

Curbing the Growing Circular Debt in Pakistan's Power Sector

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Abstract

This paper sheds light on the growing circular debt in the power sector of Pakistan. It briefly explains the origin of circular debt and its impact on country's economy. It probes into the factors contributing to ever ballooning circular debt and suggests some policy recommendations to stem its growth.

Executive Summary

Power sector's circular debt emerged in 2006 due to increase in global fuel prices and has been ballooning ever since such that it reached Rs. 2.25 trillion till the end of June 2022. Its roots can be traced back to 1990s when expensive and unsustainable contracts were made with Independent Power Producers (IPPs). Majority of the IPPs being imported fuels based plants, led to higher cost of electricity generation. The difference between NEPRA notified power tariffs and government issued rates (lower than the ones notified by NEPRA due to political reasons) leads to deficit within the power sector. Furthermore, higher transmission and distribution losses and poor bill recovery by DISCOs (Electricity Distribution Companies) have been contributing to ballooning circular debt. Successive governments have been increasing power tariffs to recover cost of electricity and to pay off the circular debt. These power tariff hikes have resulted in high cost of doing business, decline in investment, drop in productivity, and increase in inflation, ultimately impeding the country's economic growth. Therefore, a financial overhaul of DISCOs is integral to control the circular debt. Steps like breaking down of large DISCOs into smaller units, technological interventions to prevent electricity theft and improve bill recovery, revision of IPPs contracts and rationalization of power subsidies can help in reducing the circular debt in country's power sector.

