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Discussion Paper

Reform or Bust

Strategic Approaches to Address the Ricketty Electricity Distribution System





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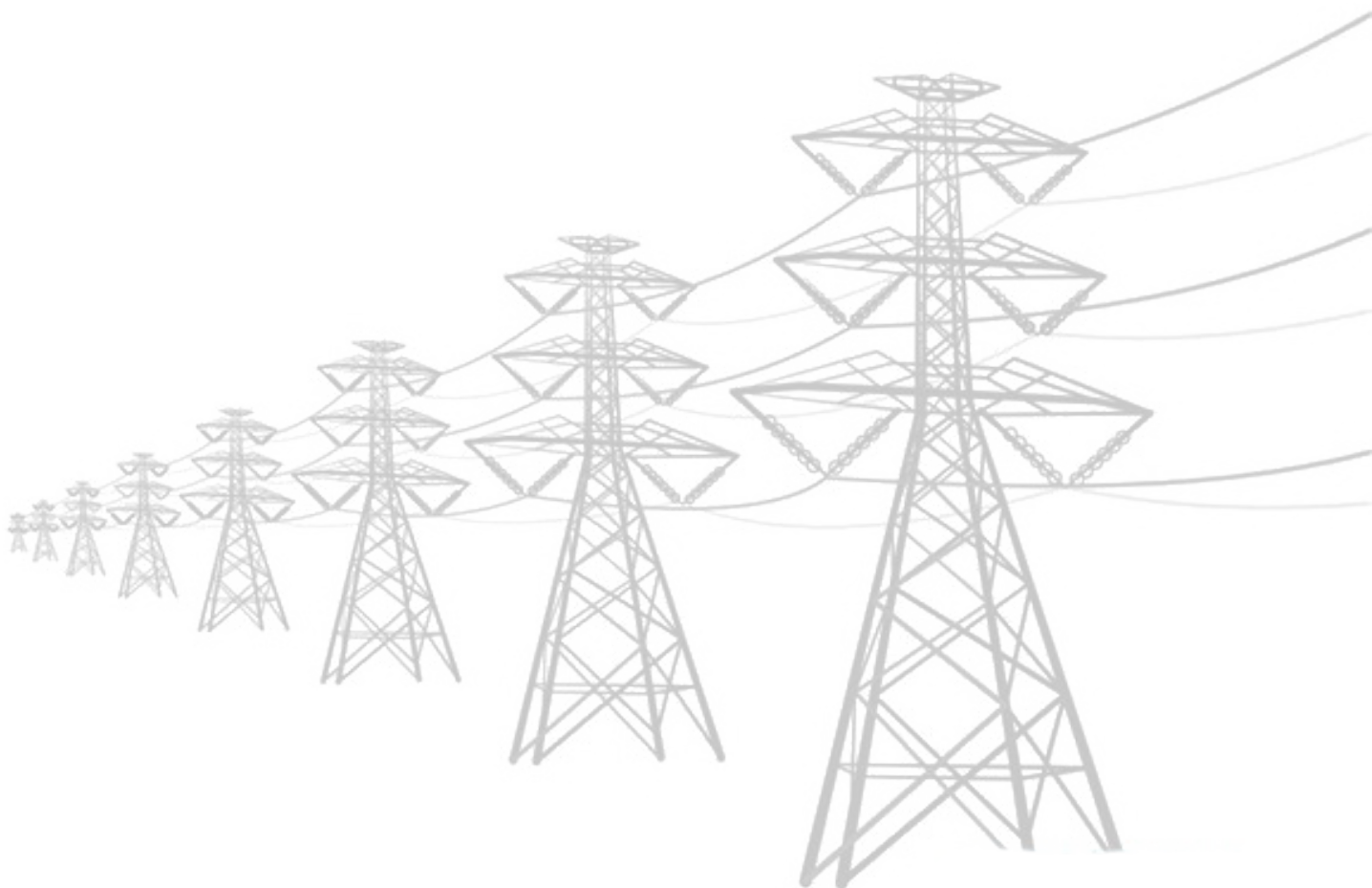
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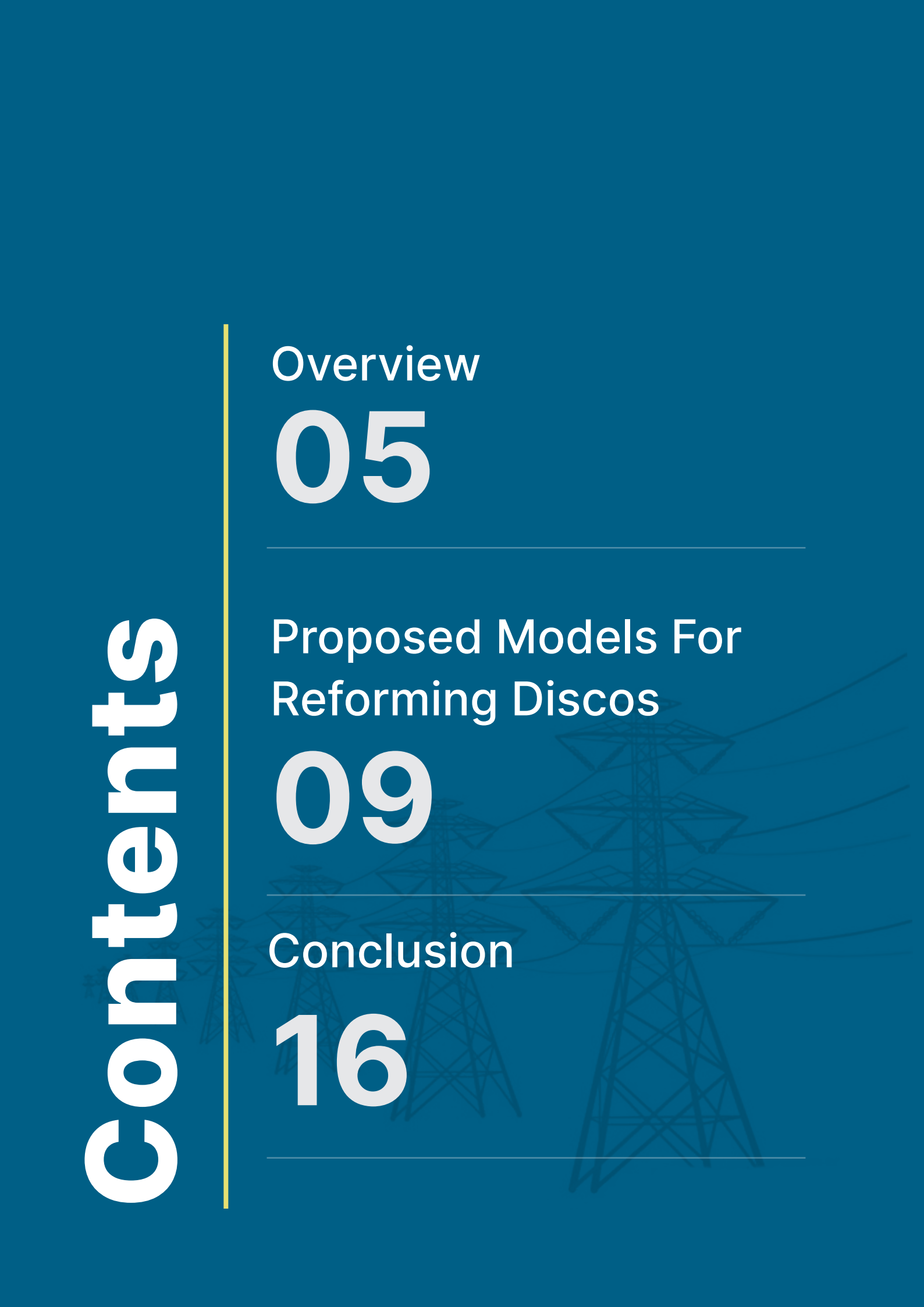


