SECTOR STUDY . MARCH 2025

PACRA
Together. Creating Value.

DISTRIBUTION | ELECTRICITY

Research Team

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Distribution | Electricity

Distribution | Electricity

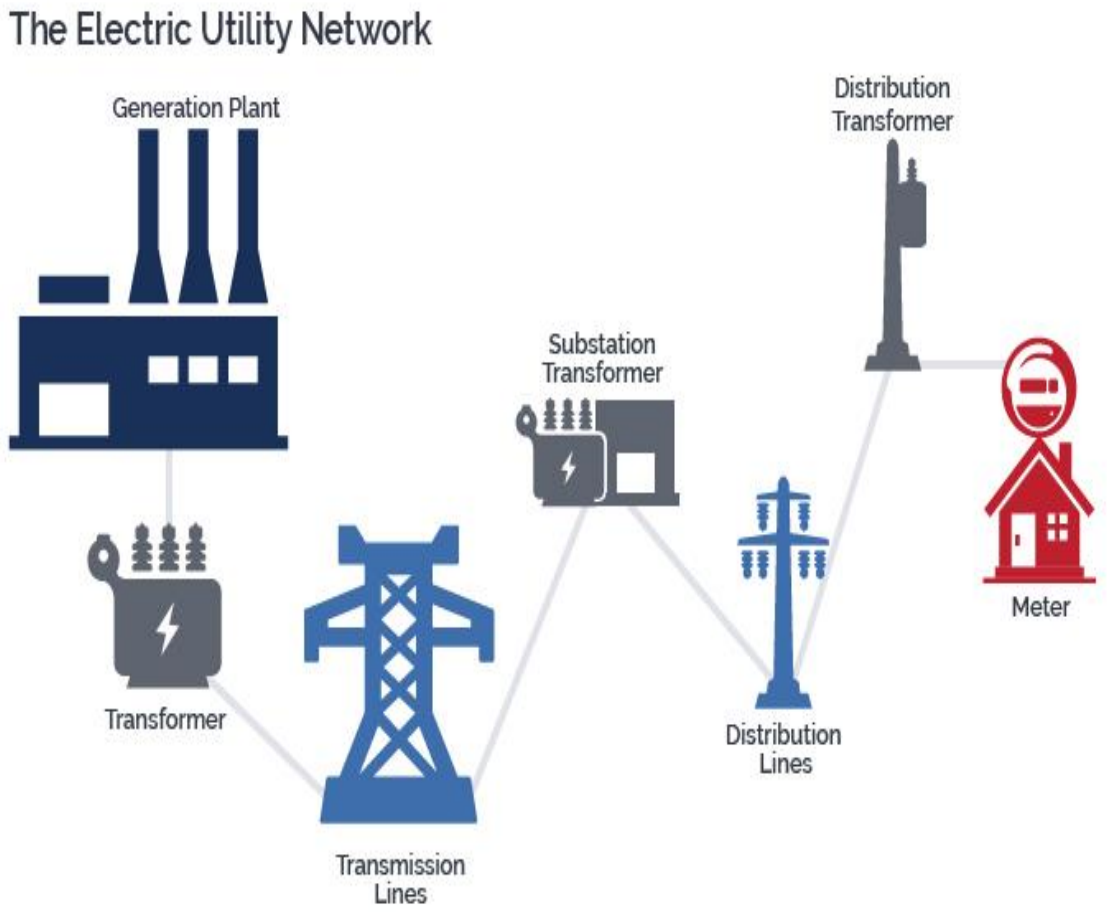
Power | An Overview

- Based on derivation, energy sources can be bifurcated into Primary and Secondary sources. Electricity, a subset of Power, is a secondary energy source, meaning thereby that it is produced through conversion of other energy sources such as coal, natural gas, oil, nuclear etc. These are known as primary energy sources. Primary energy sources are renewable or non-renewable energy.

- Since the 1660s, scientists and inventors, including the likes of Benjamin Franklin, Thomas Edison and Nikola Tesla, have contributed significantly in shaping up our understanding and use of electricity.

- In the late 1800s, Nikola Tesla pioneered the generation, transmission, and use of alternating current (AC) electricity, which reduced the cost of transmitting electricity over long distances.

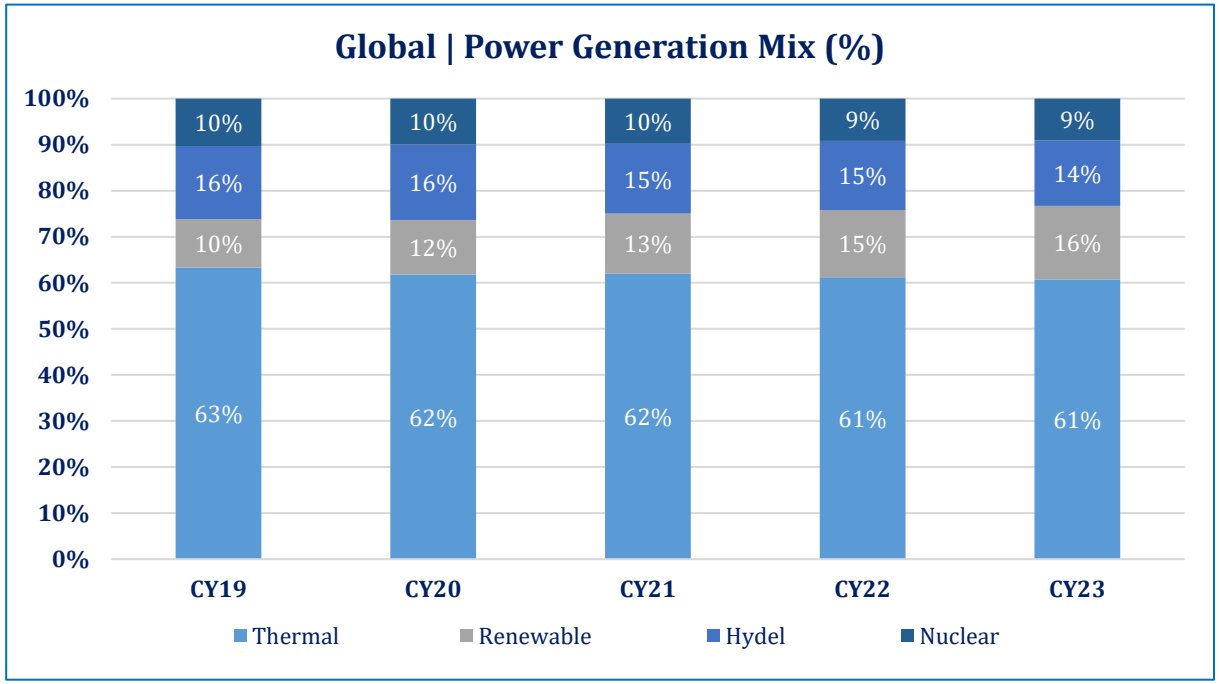
- Electricity is generated at power plants and moves through a complex system, generally called the grid, of electricity substations, transformers, and power lines that connect electricity producers and consumers. This study shall focus on the **Electricity Distribution** system.

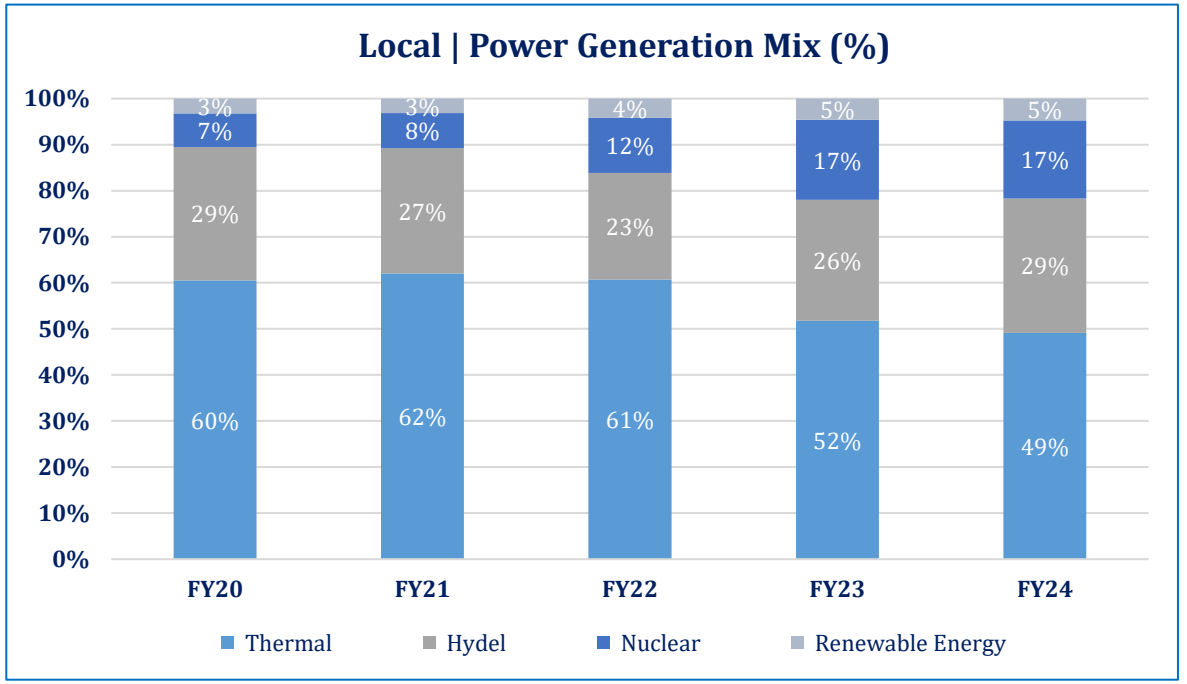


Source: EIA

Distribution | Electricity

Electricity Mix | Global vs. Pakistan





- The global power generation mix continues to be dominated by thermal energy sources, including Coal, Oil, and Gas, which accounted for ~61.0% of total generation in CY23. Meanwhile, renewable energy sources, such as solar and wind, collectively represented ~16.0% of the mix during the year. Hydel remained the largest clean energy source, contributing ~14.0%, while nuclear energy ranked second among clean electricity sources with a ~9.0% share in CY23.

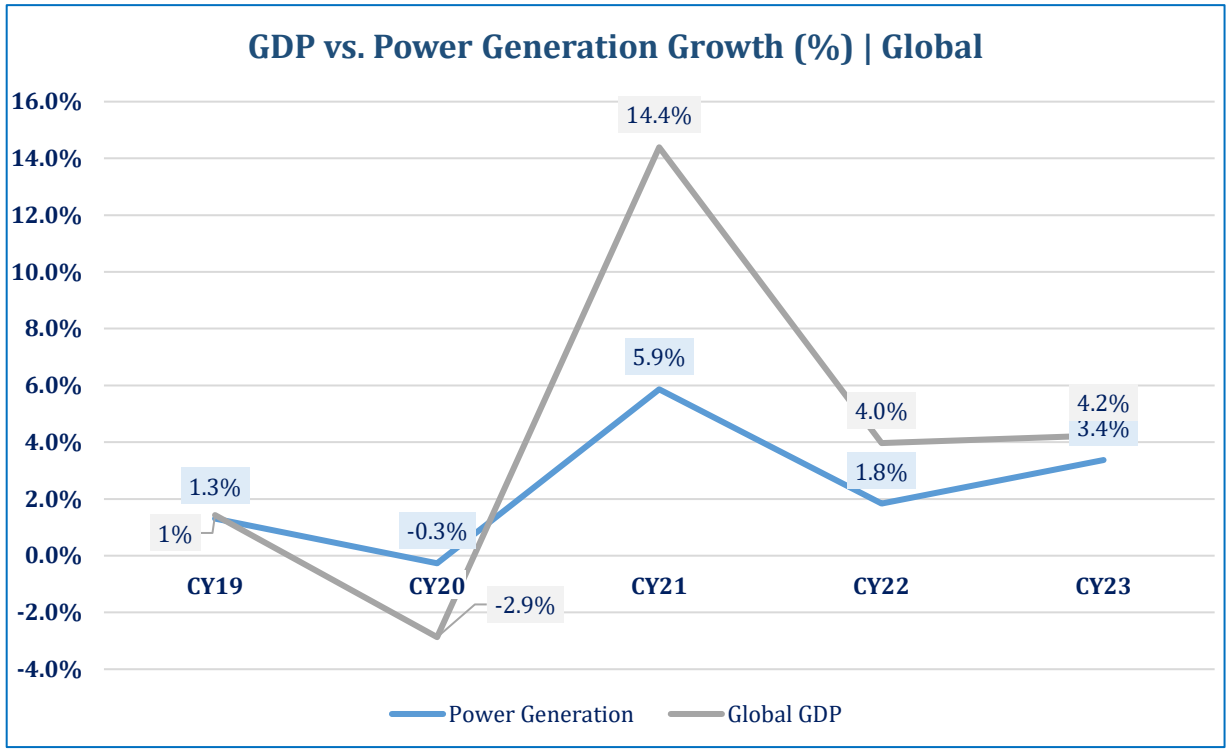
- In the case of Pakistan, the share of thermal, as a dominant source of power generation, has declined since FY21(~61.0%; FY24: ~49.0%) shifting towards nuclear (FY20: ~7.0%; FY24: ~17.0%). On the other hand, against a total power generation of ~137,196 GWh in FY24, the share of hydel and renewables was cumulatively recorded at ~34.0% during FY24 (FY23: ~31.0%).

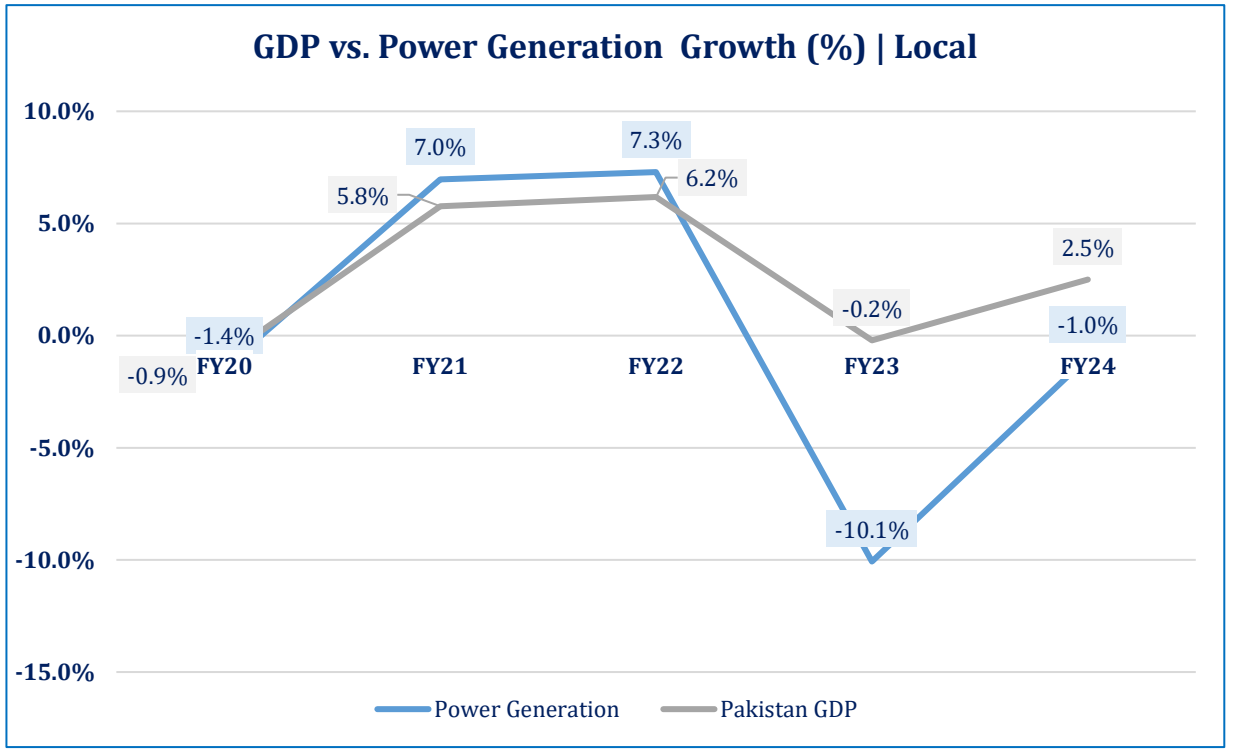
***Note**: "Others" in Pakistan's Electricity mix includes imported electricity from Iran.*

Source: Ember, NEPRA

Distribution | Electricity

Electricity Consumption vs. GDP Growth





- Global electricity generation reached ~29,471TWh in CY23, up ~3.4% YoY (SPLY: ~28,510TWh). Meanwhile, the global GDP grew by ~4.2% YoY during the same period, recording at USD~105.4trn.
- Pakistan's power generation stood at ~137,196GWh in FY24, marking a decline of ~1.0% YoY while on the other hand, GDP grew, in real terms, by ~2.5% YoY from a negative growth of ~0.2% YoY in FY23.

