

STATE OF THE INDUSTRY REPORT 2024



NATIONAL ELECTRIC POWER REGULATORY AUTHORITY

STATE OF THE INDUSTRY REPORT 2024



LIST OF CONTENTS

FOREWORD	1
1 EXECUTIVE SUMMARY	5
2 OVERVIEW OF THE ELECTRIC POWER SECTOR	7
2.1 GENERATION SECTOR	8
2.1.1 Challenges of Overinvesting in Meeting Peak Demand Capacity	8
2.1.2 Persistent Load-Shedding Amid underutilized Generation Capacity	8
2.1.3 Part Load Adjustment Charges	9
2.1.4 Payment on Account of Non-Project Missed Volume	10
2.1.5 Liquidated Damages	11
2.1.6 Energy Charges vs. Capacity Charges	12
2.1.7 Optimizing Capacity Additions for Displacing Costly Generation	13
2.1.8 Fixed Charges	13
2.1.9 Electricity Cost vs. Supplementary Charges in Electricity Bills	14
2.1.10 Surplus Installed Capacity, Fluctuating Demand and Unserved Load	15
2.1.11 Performance of Public Sector Generation Companies	16
2.1.12 Suboptimal Performance of Guddu 747 MW Power Plant	17
2.1.13 Improving Insurance Coverage in Public Sector Power Companies	18
2.1.14 Challenges of Hydropower Projects in Pakistan	18
2.1.15 Performance of Neelum-Jhelum and other Hydropower Plants	19
2.1.16 Operation of Lucky Electric Power Company Limited on Local Coal	20
2.1.17 Maximizing the Potential of Thar Coal: Addressing Under-Utilization	21
2.1.18 Strategic Integration of Renewable Energy in Pakistan's Power System	21
2.1.19 Annual Dependable Capacity Test of Power Plants	22
2.1.20 Criteria for Determining Economic Merit Order	22
2.1.21 Net-Metering Initiative: Progress and Challenges	22
2.1.22 Delays in IGCEP Submissions and Approvals	24
2.1.23 Assumptions and Horizon of the IGCEP	25
2.1.24 Conversion of Water and Space Heating to Electricity	25
2.1.25 Electrification of Transport and Electric Vehicle Charging Infrastructure	26
2.1.26 Enhancing Energy Resilience: The Case for Gas Storage Development Facility	26
2.1.27 Transforming Pakistan's Power Sector: A Call for Strategic Reform and Effective Implementation	27
2.2 TRANSMISSION SECTOR	27
2.2.1 Persistent Technical Constraints and Overloading in the NTDC Network	27
2.2.2 Major Transmission System Constraints Impacting the Power Sector	27
2.2.3 Frequent Tower Collapses	28
2.2.4 Enhancing Efficiency in the National Power Control Centre	28
2.2.5 Utilization of 660 kV HVDC PMLTC Line	29
2.2.6 HVDC Strategy Table - South to North Power Transfer Constraints	30
2.2.7 Vulnerable Areas in the High Voltage Transmission System of Pakistan	30
2.2.8 Transmission Investment Plan of NTDC	31

2.3	DISTRIBUTION AND SUPPLY SECTOR	31
2.3.1	Transmission and Distribution Losses of DISCOs	31
2.3.2	Less Recoveries of DISCOs and KE	33
2.3.3	Load-Shedding Based on Aggregated Technical and Commercial Losses	34
2.3.4	Capacity Charges for DISCOs: Transitioning to Coincidental Peak Demand	34
2.3.5	Higher Receivables of DISCOs and KE	35
2.3.6	Circular Debt - Stock, Flow, and Accumulation	36
2.3.7	Quarterly Adjustments of DISCOs and KE	37
2.3.8	Monthly Fuel Charges Adjustments of DISCOs and KE	37
2.3.9	Cross-Subsidization among DISCOs	39
2.3.10	Strategies for Optimizing Tariff Structures and Surplus Capacity Management	40
2.3.11	Issue of Inflated and Excessive Billing in DISCOs	40
2.3.12	Faulty Electricity Meters: A Growing Concern for Consumers	41
2.3.13	The Challenges of High Electricity Tariffs in Pakistan	42
2.3.14	The Real Impact of the Anti-Theft Initiative	43
2.3.15	Detection Billing: A Burden on Consumers	43
2.3.16	Solarization: A Pathway to Sustainable Energy	44
2.3.17	Creation of a Fund for Pension, Free Electricity, and Medical Expenses for Retired Employees in Pakistan's Power Sector	45
2.4	THE BOARD OF DIRECTORS: KEY TO IMPROVING GOVERNANCE IN PAKISTAN'S PUBLIC SECTOR POWER COMPANIES	46
2.5	FULL-TIME LEADERSHIP IN NTDC AND DISCOS: KEY TO STABILITY AND REFORM	47
2.6	BREAKING FREE FROM LEGACY PRACTICES: OVERCOMING INSTITUTIONAL CHALLENGES IN THE PUBLIC SECTOR	47
3	PERFORMANCE OF THE GENERATION SECTOR	49
3.1	GENERAL	49
3.2	INSTALLED AND DEPENDABLE POWER GENERATION CAPACITY IN THE COUNTRY	56
3.2.1	Installed Capacity	56
3.2.2	Dependable Capacity	58
3.3	ELECTRICITY GENERATION AND CONSUMPTION	58
3.4	SHARE OF GENERATION CAPACITY IN PUBLIC AND PRIVATE SECTOR	60
3.5	PART LOAD ADJUSTMENT CHARGES	60
3.6	START-UP CHARGES	60
3.7	DEGRADATION CHARGES	60
3.8	OPERATION OF POWER PLANTS IN VIOLATION OF ECONOMIC MERIT ORDER	61
4	PERFORMANCE OF THE TRANSMISSION SECTOR	63
4.1	GENERAL	63
4.2	NATIONAL GRID COMPANY	63
4.3	PROVINCIAL GRID COMPANIES AND SPECIAL PURPOSE TRANSMISSION LICENCES	64
4.4	SYSTEM OPERATOR LICENCE	64
4.5	POWER BALANCES IN NTDC SYSTEM	64
4.6	UNDER-UTILIZATION OF TRANSMISSION SYSTEM	65
4.7	OVER-LOADING POSITION OF NTDC'S 500 KV AND 220 KV NETWORK	65
4.8	TRANSMISSION AND TRANSFORMATION LOSSES OF NTDC	66
4.9	INVESTMENT DETAILS OF NTDC	67
4.10	FATAL AND NON-FATAL INCIDENTS IN TRANSMISSION LINE NETWORK	67
4.11	INVESTIGATION AGAINST NTDC ON ACCOUNT OF FATAL ACCIDENTS	67
4.12	NEPRA PERFORMANCE STANDARDS (TRANSMISSION) RULES, 2005	67

4.13	TRANSMISSION NETWORK OF KE	69
4.14	POWER BALANCES IN KE SYSTEM	69
4.15	LOADING POSITION OF POWER TRANSFORMERS IN KE SYSTEM	70
4.16	TRANSMISSION LOSSES OF 660 KV HVDC LINE	70
4.17	TRANSMISSION LOSSES OF STDC	71
4.18	DURATION OF TRANSMISSION LINE OUTAGES OF STDC	71
4.19	SCADA-III PROJECT	72
4.20	PERSISTENT TECHNICAL CONSTRAINTS AND OVERLOADING IN THE NTDC NETWORK	72
5	PERFORMANCE OF THE DISTRIBUTION AND SUPPLY SECTOR	75
5.1	GENERAL	75
5.2	CONSUMER BASE OF DISCO'S AND KE	75
5.3	SALES OF DISCOS AND KE	76
5.4	TRANSMISSION AND DISTRIBUTION LOSSES OF DISCOS	76
5.5	RECOVERY RATIOS IN DISCOS SYSTEM	77
5.6	RECEIVABLES OF DISCOS	79
5.7	OVER-LOADING POSITION IN DISCOS SYSTEM	82
5.8	FATAL ACCIDENTS-POOR SAFETY ENVIRONMENT IN DISCOS AND KE	83
5.9	STATUS OF NET-METERING IN DISCOS SYSTEM	84
5.10	STATUS OF PENDING CONNECTIONS	85
5.11	TRANSMISSION AND DISTRIBUTION LOSSES IN KE	86
5.12	RECOVERY OF BILLED AMOUNT IN KE SYSTEM	86
5.13	OVER-LOADING POSITION IN KE SYSTEM	87
5.14	STATUS OF NET-METERING IN KE SYSTEM	87
5.15	RECEIVABLES OF KE	87
6	MONITORING OF THE POWER SECTOR	89
6.1	GENERAL	89
6.2	MONITORING ACTIVITIES IN GENERATION SECTOR	89
6.2.1	Upgradation of Data Exchange Portal (Generation Module)	89
6.2.2	Performance Evaluation Report of Generation Sector	89
6.2.3	Under-Utilization of Efficient Power Plants-Non-Compliance of EMO	90
6.2.4	Legal Proceedings Concluded during FY 2023-24	90
6.2.5	Legal Proceedings Under Process	91
6.2.6	Operating Procedures and Black Start Facility	91
6.3	MONITORING ACTIVITIES IN TRANSMISSION SECTOR	91
6.3.1	Data Exchange Portal (Transmission Module)	91
6.3.2	Performance Evaluation Report of Transmission Sector	92
6.3.3	Monitoring of Transmission System Constraints	92
6.3.4	Legal Proceedings Initiated Against Transmission Licensees	92
6.3.5	Approval of Policies by NTDC: Handing Over/Taking Over of NTDC Assets and Compensation Policy for Right of Way and Land Acquisition	93
6.3.6	Establishment of Safety Directorate within all field formations of NTDC	93
6.4	MONITORING ACTIVITIES IN DISTRIBUTION SECTOR	93
6.4.1	Data Exchange Portal (Distribution Module)	93
6.4.2	Performance Evaluation Report of Distribution Sector	93
6.4.3	Establishment of Safety Directorate	93
6.4.4	Monitoring of Load-Shedding	94
6.4.5	Earthing/Grounding of Distribution Network: A Safety Neglect by DISCOs	94

6.4.6	AMI/AMR in IESCO System	94
6.4.7	AMI/AMR in KE System	94
6.4.8	Interconnection Issues in respect of Small Renewable Projects	95
6.4.9	System Constraints of DISCOs	95
6.5	SUMMARY OF ACTIONS TAKEN AND FINE IMPOSED ON LICENSEES WITH RESPECT TO NON-COMPLIANCE OF NEPRA'S APPLICABLE DOCUMENTS	95
7	MAJOR REGULATORY ACTIVITIES	97
7.1	COMPETITIVE TRADING BILATERAL CONTRACT MARKET	97
7.2	COLLABORATIVE INITIATIVES WITH INTERNATIONAL ORGANIZATIONS	99
7.3	INDICATIVE GENERATION CAPACITY EXPANSION PLAN	99
7.4	LICENSING	100
7.5	TARIFF	103
7.6	CONSUMER AFFAIRS	109
7.7	NEPRA APPELLATE BOARD	111
7.8	HEALTH, SAFETY, AND ENVIRONMENT	111
7.9	LEGAL	112
8	INITIATIVES BY STAKEHOLDERS	113
8.1	GENERAL	113
8.2	PRIVATE POWER AND INFRASTRUCTURE BOARD	113
8.3	NATIONAL ENERGY EFFICIENCY AND CONSERVATION AUTHORITY	115
8.4	PUNJAB POWER DEVELOPMENT BOARD	117
8.5	PAKHTUNKHWA ENERGY DEVELOPMENT ORGANIZATION	118
8.6	ENERGY DEPARTMENT, GOVERNMENT OF SINDH	118
8.7	ENERGY DEPARTMENT, GOVERNMENT OF BALOCHISTAN	120

LIST OF TABLES

Table 1	Primary Energy Supplies by Source (TOE)	123
Table 2	Final Energy Consumption by Source (TOE)	124
Table 3	Fuel Consumption for Thermal Power Generation (TOE)	125
Table 4	Installed Capacity by Type (MW)	126
Table 5	Plant-wise Installed Capacity (MW)	127
Table 6	Installed Capacity by Systems and by Sectors (MW)	130
Table 7	Electricity Generation by Type (GWh)	131
Table 8	Plant-wise Electricity Generation (GWh)	132
Table 9	Electricity Generation by Systems and by Sectors (GWh)	135
Table 10	Month-wise CPPA-G Electricity Generation Data (GWh)	136
Table 11	Monthly Source-wise Actual and Projected Generation (GWh)	138
Table 12	Monthly Source-wise Actual and Projected Energy Purchase (Rs. in Million)	140
Table 13	Month-wise KE Electricity Generation Data (GWh)	141
Table 14	Monthly Variation in Maximum Hydel Generating Capability (MW)	142
Table 15	Auxiliary Consumption and other Factors of Hydel Power Stations	144
Table 16	Month-wise WAPDA Hydroelectric Invoice for Capacity Charges and Cost Data	146
Table 17	Thermal Electricity Generation by Sector and by Fuel (GWh)	150
Table 18	Fuel Consumption and Cost of Generation Data of GENCOs (Net)	151
Table 19	Auxiliary Consumption and other Factors of GENCOs	152
Table 20	Heat Rate and Plant Efficiency Data of GENCOs	153
Table 21	Fuel Consumption and Cost of Generation Data of IPPs (Net)	154
Table 22	Auxiliary Consumption and other Factors of IPPs	158
Table 23	Heat Rate and Plant Efficiency Data of IPPs	161
Table 24	Monthly Source-wise Power Sent Out and Fuel Cost Data	164
Table 25	Electricity Statistics of K-Electric Limited	166
Table 26	Fuel Consumption and Cost of Generation Data of K-Electric and their IPPs (Net)	167
Table 27	Auxiliary Consumption and other Factors of K-Electric and their IPPs	169
Table 28	Heat Rate and Plant Efficiency Data of K-Electric and their IPPs	170
Table 29	K-Electric (Source-wise Own Generation and Fuel Cost Adjustments)	171
Table 30	K-Electric (Source-wise Power Purchase and Fuel Costs)	172
Table 31	K-Electric (Fuel-wise Own Generation and Fuel Costs)	174
Table 32	K-Electric (Fuel-wise Power Purchase and Fuel Costs)	175
Table 33	Capacity and Energy Invoiced by Generators (Rs. in Million)	176
Table 34	Energy Purchase Price and Capacity Purchase Price Data	177
Table 35	Merit Order for Power Generation Plants (CPPA-G System)	180
Table 36	Monthly Utilization Factor of Power Plants (%)	182
Table 37	Liquidated Damages against Power Plants	185

Table 38	Claims Lodged by CPPA-G against Gas Supply Company (Rs. in Million)	185
Table 39	Partial Load Adjustment Charges	186
Table 40	Monthly Partial Load Adjustment Charges	187
Table 41	Details of Verified Amount of Non-Project Missed Volume	188
Table 42	Year-wise Details of the Circular Debt	189
Table 43	Investment Plan for Private Sector Power Generation Projects	189
Table 44	Investment Plan for Power Generation Projects (K-Electric)	190
Table 45	Unit Received, Delivered and Transmission Losses in NTDC System (GWh)	190
Table 46	Grid Stations, Power Transformers and Transmission Lines with NTDC	190
Table 47	Loading Position of Transmission Lines and Power Transformers in NTDC System	191
Table 48	Grid Stations and Transmission Lines with K-Electric Limited	191
Table 49	Investment Details in Transmission System of K-Electric Limited	191
Table 50	Surplus/Deficit in Demand and Supply during NTDC's System Peak Hours	192
Table 51	Surplus/Deficit in Demand and Supply during K-Electric's System Peak Hours	192
Table 52	Overload (above 80% load) of 500 kV and 220 kV Power Transformers installed at 500 kV Grid Stations	192
Table 53	Overload (above 80% load) of 220 kV Power Transformers installed at 220 kV Grid Stations	193
Table 54	Main Electricity Statistics of the Country	195
Table 55	Hourly System Demand (MW)	195
Table 56	Monthly System Peak Load Demand (MW)	196
Table 57	Number of Circles, Divisions, Sub-Divisions, 11 kV Feeders and their Loading Positions	196
Table 58	Status of Distribution Lines (km)	198
Table 59	Status of Grid Stations (Nos.)	199
Table 60	Category-wise Number of Consumers	200
Table 61	Category-wise Sanctioned Load (MW)	201
Table 62	Peak Demand of Distribution Companies	202
Table 63	Energy Volume Consumed by Demand	202
Table 64	Maximum Demand and Energy Data of all DISCOs	203
Table 65	Total Units Purchased, Sold and Losses	207
Table 66	Units Billed, Amount of Unites Billed and Amount Realized in all DISCOs	208
Table 67	Category-wise Electricity Sold (GWh)	209
Table 68	Category-wise Energy Sales in CPPA-G and K-Electric System	210
Table 69	Category-wise Consumers and their Electricity Consumption	211
Table 70	Annual Growth Rate of Electricity Consumption	212
Table 71	Average Annual Electricity Consumption per Connection (kWh)	213
Table 72	Distribution Losses (voltage category-wise)	215
Table 73	DISCOs' Billing, Collection and Percentage of Recovery against Computed Billing	216
Table 74	DISCOs' Actual Technical and Commercial Losses	217
Table 75	Receivables of Distribution Companies including K-Electric Limited	218

Table 76	Province-wise Electricity Consumption by Economic Groups of the Country (GWh)	220
Table 77	Province-wise Electricity Consumption by Economic Groups of the Country (%)	221
Table 78	Safety (Number of Fatal Accidents for both Employees and Public)	222
Table 79	New Connections Sanctioned, Load and Pending	223
Table 80	DISCOs' Power Transformers, Capacities and their Loading Positions	224
Table 81	DISCOs' Distribution Transformers, Capacities and their Loading Positions	226
Table 82	Feeders Outages Statistics of DISCOs	227
Table 83	Village Electrification in all Distribution Companies	228
Table 84	WAPDA Hydroelectric Tariff	229
Table 85	(A) Index/Adjusted Tariff of GENCOs on Quarterly Basis	229
	(B) Index/Adjusted Tariff of Hydel Power Plants on Quarterly Basis	231
	(C) Index/Adjusted Tariff of Gas-based Power Plants on Quarterly Basis	231
	(D) Index/Adjusted Tariff of RFO-based Power Plants on Quarterly Basis	232
	(E) Index/Adjusted Tariff of HSD-based Power Plants on Quarterly Basis	232
	(F) Index/Adjusted Tariff of RLNG-based Power Plants on Quarterly Basis	233
	(G) Index/Adjusted Tariff of Coal Fired Power Plants on Quarterly Basis	233
	(H) Index/Adjusted Tariff of Wind Power Plants on Quarterly Basis	234
	(I) Index/Adjusted Tariff of Solar Power Plants on Quarterly Basis	236
	(J) Index/Adjusted Tariff of Bagasse-based Power Plants on Quarterly Basis	236
Table 86	Insurance Cost Component	238
Table 87	Use of Transmission System Charges	
	(A) National Transmission and Despatch Company Limited	239
	(B) Pak Matiari-Lahore Transmission Company (Pvt.) Limited	239
	(C) Sindh Transmission and Dispatch Company (Pvt.) Limited	239
Table 88	National Average Uniform Determined Tariff with PYA along-with GOP Applicable Tariff	240
Table 89	Consumer-end Determined Tariff for K-Electric	241
Table 90	(A) Monthly Fuel Price Adjustments in respect of all DISCOs and K-Electric	243
	(B) Detail of Quarterly Adjustment of DISCOs	244
Table 91	CPI (General/US), Exchange Rate, KIBOR and LIBOR	244
Table 92	CPPA-G Market Operator Fee	244

FOREWORD

Electricity is the backbone of economic growth and modernization. In today's world, where every aspect of daily life and industrial progress hinges on a stable and affordable power supply, the importance of electricity cannot be overstated. It is a catalyst for individual advancement and national prosperity alike. However, mere availability of electricity is not enough; its impact is profoundly influenced by its affordability and reliability. Given its significance for economic prosperity and social well-being of the people, the country may not afford to falter on the provision of affordable electricity for all walks of life.

Pakistan's power sector is entangled in a complex web of challenges, including high tariffs, partly related to weak macro-economic conditions, inefficiencies in generation, transmission, distribution and supply of electricity marked by serious governance issues. The high price of electricity is negatively affecting the businesses, social services and the households alike. While external factors like high prices of imported fuels, devaluation of Pak Rupee and the impact of global issues have certainly had negative impact on the cost of electricity generation in the country. There are unabated inefficiencies, particularly on the part of monopolistic entities, making electricity increasingly unaffordable and placing an unprecedented strain on the country's economic and financial stability.

Persistent administrative and governance issues, combined with lack of planning and under investment in technology have aggravated the power sector's difficulties.

Furthermore, in addition to the factors mentioned, heavy supplemental charges—including various fees, duties, rents, surcharges, and taxes—are significantly increasing the amount on electricity bills. As a result, many consumers are seeking alternative energy sources. Those who cannot afford these escalating costs and are unable to shift to alternate sources are forced to sacrifice their quality of life by cutting back on electricity consumption.

Nevertheless, there have been notable advances in recent years. The integration of renewable energy (RE) sources, such as solar power through the net-metering regime, reflects Pakistan's commitment to a greener future. As of June 2024, over 156,372 distributed generation solar facilities with installed capacity exceeding 2,200 MW, including K-Electric Limited (KE), have been integrated with the grid through net-metering. The ambitious goals outlined in the approved Indicative Generation Capacity Expansion Plan (IGCEP) 2022-31, targeting an additional 3,420 MW by 2031, highlight a strategic shift towards sustainable energy through RE resource. However, emerging challenges such as transformer overloading, generation losses from on-grid DG facilities during load-shedding, and uncertainty in policy decisions may undermine these efforts.

The paradox of underutilized power generation capacity amid frequent load-shedding reveals deep-seated structural flaws. Outdated transmission infrastructure, high transmission and distribution losses, and issues with RLNG fuel supplies have hindered optimum plant utilization. Planning generation capacity around peak demand and induction of plants on long term contracts necessitate best possible utilization of available plants to avoid surplus capacity. However, besides inefficiencies on the part of power sector entities, the tariff policy penalizing higher consumption has also been a contributing factor for demand suppression resulting in idle capacity. The liability of capacity payments against such idle capacity increases consumer-end tariff on one hand while on the other hand it has intensified the pace of circular debt accumulation, undermining sector sustainability. Thus, a pressing need is felt to focus on increasing electricity demand, particularly for industry and the businesses, through innovative approaches, such as peak shifting, reduced tariffs for higher consumption, and facilitating participation in a competitive electricity market.

The transmission system in Pakistan is facing significant challenges that impede its ability to deliver a robust and constraints-free network. Inadequate infrastructure and insufficient transformation and transmission capacity have forced the reliance on costlier power plants, while cheaper, more efficient options remain underutilized or idle. These shortcomings not only disrupt the reliable supply of electricity but also result in increased operational costs, contributing to higher electricity prices across the country. Addressing these issues is essential for enhancing the efficiency of the power sector and ensuring more affordable electricity for consumers.

The Distribution Companies (DISCOs) in Pakistan face significant governance challenges that hinder effective management and prevent them from paying for power purchased through the Central Power Purchasing Agency (Guarantee) Limited (CPPA-G), exacerbating power sector circular debt. Inefficiencies, lack of accountability, and mismanagement make it difficult for DISCOs to recover costs from consumers, leading to unpaid dues that increase the circular debt. This situation undermines the financial viability of power producers, deters investment, and strains energy infrastructure.

Circular Debt escalating to Rs. 2,393.370 billion as on June 30, 2024, remains a formidable challenge for the power sector as well as the country's economy as a whole. The growing circular debt compounded by defaulters owing Rs. 900.82 billion has hampered the operational efficacy of DISCOs. High Transmission and Distribution (T&D) losses and less than 100% recovery of billed amount contribute to the accumulation of the circular debt.

The T&D losses, recorded at 18.31% for FY 2023-24 compared to the allowed 11.77%, have, added Rs. 276 billion to the circular debt during the year. Higher T&D losses reflect inefficiencies and outdated infrastructure requiring a comprehensive review and improvement of T&D systems urgently. Excess losses need to be curbed through targeted improvements, prudent investment practices and better management practices to prevent escalation of circular debt for stabilizing the sector's financial health.

The low recovery rate of 92.44% has added Rs. 314.51 billion to the circular debt during FY 2023-24. Low recovery manifests underperformance of DISCOs rooted largely in poor governance. The situation requires organizational overhaul with a focus on accountability. Strategies should include outsourcing recovery efforts and addressing low-recovery areas through targeted actions against defaulters, rather than resorting to feeder shutdowns that lead to greater revenue loss for DISCOs.

The huge receivables of all DISCOs including KE, which surged to Rs. 2,320.88 billion in FY 2023-24, necessitate investigations into possible billing manipulations and accurate assessments of non-receivables. Committees having representatives of DISCO as well as independent professionals may be established to validate the correctness of receivables of DISCOs.

The practice of cross-subsidization, where more efficient DISCOs bear the financial burden of less efficient counterparts, must also be addressed on priority. This policy decision, while aiming to ensure that electricity remains uniform for all consumers, inadvertently creates a system where inefficiency is rewarded, and operational shortcomings are obscured.

Timely subsidy payments from Federal or Provincial Government(s), are necessary to bridle the further escalation of circular debt. In nutshell, robust governance structure, technological innovation, and financial reforms are necessary in the distribution segment for ensuring sustainable growth and energy security. To stabilize the power sector and break this cycle, it is essential to implement improved management practices, accountability measures, and strategic reforms.

The rise of off-grid solar installations, particularly in rural areas, highlights a growing shift towards renewable energy. In FY 2023-24, a large number of solar panels, thousands of megawatts, were imported, signalling increased reliance on solar solutions. This trend requires careful planning by policymakers to align with future energy demands and update the overall energy framework accordingly.

The lack of indigenization in Pakistan's RE sector poses challenges to achieving sustainable energy goals. Despite abundant solar and wind resources, the reliance on imported technology hinders local capacity building and job creation, while increasing vulnerability to supply chain disruptions. To fully leverage its renewable potential, Pakistan must prioritize local manufacturing and expertise development, fostering innovation and sustainability in the energy sector.

This State of the Industry Report provides a comprehensive analysis of the financial, operational, and regulatory dynamics affecting Pakistan's power sector. It highlights the need to address technical bottlenecks, economic inefficiencies, and misinformation that often inflates public scepticism toward necessary reforms. The report offers a thorough examination of the current state of the sector, outlining pressing issues and providing actionable recommendations. It aims to foster meaningful dialogue and collaborative efforts towards a more efficient, resilient, and sustainable energy future for Pakistan.

Let this report serve as a catalyst for progress, inspiring a unified approach to transforming Pakistan's power sector and securing a brighter, more sustainable energy future for the nation.

DISCLAIMER:

The data presented in the State of the Industry Report-2024 has been sourced from relevant entities and compiled with care. However, some of the data in the report is provisional and may be revised in future editions. Further, the financial impact calculated in the report are based on best estimates worked out on the basis of available information with NEPRA. The information and analyses contained in this report are intended for informational, analytical, and research purposes only. The report shall not be liable for any legal claims or disputes arising from regulatory observations or the data presented herein.

EXECUTIVE SUMMARY

01

The State of the Industry Report (SIR) for FY 2023-24 provides a thorough review of Pakistan's electric power sector, highlighting ongoing challenges and proposing well thought out interventions for the future stability and growth. This report assesses the sector's performance across its core segments—generation, transmission, distribution, and supply—and underscores the need for comprehensive reforms to address persistent issues and enhance overall efficiency.

Key issues identified in the report include high electricity costs, systemic inefficiencies, and a growing circular debt. External factors such as rising fuel prices, a high exchange rate, and long-term RLNG supply agreements, etc. have further exacerbated these challenges, driving up electricity costs and jeopardizing the sector's long-term sustainability.

One of the biggest challenges facing Pakistan's electric power sector is the generation capacity, which is currently underutilized. This low utilization leads to high electricity costs in the country. By the end of the FY 2023-24, Pakistan's installed electric power generation capacity reached 45,888 MW including KE, while the average annual utilization during the same period was only 33.88%. As a result, electricity consumers ended up paying for 66.12% of unutilized capacity, which includes cost of intermittency in case of RE power plants.

The generation cost, with around 83% share in the overall consumer-end tariff, remains the largest cost component. Optimal utilization of available excess generation capacity is the key to reduce electricity tariffs. However, despite an installed capacity of 45,888 MW, multifarious issues including operational constraints in the transmission sector and governance issues in the distribution sector have hindered best possible utilization of generation capacity. The underutilization of power plants result in capacity payments for unutilized capacity, contributing to higher per-unit electricity costs for consumers. Poor quality of services, high tariff of electricity and reduced affordability for the consumers have stimulated rapid shift towards distributed generation, especially rooftop solar. The negative impact of high cost of electricity on the economy as well as daily life of the people calls for an urgent need for reforms in the power sector to ensure reliable power supply at affordable rates to support economic growth in the country.

