Circular Debt in Pakistan’s Power Sector: Causes, Economic Implications and Policy Options

Abstract

Circular debt has remained one of the most persistent structural challenges confronting Pakistan’s energy sector and wider economy. It emerges when revenues collected within the electricity supply chain are insufficient to meet the financial obligations of power-sector entities, causing unpaid liabilities to accumulate across distribution companies, the Central Power Purchasing Agency, generation companies, fuel suppliers and ultimately the government. Although successive governments have attempted to contain the problem through tariff adjustments, subsidies, debt settlements and institutional reforms, circular debt has repeatedly re-emerged because its underlying structural causes have not been fully eliminated.

This paper examines the nature, causes and economic implications of circular debt in Pakistan’s power sector and evaluates recent policy responses. It argues that circular debt is not simply an accounting or financing problem; rather, it is the financial manifestation of weaknesses in governance, distribution efficiency, tariff design, subsidy management, electricity theft, inadequate bill recovery, high generation costs and institutional accountability. Sustainable resolution therefore requires simultaneous reforms in governance, distribution, energy pricing, subsidy targeting, generation costs and regulatory enforcement.

Keywords: Circular Debt, Pakistan, Power Sector, Energy Security, DISCOs, Electricity Tariffs, Energy Reform, Economic Growth

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1. Introduction

Reliable and affordable energy is fundamental to economic development. Industrial production, agriculture, transportation, digital infrastructure, commercial activity and household welfare all depend upon an efficient energy system. Pakistan, however, has struggled for decades to establish a financially sustainable electricity sector.

Among the most serious manifestations of this weakness is the accumulation of circular debt.

Circular debt develops when one participant in the electricity supply chain cannot fully pay another. Distribution companies collect electricity bills from consumers and transfer revenues through the power-sector payment system. When distribution companies experience excessive technical and commercial losses, electricity theft, poor bill recovery or delays in receiving subsidies, the amount collected becomes insufficient to meet their obligations. The resulting payment shortfall travels through the energy supply chain.

Consequently, what begins as a collection or efficiency problem eventually becomes a national fiscal and economic problem.

Pakistan's experience demonstrates that clearing accumulated liabilities without correcting the factors generating new debt provides only temporary relief. Sustainable reform therefore requires a distinction between the **stock of circular debt already accumulated** and the **flow of new circular debt being generated**.

Research Question

Why has circular debt persisted in Pakistan's power sector despite repeated government interventions, and what policy measures can provide a sustainable solution?

Objectives of the Study

This study seeks to:

1. Explain the concept and mechanism of circular debt.
2. Identify the principal causes of circular debt in Pakistan.
3. Examine its economic, fiscal and social consequences.
4. Assess recent government measures for controlling circular debt.
5. Propose policy options for achieving long-term power-sector financial sustainability.

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2. Understanding Circular Debt

Circular debt should not be understood simply as conventional government borrowing. It represents an accumulation of unpaid financial obligations across interconnected participants in the energy supply chain.

A simplified electricity-sector financial chain can be represented as:

Consumers → Distribution Companies → Power Purchaser → Electricity Producers → Fuel Suppliers / Banks

If consumers do not pay their electricity bills, electricity is stolen, distribution losses exceed permitted levels, government subsidies are delayed, or tariffs fail to recover legitimate costs, distribution companies experience revenue shortfalls.

They consequently become unable to make complete payments for electricity purchased. Power producers may then face difficulties meeting obligations to fuel suppliers, lenders and other counterparties.

Thus, a financial shortfall at one stage creates liabilities elsewhere in the system.

Two dimensions are particularly important.

Circular Debt Stock refers to accumulated outstanding liabilities from previous periods.

Circular Debt Flow refers to additional liabilities generated during a particular period.

This distinction is crucial for policymaking. The government can restructure or repay existing debt, but unless the annual flow is controlled, circular debt will accumulate again.

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3. Evolution and Scale of the Problem

Circular debt has developed over many years rather than emerging from a single economic shock.

NEPRA reported that power-sector circular debt reached approximately **Rs 2,393.37 billion at the end of FY2023-24**, compared with approximately Rs 2,310 billion a year earlier.

