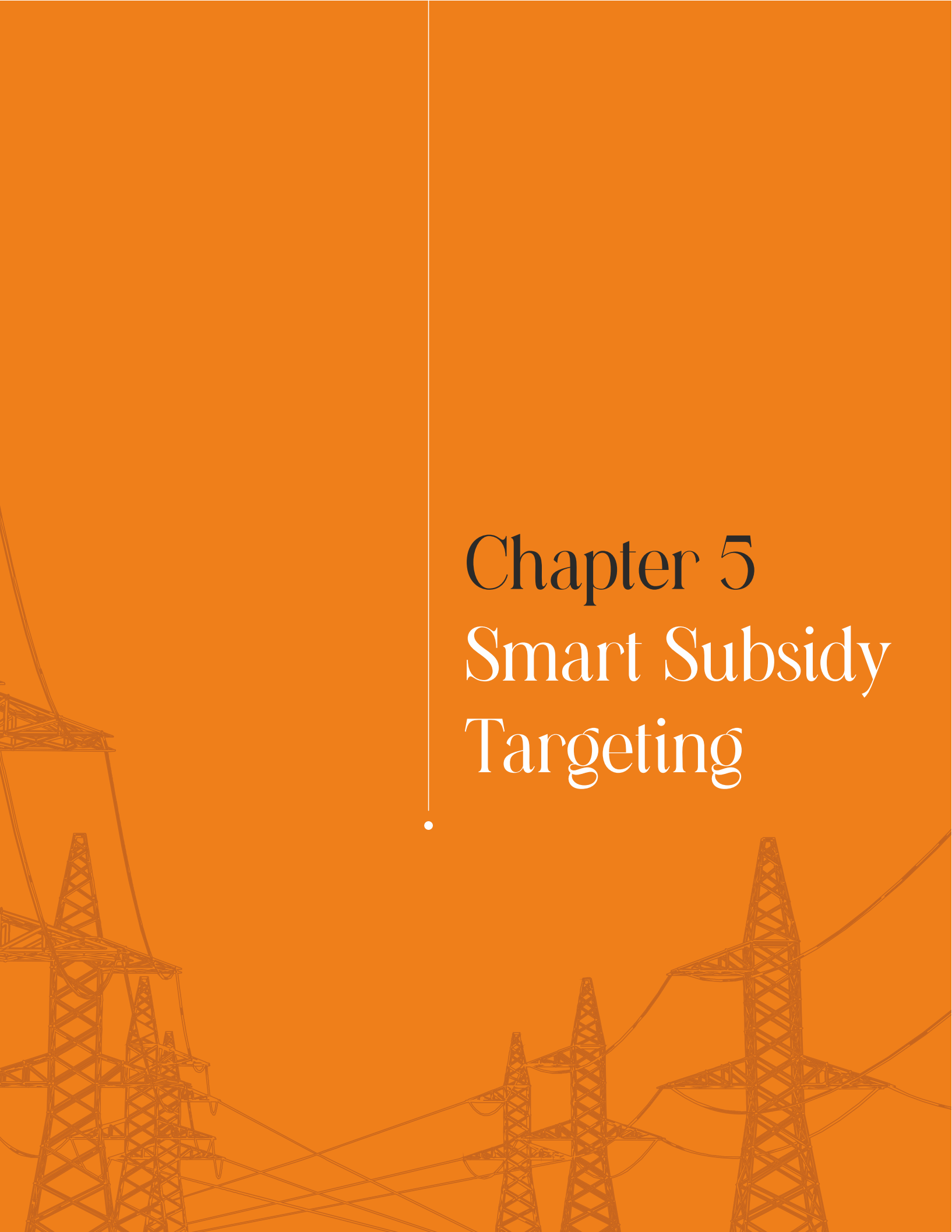
Frequent power outages raise the cost of production for industrial consumers of electricity, which hampers the ease of doing business in India and consequently hinders the nation's economic growth. A 2019 Global Competitiveness Report by the World Bank ranks India at 108th place out of 141 countries on the reliability of electricity supply. Zhang (2019), in a World Bank report, finds that eliminating power shortages would have prevented estimated business losses of USD 22.7 billion a year in India in FY '18.[59] While large businesses may manage to obtain electricity from alternative sources, India's small and medium businesses are significantly less equipped to cope with the economic losses created by load shedding.