Source: NEPRA, EMBER, WB, PACRA Database

Distribution | Electricity

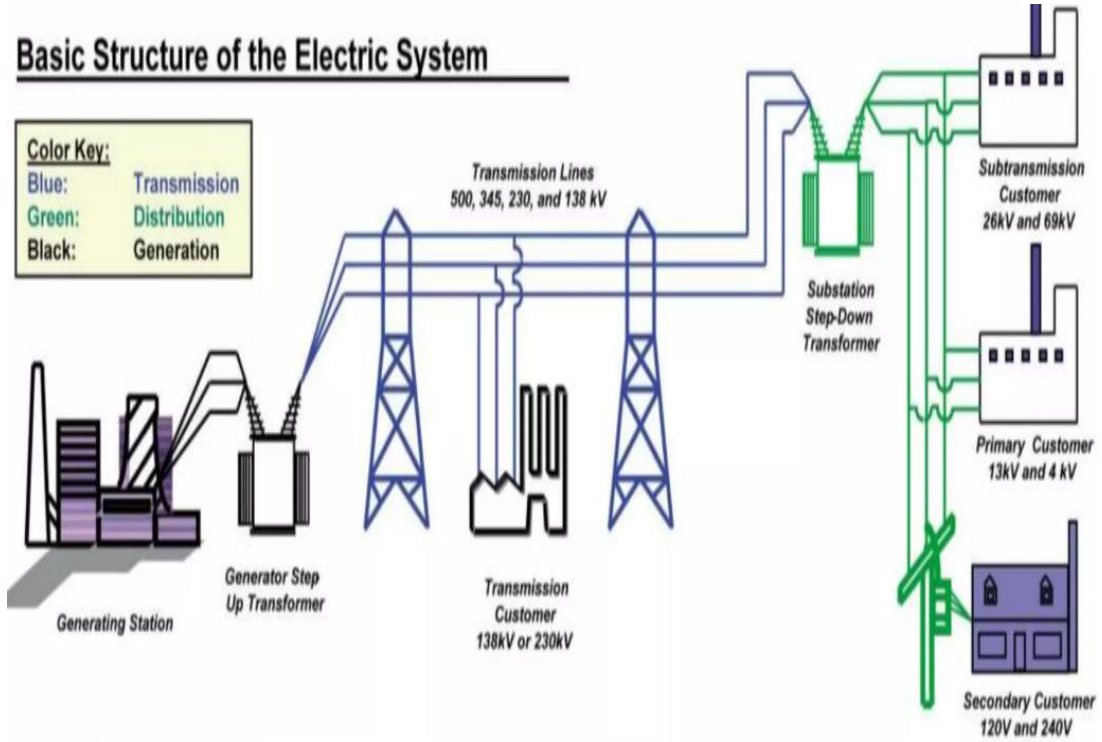
Transmission | An Overview

- Electricity Transmission is the vital link between electricity generation and distribution. Transmission lines carry electricity at high voltages over long distances from power plants to distribution companies, which bring electricity to homes and workplaces.

- As per the NEPRA Act, there can be only one National Grid Company (NGC) at a particular time. National Transmission & Dispatch Company Limited (NTDC) is acting as an NGC under a license issued by NEPRA.

- On the Provincial Scale, the NEPRA (Amendment) Act, 2018, provides Provincial Governments the right to establish one Provincial Grid Company (PGC) in each province.

- Under-utilization of efficient power plants, over-loading of transmission lines, insufficient transformation capacity of power transformers, and outages of transmission lines, etc. have been the main constraints for transmission & distribution (T&D) networks. Transmission losses due to electricity generated clocked in at ~2.5%



***Note**: For the purpose of this study, 1GWh= 1,000 MWh*

Source: NEPRA, PACRA Database

Distribution | Electricity

Transmission | Local Structure

- The National Transmission & Dispatch Company (NTDC) was incorporated in Nov'98 and commenced commercial operation in Mar'99. It was organized to take over all the properties, rights and assets obligations and liabilities of 220KV and 500KV Grid Stations and Transmission Lines/Network owned by Pakistan Water and Power Development Authority (WAPDA).

- The entity was granted transmission license in Dec'02 by National Electric Power Regularity Authority (NEPRA) to engage in the exclusive transmission business for a term of thirty (30) years.

- KE is the only vertically-integrated power utility in Pakistan, which means the organization manages all three key areas – Generation, Transmission and Distribution – of producing and delivering energy to consumers.

NTDC | Transmission Network (FY24)

No. of Grid Stations	Grid Station Potential (kV)	Transformation Capacity (MVA)	Transmission Lines (km)	Transformers Installed at Grid Stations	
				500/220kV	220/132kV
19	500	25,950	9,201	47	38
50	220	38,460	12,136	-	183
69	-	**64,410**	**21,337**	**47**	**221**

KE | Transmission Network (FY24)

No. of Grid Stations	Grid Station Potential (kV)	Transformation Capacity (MVA)	Transmission Lines (km)	Transformers Installed at Grid Stations	
				220/132kV	132/11/66kV
11	220	5,500	436	13	-
60	132	7,020	805	-	180
3	66	79		-	4
74	-	**12,599**	**1,241**	**13**	**184**

Source: NEPRA

Distribution | Electricity

Transmission Network | NTDC & KE

NTDC Network				
Year	Generation Capability (MW)	Demand During Peak Hours (MW)	Surplus/(Deficit) MW	
Actual				
FY20	27,780	26,252	1,528	
FY21	27,819	28,253	(434)	
FY22	27,748	24,564	3,184	
FY23	30,574	23,679	6,895	
FY24	31,545	25,516	6,029	
Year	Planned Generation Capability (MW)	Projected Growth Rate (%)	Demand During Peak Hours (MW)	Surplus/ (Deficit) MWh
Projected				
FY25	38,854	8.7	29,675	9,179
FY26	40,595	5.2	31,227	9,368
FY27	41,865	4.9	32,753	9,112
FY28	43,180	5.1	34,438	8,742
FY29	44,928	5.3	36,139	8,789

KE Network				
Year	Generation Capability (MW)	Demand During Peak Hours (MW)	Surplus/(Deficit) MW	
Actual				
FY20	3,196	3,530	(334)	
FY21	3,202	3,604	(402)	
FY22	3,383	3,670	(285)	
FY23	3,409	3,654	(245)	
FY24	3,550	3,568	(18)	
Year	Planned Generation Capability (MW)	Projected Growth Rate (%)	Demand During Peak Hours (MW)	Surplus/ (Deficit) MWh
Projected				
FY25	4,698	2.9	3,707	991
FY26	4,698	2.9	3,707	991
FY27	5,179	2.9	3,908	1,271
FY28	4,950	2.9	4,002	948
FY29	4,950	2.9	4,120	830

Note: *Generation capability' is the maximum generation capability of any day recorded during the year and 'Demand' is the maximum demand of any day recorded during the year.*

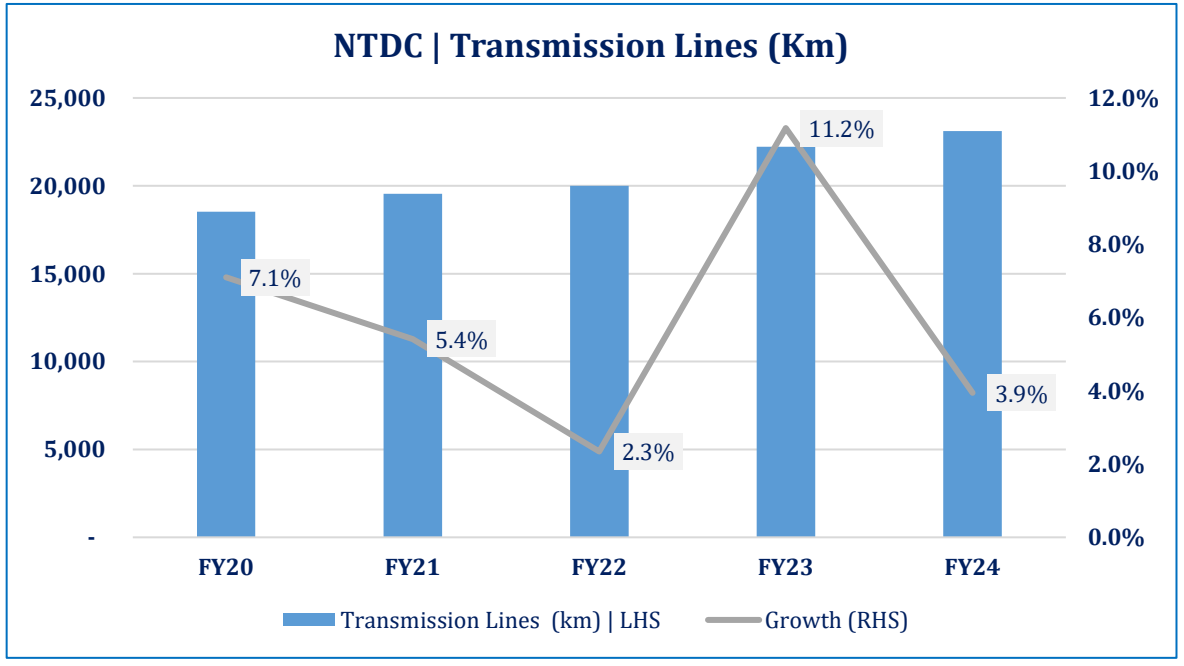
Source: NEPRA

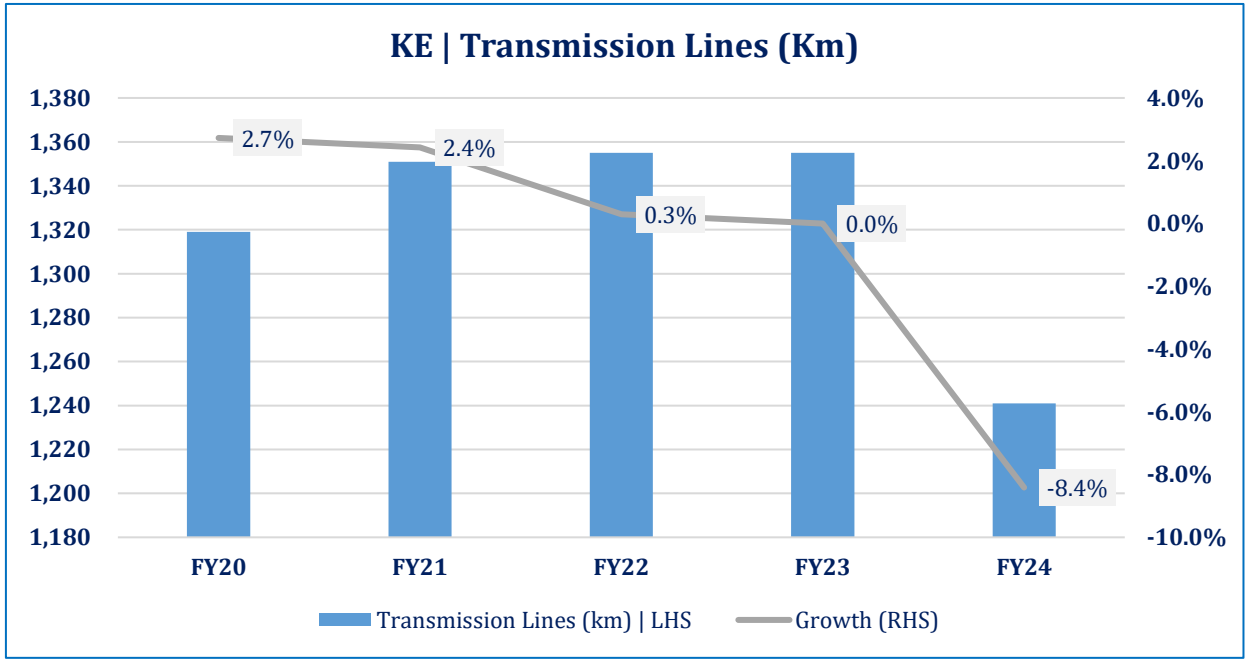
Distribution | Electricity

Transmission | Assets

Grid Stations (No.)	FY20	FY21	FY22	FY23	FY24
NTDC	62	62	69	69	69
KE	82	83	83	83	86
Total	**144**	**145**	**152**	**152**	**155**

Grid Station Capacity (MVA)	FY20	FY21	FY22	FY23	FY24
NTDC	87,800	88,600	96,220	100,330	64,410
KE	11,610	11,911	12,124	12,366	13,496
Total	**99,331**	**100,432**	**108,265**	**112,617**	**77,906**





***Note**: KE grid stations data pertains to 220/132kV grid potential.*

Source: NEPRA

Distribution | Electricity

Transmission | Losses

- Transmission Loss refers to the loss of electricity during movement from a powerplant or power station to different substations.
- Transmission refers to the movement of electricity at high voltage. Losses during transmission are generally lower than those during distribution which carries electricity at lower voltage and larger distances to the end-consumers.
- During FY24, transmission losses in NTDC network of 500/220kV grid power were recorded at ~2.5% as compared to ~2.4% in FY23.
- Distribution losses were recorded at ~18.3% in FY24 (SPLY: ~16.8%), significantly higher than transmission losses

Transmission Losses (500/220kV) (GWh)	FY20	FY21	FY22	FY23	FY24
Units Received (R)	125,941	132,299	140,346	132,008	133,815
Units Delivered (D)	122,471	128,620	136,674	128,811	130,438
Units Lost (R - D)	**3,470**	**3,679**	**3,672**	**3,197**	**3,377**
Transmission Losses (%)	**2.7%**	**2.7%**	**2.6%**	**2.4%**	**2.5%**

***Note**: Transmission losses in the table refer to NTDC Losses only. Distribution losses pertain to average of DISCOs and KE T&D losses.*

Source: NEPRA, PACRA Database

Distribution | Electricity

Distribution | An Overview

- Distribution is one of the key functions for the provision of electricity to the end consumers. As of End-June'24, there are ten State Owned Distribution Companies (DISCOs) exclusively responsible for the supply of electricity in their respective areas. These DISCOs are licensed by NEPRA. In addition, KE is also licensed to supply electricity in its designated areas. Following amendments in the NEPRA Act in April 2018, separate licenses are required to be obtained for the *supply* of electricity and *sale* of electricity.

- Besides DISCOs and KE, some other local authorities such as DHA, Bahria Town and Industrial Estates Development Authority have also been granted the license to supply electricity in the territory specified in their respective distribution licenses.

Brief Background

- DISCOs and GENCOs were created in Pakistan due to WAPDA's unbundling to restructure the power sector to improve efficiency and transform gradually into a competitive market. For this process to occur smoothly, the Pakistan Electric Company Pvt. Ltd. (PEPCO) was created in 1998 and assigned the task of unbundling WAPDA into 8 DISCOs then, 4 GENCOs and NTDC. PEPCO oversees the management of all corporatized DISCOs, GENCOs, and NTDCs. In CY21, its headquarters were relocated and rebranded as the Power Planning and Monitoring Company; however, it has yet to become operational.

- From CY07 onwards, the Ministry of Water & Power HAD notified NEPRA of the approved tariff for all DISCOs replacing the unified WAPDA tariff.

Source: NEPRA

Distribution | Electricity

Distribution | Local Structure

- DISCOs are responsible for the operations & maintenance of the transmission and distribution assets at 132kV and below. Power Delivery through DISCOs network mainly depends on the adequacy of three major components; (i) 11kV feeders, (ii) Power Transformers and (iii) Distribution Transformers.

