Table 11: Selective examples of successful discom performance improvement

States	Best Practices	Key Takeaways
New Delhi (TPDDL) private licensee[133]	**AT&C loss trajectory** 45% in 2001-02 to 9.1% in 2018-19 **ACS-ARR Gap** (₹ /kWh): 0.61 in 2009-10 to -0.21 in 2018-19 **Initial Measures:** ◆ PPP Model introduced in 1999. TPDDL & BSES awarded distribution licenses for Delhi discoms ◆ Government support in enabling transition to private licensee **Management Reforms** ◆ Dedicated Corporate Strategy Planning and Performance Management Group to formulate a long-term strategic plan ◆ 'Distributed Leadership' was implemented to run the setup as individual business units with adequate manpower ◆ Transfer of state utility employees to TPDDL with benefits, and two-way communication channels established for grievance redressal ◆ A three-tier performance management system was conceived for encouraging competition and organisational alignment among the employees ◆ A Strategic Leadership Team (SLT) maintained focus on action plans and planned deliverables through corrective and preventive actions ◆ **Technology Measures:** GIS Mapping of assets, AMR meters, tamper- proof static meters, SCADA Control Systems	Management reform rode on strong government support given to licensees Institution of strategic planning and performance management Job security, cultural buy-in, and healthy competition among the employees improve organisation's performance
Haryana, public licensees[134]	**AT&C loss trajectory:** 27% in 2012-13 to 18.1% in 2018-19 **ACS-ARR Gap** (INR/kWh): 0.94 in 2012-13 to -0.05 in 2018-19 **Profitability** (₹ Crores): -23,358 in 2012-13 to 281 in 2018-19 **Initial Measures:** ◆ Reduction in interest burden through UDAY ◆ Transition towards cost-reflective tariff via tariff hike **Management and Operational Measures**: ◆ Leadership direction of CMD ◆ Performance-based transfer policy ◆ Regular touring and interaction with field staff ◆ Compensation Policy ◆ Reward scheme for vigilance work ◆ Theft detection and imposition of fines **Technology Measures:** Aggressive installation of smart meters leading to elimination of manual intervention in meter reading	Leadership was key[135] Internal focus on improving staff performance through incentive programmes

States	Best Practices	Key Takeaways
Andhra Pradesh, public licensees[136]	**AT&C loss trajectory:** 18% in 2007-08 to 10.55 %[xiv] in 2014-15 **ACS-ARR Gap** (I ₹ /kWh): 0.94 in 2008-09 to 0.75 in 2014-15 **Profitability** (₹ Crores): 23 in 2012-13 to -9,026 in 2014-15 **Initial Measures: Sustained political** leadership **Management Measures:** Focus was on deploying reforms and long-term strategies to reduce power bills and attract private investments in the power sector. Strong collaboration among state government, regulator and utilities **Technology Measures:** HVDS System, Energy Efficient Pump Programme, DTR Replacement using Vehicle Tracking System, OMS applications to monitor feeder interruptions, complete replacement of electro-mechanical meters with high-accuracy electronic meters	Strong leadership coupled with focus on reform planning Deployment of phased roadmap with clear objectives
Gujarat, public licensees[137]	**AT&C loss trajectory:** 18% in 1996-97 to 14% in 2018-19 **ACS-ARR Gap** (I₹/kWh): 0.04 in 2008-09 to -0.02 in 2018-19 **Profitability** (₹ Crores): 149 in 2008-09 to 184 in 2018-19 **Financial Measures:** Fuel & Power Purchase Price Adjustment (FPPPA) model enabled marginal quarterly tariff adjustment minimising gap between costs and revenue **Institutional Measures:** Distribution licenses implemented in Ahmedabad, Gandhinagar and Surat, frequent theft drives, setting up of special police stations and special courts to deal exclusively with power theft **Operational Measures:** Jyotigram Yojana by the state government helped improve rural power supply by segregating agricultural feeders, use of HT lines, prepaid/ smart meters in govt establishment, installation of new substations and specially-designed transformers, AMR for feeders	Feeder separation and focus on infrastructure development Anti-theft programmes coupled with consumer-centric billing and payment initiatives to make payment seamless

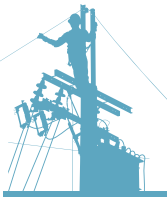
xiv Andhra Pradesh's performance has since reverted owing largely to increase in power purchase cost stemming from high RE growth, capacity payment for legacy PPAs, weak demand growth leading to overcapacity, and within this environment continuous encouragement of RE deployment leading to growing curtailment issues.