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Contents



Overview

05

Proposed Models For
Reforming Discos

09

Conclusion

16

OVERVIEW

Electricity transmission and distribution losses in Pakistan are among the highest in the world. These losses are caused by a combination of electricity theft, poor infrastructure, faulty metering, outdated equipment, and other socio-cultural and economic factors. They have made the national grid very fragile, both technically and financially. Simultaneously, they have been contributing significantly to circular debt, adversely affecting the profitability and quality of service of electricity distribution companies over the last several years.

Policy and energy experts have always stressed the importance of addressing this Achilles' heel of the power sector as a pre-requisite to start and promote sustainable changes in it. For instance, when, following the global trend, Pakistan embarked on a plan to restructure its power sector in the early 1990s, one of its main concerns was to address problems in the electricity distribution system. As a result of that restructuring, the state-owned power utility, Water and Power Development Authority (Wapda), was unbundled, and several new entities were created to take over its generation, transmission, and distribution functions. These new entities included eight new companies to be responsible for distributing electricity to consumers in different regions of Pakistan (except Karachi). Later, their number was increased to 10. They were also given a trivial sounding acronym "Discos" — short for distribution companies.

The Karachi Electric Supply Corporation (KESC), meanwhile, retained its status as a vertically integrated entity — one that could still generate, transmit, and distribute electricity simultaneously. Later, it changed its name to K-Electric (KE), though it had already been privatized in December 2005.

As mentioned above, Wapda's unbundling and K-Electric's privatization were intended to improve the administrative, managerial, and financial efficiency of Pakistan's electricity system. Around two decades later, however, these initiatives appear to have failed in achieving their objective: while K-Electric has improved its capacity to recover bills (mainly by enforcing collective punishment of rationing power in proportion to bill recovery), it still remains dependent on massive subsidies provided by the federal government (of roughly 160 billion rupees every year); remaining Discos, on the other hand, are still struggling to improve their administrative and financial capacities. They are, indeed, still reeling under both electricity and financial losses. Most of them, indeed, persistently breach electricity loss limits set by the power sector regulator, National Electric Power Regulatory Authority (Nepra) for each of them. Consequently, the government has to bail them out every year financially.

Here, it is important to distinguish the two types of losses that electricity transmission and distribution system suffer from. (1) Technical losses – which occur when electricity is converted from one voltage to another; and (2) commercial losses – which are caused by electricity theft, faulty meters, and inefficiencies in billing and payment collection.