DISCOs Operational | FY24
Peshawar Electric Supply Company (PESCO)
Tribal Areas Electric Supply Co. (TESCO)
Islamabad Electric Supply Co. (IESCO)
Gujranwala Electric Power Co. (GEPCO)
Lahore Electric Supply Co. (LESCO)
Faisalabad Electric Supply Co. (FESCO)
Multan Electric Power Co. (MEPCO)
Hyderabad Electric Supply Co. (HESCO)
Sukkur Electric Power Co. (SEPCO)
Quetta Electric Supply Co. (QESCO)
K-Electric (KE)

DISCOs | Assets Structure | FY24	NTDC	KE	Total
Transmission lines – 132kV (km)	31,271	805	**32,076**
Grid Stations – 132 kV	877	71	**948**
Grid Stations Transformation Capacity (MVA)	100,330	7,020	**108,037**
Feeders – 11 kV	11,347	2,112	**13,459**
Feeders Length (km)	359,347	10,283	**369,630**
Distribution Transformers (DTs) (No.)	916,925	31,422	**948,347**
Transformation Capacity of DTs (MVA)	62,996,442	8,963,725	**71,960,167**
DTs Low-tension LT lines (km)	247,308	30,871	**278,179**
No. of Connections	**34,684,149**	**3,565,801**	**38,249,950**

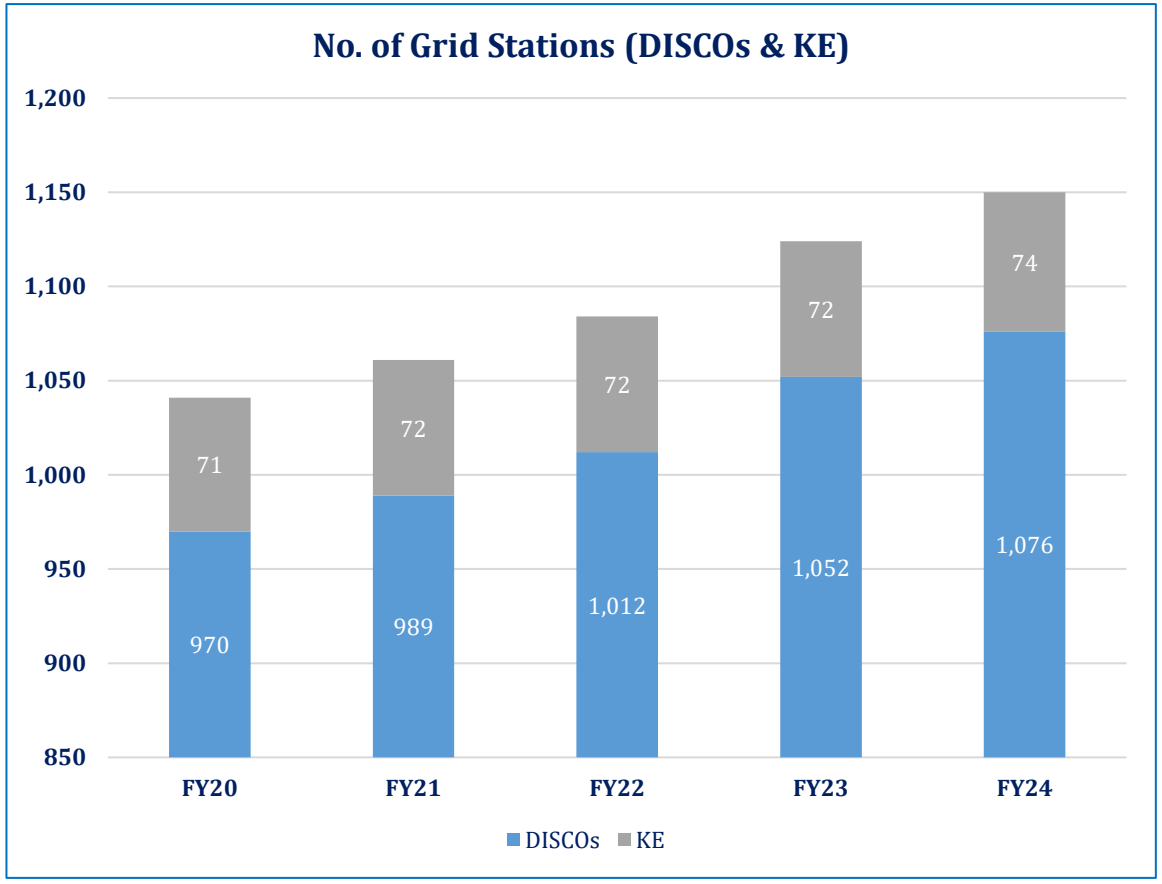
Source: NEPRA

Distribution | Electricity

Local | Assets (Lines & Grid Stations)

The country's Distribution Network is classified into DISCOs, KEs, and Small and captive Power Producers. DISCOs purchase power from NTDC through CPPA-G. As of FY24, DISCO transmission lines cover ~93.8% (SPLY: ~95.4%) of Pakistan's geographical area.

Distribution Lines DISCOs (Km)	FY20	FY21	FY22	FY23	FY24
High-Tension (HT) Lines	379,859	385,933	390,981	395,477	403,447
Low-Tension (HT) Lines	238,053	240,931	242,925	247,144	247,308
Sub-total (A)	**617,912**	**626,864**	**633,906**	**642,621**	**650,755**
Distribution Lines KE (Km)	**FY20**	**FY21**	**FY22**	**FY23**	**FY24**
High-Tension (HT) Lines	11,158	11,269	11,511	11,882	12,256
Low-Tension (HT) Lines	18,367	18,509	18,936	19,370	30,871
Sub-total (B)	**29,525**	**29,778**	**30,447**	**31,252**	**43,127**
Grand Total (A+B)	**647,437**	**656,642**	**664,353**	**673,873**	**693,882**



**High Tension Lines carry high voltage (11kV, 33kV etc.), and are used to transmit power to long distances. LT lines carry low voltage (till 1kV) and are used for shorter distances, e.g., households.*

Source: NEPRA

Distribution | Electricity

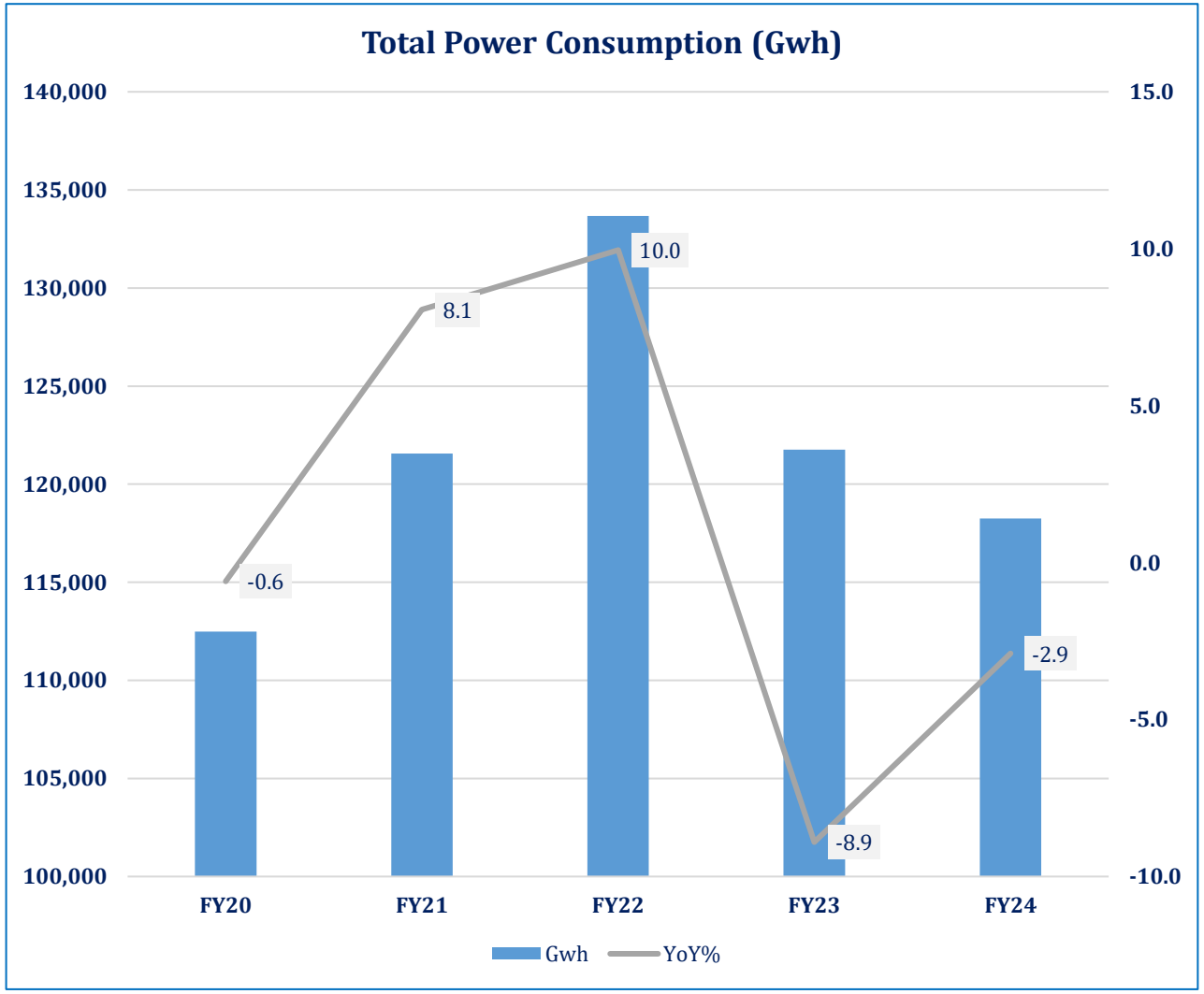
Local | Demand

- Pakistan's overall power consumption declined by ~2.9% YoY in FY24 (FY23: ~-8.9%), equivalent to ~86.2% of the total power generated during FY24. This was mainly due to high tariffs, increasing rooftop solar installation and, in some cases, faulty meter readings.

- This likely reflects power losses owing to transmission/ distribution losses. The average power consumption per capita was recorded at ~482.6kWh in FY24 (~505.2kWh in FY23).

- A global comparison reveals per capita power consumption stands at ~15.9MWh in Canada, ~12.7MWh in the USA and ~1.4MWh in India in CY23. The global average per capita consumption of electricity recorded at ~3.7MWh during the same period.

- In FY24, transmission losses in the CPPA-G system clocked in at ~2.5% (SPLY: ~2.4%), while distribution losses accrued to ~18.3% during the same year (FY23: ~16.7%).



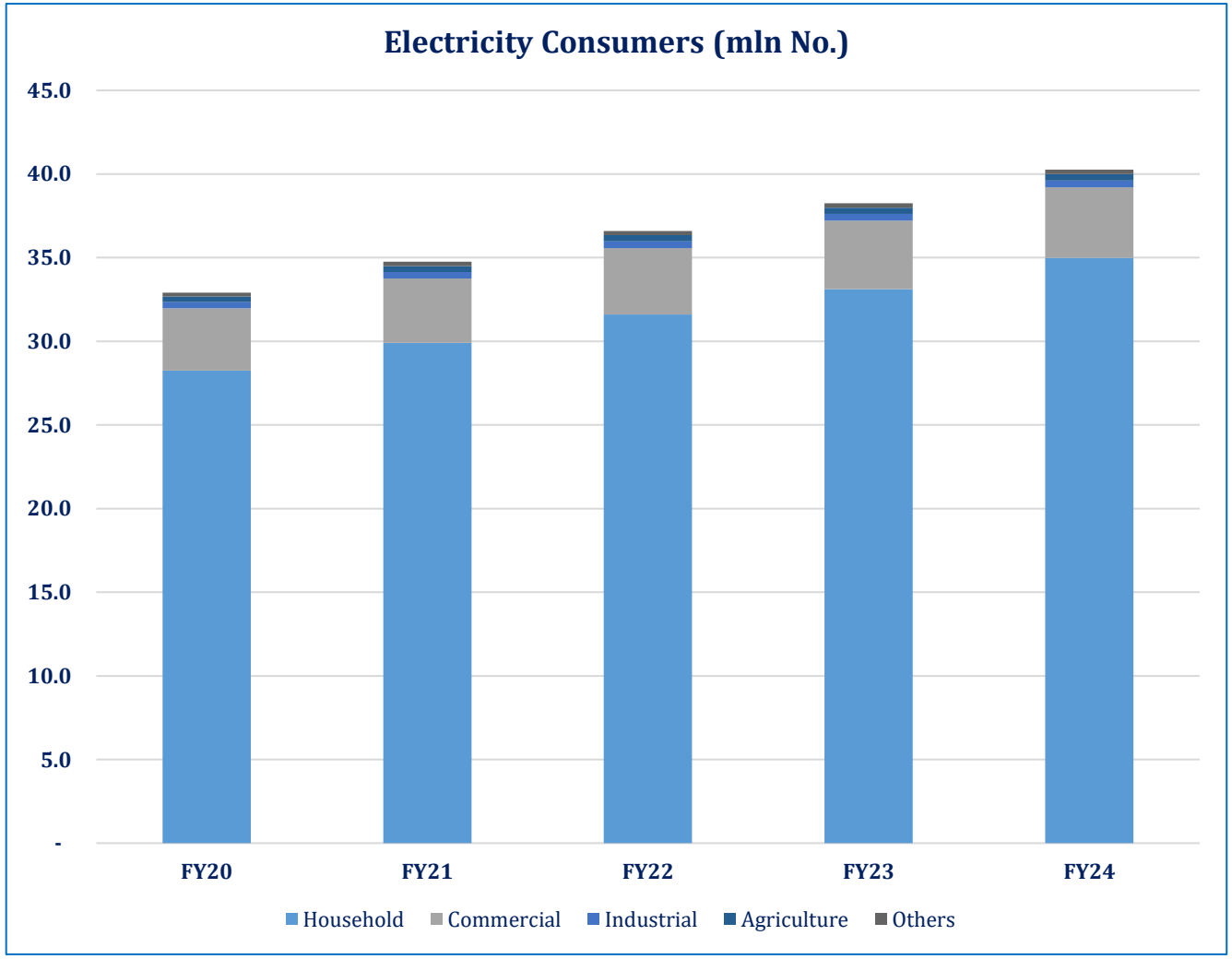
***Note**: For per capita consumption, population levels taken as ~241mln in FY23 and ~245mln in FY24*

Source: NEPRA, PBS, PACRA Database

Distribution | Electricity

Local | Consumer-wise Demand

- Household/ domestic segment makes up ~86.8% of total connections in the country followed by commercial and industrial connections during FY24.
- In terms of consumption, household consumption was highest at ~46.0%, followed by industrial at ~23.0% during the period under review.
- A regional comparison revealed that during CY22*, industrial and commercial sectors' cumulative share in total electricity consumption stood at ~49.0% for India, while domestic held ~26.0% share.
- For the USA, ~74.1% of electricity was consumed by the residential/ domestic sector, while the industrial sector consumed ~25.8% in CY22. Meanwhile, China's industrial sector accounted for ~55.0% of total electricity consumed while residential's share stood at ~17.0%.



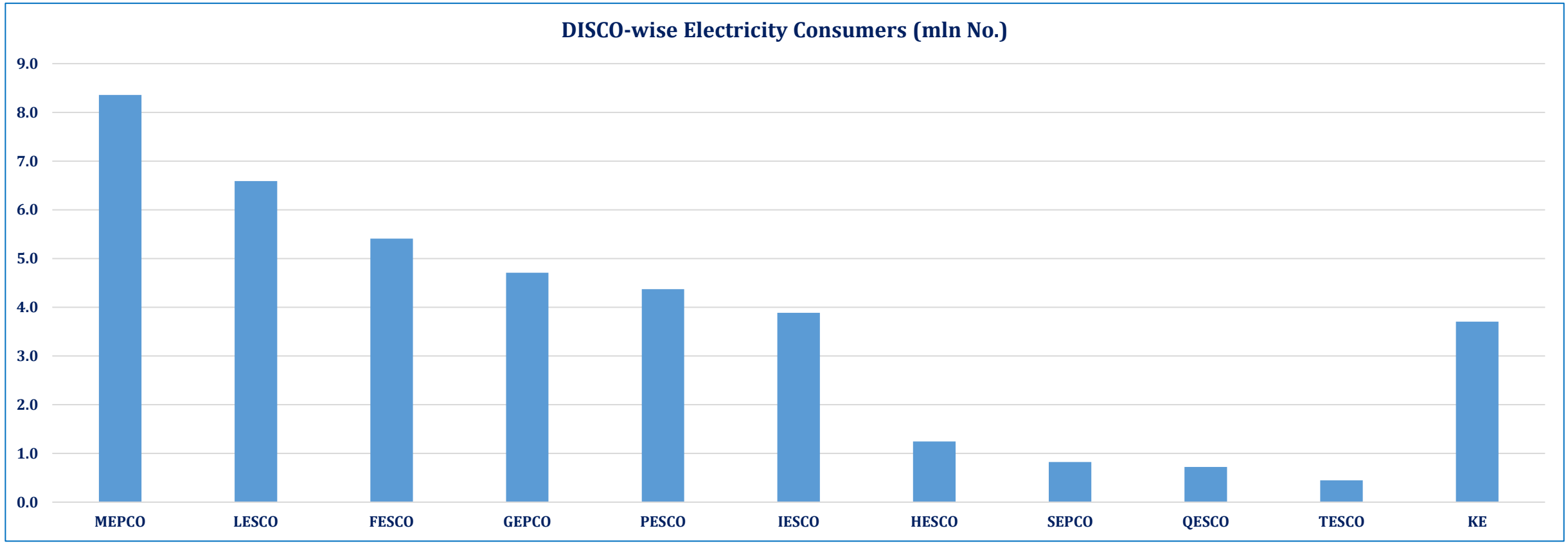
***Note**: Others in the figure above include public lighting, bulk supply of electricity etc. *Latest data.*

Source: Ember, NEPRA, MOSPI, U.S. Department of Energy, Enerdata

Distribution | Electricity

Local | DISCO-Wise Consumers

- In FY24, total number of electricity consumers nationwide surged to ~39.9mln (SPLY: ~38.0mln). The largest consumer base is served by MEPCO, followed by LESCO, FESCO and GEPCO.