States	Best Practices	Key Takeaways
Manipur, public licensee[138]	**AT&C loss trajectory**: 52% in 2015-16 to 29.8% in 2018-19 **ACS-ARR Gap** (₹ /kWh): 0.50 in 2015-16 to 0.10 in 2018-19 **Profitability** (₹ Crores): -45 in 2015-16 to -19 in 2018-19 **Initial Measures**: Unbundling and corporatisation initiated in 2015 **Institutional Measures:** Controlled energy theft using special courts and police forces; detection and disconnection of unauthorised connections and tapping; Community participation to improve O&M including theft prevention **Management Measures**: Instituting new processes and mechanisms such as project review training, frameworks, data flow, division-wise and MD-level dashboards for monitoring project performance; establishing structural and role accountability via periodic reviews at the field level **Technology Measures:** Installed prepaid meters; computerised billing and revenue collection; integrated feeder-wise performance monitoring systems, installing aerial bunched cables for LT connections, sealed meters to check tampering	Improved power availability and supply through improving O&M measures Prepaid metering was supplemented with improved power supply resulting in improved billing and collection efficiency as well as lower commercial losses
Odisha **(FEDCO, private distribution franchisee)**[139]	**AT&C loss trajectory**: Average 23% reduction between 2013-2017 **Initial Measures**: FEDCO was given franchisee for four divisions in 2013 following the challenges faces by existing licensees **Operational Reforms** ◆ Implementation of a web-based CRM software to handle customer complaints with a centralised server helped minimise the need for multiple customer care centres ◆ Formal trainings and one-on-one trainings were provided for customer care executives by FEDCO as capacity-building exercise to improve service experience with customers ◆ Quality team was set up to check and verify customer resolution timelines at the offices of line men	Focus on customer care through both technology and human resource interventions—especially considering FEDCO's operation as a distribution franchisee in smaller urban areas

7.2 RECOMMENDATIONS

7.2.1 Structural Reforms

- **Greater autonomy for state-owned discoms:** For a state-owned utility to succeed, there should be a clear separation between utility and state. The utility should have operational and financial autonomy. Good corporate governance practices, including the use of independent directors, can help ensure such separation. The performance of state-owned discoms is also determined by the ability of the respective SERC to revise tariff frequently and adequately.
- **Distribution franchisee:** There can be a variety of distribution franchisees, from models that are essentially outsourcing revenue collection to taking care of all distribution functions (including capital infusion), in a defined area. In rural areas, private investors might not find it attractive to become licensees, but a franchisee model might be attractive. This model was successfully implemented in Bhiwandi, where there have been rapid improvements in metering, billing, and collection, and a reduction in loss. In Odisha, the franchisee model was able to achieve a significant improvement in performance, even with a large agricultural and rural load.
- **Distribution licensee/company:** The recent Budget announcement delicenses distribution and proposes to allow companies non-discriminatory access to the distribution system. While a licensee model requires a high financial capacity from the private investor, a distribution company model may not do so. In Delhi, factors such as the financial capacity of the private investor, the homogeneity of the customer mix, and their relatively higher capacity to pay, were all relevant to the success of the licensee model.
- **Increasing competition:** Discoms have a monopoly in their area of functioning. Delicensing distribution can introduce competition and enable retail choice for customers. This reform can be challenging and should be accompanied with careful market design. The feasibility of competition will depend on the size of the market, the nature of the demand, the efficiency of the incumbent, potential for growth, etc.
- **Vertical unbundling:** Even where there has been de jure unbundling of state-owned power utilities, they may continue to act as de facto integrated utilities. Vertical unbundling enables transparency in operations of the discom. It can focus attention to the parts of the utility (generation, transmission or distribution) that require reform. In states such as Gujarat, the unbundling was an important step towards improving the performance of discoms. Vertical unbundling can also be a first step towards implementing privatisation or a franchisee model, if desired.
- **PPP models** can be useful in loss-making areas, where commercial operation might not be feasible without support in the form of Viability Gap Funding (VGF) from the government. For instance, in a rural area with high losses, the government could invite bids from private entities and specify the minimum service quality they would need to provide.



7.2.2 Regulatory Reforms

- An effective SERC is essential to a well-functioning distribution sector. The state governments should promote autonomy, competence, and transparency of the SERC. Tariffs should be regularly revised to ensure that they fairly reflect the actual fixed and variable costs. Rapidly changing fuel costs should be adjusted through fuel surcharges determined through a transparent process. No new regulatory assets should be created. The existing regulatory assets should be cleared over a defined schedule over the next 3-5 years through appropriate tariff changes. One way that has been suggested to insulate the regulatory functions from political pressures is to create regional electricity regulatory commissions.
- DBT can help improve efficiency and reduce leakages. It has recently been implemented in parts of Madhya Pradesh. The respective state government should prescribe the details of the DBT scheme. DBT should not be imposed on consumers. Instead, consumers should be able to choose whether to opt for it or not. For those who do not opt for it, the supply of subsidised electricity should continue. The DBT scheme could, for instance, be structured such that consumers do not stand to lose their current benefits but are paid more for efficient use of electricity, such as the Paani Bachao Paise Kamao scheme in Punjab. This will de-risk the consumers. Over time, consumers will see others benefitting and they will be encouraged to adopt the DBT regime.