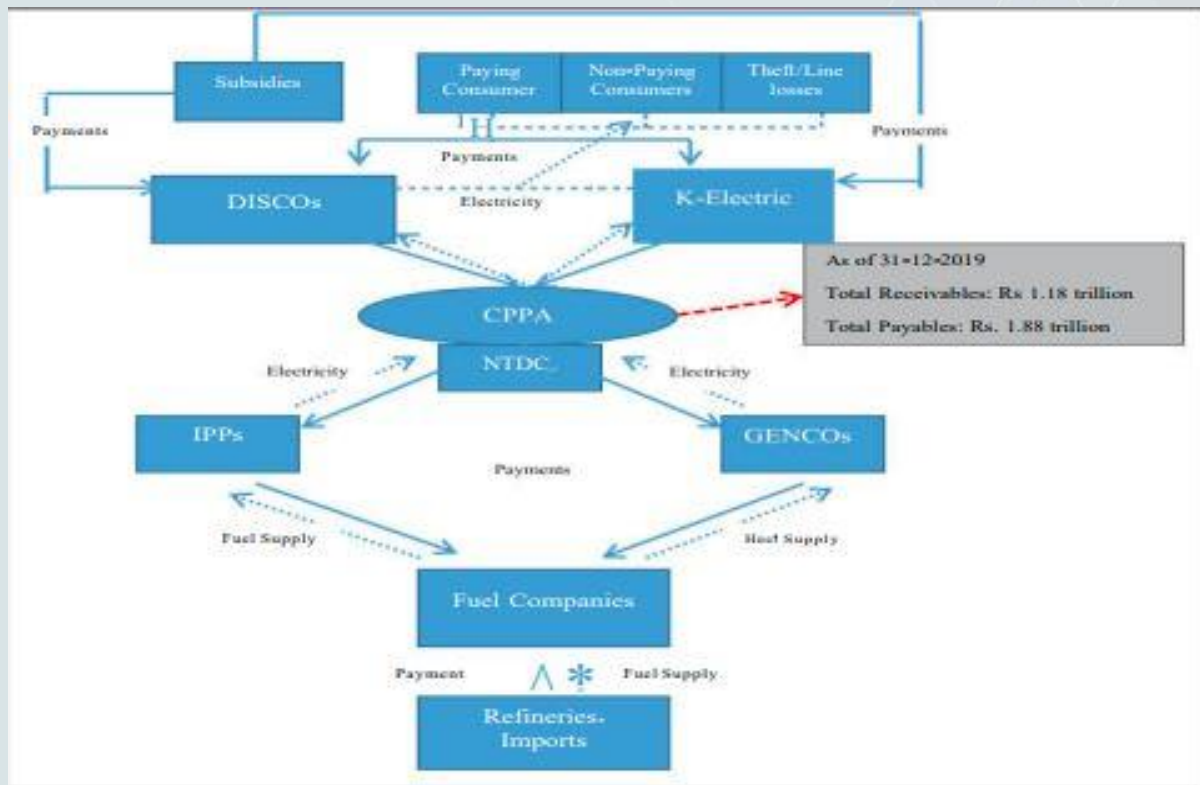
Introduction

Circular debt is a persistent problem in Pakistan that has caused significant economic and energy-related challenges. Unfortunately, the issue of circular debt in the power sector has not been controlled yet despite efforts by successive governments. The power, petroleum, and natural gas sectors are the three largest contributors to the circular debt in the energy sector, contributing Rs. 2,277 billion, Rs. 600 billion, and Rs. 1,400 billion respectively till the end of 2022.¹ Though the circular debt emerged in 2006 in the power sector, its seeds were sown in 1990s with the implementation of short-sighted contracts with Independent Power Producers (IPPs). It allowed furnace oil based expensive power generation plants and burdened the governments with the increasing capacity payments. Expensive energy fuel mix, loss incurring DISCOs (Power Distribution Companies), flawed and delayed power tariff determination and unbudgeted subsidies are some of the other factors contributing to the growing circular debt in power sector. The accumulation of circular debt in the power sector is affecting not only the available capacity but also the creditworthiness of the country in the eyes of investors. The governments have been increasing the power tariff to pay off the debt (capacity payments mainly). These power tariff hikes have resulted in high cost of doing business, decline in investment, drop in productivity, and increase in inflation, ultimately impeding the country's economic growth. Therefore, it needs immediate attention of policy makers.

Understanding Circular Debt in the Power Sector

Circular debt in the power sector is a power sector deficit that refers to a situation where money owed by electricity distribution companies to power supplier is not or partially transferred, which then is not able to either pay or end up delaying the payments to the power generation utilities and fuel suppliers, creating a vicious cycle. Circular debt in Pakistan refers to the accumulated unpaid liabilities of power distribution companies (DISCOs) to the Central Power Purchasing Authority-Guarantee (CPPA-G), resulting in delayed payments by CPPA-G to power generation companies (GENCOs). To bridge the cash shortfall, Power Holding Private Limited (PHPL) borrows funds to settle CPPA-G's obligations. The circular debt is typically distributed between CPPA-G and PHPL in almost equal proportions. Figure 1 highlights the shortfall in the cash flow all the way from DISCOs to fuel suppliers. Due to poor recovery and high distribution losses incurred by the DISCOs, CPPA-G does not receive the outstanding payment from them. Resultantly, CPPA-G cannot make payments to other power companies which include state-owned generation companies (GENCOs), Independent Power Producers (IPPs) and National Transmission and Dispatch Company (NTDC). This shortfall in payment cascades into GENCOs and IPPs failing to clear their dues to fuel suppliers. Therefore, the fuel suppliers like Pakistan State Oil default on their payment towards refineries and international fuel suppliers.

¹ <https://tribune.com.pk/story/2391025/circular-debt-soars-past-rs4177bn>

Figure 1- Cash Flow and Power Supply in the Power Sector

Source: PIDE Working Papers No 2020:20²

Current Status of Circular Debt

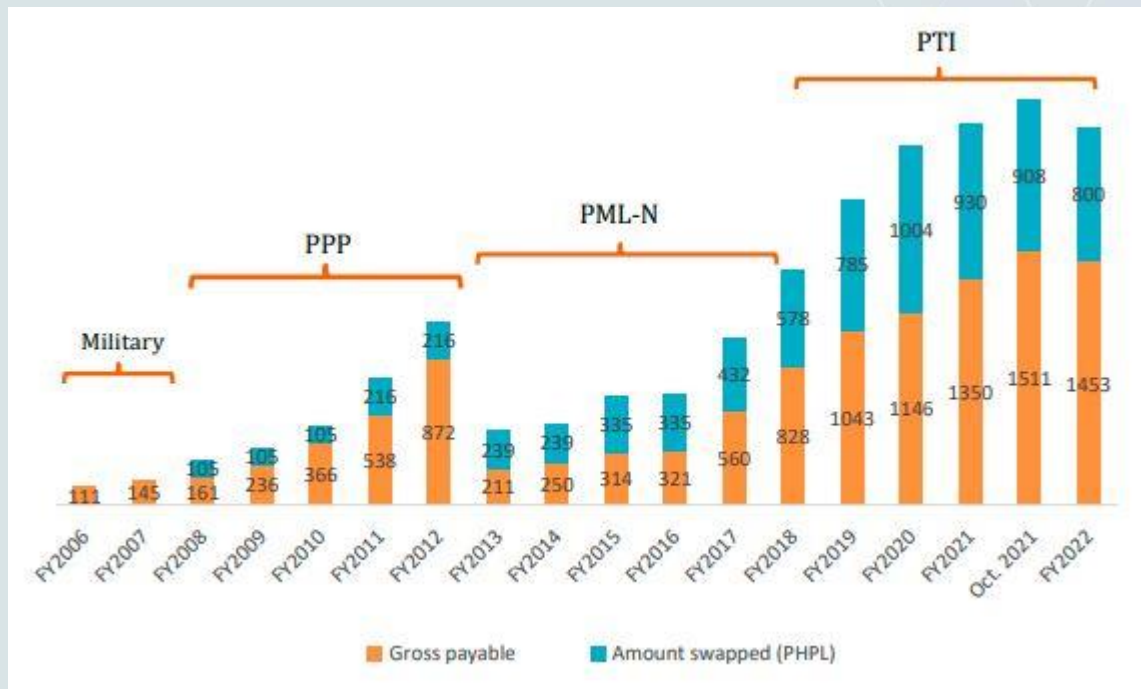
Circular Debt in the power sector was recorded in FY2006 for the first time due to a sharp rise in international fuel prices.³ Because of global increase in fuel prices, the generation cost of electricity also went up, but consumer-end tariffs remained almost static keeping in view the political consideration. Power tariffs started increasing in 2008 and onwards but they were not at par with the cost recovery rate and thus, engendered deficit in the power sector. The crisis at hand can be traced back to the 1990s, specifically during the unbundling of WAPDA, where ill-advised long-term contracts were made with private independent power producers (IPPs) without proper long-term impact analysis. This mistake was repeated over the years as more IPPs were given licenses to add more installed power generation capacity without updating transmission and distribution infrastructure. This burdened both the energy sector and the overall economy, with the circular debt reaching a staggering amount of Rs 2.25 trillion till the end of June 2022, equivalent to 3.4% of the GDP. The cumulative losses incurred by the sector since FY2006 are estimated to be around Rs 5.7 trillion, which accounts for a significant 9%