Source: WB, NEPRA

Distribution | Electricity

Local | Performance Parameters

Transmission & Distribution Losses

- T&D losses are a vital parameter in measuring the performance of DISCOs.
- NEPRA has set targets for the DISCOs to maintain their losses to a certain level. Breaching these targets leads to a significant loss to the national exchequer.
- The performance of DISCOs is benchmarked with their actual losses as against the targets set by NEPRA. The more the actual losses exceed the target, the worse its performance is considered to be.

Recoveries

- DISCOs are ideally required to realize the maximum number of recoveries against their billing.
- Lower recoveries of DISCOs is the root cause of the crumbling financial issues of the power sector.
- Rising circular debt also stems from the inefficiency of the DISCOs to fully recover their billed amounts and clear their dues to the NTDC and Power Producers in the given time frame.

Load Shedding

Although load shedding has reduced significantly over the years, it is still not eliminated completely as DISCOs are carrying out load management as per AT&C criteria which is still not in line with the requirements of NEPRA Performance Standards.

Safety

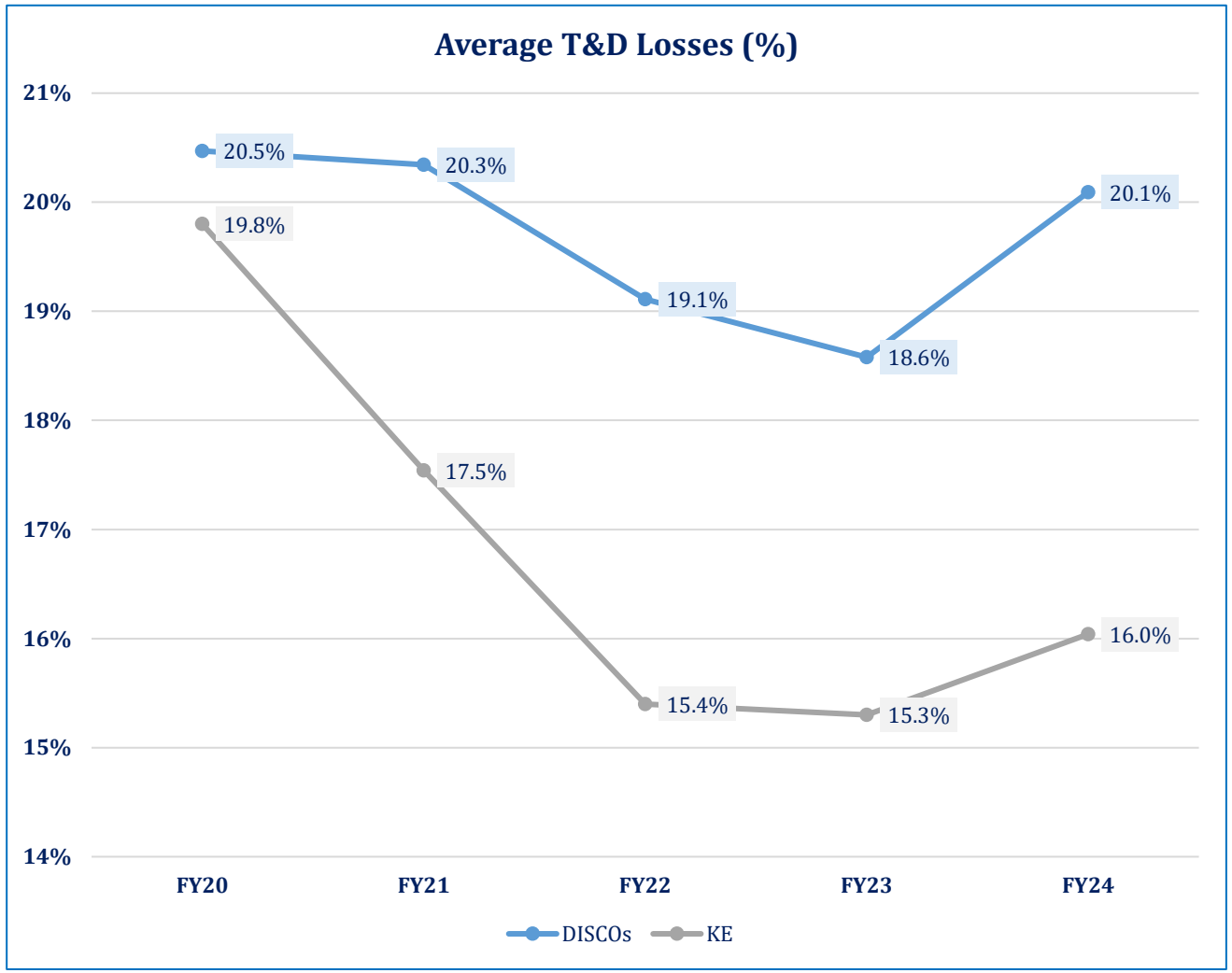
Safety is also one of the very important features in evaluating the quality of infrastructure and maintenance standards of the DISCOs. The increasing number of fatalities for both employees and the public on account of electricity accidents is a concern.

Source: NEPRA

Distribution | Electricity

Local | Transmission & Distribution Losses

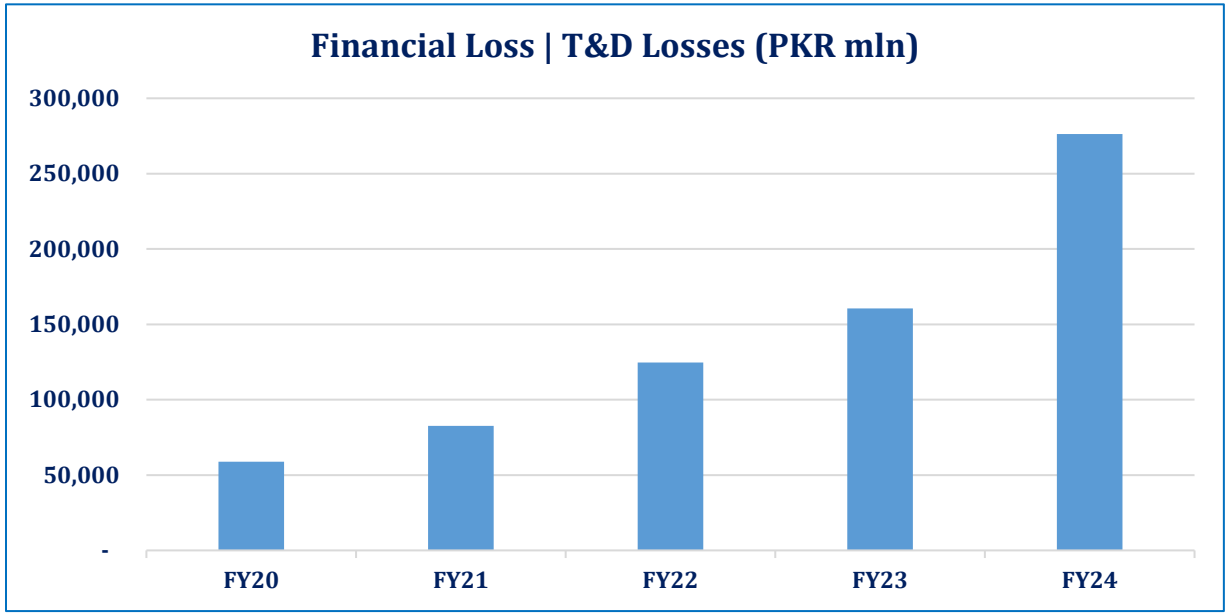
- NEPRA has allowed a certain percentage of T&D Losses in the tariff structure of DISCOs. Any loss above the allowed limit results in financial loss to the national exchequer (covered subsequently).
- Average T&D Losses of the DISCOs and KE were recorded at ~20.1% and ~16.0%, respectively, in FY24 (SPLY: ~18.3% and ~15.3%, respectively).
- In CY22, the KE applied to NEPRA for approval of generation tariffs for its power plants beyond Jun'23, as per NEPRA rules. Meanwhile, the Multi-Year Tariffs for Transmission, Distribution, and Supply businesses for FY24-30 are under NEPRA's determination.



Distribution | Electricity

Local | Transmission & Distribution Losses

- In FY24, all DISCOs reported transmission and distribution (T&D) losses higher than their allocated limits, as depicted in the table below.
- These T&D losses result in a significant financial loss to the national exchequer, as is witnessed from the adjacent chart. A financial impact of PKR~276.3bln (SPLY: PKR~160.5bln) was recorded in FY24 (up ~72.1% YoY).



FY24 | Overview of T&D Losses											
DISCO-wise T&D Losses	**PESCO**	**IESCO**	**GEPCO**	**FESCO**	**LESCO**	**MEPCO**	**QESCO**	**SEPCO**	**HESCO**	**TESCO**	**KE**
Actual Reported Loss (%)	38.1%	8.9%	11.5%	9.9%	15.9%	15.3%	29.8%	34.9%	27.6%	9.0%	16.0%
Loss (%) Allowed in Tariff by NEPRA (FY24)	29.7%	7.3%	9.0%	8.7%	10.0%	11.8%	14.0%	16.7%	18.1%	8.6%	15.3%
Loss Exceeding/(Less than) Allowance	**8.4%**	**1.5%**	**2.5%**	**1.1%**	**5.9%**	**3.5%**	**15.7%**	**18.2%**	**9.6%**	**0.4%**	**0.7%**

Source: NEPRA

Distribution | Electricity

Local | DISCO's Average Recoveries

Recoveries of Billed Amounts | DISCOs and KE (%)												
Period	**PESCO**	**TESCO**	**IESCO**	**GEPCO**	**LESCO**	**FESCO**	**MEPCO**	**HESCO**	**SEPCO**	**QESCO**	**Overall DISCOs**	**KE**
FY20	87.6	68.1	90.2	94.3	94.4	94.1	92.9	73.1	56.5	49.2	**88.7**	92.6
FY21	101.8	83.2	116.8	105.1	98.7	97.2	102.1	75.6	64.4	39.8	**97.3**	94.9
FY22	91.9	66.2	95.6	98.1	96.6	94.8	92.0	73.7	63.7	35.2	**90.5**	96.7
FY23	91.6	85.1	104.9	98	94.3	100.3	98.2	74.4	66.5	36.9	**93.3**	92.8
FY24	91.9	105.6	97.0	96.2	96.1	99.6	97.2	76.5	66.6	36.6	**92.6**	91.5

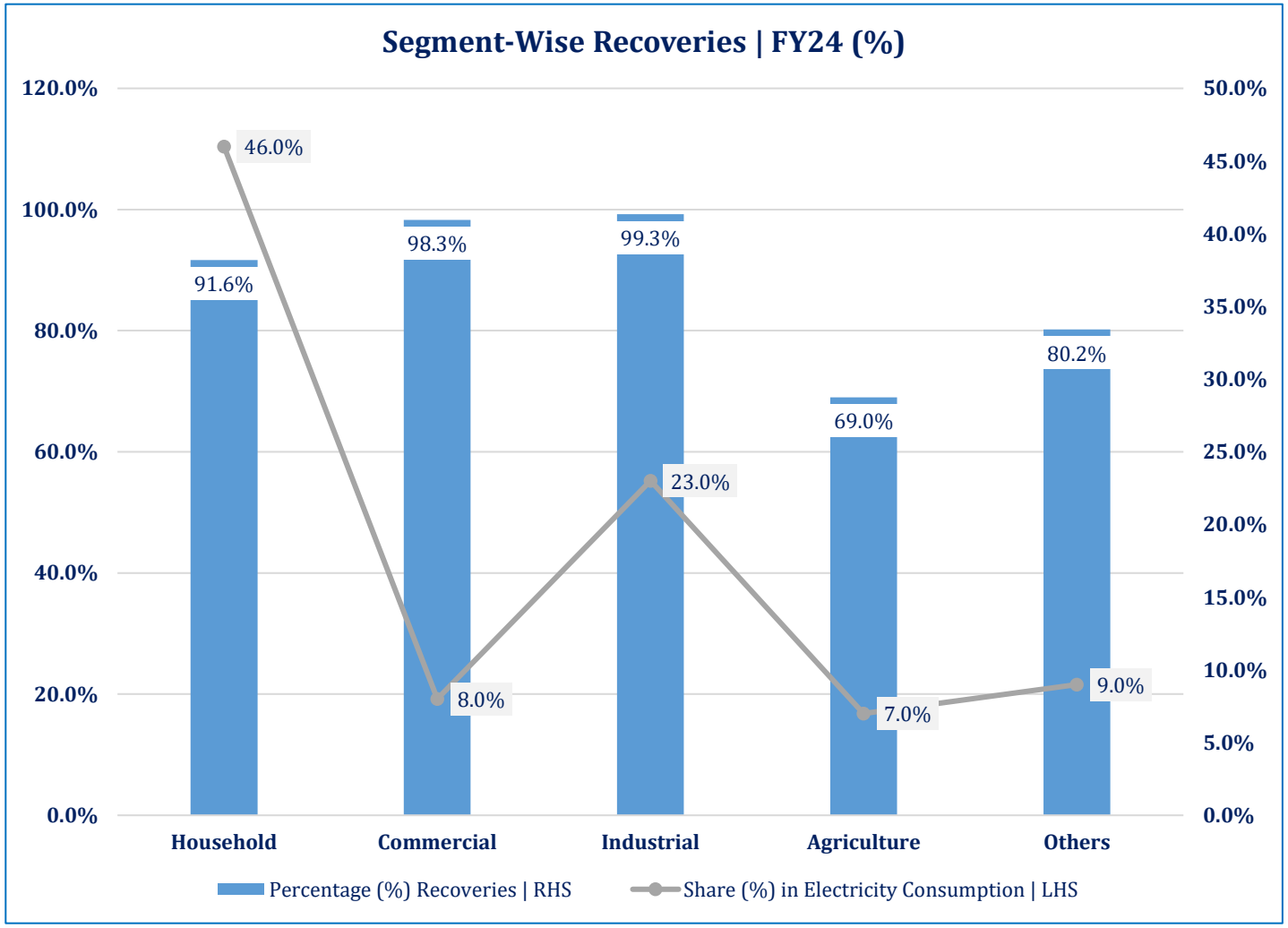
- During FY24, recoveries against the billed amount stood at ~92.6% (SPLY: ~93.3%), amounting to PKR~631.2bln.
- Given the cyclic nature of payments, the low recovery of DISCOs hampered the ability to make payments to generation and transmission companies through the CPPA-G. In FY24, overall receivables for DISCOs surged to PKR~2,034bln, compared against PKR~1,727bln in SPLY, indicating an increase of PKR~307.0bln or ~17.7% YoY.

Source: NEPRA

Distribution | Electricity

Local | Segment-wise Recoveries

- In FY24, the lowest recovery rate was witnessed in the agricultural segment at ~69.0%, although this was an improvement from FY23 levels (~62.0%), while those from the household segment improved slightly to ~91.6% (SPLY: ~91.0%).
- Recovery rate was the highest among commercial and industrial consumers recorded respectively at ~98.3% and ~99.3% (SPLY: ~97.0% each).
- The 'Others' category, as depicted in the chart, include public lighting and bulk supply of electricity etc. and recorded a recovery rate of ~80.2% in FY24 (SPLY: ~104.0%).