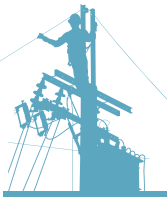
7.2.3 Operational Reforms

- **Reducing power procurement costs:** Discoms should optimise their power purchase by procuring from the markets as suitable, and they should be rewarded for efficiency gains from the use of the market. The discoms should develop the human resources and daily liquidity that are required to use this relatively new facility. As long as the markets continue to provide low-cost power, discoms should not sign new expensive long-term thermal PPAs. States such as Chhattisgarh, Gujarat, Maharashtra, and Uttar Pradesh have banned new thermal PPAs till 2022. Discoms should use ToD tariffs to incentivise changes in demand patterns. Dynamic tariffs, enabled by advanced metering and a smart grid, can reduce power purchase costs and help manage peak loads.
- **Billing efficiency:** Many discoms need to improve their billing efficiency through better metering. They should fully utilise the revamped central government reform scheme to achieve 100 percent metering using prepaid/smart meters while being careful of guarding against cybersecurity threats.
- **Collection efficiency:** Discoms should target 100 percent collection efficiency. Theft can be reduced through concerted action by the discom and the state. Prepaid metering can help reduce pilferage and increase collection, as demonstrated in Manipur. Many state government departments and municipalities are also major defaulters in payments**.** Discoms should follow up tenaciously to collect current bills as well as arrears.

- **Reduce technical losses:** Discoms may reduce their technical losses through investment by improving their grid (including upgrading conductors, high-tension lines, and right-sizing transformers) and through the implementation of appropriate monitoring technologies, as was done effectively in Gujarat. This is expected to be a major component of the revamped central government reform scheme announced in the Budget, and the state discoms should aggressively use this support to upgrade their distribution infrastructure.
- **Agricultural demand management:** States with large rural or agricultural consumer bases such as Rajasthan, Andhra Pradesh, Gujarat, Karnataka and Maharashtra have benefited from separating feeders for agricultural use from non-agricultural use. Investment in feeder separation has been encouraged by the government at the Centre through DDUGJY. Further, solar pump deployment has also received a push through PM-KUSUM scheme. Discoms can significantly improve their financial situation by encouraging the use of solar pumps for agriculture.

7.2.4 Renewable Energy Integration Reforms

- Solar and wind power are intermittent sources of power. Even more conventional power sources (coal, natural gas, hydroelectric, or nuclear) also have distinctive characteristics such as different ramp rates and varying abilities to function efficiently at different levels of output. In order to increase the firmness of RE power, reduce their power procurement cost, and handle this variety of power sources, discoms can deploy large-scale energy storage or use hybrid projects such as solar/wind. Storage can be provided by battery systems or pumped hydro-storage systems. Curtailment of renewable power can be reduced by improving transmission grid, accounting for dynamic changes in transmission capacity, and by retrofitting old thermal plants to enable them to operate at lower loads. Discoms need to develop better RE forecasting capabilities to reduce their deviation costs and reduce the need for real-time balancing.
- Currently, many discoms and regulators fear that the rise of RTS can harm their revenue stream. Discoms should be fairly compensated for the additional expenses they need to incur to integrate RTS power generation. Further, tariffs for RTS should be set so that all consumers and producers face fair and relevant price signals as relevant to their state. Off-grid solar power plants are simpler and cheaper than grid-connected solar plants, though they may require storage. Such off-grid solar plants should receive greater policy encouragement.
- While the grid has reached most households, the quality and availability of power is still poor in many remote areas. In such areas, mini and micro-grids can provide more predictable power. Mini-grids can also be used to provide greater resilience to critical infrastructure. Generally, the cost of mini-grid power is much higher than power from discom. A PPP model can be explored in such remote areas, with the government providing VGF (or charging a premium, as the case may be) in return for the concessionaire supplying power at a specified



rate while meeting service quality targets. The mini-grid could also act as a distribution franchisee. Another possibility is that the mini-grid could be run by a well-capacitated local government, with support from the state government.

7.2.5 Managerial Reforms

- Discoms should take proactive steps to improve customer relations. Easily accessible call centres, convenient bill payment facilities, and accurate billing can help reduce customer dissatisfaction and increase revenue.
- Energetic and enthusiastic employees are key to the financial and operational success of a discom. Performance incentives should be designed to align the employees with the interests of the organisation. Zones or circles in the discom could be treated as profit centres, with the employees given commensurate autonomy as well as responsibilities. This can bring in a sense of ownership among employees about running the business profitably.
- The operation and management of the power distribution business are quite complex. They require expertise in a variety of fields: engineering, finance, billing and collection, human resources, administration, etc. Some organisations have been established to provide training (such as the National Power Training Institute, and the Tata Power DDL Learning Centre). There is a need to augment the capacity to provide training in these fields.