Government directives to prevent power outages have been passed but not enforced. The Ministry of Power issued the Electricity Right of Power Consumers Rules in 2020 to ensure a minimum standard of service for the supply of electricity to end consumers. The rules require SERCs to develop clear guidelines for discoms to follow for maintaining a 24/7 reliable distribution, detailed mechanisms for performance measurement and ensure suitable compensation for consumers in case of non-performance.[60] The lack of regulatory will to penalise discoms for poor performance may derive in part from a lack of public pressure. As consumers have internalised a significant share of discom costs over the years, their expectations of improved reliability are low.

The state of Gujarat represents the ideal case, as it gave out a reasonably low power subsidy, enjoyed a power surplus and experienced very few hours of power outages on average in FY '21. The strong performance of Gujarat's power sector can be attributed to the successful implementation of various power sector reforms and the harnessing of technology to address power needs. The state has diligently implemented UDAY's prescribed operational parameters, outperforming its targets on feeder metering, feeder segregating and feeder auditing in rural and urban areas. Farmers have been provided with solar water pumps and connected to the state grid, which has turned them into power producers and reduced the government's subsidy burden. The Solar Policy of 2015 and the Net Metering Regulation of 2016 have also helped the state generate electricity from renewable sources, for which the marginal production cost of electricity is zero.[61] As such, Gujarat's power sector represents a model for all other states.

[58]NDTV. https://www.ndtv.com/business/centre-asks-states-with-surplus-power-to-serve-their-customers-first-rather-than-selling-it-outside-2572954
[59]Zhang, F., 2018. In the dark: how much do power sector distortions cost South Asia?. World Bank Publications.
[60]https://pib.gov.in/PressReleasePage.aspx?PRID=1682384

Chapter 5
Smart Subsidy Targeting



Power subsidies may only be justified if they supplement the purchasing power and welfare of the poorest consumers. The resultant welfare benefits must exceed the fiscal burden they impose on state budgets and the inefficiencies they create within the power ecosystem. Indeed, Article 38 of the Constitution mandates that the state secures a social order that promotes people's welfare and minimises and even eliminates inequalities in income, status, and opportunities. However, our literature review suggests that the power subsidy regime in its current form does not target the poorest households effectively and falls short of its intended social welfare objectives.

Mayer, Banerjee and Trimble's 2015 study "Elite Capture: Residential Tariff Subsidies in India" finds that 87% of residential electricity subsidy payments go to above poverty line (APL) households instead of below poverty line (BPL) ones due to regressive tariff design.[62] Over half the subsidy benefits extended across the country are captured by the richest two-fifths of households. In states where minimum fixed charges are levied, effective tariffs end up being lower for the upper quintiles of the income distribution because APL households tend to consume more electricity than BPL ones. For example, in Rajasthan in 2015, a household that consumed 25 kWh a month paid an effective tariff of INR 5.95/kWh. By contrast, households that consumed 75 kWh paid only INR 3.87/kWh, and those that consumed 300 kWh paid INR 3.60/kWh.

Tongia's 2017 study, "Delhi's Household Electricity Subsidies: High and Inefficient", finds that subsidy design is particularly regressive in Delhi. When the study was conducted in 2015, a 50% subsidy was provided to households that consumed less than 400 units a month, alongside a tariff schedule that increased with consumption. As such, consumers in the second slab of consumption (201-400 units a month) received a greater proportion of the 50% subsidy than those in the first slab (below 200 units a month). On average, the lowest slab received under 33% of the net billing subsidy, while those just below the 400-unit limit received over 40%. As such, even though the tariff schedule itself was progressive, the higher the consumption, the higher the subsidy per unit was, benefitting large consumers of electricity more than small consumers who are more likely to be poor.

A 2019 study by the Centre for Policy

[61]Resurgent India Ujwal Discom Assurance Yojana: Reviving the Discoms (2022), Pahle India Foundation. https://pahleindia.org/resurgent-india-ujwal-discom-assurance-yojna-reviving-the-discoms/
[62]Mayer, K., Banerjee, S.G. and Trimble, C., 2015. Elite capture: Residential tariff subsidies in India. Washington, DC: World Bank.