The performance of transmission sector, managed primarily by the National Transmission and Despatch Company Limited (NTDC) continues to remain under par. It is faced with extensive challenges such as the lack of a robust constraint free transmission system to transmit cheaper electricity from the southern region to the load centres at the centre and the north, under-utilization of the HVDC transmission line, system overloading, and rising transmission costs. Financial strains from delays in completion of the transmission projects are also pressing concerns. The report highlights need for targeted investments in grid and transmission line infrastructure and timely project execution to address inefficiencies in the transmission segment to ensure stable and affordable electricity supply.

The distribution and supply segments have also not shown any improvement over the last year; rather, there has been a noticeable decline in electricity sales growth during FY 2023-24. Higher-than-allowed T&D losses and less recovery ratio by DISCOs have worsened the circular debt crisis. Taking the stock of poor performance of DISCOs, this report highlights the need for immediate actions to address governance issues in the DISCOs, minimize losses, and improve the financial health of the distribution sector. Strict enforcement of commercial contracts among the relevant public sector entities is needed to instil discipline and enhance system efficiency. In a nutshell, revamping of the public sector companies is more essential to reverse the current downward trend.

Besides high generation cost and inefficiencies in the transmission and distribution segments, the consumer is burdened by high supplementary charges, including taxes, surcharges, and cross-subsidies, which exacerbate electricity costs and complicate efforts to stabilize and reduce prices.

The report also presents a glimpse of NEPRA's regulatory activities during the year in the areas of licensing, tariff, monitoring & enforcement, and consumer affairs. During the year, NEPRA focused on enhancing compliance by the licensees. Data exchange portal has been improved for better monitoring of licensees. In addition, fines were imposed on non-compliant licensees for enforcement of the decisions of the Authority as well to penalize the inefficient practices.

It is important to note that the share of the public sector in Pakistan's power sector is quite significant, yet governance and efficiency issues, including regulatory non-compliance by these public entities, are prevalent. The process of initiating and concluding legal proceedings against any violations of applicable regulations is time-consuming. However, it is observed that in most cases, public sector entities, rather than addressing the issue and using it as an opportunity for improvement, tend to delay action by resorting to regulatory reviews, appeals to the NEPRA Appellate Tribunal, and litigation in higher courts, ultimately weakening deterrence measures.

In the public sector, many violations are ongoing, and the lack of adherence to regulatory decisions by public sector entities contributes to financial, technical, and regulatory indiscipline within the power sector. The recovery rate of fines is notably low.

Given these challenges, it is essential to address these issues. If improving efficiency within the public sector proves difficult, privatization of these entities or transferring their operations to private management should be seriously considered.

The ongoing efforts for the development of the Competitive Trading Bilateral Contract Market (CTBCM) is a significant step to foster competition in the supply segment and break the DISCOs' monopoly. The progress on the initiative of CTBCM and bottlenecks in its implementation has been discussed in the report.

Key stakeholders, including the Private Power and Infrastructure Board (PPIB), the National Energy Efficiency and Conservation Authority (NEECA), and provincial energy departments have been making efforts for promoting investment, expanding renewable energy, and improving energy efficiency. However, more coordinated efforts are essential to enhance the financial health of the country's power sector.

Structured into two sections, the SIR provides a detailed evaluation of the sector's performance in Section 1, while presents essential statistical data for informed decision-making in Section 2.

In addition to the previous two sections, NEPRA has enhanced the comprehensiveness of this report by incorporating two new sections on its website accessible to interested stakeholders via QR code. This initiative facilitates easier access to vital information, fostering greater transparency and engagement with the report's contents. One section compiles detailed data on various generation companies, offering a comprehensive overview of performance metrics and operational statistics to aid informed decision-making. Another addition is an infographic section, featuring interactive graphs that simplify complex data, allowing stakeholders to quickly grasp key trends. NEPRA is dedicated to continuous improvement and will refine these sections in future reports based on stakeholder feedback, ensuring the information remains relevant and valuable to all energy sector participants. Researchers, educators, civil society organizations, private business owners, Pakistan International Development Partners, analysts, planners, and decision-maker are encouraged to leverage this robust data and visual tools to develop innovative, data-driven solutions that address ongoing challenges in the power sector.

Submitted in accordance with Section 42 (b) of the NEPRA Act, this report aims to inform the Federal Cabinet and the Council of Common Interests (CCI) about the current state of the Pakistan's electric power industry, offering actionable recommendations and strategic interventions to ensure a more efficient and sustainable energy future for the nation.

OVERVIEW OF THE ELECTRIC POWER SECTOR

02

Electricity is the backbone of economic growth and the foundation of modern society, driving progress and elevating the quality of life by powering innovation, infrastructure, and everyday essentials. The socio-economic growth of a country depends on access to electricity to drive productivity, attract investment, and support vital infrastructure. Be it industry, businesses, social services or routine lives of households, electricity is the fundamental requirement for all walks of life in today's world. Inadequate and unaffordable access to electricity can perpetuate poverty, limit economic opportunities, and stifle national progress. Thus, the role of electricity transcends from a mere utility to a critical driver of national development and prosperity.

In Pakistan, the electric power sector has long been struggling to provide affordable electricity to its citizens. Initially grappled with power generation deficits, the sector's primary challenge today is managing and reducing the soaring cost of electricity, largely driven by underutilized excess capacity. Additionally, curtailing of RE power generation capacity is also becoming a formidable challenge.

The current generation mix, combined with the under-utilization of existing power generation capacity, has led to elevated electricity costs undermining sustainable development and disproportionately impacting low and middle-income groups. Despite ongoing efforts to address issues within the generation, transmission, distribution, and supply segments, the sector continues to face intensive challenges. Systemic inefficiencies, the devaluation of the Pakistani Rupee, rising prices of imported fuel, fuel supply management issues, and high-capacity charges have all contributed to the escalating cost of electricity during FY 2023-24.

The soaring cost of electricity, compounded by a web of taxes, surcharges, fees, and duties, has reached an unsustainable level for most consumers, crippling their ability to pay and severely undermining the financial recovery efforts of DISCOs.

Today, the power sector is facing a host of challenges in the generation, transmission, distribution and supply segments which need to be addressed through a comprehensive strategy focusing on the efficient management of primary fuel supplies, the integration of affordable, clean, and green electricity sources, and the promotion of competition to bolster energy independence and enhance efficiency across all segments of the sector.

This overview takes a look at the major issues affecting the power sector and recommends possible remedial measures to address the persistent challenges for sector's sustainability. It highlights the critical need for strategic reforms to reduce electricity costs, improve operational efficiency, and enhance overall sector performance.

The forthcoming sections will delve into the specific challenges faced in each segment—generation, transmission, distribution, and supply—providing a detailed analysis and actionable recommendations for overcoming these issues.

2.1 GENERATION SECTOR

In the previous State of the Industry Reports, NEPRA has consistently highlighted enduring issues within the power generation sector, such as violations of Economic Merit Order (EMO), excessive capacity payments, payments related to Non-Project Missed Volume (NPMV), Partial Load Adjustment Charges (PLAC), as well as issues involving CPPA-G and KE. Unfortunately, these issues continued to persist in FY 2023-24. Key challenges affecting the performance of the generation sector during FY 2023-24 are outlined below:

2.1.1 Challenges of Overinvesting in Meeting Peak Demand Capacity:

Despite the fact that existing installed electric power generation capacity often remains underutilized in Pakistan, the IGCEP is developed with the aim to meet the peak demands that occur for less than few hours annually. This planning approach raises concerns regarding its economic efficiency. Over-investing in electric power generation capacity that is occasionally used can lead to increased overall costs and worsen the issue of high electricity cost within the power sector.

Electric power demand fluctuates not only by season but also throughout the day. The peak demand within a year significantly exceeds the average demand, showing a disparity between maximum and average load requirements. If the supply side—i.e., generation capacity—is planned to meet the maximum peak demand, which lasts only for a few hours annually, it adversely affects the economics of the power sector. This approach results in higher electricity costs for consumers due to the underutilization of capacity during low demand periods.

At the close of FY 2023-24, the installed generation capacity in the CPPA-G system was 42,512 MW. During the same fiscal year, the CPPA-G system experienced a maximum demand of 30,150 MW and a minimum demand of 7,015 MW. In contrast, the CPPA-G system was able to serve a maximum load of only 25,516 MW, and that was also for a limited duration. The average annual load served by the CPPA-G system during FY 2023-24 was 18,463 MW.

The presence of excess generation capacity, combined with fluctuating demand and the system's inability to consistently meet maximum demand, poses a significant challenge. This imbalance between generation capacity and actual demand, along with inadequate transmission and distribution capacity, is a key factor driving high electricity costs and imposing a financial burden on the sector.

To address these issues, it is important to plan future generation capacity expansion with a focus on economic feasibility. Effective load management strategies coupled with efforts to increase industrial consumption to flatten the demand curve closer to the dependable generation capacity should be implemented to balance supply and demand more efficiently. This approach will help mitigate the financial burden on the power sector and reduce the overall cost of electricity for consumers.

2.1.2 Persistent Load-Shedding Amid underutilized Generation Capacity:

Despite an installed generation capacity of 45,888 MW as of June 30, 2024, persistent load-shedding occurs in many DISCOs. This paradox of the power sector is rooted in high Aggregate Technical and Commercial (AT&C) losses, which are both unacceptably high and unjustifiable.

The core issue stems from inefficiencies and governance challenges within DISCOs. High AT&C losses are primarily driven by widespread electricity theft, often facilitated by weaknesses in oversight and local operational practices, along with poor infrastructure maintenance and inadequate billing and revenue collection systems. NEPRA has taken cognizance of these issues and initiated legal proceedings against DISCOs, including KE. The proceedings concluded with fines imposed on these entities. However, DISCOs have shown reluctance to pay these fines and continue to practise load-shedding, failing to address the root causes of their inefficiencies.

This unabated load-shedding is a direct consequence of governance failures within DISCOs, which have not effectively tackled electricity theft or ensured the recovery of billed amounts. Consequently,

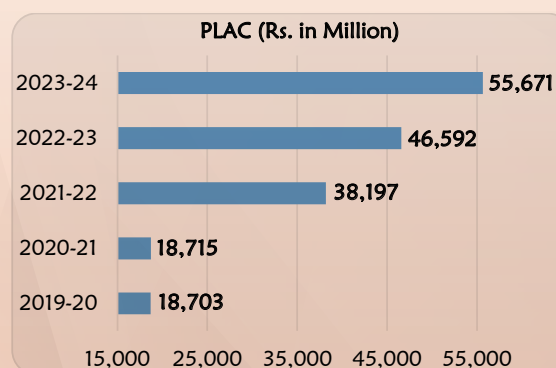
consumers who are prompt in paying their bills and are not involved in theft are unfairly bearing the brunt of these inefficiencies. The adverse effects of indiscriminate load-shedding on the pretext of AT&C losses include:

- (a) **Negative Sales Growth:** The load-shedding results in reduced electricity consumption, leading to negative sales growth. This, in turn, undermines the utilization of existing surplus generation capacity, jacking up the per-unit cost of electricity.
- (b) **Impact on Net-Metering:** Persistent load-shedding adversely affects the generation from on-grid net-metering connections. Since these systems rely on a stable grid to function effectively, frequent outages reduce their efficiency and overall contribution to the energy mix.
- (c) **Shift to Off-Grid Solutions:** The unreliability of the grid has pushed consumers towards off-grid solar installations. This shift is reducing demand from the grid-based generation sources, including CPPA-G and KE systems, further exacerbating the imbalance between the available power generation capacity and actual usage. Shifting to off-grid solutions impact DISCOs through lower or negative sales growth.
- (d) **Lack of Progress:** It is particularly concerning that despite the prolonged period of these issues, some DISCOs have made little to no progress in addressing their inefficiencies. This stagnation reflects a systemic failure to implement necessary reforms and improvements.

The ongoing load-shedding is particularly harming those consumers who diligently meet their financial obligations. This situation underscores the need for comprehensive reforms within DISCOs, including improved governance, effective measures to combat electricity theft, and enhanced revenue collection practices. These challenges need to be addressed inevitably for optimising the utilization of existing generation capacity and ensuring a reliable electricity supply for all consumers.

2.1.3 Part Load Adjustment Charges:

Part Load Adjustment Charges (PLAC) are prompted when power plants operate below their full load capacity. Such operation often results in decreased efficiency and higher generation costs, which are then reflected in the monthly Fuel Price Adjustment (FPA) charges borne by end-consumers. Under Power Purchase Agreements (PPAs), power plants are entitled to claim PLAC when they operate at less than full capacity. This is an undesirable cost causing unnecessary burden on the power sector.



Source: CPPA-G

During FY 2023-24, Rs. 55.671 billion accumulated on account of PLAC payments compared to Rs. 46.59 billion in the previous year.

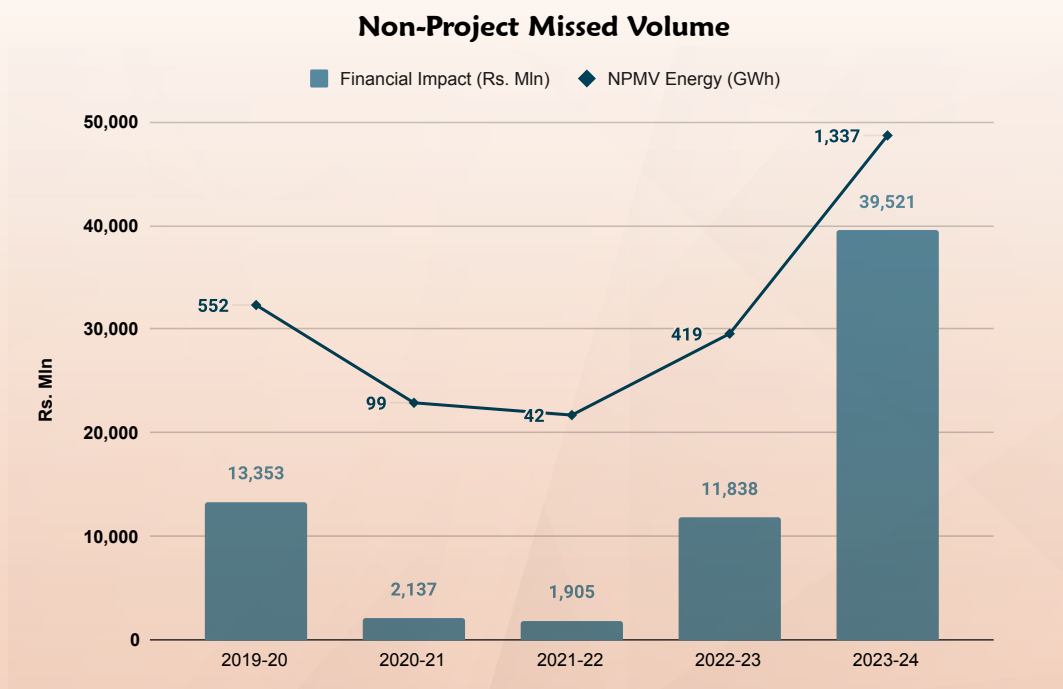
Looking ahead, the cost of PLAC is expected to rise further as the schedules of various PPAs with the CPPA-G are currently being processed and finalised in the near future. To mitigate these costs, it is essential to focus on optimising the operation of base load plants, particularly those utilizing coal and other efficient thermal technologies with steam turbines. These plants are generally more efficient when operated at or near full load. Power plants with flexible characteristics, such as hydro, gas turbines, are better suited to manage short duration peak demands and reduce overall generation costs.

Additionally, adopting Time-of-Use (TOU) tariff structures can play an important role in flattening the demand curve, thereby reducing the frequency and magnitude of PLAC costs. By aligning generation capacity with actual demand more effectively, efficient TOU tariffs can help in minimising the financial impact of part load operations.

Balancing grid stability with fair compensation for plants operating at part load remains a complex challenge. It requires careful policy considerations and innovative solutions to promote a more efficient and cost-effective energy system. This issue needs to be addressed not only to help control costs but also to enhance the overall stability and sustainability of the power sector.

2.1.4 Payment on Account of Non-Project Missed Volume:

Non-Project Missed Volume (NPMV) refers to the energy that could have been generated but was lost due to factors such as grid constraints and other operational issues beyond the control of power producers. The non-evacuation of available energy from RE power plants, particularly wind farms, poses a significant challenge in Pakistan's power sector. Despite substantial investments in wind energy, inadequate transmission infrastructure and poor grid connectivity have resulted in large quantities of potential electricity generation going unused. This inefficiency not only undermines the effectiveness of renewable energy initiatives but also contributes to higher electricity prices for end users through payments made for NPMV. A detailed overview of the available energy from wind and solar power plants that could not be evacuated over the past five years, along with the corresponding financial impact in Rs. million, is provided in the graph below:



Source: CPPA-G

The liability on account of NPMV has been on the rise. From Rs. 1,905 million in FY 2021-22, the payments on account of NPMV swelled to Rs. 11,838 million in FY 2022-23 and reached approximately Rs. 39,521 million during FY 2023-24.

The substantial increase in NPMV payments highlights the urgent need for effective measures to address and reduce the causes of missed energy volumes. It is essential for policymakers and industry stakeholders to prioritise strategies that minimise NPMV and mitigate its monetary impact, thereby fostering an efficient and economically viable power sector.

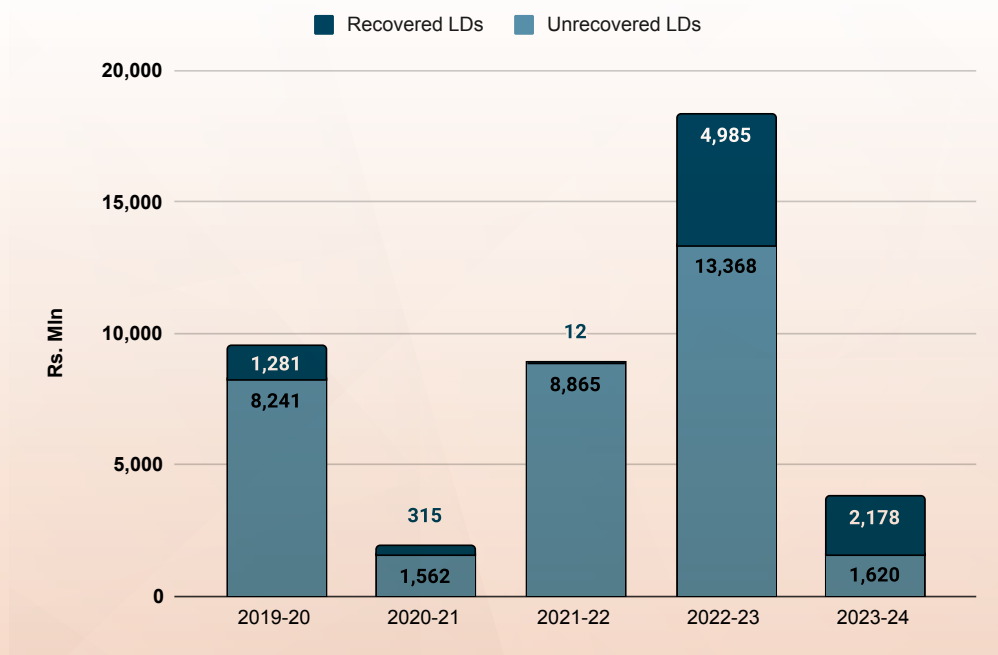
Key measures required to address this issue may include resolving grid constraints and improving system operations. By implementing these measures, the efficiency of RE projects can be significantly enhanced, which can help lower costs and stabilise electricity prices for consumers.

2.1.5 Liquidated Damages:

Liquidated Damages (LDs) are financial penalties imposed on power producers who fail to comply with the terms and conditions outlined in their PPAs. These penalties are intended to enforce adherence to contractual obligations and ensure that power producers meet their operational commitments, including the availability of compulsory fuel and maintaining plant availability.

During FY 2023-24, the CPPA-G levied LDs totalling Rs. 3,797.93 million against various power producers. The graph illustrates the trend of LDs recovered and unrecovered thereof over the last five years.

Recovered and Unrecovered Liquidated Damages



Source: CPPA-G

Despite the imposition of these LDs, the recovery ratio remains notably low. This is largely due to the frequent use of dispute resolution mechanisms by licensees, who often challenge the imposed penalties on various legal and contractual forums. The protracted nature of these disputes not only delays the recovery of LDs but also adds to the administrative and legal costs associated with enforcing contractual compliance.

The persistent issue of low recovery rates highlights the need for effective enforcement strategies and dispute resolution mechanisms. To enhance the efficacy of LDs and ensure better compliance with contractual terms, it is important for stakeholders to explore solutions that streamline the resolution process and reduce the incidence of disputes.

Further, the current level of LDs imposed for the non-availability of power plants is frequently insufficient to cover the actual losses incurred. This shortfall is due to the considerable gap between the LD amount and the costs related to marginal fuel prices. It's important to address this discrepancy in order to accurately capture the economic impact of power plant outages.

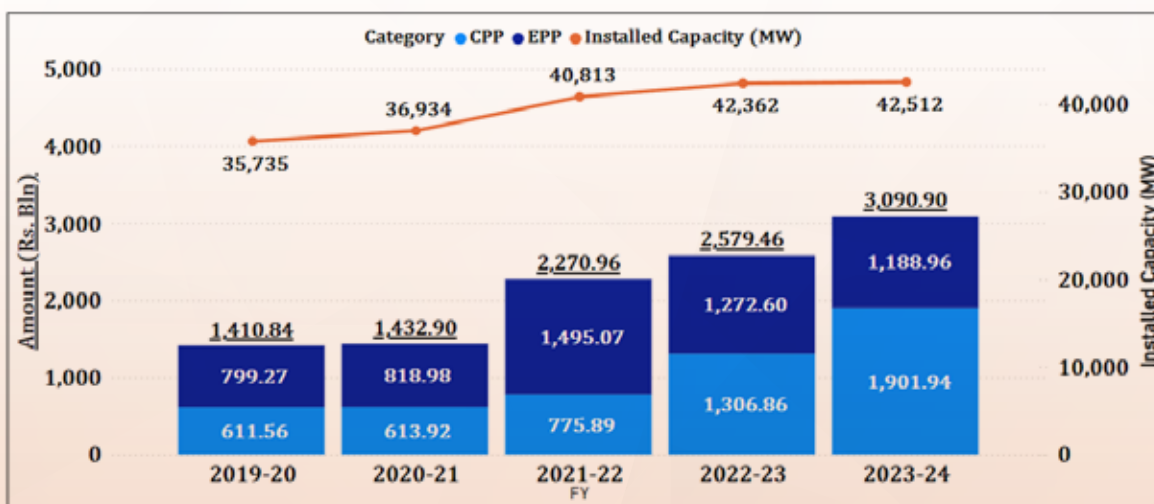
Addressing these challenges is essential for maintaining the financial integrity of power sector operations and ensuring that contractual obligations are met. By improving the enforcement and recovery of Liquidated Damages, the sector can better manage operational risks, enhance overall efficiency, and ultimately provide more stable and reliable electricity services to consumers.

2.1.6 Energy Charges vs. Capacity Charges:

The consumer-end tariff comprises of Energy Purchase Price (EPP), Capacity Purchase Price (CPP), the impact of T&D losses, Distribution and Supplier Margins, Transmission Charges, Market Operator Fee, and Prior Year Adjustments. For the FY 2023-24, the tariff breakdown reveals a substantial allocation towards capacity-related costs. The EPP accounted for approximately 39% of the total tariff, while the CPP constituted about 61%. This trend is expected to continue into the next fiscal year, with the CPP projected to rise to 62%.

The below graph illustrates the total Power Purchase Price (PPP) in billion rupees over the past five years alongside its breakdown into CPP and EPP. It also presents the combined installed power generation capacity (in MW) at the end of each fiscal year.

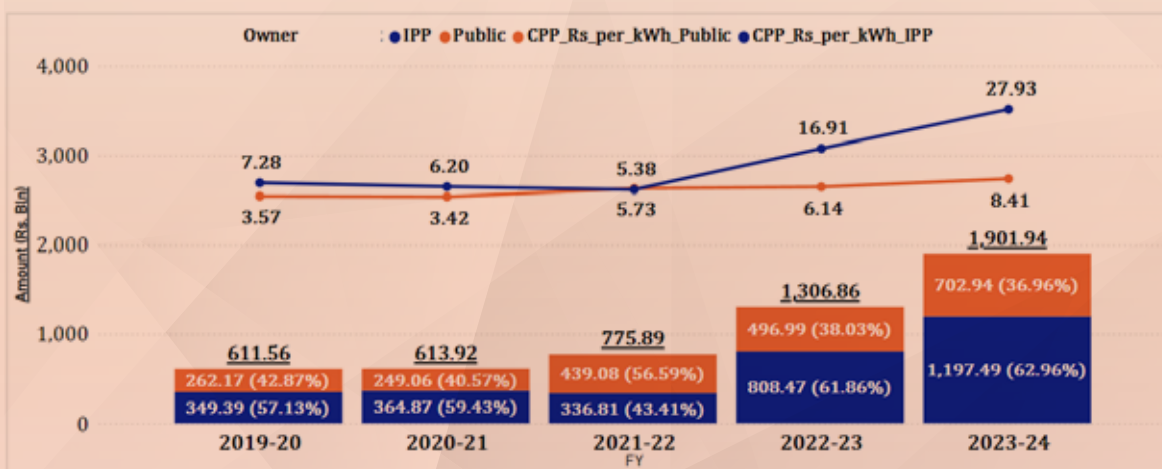
PPP Trend (Rs. in Billion) in CPPA-G System



Source: CPPA-G

The below graphs breaks down the total CPP among power plants commissioned in both public and private sectors, along with the annual average CPP per unit for public and private sectors.

CPP (Rs./kWh) by Ownership



The growing proportion of CPP, mostly due to rupee devaluation, higher interest rates and increasing trend of inflation highlights critical need to rethink the capacity induction in the power system. It also underscores the importance of carefully balancing tariff components to ensure affordability for

consumers while maintaining the financial viability of the power sector. Achieving this balance requires a thorough evaluation of capacity investments, operational efficiencies, and the impact of macroeconomic factors on tariff. Different options/strategies may be explored to increase the productive industrial load and reduce the per-unit capacity cost for the consumers.

2.1.7 Optimizing Capacity Additions for Displacing Costly Generation:

The addition of renewable energy power generation capacity aimed at displacing costlier generation necessitates a comprehensive review, particularly regarding the impact of capacity payments for the new capacity compared to the fuel costs of the displaced plants, both in the short and long run. In displacement scenarios, it is crucial that the total power purchase costs for the new capacity, along with other associated costs—including those related to intermittency—are lower than the fuel costs of the displaced generation. Notably, during the debt servicing period, projects often require higher capacity payments, which can significantly impact overall financial sustainability, especially during this critical phase. Therefore, it is essential to evaluate whether these added capacities will provide sufficient benefits during the debt servicing period to justify the increased costs. A thorough assessment will ensure that decisions align with both short- and long-term financial health and efficiency within the sector. It is important to note that during FY 2023-24, the determined average per unit EPP was Rs. 7.62/kWh, whereas the CPP stood at Rs. 17.01/kWh.

In planning for the addition or displacement of generation capacity, a key consideration is the fluctuating availability of various generation technologies, which directly influences the System Operator's dispatch decisions and impacts consumer-end tariffs. For instance, during winter, low water levels can substantially reduce hydroelectric generation capacity, while the output from wind and solar technologies fluctuates based on both seasonal variations and the time of day. This daily and seasonal reduction in generation yield, compared to installed capacity, must be integrated into planning, while factoring in the impact of higher transmission costs associated with integrating renewable energy, to ensure system reliability and cost efficiency. Given that Pakistan's power sector already has an underutilized excess power generation capacity, for which transmission facilities have been developed, this comprehensive analysis becomes even more critical.

To address these challenges, it is vital to plan future generation capacity expansion with a strong emphasis on economic feasibility, ensuring that it does not negatively impact the already strained power sector especially during the initial years, specifically debt-servicing period, of capacity induction.

2.1.8 Fixed Charges:

For FY 2023-24, fixed charges billed to electricity consumers ranged between Rs. 200 and Rs. 500/kW/month. These charges are applied based on the Actual Maximum Demand recorded for the month or 50% of the sanctioned load, whichever is higher. This structure aims to reflect the capacity reserved for each consumer, regardless of their actual energy usage. In contrast, capacity charges billed to DISCOs by CPPA-G are substantially higher, consistently exceeding Rs. 6,460/kW/month.

The high disparity between the fixed charges levied on consumers and the capacity charges billed to DISCOs is an important issue for the power sector. Fixed charges account for only about 3% to 4% of total fixed costs, with the majority of costs covered by variable charges based on actual energy consumption. This indicates a considerable difference in cost distribution between what consumers are billed and the expenses DISCOs incur for maintaining generation capacity.

To mitigate the impact of capacity charges, it is essential to implement strategies that focus on reducing overall costs. By increasing the number of units consumed in a controlled manner (taking into the account the marginal EPP of plants needed to meet that increased demand), the fixed capacity costs recovered through volumetric charges can be spread across a larger volume, reducing the cost per unit. Additionally, addressing high generation costs involves retiring outdated and inefficient generation capacity. This includes phasing out low-efficiency power plants operated by GENCOs and KE, which contribute to elevated costs and inefficiencies in the sector.