² <https://pide.org.pk/research/circular-debt-an-unfortunate-misnomer/>

³ <https://pide.org.pk/research/circular-debt-an-unfortunate-misnomer/>

of the current GDP.⁴ Figure 2 highlights the growth of circular debt over the years under different political regimes.

Figure 2: Growth of Circular Debt (Rs. Billion)



Source: Power Sector: An Enigma with No Easy Solution, PIDE⁵

Gravity of the Issue

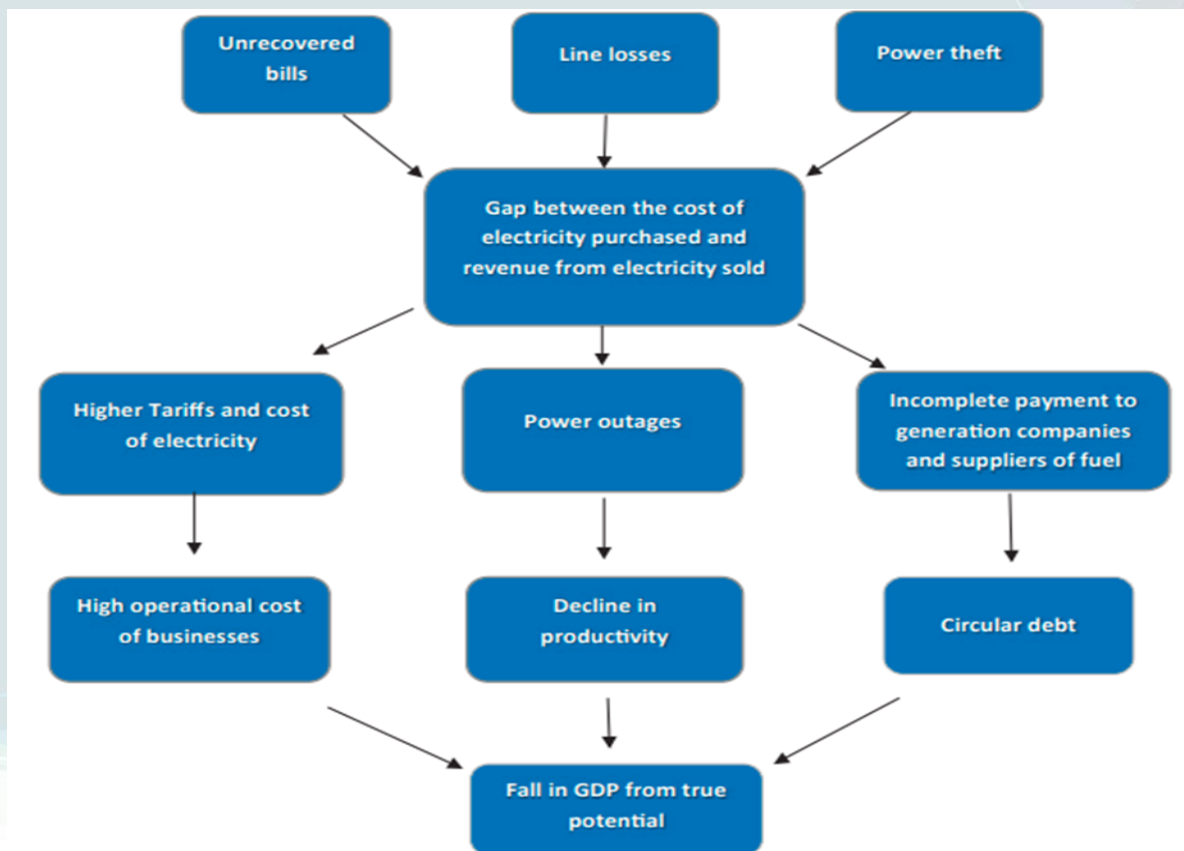
The effects of circular debt are far-reaching and damaging to the economy. It has led to high tariffs, high cost of doing business, decline in investment, increase in power outages, and decrease in productivity; impeding the economic growth. Additionally, circular debt has put significant pressure on the public finances, forcing it to allocate a large portion of its budget to repay the debt. As outflows in the power sector are guaranteed payments, government borrows from commercial banks to finance the deficit in the power sector. It leads to crowding out private borrowing. Since a huge share of budget is spent to finance the power sector deficit, other development expenditures are neglected. For example, from FY07 to FY19, the government provided a cumulative budgetary support of around Rs. 3,202 billion to the power sector, out of which Rs. 2.86 trillion was paid on account of budgetary subsidies and Rs. 342