Research, under the Regulatory Assistance Project, "Mapping Power," shows that more than 80% of households in Delhi benefit from the power subsidy, including many middle and higher-income households.[63] This suggests that the subsidy is excessively wide-reaching, as the upper limit of 400 units for eligibility encompasses the vast majority of the city. Fiscal resources are not efficiently directed to the poorest and instead leak out to relatively affluent households. Providing free or subsidised power to well-off households does not necessarily fall within the obligations of a welfare state.

Accurate targeting of beneficiaries to minimise leakages in the system would achieve optimal subsidy performance at the lowest fiscal burden. How can we ensure that subsidies reach those most in need while reducing benefits for relatively well-off consumers?

Tongia (2017) suggests a few general principles to be followed for viable power subsidy design: they should focus on the poorest, encourage energy efficiency, have specific goals, diminish over time to align tariffs with true economic costs, remain simple rather than complex to discourage gaming the system, and promote a healthy view of paying for electricity. For example, partial subsidies are better than freebies to maintain the sanctity of metering.

Tongia (2017) also notes that lowering the threshold of maximum consumption eligible for the subsidy can deliver significant benefits. In Delhi in 2015, subsidising electricity by 50% to consumers using less than 400 units in a month covered 80% of all households on average and even 95% in certain months. He calculated that a reduction of this threshold to 300 units per month would result in 30% taxpayer savings while reducing coverage by only 13%. A reduction to 200 kWh a month would cover over half the population but save 60% of the fiscal burden, or INR 1,000 crore a year. Instead of implementing such a reduction, Delhi's power subsidy scheme expanded in 2019 to offer free power to all households consuming up to 200 units of electricity per month, while continuing the subsidy of 50% up to 400 units.

The International Institute for Sustainable Development (IISD) study "How to Target Electricity and LPG Subsidies in India" (2021) recommends opt-out schemes that allow households to voluntarily unsubscribe, like the Give It Up scheme for LPG.[64] An opt-in scheme was implemented in Delhi in September 2022 by requiring power

[63]Mapping Power: The Political Economy of Electricity in India's States, an edited volume by Navroz K Dubash, Sunila S Kale, and Ranjit Bharvirkar. Available at: https://cprindia.org/project/mapping-power/
[64]Sharma, Moerenhout, Aklin, and Bajaj. 2021. How to target LPG subsidies in India. International Institute for Sustainable Development. Available at: https://www.iisd.org/system/files/2021-04/target-lpg-subsidies-india-jharkhand.pdf.

consumers to fill up forms through a mobile number if they desired to opt into the subsidy. Over 40% of domestic consumers did not opt for it in for the month of October 2022.

Altering the design of subsidy disbursal could ensure that a greater proportion of the subsidy reaches its intended beneficiaries. India's 2006 National Electricity Tariff Policy promotes direct cash transfers over tariff-based subsidies. As a substitute for tariff-based subsidies, state governments could raise resources through an electricity duty and transfer them directly to BPL households. Ahmed (2011) writes that resistance to subsidy reform may be a reflection of poor public sector governance. Low and middle-income households see price subsidies as an assured, tangible benefit from the government when the provision of other public services is weak or inconsistent.[65] As such, power subsidy reform must redirect funds transparently and effectively towards broad-based social protection mechanisms to compensate the poorest households.