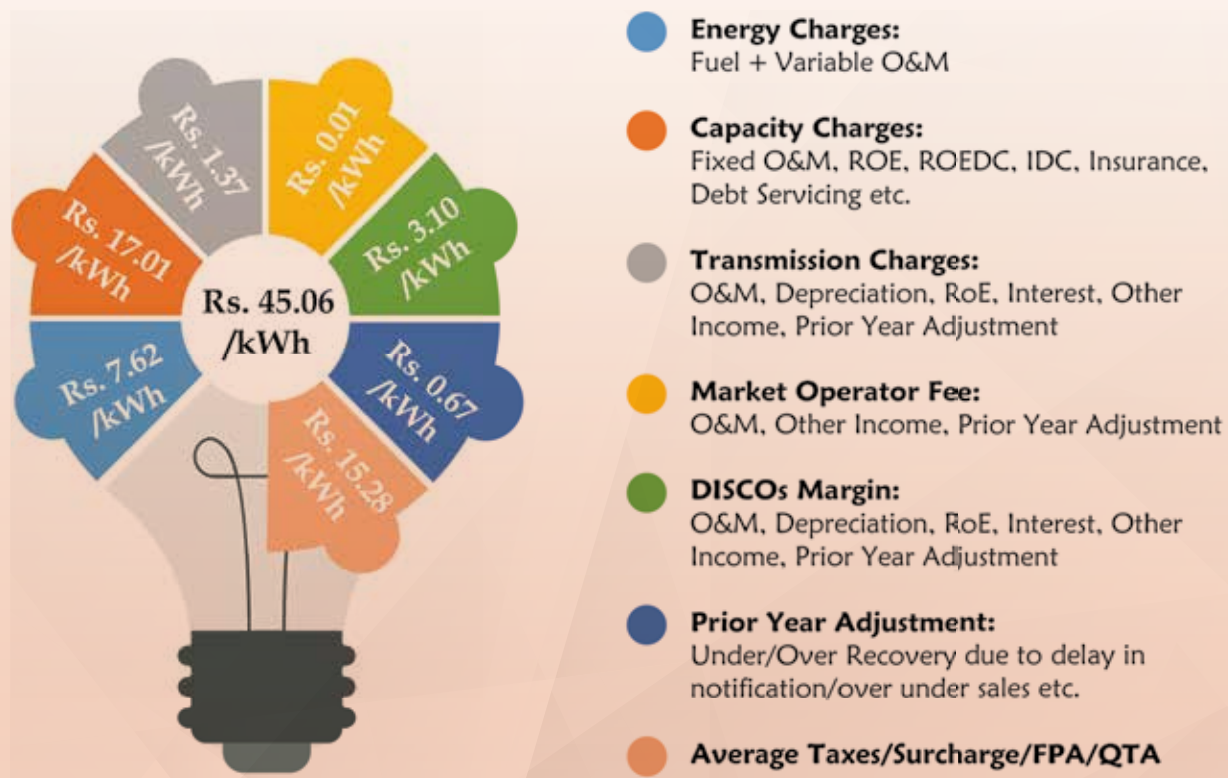
Furthermore, decisions regarding the addition of new generation capacity should be based on a comprehensive evaluation of all relevant factors. This assessment should extend beyond generation costs to include considerations such as the costs associated with intermittency, network interconnections, and the per-unit impact on end-consumers. Only after a thorough analysis of the sector's needs and economic conditions new capacity should be introduced.

The highlighted issues must be addressed through a balanced and cost-effective approach to manage fixed charges, thereby promoting operational efficiency and financial sustainability.

2.1.9 Electricity Cost vs. Supplementary Charges in Electricity Bills:

The electricity bills issued by DISCOs to consumers include a range of supplementary charges such as taxes, duties, fees, and surcharges inflating the total amount payable significantly. These supplementary charges are not part of the basic electricity cost; instead, they include various fees, surcharges, duties, and taxes imposed by the government, which ultimately increase the overall expenses for consumers.

For the FY 2023-24, the reference uniform national average tariff for electricity has been determined. This includes various tariff components such as EPP, CPP, Transmission Charges, MoF, Distribution Margin, PYA, and Average Taxes/Surcharges/FPA/QTAs, which are outlined below:



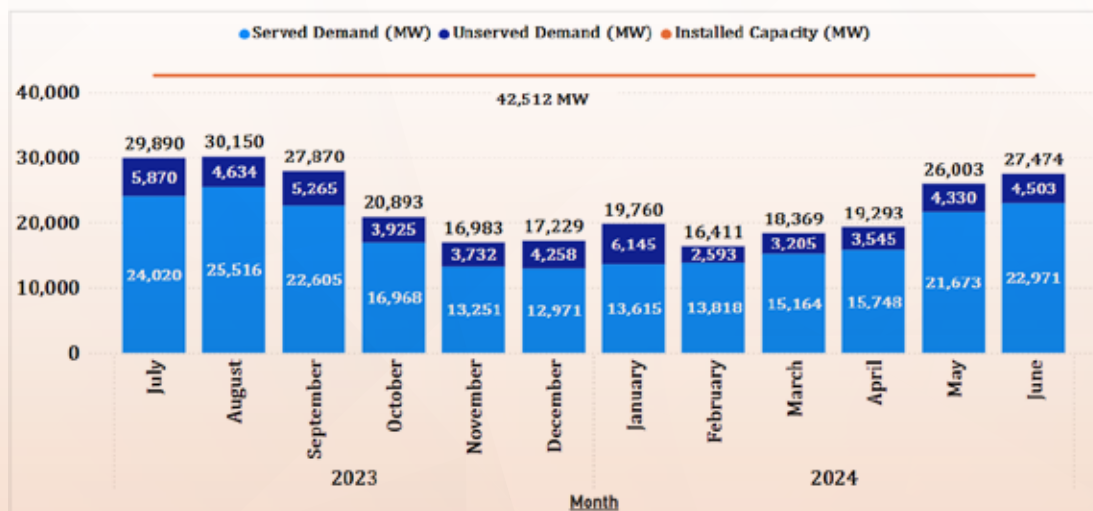
Efforts must be focused on reducing supplementary charges to lower the total amount on electricity bills, as the growth in electricity sales is directly tied to its cost. High electricity bills are pushing consumers toward off-grid solutions, leading to underutilization of grid generation capacity. This underutilization not only exacerbates the issue of rising electricity costs but also undermines the overall efficiency of the power sector. By addressing supplementary charges, we can encourage grid usage and foster a more sustainable energy landscape.

2.1.10 Surplus Installed Capacity, Fluctuating Demand and Unserved Load:

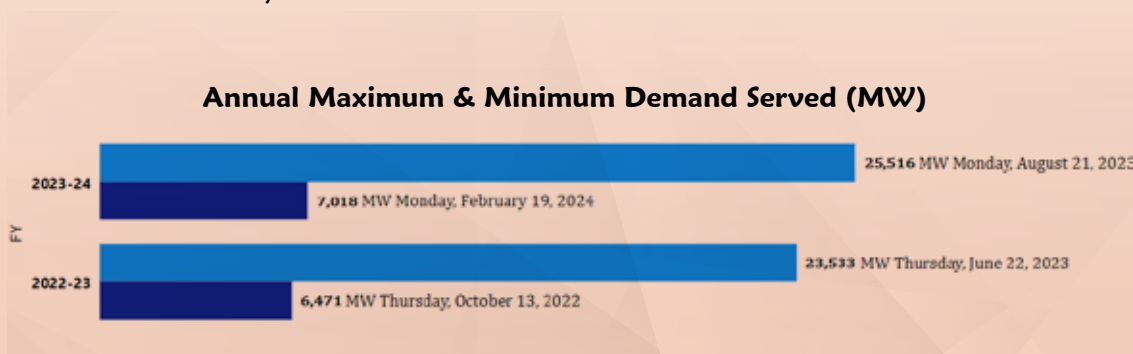
During FY 2023-24, the Pakistan power sector has encountered significant challenges due to fluctuating load demands across different seasons and times of day. These variations have adversely affected the sector's operational stability and planning efforts.

The following graph provides a comprehensive overview of monthly maximum demand, maximum demand served, and the installed surplus generation capacity for corresponding month. The significant disparity between higher installed capacity and lower generation, despite existing demand, highlights the major challenges confronting the power sector.

Surplus Installed Capacity, Fluctuating Demand and Unserved Load in CPPA-G System

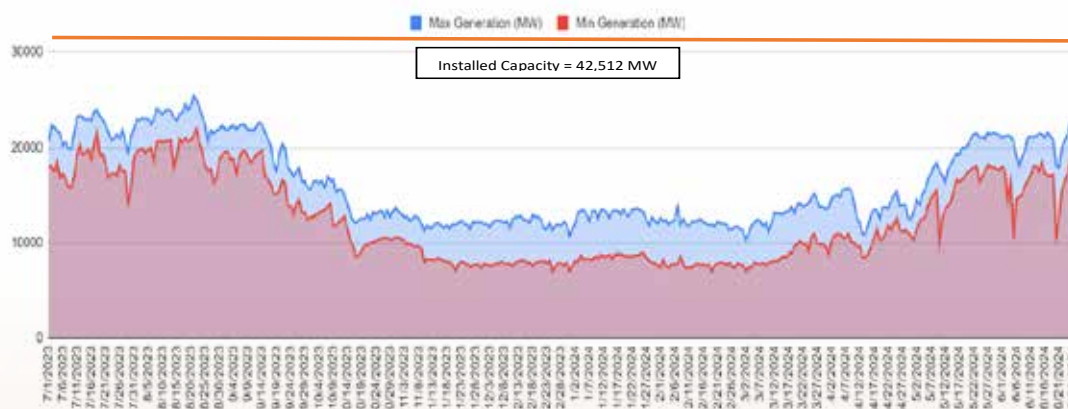


The graph below displays the annual maximum and minimum demand served in the CPPA-G system for the two most recent fiscal years i.e. FY 2022-23 and FY 2023-24.



The following graph illustrate the variation in maximum and minimum generation on representative days during FY 2023-24, alongside the installed generation capacity. This variability can be influenced by factors such as seasonal demand, changes in weather patterns, and other operational challenges. Such wide fluctuations adversely impact the power sector, affecting both financial stability and operational performance. Understanding these trends is essential for effective energy planning and management, as it helps ensure a reliable supply while optimizing resource allocation.

Variation in Maximum and Minimum Generation during FY 2023-24



This above graph provides valuable insights into fluctuations in energy demand and generation relative to installed capacity, highlighting challenges across generation, transmission, distribution, and supply segments.

A comprehensive analysis of these trends is important for developing a cost-effective power sector that ensures competitive electricity prices for consumers. By understanding demand patterns and optimizing generation strategies, we can improve efficiency, reduce costs, and ultimately provide more reliable and affordable energy to our customers.

2.1.11 Performance of Public Sector Generation Companies:

The performance of public sector Generation Companies (GENCOs) in Pakistan's power sector has significantly declined, exposing critical operational and financial issues that affect the efficiency and cost-effectiveness of the national electricity grid.

GENCOs have experienced a substantial drop in operational efficiency, resulting in lower or even almost zero plant utilization in some cases. The following table summarises the performance details—dependable capacity, energy generation and capacity payments invoices—for all three GENCOs over the past three years:

Name of GENCO	FY	Dependable Capacity (MW)	Energy Generated (GWh)	Capacity Payment Invoiced (Rs. Million)
GENCO-I	2021-22	649	245.51	3,381.92
	2022-23	649	24.38	3,409.83
	2023-24	300	0.00	3,204.87
GENCO-II	2021-22	1,641	3,521.80	16,645.11
	2022-23	1,641	4,604.30	7,605.18
	2023-24	1,361	2,551.35	3,580.71
GENCO-III	2021-22	1,610	685.56	13,511.39
	2022-23	1,338	1,311.36	11,764.09
	2023-24	950	938.73	15,968.67

Source: CPPA-G

A major challenge confronting GENCO-II is the operation of its plants in open cycle mode which is far less efficient than combined cycle operations. The open cycle plants generate electricity at about 1.5 times the cost of their combined cycle counterparts. This inefficiency leads to increased operational expenses and financial losses. By restoring to combined cycle operations, GENCO-II could substantially lower costs and enhance overall performance.

The ST 13 (CPGCL Block 11-13) and ST 16 (Guddu 747) plants have been non-operational since March 24, 2013, and July 10, 2022, respectively. The prolonged inactivity of these machines necessitates reliance on more expensive power sources with higher marginal fuel costs. To address these challenges, a comprehensive approach is needed:

- (a) **Repowering Initiatives:** Installation of solar power facilities at existing GENCO locations in PPP mode could provide a cost-effective solution. The site advantage as well as already available infrastructure and human resources can facilitate the installation of solar power at competitive rates while also contributing to improving the financial position of the GENCOs. Repowering of GENCOs should, however, only be assessed in relation to developments of solar power plants at other locations in the system through competitive bidding. The decision should be based on a detailed techno-economic assessment and should advance the goal of provision of electricity on least-cost basis.
- (b) **Repair of Damaged Steam and Gas Turbines:** The damaged steam and gas turbines should be restored immediately to enable the plants to operate in combined cycle mode. By reinstating combined cycle technology, GENCO-II could substantially lower operational costs and enhance economic viability. This strategy would optimise the use of existing resources and significantly improve overall plant performance.
- (c) **Optimising Indigenous Gas Use:** GENCO-II has access to relatively cheaper indigenous gas resources, which are currently sub-optimally used in open cycle mode. The use of available gas in combined cycle plants could further lower costs and improve efficiency.
- (d) **Retrofitting of GENCOs:** Additionally, rather than decommissioning older plants, particularly those located at strategic locations close to load centers, it is advisable to evaluate the process of converting these power plants into synchronous condensers. This conversion would enhance the stability of the grid by providing vital ancillary services, thereby optimizing the generation capacity. A collaborative consultation process, involving key stakeholders such as CPPA-G, IPPs, NTDC, System Operator and GENCOs, should be initiated to explore the feasibility and benefits of this conversion.

While GENCOs face numerous operational and financial challenges, strategic measures such as repowering with solar technology, investing in combined cycle operations, and optimal use of indigenous gas can enhance their efficiency and economic viability. With targeted investments and technological upgrades, the performance of GENCOs can be improved for their overall effectiveness and sustainability.

2.1.12 Suboptimal Performance of Guddu 747 MW Power Plant:

Guddu 747 MW is a relatively new addition to the GENCO-II generation fleet, commissioned on December 17, 2014. This plant benefits from supply of local, indigenous gas, and its strategic location enhances grid stability. Unfortunately, like many other public sector plants, it has not performed at its optimal level. Since its Commercial Operation Date (COD), Guddu 747 has experienced two significant machine failures: its gas turbine suffered damage from February 12, 2021 to June 24, 2022, and the steam turbine went on forced outage on July 10, 2022, a situation that remains unresolved.

Focusing on its performance during FY 2022-23 and FY 2023-24, Guddu 747 has been operating solely in open cycle mode since the steam turbine failure. Over these two fiscal years, the plant generated a total of 4,845.05 GWh in this mode. Given that the cost of electricity generation in open cycle is approximately 1.5 times higher than in combined cycle, the financial impact of operating in open cycle mode during FY 2023-24 was estimated at around Rs. 7.92 billion, up from approximately Rs. 6.49 billion in FY 2022-23. This increasing financial burden underscores the challenges facing the power sector.

Additionally, the ongoing reliance on expensive marginal plants due to the absence of the Guddu 747 steam turbine has further exacerbated the financial implications, with an estimated cumulative impact of approximately Rs. 86.18 billion over the two years. It is relevant to mention that vide para 9.2 of the tariff determined of Guddu 747 power plant dated April 26, 2016, the claimed EPC cost of the Steam Turbine was US\$ 41.92 million (approximately Rs. 11.6 billion at current exchange rate of Rs. 280/US\$).

The unavailability of the steam turbine at Guddu 747 MW is not only leading to the suboptimal utilization of locally sourced, cheaper gas but also exerting additional pressure on the country's foreign exchange reserves.

This situation highlights the urgent need for a strategic review of Guddu 747's operational framework, particularly regarding its role in the overall energy mix and cost efficiency. Addressing these challenges is essential for enhancing the performance of Guddu 747 and ensuring its alignment with the broader objectives of the energy sector. Furthermore, steps must be taken on a war-footing basis to repair the out of function steam turbine to avoid losses to consumers as well as the national exchequer.

2.1.13 Improving Insurance Coverage in the Public Sector Power Companies:

NEPRA has recognized the importance of mitigating risks associated with damage to plant and machinery by incorporating an insurance component into the tariff determinations of all power plants. This provision is designed to cover potential losses due to damage, ensuring that operators are not unduly burdened by the financial impacts of unforeseen incidents. Ideally, the scope of insurance should extend beyond just plant and machinery to include the broader business risks, as damage to power plants—especially cost-efficient ones—can have far-reaching consequences for both consumers and the national economy. Any disruption to the operation of these plants, particularly those with lower operational costs, directly impacts electricity prices, leading to higher costs for consumers and economic instability. However, despite this need, the culture of securing comprehensive insurance coverage remains underdeveloped in the public sector. A persistent issue is the limited reliance on the National Insurance Corporation Limited (NICL) for insurance coverage, which is often restrictive and does not fully address the scope of risks faced by public sector power companies. This approach has severely affected the operational resilience of these companies, leading to potential financial losses that ultimately hurt the electricity consumers and the public at large.

One stark example of this oversight is the continued operation of the 747 MW Guddu Power Plant without insurance coverage, a situation that presents a significant risk to both the plant's operation and the broader energy security of the country. Such cases highlight the critical need for public sector companies to adopt a more comprehensive, proactive approach to insurance, ensuring that assets are adequately protected against potential damages. NEPRA emphasizes the urgency of resolving the insurance issues in public sector entities, as the lack of proper coverage not only undermines the financial stability of the sector but also jeopardizes the interests of consumers and the national economy. Immediate action is required to establish robust insurance frameworks that align with international best practices and safeguard both public assets and public interest.

2.1.14 Challenges of Hydropower Projects in Pakistan:

Hydropower is a key component of Pakistan's energy portfolio. It is an indigenously available renewable source of electricity offering clean energy. Notwithstanding abundant benefits of Hydropower, its development faces several challenges which impact its economic viability.

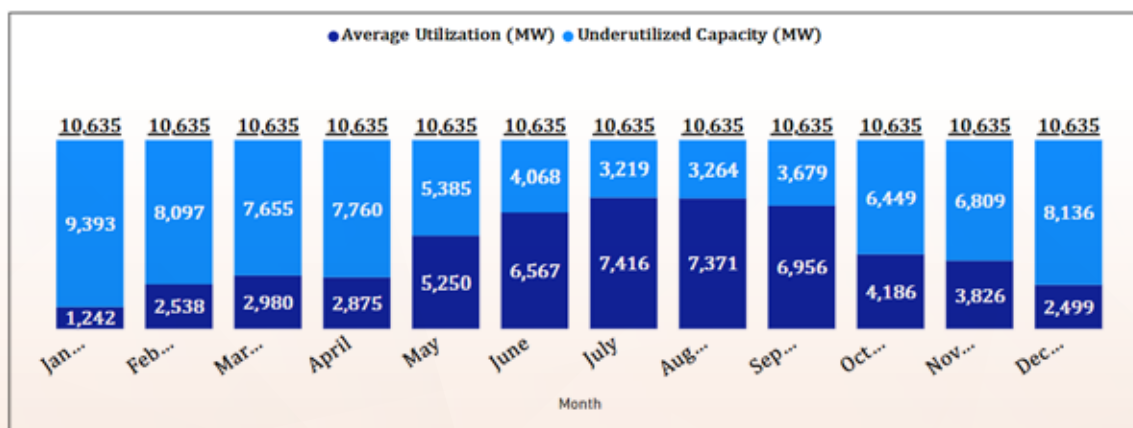
Hydropower generation is highly dependent on seasonal hydrological conditions, which can affect power generation consistency. Remote locations of hydropower plants induce logistical complexities and high costs associated with construction and extended transmission lines. Furthermore, the substantial initial investment and high tariffs during debt servicing can make hydropower economically less competitive compared to solar and wind technologies owing to their rapidly declining costs.

Furthermore, the output of hydropower plants poses a significant challenge due to its variation throughout the day. The release of water from dams is contingent on IRSA's indent which is driven by agricultural needs and canal operations. While this management is essential for irrigation, it creates challenges for the economics of the power sector. It is crucial to assess and mitigate these impacts to ensure a more stable and efficient energy supply.

To ensure economic viability and to achieve the lowest Levelized Cost of Electricity (LCOE), hydropower projects may be developed by selecting optimal sites, utilizing advanced technologies, and exploring hybrid systems that integrate hydropower with solar and wind energy to balance variability and enhance reliability, provided hybrid system is cost effective.

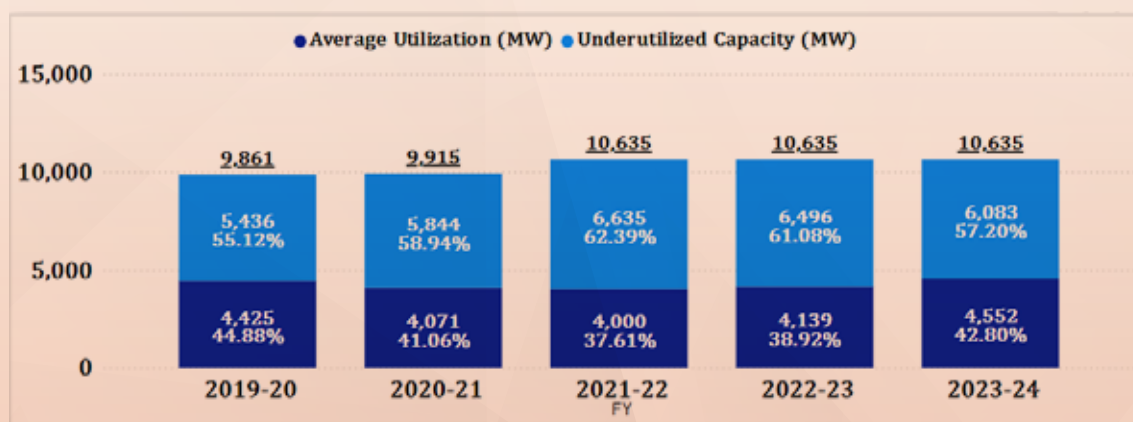
During FY 2023-24, the performance of hydropower plants showed both the strengths and limitations of this energy source. Metrics such as generation output and efficiency reflect the impacts of seasonal hydel variations and the effectiveness of water management practices. The graph below illustrates the monthly average generation (MW) from all hydropower plants during FY 2023-24 compared to their installed generation capacity.

Monthly Variation in Utilization of Hydel Capacity (MW)



The graph below illustrates the combined installed hydropower capacity in the country in relation to the total power it has produced over the past five years.

Trend of Hydel Capacity Utilization



Hydropower remains vital for Pakistan's renewable energy strategy. By focusing on site optimization, technology integration, and economic considerations, effectiveness of hydropower projects can be considerably improved. Continued innovation and strategic planning are essential to align hydropower with Pakistan's broader energy objectives and market dynamics. Furthermore, innovative solutions like floating solar can be explored to contribute to the generation mix in low hydro season for optimal utilization of the installed transmission capacity. However, any such solution must be inducted only if it makes economic sense and contributes to lowering of the consumer-end tariffs in the short and long term.

2.1.15 Performance of Neelum-Jhelum and other Hydropower Plants:

The Neelum-Jhelum Hydropower Project is a 969 MW run-of-the-river facility that harnesses the potential of the Neelum River in Azad Kashmir. Located near the Jhelum River in Neelum Valley, the

project is developed under the public sector and is designed to generate an estimated 5,126 GWh of electricity annually, making a significant contribution to Pakistan's energy supply while supporting efforts to reduce reliance on fossil fuels.

Construction began in 2007-08, but the project faced various delays due to technical challenges and financing issues. To address financial constraints during this phase, electricity consumers were charged a Neelum-Jhelum surcharge on their bills. The project was ultimately completed in 2018.

However, since its commissioning, the plant has encountered significant challenges, including two major shutdowns. The first occurred in 2022 (July 05, 2022 to August 06, 2023), followed by a second in 2024 (May 01, 2024 to till date). The progress of the power plant since its commissioning is detailed in the following table:

Estimated Generation (GWh) (Annually)	Actual Generation (GWh)					
	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22	FY 2022-23	FY 2023-24
5,126	3,965	4,842	4,784	3,620	108	1,744

Since its commissioning, it is evident that the Neelum-Jhelum Hydropower Project has consistently failed to achieve the estimated electricity generation targets set during its development. This shortfall has negatively impacted the power sector, necessitating that the deficit be covered by more expensive power plants.

This underperformance has adversely affected electricity consumers. The inability of the power plant to provide cheaper, clean energy has forced the country to rely on costlier imported fuels, exacerbating foreign exchange burdens. Consequently, the power sector faces increased costs, further complicating the country's energy challenges.

Only a few hydropower plants have successfully achieved electricity generation levels exceeding their estimates. The poor performance of some power plants is detailed in the following table:

Name of Power Plants	Estimated Gen. (GWh) (Annually)	Actual Generation (GWh)						
		FY 2017-18	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22	FY 2022-23	FY 2023-24
Golen Gol	436	19	98	86	82	138	138	175
Jinnah Hydel	688	224	219	177	235	256	207	205
Khan Khwar	306	167	233	274	231	162	263	245
Gomal Zam	91	-	32	54	62	57	41	25
Malakand-III	553	362	399	408	320	354	268	222
Gulpur Hydro	465	-	-	34	257	230	305	268

2.1.16 Operation of Lucky Electric Power Company Limited on Local Coal:

The Lucky Electric Power Company Limited operates a 660 MW coal-based power plant located in the southern region of Pakistan, near Karachi. Initially licensed to run on imported coal, the plant later shifted its primary fuel source to local Thar coal, in line with the Government of Pakistan's commitment to utilize indigenous resources. However, pending the availability of local Thar coal, the plant has been permitted to operate on sub-bituminous imported coal until local supplies commence, which has yet to be materialized, leaving the plant reliant on imported coal.

Since achieving its COD on March 21, 2022, the plant's utilization factor has remained notably low, at 74.40% (FY 2022-23) and 37.80% (FY 2023-24), primarily due to this dependency on imported coal. This reliance has negatively affected the plant's overall utilization, as its position in the EMO diminishes with imported coal, often resulting in disqualification from dispatch orders from the system operator. Furthermore, operating the plant on imported coal places a significant strain on the national exchequer due to increased foreign exchange expenditures. The estimated loss from the underutilization of the plant, arising from the unavailability of local Thar coal since COD, is approximately Rs. 15,053 million.

To enhance reliance on indigenous resources and alleviate the forex burden, it is essential to expedite the continuous supply of local coal to the plant.

2.1.17 Maximizing the Potential of Thar Coal: Addressing Under-Utilization:

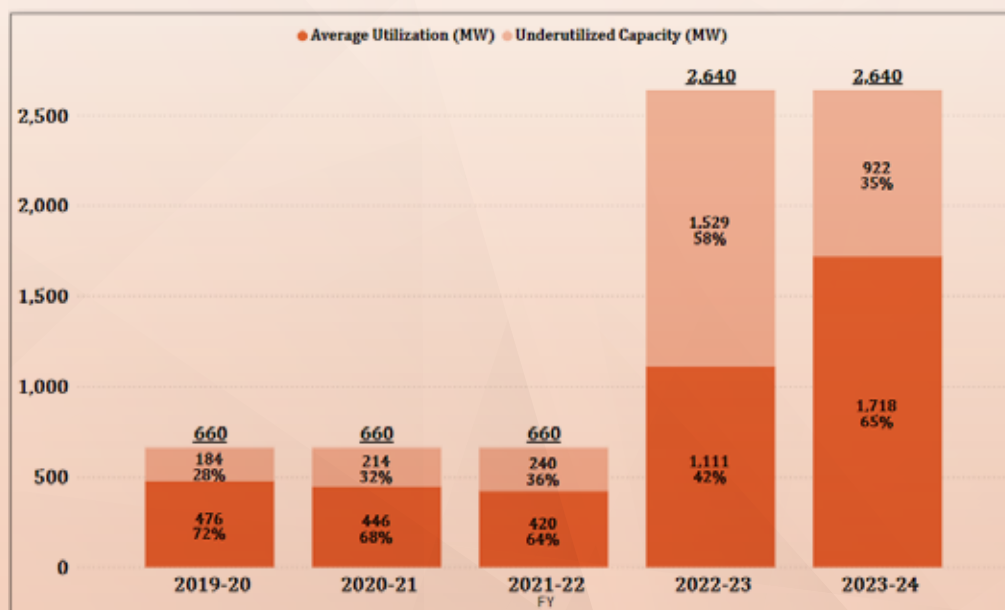
The commissioning of coal power plants at Thar, utilizing local Thar coal, was a national ambition aimed at achieving energy independence through indigenous resources. In this effort, significant power generation capacity has been added, operating on local Thar coal. The energy purchase price from these power plants is cost-effective, and they provide a source of electricity generated from local primary energy resources.