DISCOs' Losses Year on Year

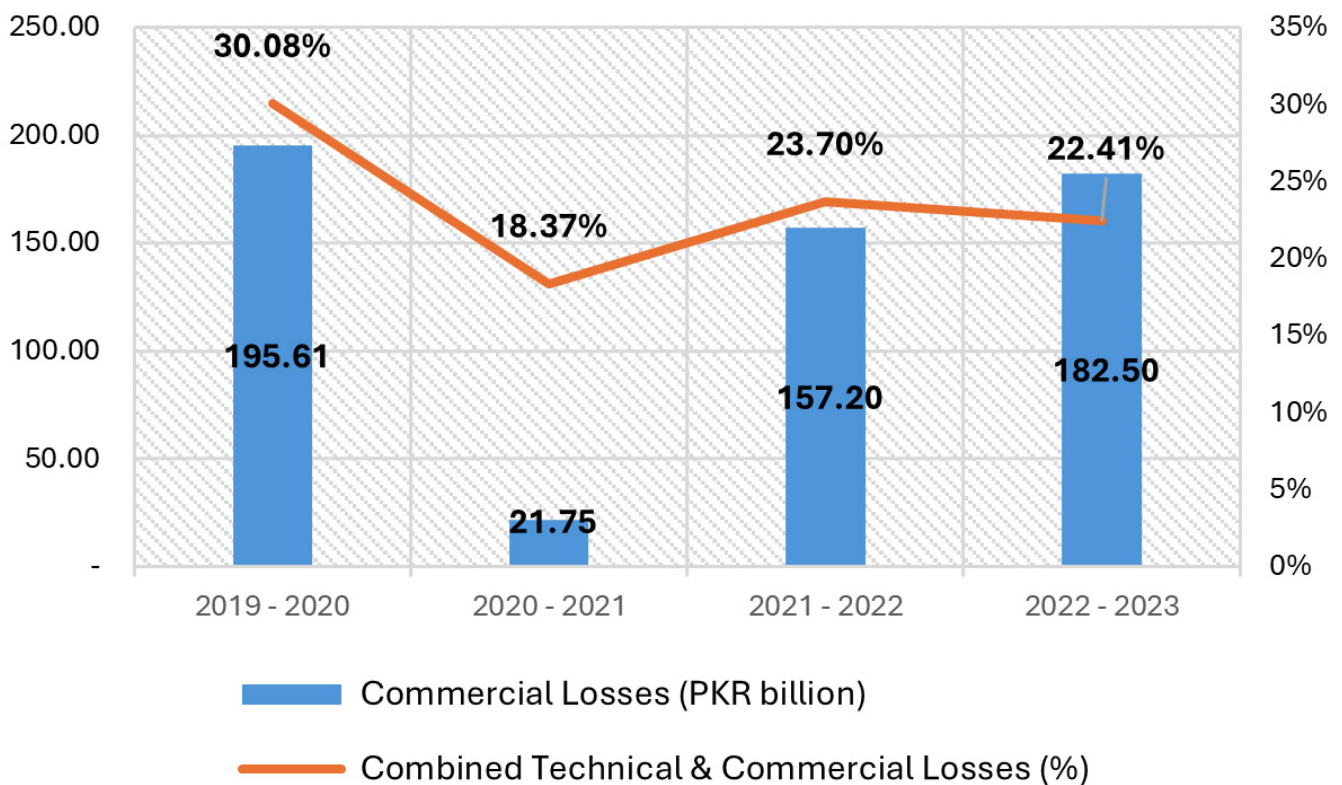


Figure 1: DISCOs' Losses Year on Year

As shown in Figure 1, aggregated transmission and distribution losses of Discos stand at 22.41 percent of all the electricity Discos receive from the national transmission system.

Their consumer bill recovery remained weak, with non-recoveries recorded at rupees 183 billion in financial year 2022-23 alone. These unrecovered bills, combined with the monetary losses of transmission and distribution of electricity, reached a staggering loss of 347 billion rupees in the 2022-23 financial year.

Though some of the Discos perform worse than others in bill recovery, these enormous amounts indicate that all of them are neither efficient administratively nor sustainable financially. No wonder their consumers collectively owe them a hefty amount of 900.821 billion rupees.

Their inability to balance their books creates a cascading effect in the finances of the entire energy sector, disrupting cash flows across its whole supply chain. For instance, unrecovered bills lead to the government's failure to pay to electricity producers and, in turn, to the inability of power producers to pay for the fuels they use such as gas, oil, and coal.

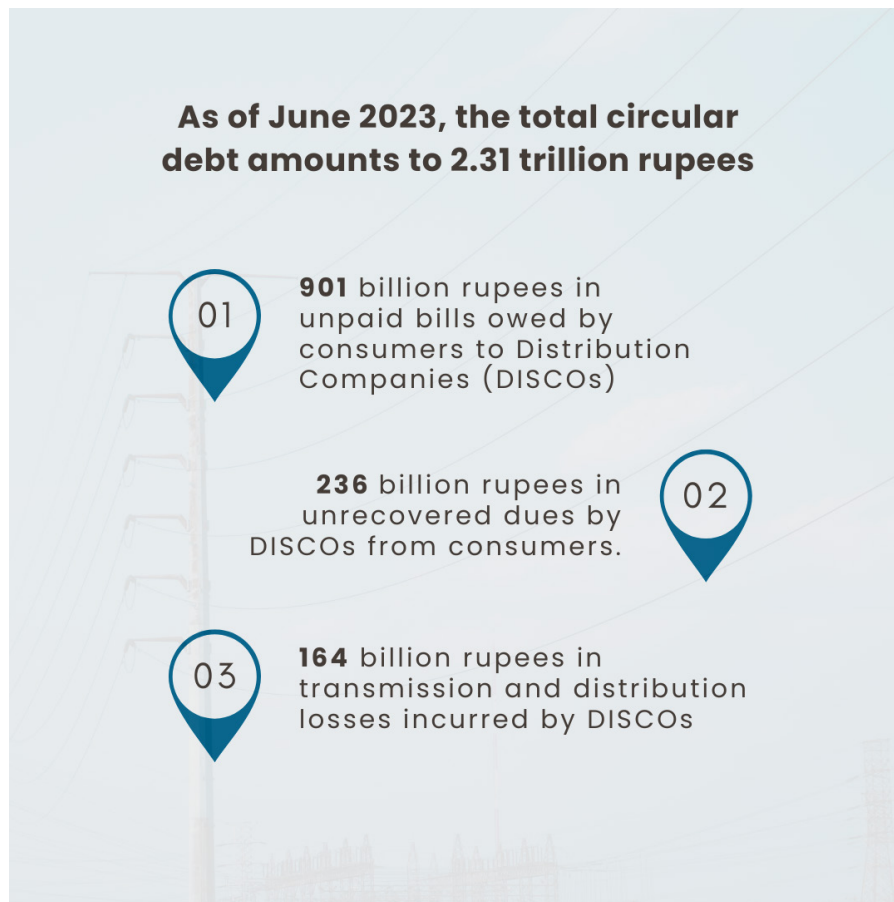


Figure 2: Circular Debt Snapshot (Source: Nepra)

This is what generates and inflates the circular debt. The collective impact of financial and administrative inefficiencies of Discos on circular debt – which stood at 2310 billion rupees in June 2023 -- amounts to 1301 billion rupees as can be seen in Figure 2.¹ Though the government has periodically paid down circular debt, its financial rescue only weakens the urgency among Discos to improve their administrative and financial efficiency.