Source: NEPRA

Distribution | Electricity

Circular Debt | The Unfortunate Menace

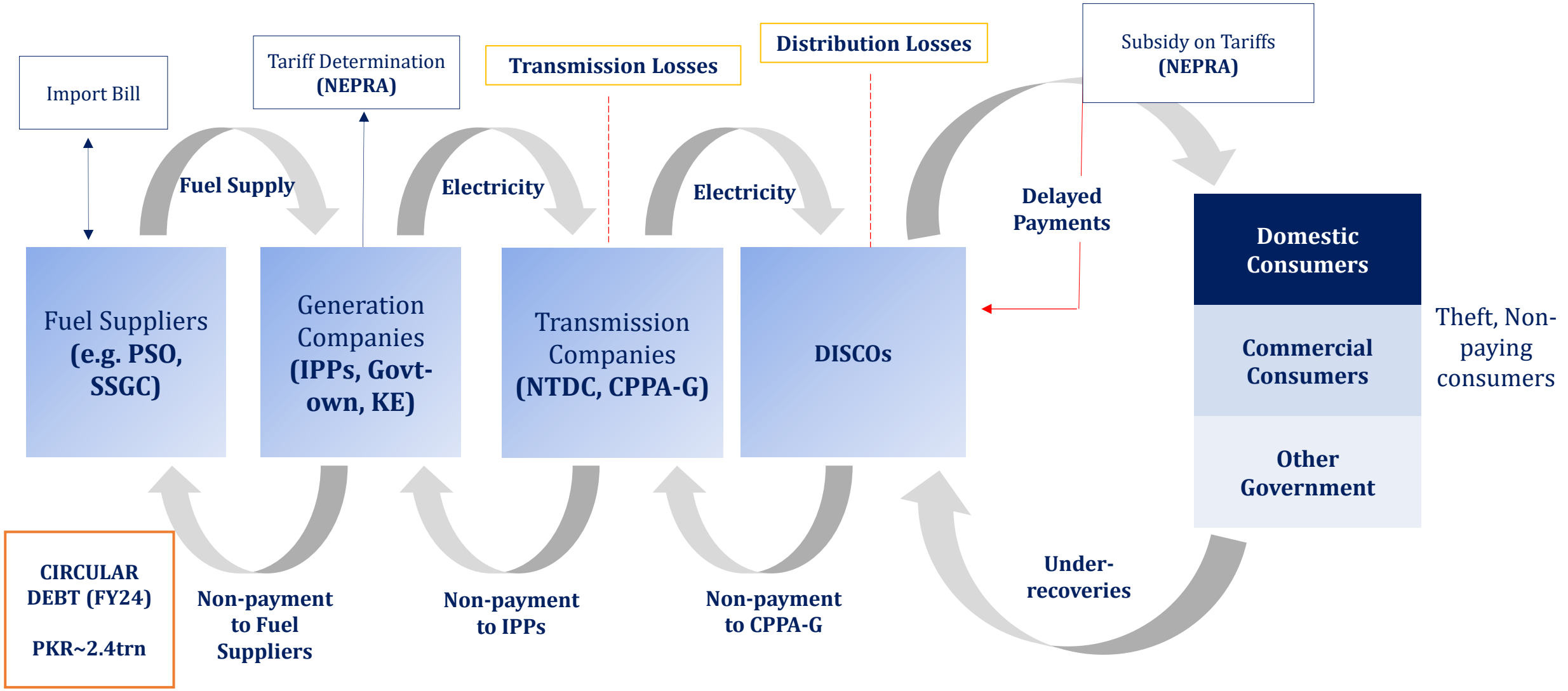
- **Circular Debt is the net unfunded outstanding liability position of the power distribution companies (DISCOs) to the Central Purchasing Power Authority-Guarantee (CPPA-G)**, which further cascades into delayed settlement of payment obligations by the CPPA-G to the Power Generation Companies (GENCOs)/ Independent Power Producers (IPPs). The cash gap at the CPPA-G is bridged through borrowings by Power Holding Private Limited (PHPL) to settle CPPA-G's debts.

- The **five key contributors** include, (i) High cost of power generation, (ii) delays in tariff determination, (iii) high transmission and distribution (T&D) losses and poor revenue collection by the DISCOs, (iv) partial (and often delayed) tariff deferential subsidies (TDS) payment by the GoP to the DISCOs and K-Electric (KE), and (v) high financial costs on PHPL borrowing, and late-payment penalty charges on CPPA-G payables.

Source: ADB

Distribution | Electricity

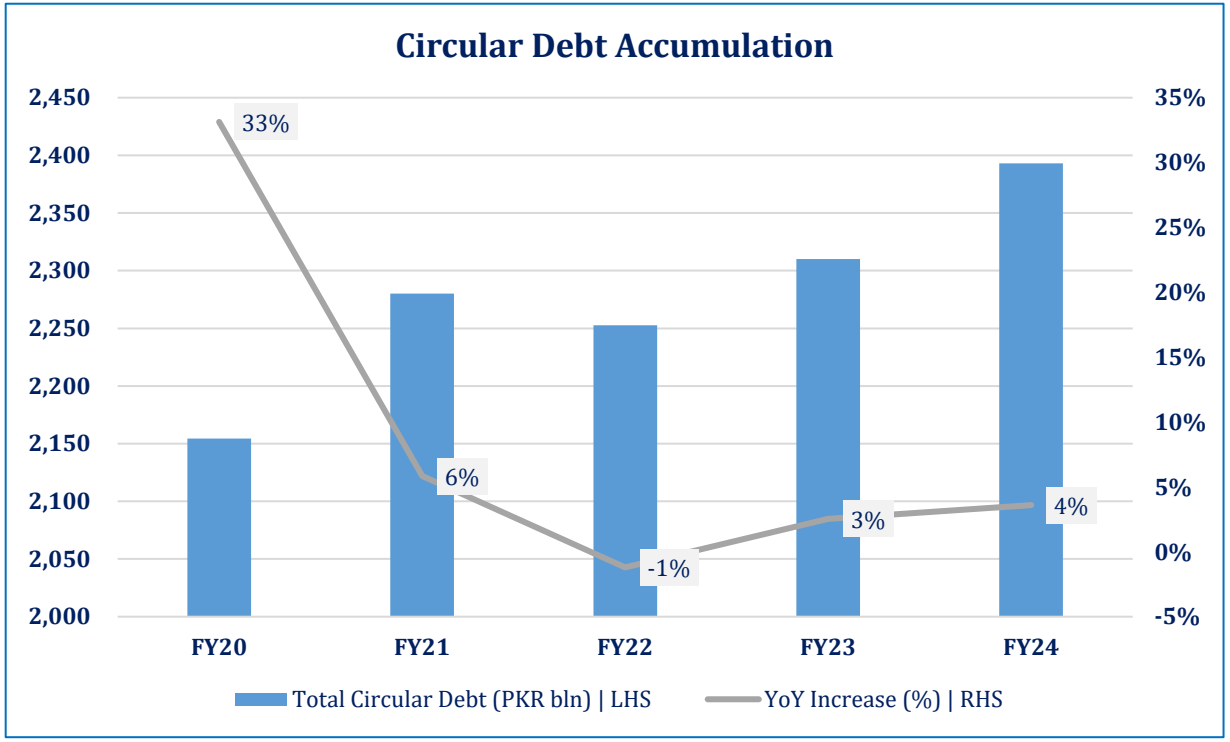
Circular Debt | How it Flows

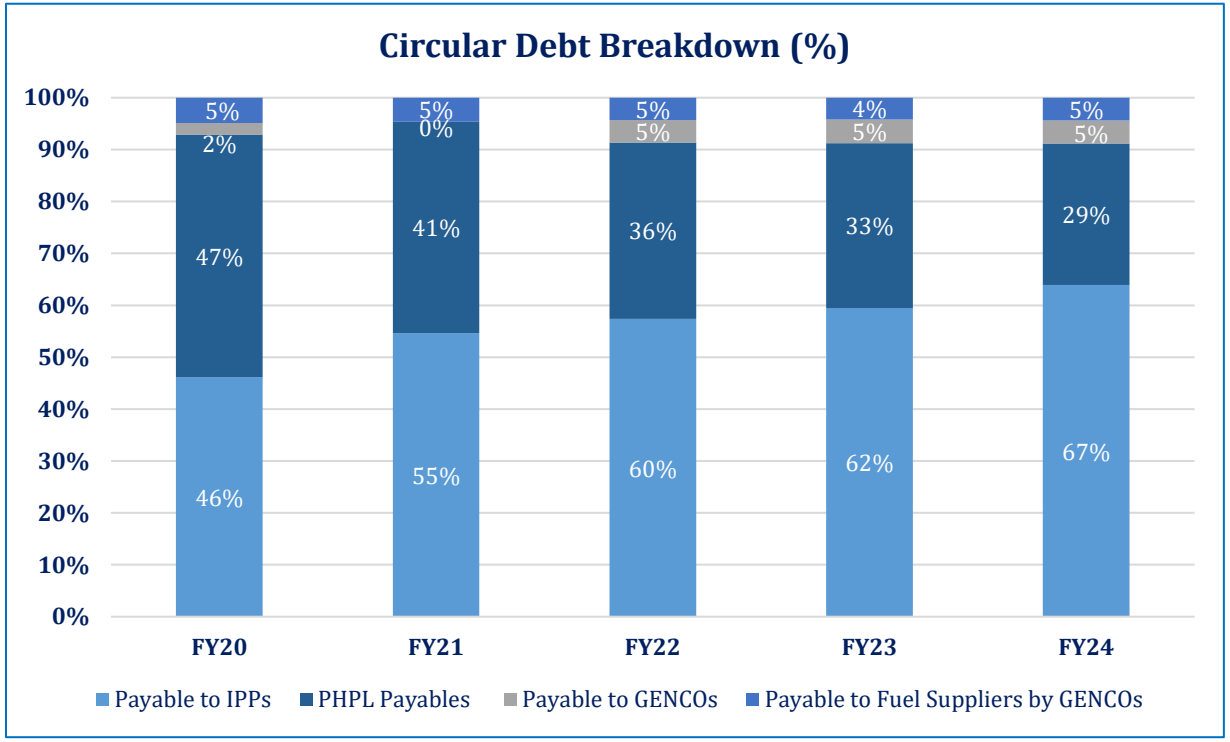


Source: ADB

Distribution | Electricity

Local | Circular Debt Stock





- Pakistan's total circular debt soared to PKR~2,393.4bln as of FY24, up ~3.6% YoY, reflecting the continuing accumulation of circular debt. A further breakdown of circular debt flow is described later. During the said period, circular debt made up ~2.3% of the country's GDP (taken at current prices) (FY23: ~2.9%).
- However, as of End-Nov'24, the stock was down by a marginal ~0.5% to PKR~2,381bln, as compared against End-Jun'24. Payables to IPPs and PHPL payables together accounted for ~96.0% of the circular debt stock in FY24 (SPLY: ~95.0%).

Source: NEPRA, MoE (Power Division)

Distribution | Electricity

Local | Circular Debt Flow

- Circular debt affects not only the liquidity of the fuel supplier, generation, transmission, and distribution companies but also increases the cost of electricity for the end-consumer.

- DISCOs continue to underperform, putting pressure on the financial health of the Power sector. In FY24, DISCOs' shortfall added PKR~276.4bln to the overall power sector circular debt.

- T&D losses rose to ~18.3% in FY24 (FY23: ~16.8%) while, recoveries against the billed amount stood at ~92.4% (FY23: ~92.4%). The shortfall in the recovery added PKR~314.5bln to the circular debt.

- In FY24, receivables for DISCOs continued to surge and were registered at PKR~2,017.1bln (FY23: PKR~1,727.0bln), an increase of PKR~290.1bln or ~16.8% YoY. Delays in subsidy payments and increasing receivables from public and private consumers are some of the major contributing factors to the mounting power circular debt.

Figures are stated in PKR bln.

Break-up of Increase/(Decrease)	FY23	FY24	5MFY24	5MFY25
Budgeted but unreleased subsidies	0	0	10	5
Unclaimed Subsidies	-70	-63	-	-
IPPs Interest Charges on delayed payments	100	138	63	70
PHL Markup paid out of IPPs' claims	43	-	-	-
Pending Generation Cost (QTAs + FCA)	250	145	146	-31
Non-payment by K-Electric	(53)	-155	59	11
DISCOs Losses Inefficiencies	160	276	70	94
DISCOs Under Recoveries	236	125	153	76
Other Adjustments (prior year recovery, etc.)	-447	-198	-133	-234
PHL Principal Repayments	-35	-82	-	-
PHL Unpaid Markup	-	-	-	-
Stock Payments	-127	-292	-	-4
Total Debt Increase/ (Decrease)	**57**	**106**	**368**	**-13**

Source: Power Division

Distribution | Electricity

Local | Recalibrating Circular Debt

IPPs | Amendments to the PPAs

- In CY21, the Government of Pakistan (GoP) initiated reforms in the sector to renegotiate the Power Purchase Agreements (PPAs) with the IPPs to reduce the rising power tariffs and contain the increasing accumulation of circular debt. However, most of the negotiation remained unresolved.
- The Government of Pakistan in CY24 resumed the negotiation process with the IPPs and formed a special task force to take charge of it. However, this time, the process does not only involve 'renegotiation' with the IPPs but also an early 'termination' of some of the PPAs. Furthermore, renegotiation features would involve a shift of agreements from 'Take or Pay' to 'Take and Pay model'.
- In the initial phase of the process, the GoP has terminated PPAs of ~5 IPPs which were operational under the Power Policy of 1994 and 2002. The GoP, in return, has agreed to clear all outstanding dues on its part as of End-Sep'24, in the context of capacity payments, energy purchase price and pass-through items, by End-Dec'24.
- The GoP believes in saving around PKR~411.0bln to the national exchequer over the remaining contract periods of these terminated IPPs and reducing the power unit cost by PKR~0.71/kWh. Overall, the government expects to cut PKR~8-10/kWh as part of the overall policy measures.
- In the second phase, following the termination of five Independent Power Producers (IPPs) under the 1994 and 2002 Power Policy, the government has successfully negotiated revised agreements with ~8 bagasse IPPs and is now renegotiating with ~18 additional IPPs established under the 1994 and 2002 Power Policies.
- These IPPs will be transitioned from a 'Take or Pay' model to a 'Hybrid Take and Pay' model, aiming to improve efficiency and reduce financial burdens. However, the government has yet to reveal whether additional IPPs terminations are planned as part of this restructuring.

Source: Power Division

Distribution | Electricity

Indicative Generation Capacity Expansion Policy (IGCEP 2022-31)

- The IGCEP 2022-31, developed by NTDC and approved by NEPRA in Feb'23, serves as a key document for planning new generation capacity to meet future electricity demand scientifically and systematically. The document, covering a horizon of ~10 years and to be revised annually, builds on the plans laid down by the preceding iteration and proposes a gradual shift from an energy mix heavily dominated by imported fossils like Coal, Furnace Oil and RLNG towards one pillared by indigenous sources of energy, including Hydel, Thar Coal, Wind and Solar. Moreover, it targets using indigenous and renewable energy resources to generate low-cost, environment-friendly electricity.

- Furnace Oil is expected to be phased out by CY31. Similarly, electricity generation from RLNG and imported Coal will drop to ~2% and ~8%, respectively, in CY31. At the same time, there will be a substantial increase in the electricity generated by hydel, wind and solar PV. The contribution of hydel, wind and solar PV which currently stands at ~28%, ~4% and ~1% respectively will be increased to ~39%, ~10% and ~10% respectively, thereby increasing the total share of green electricity to ~59%.

- However, the development of IGCEP was not finalized, and hence, the government formed a technical committee to finalize the assumption sets for IGCEP. Building on this framework, NTDC developed the latest iteration, IGCEP 2024-34, aligning it with the newly approved Grid Code 2023 and the directives outlined in the National Electricity Policy 2021 and the National Electricity Plan 2023-2027.

- NTDC/System Operator submitted ISP-2024, integrating IGCEP 2024-34 and TSEP 2024-34, for the Authority's review. However, the case was returned for further sensitivity analysis, which NTDC delayed, leaving it still pending. Out of ~120 countries, Pakistan was ranked ~113 on the Energy Transition Index (ETI) in CY23, with an ETI score of ~46.2, reflecting a lack of sufficient initiatives aligning with the county's commitment to energy transition efforts. A further bifurcation of this score reveals that for System Performance (SP), the country's score was recorded at ~55.2, whereas on the Transition Readiness (TR) indicator, it scored ~34.5. TR includes factors such as skilled workforce, innovation and physical and digital infrastructure.