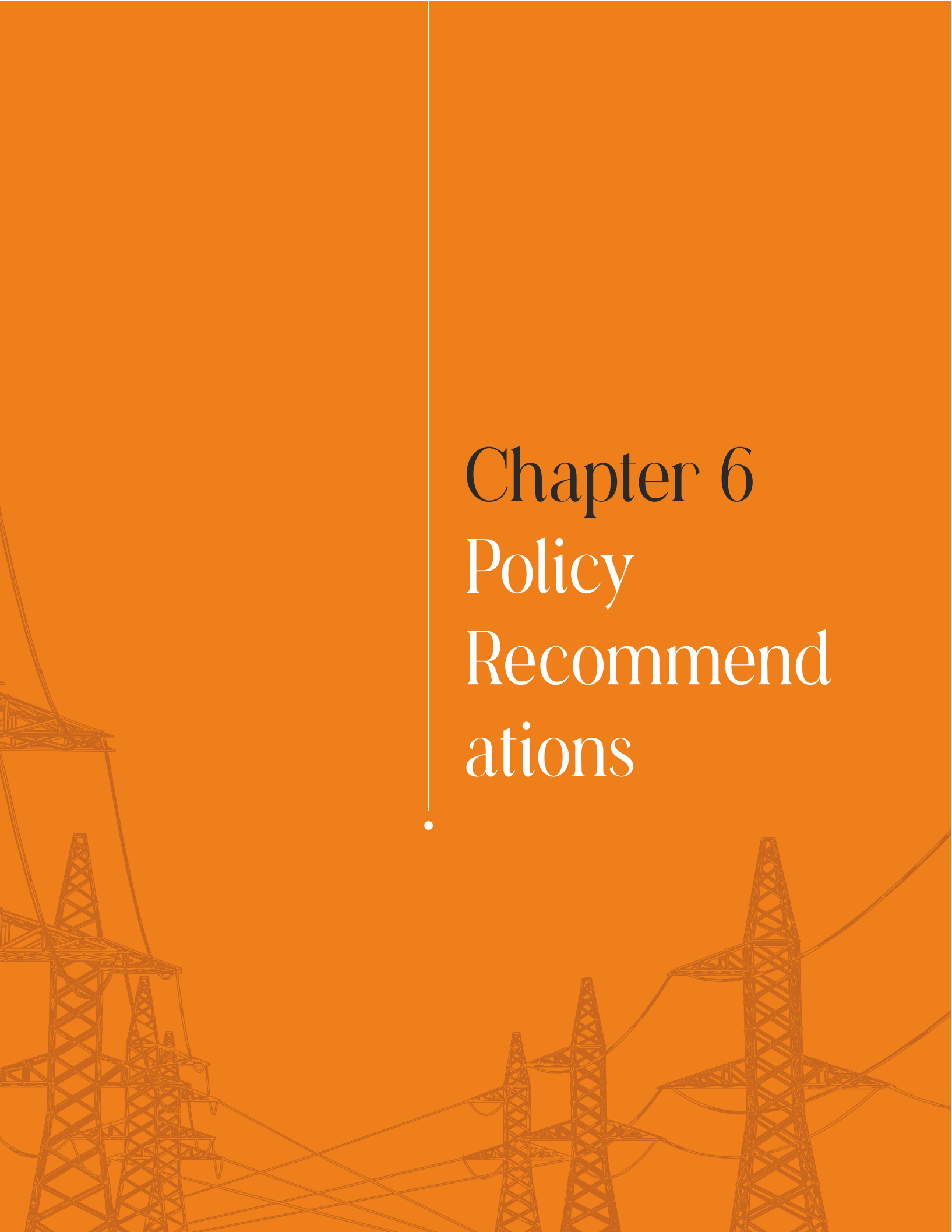
A strong social safety net would achieve the social welfare objectives of power subsidies at more cost-effective rates, without incurring their negative externalities.

Indonesia and Jordan represent two global success stories in phasing out energy subsidies, albeit in fuel. In both cases, the freed up funds were directed towards welfare programmes that targeted the poor. In 2005 and 2008, the Indonesian government used the Cash Transfer Assistance Programme (Bantuan Langsung Tunai or BLT) to reduce opposition to fuel price increases and help poor families cope with higher energy costs (Soni et al. 2012[66]). Jordan started gradually phasing out fuel subsidies in 2005, easing the adjustment by giving out cash transfers to low-income households and increasing allocations to the National Aid Fund (Ahmed 2011).

Ahmed (2011) also notes that public buy-in is crucial to a successful transition away from any power subsidy regime. Changes to the subsidy structure should involve a comprehensive communications strategy, spreading awareness of the true costs of power subsidies. The measures planned by distribution utilities towards improving their electricity supply should also be made public. Any changes must be implemented incrementally, rather than fully or immediately, to help households adapt to short-term income shocks. Ahmed (2011) also writes that efforts must be broad and co-ordinated across states to ease resistance.

[65]Ahmed, M., 2011. Subsidies—Love them or hate them, it's better to target them. Retrieved from https://blogs.imf.org/2011/05/10/food-and-fuel-subsidies/
[66]Soni, A., Chatterjee, A., Bandyopadhyay, K., Lang, K. and Vis-Dunbar, D., 2012. A Citizens' Guide to Energy Subsidies in India.