In order to address these inefficiencies, government officials, power sector specialists, economists, and Pakistan's development partners such as the World Bank (WB) and the International Monetary Fund (IMF), often advocate the privatization of Discos. They argue that the real problem with these companies is that they are owned by the state and run by the government – a model that ill-suits the prevalent neo-liberal economic ideology. They also contend that private owners and management of these companies will be better placed to introduce best management and administrative practices, ensure better accountability, and make much-needed investments in infrastructure and human resources.

Multilateral Development Banks (MDBs), particularly IMF and WB, have been consistently pushing Pakistan to privatize all state-owned entities in the power sector, including Discos. Recently, WB has linked its assistance to Pakistan for developing an asset performance management system (APMS) under its Electricity Distribution Efficiency Improvement Project (EDEIP) with private sector involvement, insisting that this involvement would automatically bring the required investments ².

1 <https://nepra.org.pk/publications/State%20of%20Industry%20Reports/State%20of%20Industry%20Report%202023.pdf>

2 <https://www.brecorder.com/news/40313078>

The government has also agreed to adopt the Turkish model (described later in this paper) as part of its latest staff-level agreement with the IMF³, committing itself to appointing a transaction adviser for the purpose. The IMF underscores the need for “decisive cost-reducing reforms” in the energy sector and indicates its support for the privatization of Discos to enhance their efficiency.⁴ IMF’s press release no. 24/273 which contains the highlights of this agreement states:

“Restoring energy sector viability and minimizing fiscal risks through the timely adjustment of energy tariffs, decisive cost-reducing reforms, and refraining from further unnecessary expansion of generation capacity. The authorities remain committed to undertaking targeted subsidy reforms and replace cross-subsidies to households with direct and targeted BISP support.”

Research, however, suggests that privatization could lead to increased user-end tariffs in the long run. This is exactly what happened in Turkey where the privatization of distribution companies resulted in higher wholesale and retail tariffs since 2009, with a more pronounced increase in the latter⁵. Privatization may also lead to profiteering by private sector companies. Several studies in other parts of the world have shown that privatized distribution companies often behave like regional monopolies, causing substantial welfare losses⁶.

Discussions about privatizing Discos have also been taking place in several other relevant forums – bureaucracy, political parties, parliament, and business associations. Nepra, in fact, has approved a government plan to unbundle them by separating their distribution and supply functions into distinct entities. This plan is yet to be implemented, but it is obvious that it will be far from sufficient to fully address the problems being faced – and also caused by Discos.

Notably, the government has sought financial assistance from the World Bank for the Asset Performance Management System (APMS)/Transformer Monitoring System (TMS) under the This support would significantly address the longstanding issues of reliability and distribution losses in Discos.

3 <https://www.imf.org/en/News/Articles/2024/07/12/pr-24273-pakistan-imf-reaches-agreement-on-economic-policies-for-37-month-eff>

4 <https://tribune.com.pk/story/2457809/discos-govt-to-adopt-turkish-model?amp=1>

5 <https://www.sciencedirect.com/science/article/abs/pii/S030142151300894X>

6 <https://www.sciencedirect.com/science/article/abs/pii/S0140988307000576>

PROPOSED MODELS FOR REFORMING DISCOS

1. K-Electric Model

This model involves transferring a majority of shares and management functions of the electricity company from the government to a private entity. Such privatization, however, creates a monopoly in a certain region that might allow inefficiencies and losses to persist due to the absence of competition. Enjoying a monopoly over distribution, the private management of the company could also charge its consumers a higher cost of electricity which the consumers will be constrained to pay due to the lack of alternatives.

Although designed to overcome circular debt, this privatization model has shown many financial limitations in Pakistan. For instance, K-Electric still receives subsidized electricity from the national grid (and, thus, indirectly contributing to circular debt) and the government also pays it cash subsidies so that lifeline consumers can get cheap electricity. In financial year 2022-23 alone, K-Electric received 169 billion rupees in cash subsidies - exceeding the combined subsidy of 158 billion paid to all the 10 state-owned Discos. It is also not providing cheap electricity to its consumers as its per unit cost of electricity for all consumer categories is higher than what Discos charge -- as is shown in figure 3.