However, it has been observed that, over the past five years, the average utilization of the available generation capacity from local coal-based power plants has been relatively low. As a result, the goal of achieving a cheaper energy source in the national energy mix has not been fully realized.

For example, the Lucky Electric Power Company, which is capable of operating on Thar coal, has not been able to secure a reliable supply of local Thar coal. Similarly, other Thar coal-based plants have not been fully utilized due to a combination of internal operational issues, transmission constraints, and demand fluctuations within the power sector.

The graph below illustrates the average utilization of the installed capacity that can operate on Thar coal.

Trend of Capacity Utilization of Thar Coal Based Plants



2.1.18 Strategic Integration of Renewable Energy in Pakistan's Power System:

Renewable energy is increasingly recognized as a vital solution for enhancing energy security while delivering environmental friendly and cost-effective electricity. Pakistan, endowed with significant indigenous renewable resources—including wind, solar, hydro, geothermal, and bagasse—is strategically positioned to enhance energy security and achieve a sustainable electricity supply. The estimated potential of these resources is considerable, with wind power estimated at 346,000 MW, solar PV at 40,000 MW, hydropower at 64,000 MW, geothermal at approximately 500 MW, and bagasse at 2,000-2,500 MW.

Despite substantial potential, RE excluding hydropower currently constitutes only 6.92% of Pakistan's generation mix. Therefore, a significant opportunity exists for growth in the RE sector particularly given the country's vast solar and wind resources.

However, while planning to add generation capacity—regardless of the source—lessons must be learned from the present quagmire of underutilized capacity and high CPP payments against these RE power plants. It is essential to consider all associated costs, including those related to intermittency. While RE plants typically have no fuel costs, their capacity charges can impact tariffs negatively in the short and long term.

A viable strategy to mitigate these challenges is to promote decentralised solar generation at the individual level, supported by a rationalised net metering tariff. This approach could help address the sector's high-capacity charges issue while taking advantage of lower EPP. By focusing on these measures, Pakistan can effectively integrate renewable energy into the power system, enhancing both efficiency and sustainability.

2.1.19 Annual Dependable Capacity Test of Power Plants:

In Pakistan's power sector, the majority of power plants within the CPPA-G generation basket have two part tariff structure i.e. capacity and energy components. These plants qualify for capacity payments based on the dependable capacity established through initial and annual tests and plant availability, regardless of whether they are operational. The Annual Dependable Capacity (ADC) test, as mandated by the PPA, is important for confirming that these plants meet their contractual obligations for reliability and performance. This test is carried out once in an Agreement Year. This test evaluates the plant's ability to consistently generate electricity at the agreed capacity under standard operating conditions, with its results directly influencing capacity payments. In FY 2023-24, ADC test for fifteen (15) power plants were carried out.

A major challenge arises when these plants are not in operation due to low demand or their position lower in the EMO. Conducting the dependable capacity test under such conditions may require bypassing the EMO, which could lead to additional costs and potential disruptions. Conversely, if the test is not performed, the dependable capacity of such plants remains undetermined, which can impact the accuracy of capacity payments. The issue of not conducting the ADC test for public sector power plants is more serious, especially given their deteriorating dependable capacity compared to the capacity payments being invoiced. A collaborative effort is required from all stakeholders to develop a solution creating a balance in the operational efficiency, economic priorities, and compliance with contractual obligations. The power purchaser need to exercise greater vigilance in this matter.

2.1.20 Criteria for Determining Economic Merit Order:

The EMO is essential for minimising electricity generation costs and ensuring consumer affordability. Traditionally, the EMO ranks power plants based on the Fuel Costs Component (FCC) and variable Operations and Maintenance (O&M) costs. However, for a more comprehensive and accurate evaluation, additional factors such as PLAC, degradation factor, start-up charges, plant location etc. should also be considered. The PLAC, Degradation Charges, and Start-up Charges for FY 2023-24 were 55.671 billion, 5.745 billion, and 0.637 billion, respectively.

The evaluation process will be significantly improved by incorporating these parameters into the EMO criteria, for more precise plant rankings. Necessary adjustments in the applicable documents, wherever necessary, including Grid Code may be considered and proposed by the System Operator in this regard. Furthermore, the EMO is currently determined on fortnightly basis, ideally it should be determined on a shorter period such as day ahead.

2.1.21 Net-Metering Initiative: Progress and Challenges:

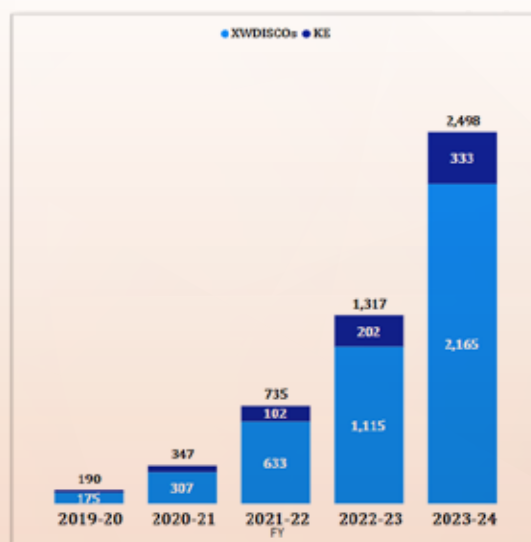
The net-metering initiative in Pakistan has demonstrated significant benefits, including, but not limited to, improved voltage stability and reduced T&D losses. The country has been rapidly embracing net-metering owing to drastically reduced prices of solar panels and financial benefit for the consumers. By June 30, 2024, over 156,372 distributed generation solar facilities with more than 2,200 MW of capacity, including KE, have been installed with net-metering arrangement. The number of net-metering

consumers within the country as on 30-06-2024 was 157,844 compared to 75,724 in FY 2022-23. The total capacity added from net-metering during FY 2023-24 was 1,181 MW, compared to 583 MW added during FY 2022-23 raising the total net-metering installed capacity to 2,498 MW within country. Despite the resistance from DISCOs in facilitating net-metering connections, the substantial increase in the number of net-metering consumers and their combined generation capacity over just one year underscores a growing dependence on alternatives to the national grid. The IGCEP 2022-31 sets forth an ambitious target to expand net-metering capacity by an additional 3,420 MW by 2031, highlighting a strong commitment to integrating green energy. If DISCOs do not hinder this initiative, it is anticipated that the current momentum towards roof top solarisation will enable the target to be achieved, much sooner than expected.

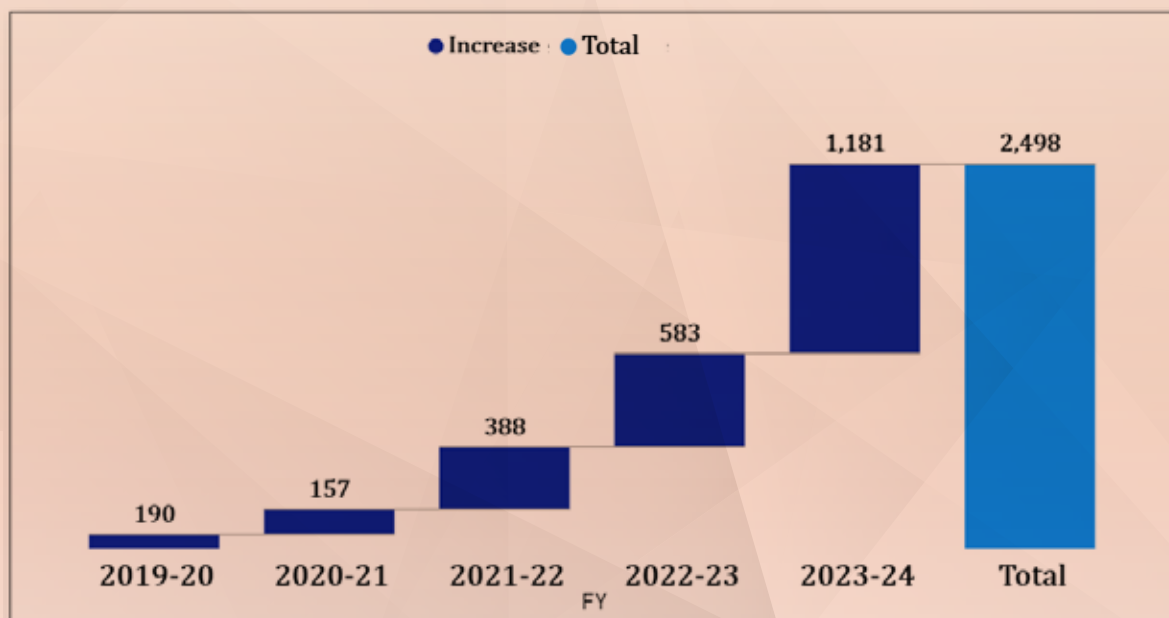
Net-Metering Consumers in DISCOs and KE



Installed Capacity of Net-Metering Consumers in DISCOs and KE



Trend of Net-Metering Addition (MW)



Given the proven advantages of distributed generation, there is a need to encourage rooftop solar installations, shifting focus away from large-scale solar projects, which require substantial long-term

capital and operational investments, while also burdening the government with sovereign guarantees and dollar-indexed tariffs due to the country's economic situation. The utility scale solar tariff, initially (reference) Rs. 17.117/kWh in FY 2017, rose to Rs. 49.136/kWh in year 2024. Rooftop solar projects offer distinct advantages: they incur no direct government financial commitment, are sited at load centres', minimise T&D losses, no indexations, no payment for NPMV, and improve voltage profiles. Furthermore, the financial liquidity of DISCOs is improved as they sell the electricity purchased from net-metering consumers and recover the amount against it but do not have to immediately pay the number of imported units to net-metering consumers.

Unfortunately, many DISCOs perceive net metering as competition rather than a complementary energy solution, which has led to delays in approval and installation. Numerous complaints have been filed with NEPRA and other forums regarding prolonged processing times, despite applicants meeting all necessary requirements. These delays undermine the potential benefits of renewable energy and grid efficiency. Additionally, reports of DISCO staff soliciting illegal payments to expedite applications exacerbate the problem, creating financial burdens for consumers and highlighting systemic inefficiencies and corruption. These practices erode public trust and violate principles of transparency and accountability, ultimately hindering the development of a sustainable, efficient energy system.

The details of fully processed new connection applications pending for net-metering connection in each DISCO, as of June, 2024, along with the accumulated generation capacity of solar facilities, are provided in the table below:

Company	Total No. of Net-Metering Pending Applications	Total Generation Capacity (KW) of Pending Applications
PESCO	288	2,588.68
TESCO	1	240.00
IESCO	1,363	12,276.00
GEPCO	117	6,282.00
LESCO	699	6,143.68
FESCO	871	12,399.51
MEPCO	548	5,364.19
HESCO	60	723.00
SEPCO	14	2,122.00
QESCO	8	519.00
KE	773	10,164.00
Total	4,742	58,822.06

A notable challenge faced by DISCOs with net metering is buy-back rates for excess units exported by the net-metering consumers, which is linked to the National Average Purchase Price (NAPP). As the NAPP has increased over time, the tariff for net-metering has also risen. Aside from the issue with buy-back rates, net-metering remains advantageous due to its low risk and liability profile. Considering the adoption of a well-balanced revised tariff structure for new net-metering connections, including renewal cases, could facilitate a more balanced outcome, beneficial for all stakeholders involved.

2.1.22 Delays in IGCEP Submissions and Approvals:

Under the Grid Code, NTDC is required to submit the IGCEP annually by a specified deadline. However, NTDC has consistently failed to meet this deadline, often submitting the plan late or, when submitted on time, providing a draft that does not meet the necessary quality standards for approval. These drafts have frequently lacked the required details and technical rigor, rendering them inadequate for thorough evaluation. The most recent draft IGCEP 2024-34 submitted by NTDC also contained significant deficiencies that required substantial revision. As a result, the draft was returned to NTDC for revision before it could be processed further. Unfortunately, NTDC failed to resubmit the revised draft within the required timeframe, preventing the regulator from approving it in a timely manner.

This delay in finalizing the IGCEP within the required time frame is adversely affecting the planning and development of the national power grid and hindering the long-term capacity expansion strategy.

To address these issues, NTDC must enhance its capacity to submit high-quality demand reflective drafts of the IGCEP within the stipulated deadlines, ensuring timely processing and approval. Given the recurring challenges in the submission process and the time-consuming nature of IGCEP preparation and approval, it is necessary to reconsider the current annual approval cycle. A more flexible approval period, such as once in two years, may be considered by all stakeholders to allow for a more thorough review and better alignment with the evolving needs of the power sector.

2.1.23 Assumptions and Horizon of the IGCEP:

The rapid growth of distributed generation technologies, particularly solar energy, coupled with declining costs for energy storage systems, is reshaping the global energy landscape. Consequently, Pakistan's power sector planning must be holistic, well-structured, and based on robust data and analysis to effectively navigate these changes.

The Grid Code 2023 mandates the annual preparation of the IGCEP with a minimum horizon of ten years, following the least-cost principle to address projected demand. However, despite these guidelines from the Grid Code, National Electricity Policy, and National Electricity Plan, there are notable inconsistencies in the quality and coherence of long-term planning outputs. Issues such as inaccurate growth projections and misaligned capacity additions point to deeper problems within the planning process.

A comprehensive and precise set of assumptions is essential for the effectiveness of the IGCEP as they significantly affect the outcomes and shape strategic decisions in the power sector. During the approval of the 1st iteration of the IGCEP, the CCI outlined specific tasks in its Decision dated September 13, 2021, for consideration of the subsequent IGCEPs. The CCI highlighted several key issues, including the criteria for declaring committed projects, the methodology for assessing strategic projects, and the inclusion of transmission costs in least-cost generation calculations. It directed the relevant agencies to take necessary actions. The CCI's directives are important and require immediate action from the relevant entities. To ensure that the IGCEP remains a reliable and credible document for guiding long-term, cost-effective power sector development—free from external factors that could undermine the country's long-term generation mix—implementing the CCI's decision is essential. The co-optimization of generation additions with the associated interconnection costs must be considered while preparing the IGCEP to present a complete picture of the actual impact the proposed generation capacity addition may have on the consumer-end tariff.

Further, the submission and approval process for the IGCEP is often more protracted than the timelines outlined in the Grid Code, leading to delays in decision-making and implementation. While the Grid Code suggests annual iterations, a revision cycle of every 2 year may provide more stability for investors and support long-term policy development by government institutions. A comprehensive review by stakeholders is essential to develop a robust IGCEP model.

2.1.24 Conversion of Water and Space Heating to Electricity:

Seasonal fluctuations in electricity demand, particularly the drop during winter, result in higher per unit capacity costs and increased consumer tariffs. To address this, the Government of Pakistan (GOP), in past, introduced subsidies for higher electricity use in winter. Another potential solution is converting water and space heating from gas to electricity, which could stabilise demand year-round and enhance the utilization of existing electricity infrastructure during winter season.

The shift to electric heating aims to address seasonal demand imbalances by increasing winter electricity consumption. This could improve power plant efficiency and reduce seasonal capacity costs. Following are the main considerations for the conversion:

- (a) **Transmission and Distribution:** Evaluate whether the existing infrastructure can handle the increased demand of electric heating and identify any necessary upgrades.
- (b) **Financial Viability:** Assess the cost-effectiveness of converting from fossil fuel to electricity, including impacts on overall energy costs and infrastructure investments.
- (c) **Impact on Gas Sector:** Analyse how increased electricity demand might affect gas availability, pricing, and sector sustainability.
- (d) **Operational Efficiency:** Consider how additional winter demand might necessitate the use of more expensive power plants, potentially impacting tariffs.

While converting heating systems to electricity could balance seasonal demand and optimise power plant use, it requires a thorough evaluation of infrastructure constraints, financial implications, and impacts on both the gas sector and power plant operations. A detailed study is essential to ensure economic viability and sectoral benefits.

2.1.25 Electrification of Transport and Electric Vehicle Charging Infrastructure:

The electrification of Pakistan's transport sector represents another promising opportunity to support the country's power sector in its energy transition. As Electric Vehicles (EVs) replace conventional, fossil-fuel-powered vehicles, the electricity demand will increase, but this shift will help reduce the country's dependency on imported oil and lower greenhouse gas (GHG) emissions. By integrating EVs into the energy system, the transport sector can leverage cleaner energy sources like solar and wind, thereby reducing overall carbon emissions and contributing to Pakistan's climate goals. Additionally, the increased electricity usage due to EVs can help balance the demand-supply curve, particularly during off-peak hours, making it easier to manage the grid. This can lead to improved grid solar and encourage the development of distributed energy resources like rooftop solar, and enable the deployment of energy storage systems. Moreover, the electrification of transport can strengthen the distribution network by incentivizing investments in smart grids and grid modernization, which are essential for handling the increased load from EV charging infrastructure. As reliance on electricity grows, the power sector can move away from volatile fossil fuel markets, making the energy system more self-sufficient and resilient to external economic shocks. Further, off-grid EV charging is also a promising option in areas where grid access is more limited or there is no grid access at all. To encourage the EV charging stations the tariff design has also been made attractive by applying flat rate on EVCs consumptions and no monthly FCA and fixed charges imposed on such connections.

2.1.26 Enhancing Energy Resilience: The Case for Gas Storage Development Facility:

Pakistan has a substantial capacity of RLNG power plants; however, these plants frequently rank lower in the EMO due to higher RLNG prices and other operational inefficiencies. A significant challenge is the violation of the EMO, primarily caused by gas pipeline issues – line pack issue, firm long-term RLNG supply Agreements, and the absence of adequate gas storage facilities. This lack of storage has led to operational challenges, forcing plants to run in violation of EMO and resulting in considerable financial losses for the power sector.

To mitigate these ongoing challenges, it is crucial to explore the development of gas storage facilities. Establishing such infrastructure could significantly enhance the flexibility of gas procurement and improve the operational reliability of RLNG plants. By acting as a buffer during periods of high demand or supply disruptions, gas storage would enable more efficient dispatch of power generation assets, facilitating alignment with the EMO.

Conducting a comprehensive economic viability study for gas storage facilities is essential to evaluate investment requirements, operational costs, and potential returns. This analysis should draw on best practices from countries that have successfully integrated gas storage into their energy systems, thereby boosting overall power generation efficiency. Strategic investments in this area are vital for fostering a more resilient and economically sustainable energy sector, ultimately supporting Pakistan's long-term energy objectives.

2.1.27 Transforming Pakistan's Power Sector: A Call for Strategic Reform and Effective Implementation:

The reforms for the power sector in Pakistan were initiated through the WAPDA's Strategic Plan for the Privatisation of the Pakistan Power Sector of 1992. While these reforms aimed to enhance the efficiency and reliability of the power sector, their execution faced significant challenges. A significant obstacle was the resistance—both explicit and implicit—to change from established legacy systems, coupled with slow decision-making processes and a reluctance to embrace bold initiatives. These factors severely hindered the effective implementation of the proposed reforms. Instead of delivering the intended relief to the power sector, the lack of proper execution contributed to a decline in its financial health, resulting in escalating losses and inefficiencies that persist to this day.

Despite the setbacks experienced over the years, there remains an urgent need to implement the WAPDA's Strategic Plan for the Privatisation of the Pakistan Power Sector developed in 1992 while factoring in the latest developments in the sector. A renewed commitment to reform and strategic execution is crucial for securing the future of Pakistan's energy sector.

2.2 TRANSMISSION SECTOR

2.2.1 Persistent Technical Constraints and Overloading in the NTDC Network:

The NTDC transmission network has been identified as a critical bottleneck hindering the delivery of affordable and reliable electricity. Although there is a substantial amount of economic power generation such as nuclear, Thar coal, and renewable energy, primarily located in the southern regions, the current transmission and transformation infrastructure is inadequate for transporting this cost-effective power to key load centres.

The congestion in transmission and the inadequacy of the transmission system have significantly affected the power sector, resulting in estimated losses of approximately Rs. 3.67 billion in FY 2021-22, Rs. 20.203 billion in FY 2022-23, and Rs. 60.386 billion in FY 2023-24.

The Authority has also engaged a third-party Consultant to assess performance of NPCC's operations. The Consultant has assessed the financial impact for four years from FY 2017-18 till FY 2020-21 and found losses of around Rs. 13 billion due to various constraints in the transmission and distribution system, and Rs. 437 billion due to non-availability of efficient and cost effective fuel. The report of the Consultant is under review.

To address these persistent issues, NTDC's transmission investment plan has outlined twenty eight (28) strategic projects aimed at resolving long-standing system constraints. These projects are crucial for enhancing grid stability, improving reliability, and alleviating overloading challenges within the network. The specifics of these projects, designed to remove technical limitations and boost overall performance, are detailed in the relevant chapter, "Performance of Transmission Sector", in this report.

2.2.2 Major Transmission System Constraints Impacting the Power Sector:

The transmission system in Pakistan faces numerous challenges, which significantly impact the financial health of the country's power sector. Key issues include overloaded and underutilized power transformers, as well as congestion in various sections of transmission lines and grids. Below are some of the major constraints affecting the power sector of Pakistan.

- (a) **500 kV New Rawat Grid Station Constraint:** Ongoing since June 2017, this constraint has led to the operation of a costly RFO power plant - Attock Gen.
- (b) **500/220 kV Nokhar Grid Station Constraint:** Since June 2018, delays in installing a 1x600 MVA transformer have resulted in expensive generation from Narowal Energy and Nandipur Power Plants.
- (c) **220 kV ISPR Sangjani and Islamabad University Grid Station Constraint:** Persistent since 2018, this constraint has hindered grid efficiency and delayed load relief efforts.

- (d) **220/132 kV Sundar and Kasur Grid Station Constraints:** Ongoing since June 2018, these constraints have necessitated costly RFO generation from Nishat Chunian, Nishat Power, and Kohinoor Power Plants.
- (e) **500 kV Sheikhpura Grid Station Augmentation:** Delays since August 2019 in upgrading transformers from 4x160 MVA to 4 x 250 MVA have forced reliance on expensive generation from Saba Power, Halmore Power, and Sapphire Electric.
- (f) **220 kV Kassowal, 500 kV Yousafwala, & 220 kV Vehari Grid Station Constraints:** These ongoing constraints since June 2017/2018 have necessitated costly generation from Fauji Kabirwala and Saif Power Plants.
- (g) **220 kV Daud Khel and Ludewala Grid Station Constraints:** Since 2018, these constraints have led to load management issues, resulting in load-shedding and reliance on Jinnah Hydel for interim relief.
- (h) **220 kV Kot Lakhpat, Ravi, and WAPDA Town Grid Station Constraints:** Ongoing since June 2019, these constraints have adversely affected grid performance and delayed critical infrastructure for load management.
- (i) **220 kV/132 kV Gujranwala-II Grid Station Constraint:** Since 2017, delays in completion have impacted the reliability of adjacent 220 kV Ghakkhar, Sahuwala, and 500 kV Nokhar Grid Stations.
- (j) **220 kV Switchyard of 500 kV Jamshoro Grid Station Constraint:** Ongoing since June 2017, this constraint has delayed the completion of Mirpurkhas Grid Station and forced less efficient grid operations.
- (k) **220 kV Quetta Industrial Grid Station Constraint:** Unresolved since June 2017, this constraint has caused reliability and overloading issues for industrial consumers due to delays in the 220 kV Mastung Grid Station.
- (l) **500 kV K2/K3-Port Qasim Transmission Line Constraint:** Since April 2022, this constraint has resulted in reliability issues, including a partial blackout in October 2022, pending the completion of the dedicated line by December 2024.

2.2.3 Frequent Tower Collapses:

A robust transmission network is critical for delivering electricity over long distances to load centres. However, there has been a troubling trend of frequent tower collapses in recent years, resulting in power outages, safety hazards, and disruptions to economic activities. The primary causes of these collapses include structural stress from extreme weather conditions such as heavy windstorms, thunderstorms, and tornadoes; damage from theft or sabotage; and inadequate inspection and maintenance of towers. During FY 2023-24, thirty-six (36) incidents of tower collapses were reported within the 500 kV and 220 kV transmission networks. Of these, 27 occurred within the NTDC network, while 9 in KE area. These incidents not only disrupt the transmission system but also pose significant risks to human safety and undermine the overall integrity of the network. A comparative analysis of tower collapses in the 500 kV and 220 kV networks over the past four years highlights an urgent need to improve resilience of transmission infrastructure and maintenance practices.

Region	FY 2020-21	FY 2021-22	FY 2022-23	FY 2023-24
South Region (Hyderabad+Quetta)	11	23	33	26
North Region (Islamabad+Lahore+Multan)	02	03	09	01
Total (South+North)	13	26	42	27
KE	15	02	04	09

NTDC need to enhance the design parameters by conducting comprehensive investigations and independent studies to strengthen the structural resilience of the transmission system.

2.2.4 Enhancing Efficiency in the National Power Control Centre:

The National Power Control Centre (NPCC) in Pakistan is fraught with inefficiencies stemming from

outdated technology, insufficient human resources, and various operational constraints. NPCC is facing enormous challenges arising largely from the lack of modern tools, inadequate real-time data, and systemic issues related to its structure.

NPCC has struggled with an incomplete Supervisory Control and Data Acquisition (SCADA) system, which is important for real-time grid monitoring, control, and efficient Security-Constrained Economic Dispatch (SCED). Although the SCADA-III project is underway with an anticipated completion by the end of the upcoming fiscal year, delays could exacerbate existing inefficiencies. Lack of a fully operational SCADA system continues to hinder NPCC's ability to manage and optimise grid performance effectively.

In addition, NPCC relies on outdated forecasting methods, using historical weather patterns and demand correlations without modern forecasting tools. This reliance results in suboptimal dispatch decisions undermining grid reliability and cost-effectiveness.

The technical constraints and a reactive approach to address them have intensified inefficiencies. NPCC's limited proactive measures and its lack of operational independence, as part of NTDC, have further obstructed progress and the resolution of critical issues.

As Pakistan moves towards a competitive electricity market, the role of NPCC becomes increasingly vital. The competitive market demands transparency, efficiency, and integration of advanced technology—requirements which cannot be met without modernization of NPCC both in terms of equipment and the practices.

To enhance reliability and efficiency in Pakistan's power sector, NPCC must focus on timely completion of the SCADA-III project, adopting modern forecasting tools to improve demand prediction, and shifting from a reactive to a proactive management approach. These steps are essential for facilitating transition to a competitive electricity market and ensuring a stable and cost-effective power supply.

2.2.5 Utilization of 660 kV HVDC PMLTC Line:

The 660 kV High Voltage Direct Current (HVDC) transmission line, extending 886 km from Matiari to Lahore, was developed to enhance power transmission, particularly for Nuclear and coal-based power, from southern to central Pakistan. NEPRA approved the project, with a capacity of 4,000 MW. During FY 2023-24, the HVDC line encountered several issues including the following:

- (a) System Stability Issues:** Stability concerns adversely affected the line's operation, contributing to its underperformance.
- (b) Infrastructure Deficiencies:** The necessary Alternating Current (AC) infrastructure, such as the 500 kV Lahore North Grid Station and related transmission lines, was not fully developed, limiting the line's effectiveness.

These challenges led to considerable underutilization of the HVDC line. During FY 2023-24, it transmitted only 13,226.60 GWh, achieving utilization factor of approximately 38%, well below the designed capacity.

The underutilization of the HVDC line imposed a substantial financial burden on end-consumers. Despite the reduced transmission output, capacity payments to PMLTC amounted to approximately Rs. 97.833 billion for the FY 2023-24 while transmitting 13,226.60 GWh, resulting in average per unit cost of Rs. 7.39/kWh. These facts underscore the need for a comprehensive review of the line's operational efficiency and associated cost implications.

The 660 kV HVDC line is a major investment in Pakistan's transmission infrastructure. However, its effectiveness has been compromised by demand constraints, system stability issues, and insufficient and incomplete AC infrastructure. These challenges need to be addressed through improved system planning and infrastructure development to mitigate negative financial impacts of the line and optimise its contribution to the national grid.

2.2.6 HVDC Strategy Table - South to North Power Transfer Constraints:

The HVDC strategy table, prepared by the system operator, outlines the constraints and capabilities for power transfer from the southern to the northern regions of Pakistan via the HVDC and High Voltage Alternating Current (HVAC) transmission corridors. This analysis carries importance for understanding how to maximise the efficiency and stability of power transfer across the country.

According to the system needs assessment report provided by the NTDC to the regulator, the Available Transfer Capacity (ATC) on the combined AC/DC corridors from south to north is as follows:

- (a) **Summer:** The ATC is limited to 4,500 MW.
- (b) **Winter:** During normal operations, the ATC reduces to 2,500 MW. However, this capacity further drops to 2,000 MW during maintenance mode.