7.3 CONCLUSION

The Indian power sector is one of the largest and most complicated in the world. External expertise, structural frameworks, and new technology are required but they are not sufficient to drive India's power sector transition. Similarly, a push to retail choice through separation of content and carriage may not necessarily result in the full set of theoretical benefits touted.

One key lesson from the history of the power sector in India is that the country is too large and diverse for a one-size-fits-all approach. A flexible and home-grown approach to reform, which is supported by state and central political will, and which allows for 'learning by doing', will be instrumental in determining the success of reforms.

Appendix

APPENDIX 1: DISCOM PROFITABILITY 2009–10 TO 2018–19 (INCLUDING TARIFF SUBSIDY RECEIVED, IN ₹ CRORE)

Profit After Tax including tariff subsidy received (In Crore ₹)											
								UDAY Period			
Region	State	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
East	Jharkhand	-707	-723	-3,211	-2,668	-4,021	-474	-1,151	-1,741	-212	-751
East	Bihar	-1,412	-1,332	-2,662	-1,228	-343	-1,239	-1,073	-1,257	-1,872	-1,163
East	Odisha	-241	-216	-423	-559	-342	-881	-931	-912	-793	-1,539
East	West Bengal	71	95	73	82	19	20	137	-175	72	-14
East	Sikkim	-9	-23	-17	39	33	-35	-182	-115	-29	-3
NER	Manipur	-145	-204	-307	-315	-194	-30	-20	-15	-8	-19
NER	Arunachal Pradesh	-212	-182	-274	-255	-428	-257	-40	-324	-429	-428
NER	Nagaland	-108	-179	-214	-212	-191	-315	-15	-62	-62	-325
NER	Mizoram	-142	-158	-127	-200	-192	-192	-122	-147	87	-83
NER	Meghalaya	-56	-91	-204	-221	-295	-198	-192	-343	-287	-203
NER	Tripura	-11	-130	-157	-107	-107	-102	-100	40	28	21
NER	Assam	-303	-486	-558	-568	-693	-578	-194	-58	302	311
North	Rajasthan	-11,006	-21,370	-19,572	-12,351	-15,645	-12,474	-12,784	-3,468	686	-523
North	Jammu & Kashmir	-2,106	-2,167	-3,037	-3,129	-3,375	-4,114	-4,278	-4,063	-2,999	-2,902
North	Delhi	615	801	481	356	353	418	227	426	507	787
North	Uttar Pradesh	-5,260	-3,967	-9,225	-9,778	-16,725	-6,798	-2,522	-3,321	-5,002	-6,031
North	Haryana	-1,592	-1,084	-13,203	-3,649	-3,554	-2,117	-808	-193	412	281
North	Himachal Pradesh	-153	-502	-513	-340	-137	-114	391	-170	-44	99
North	Uttarakhand	-527	-204	-55	-16	323	-260	-95	-289	-229	-553
North	Punjab	-1,302	-1,640	-459	94	249	-1,067	-2,558	-3,412	-2,618	363
South	Tamil Nadu	-10,295	-11,907	-13,308	-12,064	-14,052	-12,757	-5,787	-4,349	-7,761	-12,623
South	Andhra Pradesh	-3,641	-2,177	-4,023	-17,522	-1,379	-2,549	-3,933	-2,712	-545	-16,736
South	Telangana						-2,912	-3,674	-6,209	-6,387	-9,020
South	Puducherry	-47	-134	-164	-308	51	104	6	-8	5	-39
South	Karnataka	-425	9	-82	-905	-534	84	-132	-1,920	-2,003	-1,825
South	Kerala	241	241	241	241	116	-1,273	-697	-1,495	-784	-290
West	Madhya Pradesh	-3,343	-2,157	-2,920	-4,452	-6,376	-5,001	-5,474	-1,112	-5,192	-9,390
West	Goa	16	-79	-271	-285	-4	-17	-286	-283	26	-172
West	Chhattisgarh	-351	-581	-2,012	-498	-630	-1,554	24	-573	-510	-1,183
West	Maharashtra	-1,085	-1,505	-808	-871	-280	-366	-2,442	-765	1,620	2,413
West	Gujarat	49	104	133	71	95	108	84	279	425	184
Total		-43,487	-51,948	-76,878	-71,618	-68,258	-56,940	-48,621	-38,746	-33,596	-61,356

(Source: PFC[140])