Per unit cost comparison of DISCOs & K-Electric

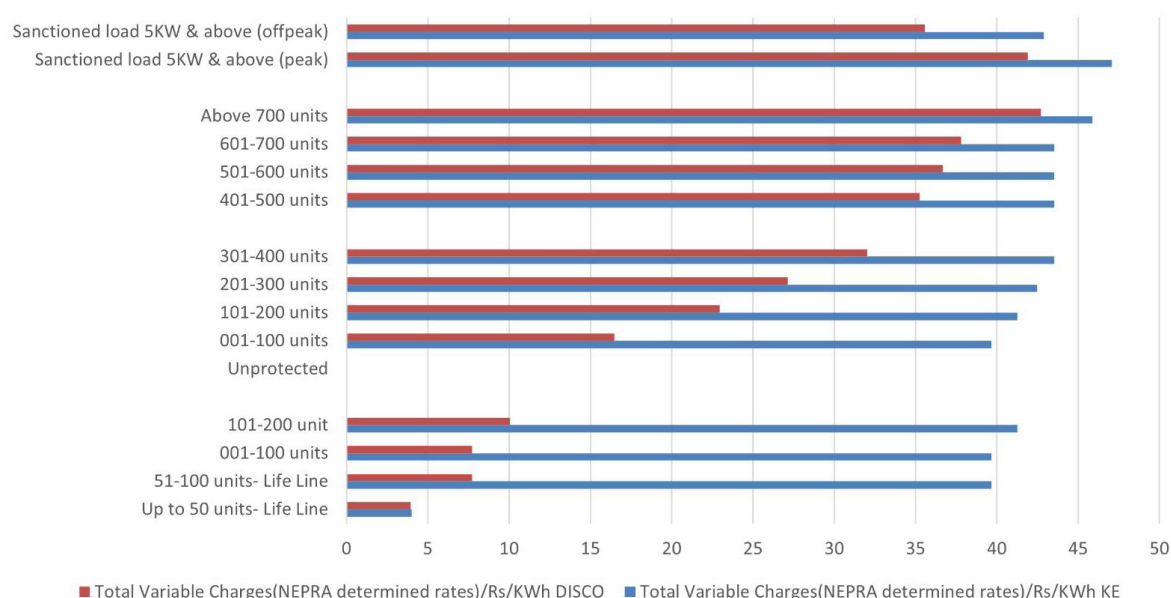


Figure 3: Per unit cost comparison of Discos & KE (Rs/kWh)

Instead of holding K-Electric accountable for charging exorbitant consumer tariffs, the federal government continues to subsidize it. In financial year 2023-2024, alone it will receive 298 billion rupees in subsidies^{7,8}.

⁷ <https://nepra.org.pk/tariff/Tariff/K-Electric/2023/TRF-362%20K-ELECTRIC%20MOTION%20BY%20MOE%202022-11-2023%2037540-43.PDF>

⁸ <https://nepra.org.pk/tariff/Tariff/K-Electric/2023/TRF-362%20K-ELECTRIC%20MOTION%20BY%20MOE%202022-11-2023%2037540-43.PDF>

Also, privatization has not helped K-Electric to improve its financial performance. If anything, this performance has declined over the years; its gross profit dropping from 21 percent in 2018 to 10.20 percent in 2023. Nepra's State of Industry Report 2023⁹ reports that K-Electric, in fact, incurred a loss of more than 30 billion rupees in financial year 2022-23, even when per unit cost of electricity paid by its consumers remained significantly higher than that charged by state-owned Discos.

K-Electric's Gross Profit 2018–2023

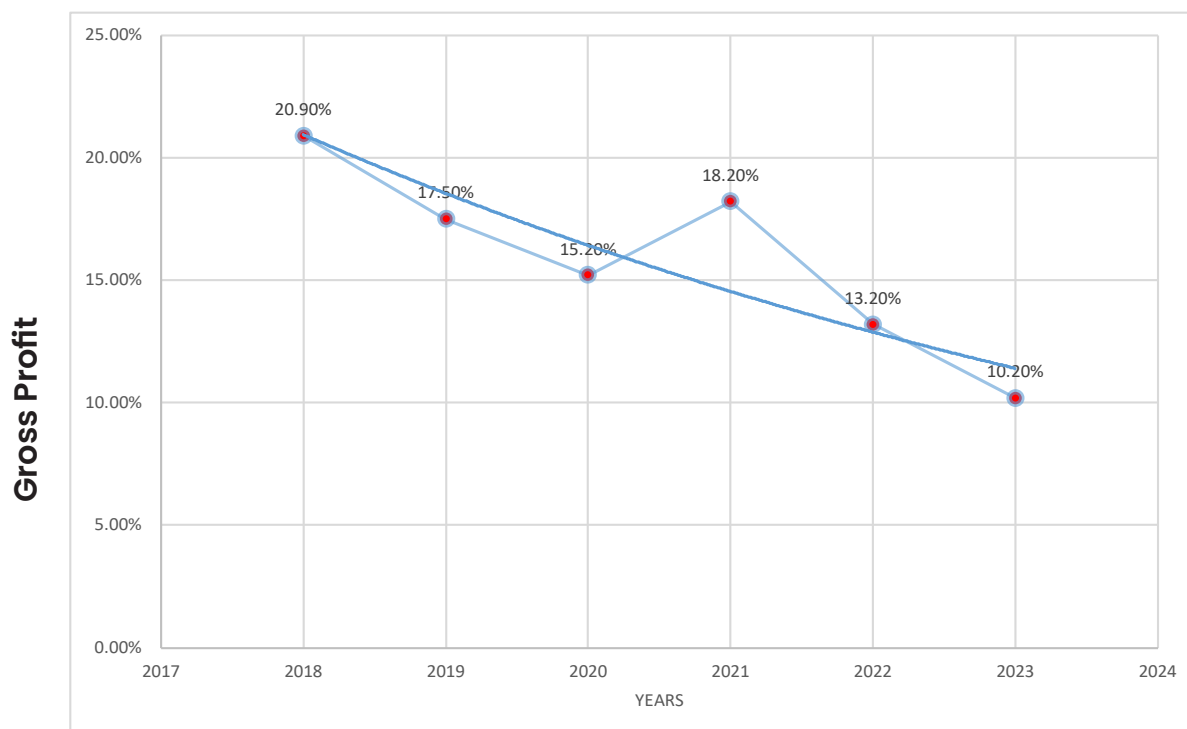


Figure 4: K-Electric's Gross Profit Year on Year

This consistent decline, (as shown in figure 4), as well as the need to pay heavy annual subsidies to K-Electric, suggests that the privatization model requires a serious reevaluation in order to address its underlying constraints.¹⁰

Privatization model, in fact, can only work if it leads to two or more distribution companies having to compete with each other to attract the same consumer base. And privatization can help the government overcome the problem of circular debt only if the private distribution companies do not have to rely on state subsidies to maintain their cash flows, if they are able to recover near 100 percent bills, and if the distribution infrastructure to be used by them is flawless.