⁴ <https://pide.org.pk/research/power-sector-an-enigma-with-no-easy-solution/>

⁵ <https://pide.org.pk/research/power-sector-an-enigma-with-no-easy-solution/>

billion in other liquidity injections.⁶ As a bulk of budget is disbursed to finance the power sector deficit, the budgetary space for development expenditures is shrunk. A case in point is the electricity subsidies given in FY2020 which accounted for almost 8% of net revenue. Whereas, education sector received hardly 2.6% in total.⁷ Despite various measures taken by successive governments, power sector financial losses are increasing. Declining budgetary support in the development sectors have negatively impacted labor productivity, ultimately leading to a decline in economic productivity. Figure 3 highlights the impact of shortfall in the cash flow (due to poor recovery and higher T&D losses) on circular debt and consequently on the economic growth.

Figure 3- Linkage between Circular Debt and Economic Growth



Source: PRIME Report, September 2021⁸

Causes of Circular Debt

Following are the five key contributors to the circular debt flow:

1- Flawed Contracts with The Independent Power Producers (IPPs)

⁶ <https://tribune.com.pk/story/2199737/two-decades-flawed-policies-power-producers-make-billions-pakistan>

⁷ <https://pide.org.pk/pdfpideresearch/wp-0191-circular-debt-an-unfortunate-misnomer.pdf>

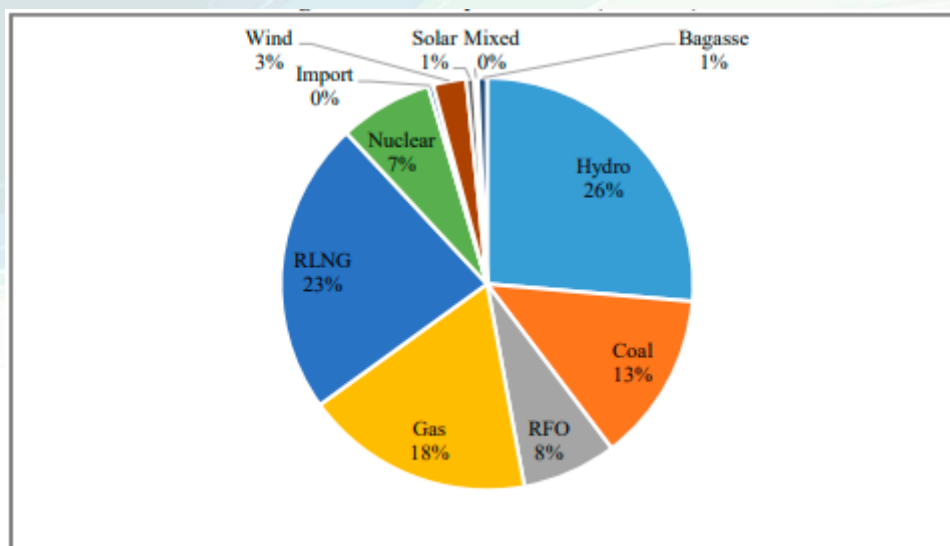
⁸ <https://primeinstitute.org/wp-content/uploads/2021/10/DISCOs-Report-PRIME.pdf>

1994 power policy combined with successive power policies, offered lucrative incentives, such as tax exemptions, free repatriation of equity and dividends, and guaranteed capacity payments, to Independent Power Producers (IPPs) for adding into the installed generation capacity. The contracts didn't mention checks on expensive fuel utilization by the IPPs. It led to an increase in the generation cost because of capacity payments component under 'Take or Pay' model. Dollar based rate of return to IPPs have further burdened the national exchequer as the rupee has been consistently devaluing. As a result, demand for electricity has gone down due to rising cost affecting revenues of DISCOs, and accordingly, payables to IPPs are ballooning adding to the circular debt.