The figures illustrate the persistence of the problem:

Financial Year	Approx. Circular Debt Stock
2019-20	Rs 2,198 billion
2020-21	Rs 2,280 billion
2021-22	Rs 2,253 billion
2022-23	Rs 2,310 billion
2023-24	Rs 2,393 billion

The numbers demonstrate an important policy lesson: despite repeated interventions, the system continued generating financial imbalances.

More recent reforms have produced a significant reduction in the reported stock. By early 2026, international assessments estimated power-sector circular debt at approximately **Rs 1.764 trillion**.

This reduction represents important progress, but it does not mean that the structural circular-debt problem has disappeared. The central policy challenge remains preventing fresh accumulation.

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4. Major Causes of Circular Debt

4.1 Transmission and Distribution Losses

High transmission and distribution losses are among the most important structural causes.

Some electricity loss is technically unavoidable during transmission and distribution. However, losses exceeding regulatory allowances create financial deficits.

NEPRA estimated that excess transmission and distribution losses across DISCOs imposed an additional financial burden of approximately **Rs 276.35 billion during FY2023-24**.

Poor infrastructure, overloaded networks, outdated equipment, weak maintenance and electricity theft all contribute to these losses.

4.2 Poor Recovery of Electricity Bills

Generating an electricity bill does not guarantee collection.

Distribution companies frequently fail to recover the full amount billed to consumers. According to NEPRA, shortfalls in bill recovery contributed approximately **Rs 314.5 billion** to financial pressures during FY2023-24.

Persistent non-payment creates a liquidity deficit throughout the electricity supply chain.

Improved billing without improved collection therefore cannot resolve circular debt.

4.3 Electricity Theft

Electricity theft has both financial and governance dimensions.

Illegal connections, meter manipulation and other forms of unauthorized consumption mean electricity is generated and supplied without corresponding revenue.

The financial burden of these losses ultimately falls on paying consumers, power-sector companies or the government.

Electricity theft therefore creates an equity problem as well: compliant consumers indirectly bear the cost of non-compliant users.

4.4 Inefficient Distribution Companies

Pakistan's electricity distribution companies vary considerably in operational and financial performance.

Weak corporate governance, political interference, insufficient managerial accountability, inefficient procurement and inadequate performance incentives contribute to losses.

Circular debt cannot therefore be addressed solely by increasing electricity tariffs. Distribution-sector reform is essential.

4.5 Tariff-Cost Gap

The electricity tariff must generate sufficient revenue to recover legitimate system costs.

When tariffs remain below cost-recovery levels without corresponding and timely government subsidies, a financing gap emerges.

However, continuously raising tariffs presents another problem.

Higher tariffs can reduce affordability, encourage electricity theft, decrease consumption by paying customers and increase non-payment. Pakistan can consequently enter a vicious cycle:

Higher Costs → Higher Tariffs → Lower Consumption/Recovery → Revenue Shortfall → Further Tariff Pressure

Tariff reform must therefore be accompanied by cost reduction and efficiency improvements.

4.6 Capacity Payments

Pakistan's generation structure also creates substantial fixed payment obligations.

Many power-purchase agreements require capacity payments to generators based on contracted capacity and other contractual conditions, even when electricity demand is insufficient to fully utilize available generation.

When electricity consumption growth is weaker than anticipated, fixed costs are distributed over fewer units sold, increasing the average cost of electricity.

Capacity payments have therefore become an important component of Pakistan's electricity-cost debate.

4.7 Exchange-Rate Depreciation

A significant portion of Pakistan's power-sector costs is directly or indirectly linked to foreign currencies.

These include:

- imported fuels;
- foreign-denominated project financing;
- imported machinery;
- spare parts; and
- contractual payments linked to foreign currencies.

When the Pakistani rupee depreciates, these costs increase in rupee terms.

This creates additional pressure on electricity tariffs and the financial sustainability of the sector.

4.8 Dependence on Imported Energy

Pakistan has historically depended substantially on imported oil, LNG and coal.

International energy-price shocks can therefore increase electricity-generation costs.

External geopolitical developments can consequently translate into domestic electricity-price and fiscal pressures.

Diversification toward economically viable domestic and renewable resources can reduce, though not eliminate, this vulnerability.

4.9 Subsidies and Delayed Payments

Electricity subsidies are sometimes necessary to protect vulnerable consumers.