Additionally, given that different Discos cater to different consumer bases and given that infrastructure, technical capacity, and the strength and skills of human resources availability are not consistent across all of them, it is but natural that their respective performance, and their ability to attract private investors, varies

⁹ <https://nepra.org.pk/publications/State%20of%20Industry%20Reports/State%20of%20Industry%20Report%202023.pdf>

¹⁰ <https://www.ke.com.pk/download/financial-data/KE-Annual-Report-FY-2023.pdf>

sharply. For instance, Tribal Electricity Supply Company (Tesco), Quetta Electricity Supply Company (Qesco), Sukkur Electricity Supply Company (Sepco), and Hyderabad Electricity Supply Company (Hesco) have rather small consumer bases, the transmission and grid infrastructure in their jurisdictions are old and inadequate, and their staff lacks technical skills to perform its functions.

Figure 5 is an appropriate representation of these problems, which measures the reliability and performance of power distribution systems through System Average Interruption Frequency Index (SAIFI). This index measures the average annual power outages per customer. According to the Performance Standard¹¹ (Distribution) Rules 2005, the measure on this index should not exceed 13 minutes, but all Discos exceed this limit by a massive margin because of their administrative, technical and infrastructural deficiencies as evident from Figure 5.

System Average Interruption Frequency Index

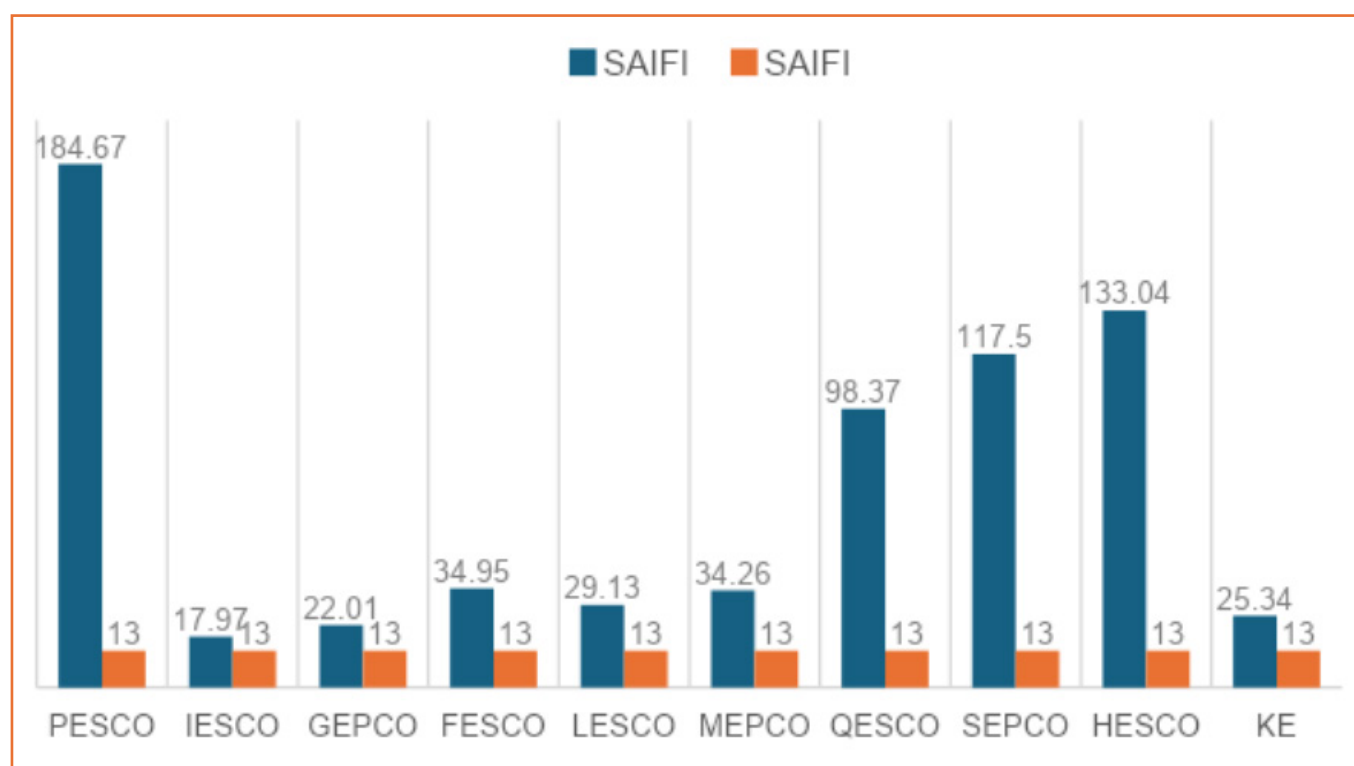


Figure 5: System Average Interruption Frequency Index (SAIFI), Source: Nepra's Performance Evaluation Report 2023

¹¹ [https://www.nepra.org.pk/Legislation/Rules/Performance%20Standards%20\(Distribution\)%20Rules%202005.pdf](https://www.nepra.org.pk/Legislation/Rules/Performance%20Standards%20(Distribution)%20Rules%202005.pdf)

These Discos also suffer massive losses every year as is shown in the figure 6 below.