2- High cost of power generation eventually contributing to the DISCOs' bill collection and operational inefficiencies

From the figure 4, it is visible that Pakistan's energy mix is highly expensive because over 40 percent of power generation relies on imported fuels. Over the years, our reliance on re-gasified liquefied natural gas (RLNG) and imported coal has increased. As the imported fuels are subject to their international market prices, a rise in their international price adds to the cost of power generation, which the consumer-end tariffs are unable to recover fully, adding to the deficit in the power sector. Currency devaluation further exacerbates the circular debt issue. Expensive electricity also lowers its demand and consequently poor bill revenue generation by the DISCOs triggering a shortfall in cash flow within the power sector.

Figure 4: Electricity Fuel Mix, 2019



Source: Circular Debt- An Unfortunate Misnomer⁹

3- Pitfalls and delays in the tariff determination

⁹ <https://pide.org.pk/research/circular-debt-an-unfortunate-misnomer/>

The rates notified by the government for end consumers are often lower than the tariffs recommended by NEPRA (National Electric Power Regulatory Authority) due to political reasons. This creates a disparity between electricity costs and revenues. Additionally, the notification process is frequently delayed by an average of 9-12 months.¹⁰ This delay also adds to payment arrears. To cover the fiscal gap between actual cost and notified rate, the government provides tariff differential subsidies to the DISCOs (Distribution Companies). However, many a times the government is unable to make timely payments or delays them. Because of financial constraints, the government passes on the costs to compliant consumers through taxes, surcharges, and tariff hikes. This puts a burden on consumers, in the form of increased power tariffs, and diminishes their purchasing power, leading to reduced electricity demand and subsequently lower bill collection by the DISCOs. The bills' low recovery feeds into circular debt.

4- High Transmission and Distribution Losses and Poor Revenue Collection by the DISCOs

All the DISCOs including K-Electric have been incurring huge T&D losses and facing low recovery of the billed amount (due to leakages, electricity theft and non-compliance) which add to the circular debt accumulation. Table 1 shows the contribution of DISCOs to the circular owing to T&D losses and poor bill recovery over the fiscal years 16-20.

Table 1- Financial Loss Due to DISCOs' Inefficiency (FY16-20)

Financial Loss	Amount in billion rupees
Financial Loss due to T&D losses	195
Financial Loss due to non-recovery of Bills	452
Total Financial Loss	647

Source: PRIME Report September 2021¹¹

5- Unbudgeted Subsidies

As discussed earlier, government provides tariff differential subsidies to DISCOs for distributing electricity to the end-consumers at the government-notified power tariffs. But most often, government cannot fully fund these subsidies to the DISCOs. These unfunded subsidies have contributed to an increase in circular debt by PRs135 billion during the period from

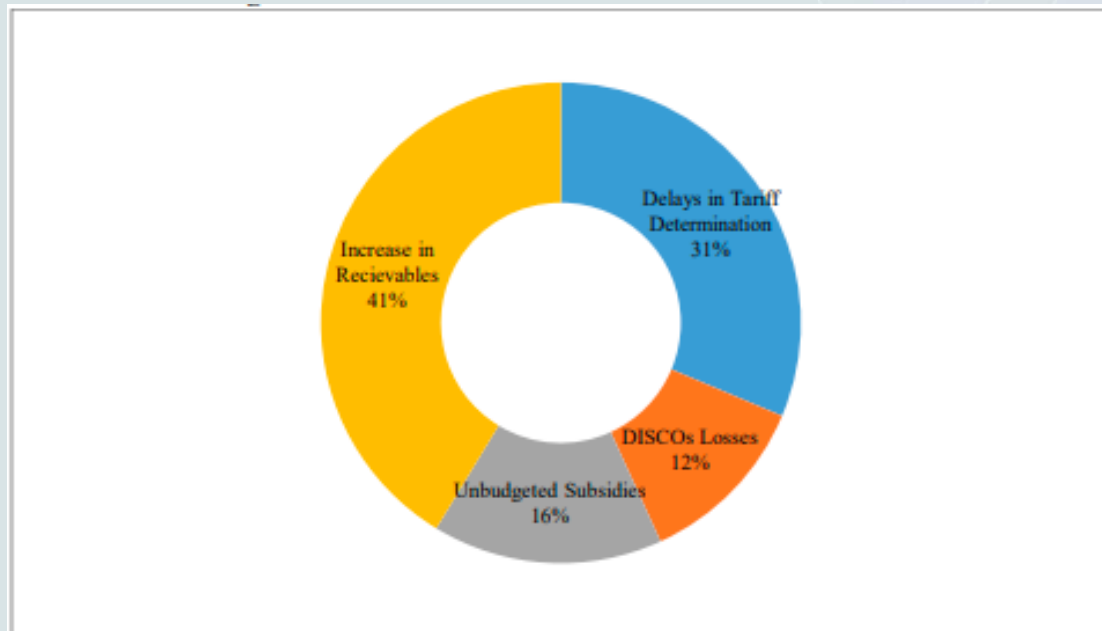
¹⁰ Energy Sector Reforms and Financial Sustainability Program (Subprogram 2), Circular Debt Impact on Power Sector Investment