These limitations are influenced by the interaction between the HVDC and HVAC systems. For instance, if the AC system is operating at a load of 1,800 MW, the HVDC line can carry up to 2,700 MW. This scenario leaves 1,300 MW of HVDC capacity unused due to the restricted capacity of the AC corridor. Conversely, if the HVDC line is utilized at 3,200 MW, the HVAC corridor can only handle an additional 1,300 MW, thereby constraining the total power transfer capability.

The NTDC report highlights that a single monopole of the HVDC system has an overload capacity of 2,200 MW. To fully utilize the HVDC link's total capacity of 4,000 MW, it is imperative to enhance the AC corridor's capacity by at least 1,800 MW. This enhancement is necessary to:

- (a) **Accommodate Additional Power:** Facilitate the additional power transfer from the HVDC link without compromising the stability of the system.
- (b) **Prevent System Instability:** Ensure the system can handle power transfers in the event of a monopole failure without risking transient instability, poorly damped power oscillations, or thermal overloading.

It's important to note that the more affordable energy generation is located in the south, while the demand for this energy is concentrated in the central region. Therefore, a robust transmission system is essential to effectively harness and distribute the benefits of this cheaper generation.

The HVDC strategy table, illustrates the critical constraints and potential of the HVDC and HVAC corridors for power transfer from south to north. To optimise the use of the 4,000 MW HVDC link, significant improvements in the AC corridor capacity are required. This enhancement will enable better utilization of HVDC capabilities, improve system reliability, and prevent operational issues related to overloads and instability. Addressing these capacity constraints through strategic planning and infrastructure upgrades will be essential for maximising the efficiency and effectiveness of Pakistan's power transmission network.

2.2.7 Vulnerable Areas in the High Voltage Transmission System of Pakistan:

The recent NTDC need assessment report reveals significant vulnerabilities in Pakistan's high voltage transmission system. Traditionally, efforts have focused on integrating new generators, removing system constraints, and expanding transmission infrastructure. However, delays and shortcomings in these initiatives have exposed two critical areas of concern: the southern half of the 500 kV network, and the Lahore ring.

- (a) **Jamshoro Grid Station:** In the southern half, the Jamshoro Grid Station is a critical congestion point due to its inadequate transmission capacity. It serves as the central hub for approximately 10,645 MW of bulk power generation from the south. Compounding the issue, the station is burdened by outdated equipment and suffers from critical understaffing. These factors significantly impair its ability to manage the high volume of power and respond to operational challenges effectively.

- (b) **Lahore Ring & HVDC Commutation Failure:** In HVDC systems utilizing Line-Commutated Converters (LCC), Commutation Failure (CF) is a significant concern. CF events, triggered by AC system faults, cause temporary interruptions in power transfer. At the Lahore Converter Station (LCS), CF events can last between 40 to 200 milliseconds. If AC faults are not resolved promptly, they can lead to subsequent CF occurrences, disrupting the stability of power transfer.

The vulnerabilities at the Jamshoro Grid Station and within the Lahore Ring signifies urgent need for infrastructure enhancements and strategic planning. To ensure the stability and efficiency of the national power grid, it is important to undertake targeted upgrades and make additional investments. Improving system planning, advancing infrastructure development, and implementing technological upgrades will be essential to addressing these vulnerabilities and supporting the country's energy needs.

2.2.8 Transmission Investment Plan of NTDC:

NTDC initially submitted its investment plan and losses assessment for FY 2022-23 to FY 2024-25 on September 23, 2022. Following this, NTDC revised its investment plan in July, 2023. The revised plan introduced 18 new projects and updated the budget for 33 existing projects, increasing the total investment requirement from Rs. 370 billion to Rs. 510 billion.

The revised Transmission Investment Plan (TIP) by NTDC aims to address critical system constraints and implement essential interventions to enhance system security and reliability. This comprehensive plan is designed to rectify existing limitations and bolster the overall stability of the transmission network. A summary of the projects included in the revised TIP is provided below:

S. No.	Head	Number of Projects	CAPEX (Million Rs.)	%
1	Constraints Removal Projects (CRPs)/ System Expansion Projects	51	172,681	34
2	Power Evacuation Projects (PEPs)	30	277,434	54
3	Projects for Special Economic Zones (SEZs)	5	30,369	6
4	Other Development Projects	13	29,621	6
Grand Total		99	510,105	100

The projects identified in this investment plan are currently in the execution stage. Timely completion of these projects will be important for providing reliable and cost-effective power supply, which is essential for meeting the country's energy demands and enhancing overall system stability.

2.3 DISTRIBUTION AND SUPPLY SECTOR

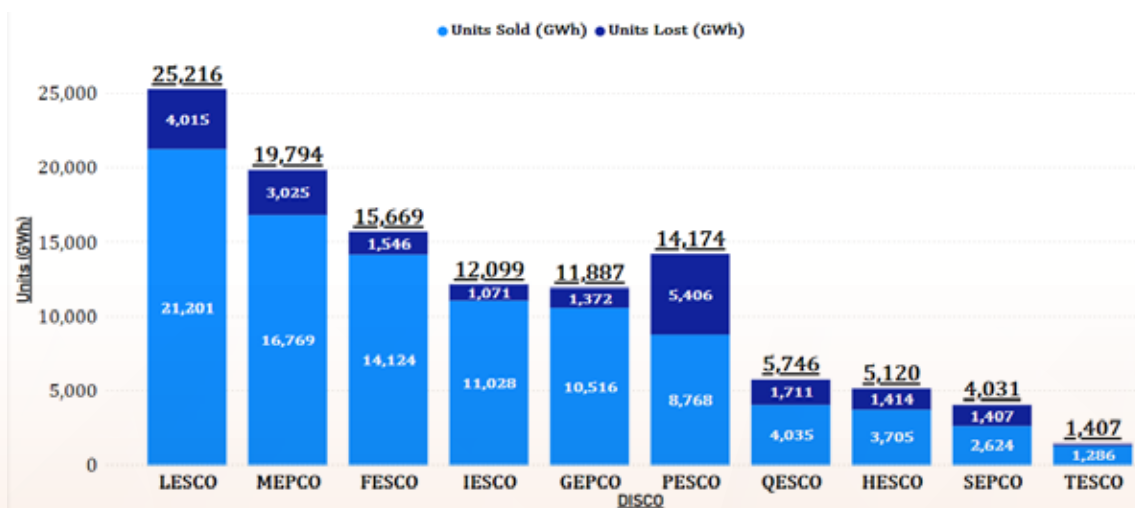
2.3.1 Transmission and Distribution Losses of DISCOs:

The performance of DISCOs has great bearing on the financial health of the power sector. DISCOs are, however, plagued with the high T&D losses and low recovery rates putting financial strain on the whole sector and substantially contributing to the circular debt.

For FY 2023-24, the data reveals that most DISCOs failed to meet the T&D loss targets set by the Authority, except for TESCO. It needs to be highlighted here that since TESCO does not have proper metering and billing arrangements and receives a significant amount of subsidies from the GOP, therefore, the T&D losses figures reported by TESCO are not true reflective of its actual operational performance. This shortfall has added a substantial amount of Rs. 276.35 billion to the circular debt.

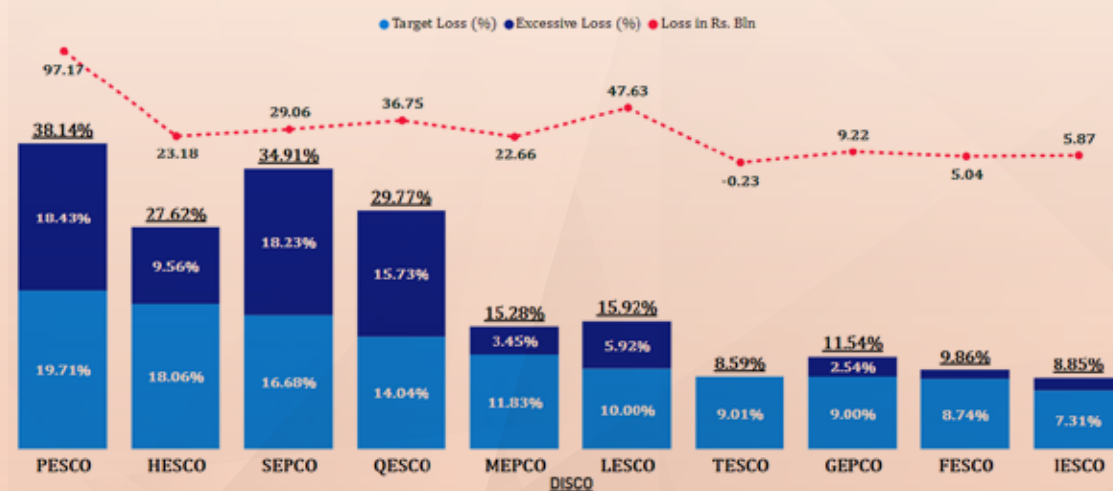
The following graph offers a comprehensive overview of each DISCO's performance during FY 2023-24. It displays the units purchased at the top of each bar, while the units sold, and units lost are represented within the bars. This clear visualisation facilitates an easy comparison of how much energy was acquired against what was successfully sold and what was lost.

DISCO-Wise Details of Units Sold/Lost



The following graph provides a detailed analysis of T&D losses for each DISCO, expressed as percentages. Total T&D losses for each DISCO are displayed at the top of each bar, while the allowed losses and any additional losses exceeding the targeted thresholds are shown within the bars. Additionally, the financial implications of lost units surpassing the target losses for each DISCO, measured in billion rupees, are highlighted with dotted lines.

Comparison of DISCO-Wise Losses (Actual vs Target)



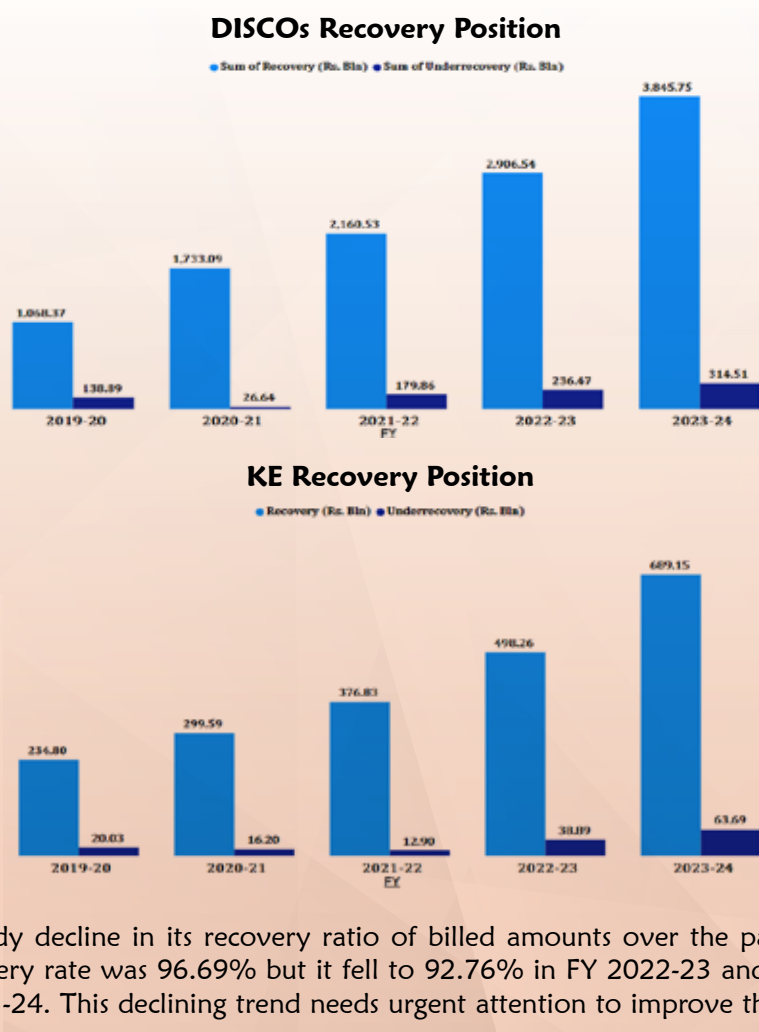
Together, the above two graphs provide valuable insights into the operational efficiency and financial performance of each DISCO during FY 2023-24.

Furthermore, the aggregate T&D losses of all DISCOs combined during FY 2023-24 have increased to 18.31% as compared to 16.84% during FY 2022-23. It is pertinent to highlight here that NEPRA's allowed average target of T&D losses for FY 2023-24 was 11.77%. Thus, all DISCOs combined have exceeded the target by 6.54%. This breach of target contributed around Rs. 276 billion in circular debt for FY 2023-24. This is despite the fact DISCOs have been allowed an investment amount of Rs. 163.1 billion for FY 2023-24 to improve their network.

The high T&D losses across various DISCOs highlight serious inefficiencies in both the distribution network and the supply business. To enhance financial stability and operational efficiency within the sector, it is essential to implement effective measures aimed at reducing these losses.

2.3.2 Less Recoveries of DISCOs and KE:

The Authority sets consumer-end tariffs for DISCOs based on the assumption of 100% receivables. However, despite the stringent recovery target set by the regulator, the combined recovery rate across all DISCOs for FY 2023-24 remained approximately 92.44%, as against last year's recovery of 92.39%. This recovery shortfall contributed an additional Rs. 314.506 billion to the circular debt during FY 2023-24, intensifying the financial pressure on the power sector. The following graph provides a recovery percentage and shortfall amounts (Rs. Billion) for all DISCOs (combine) including KE over the past five years.



KE has seen a steady decline in its recovery ratio of billed amounts over the past two years. In FY 2021-22, the recovery rate was 96.69% but it fell to 92.76% in FY 2022-23 and further dropped to 91.54% in FY 2023-24. This declining trend needs urgent attention to improve the financial health of the company.

Accurate billing is essential for improving recovery rates. There have been reports of overbilling practices employed by some DISCOs to artificially reduce reported T&D losses. Such practices result in inflated billed amounts, leading to ineffective recovery and further deteriorating the financial health of these entities.

The ongoing low recovery rates within DISCOs are indicative of deeper governance issues giving rise to the need for, fostering a culture of accountability in DISCOs. The Government, as the owner of DISCOs, should consider appropriate strategies to enhance recovery efficiency. Instead of imposing Debt Servicing Surcharge (DSS) and implementing disruptive measures like feeder shutdowns, which result in additional revenue losses, efforts should be diverted to pinpoint and address specific areas with low recovery rates.

A multi-faceted strategy to improve recovery rates and overall operational efficiency may include targeted training programs, the adoption of advanced technologies, the implementation of stringent performance metrics, and the cultivation of a supportive organisational culture. Effective execution of these measures can significantly enhance the financial stability of DISCOs and contribute to the long-term sustainability of Pakistan's power sector.

2.3.3 Load-Shedding Based on Aggregated Technical and Commercial Losses:

The practice of load-shedding based on Aggregated Technical and Commercial (AT&C) losses was introduced in FY 2014-15. The primary intent behind this policy was to curb the growth of electricity sales in high-loss areas—areas with both high technical losses (i.e., energy lost during transmission and distribution) and commercial losses (i.e., theft and non-recovery of payments). By reducing the supply to these areas, the policy aimed to reduce losses and incentivize better management of electricity distribution.

The following table outlines the load-shedding hours assigned to different categories of AT&C losses. The table categorizes areas based on their percentage of AT&C losses and determines the corresponding load-shedding duration:

Category	I	II	III	IV	V	VI	VII
AT&C Losses (%)	0–10	10.1–20	20.1–30	30.1–40	40.1–60	60.1–80	80.1 and above
Load-Shedding (Hours)	0	0	2	4	8	12	16

However, this policy has been fundamentally flawed, as it disproportionately affects honest consumers who are not involved in electricity theft and who pay their bills on time. Rather than targeting the root causes of high losses, such as improving infrastructure, enhancing governance, and reducing system inefficiencies, the policy has been exploited by DISCOs as an easy way to reduce their operational challenges.

Instead of addressing the systemic issues, DISCOs have opted for the simple but damaging solution of switching off feeders for extended periods, sometimes for more than 12 hours a day. This overuse of load-shedding in high-loss areas has not only resulted in significant inconvenience to paying consumers, but it has also led to the underutilization of available generation capacity.

The impact of this underutilization is twofold: First, it puts unnecessary pressure on the power sector's operational efficiency, as available generation capacity is not being fully utilized. Second, the resulting reduction in supply forces the cost per unit of electricity to increase, particularly the capacity component of the electricity tariff. When generation capacity is underutilized, it is spread across fewer units of electricity consumed, driving up costs for consumers who are already paying their bills on time.

Instead of continuing to rely on this short-term ineffective strategy, there needs to be a more focused effort on improving the infrastructure of the power distribution network, reducing technical losses, enforcing better governance and accountability within DISCOs. This would not only help in curbing electricity theft and improving revenue collection but also ensure a more equitable and sustainable power supply for all consumers, particularly those who are law-abiding and timely in their payments.

2.3.4 Capacity Charges for DISCOs: Transitioning to Coincidental Peak Demand:

Currently, capacity charges for DISCOs under legacy contracts are based on non-coincidental peak demand, which fails to accurately reflect their contributions to the system peak. This method allocates

charges solely on individual peaks rather than assessing overall impact, limiting incentives for DISCOs to minimize peak demand. Historically, calculating coincidental peak demand has been challenging due to the absence of a Secured Metering System (SMS) until the CTBCM test run began. Understanding coincidental peak demand is important for effective system planning and capacity payment allocation in a centralized market.

The outdated reliance on non-coincidental demand perpetuates inefficiencies and does not motivate DISCOs to optimize operations. Strategic Directive 45 of the National Electricity Plan calls for capacity from legacy contracts to be allocated based on coincidental system peak demand. With the CTBCM test run concluded and two years of SMS data available, transitioning to a coincidental peak-based invoicing system for DISCOs is essential. This change will ensure a fair distribution of capacity charges and foster a competitive environment where DISCOs can strategically manage their demand.

Implementing a coincidental peak demand billing structure aligns with regulatory framework and enhances market efficiency. By incentivizing DISCOs to reduce peak demand, this transition will lead to lower capacity payment invoices, ultimately contributing to a more resilient and sustainable electricity market in Pakistan, benefiting both DISCOs and consumers.

2.3.5 Higher Receivables of DISCOs and KE:

The persistent high level of receivables at DISCOs remains a significant concern for all stakeholders, as highlighted in various determinations and State of the Industry Reports. By the end of FY 2023-24, DISCOs' combined receivables amounted to approximately Rs. 2,017.065 billion, compared to Rs. 1,727.104 billion at the end of FY 2022-23. A detailed breakdown of receivables for each DISCO including KE over the past four years is provided below:

DISCO	Receivables (Rs. Million) as on June 30,			
	2021	2022	2023	2024
PESCO	146,612.08	194,892.99	215,062.85	246,106.62
TESCO	63,224.75	79,423.48	86,569.74	83,962.09
IESCO	82,098.00	100,748.83	73,957.67	89,447.32
GEPCO	32,906.00	45,392.99	43,030.67	60,497.06
LESCO	129,561.00	163,129.72	213,235.22	224,648.67
FESCO	54,222.48	73,157.60	71,285.76	86,116.63
MEPCO	69,343.48	100,753.45	109,598.79	128,871.11
HESCO	116,567.57	139,809.13	172,759.43	209,340.28
SEPCO	148,059.00	172,235.71	198,343.90	235,265.61
QESCO	346,905.69	460,955.69	543,260.44	652,809.99
Total	1,189,500.05	1,530,499.59	1,727,104.47	2,017,065.38
KE	198,645.66	197,881.83	233,068.19	303,811.15

This high level of receivables underscores the urgent need for a comprehensive recovery strategy. Recovery of these outstanding amounts from defaulters is critical. The high level of receivables raises concerns about potential billing manipulation, to artificially present improved T&D losses. If such malpractices are identified, it is essential to conduct thorough investigations into billing practices and hold the responsible personnel accountable. Accurate unit recording and billing are important for maintaining financial integrity and stakeholder trust.

The performance of officials within DISCO Sub-Divisions, Divisions, and Circles should be rigorously assessed with regard to AT&C losses. If improvements are not realised or sustained, appropriate corrective actions must be taken. Tagging the AT&C performance for relevant DISCO's officials could be used to effectively assess their performance. To address the issue of high receivables effectively, it is vital to establish independent committees comprising DISCO representatives and external professionals. These committees should carry out comprehensive audits to verify the accuracy of receivables and ensure transparency in billing and collections.

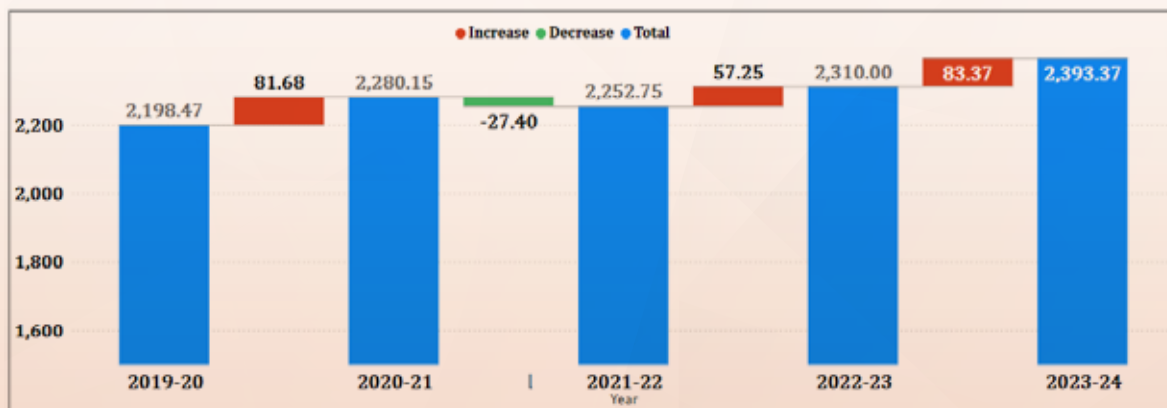
One notable aspect regarding receivable is that running defaulters soars up to Rs. 1,094 billion witnessing an increase of Rs. 194 billion for FY 2023-24 as compared to running defaulters of Rs. 900.82 billion for FY 2022-23. This aspect itself depicts the performance of DISCOs and also raise concerns on recovery undertaken during the fiscal year.

2.3.6 Circular Debt - Stock, Flow, and Accumulation:

Circular debt remains a significant challenge for Pakistan's power sector hindering economic development and impacting investors and consumers alike. As of June 30, 2024, circular debt of the power sector has surged to Rs. 2,393.37 billion, reflecting an increase of Rs. 83.37 billion from Rs. 2,309.997 billion at the end of FY 2022-23. This upward trend underscores the growing financial distress within the sector.

Circular debt has been a persistent issue in Pakistan's power sector, driven by a complex mix of financial mismanagement and operational inefficiencies. This ongoing problem highlights the urgent need for targeted interventions to address its underlying causes. The growth of circular debt is illustrated in the accompanying graph.

Increase/Decrease in Circular Debt (Rs. in Billion)



In FY 2023-24, due to T&D losses across all DISCOs in excess of regulator-approved levels, the sector faced an additional financial burden of approximately Rs. 276.35 billion. Moreover, shortfalls in the recovery of billed amounts added Rs. 314.506 billion to the circular debt. The situation is further worsened by approximately Rs. 1,094.936 billion in outstanding dues from running defaulters, whose unpaid bills continue to put immense pressure on the system. The increase in circular debt for FY 2023-24, remained around Rs. 83 billion, which is lower than the actual, primarily due to the fact that some payment has been made through the fiscal space.

The substantial volume of unpaid dues highlights deeper systemic issues within DISCOs. To address these challenges effectively, it is important for DISCOs owner to conduct thorough investigations to pinpoint the root causes of collection failures and implement comprehensive measures to improve financial management and operational efficiency. Imposing a DSS to address circular debt harm both consumers and the economy.

To address circular debt effectively, a detailed and coordinated plan is required. First, structural reforms must be introduced to streamline operational processes, improve management practices, and ensure greater accountability. Second, investing in advanced technologies is critical to boost efficiency and minimise financial losses. Additionally, robust systems must be implemented to ensure timely recovery of billed amounts. These measures are essential to stabilise Pakistan's power sector and secure its long-term sustainability, ensuring lasting benefits for both consumers and investors.

2.3.7 Quarterly Adjustments of DISCOs and KE:

Under Section 31(7) of the NEPRA Act, 1997, the Authority is empowered to make quarterly adjustments to the approved tariff to account for changes in capacity and transmission charges, transmission and distribution losses, variable operation and maintenance costs, and other policy guidelines issued by the Federal Government. These adjustments must be communicated to the Federal Government before being published in the Official Gazette and are reflected in consumers' monthly bills. For the FY 2023-24, the quarterly adjustments for DISCOs have been calculated and applied as follows:

Quarterly Adjustments Period	Allowed National Average (Rs./kWh)	Applicability Period (with effect from)
3 rd Quarter FY 2022-23	1.2489	July, 2023 to October, 2023
4 th Quarter FY 2022-23	3.2814	October, 2023 to March, 2024
1 st Quarter FY 2023-24	1.1502	January, 2024 to March, 2024
2 nd Quarter FY 2023-24	2.7492	April, 2024 to June, 2024
3 rd Quarter FY 2023-24	Rs. 1.90/kWh for June, 2024 and Rs. 0.93/kWh for July and August, 2024	June, 2024 to August, 2024

Source: NEPRA

In addition, the Authority also decided the following quarterly/annual adjustment requests of KE as per its Multi-Year Tariff (MYT) determination mechanism:

Quarterly Adjustments Period	Decision Dated	Quarterly Adjustment (Rs./kWh)
July, 2022 to September, 2022	August 04, 2023	(3.3064)
October, 2022 to December, 2022	August 04, 2023	2.4805
January, 2023 to March, 2023	January 01, 2024	2.8680
April, 2023 to June, 2023	August 02, 2024	6,690 (Rs. Million)

Source: NEPRA

These quarterly adjustments reflect fluctuations in various operational costs and policy impacts, ensuring that the tariff remains aligned with actual cost conditions and regulatory requirements.

2.3.8 Monthly Fuel Charges Adjustments of DISCOs and KE:

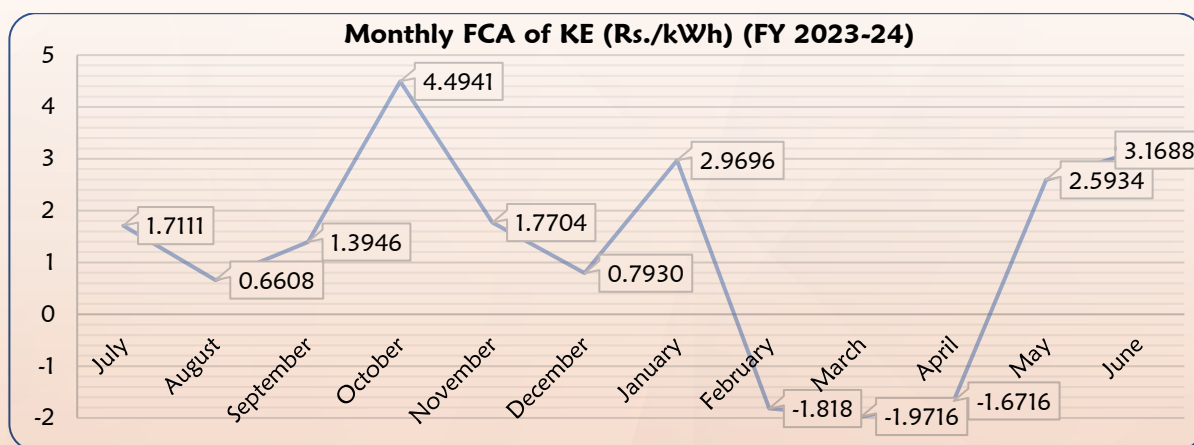
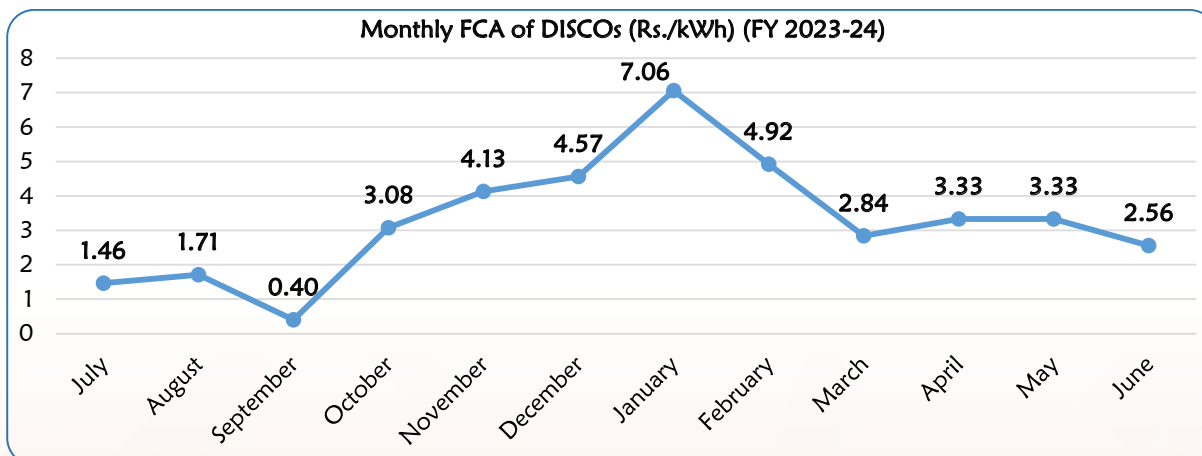
In accordance with Section 31(7) (iv) of the NEPRA Act, 1997, the Authority is mandated to adjust the approved base tariff for fuel price variations on a monthly basis, within a seven-day period. This adjustment is important to reflect the fluctuations in fuel costs and their impact on the generation cost of electricity.