Source: NEPRA, World Energy, WEF

Distribution | Electricity

Local | National Electricity Policy

- **National Electricity Plan 2023-2027 (First Plan)**
  - The plan outlines the implementation framework for National Electricity Policy 2021 under the umbrella of 6 overarching objectives that include diversification, resilience & accessibility, self-sufficiency, affordability, financial viability and sustainability.
  - It also includes a tangible action plan covering ~20 priority areas including investments, subsidies, fiscal incentives, regional integration, localization, digitalization, tariff design, climate change mitigation, governance, research & development, and capacity building.
- **Fast Track Solar PV Initiatives 2022**

The main objectives of these initiatives are as follows:

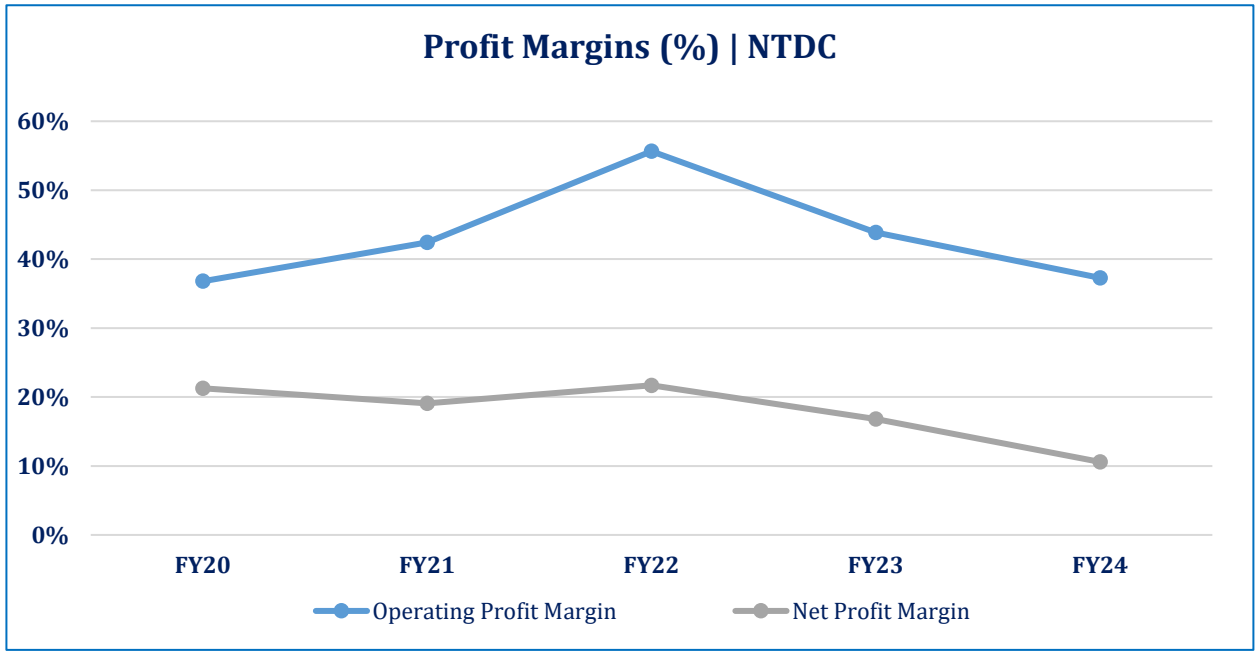
- Substitute expensive imported fossil fuels used for power generation with Solar PV energy deployments.
- Utilize existing transmission networks to the maximum for offtake of electric power for Federally-owned public power utilities (FPUs).
- Easing the pressure on foreign exchange reserves through reduced reliance on imported fossil fuels.
- Solarization of Public Buildings.
- Solar PV Generation on ~11 kV Feeders

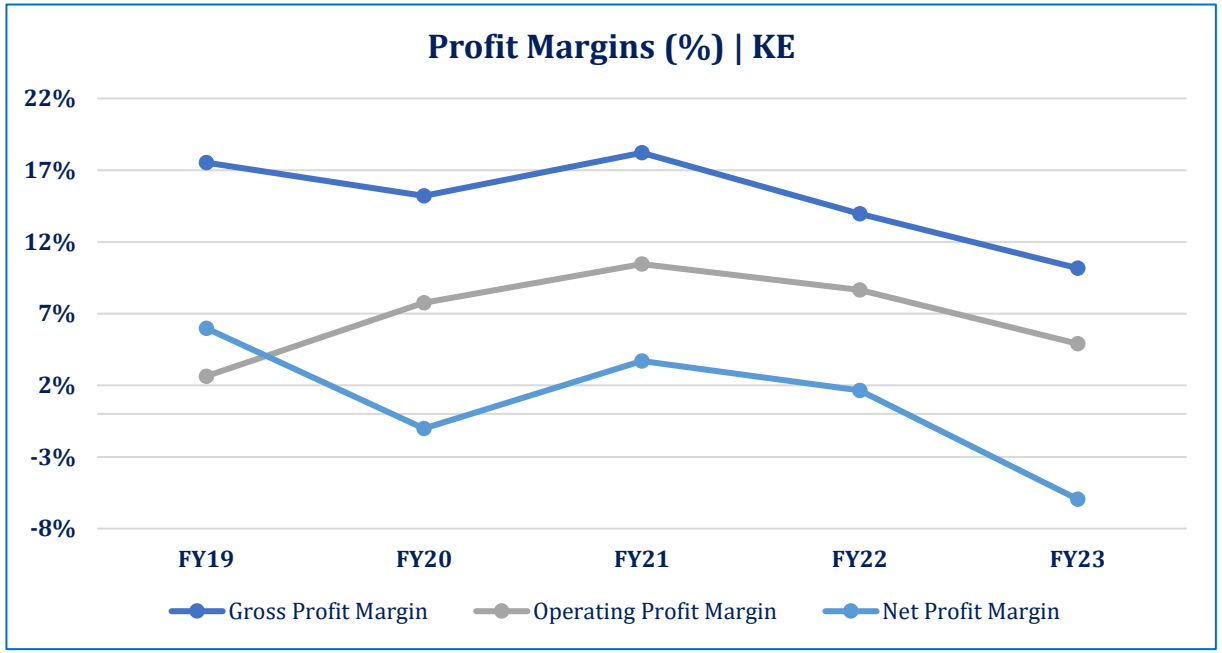
- In continuation with the above, the GoP has set the target for renewable energy share to ~20% by CY25 and ~30% by CY30 according to the ARE Policy, CY20, to bring down high prices of electricity and ensure sustainable use of resources.
- In FY24, the government launched the Anti-Theft Campaign to combat electricity theft. The operation involved resolving numerous cases, filing FIRs, making arrests, and suspending several employees.
- Despite these efforts, the campaign had a minimal financial impact, yielding recoveries of PKR~12.2bln from defaulters and PKR~8.3bln from fines and recoveries. However, transmission and distribution (T&D) losses, along with the non-recovery of bills, continued to escalate, contributing PKR~591.0bln to the circular debt during FY24.

Source: Ministry of Energy

Distribution | Electricity

Business Risk | NTDC & KE





- In the case of NTDC, the entity's gross/ operating profit margin dipped to ~37.0% in FY24 on account of a rise in administrative expenses which rose by ~8.0% YoY. Similarly, the net profit margin was also down to ~11.0% during the year (SPLY: ~17.0%), on account of ~22.9% YoY increase in finance costs.

- Average gross profit margin for the DISCOs registered a decline to ~10.0% in FY24, despite net revenue inching up ~10.5% YoY, owing to ~20.7% YoY lower tariff adjustment and ~3.6% YoY increase in COGS, a considerable portion of which stemmed from the purchase of electricity from NTDC/ CPPA-G. Moreover, on account of a ~128.6% YoY surge in finance cost, the entity's net profit margin diluted to ~(6)% .

***Note**: KE is involved in all 3 verticals of Power sector while NTDC is involved in transmission only. FY24 data for KE has not yet been made available.*

Source: PACRA Database

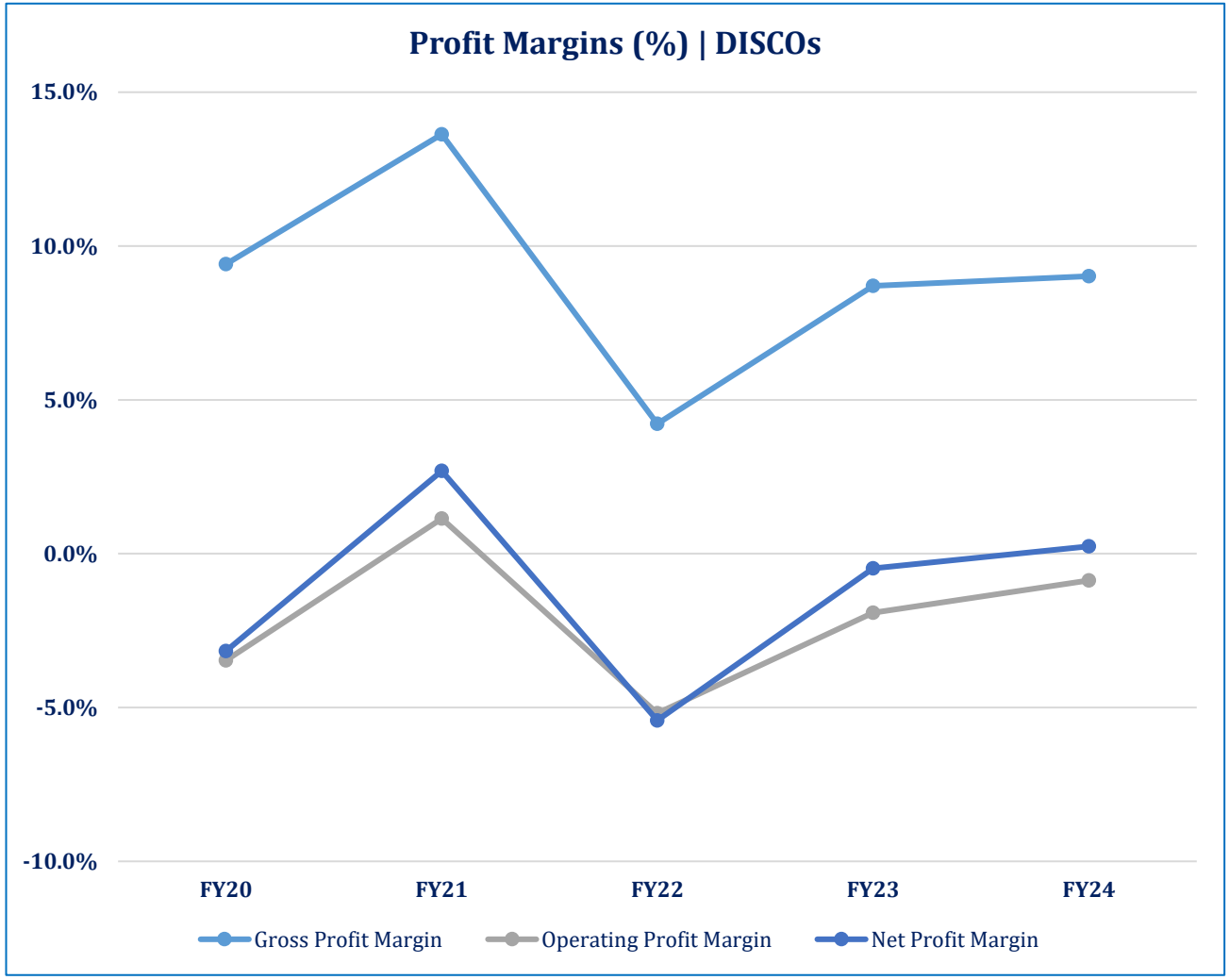
Distribution | Electricity

Business Risk | DISCOs

- At the distribution stage of electricity, DISCOs are allowed distribution margins to cover O&M cost, salaries, wages and other benefits, depreciation, other operating expenses, return on rate base, other income, T&D losses (as covered earlier) as well as prior year adjustments.

- The average gross profit margin of sector players stayed rangebound at ~9.0% in FY24, same as SPLY, on account of ~31.1% YoY increase in revenue, while COGS was up ~28.7% YoY during the year.

- Meanwhile, average net profit margin for DISCOs also improved to ~0.2% in FY24 from ~(5)% in FY23 on account of ~5.5% YoY lower finance costs.

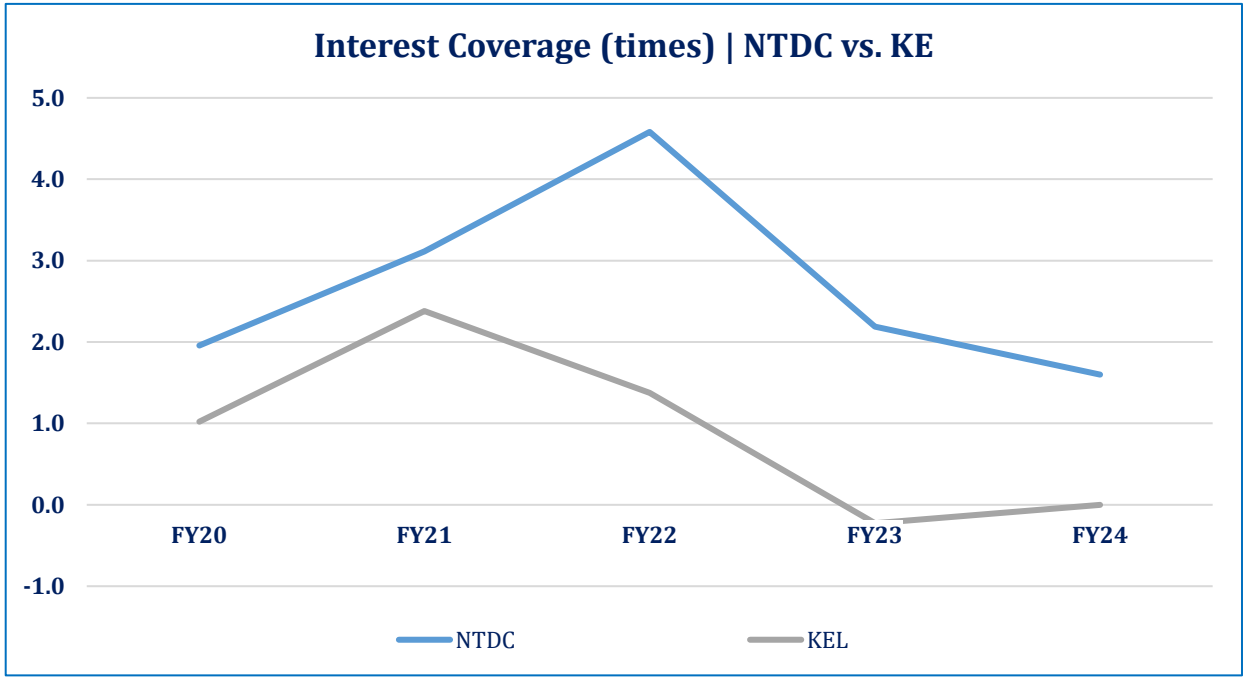


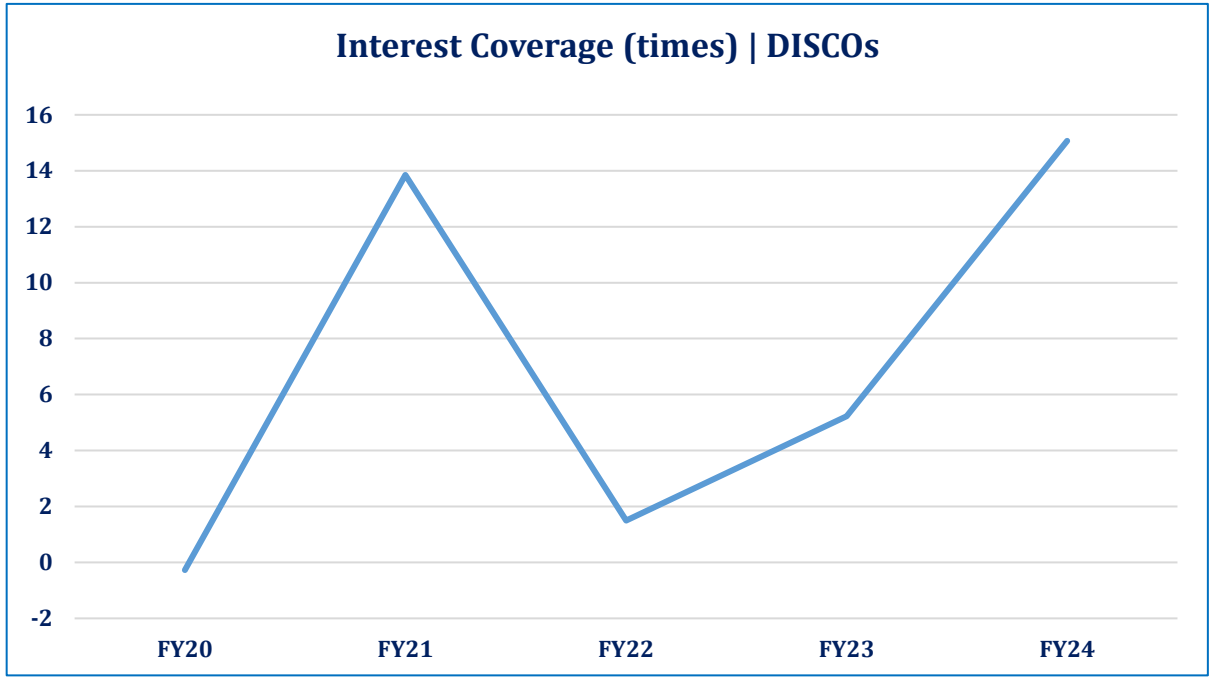
***Note**: DISCO's data is indictive of 4 DISCOs: MEPCO, GEPCO, IESCO & FESCO.*