<https://www.adb.org/projects/documents/pak-53165-002-rrp>

¹¹ <https://primeinstitute.org/wp-content/uploads/2021/10/DISCOs-Report-PRIME.pdf>

FY2019 to FY2020. The budget allocation for government subsidies has decreased from PRs240 billion to PRs120 billion for the period from FY2020 to FY2021.¹²

Figure 4: Composition of Circular Debt Flow, 2019-2020



Source: Circular Debt Impact on Power Sector Investment, Energy Sector Reforms and Financial Sustainability Program (Subprogram 2)¹³

Policy Recommendations:

1- Improving the Financial Performance of DISCOs in Pakistan

High transmission and distribution losses of the DISCOs are one of the biggest contributors to growing circular debt. Following governance and managerial models within DISCOs can be undertaken for their financial turnaround. The purpose is to replace bureaucratic management with professional and more decentralized management of DISCOs.

- *Municipality model*

¹² Energy Sector Reforms and Financial Sustainability Program (Subprogram 2), Circular Debt Impact on Power Sector Investment

<https://www.adb.org/projects/documents/pak-53165-002-rrp>

¹³ Energy Sector Reforms and Financial Sustainability Program (Subprogram 2), Circular Debt Impact on Power Sector Investment

<https://www.adb.org/projects/documents/pak-53165-002-rrp>

Government needs to make all the DISCOs independent. DISCOs cannot run according to the service model. As per this model, Municipality needs to buy electricity in bulk, collect the bills, and pay back. This model can be extended from the municipality to the district level. The rationale behind this municipality model is that due to ministerial influence, via PEPCO, DISCOs employees cannot recover the bills from consumers who have political backing. And so, they can't make decisions as well. Hence, decentralized control is a must, which can only be ensured via the municipality model. The municipal administration can ensure 100% recovery as they have the law enforcement departments and civil administration at their disposal. Municipality model is an antidote to the political interference, as it would assign responsibility of bill recovery to the very political leaders, who have otherwise interfered in DISCOs' administration decisions to their detriment. However, a strong local government system is a pre-requisite for the implementation of this model.

- *Cooperative Model*

Cooperative model can be adopted especially in the rural areas. This model has been a huge success in US and China. Under this model, the community members are given the ownership of power distribution in their community, for which they have to collect bills among themselves and pay back to the power suppliers. Therefore, make cooperatives in rural areas. It is implemented in America where their rural distribution works on the model of cooperatives.

- *Management model*

Another model is the private management model. We can make a private board for each DISCO. The board should consist of 20-25 members, which are experts from all the related fields. In short, this model is analogous to the private business model in the public sector organizations. They should decide the matters of the companies. This model is effective as not only it will bring in expert management, but also the control of ministry would be reduced on the affairs of DISCOs, as it would be difficult for the government to expel all the members of the private boards as it does with the CEO of the DISCOs. A sample test of this model can be tested and later applied to all the DISCOs.

a. Breaking up of DISCOs into smaller units

Large geographical area is a main hurdle to achieving 100% bill recovery and reducing T&D losses. Large areas are hard to control and data analysis corroborates this argument. Three DISCOs combined cover an area of around 493,177 kilometers square, which is nearly 62% of the total area of the country. The table below details the areas covered by each of these three DISCOs:

Table 2: Geographical Areas of DISCOs (QESCO, PESCO and MEPCO)

DISCO	Geographical Area (km ²)	% of Country's Total Area
QESCO	334,616	42.03%
PESCO	77,474	9.73%
MEPCO	81,087	10.19%
Total	493,177	61.95%

Source: *Improving power DISCOs' performance, The EXPRESS TRIBUNE*.¹⁴

And if we look at NEPRA's 2019-2020 Performance Evaluation Report of DISCOs, we come to know that all these three DISCOs have the major share in AT&C losses. They also perform the least in indicator of bill recovery. Refer to the figures below to assess their relative performance in terms of the AT&C losses and their share in the T&D loss category.