The Authority approved the power purchase price based on projected electricity generation and expected fuel prices for different sources. These projections are adjusted later to reflect actual figures, with any changes—whether increases or decreases—passed on to consumers as monthly fuel charge adjustments.

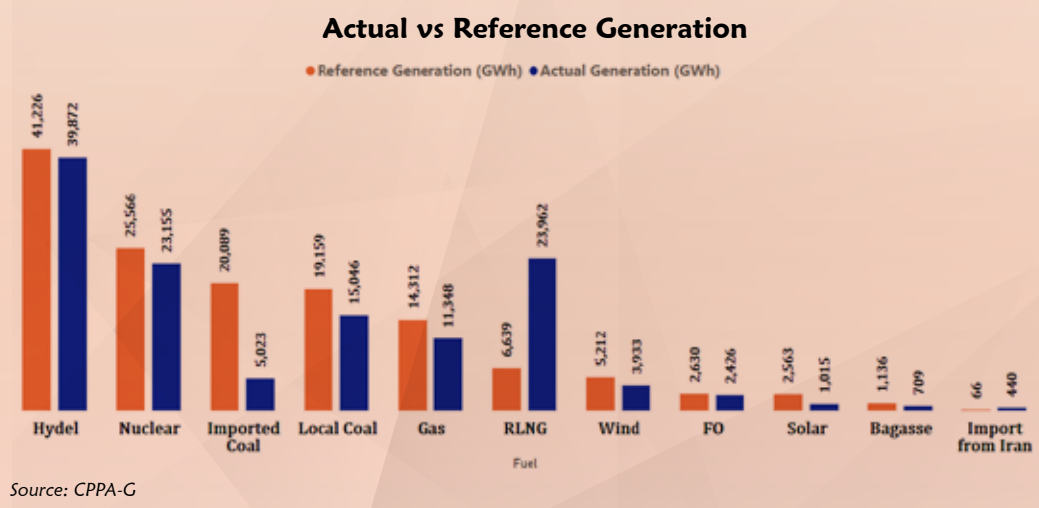
The adjustment process calculates the fuel charge for each DISCO based on their specific energy purchases, including those from the CPPA-G, bilateral contracts (CPP and SPP), and net metering. According to the uniform tariff rules set by the NEPRA Act and the National Energy Policy, NEPRA determines a National Average Uniform Fuel Charge Adjustment (FCA), which applies to all consumers except lifeline consumers. FCA for KE is determined separately.

During FY 2023-24, the FCA changed significantly due to fluctuations in fuel prices and variations in the generation mix. The details regarding fuel cost adjustments for FY 2023-24, along with the factors influencing these adjustments, such as fuel prices, generation mix, and exchange rate variations, are given in the following graphs:

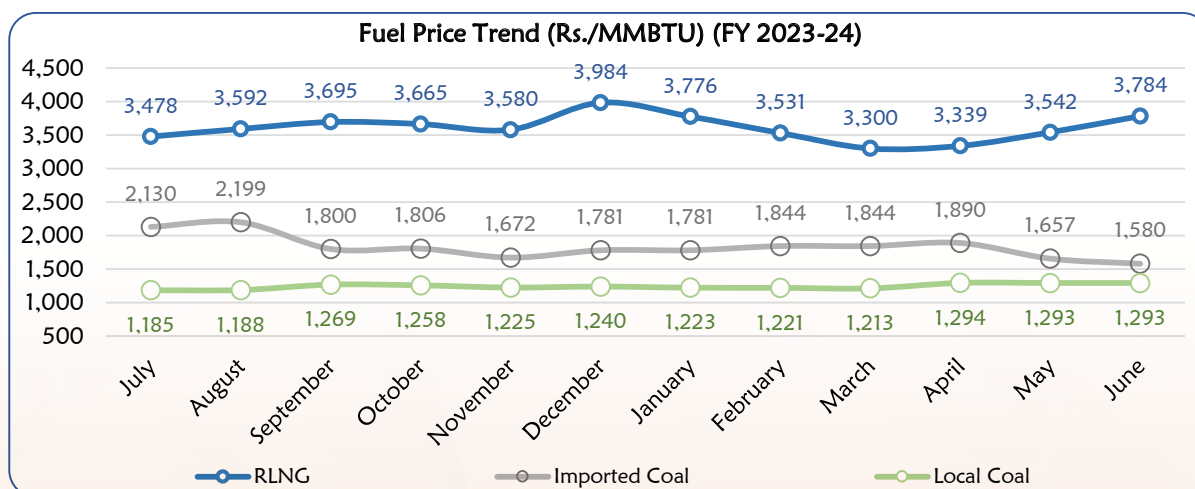
The monthly FCA for the CPPA-G and KE systems for the FY 2023-24 are given in the following two graphs.



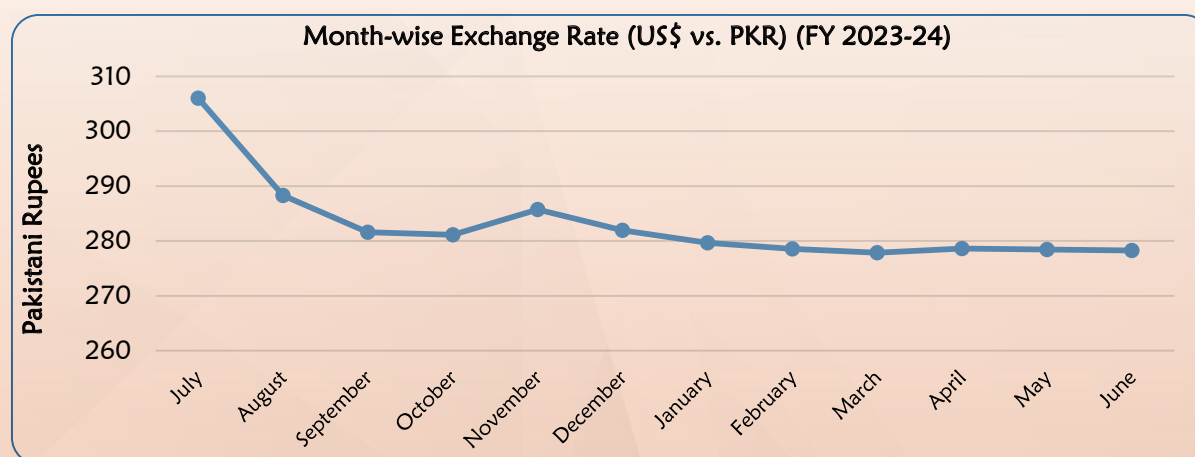
The projected vs. actual generation for FY 2023-24 across each fuel source is displayed in the following graph:



The month-by-month trend of fuel prices for RLNG (Rs. million/MMBTU), Imported Coal (Rs. million/metric ton) and Local Coal (Rs. million/metric ton) is presented in the following graph:



Since, fuel prices are linked with the rupee-to-dollar exchange rate, therefore, the position of PKR vs US\$ parity during the FY 2023-24 is illustrated in the following graph:



Together, these graphs provide a clear overview of the factors affecting power pricing. They help stakeholders understand how fuel costs impact consumers and encourage more informed discussions about energy pricing and policy.

2.3.9 Cross-Subsidization among DISCOs:

The practice of cross-subsidization within the power sector is one of the major issues that impacts the overall efficiency and financial stability of DISCOs. Under the Government's uniform tariff policy, DISCOs are required to charge a uniform rate to their consumers. When a DISCO's regulated tariff is lower than the notified tariff, it is not allowed to pass these savings directly to its consumers. Instead, it imposes a Tariff Rationalization Surcharge (TRS) to bridge the difference. Through this mechanism the consumers of DISCOs with lower tariffs subsidise the consumers of DISCOs with higher operational costs. The details of DISCOs regarding the provision and receipt of cross-subsidies (Rs. Billion) during FY 2024-25 are outlined below:

FY 2024-25 (Determined Tariff)	Determined Revenue	Revenue based on Uniform Tariff	Subsidy	Surcharge
PESCO	444.89	441.75	3.14	-
TESCO	71.32	48.99	22.33	-
IESCO	345.69	411.57	-	(65.88)
GEPCO	368.55	382.72	-	(14.17)
LESCO	799.96	839.50	-	(39.53)
FESCO	535.76	525.08	10.68	-
MEPCO	629.73	635.93	-	(6.19)
HESCO	209.62	151.48	58.14	-
SEPCO	136.32	124.00	12.32	-
QESCO	226.11	206.94	19.17	-
All DISCOs	3,767.96	3,767.96	125.78	(125.78)

This cross-subsidization practice, where relatively efficient DISCOs shoulder the financial burden for less efficient counterparts, inadvertently undermines efficiency and perpetuates operational shortcomings. The inefficiencies of some DISCOs are masked by the financial contributions of others, encouraging indifference to improve performance and operational standards.

To address this issue, it is imperative to review and reform the current subsidy structure compelling low performers to improve their efficiency and mitigate the financial burden on the sector.

2.3.10 Strategies for Optimizing Tariff Structures and Surplus Capacity Management:

The sector is currently burdened by excessive power generation capacity, which exacerbates financial strain when such capacity remains underutilized. The existing tariff structure, which penalises higher consumption, further hinders the effective use of these generation assets. This misalignment results in significant financial inefficiencies, as the sector is obligated to pay for surplus capacity that is not being utilized effectively.

To address the financial instability and underutilization of infrastructure in Pakistan's power sector, a strategic approach is needed to manage surplus power generation capacity through tariff reforms. The existing tariff approach, which imposes progressively higher rates for increased consumption, discourages higher usage and conflicts with the goal of maximising the utilization of installed capacity.

A comprehensive re-evaluation of the tariff approach is essential. Focus should be on either incentivizing higher electricity consumption to better utilize the surplus generation capacity or decommissioning excess capacity that is no longer economically viable. Incentivizing increased usage through revised tariff policies could help absorb the surplus capacity, reducing financial pressure and help reduce the circular debt. Alternatively, decommissioning redundant capacity could alleviate the financial burden associated with long-term contracts.

Ultimately, addressing both the tariff structure and the management of surplus generation capacity is important for improving the power sector's efficiency and financial health. Clear strategies are needed to either optimise the use of existing capacity or reduce it to prevent unnecessary financial strain. These measures will be key to achieving a more stable and effective power sector, capable of overcoming current operational and economic challenges.

2.3.11 Issue of Inflated and Excessive Billing in DISCOs:

During the FY 2023-24, the issue of overbilling by DISCOs has arisen on two occasions. NEPRA conducted inquiry in both cases and the details are as under:

First Inquiry: NEPRA received a number of complaints regarding inflated electricity bills for July and August 2023, leading to a thorough inquiry into the practices of DISCOs. The inquiry uncovered significant discrepancies, primarily related to excessive billing cycles that exceeded the mandated 30 days. This mismanagement resulted in the improper reclassification of consumers, causing many to shift from lifeline to non-lifeline or from protected to unprotected status. Over 2.6 million consumers in

MEPCO and 1.2 million in GEPCO were notably impacted, with many bills lacking valid meter reading snapshots.

The inquiry also revealed that DISCOs failed to replace defective meters promptly, leading to extended periods of average billing—some cases extending back over three years. Furthermore, questionable detection billing practices contributed to alarmingly low recovery ratios in regions such as HESCO and SEPCO, where only 5% and 6% of these bills were successfully collected. This mismanagement not only heightened consumer dissatisfaction but also exacerbated AT&C losses, leading to increased load-shedding hours.

Based on these findings, NEPRA directed all DISCOs to: (a) adjust bills to accurately reflect 30-day billing cycles using pro-rata calculations, ensuring proper alignment of consumer slabs; (b) conduct a comprehensive review of inflated bills to ensure compliance with established billing practices; and (c) promptly replace defective meters to enhance service reliability. Additionally, the Authority initiated legal proceedings against all DISCOs for regulatory violations.

Second Inquiry: For the months of April to June 2024, NEPRA received a significant influx of complaints regarding inflated electricity bills, marking the second wave of such concerns within the same fiscal year. In response, NEPRA launched comprehensive inquiries into the practices of DISCOs during this period. These investigations uncovered substantial discrepancies primarily linked to improper billing practices, particularly the misuse of pro-rata adjustments for meter readings. Many DISCOs recorded meter readings in less than the mandated 30 days and compensated for this by projecting additional units onto consumer bills. This practice led to mismatches between snapshot and indexed meter readings, causing numerous consumers to be reclassified from protected to unprotected categories or from lifeline to non-lifeline status, resulting in higher tariff slabs and increased financial burdens.

As a result of these improper adjustments, over 404,000 consumers faced adverse reclassifications for billing periods shorter than 30 days. Additionally, defective meters emerged as a critical factor contributing to inflated bills, leading to widespread dissatisfaction and confusion among consumers regarding their billing status.

In light of these findings, NEPRA directed all DISCOs to align their billing practices with established tariff conditions, ensuring strict adherence to the 30-day meter reading standard. Legal proceedings were initiated against DISCOs for regulatory violations, and they were also directed to replace defective meters promptly to prevent future instances of average billing.

The inorganic management practices employed by DISCOs to tackle losses and recovery issues have raised serious concerns in the electricity sector. Instead of pursuing sustainable solutions, some DISCOs have resorted to artificially inflating bills and manipulating billing categories, often enforcing strict recovery measures that unfairly burden consumers. This approach can yield short-term gains but undermines long-term consumer trust and satisfaction. By neglecting critical issues such as outdated infrastructure and faulty metering systems, DISCOs risk deepening consumer dissatisfaction and perpetuating a cycle of non-payment. A more effective strategy would prioritise transparency, consumer engagement, and investment in technology to create a reliable and equitable electricity distribution system.

2.3.12 Faulty Electricity Meters: A Growing Concern for Consumers:

A significant number of consumer complaints filed with the Federal Ombudsman, DISCOs, NEPRA, and provincial inspection offices are related to metering and billing discrepancies, with defective meters and average billing being a primary cause. These faulty meters often result in inaccurate readings, leading to either inflated or undercharged bills. In addition to billing errors, incorrect readings can also cause misclassification of consumers between tariff categories—such as shifting from Lifeline to Non-Lifeline or from Protected to Unprotected status. Such misclassification can have serious financial consequences, particularly for vulnerable consumers who rely on subsidies or protective tariffs.

It has been observed that DISCO staff sometimes exploit defective meters to manipulate billing outcomes, either to unfairly benefit consumers or the DISCO. In certain cases, faulty meters are left unresolved or intentionally deployed, leading to inaccurate billing. Frequently, these defective meters record fewer units (average reading) than actual consumption, resulting in under-billing that benefits consumers for reasons known only to those involved. Conversely, defective meters may also register more units (average reading) than actually consumed, benefiting the DISCO by inflating revenue and improving T&D loss figures, or serving other personal interests of the staff. Under Clause 4.3.1 of the Consumer Service Manual (CSM), DISCOs are required to replace defective or tampered meters within two billing cycles. However, a significant backlog in meter replacements exists, particularly in the MEPCO, LESCO, and FESCO regions.

Under Clause 4.4 of the CSM, DISCOs are responsible for the cost of replacing defective meters unless the damage is caused by the consumer. Despite this, it is reported that, DISCOs often charge consumers for meter replacement costs, either officially or unofficially, even when the defects are not caused by the consumer.

To address these issues, stricter monitoring, enhanced accountability, and prompt replacement of faulty meters are essential. The table below presents the status of defective single-phase and three-phase meters across various DISCOs including KE as of June, 2024.

Name of DISCO	Single Phase		Three Phase	
	Available Meters	Defective Meters	Available Meters	Defective Meters
PESCO	41,731	-	11,641	108
TESCO	278	31	32	10
IESCO	166,945	11,509	16,353	944
GEPCO	301,585	15,411	1,657	636
LESCO	54,742	53,982	131	4,122
FESCO	39,457	22,372	9,606	1,040
MEPCO	100	46,717	13	1,100
HESCO	5,866	603	1,802	28
SEPCO	19,756	19	2,409	10
QESCO	24,461	3,573	4,511	253
KE	87,984	16,631	18,284	2,030
Total	742,905	170,848	66,439	10,281

2.3.13 The Challenges of High Electricity Tariffs in Pakistan:

The dilemma of high electricity tariffs in Pakistan presents significant challenges across multiple sectors, impacting consumers, the economy, and the overall energy landscape. Various inefficiencies, as well as supplemental charges, have contributed to elevated electricity costs. While these rising tariffs aim to reflect the actual cost of electricity and alleviate the financial deficits of state-owned utility companies, they disproportionately affect low-income households that already allocate a substantial portion of their income to energy expenses. This economic strain extends beyond residential consumers, adversely impacting commercial and industrial sectors as well, ultimately stunting overall economic growth and development.

Furthermore, the financial repercussions of increased electricity tariffs significantly burden the government budget, as rising costs have escalated expenditures on electricity consumption across various government sectors. The billing amount for government connections across all DISCOs, including KE, which stood at Rs. 204.64 billion during FY 2019-20, has now increased to Rs. 512.59 billion in FY 2023-24.

Such a situation diverts critical resources away from essential development projects and deters investment, with both domestic and foreign investors becoming increasingly wary of entering a market characterised by high operational costs. Therefore, it is essential to address the inefficiencies and underlying factors including high supplemental charges driving these elevated tariffs to foster a sustainable energy sector and ensure broader economic stability in Pakistan.

2.3.14 The Real Impact of the Anti-Theft Initiative:

Pakistan's power sector is grappling with a severe circular debt crisis, primarily caused by high T&D losses, poor recovery of billed amounts, and large receivables from defaulters. Law-abiding consumers are unfairly burdened with a Circular Debt Surcharge of Rs. 3.23/kWh, while even protected consumers pay Rs. 0.23/kWh. It is an injustice that honest consumers are effectively paying for the defaults of others, whether these defaulters are genuine or appearing on record due to mismanagement by DISCOs. A significant cause of the high receivables is the overbilling of non-existent or non-using consumers, a practice, reportedly, used to artificially manage T&D losses.

In an effort to address this, the government launched a comprehensive Anti-Theft Campaign from September 07, 2023, to September 12, 2024. This initiative aimed to tackle electricity theft and included a large number of cases, FIRs, arrests and the suspension of employees. Despite these efforts, the financial recoveries were minimal, amounting to just Rs. 15.251 billion from defaulters and Rs. 8.323 billion from fines and penalties—far lower than the overall outstanding receivables. Meanwhile, during FY 2023-24 alone, T&D losses and non-recovery of billed amount continue to rise, adding Rs. 591 billion to the circular debt.

While the campaign has raised awareness and resulted in some recoveries, its long-term success depends on comprehensive reforms within DISCOs. There must be improvements in governance, operational efficiency, and the strict enforcement of regulations to effectively tackle theft and stabilize the financial health of the sector through recovery of all billed amount. Mismanagement, over-billing, and premature revenue collection, as evidenced by recent incidents, undermine consumer trust and hinder the campaign's effectiveness. Without sustained systemic reform, the circular debt crisis will persist and continue to destabilize Pakistan's power sector.

2.3.15 Detection Billing: A Burden on Consumers:

Detection billing, as per NEPRA, is intended to correct discrepancies in meter readings caused by faulty meters, unauthorized usage, or theft. However, concerns have arisen regarding its misuse by certain DISCOs. Instead of addressing genuine issues, some DISCOs use detection billing to cover T&D losses or inflate their financial performance, unfairly burdening consumers.

Detection bills are sometimes issued to artificially boost revenue, without verifying accuracy, leading to further financial strain on consumers. This lack of transparency and the perception that detection billing is used for financial manipulation has caused widespread dissatisfaction, eroding trust in the system.

Correcting unjustified detection bills is a significant hassle for consumers, requiring considerable time and resources. The lack of a customer-centric approach within DISCOs exacerbates this issue, creating further difficulties for consumers. In many cases, consumers are forced to pay these bills, not because they believe them to be accurate, but because they lack the time, resources, or financial means to challenge them. This systemic issue not only places an unfair burden on consumers but also opens the door for corrupt practices, as the cumbersome process to dispute bills leaves many vulnerable to exploitation.

In the last quarter of FY 2023-24 (April to June 2024), detection billing impacted 1.38 million consumers, totalling approximately Rs. 35 billion. The table below outlines the details of detection bills issued by each DISCO, including the number of consumers, detection units charged, billed amounts, and payments received. The low recovery rate raises concerns regarding the accuracy and effectiveness of the detection units.

DISCO	Consumers	Units	Amount	Payment
PESCO	70,506	41,843,117	1,520,698,544	450,828,758
IESCO	12,703	7,122,256	349,847,259	345,914,617
GEPCO	66,743	9,142,235	118,621,261	861,297,270
LESCO	38,712	70,460,167	3,736,596,058	1,176,244,421
FESCO	46,757	10,771,774	360,641,348	630,188,804
MEPCO	91,553	24,880,851	760,198,646	1,376,742,310

DISCO	Consumers	Units	Amount	Payment
HESCO	492,490	305,767,717	7,609,535,270	338,911,052
SEPCO	556,091	364,192,884	13,157,354,458	411,975,922
QESCO	7,446	3,747,104	195,852,691	144,854,134
KE	n.p.	122,839,593	7,441,637,116	n.p.
Total	1,383,001	960,767,698	35,250,982,651	5,736,957,288

To restore fairness, DISCOs must strictly follow NEPRA's guidelines, issuing detection bills only for legitimate discrepancies, with clear evidence. Efforts should focus on reducing T&D losses through infrastructure improvements, ensuring consumers are treated fairly, and rebuilding trust in the system.

2.3.16 Solarization: A Pathway to Sustainable Energy:

(a) Challenges of Rural Electrification in Pakistan

Providing electricity to rural and remote areas in Pakistan presents significant logistical and economic challenges for DISCOs. Extending the national grid incurs high infrastructure costs, which often exceed the potential revenue from these connections, making it financially unfeasible. This strains DISCOs, broader consumers, and national finances. Given the large rural population, Pakistan has significant potential for solar power, offering a viable alternative.

Instead of solely expanding the grid, renewable energy-based micro-grids and mini-grids are effective solutions for decentralized electricity access in rural areas. Solar micro-grids reduce infrastructure costs while improving reliability and affordability. A Public-Private Partnership (PPP) model can incentivize private investment through subsidies, tax relief, and soft loans, making these projects financially viable.

Integrating solar power into Pakistan's energy mix enhances rural energy access, improves grid reliability, and reduces the burden on national finances, offering a sustainable, cost-effective solution for remote areas.

(b) Solarization of Agricultural Connections

The agricultural sector, often located in remote rural areas, poses significant challenges for DISCOs in providing reliable electricity due to technical constraints and the high costs of infrastructure. In this context, solarizing agricultural tube wells presents an effective solution that benefits all stakeholders.

In FY 2023-24, agricultural consumers across all DISCOs, including KE, consumed 8,578 GWh of electricity, resulting in a total billing of Rs. 343.05 billion. However, only Rs. 236 billion was recovered, reflecting a recovery ratio of 68.79%. This highlights challenges in revenue collection, driven by poor payment habits and high delivery costs to remote areas.

Solarizing tube wells can alleviate the burden on DISCOs by reducing reliance on grid electricity, while providing farmers with a more stable, affordable, and sustainable power source. This approach not only reduces infrastructure costs but also creates a more predictable revenue stream for DISCOs. Furthermore, solar energy reduces the carbon footprint of agricultural operations, contributing to sustainability goals. In summary, solarization of agricultural tube wells offers a cost-effective and environmentally friendly solution for enhancing energy access, improving revenue collection, and promoting sustainable agriculture.

(c) Government Initiative for Solar Panel Distribution to Residential Consumers

The government initiative to provide solar panels to domestic electricity consumers, particularly those currently receiving subsidies or cross-subsidized by other consumers, presents a promising opportunity, especially in rural areas. This initiative has the potential to benefit all stakeholders, including power sector entities, the government, and electricity consumers.

From the government's perspective, this initiative can significantly reduce subsidy expenditures, allowing for the reallocation of resources to other critical sectors, thereby improving fiscal efficiency.

For consumers, the solarization of households provides access to reliable electricity for extended periods—potentially over 12 hours a day—especially when combined with battery backup systems. In rural areas or places with no grid access, this enhancement in energy access can substantially improve the quality of life, support local businesses, and stimulate economic activities that rely on a stable power supply. By ensuring more consistent and affordable energy, the initiative can foster long-term socio-economic growth in underserved communities.

(d) Government Subsidy vs. Solarization of Low-Income Consumers

The government allocates substantial subsidies, particularly to residential and agricultural consumers, focusing on life-line and protected users. However, the escalating cost of these subsidies and the growing burden of cross-subsidies are placing significant financial pressure on both the national exchequer and the electricity consumers who subsidize these costs. A promising solution is to incentivize solar energy systems with integrated battery storage for low-income households while gradually reducing subsidies. This strategy would foster energy self-reliance and align with the goals of the Renewable Energy Policy 2019, which aims to increase the share of renewable energy in the national grid.

For both DISCOs and subsidized consumers, solarization offers a win-win scenario. Supporting this transition would reduce transmission and distribution losses, enhance energy independence for rural consumers, and contribute to a more sustainable and environmentally friendly energy future. This approach not only supports environmental goals but also strengthens the socio-economic fabric of rural areas, driving long-term economic growth and promoting energy sustainability.

2.3.17 Creation of a Fund for Pension, Free Electricity, and Medical Expenses for Retired Employees in Pakistan's Power Sector:

In Pakistan's power sector, public entities such as GENCOs, TRANSCO, and DISCOs offer essential benefits like pensions, free electricity, and medical care to retired employees. However, these costs should not be treated as direct expenses of their services. To manage these financial liabilities effectively, a dedicated fund is essential. Currently, many entities charge these costs to electricity tariffs, distorting the true cost of generation and placing an undue burden on consumers.

The financial strain from these benefits is growing due to an increasing number of retirees and rising electricity and healthcare costs. As the workforce ages, the demand for pensions and medical care escalates, exacerbated by higher service rates. Over the past year, the expenses related to pensions, free electricity, and medical services in public sector DISCOs are detailed below:

Pension for Retired Employees, Medical Expenses, and Free Electricity, in all DISCOs (Rs. Thousand)

DISCO	Description	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22	FY 2022-23
PESCO	Post-Retirement Benefits	4,862,995.00	5,460,969.00	6,564,448.21	6,569,579.11	8,646,717.67
	Medical Facilities	6,540.00	8,781.00	6,680.20	7,694.27	9,486.77
	Free Electricity	65,801.00	81,948.00	86,735.28	103,988.04	222,537.68
	Total	4,935,336.00	5,551,698.00	6,657,863.69	6,681,261.42	8,878,742.12
IESCO	Post-Retirement Benefits	1,570,124.00	2,710,824.00	3,446,780.00	3,542,645.59	3,765,409.85
	Medical Facilities	10,472.00	17,529.00	19,205.00	413,977.63	323,822.74
	Free Electricity	15,457.00	53,615.00	71,658.00	77,102.61	70,540.21
	Total	1,596,053.00	2,781,968.00	3,537,643.00	4,033,725.83	4,159,772.81
GEPCO	Post-Retirement Benefits	2,463,083.00	2,551,447.00	2,895,186.00	3,428,943.97	4,202,995.50
	Medical Facilities	316,841.00	337,323.00	433,031.00	471,368.50	517,740.79
	Free Electricity	101,556.00	113,414.00	134,613.00	121,649.63	196,170.43
	Total	2,881,480.00	3,002,184.00	3,462,830.00	4,021,962.10	4,916,906.72
LESCO	Post-Retirement Benefits	-	-	-	-	-
	Medical Facilities	-	-	-	-	-
	Free Electricity	-	-	-	-	-
	Total	6,913,001.86	8,597,451.62	8,777,567.65	9,402,284.77	10,126,459.64

DISCO	Description	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22	FY 2022-23
FESCO	Post-Retirement Benefits	4,057,729.00	4,559,782.00	4,753,447.00	5,144,894.55	6,542,576.08
	Medical Facilities	402,390.00	512,726.00	569,938.00	643,687.24	718,344.60
	Free Electricity	145,626.00	148,122.00	175,948.00	204,986.27	323,845.49
	Total	4,605,745.00	5,220,630.00	5,499,333.00	5,993,568.06	7,584,766.17
MEPCO	Post-Retirement Benefits	3,939,899.00	4,071,530.00	4,534,364.59	7,180,839.32	11,797,189.23
	Medical Facilities	15,226.00	11,691.00	15,775.92	1,088,227.07	1,843,214.73
	Free Electricity	81,024.00	104,238.00	95,852.30	511,236.92	728,932.92
	Total	4,036,149.00	4,187,459.00	4,645,992.82	8,780,303.30	14,369,336.87
HESCO	Post-Retirement Benefits	2,088,787.00	2,139,962.20	2,483,878.98	2,615,689.03	-
	Medical Facilities	148,663.00	190,100.43	233,203.27	274,467.98	-
	Free Electricity	52,647.00	66,863.27	81,227.46	73,039.87	-
	Total	2,290,097.00	2,396,925.90	2,798,309.72	2,963,196.88	3,016,269.68
SEPCO	Post-Retirement Benefits	-	1,435,144.57	1,582,595.37	-	-
	Medical Facilities	-	152,663.72	185,237.39	-	-
	Free Electricity	-	-	1,113.19	-	-
	Total	-	1,587,808.29	1,768,945.94	1,578,659.03	1,714,360.56
QESCO	Post-Retirement Benefits	908,500.00	1,226,827.00	1,460,042.66	1,328,261.53	-
	Medical Facilities	3,627.00	3,457.00	4,660.89	4,055.83	-
	Free Electricity	33,075.00	50,529.00	32,105.29	63,486.10	-
	Total	945,202.00	1,280,813.00	1,496,808.84	1,395,803.45	1,593,605.05

A specialized fund would ensure these obligations are met without negatively impacting current consumers or the sector's financial health.