Chapter 6
Policy Recommend ations



The power subsidy regime in its current design places an unsustainable burden on state finances. At best, power subsidies fail to address the discom financial crisis and at worst, they heighten it even further. Given its financial distress, the distribution sector is currently unprepared to meet rising future demand and is unable to invest in the technological changes required to shift to renewable energy. A transition away from the current power subsidy regime is more important than ever to put Indian states and the power sector on a financially sustainable path.

- Power subsidies should be eliminated or significantly reduced, particularly in highly fiscally stressed states like Punjab, Madhya Pradesh, Rajasthan and Bihar. Freed-up funds should be diverted to government schemes incentivising a shift to solar power, such as the *Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyaan*, or PM KUSUM.[67]

- Power subsidies only mask the inefficiencies of discoms in the short run, disguising their losses as subsidised consumption. Discoms' operational inefficiencies must be addressed through structural reforms. To reduce AT&C losses, state governments must encourage discoms to adopt smart metering, feeder segregating, feeder auditing, etc., and introduce technology to address power consumption needs where possible, like promoting the adoption of solar water pumps for farmers. Gujarat's successful implementation of power sector reforms serves as a model for all other states.

- The design of the power subsidy regime should be altered to a direct benefits transfer system, wherein electricity prices will be set at the cost of supply, and eligible consumers can apply for subsidies. This prevents the distortion of economic signals.

- Public awareness campaigns should be held on the true costs of power subsidies to increase public support for a transition away from the current subsidy regime. The regulatory will to enforce relevant government directives will improve with greater public pressure.

- Subsidy design should focus on the poorest and exclude well-off households to achieve social welfare objectives at the lowest fiscal burden. This could be done by lowering the consumption threshold for households eligible to receive power subsidies.

- Subsidies should diminish over time to align tariffs with true economic costs and promote a healthy view of paying for electricity. This will push the distribution sector towards a virtuous cycle of bill payment, profitability and strong discom performance, rather than a vicious cycle of bill non-payment, subsidy dependence and long-term structural inefficiencies.

- Subsidy disbursal should be linked to the successful implementation of power sector reforms to incentivise discoms to invest in structural improvements.

[67]Please see the Appendix for a more detailed discussion of the PM KUSUM scheme.

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Appendix: Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyaan (PM KUSUM)

The budget outlay for power subsidies could be transferred towards schemes that incentivise solar power take-up, such as the Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyaan, or PM KUSUM. This scheme provides funding support for solar energy installations to generate electricity for agricultural pump-sets.
Under the Ministry of New and Renewable Energy, PM KUSUM offers a total central financial support of INR 34,422 crore to add solar and other renewable capacity of 30,800 MW by 2026.

The scheme involves three components. Component A supports the installation of small solar-energy based power plants (SEPP) by individual farmers, groups of farmers, co-operatives, panchayats, farmer producer organisation (FPOs) and water user associations (WUA). The surplus power generated is purchased by discoms at a feed-in tariff determined by the SERC, and discoms are given a procurement-based incentive at INR 0.40 per unit purchased or INR 6.6 lakh per MW of capacity installed. Component B assists individual farmers installing standalone solar pumps in off-grid areas. Component C is for the solarisation of existing grid-connected pumps or agricultural feeders with photovoltaic components.

For each component, the central government and state government each provide at least a 30% subsidy, so the farmer is responsible for paying no more than 40% of the total cost. Additionally, bank finance may be availed for another 30%, so the farmer has to initially pay no more than 10% of the cost.

Subsidies on the incorporation of renewable energy like solar power into agricultural production have the potential to address several issues simultaneously. The agricultural sector typically accounts for the highest proportion of subsidies provided by state governments (75 per cent in FY 2020). Through solar power, farmers could avail of free or low-cost electricity for both irrigation and household consumption needs, thus reducing the power subsidy burden on the state. Moreover, such a subsidy would in theory be a one-time payment, unlike power subsidies that are repeated payments and tend to grow year-on-year due to their role in perpetuating inefficiencies.

Additionally, as farmers become electricity producers rather than consumers, selling their surplus electricity to discoms would supplement their incomes. At the same time, progress would be made towards India's climate goals, such as the target of 500 GW non-fossil fuel generation capacity by 2030, as announced at the COP26 summit. As of October 2022, no more than 172.72 GW of capacity from non-fossil fuel sources has been installed.

Solarisation of electricity for agricultural purposes would lead to significant savings to state governments over time. Thus there is a strong argument to divert funds from power subsidies towards schemes promoting solar power, like PM KUSUM.

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