Energy Units Delivered to DISCOs vs Energy Units Billed 2022–2023



Figure 6: Units Received by DISCOs vs. Units sold by DISCOs, Source: Nepra's State of Industry Report 2023

All these problems make them rather unattractive for a private investor to buy. In contrast, Discos in Lahore, Gujranwala, Multan, and Islamabad have vast consumer bases, have stronger and newer infrastructure at their disposal, and have relatively larger and better trained manpower. They, therefore, seem to be perfectly placed to attract private investment.

2. Provincialization Model

Another proposal doing the rounds in the federal capital, Islamabad, and some provincial capitals, is to hand over Discos to the provinces where their respective consumer base is located. The assumption behind this suggestion is that running the Discos from Islamabad through long distance management is a major reason why they are so inefficient. Handling them through the provincial capitals might, thus, improve their performance. Also, the federal authorities do not have the administrative wherewithal – such as police and other law enforcement agencies operating on the ground – to help Discos recover their bills, but provincial governments do possess that infrastructure.

Figure 6 highlights a significant gap exists between the electricity units delivered by each Disco and the bills recovered by each of them, suggesting that improved administration and better management¹² might help them bridge this gap.

¹² <https://nepra.org.pk/Standards/2023/PER-DISCO%20FY%202021-22%20final.pdf>

System Average Interruption Duration Index (SAIDI)

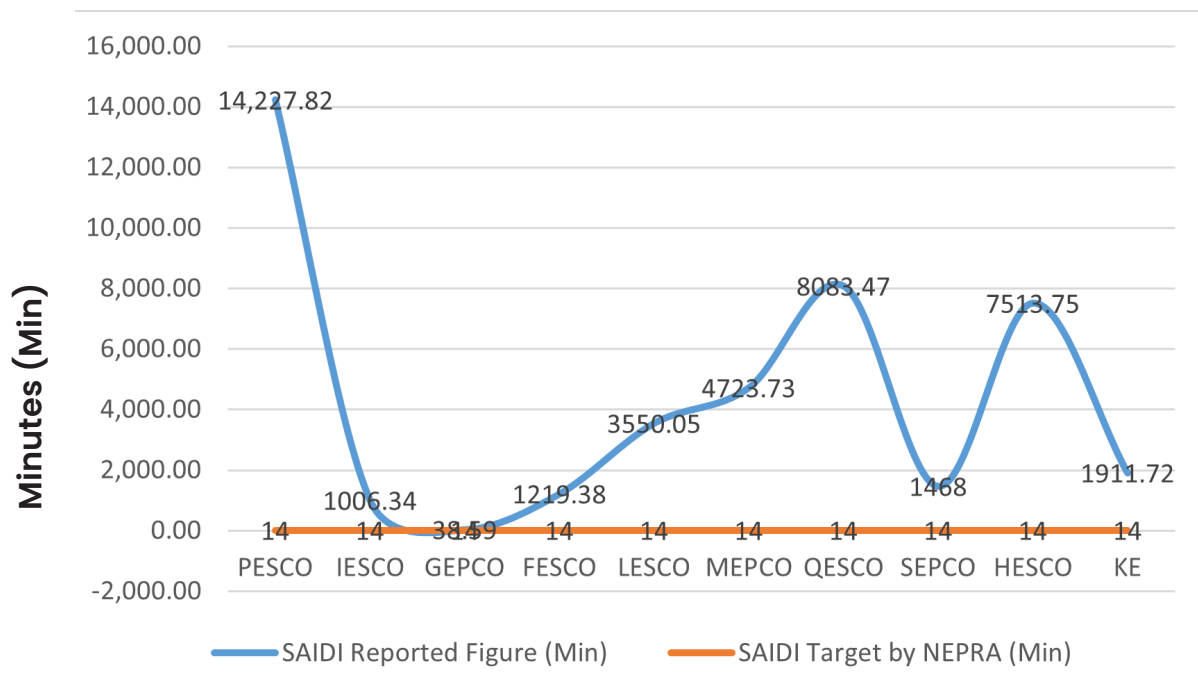


Figure:7 System Average Interruption Duration Index

This model, however, does not consider several factors apart from the administrative failure to recover bills. Most important of these factors is the liabilities and losses that each Disco accumulates every year. Energy department officials in Quetta say that the liabilities and losses of Qesco are so huge that overcoming them will leave the provincial government with no money at all for its annual development plans.

There are other gaps in the electricity system as well, which the provincialization of Discos will be unable to bridge on its own. Consider figures 5 and 7. They show that, whether by design or by default, the current system of electricity transmission and distribution prefers Discos in central regions and does not really cater well to those in northern, western, and southern parts of Pakistan. How will the provincialized Discos overcome this geographical bias as long as the power generation and power transmission system remain in the hands of the federal government, remains a moot point.

The provinces, therefore, will be required to have their own power generation, power transmission, and also power regulation infrastructure before being able to run a Disco better than the federal authorities are doing. Though Sindh province has already taken its route, having set up its own electricity dispatch company and its electricity regulatory authority, it is still far from putting in place the regulatory, technical, administrative, and financial frameworks required for the Discos to run efficiently and effectively. Other provinces lag even further behind.

3. Management Contracts Model

A third proposal to reform Discos involves outsourcing their management to private firms that possess the required administrative and managerial expertise, experience, and apparatus to run Discos well. Also known as the Turkish model, it is premised on a partnership between the public and private sectors.