The problem arises when subsidies are poorly targeted, inadequately budgeted or paid late.

If distribution companies supply electricity at subsidized tariffs but do not receive the corresponding government payment on time, their cash flow deteriorates.

Effective subsidy policy therefore requires both accurate targeting and timely fiscal settlement.

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5. Economic Consequences

Circular debt extends well beyond the electricity industry.

5.1 Pressure on Government Finances

When power-sector entities cannot meet their obligations, the government frequently becomes the ultimate financial backstop.

Debt servicing, subsidies, guarantees and periodic debt settlements consume fiscal resources that could otherwise finance education, healthcare, infrastructure or social protection.

Circular debt therefore creates an opportunity cost for national development.

5.2 Higher Electricity Prices

Consumers ultimately bear a substantial portion of power-sector inefficiencies.

As financial gaps increase, authorities face pressure to raise tariffs or introduce surcharges.

This affects household disposable income and increases the cost of doing business.

5.3 Industrial Competitiveness

Electricity represents a significant production cost for many Pakistani industries, particularly textiles, steel, cement, engineering and other energy-intensive activities.

Expensive or unreliable electricity reduces international competitiveness.

Higher energy costs can:

- increase production costs;
- discourage investment;
- weaken exports;
- encourage firms to reduce production; and
- adversely affect employment.

Circular debt should therefore also be regarded as an industrial-policy challenge.

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6. Social Consequences

Repeated electricity-price increases disproportionately affect lower- and middle-income households.

Energy expenditure can consume a significant portion of household income. As electricity becomes more expensive, families may reduce expenditure on education, nutrition, healthcare and other essential needs.

This illustrates the difficult balance facing policymakers.

Tariffs below sustainable costs can generate circular debt, but indiscriminate tariff increases can create serious affordability problems.

The appropriate solution is therefore neither permanently subsidized electricity nor unlimited tariff increases. It is a more efficient electricity system combined with targeted protection for genuinely vulnerable households.

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7. Recent Policy Measures

Pakistan has undertaken several important measures to address circular debt.

These include:

- periodic tariff rebasing;
- fuel-cost and quarterly tariff adjustments;
- anti-theft campaigns;
- improvements in electricity-bill recovery;
- reforms of distribution companies;
- renegotiation of certain power-purchase arrangements;
- better targeting of subsidies;
- private-sector participation in DISCOs;
- restructuring of accumulated power-sector liabilities; and
- efforts to reduce the cost of electricity generation.

A particularly significant development was the **Rs 1.225 trillion power-sector circular-debt restructuring announced in 2025**.

The arrangement involved approximately Rs 660 billion in restructuring of existing loans and Rs 565 billion in fresh financing intended to clear overdue payments to power producers.

This represents an important financial intervention.

However, restructuring accumulated debt solves primarily the **stock problem**.

The ultimate success of the policy will depend upon whether Pakistan simultaneously eliminates or substantially reduces the **flow problem**.

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8. Assessment of Recent Progress

Recent developments indicate that Pakistan has achieved measurable progress.

The reduction in the reported circular-debt stock and improvement in some DISCO operational indicators suggest that reforms can produce results.

Nevertheless, sustainability remains uncertain.

International assessments continue to emphasize:

- timely tariff adjustments;
- reduction in distribution losses;
- stronger bill recovery;

- targeted rather than generalized subsidies;
- improved DISCO governance;
- private-sector participation;
- cost-reducing structural reforms; and
- prevention of new circular-debt accumulation.

The key lesson is that financial engineering alone cannot permanently resolve an operational and governance problem.

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9. Policy Recommendations

9.1 Prioritize Prevention of New Debt

Government policy should focus not only on reducing accumulated debt but on preventing new circular-debt flow.

A publicly accessible dashboard could report monthly:

- circular-debt stock;
- new debt flow;
- DISCO losses;
- recovery ratios;
- subsidy receivables; and
- major outstanding liabilities.

Greater transparency would improve institutional accountability.

9.2 Reform Distribution Companies

DISCO reform should be at the centre of the circular-debt strategy.

Each distribution company should operate under measurable performance targets for:

- transmission and distribution losses;
- recovery rates;
- theft reduction;
- service quality;
- interruption frequency;
- financial performance; and
- complaint resolution.