Figure 5: DISCOs' Breach of T&D target

Name of DISCO	Actual Reported (%)	Allowed in Tariff (%)	Breach of Target (%)
(1)	(2)	(3)	4=(2-3)
PESCO	38.9	31.95	6.95
IESCO	8.69	8.60	0.09
GEPCO	9.51	10.03	-0.52
FESCO	9.60	10.10	-0.50
LESCO	12.40	10.88	1.52
MEPCO	15.20	15.00	0.20
QESCO	26.70	17.50	9.2
SEPCO	36.30	29.75	6.55
HESCO	28.90	22.59	6.31
K-Electric	19.73	17.76	1.97
W. Av:	18.20	15.97	2.23

Source: *NEPRA's Performance Evaluation Report of Distribution Companies 2019-2020*¹⁵

¹⁴ <https://tribune.com.pk/story/2336829/improving-power-discos-performance>

¹⁵ <https://nepra.org.pk/Standards/2021/PER%20DISCOs%202019-20%20updated.pdf>

Figure 6: DISCOs' Breach of T&D target

Source: NEPRA's Performance Evaluation Report of Distribution Companies 2019-2020¹⁶

And comparative analysis of the financial loss caused by MEPCO, QESCO and PESCO to the national exchequer is roughly 59% (calculations performed in the table 3).

Table 3: Financial Losses Incurred by DISCOs (PESCO, QESCO, and MEPCO)

Name of DISCO	Financial Loss (million Rs.)	% Financial Loss of the Total Loss incurred by all the DISCOs
PESCO	22,521.27	38.28%
QESCO	682.44	1.16%
MEPCO	10,933.22	18.58%
Cumulative loss of above three DISCOs	34,136.93	58.03%
Total Loss of all DISCOs	58,828.67	

Source: Author's calculations, NEPRA's Performance Evaluation Report of Distribution Companies 2019-2020¹⁷

Thus, larger geographical area is directly proportional to more T&D losses. Therefore, in order to improve their efficiency (DISCOs with larger areas to supply power), they need to be divided

¹⁶ <https://nepra.org.pk/Standards/2021/PER%20DISCOs%202019-20%20updated.pdf>

¹⁷ NEPRA's Performance Evaluation Report of Distribution Companies 2019-2020

into smaller units. High-loss DISCOs like PESCO, QESCO, and MEPCO may be initially taken up for this task. The reason large service areas translate into more AT&C losses and poor bill recovery is because of the larger distances between control centers and field offices and operations. This weakens the control and oversight capacity of DISCOs' administration. And if the size of a DISCO's service area is reduced, it becomes easier for the staff to manage the power facilities and to exert control. Smaller DISCOs may require cheaper management and smaller boards as well. T&D losses and other pilferages can be reduced due to closer control and oversight. The other benefit of smaller DISCOs is that private companies find it easier to manage because the risks of controlling far located regions are minimized. Thus, prospects of privatization of DISCOs increase with the division of large DISCOs into smaller ones. In short, there is indeed a strong case for dividing large geographical domains of DISCOs into two or three parts.

2- Overcoming social norms of electricity theft / non-payment of bills

One key factor behind poor recovery of bills relates to the social norm or the people's mindset of not paying the electricity. Many people consider electricity an entitlement, and not a private good. This factor is particularly challenging as technical and punitive measures fail to show progress on this front. It calls for innovative policy solutions. Following innovative policy solutions can be employed to achieve the desired results:

a. Shifting public perception on electricity from an entitlement towards a private good

It is possible through tariff reforms aimed at reducing the subsidy. The subsidized provision of electricity has a regressive effect on the consumers. It implicitly reinforces the social norm that electricity is an entitlement, which has to be provided by the government. Thus, the government should omit the subsidy from the electricity tariffs. Because electricity subsidy is not achieving the intended objective. Government has subsidized tariffs for poor consumers (who use below 300 units per month). But even the middle and rich consumers, who actually have the capacity to purchase electricity at its actual cost of production and distribution, are exploiting it to their advantage. They are doing so by installing more than one meter at their places so that the units' reading gets divided across the meters. It helps them pay the bills at subsidized tariffs as their consumed electricity units fall under the protected consumers' category. Instead, what government can do is to ensure a system of unconditional, direct cash transfers targeted at the poorest. Poor consumers can use this amount to pay their bills. Also, these transfers would be hard for rich consumers to avail for themselves.

b. Incentive schemes

A policy option in this regard is the introduction of performance incentives for bill collectors. The more they collect bills, the more performance bonuses they will get. Not only will this boost their collection efforts, but also hinder DISCOs' staff collusion with the default consumers.

c. Social trust mechanisms to improve bill collection

This is probably the most innovative policy intervention. But unfortunately, none of the DISCOs had taken it up so far. It attempts at gaining the trust of the community to pay their bills. A community mobilization mechanism should be devised in a way that consumers are charted into small community circles on the basis of their geographical connectivity. Among these communities, local leaders should be identified. They should be incentivized to liaison with the bill recovery staff of DISCOs. It would improve bill recovery because if your own neighbor is coming to your doorsteps, it would be hard for you to avoid payment of bills.