Establishing such a fund would promote fiscal responsibility and enhance the welfare of retired employees, providing them with assurance regarding their benefits. This proactive approach would foster transparency and accountability in the power sector, contributing to a more stable energy market. By decoupling these expenses from current revenue requirements, the sector can concentrate on improving service delivery and operational efficiency while honouring its commitments to those who have served the nation's energy needs.

2.4 THE BOARD OF DIRECTORS: KEY TO IMPROVING GOVERNANCE IN PAKISTAN'S PUBLIC SECTOR POWER COMPANIES

The Board of Directors (BOD) plays a crucial role in guiding the strategic direction of a company, ensuring sound governance, and holding management accountable for performance. It is responsible for setting clear objectives, optimizing resources, approving key projects, and making critical decisions on policy, operations, and financial health. Equally important is the BOD's responsibility to oversee management's execution of the company's strategy, ensuring compliance with regulatory standards and promoting long-term sustainability.

When a company fails to meet its objectives or suffers financial losses, it directly impacts both operational performance and governance. In public-sector organizations, the consequences are even more severe, as they not only affect the company but also place a heavy burden on the economy and national development. Therefore, the BOD must act proactively to address inefficiencies and ensure that the company contributes positively to national progress, rather than impeding it.

For a company to function efficiently, its BOD must consist of qualified professionals with relevant expertise and experience, free from external pressures. A non-technical BOD is unlikely to drive meaningful change and often impedes progress on key initiatives. The sector urgently requires an independent, skilled, and accountable BOD capable of making informed, strategic decisions and holding management to account. This will enable the sector to overcome its longstanding challenges and better serve the public.

The power sector in Pakistan, established after the unbundling of WAPDA in the early 1990s, was initially intended for privatization to improve efficiency and deliver electricity at competitive rates. However, despite over two decades of reforms, these companies remain entirely government-owned, and the financial losses continue to burden both the government and citizens. The inefficiencies within the sector have become a significant drag on the national economy, negatively impacting both government finances and the livelihoods of ordinary Pakistanis.

Public-sector generation companies (GENCOs) remain a major financial burden, with outdated and underutilized plants continuing to receive capacity payments under their contracts. The NTDC has similarly struggled with inefficiencies in planning, execution, and operations. Transmission congestion and the underutilization of critical infrastructure, such as the HVDC line, exacerbate the problem. DISCOs also face poor governance, corruption, and financial mismanagement, contributing to a high circular debt, which reached approximately Rs. 591 billion in FY 2023-24.

It is imperative that the BOD demonstrate a greater sense of urgency in addressing these challenges. One particularly concerning issue is the lack of permanent leadership, as seen with NTDC, which has been without a permanent Managing Director for extended periods. This leadership instability hampers the company's ability to effectively tackle pressing issues.

To resolve these challenges, a dynamic and independent BOD is essential. This BOD must have clear goals, well-defined responsibilities, and a strong sense of accountability. Additionally, regular biannual performance assessments, conducted by a high-level committee that includes representatives from the relevant stakeholders, should be mandated to ensure continuous improvement in governance and performance. By adopting this proactive approach, the sector can regain its efficiency, reduce financial losses, and contribute to the sustainable development of the national economy.

2.5 FULL-TIME LEADERSHIP IN NTDC AND DISCOS: KEY TO STABILITY AND REFORM

The absence of full-time leadership in key public sector entities, such as the NTDC and the DISCOs, has raised significant concerns regarding the operational efficiency and strategic direction of these organizations. Currently, these companies are being led by interim or acting heads, which undermines the stability and long-term vision required to address the complex challenges facing the power sector. Full-time leadership, for a reasonable time period, is essential for ensuring continuity, strong decision-making, and the development of a cohesive strategy aligned with the evolving needs of the energy sector. A permanent Managing Director for NTDC and Chief Executive Officers for DISCOs, with vast experience and a deep institutional understanding of the respective organizations, are critical to building institutional memory and effectively driving reforms. Such leadership is necessary not only to enhance operational performance but also to strengthen accountability, foster innovation, and ensure that these companies meet their regulatory and service obligations in a sustainable and efficient manner. The lack of permanent leadership at the helm of these organizations poses a serious risk to the stability of the power sector and highlights the urgent need for competent, full-time leadership.

2.6 BREAKING FREE FROM LEGACY PRACTICES: OVERCOMING INSTITUTIONAL CHALLENGES IN THE PUBLIC SECTOR

The NTDC is tasked with the development of transmission lines at 220 kV and above, as well as the establishment of interconnection arrangements for the evacuation of power from generation plants. Meanwhile, the DISCOs are responsible for the development of sub-transmission and distribution lines at 132 kV and below. However, longstanding disputes namely TPS Nandipur, Golen Gol, Jhimpir Corridor and Kotri Switchyard have been observed between these entities regarding the development, operation, and maintenance of various transmission and distribution infrastructure. These conflicts are severely hampering the operational efficiency and financial sustainability of the power sector.

The underlying issues often stem from the lack of coordination and unclear responsibilities, leading to delays in critical infrastructure projects, inefficiencies in power transmission, and financial losses. Furthermore, the public sector power companies continue to operate under the legacy framework of a pre-unbundled system, which is not aligned with the objectives of the current power sector reforms. This outdated mode of operation is preventing the sector from achieving its potential, both in terms of efficiency and profitability.

There is an urgent need for these companies to adopt a more commercial and performance-based approach, rather than continuing with the legacy practices that undermine reform efforts. In order to break free from the constraints of the pre-unbundled era, NTDC, DISCOs, and other public sector entities must align their operations with modern, market-oriented principles, focusing on transparency, accountability, and financial sustainability. Adopting such a commercial mind set will be critical to resolving existing disputes, improving collaboration, and ultimately driving the reforms necessary to ensure a more efficient, reliable, and financially viable power sector. Clear commercial contract among public sector entities, aligned with prudent utility practices, are essential to identify in-efficiencies.

PERFORMANCE OF THE GENERATION SECTOR

03

3.1 GENERAL

The electric power generation segment is the backbone of Pakistan's power sector, representing the largest cost component in terms of revenue requirements. In FY 2023-24, generation costs accounted for over 82% of the total consumer-end tariff, underscoring their substantial impact on electricity prices. The remaining portion—less than 18%—covers other essential components such as transmission charges, distribution margins, market operator fees, and prior year adjustments.

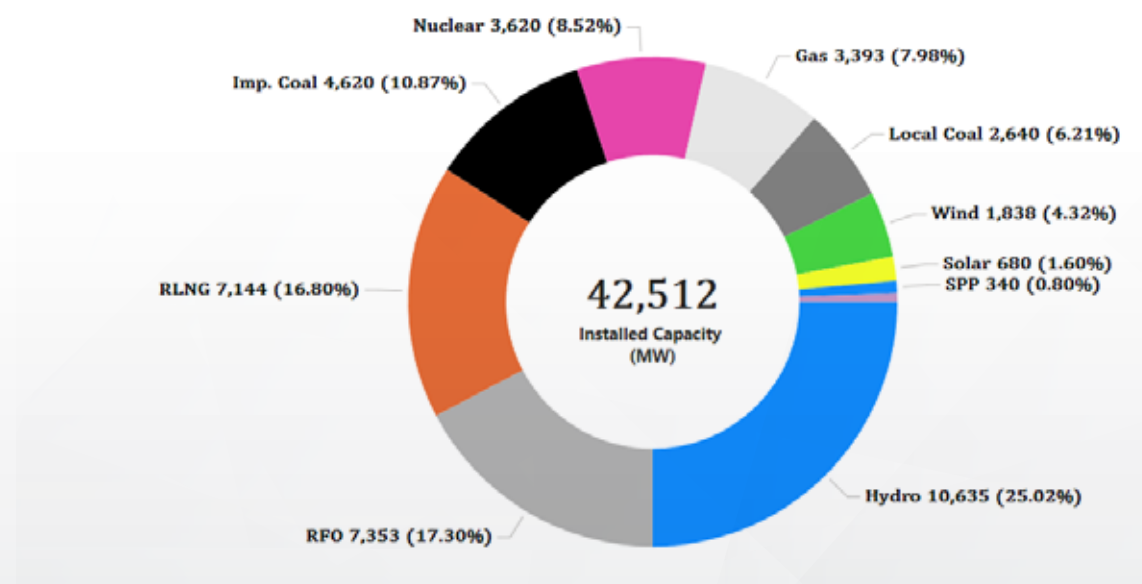
Pakistan's electric power generation sector is primarily divided into two main categories: thermal power plants, which serve as base load power sources, and renewable energy (RE) power plants, characterized by their intermittent nature. Within the thermal segment, power plants are classified by fuel type, including Residual Fuel Oil (RFO), Natural Gas, Regasified Liquefied Natural Gas (RLNG), High-Speed Diesel (HSD), and Nuclear Power. In contrast, the renewable energy segment encompasses a diverse array of sources, including wind, solar, hydroelectric, and bagasse.

The geographical distribution of these generation sources is critical, affecting both the reliability of electricity supply and the economic viability of energy production. Major load centers, with the exception of Karachi, are primarily located in the central regions of the country. In contrast, significant hydropower resources are concentrated in the north, while the majority of cost-effective thermal power plants are situated in the south. This disparity between the locations of load centers and power generation facilities presents considerable challenges in providing an uninterrupted and reliable electricity supply at affordable rates.

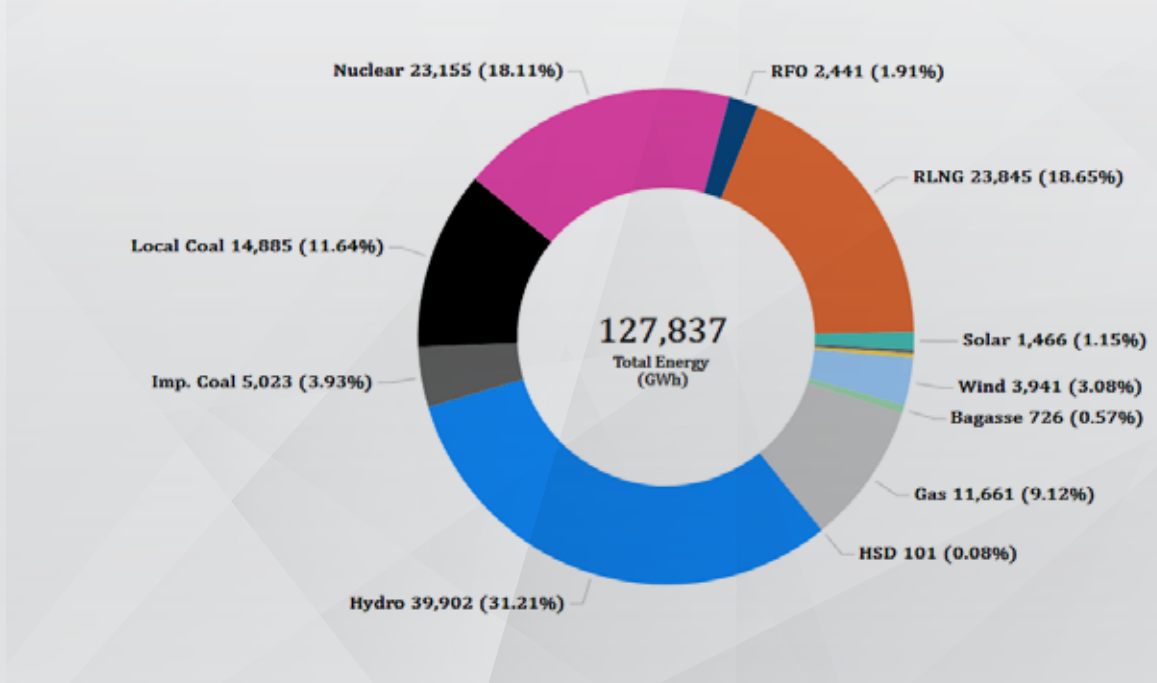
As of June 30, 2024, Pakistan's installed thermal power generation capacity, including nuclear, stands at a substantial 32,386 MW, accounting for 70.06% of the total installed capacity. In contrast, RE power plants, including hydroelectric sources, amount to approximately 13,502 MW, representing 29.93% of the national electricity generation capacity.

Pakistan's power generation fleet features a diverse range of ownership and management structures, including the Federal Government, Provincial Governments, IPPs, and KE. Each entity plays a vital role in shaping the energy landscape and ensuring the efficient development and operation of the country's electricity supply. Additionally, the generation portfolio is bolstered by various small-scale sources, including captive power plants, small power plants, distributed generation facilities, and net-metering systems.

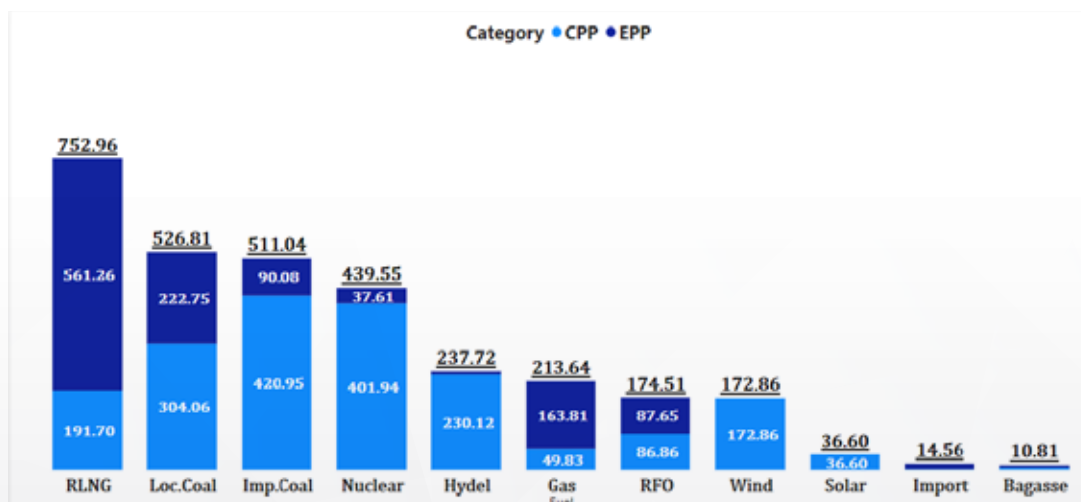
Capacity Mix in CPPA-G System: The capacity mix in the power sector is vital for cost-effectiveness and energy security. It represents the distribution of installed capacity across energy sources like hydropower, imported coal, local coal, indigenous gas, RLNG, nuclear, RFO, HSD, and renewables. This mix determines electricity generation potential. The CPPA-G's system capacity mix as on June 30, 2024 is shown in the following graph:



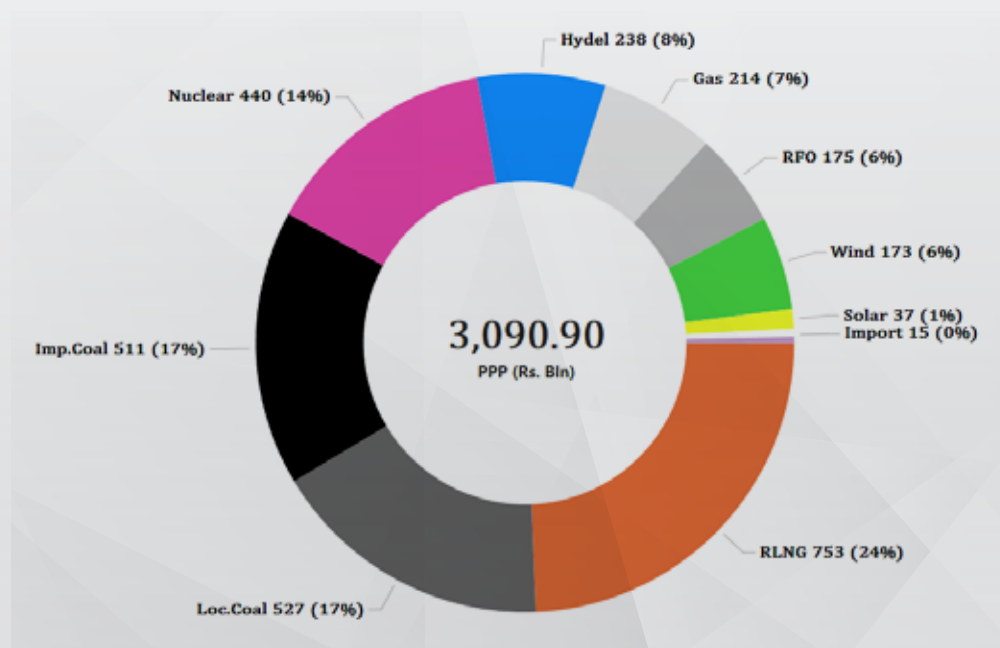
Generation Mix in CPPA-G System: A diverse generation mix is key to ensuring a stable, reliable, and sustainable power supply. It reflects the actual contribution of each energy source to total electricity generation, influenced by factors like demand, fuel availability, and weather conditions. The generation mix of CPPA-G for the FY 2023-24 is as follows:



Energy and Capacity Purchase Price: The EPP and CPP are crucial cost components in power generation. EPP reflects the cost of the electricity consumed, while CPP covers the cost of securing generation capacity, irrespective of actual usage. Together, they determine the overall electricity cost, power purchase price, and the economic viability of power supply.



Price Mix of CPPAG system: The price mix of power generation includes key cost components that shape electricity prices, such as the EPP for consumed electricity and the CPP for maintaining generation capacity. This mix directly influences the final price for consumers and the economic sustainability of the sector. The following graphs illustrate the price mix of Pakistan's power sector for FY 2023-24.



The following table clearly presents the share of capacity, generation, EPP, CPP, and PPP for each fuel type during the FY 2023-24.

Fuel	Share of									
	Capacity		Generation		EPP		CPP		PPP	
	MW	%	GWh	%	Rs. Billion	%	Rs. Billion	%	Rs. Billion	%
Hydro	10,635	25.02	39,902	31.21	7.6	0.64	230.12	12.10	237.72	7.69
RLNG	7,144	16.80	23,845	18.65	561.26	47.19	191.7	10.08	752.96	24.36
Nuclear	3,620	8.52	23,155	18.11	37.61	3.16	401.94	21.14	439.55	14.22
Local Coal	2,640	6.21	14,885	11.64	222.75	18.73	304.06	15.99	526.81	17.04
Gas	3,393	7.98	11,661	9.12	163.81	13.77	49.83	2.62	213.64	6.91
Imp. Coal	4,620	10.87	5,023	3.93	90.08	7.57	420.95	22.13	511.03	16.53
RFO	7,353	17.30	2441	1.91	87.65	7.37	86.86	4.57	174.51	5.65
Wind	1,838	4.32	3,941	3.08	0	0.00	172.86	9.09	172.86	5.59
Solar	680	1.60	1,466	1.15	0	0.00	36.6	1.92	36.6	1.18
Bagasse	249	0.59	726	0.57	5.47	0.46	5.33	0.28	10.8	0.35
Imported	-	-	377	0.29	13.04	1.10	1.52	0.08	14.56	0.47
HSD	-	-	101	0.08	*	*	*	*	*	*
Mix/SPPs/CPP	340	0.80	314	0.25	-0.31	-	0.16		-0.15	
Total	42,512	100	127,837	100	1,188.96	100	1,901.93	100	3,090.90	100

From the table, it is evident that during FY 2023-24, hydropower has a relatively high share in both the capacity and generation mix, at 25.22% and 31.41%, respectively. However, its share in the price mix is comparatively low at 7.69%. In contrast, RLNG power, which has a lower share in both capacity and generation mix (16.94% and 18.88%, respectively), contributes significantly more to the price mix at 24.36%. A similar comparison for power generated from other fuel sources can also be seen in the table above.

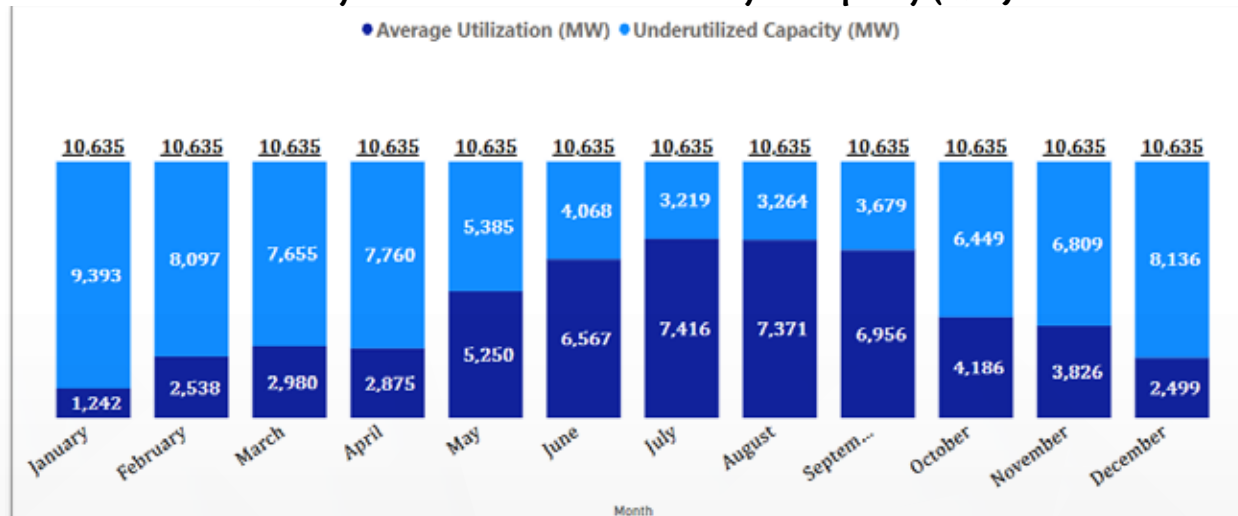
It is important to clarify that the above analysis for hydropower applies only when considering the combined capacity of all hydropower plants in the CPPA-G system. This is because the capacity cost for older, large hydropower plants like Tarbela, Mangla, Warsak, Ghazi Brotha etc. is relatively low. However, for newer hydropower plants, such as Gulpur, Suki Kinari, Karot, etc. this analysis may not hold true, as the per unit cost of electricity from these plants can be significantly higher than that of thermal power plants in many cases.

The combined analysis of the table and graphs highlights the challenges in thermal power generation, primarily due to the high costs associated with EPPs and CPPs. The cost of CPPs in thermal power plants is further exacerbated by underutilized capacity. However, these plants remain essential in the capacity and generation mix, as they serve as base-load plants that ensure a continuous power supply and support RE plants by stabilizing seasonal, daily, and hourly fluctuations in power generation.

Although RE plants don't involve EPP, they face intermittency, leading to low capacity factors due to fluctuations in their primary energy sources. This results in higher per-unit capacity costs, especially during debt servicing. In many cases, the per-unit costs of hydro, wind, and solar power, in existing CPPA-G basket, are higher than those of thermal and nuclear plants. The variability in RE generation, driven by these fluctuations, is discussed in the following paragraphs.

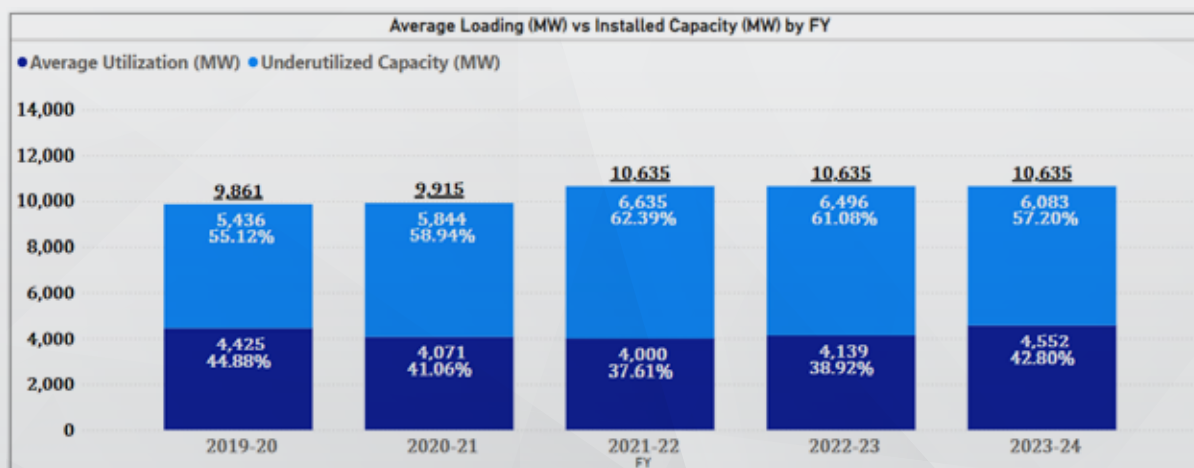
Variability in Capacity Factor of Hydropower Plants: The monthly variability of the capacity factor of all hydropower plants (combined) in the country during the FY 2023-24 is illustrated in the following graph. It demonstrates that, primarily due to hydrological conditions, the lowest capacity factor of 11.68% was recorded in January 2024, while the highest capacity factor of 69.73% occurred in July 2023.

Monthly Variation in Utilization of Hydel Capacity (MW)



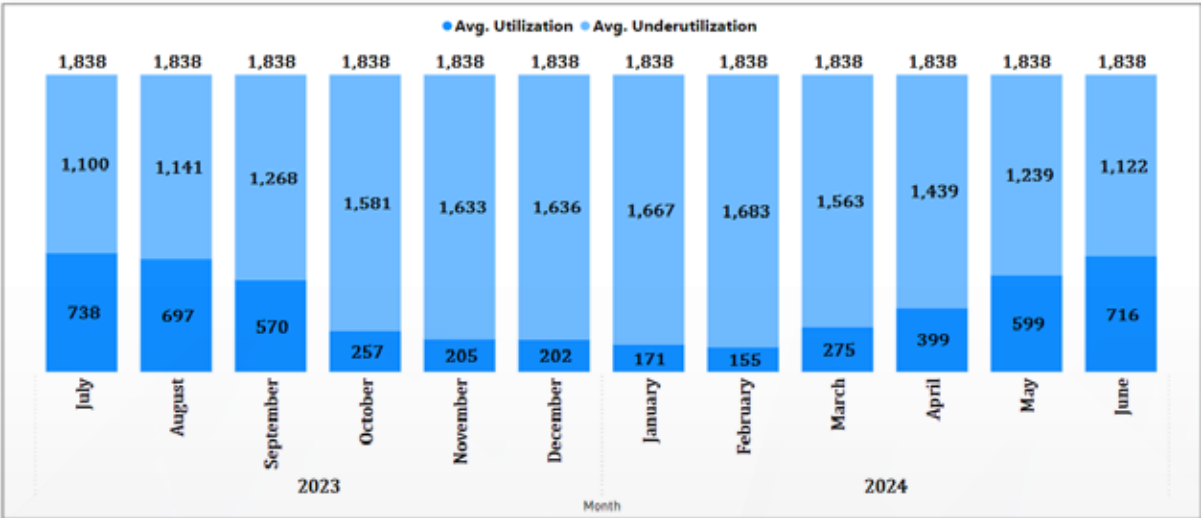
The figure at the top of the bar represents the total installed generation capacity of all hydropower plants (combined) in the country at the end of each month. The accompanying figures and percentages in the bars illustrate the average utilized and unutilized installed capacity for each respective month. Additionally, the following graphs illustrate the annual capacity factor of all hydropower plants (combined) over the past five fiscal years, along with the average utilized and unutilized capacity for each year.