Source: PACRA Database, SBP

Distribution | Electricity

Financial Risk | NTDC & KE





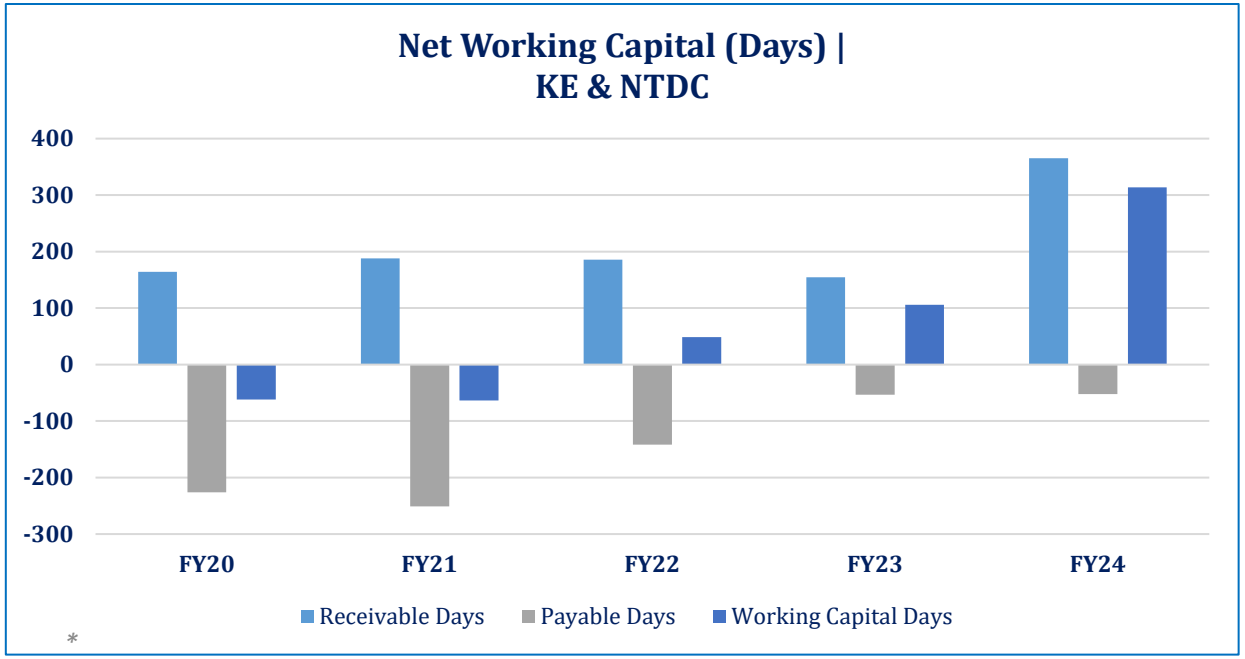
- Interest coverage for the NTDC continued to deteriorate in FY24 to ~1.6x, compared to ~2.2x in FY23 on the back of a ~22.9% YoY increase in the finance cost in FY24. The interest rates throughout the period under review had stayed constant at ~22.0%, however, monetary easing began in Jun'24, whereby rates were cut in six consecutive rounds (Jun'24-Jan'25) to ~12.0% as at End-Jan'25. This is expected to provide some respite to the entity in the form of lower finance costs.
- The average coverage ratio of DISCOs has been on an upward trajectory since FY22. In FY24, it improved to ~15.1x (SPLY: ~5.2x), driven by a ~5.5% YoY decline in the finance cost of the sector. The players' borrowings registered ~3.0% YoY decline during the same period.

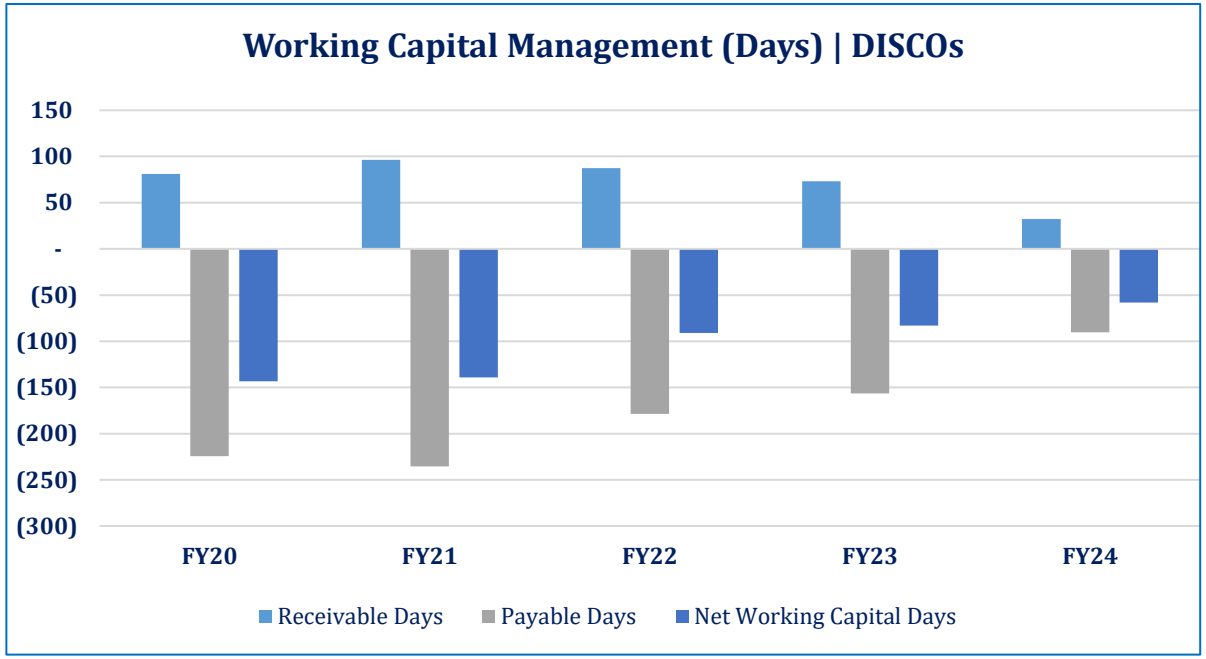
***Note**: DISCO's data is indictive of 4 DISCOs: MEPCO, GEPCO, IESCO & FESCO. KE is involved in all 3 verticals of Power sector while NTDC is involved in transmission only. KEL data for FY24 assumed at FY23 levels due to data non-availability.*

Source: PACRA Database

Distribution | Electricity

Financial Risk | Working Capital Management





- The average net working capital days of the NTDC increased to ~314 days in FY24 (SPLY: ~313 days), mainly on the back of increased receivable days which were recorded at ~366 days. For the DISCOs, average working days were recorded at negative ~114 days from FY20-23 however they clocked at negative ~58 days in FY24. This is because of the low receivable days in FY24 which were recorded at ~32 days (FY23: ~73 days) while payable days remained high in FY24 at ~90 days but low compared to the previous year where they were recorded at ~157 days.
- Negative working capital days are a result of low recoveries/ line losses by electricity distribution and transmission companies as well as delays in receipts of subsidies from the government which results in payment delays to creditors.

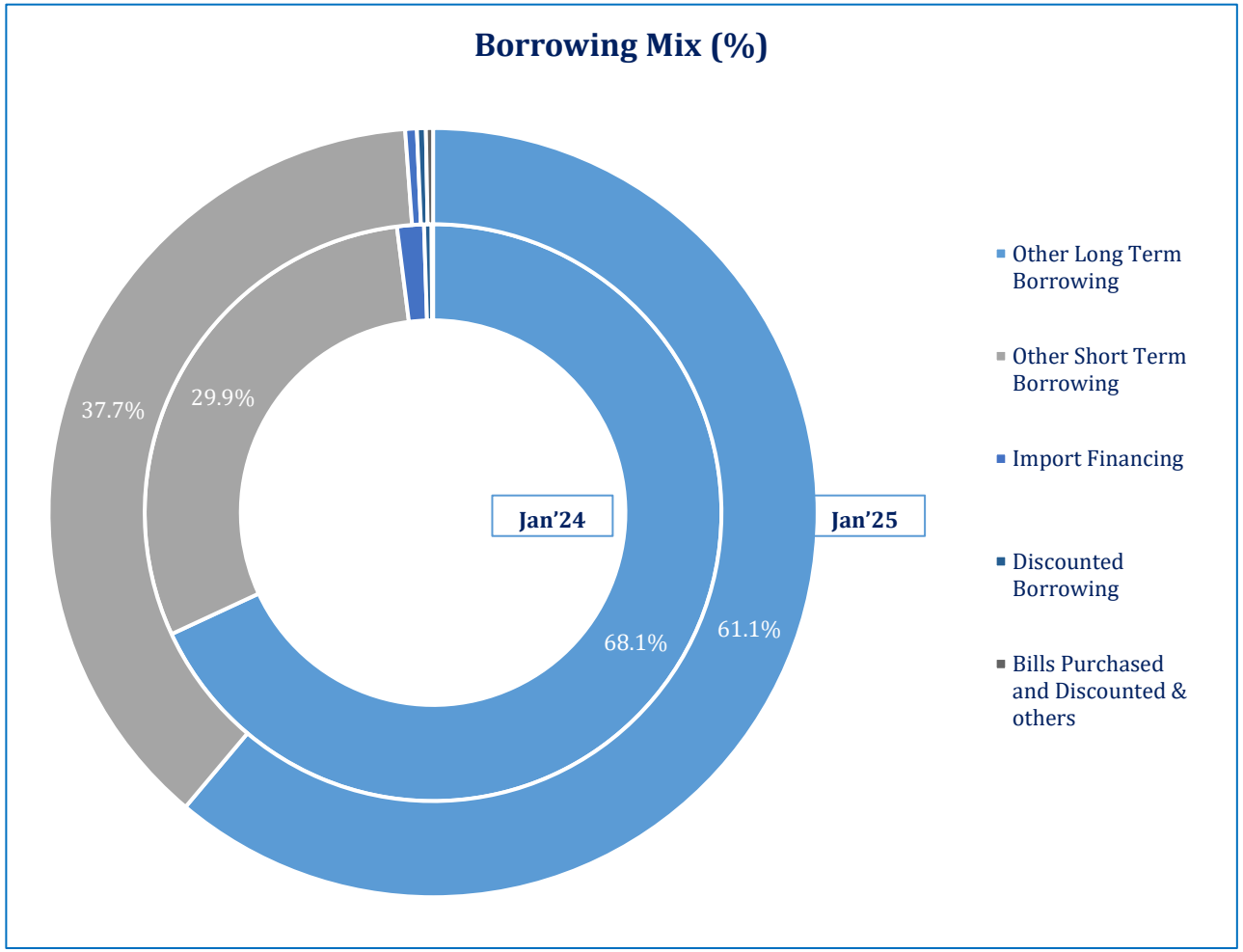
***Note**: DISCO's data is indicative of 4 DISCOs: MEPCO, GEPCO, IESCO & FESCO. KE is involved in all 3 verticals of the Power sector while NTDC is involved in transmission only.*
**FY24 data for KE & GEPCO has not yet been made available therefore our analysis pertains to NTDC and other DISCOs only.*

Source: PACRA Database

Distribution | Electricity

Financial Risk | Borrowing Mix

- The total borrowings of the segment stood at PKR~454,820mln as End-Jan'25 (SPLY: PKR~466,504mln), down marginally by ~2.6% YoY.
- The largest component of these borrowings comprised fixed long-term loans which constituted ~61.1% of total borrowings and stood at PKR~278,654mln as of End-Jan'25 (SPLY: PKR~ 317,818mln).
- Meanwhile, the working capital component formed ~38.4% of the total borrowing and stood at PKR~174,854mln as at End-Jan'25 .



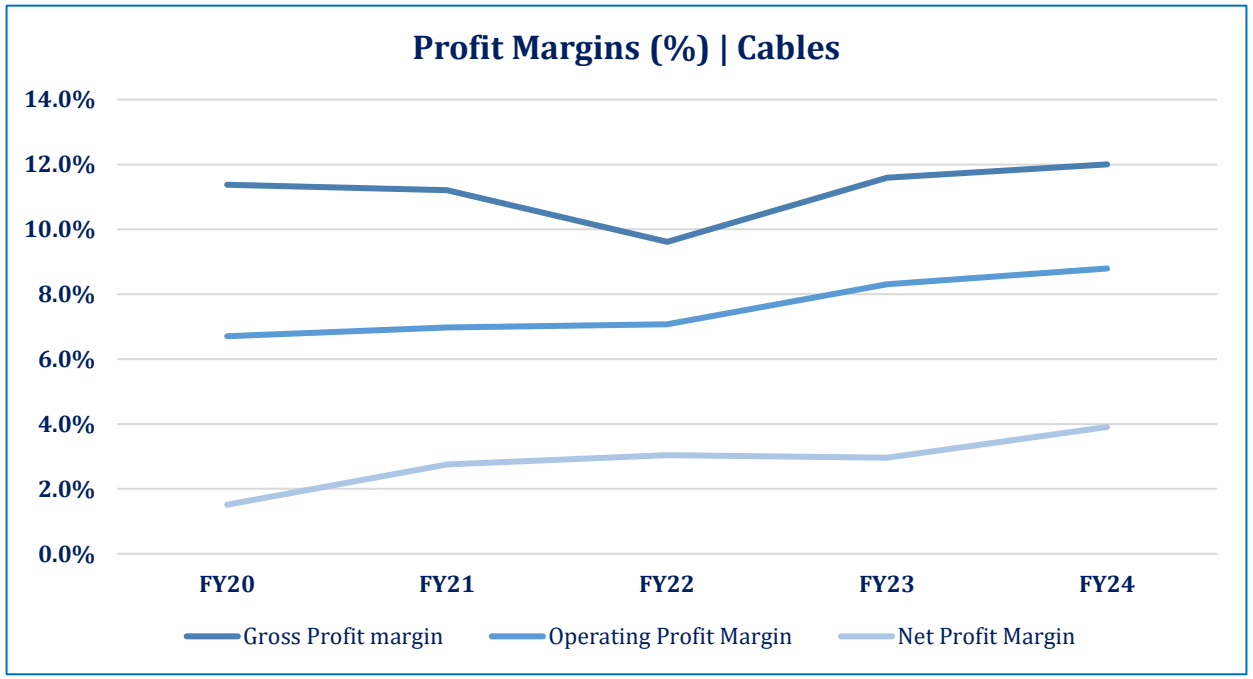
***Note**: Data is reflective of SBP classification "Electric Power Generation, Transmission and Distribution"*

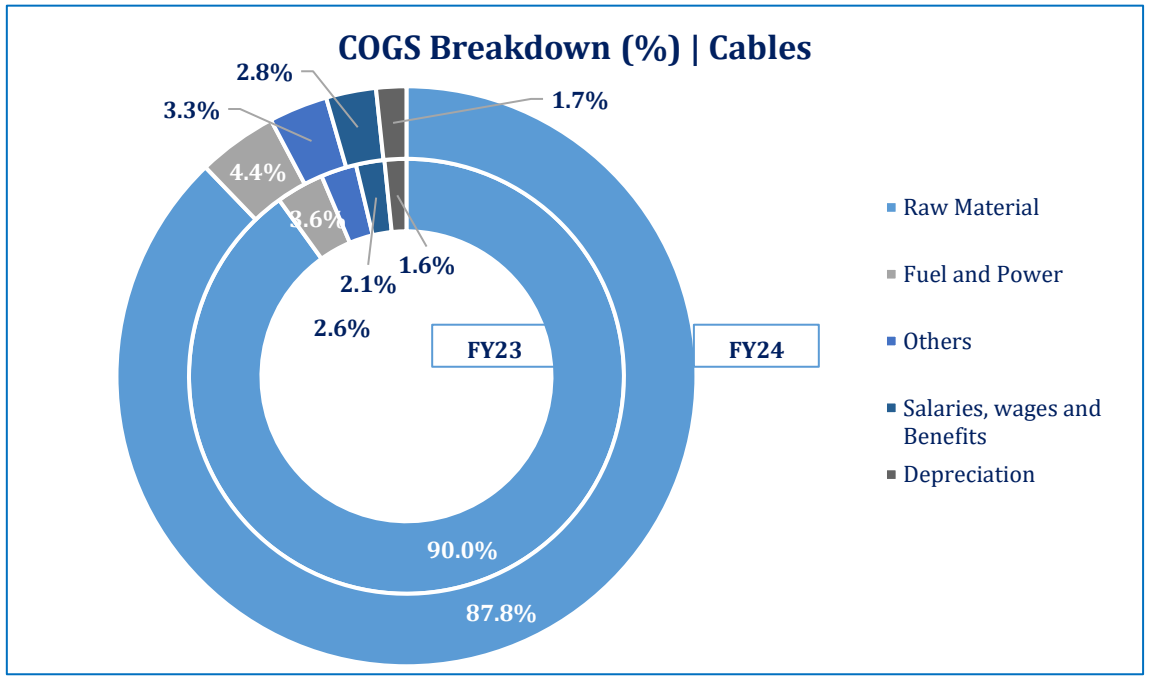
Source: SBP

Distribution | Electricity

Margins & Cost Structure | Cables

- Average gross margins of the segment during the FY20-23 period stood at ~11.0% and increased slightly to ~12.0% in FY24. Revenue was down by ~2.8% YoY while COGS was down ~3.2% YoY. Similarly, average operating margins for the segment also rose slightly to ~8.8% in FY24 (SPLY: ~8.3%), reflecting better expense management and the increase in revenue being enough to absorb the increase in operating and non-operating costs. Additionally, the average net profit margin increased to ~3.9% in FY24 (SPLY: ~3.0%), despite the high-interest rate environment.
- The largest component of the segment's direct costs is raw material which constituted ~87.8% of direct costs in FY24. Thus, any fluctuation in the price and availability of raw materials can have a significant impact on the segment players' performance.