This community mobilization was the key element behind the success of rural electrification cooperatives in America¹⁸. These rural cooperatives were made up of communities of farmers, who maintained the grid and collected bills. It not only brought their bill recovery up but also led to rural grid expansion¹⁹. A simile model was also practiced in China, which proved to be a success.

3- Use of technology for making electricity excludable to non-payers

The response of DISCOs' staff towards the non-payers has been very reactionary in nature. This is evident from cases of revenue-based load shedding in high theft/low recovery areas of PESCO and K-Electric. But it is not a wise step, as it also hurts the fair consumers and rather discourages them to pay bills. Instead of blocking out power to the whole area, some technological tools could be employed to make electricity excludable to non-payers. Following are some tangible technological solutions:

a. Replacement of bare conductors wires with Kunda Resistant Aerial Bundled Cables:

One common way of stealing electricity is by hooking a Kunda with the bare electrical wires. This can be reduced by replacing Kunda-resistant ABC cables, which do not let Kunda draw current from the power supply cables. K-electric has installed these Kunda-resistant cables in their high theft regions, and positive effects (in the form of lower theft cases) are achieved.

b. Smart Metering:

A drive for smart metering should be started by all the DISCOs, as it would help them improve their recovery ratio. If a consumer is consuming electricity, but not paying the bill, DISCOs' officials can disconnect the service by sitting in their offices. But for it, a smart meter should be connected at the consumer's place. Smart meters also have an inbuilt prepaid billing option. That can also help improve the bill recovery.

4- Reducing the Cost of Electricity Generation

¹⁸ <https://www.theigc.org/wp-content/uploads/2020/03/Burgess-et-al-2019-Final-Report.pdf>

¹⁹ <https://www.theigc.org/wp-content/uploads/2020/03/Burgess-et-al-2019-Final-Report.pdf>

Cost of electricity generation can be reduced by undertaking following reforms within the contracts with IPPs and energy fuel mix:

- a. Replace the dollar-indexed rate of return to IPPs with the one based on Pakistani rupee.
- b. A forensic audit of IPPs should be done to check on their excess profitability.²⁰
- c. The contracts with IPPs which are matured, should be discontinued.
- d. In order to reduce reliance on imported fuel which are adding to the cost of power generation, government needs to work on indigenous energy resources such as Thar coal having the power generation potential of over 100 GW and renewable energy with over 3,000 GW potential of power generation.²¹

5- Reducing Subsidies

- a. The government should terminate subsidies on electricity and rather provide direct cash transfers to low-income households.

Conclusion:

Circular debt is a major challenge for Pakistan's economy and energy sector. Addressing this problem requires a comprehensive and integrated approach, including models for financial turnaround of DISCOs, reforms in IPPs' contracts, indigenization of fuel mix, and rolling back of subsidies. The implementation of these policies will help to break the vicious cycle of circular debt and ensure the sustainable growth of the energy sector and the economy.

²⁰ <https://tribune.com.pk/story/2199737/two-decades-flawed-policies-power-producers-make-billions-pakistan>

²¹ <https://www.pbc.org.pk/wp-content/uploads/Towards-Pakistanu2019s-Energy-Security-and-Competitiveness.pdf>

ACTION MATRIX

Problem	Pathways to Solutions	How to Implement Each Solution	Actors Responsible	Implementation Timeline
<p>Circular Debt: 2.25 trillion recorded on 30 June 2022</p>	<p>Improving the Financial Performance of DISCOs.</p> <p>Reducing the Cost of Electricity Generation.</p> <p>Reducing Subsidies</p>	<p>Breaking up of DISCOs into smaller units.</p> <p>Overcoming social norms of electricity theft/non-payment of bills.</p> <p>Shifting public perception on electricity from an entitlement towards a private good.</p> <p>Incentive schemes.</p> <p>Social trust mechanisms to improve bill collection.</p> <p>Use of technology for making electricity excludable to non-payers.</p> <p>Municipality model. Cooperative Model. Management Model.</p> <p>Reforms in IPPs' contracts. Indigenization of Fuel Mix</p>	<p>Ministry of Energy.</p> <p>Ministry of Petroleum.</p> <p>Ministry of Planning Development and Special Initiative.</p> <p>DISCOs.</p> <p>PEPCO.</p> <p>CPPA.</p> <p>IPPs.</p> <p>GENCOs.</p> <p>NTDC</p>	<p>All these policy measures vary in terms of their implementation timeline.</p> <p>Measures like breaking up of DISCOs into smaller units, and reducing the cost of electricity generation are long term solutions, which can take 5 to 7 years for their implementation.</p> <p>Solutions such as managerial reforms within DISCOs and reducing subsidies are short term in nature and can be implemented with 1 to 3 years.</p>

About the Author

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