In Turkey, this model operates through a two-step approach^{13,14} - as is described below:

- **Step 1:** Concessionaire regime (assignment model): Private entities under this step are given exclusive rights to cater to the consumers living within their jurisdiction. They do not have to face any competitors and they do not need to have certain distinguished features to be eligible to get the concession. In simpler words, while the government still owns all the transmission and distribution infrastructure and also pays all the liabilities and losses pertaining to that infrastructure, it outsources electricity distribution and bill recovery to a private company of its own choosing.
- **Step 2:** Non-Concessionaire regime: Under this step, distribution and sales functions are unbundled. Private companies buy electricity either directly from private power producers or from the government, pay the government for using its transmission and distribution infrastructure, and then sell electricity to consumers who can choose their suppliers. In other words, electricity sales are entirely privatized with many sellers operating in the same market but other functions remain mostly in the government's hand. In Pakistan's context, the non-concessionary regime looks like a stringer version of the Competitive Trading Bilateral Contract Market (CTBCM). This mechanism has been in the works for several years under the tutelage of IMF and the World Bank but there is little to no progress in its implementation, mainly because of Pakistan's legendary bureaucratic inertia, political instability, and policy inconsistency.

The transition from the concessionary regime to the non-concessionary regime is a crucial component of this model because this transition is necessary to enhance service quality through:

- timely and adequate distribution
- investments in grid
- implementation of cost-reflective pricing
- minimizing of cross-subsidization and loss/theft ratios
- ensuring distribution companies' creditworthiness to support generation investments
- strengthening the regulatory authority's autonomy in setting regulated tariffs and prices free from political influence.

13 Rethinking Power Sector Reform in the Developing World, https://ppp.worldbank.org/public-private-partnership/sites/ppp.worldbank.org/files/2022-03/RPSR_Launch_ull_Report.pdf

14 <https://documents1.worldbank.org/curated/en/846621467997641404/pdf/101754-WP-P146042-Box393265B-PUBLIC-Private-Sector-Participation-in-Power-Grids-Turkey.pdf>

In Pakistan, this model has been used already for the privatization of the state-owned Pakistan Telecom Corporation Limited (PTCL), but it has failed to produce the desired results¹⁵ even when it has resulted in the creation of an almost open telecommunication distribution market in which the government still holds a near monopoly over the main transmission network. This failure, however, can be attributed to a weak regulatory regime and lack of oversight and accountability of the private companies that often join hands to keep consumer costs high and service quality low.

If Pakistan has to replicate this model in the electricity sector, it should ensure that the weaknesses and flaws marring the performance of a privatized telecommunication market do not creep into a privatized electricity market.

Variable Structure of Disco Management: A Case Study of India^{16,17}

Distribution of power in India has witnessed substantial changes following the provincialization of Distribution System Operators. Owned by the state (provincial) governments, these operators have been split into smaller entities that can be easily managed, each serving a different geographical zone or circle.

The system consists of both private and public sector elements, though the degree of partnership between the two differs in each state. For instance, Dakshinanchal Vidyut Vitaran Nigam Limited (DVVNL) and Kanpur Electricity Supply Company (Kesco) are owned and run by the state government of Uttar Pradesh, but Delhi Electricity Supply Company is run as a partnership between the state government and some private firms. Some other distribution enterprises are entirely privately owned. These include Calcutta Electricity Supply Co. (CESC) and BSES (Reliance Energy Ltd) in Delhi.

15 <https://www.grin.com/document/419489?lang=en>

16 https://www.niti.gov.in/sites/default/files/2021-08/Electricity-Distribution-Report_030821.pdf

17 <https://prsindia.org/billtrack/prs-products/discussion-paper-power-distribution-sector>

CONCLUSION

One of the major overlooked factors in the debate about Discos is that the business of electricity distribution in Pakistan is not profitable. Even K-Electric makes most of its profit from its generation business. Circular debt is another factor that hinders any meaningful discussion about reforming Discos. Old electricity purchase contracts and a fair severance deal to be offered to their employees are also major sticking points in the reform process. Given that Discos have thousands of unionized workers, any pathway to their privatization will be fraught with protests and strikes. To avoid this situation, the government will need to engage unions in an extensive and intensive dialogue to ensure a just compensate for those who will lose their jobs as a result of privatization.

Short of outright privatization, the government can also follow the options of provincialization and/or public-private partnerships. It, however, first needs to address the overall structural issues in Discos before putting them up for reform or structural changes. These issues include the fact that a rent-seeking behavior is pervasive in all Discos at all levels, including the upper management. This behavior, among many other things, can be blamed for their failure to both stop electricity theft and recover bills.

Nepa, indeed, highlighted this very problem in its Performance Evaluation Report of Discos 2022 – 2023, holding it responsible for the lack of will among Discos to reform themselves. It stated:¹⁸

“Nepa has provided substantial investment and Operation & Maintenance (O&M) funds to Discos annually, with the intention that these resources would be used to undertake necessary initiatives. This may include addressing the system constraints, reducing feeder lengths, implementing automated metering, and performing preventive maintenance. However, it is disappointing that many Discos have been reluctant to undertake such projects and activities, which are essential for reducing T&D losses and ensuring the efficiency of the power distribution system.”

The problem is that Discos cannot survive forever with this kind of attitude. Pakistan's economic crisis is so intertwined with its energy and power sectors that something will give sooner rather than later. If nothing is done to reform the power sector, the entire economy is running the risk of collapsing. The need for reforming Discos, therefore, has never been more urgent than before.

This warning, however, should also be tagged with a serious note of caution: any quick fixes and rushed solutions will produce more problems than they will resolve. So, whatever path – privatization, provincialization, or private-public partnerships – Pakistan takes to reform Discos, it must ensure that this path is seriously thought through. Otherwise, its failure can easily be foretold.

18 <https://www.nepra.org.pk/M&E/PER/Distribution/PER%202022-23%20-%20DSICOs.pdf>



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