Management performance should be linked to these indicators.

Private-sector participation should be considered where it can improve governance and operational efficiency, but privatization itself should not be regarded as a substitute for effective regulation.

9.3 Accelerate Smart Metering

Advanced metering infrastructure can help reduce:

- theft;
- inaccurate billing;
- meter manipulation;
- delayed readings; and
- commercial losses.

High-loss feeders and areas should receive priority rather than attempting an immediate nationwide rollout.

9.4 Strengthen Enforcement Against Electricity Theft

Electricity theft should be treated as an economic-governance problem rather than merely a technical problem.

Enforcement should combine:

Technology + Legal Action + Institutional Accountability

Employees facilitating theft should face the same accountability mechanisms as external offenders.

9.5 Replace Broad Subsidies with Targeted Support

Government assistance should focus on vulnerable households rather than providing indiscriminate subsidies.

Targeting mechanisms linked to reliable socioeconomic databases can protect low-income consumers while reducing fiscal leakage.

9.6 Reduce Generation Costs

Long-term financial sustainability requires lowering the underlying cost of electricity.

Pakistan should pursue an economically optimized generation mix emphasizing:

- domestic energy resources;
- competitive renewable-energy procurement;
- hydropower where economically viable;
- improved transmission infrastructure;
- storage where justified;
- efficient generation dispatch; and
- reduced dependence on volatile imported fuels.

Energy planning should be based on realistic demand projections to avoid unnecessary capacity and associated fixed costs.

9.7 Improve Power-Purchase Contract Management

Future power-purchase agreements should allocate commercial, exchange-rate, demand and fuel risks more carefully between investors, consumers and government.

Contract renegotiation, where legally and commercially feasible, should seek cost reductions without damaging Pakistan's credibility with legitimate investors.

9.8 Improve Regulatory Independence

NEPRA requires adequate institutional independence and enforcement capacity.

Regulatory decisions should prioritize:

- transparency;
- efficiency;
- consumer protection;
- cost-reflective pricing; and
- long-term market sustainability.

Political considerations should not routinely delay decisions that create larger financial liabilities later.

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10. Proposed Reform Framework

A sustainable circular-debt strategy can be organized around five pillars:

Pillar I — Stop New Debt

Improve recoveries, reduce theft and losses, ensure timely subsidy payments and maintain financially sustainable tariffs.

Pillar II — Reduce Electricity Costs

Improve generation efficiency, reform contractual obligations where feasible, optimize dispatch and reduce exposure to expensive imported energy.

Pillar III — Reform Institutions

Professionalize DISCO management, strengthen regulatory enforcement and introduce meaningful accountability.

Pillar IV — Protect Consumers

Replace poorly targeted subsidies with direct assistance to vulnerable households and ensure that efficiency improvements translate into lower long-term costs.

Pillar V — Resolve Existing Debt

Restructure accumulated liabilities transparently without simply transferring inefficient-sector costs indefinitely to taxpayers or electricity consumers.

These pillars must operate simultaneously.

Addressing only one component will likely cause the problem to reappear elsewhere in the system.

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11. Conclusion

Circular debt is one of the clearest manifestations of structural weakness in Pakistan's electricity sector.

It is frequently discussed as a debt problem, but debt itself is primarily the outcome rather than the root cause.

The underlying causes include excessive distribution losses, inadequate bill recovery, electricity theft, governance weaknesses, poorly targeted subsidies, high generation costs, capacity obligations, exchange-rate exposure and institutional inefficiencies.

Pakistan has recently made meaningful progress in reducing accumulated power-sector liabilities and improving aspects of sector performance. Nevertheless, historical experience demonstrates that paying or restructuring accumulated debt without eliminating the mechanisms producing new liabilities cannot provide a permanent solution.

The country's policy objective should therefore shift from periodic **circular-debt clearance** toward permanent **circular-debt prevention**.

A sustainable solution requires financially disciplined tariffs, lower generation costs, stronger DISCO governance, better recovery, reduced theft, targeted consumer protection, technological modernization and transparent institutional accountability.

Ultimately, resolving circular debt is not merely an energy-sector objective. It is essential for Pakistan's fiscal stability, industrial competitiveness, investment environment, energy security and long-term economic development.

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