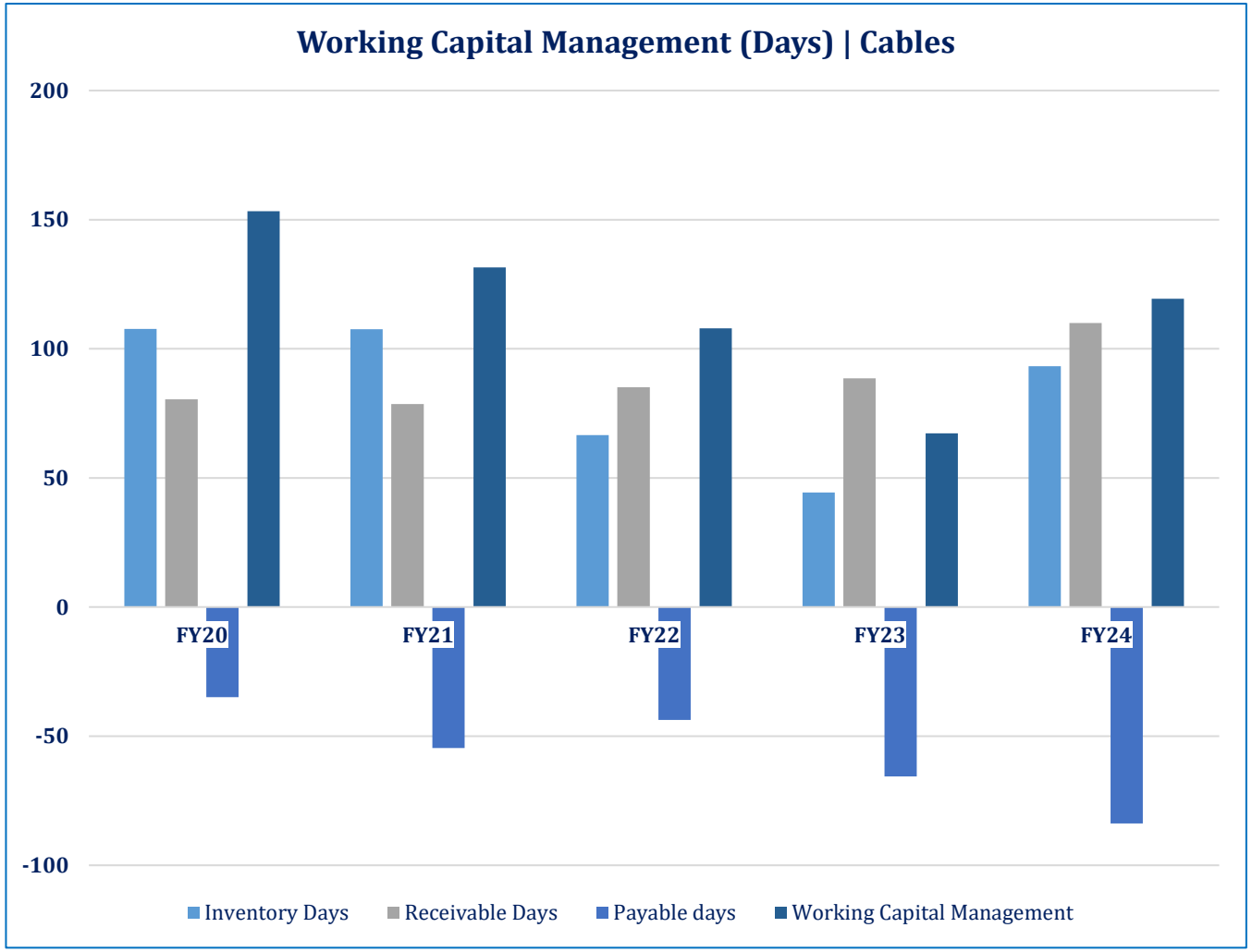
Note: *Data is reflective of PACRA-rated sector players.*

Source: PACRA Database, PSX

Distribution | Electricity

Financial Risk | Working Capital Management | Cables

- The segment's working capital management is largely a function of its trade receivables and payables. The average working capital cycle was recorded at ~115 days during FY20-23, worsening in FY24 to ~119 days (SPLY: ~67 days).
- The decline in the working capital cycle came on the back of an increase in payable days, which rose to ~84 days in FY24 (SPLY: ~66 days). This, in turn, reflects segment players' lower repayment capacity to debtors.



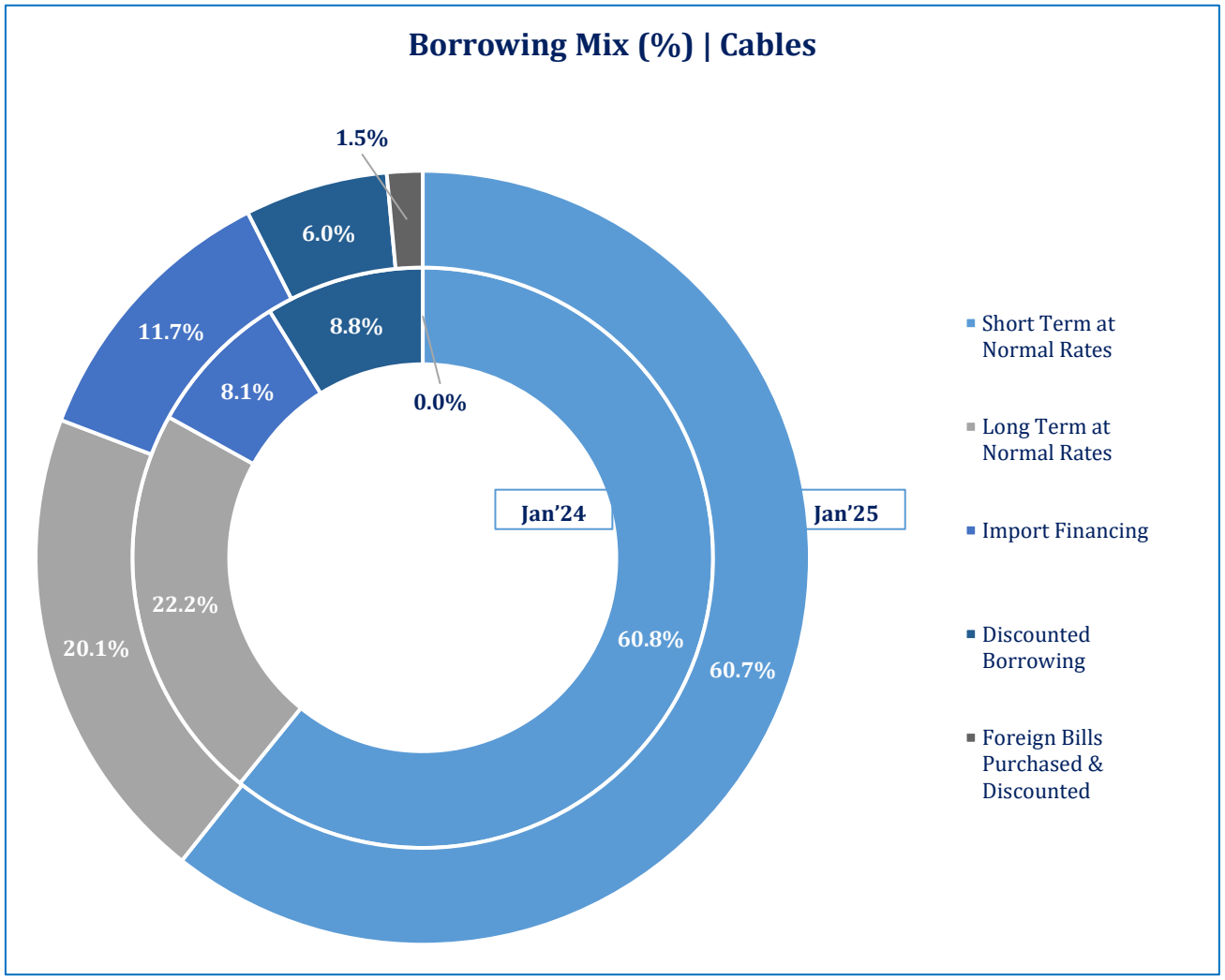
Note: *Data is reflective of PACRA-rated sector players.*

Source: PACRA Database, PSX

Distribution | Electricity

Financial Risk | Borrowings | Cables

- The cable segment recorded total borrowings of PKR~25.9bln as at End-Jan'25, marking a YoY increase of ~42.4%.
- Short-term borrowings (STBs) constituted ~60.7% of total borrowings as of End-Jan'25 and stood at PKR~15.7bln, marking ~41.4% YoY decline.
- Meanwhile, long-term borrowings (LTBs) constituted ~20.1% share and were recorded at PKR~5.2bln as at End-Jan'25, while import financing constituted ~11.7% share, recording at PKR~3.0bln during the period under review.
- The segment exhibited an average leveraging ratio of ~60.4% in FY24 (SPLY: ~56.5%) while average interest coverage recorded at ~2.1x in FY24 (SPLY: ~2.0x).



Note: *Leverage is based on the PACRA-rated player. Borrowing data is reflective of SBP classification "Manufacture of Other Electronic and Electric Wires and Cables"*

Source: SBP, PACRA Database

Distribution | Electricity

SWOT Analysis

- Backbone of the economy, with players operating in a regulated environment.
- Low business risk due to risk mitigants such as sovereign guarantees on payment by purchaser and performance guarantees by contractors.
- Fixed distribution margins. Regulator allowances for T&D Loss Limits.

- Power structural reforms as envisaged could not be achieved due to DISCOs not becoming entirely independent autonomous entities.
- Inefficiency in the distribution system leading to power outages despite available capacity (T&D losses and fatalities).
- Lack of investment in T&D infrastructure.

- Mounting Circular Debt
- Increased T&D Losses.
- Liquidity Damages (LDs) on account of non-performance of FSA.
- Change in regulatory environment leading to lower/or no guaranteed off take for new plants and change of terms for existing ones.

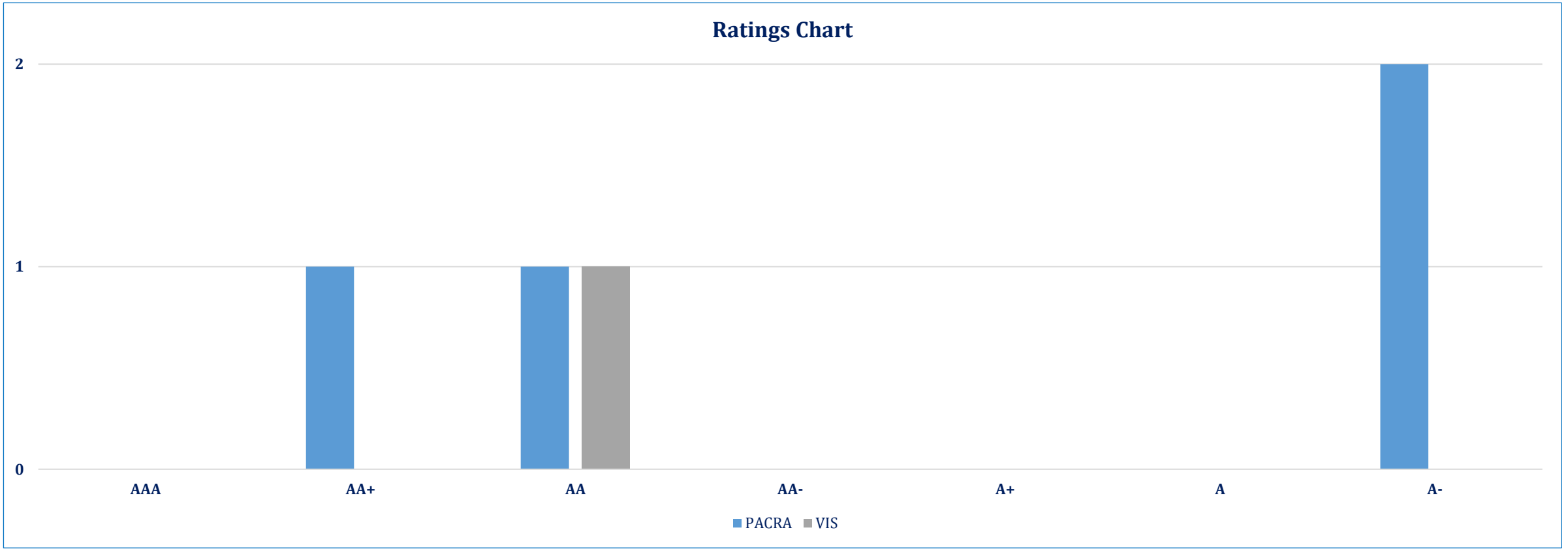
- Revival in economic activity resulting in increased demand.
- Amendment to PPAs to revise the payment and tariff structure for power purchase from IPPs.
- Exploration of Coal reserves leading to significant coal-based power projects and investments in the Hydel and Renewable Energy Power plants.

Source: PACRA Database

Distribution | Electricity

Rating Curve

- PACRA rates 2 entities in the Electricity (Distribution) sector, namely, NTDC and K-Electric, with rating bandwidth ranging between AA+ and AA. These also include a player operating in the Cables segment with a Long-Term Rating of ~A- and one DISCO.



Source: PACRA Database

Distribution | Electricity

Outlook: Stable

- Pakistan's overall power consumption was down ~2.9% YoY in FY24, equivalent to ~86.2% of the total power generated during the same year (SPLY: ~-8.9% YoY; ~87.9%, respectively). The sector has grappled with persistent challenges, including high Transmission & Distribution (T&D) losses and inadequate bill recovery by the DISCOs. Governance issues have significantly contributed to the mounting circular debt, which reached a staggering PKR~2.4trn in FY24, a YoY build-up of PKR~100.0bln and formed ~2.3% of the country's GDP. Payables to IPPs and PHPL payables together accounted for ~96.0% of the circular debt stock in FY24 (SPLY: ~95.0%). As of End-Nov'24, the stock was marginally down by ~0.5% as compared to End-Jun'24.
- Moreover, while average T&D losses of the DISCOs and KE were recorded at ~20.1% and ~16.0%, respectively, in FY24 (SPLY: ~18.3% and ~15.3%, respectively,), these resulted in a financial impact of PKR~276.3bln in FY24 (up ~72.1% YoY). While recoveries against the billed amount stood at ~92.6%, down by ~0.7% YoY (SPLY: ~93.3%), receivables for DISCOs surged to PKR~2,034.0bln, a ~17.7% YoY increase.
- During FY24, for NTDC, gross/ operating profit margin dipped to ~37.0% (SPLY: ~44.0%). Similarly, the net profit margin was also down to ~11.0% during the year (SPLY: ~17.0%). On the other hand, the average gross profit margin for DISCOs remained the same compared to the previous year at ~9.0% despite net revenue inching up ~31.0% YoY and the average net profit margin diluted to ~-6.1%. Along with a dip in electricity consumption, sector players faced high energy and finance costs, on the back of overall high inflation and SBP's hawkish monetary stance.
- Although Pakistan's electricity distribution capability is sufficient to meet its demand, it is equally essential to strengthen and expand the T&D network of the country to achieve optimal utilization of the distribution capacity. Immediate measures are required for integrated planning and investment in the National Grid System to remove the T&D constraints and ensure smooth transmission of cheaper electricity to the end-consumers.
- Recent measures such as the shift to solarization are likely to result in lower losses and enhance energy independence for rural consumers. Disaggregating national unfirm tariffs while allowing well-managed DISCOs towards privatization would also improve efficiency and minimize T&D losses. Moreover, since subsidies are borne by the Federal Government, the provinces are not incentivized to control electricity theft, therefore, urgent structural/ infrastructural reforms are required.

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