Trend of Hydel Capacity Utilization



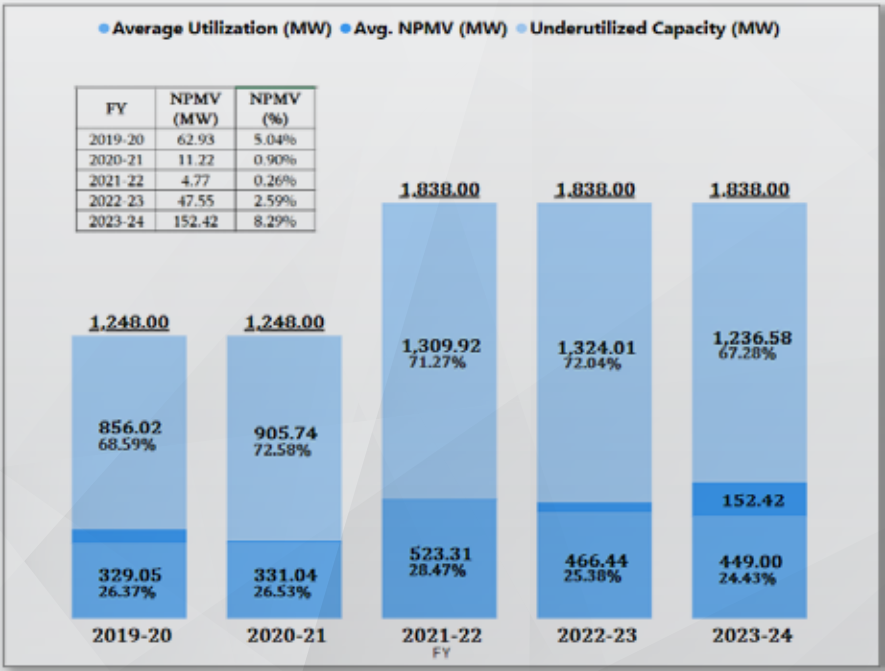
Variability in Capacity Factor of Wind Power Plants: The monthly variability of the capacity factor of all wind power plants (combined) in Pakistan during the FY 2023-24 is illustrated in the following graph. It demonstrates that, primarily due to wind resource, the lowest capacity factor of 8.43% was recorded in February 2024, while the highest capacity factor of 40.15% occurred in July 2023.

Monthly Variation of Wind Power Plants



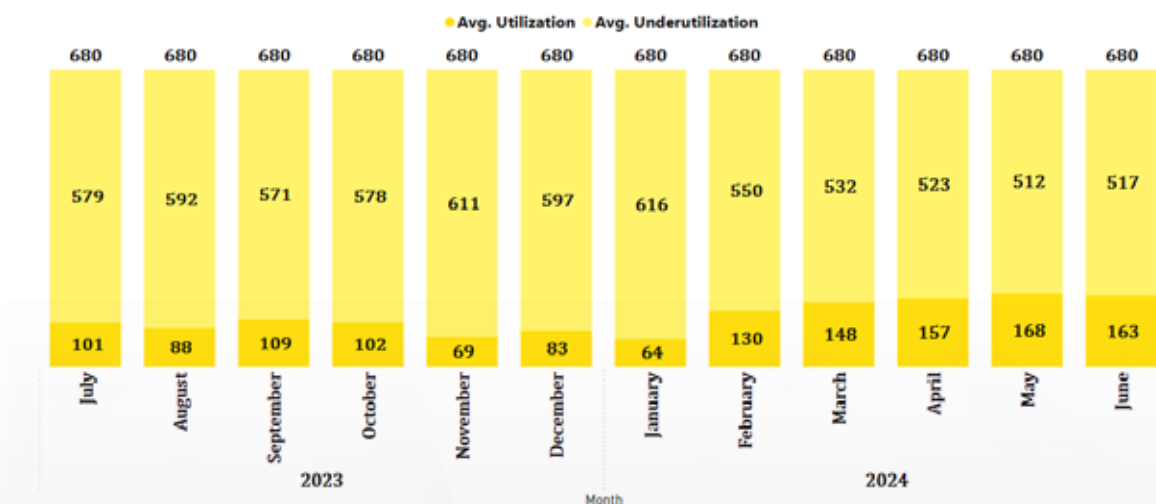
The figure at the top of each bar represents the total installed generation capacity of all wind power plants (combined) in the country at the end of each month. The accompanying figures and percentages within the bars depict the average utilized and unutilized installed capacity for each respective month. Additionally, the following graph illustrate the annual capacity factor of wind power plants over the past five fiscal years, along with the average utilized and unutilized capacity for each year and NPMV.

Annual Capacity Factor of Wind Power Plant



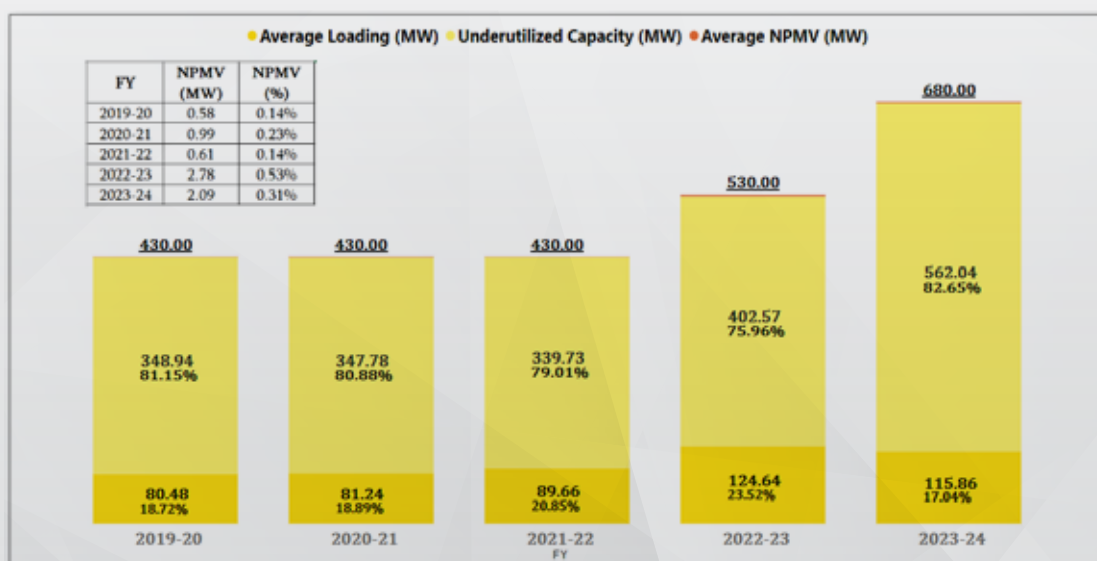
Variability in Capacity Factor of Solar Power Plants: The monthly variability of the capacity factor of all solar power plants (combined) in Pakistan during the FY 2023-24 is illustrated in the following graph. It demonstrates that, primarily due to solar irradiance resource, the lowest capacity factor of 9.41% was recorded in January 2024, while the highest capacity factor of 24.71% occurred in May 2024.

Monthly Variation of Solar Power Plant



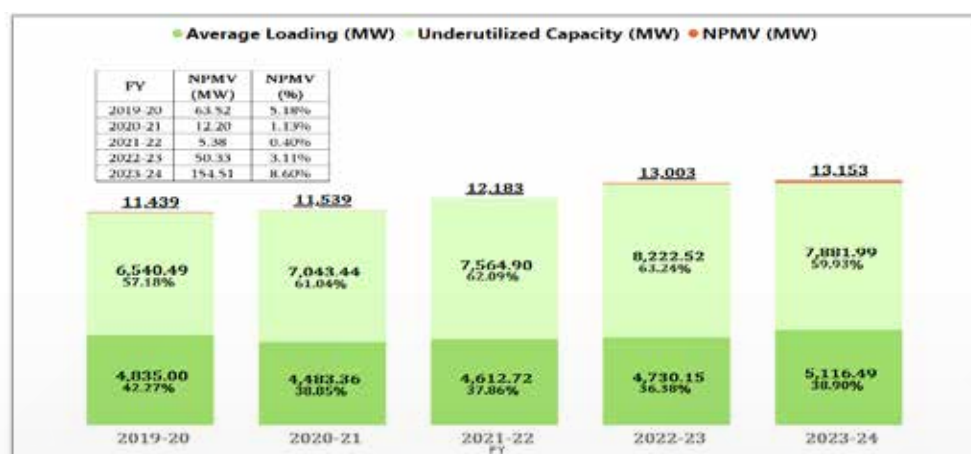
The figure at the top of each bar represents the total installed generation capacity of all solar power plants (combined) in the country at the end of each month. The accompanying figures and percentages within the bars depict the average utilized and unutilized installed capacity for each respective month. Additionally, the following graphs illustrate the annual capacity factor of solar power plants over the past five fiscal years, along with the average utilized and unutilized capacity for each year and NPMV.

Annual Capacity Factor of Solar Power Plant



Variability in Capacity Factor of RE (Hydro + Wind + Solar) Power Plants: The following graph illustrate the annual capacity factor of all RE (hydro + wind + solar) power plants over the past five fiscal years, along with the average utilized and unutilized capacity for each year.

Annual Capacity Factor of RE (Hydro + Wind + Solar) Power Plant



The figure at the top of each bar represents the total installed generation capacity of all renewable energy (Hydro, Wind, Solar, Bagasse) power plants in the country at the end of each respective fiscal year. The accompanying figures and percentages within the bars illustrate the average utilized and unutilized installed capacity for each year and NPMV. The primary reason for unutilized capacity is the lack of requisite natural resources, such as hydrology, wind, and solar irradiance. However, a very small portion of the unutilized capacity is due to plant availability issues.

3.2 INSTALLED AND DEPENDABLE POWER GENERATION CAPACITY IN THE COUNTRY

In addition to the installed generation capacity, the dependable generation capacity is equally important. The following paragraphs provide a detailed explanation and analysis of both the installed and dependable capacities. Installed capacity represents the maximum output a power plant can achieve under ideal conditions, serving as a theoretical benchmark for performance. In contrast, de-rated or dependable capacity provides a more realistic assessment by considering operational limitations, such as ageing equipment and environmental factors. Understanding this distinction is essential for accurately evaluating a power plant's actual performance and reliability.

Currently, a significant portion of Pakistan's generation capacity is on two part tariff structure basis. This arrangement, given under their respective power purchase agreement, guarantees that power plants receive capacity payments for their de-rated capacity, regardless of their actual electricity output. Additionally, CPPA-G, under respective EPA, is bound to purchase all electricity from RE power plants, regardless of the demand. In case of failure to evacuate this must-purchase energy due to system limitations or low demand, CPPA-G is contractually bound to pay NPMV to such RE power plants.

In FY 2023-24, an additional 281 MW was added to the system. The installed and dependable power generation capacities at the end of FY 2023-24 are presented below under separate headings.

3.2.1 Installed Capacity:

As of June 30, 2024, Pakistan's installed capacity stands at 45,888 MW. The detailed breakdown of this capacity according to energy sources and different zones is provided in the following table:

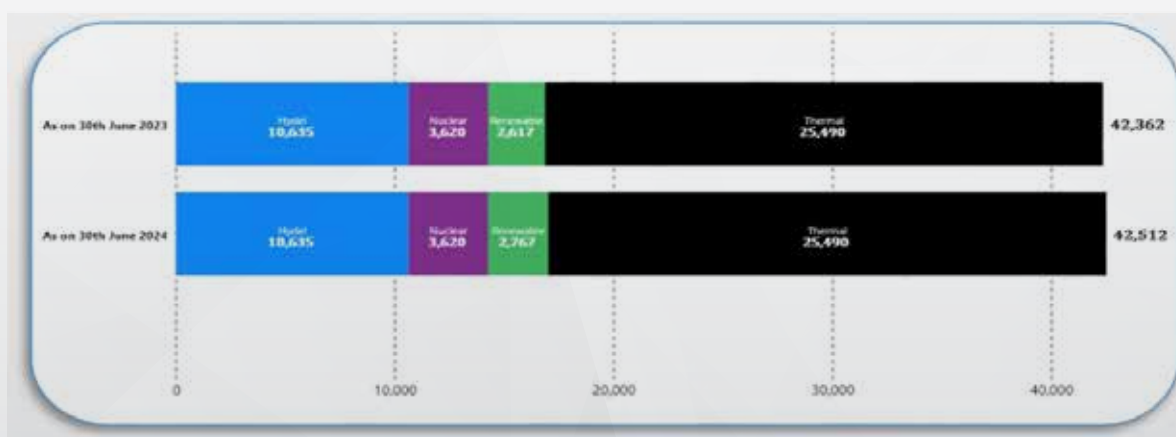
	As on 30-06-2023	As on 30-06-2024	Variation	
			(MW)	(%)
A. CPPA-G SYSTEM				
WAPDA Hydel	9,389	9,389	0	0.00
IPPs Hydel	1,246	1,246	0	0.00
Total: Hydel	10,635	10,635	0	0.00
GENCOs	4,587	4,587	0	0.00
IPPs	20,563	20,563	0	0.00
SPPs/CPPs	340	340	0	0.00
Total: Thermal	25,490	25,490	0	0.00

	As on 30-06-2023	As on 30-06-2024	Variation	
			(MW)	(%)
Nuclear	3,620	3,620	0	0.00
Wind	1,838	1,838	0	0.00
Solar	530	680	150	28.30
Bagasse/Biomass	249	249	0	0.00
Total RE	2,617	2,767	150	5.73
Total: CPPA-G System	42,362	42,512	150	0.35
B. KE SYSTEM				
KE Own	2,816	2,816	0	0.00
IPPs	366	366	0	0.00
SPPs/CPPs	94	94	0	0.00
Solar	100	100	0	0.00
Total: KE System	3,376	3,376	0	0.00
Grand Total:	45,738	45,888	150	0.33

Note: The net-metering installed capacity of CPPA-G and KE system is not included in the utility scale installed capacity.

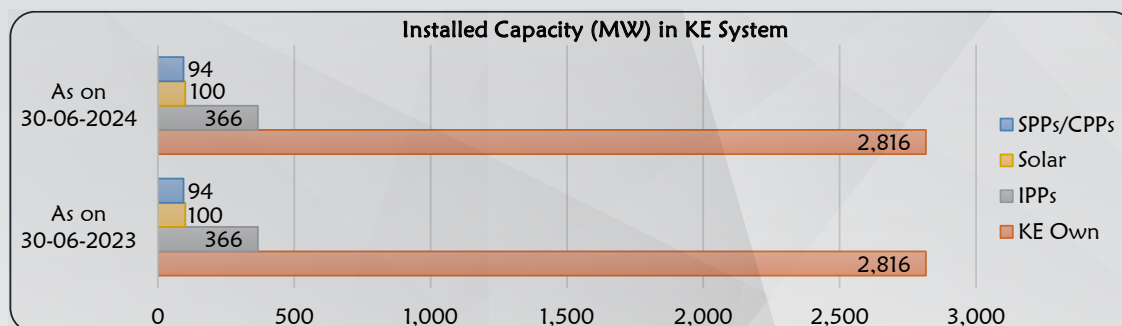
Source: GENCOs/WAPDA/IPPs/DISCOs/KE

The following is the graphical representation showcasing the installed power generation capacity across various energy sources for the FY 2022-23 and FY 2023-24, illustrating the growth in Pakistan's energy portfolio:



As of June 30, 2024, the installed capacity within the CPPA-G system stands at 42,512 MW. This capacity is distributed across various energy sources: thermal generation accounts for 25,490 MW, nuclear power 3,620 MW, while hydroelectric power contributes 10,635 MW. Wind power adds 1,838 MW, solar power generation contributes 680 MW, and bagasse/biomass stands at 249 MW.

The following is the graphical representation showcasing the installed power generation capacity across various energy sources for the FY 2022-23 and FY 2023-24, illustrating the diversity and growth in KE's energy portfolio:



KE operates a thermal generation fleet of 2,816 MW, which is more expensive than the generation mix price of CPPA-G. This capacity is also insufficient to meet both current and future demand within its service area. To manage the shortfall and reduce reliance on its costlier thermal generation, KE procures electricity from various external sources, including 366 MW from thermal IPPs, 100 MW from solar power, 94 MW from SPPs/CPPs, and 33 MW from distributed generation through net-metering. Additionally, KE sources approximately 1,100 MW from the CPPA-G system.

On a national scale, out of a total installed capacity of 46,221 MW, the public sector owns 22,847 MW (49.43%), while the private sector holds 23,374 MW (50.57%).

3.2.2 Dependable Capacity:

As of June 30, 2024, Pakistan's total dependable generation capacity reached 45,888 MW, comprising 37,450 MW within the CPPA-G system and 3,217 MW within the KE system. The table below provides a detailed breakdown of this capacity by energy source and system, offering a comprehensive view of Pakistan's power generation landscape.

	As on 30-6-2023	As on 30-6-2024	Variation	
			(MW)	(%)
A. CPPA-G SYSTEM				
WAPDA Hydel	9,349	9,466	117	1.25
IPPs Hydel	1,244	1,200	(44)	(3.54)
Total: Hydel	10,593	10,666	73	0.69
GENCOs	4,036	2,611	(1,425)	(35.31)
IPPs	19,648	17,833	(1,815)	(9.24)
SPPs/CPPs	257	257	0	0.00
Total: Thermal	23,941	20,701	(3,240)	(13.53)
Nuclear	3,575	3,326	(249)	(6.97)
Wind	1,828	1,845	17	0.93
Solar	438	634	196	44.75
Bagasse/Biomass	253	278	25	9.88
Total RE	2,519	2,757	238	9.45
Total: CPPA-G System	40,628	37,450	(3,178)	(7.82)
B. KE SYSTEM				
KE Own	2,594	2,593	(1)	(0.04)
IPPs	354	354	0	0.00
SPPs/CPPs	94	191	97	103.19
Solar	79	79	0	0.00
Total: KE System	3,121	3,217	96	3.08
Grand Total	43,749	40,667	(3,082)	(7.04)

Source: GENCOs/WAPDA/IPPs/DISCOs/KE/DLR

3.3 ELECTRICITY GENERATION AND CONSUMPTION

During FY 2023-24, Pakistan's total electricity generation—including both the CPPA-G and KE systems—reached 137,196.07 GWh, marking a slight decline from 138,539.00 GWh in the previous fiscal year. The country imported 377.58 GWh of electricity from Iran, down from 478.62 GWh the year before.

Despite the addition of 2,018,286 new electricity consumers in Pakistan's power sector, overall electricity consumption has paradoxically declined. The most significant reductions were observed in the industrial and agricultural consumer categories. Several factors have contributed to this downturn in both generation and consumption, with high electricity costs emerging as the most pressing issue. The rise of distributed generation, particularly through rooftop solar installations, reflects a waning confidence in the national power supply system.

Furthermore, the demand-suppressive tariff structure for large consumers, coupled with AT&C losses and unreliable supply from DISCOs, have exacerbated this negative growth trend. Poor service quality and inadequate customer relationships fostered by DISCOs have prompted consumers to seek

alternatives outside the national grid. With advancements in technology and the increasing viability of battery storage solutions, there is growing concern that if the national system cannot provide affordable electricity and DISCOs fail to adopt customer-centric practices, engagement with the national grid may continue to diminish.

These challenges mirror those faced in the previous year, highlighting persistent, unresolved issues. To rejuvenate electricity consumption and stimulate economic growth, it is essential to address the root causes undermining confidence in the national grid power supply system. A comprehensive, multifaceted approach is needed, focusing on sustainable generation planning that factors in the impact of off-grid and on-grid distributed generation, designing tariff structures that increase demand, infrastructure improvements, enhancements in system efficiency, and stronger governance across all segments of the power sector.

Implementing necessary measures to ensure reliability is crucial, along with developing strategies that adapt to changing societal dynamics, particularly the increasing shift toward alternative energy sources. Reducing electricity costs and rebuilding trust in the power infrastructure are vital for encouraging increased consumption, which will play a pivotal role in driving economic growth and securing a sustainable energy future for Pakistan.

The accompanying table illustrates significant fluctuations in electricity generation and import levels, suggesting potential shifts in the factors influencing energy demand. A thorough examination of these trends is vital for formulating effective strategies to ensure the financial stability and sustainability of Pakistan's electric power sector. By analyzing these variations, we can gain valuable insights into the underlying dynamics and develop well-informed policies to enhance energy security and improve the sector's economic viability.

As on 30 th June	FY 2022-23	FY 2023-24	Variation	
			(GWh)	(%)
A. CPPA-G SYSTEM				
WAPDA Hydel	31,399.16	35,032.87	3,633.72	11.57
IPPs Hydel	4,863.15	4,869.47	6.32	0.13
Total: Hydel	36,262.31	39,902.34	3,640.04	10.04
GENCOs	5,957.03	3,489.59	(2,467.44)	(41.42)
IPPs	56,208.19	54,464.00	(1,744.20)	(3.10)
SPPs/CPPs	150.02	314.19	164.17	109.43
Import From Iran	478.62	377.58	(101.04)	(21.11)
Total: Thermal	62,793.87	58,645.36	(4,148.51)	(6.61)
Nuclear	24,054.56	23,154.81	(899.75)	(3.74)
Wind	4,086.05	3,941.07	(144.98)	(3.55)
Solar	908.83	1,028.90	120.07	13.21
Net-Metering Import	183.04	438.46	255.42	139.54
Bagasse/Biomass	845.36	726.85	(118.51)	(14.02)
Total RE	6,023.28	6,135.28	111.99	1.86
Total: CPPA-G System	129,134.01	127,837.78	(1,296.24)	(1.00)
B. KE SYSTEM				
KE Own	7,093.09	7,471.32	378.23	5.33
IPPs	1,606.80	1,156.19	(450.61)	(28.04)
SPPs/CPPs	406.90	348.33	(58.57)	(14.39)
Solar	191.01	187.38	(3.63)	(1.90)
Net-Metering Import	107.18	195.07	87.89	82.00
Total: KE System	9,404.98	9,358.29	(46.69)	(0.50)
Grand Total:	138,539.00	137,196.07	(1,342.93)	(0.97)

Source: GENCOs/WAPDA/IPPs/DISCOs/KE/CPPA-G

Year-on-year comparisons indicate a decrease in total generation by 1,342.93 GWh (-0.97%). Noteworthy shifts include a decline in thermal generation by 4,148.51 GWh (-6.61%) and an increase in renewable energy generation by 111.99 GWh (+1.86%). In contrast, hydropower experienced a significant increase of 3,640.04 GWh (+10.04%). The decrease in thermal generation, coupled with an increase in renewable energy (RE) generation, is advantageous for the EPP, as it generally contributes to lower overall costs. However, this transition can adversely affect the per-unit CPP, particularly in the context of underutilized excess generation capacity.

In the KE service area, total generation amounted to 9,358.29 GWh, representing 6.82% of the national output. This includes 7,471.32 GWh from KE's own resources and 2,201.16 GWh from imports through IPPs, SPPs/CPPs, and CPPA-G.

Year-on-year, the KE system also saw a slight reduction in total generation by 46.69 GWh (-0.50%). However, it did witness an increase in solar power generation by 84.26 GWh and an uptick in output from KE-owned sources by 378.23 GWh. The most significant reductions in the KE system came from purchases from IPPs, which decreased by 450.61 GWh, and from SPPs/CPPs, down by 58.57 GWh.

3.4 SHARE OF GENERATION CAPACITY IN PUBLIC AND PRIVATE SECTOR

In FY 2023-24, power generation from public sector power plants in Pakistan totalled 84,282.08 GWh, accounting for 61.43% of the country's total electricity production. In contrast, private sector power plants, including KE, generated 52,913.99 GWh, representing approximately 38.57% of overall output.

3.5 PART LOAD ADJUSTMENT CHARGES

PLAC are being paid to the power producers under their respective PPAs, in case the power plants are not being operated at full load by the System Operator. Operation of power plants at part load results in lower efficiency which inter alia impacts the end consumer through additional cost in monthly FPA. During the current fiscal year an amount of Rs. 55.67 billion has been incurred on account of PLAC as compared to Rs. 46.59 billion during previous year. Month-wise along with plant-wise details of PLAC is given in statistical portion.

3.6 START-UP CHARGES

Start-up charges for power plants refer to the costs incurred when a facility resumes operations after being offline. These charges are typically detailed in the PPA between the power purchaser and the power producers. The specifics can vary from plant to plant, as well as according to individual contractual agreements. The following table presents the monthly start-up charges (Rs. million) in respect of various power plants during FY 2023-24.

Name of IPP	July	August	September	October	November to June	Total
Pak Gen Power	-	12.43	-	-	-	12.43
Port Qasim Electric Power	161.91	-	201.06	217.59	-	580.56
China Power Hub	44.42	-	-	-	-	44.42
Total	206.33	12.43	201.06	217.59	-	637.41

3.7 DEGRADATION CHARGES

Degradation charges in power plants refer to costs arising from the reduced performance or efficiency of a generation facility over time. These charges are linked to equipment wear and tear, aging infrastructure, or diminished output capacity due to prolonged operation or environmental factors. Typically outlined in the PPA between the power purchaser and producers, the specifics can vary by plant and contractual agreements. The following table presents the monthly degradation charges (Rs. million) in respect of various power plants during FY 2023-24.

Name of IPP (FY 2023-24)	July	August	September	October	November	December
Engro Powergen Qadirpur	1.82	1.82	1.76	2.17	2.40	2.49
Foundation Power	12.39	12.50	12.13	10.89	10.74	11.17
Uch-II Power	103.12	102.60	99.81	108.78	108.88	113.79
Saif Power	6.66	6.66	7.34	8.33	8.28	8.77
Sapphire Electric	13.56	9.19	7.16	7.57	7.52	8.00
Halmore Power	13.75	13.59	13.48	14.96	14.82	15.18
Orient Power	17.41	17.19	9.49	7.87	7.89	8.38
Quaid-e-Azam Thermal	109.89	112.45	111.80	107.74	108.00	112.69
Haveli Bahadur Shah	103.85	106.82	105.40	111.09	108.26	110.82
Balloki Power	99.44	103.62	103.69	109.60	109.35	112.04
Total	481.89	486.44	472.05	489.01	486.13	503.34

Name of IPP (FY 2023-24)	January	February	March	April	May	June	Total
Engro Powergen Qadirpur	2.54	2.36	2.52	2.36	2.21	2.13	26.57
Foundation Power	11.32	10.40	11.02	10.15	13.99	18.25	144.96
Uch-II Power	114.42	105.43	109.88	102.46	103.57	109.01	1,281.74
Saif Power	8.93	8.16	8.54	8.02	7.12	6.84	93.65
Sapphire Electric	8.15	7.39	7.70	7.23	7.04	6.72	97.23
Halmore Generation	15.75	14.49	14.62	13.62	13.14	11.88	169.28
Orient Power	8.36	7.63	7.97	7.52	7.34	6.68	113.72
Quaid-e-Azam Thermal	110.89	103.08	109.71	104.50	105.56	101.22	1,297.52
Haveli Bahadur Shah	109.33	101.77	108.70	103.80	104.12	99.19	1,273.15
Balloki Power	105.01	99.01	105.46	99.64	102.54	98.37	1,247.79
Total	494.69	459.71	486.13	459.31	466.62	460.29	5,745.61

3.8 OPERATION OF POWER PLANTS IN VIOLATION OF ECONOMIC MERIT ORDER

In Pakistan's power sector, the operation of power plants often deviates from the EMO, which prioritizes electricity dispatch based on the lowest generation costs. This principle is crucial for maintaining efficiency and keeping electricity prices manageable for consumers. However, systemic issues—such as inadequate transmission infrastructure, particularly in the south-to-north corridor and the Lahore ring, alongside long-term gas contracts and gas pressure challenges—have led to violations of the EMO. Consequently, more expensive plants are prioritized over cheaper alternatives, resulting in inflated costs for consumers.

The financial impact of these deviations has been substantial, amounting to Rs. 20.203 billion for FY 2022-23 and Rs. 60.386 billion for FY 2023-24. While responsible entities may offer explanations for these discrepancies, effective planning and timely project execution could have alleviated many of these issues. This failure to adhere to the EMO not only drives up electricity tariffs but also threatens the financial sustainability of the power sector, ultimately shifting the burden onto consumers. By aligning operations with the EMO, Pakistan's power sector could significantly lower electricity costs for its consumers.

PERFORMANCE OF THE TRANSMISSION SECTOR

04

4.1 GENERAL

The transmission network serves as a backbone of the power system, ensuring the reliable flow of electricity from generation sources to load centres across the country. Its role is critical not only in maintaining an uninterrupted and reliable supply of power but also in enabling the efficient dispatch of electricity from the most cost-effective generation plants. By providing the infrastructure needed to transport power from diverse generation sources, often located far from demand centres, the transmission network ensures that electricity is dispatched in accordance with the EMO. This minimises overall system costs, as it allows the most efficient and least expensive plants to supply power, regardless of their location. A robust, well-maintained transmission system is essential for both the reliability of electricity supply and the economic efficiency of the power market, benefiting consumers through lower energy costs. The regulation and governance of electric power transmission in Pakistan fall under the specific mandate of the NEPRA Act of 1997:

- (a) Section 16 of the Act outlines the framework for granting Transmission Licences.
- (b) Section 17 details the criteria for the issuance of Transmission Licences for National Grid Companies (NGCs).
- (c) Section 18(A) authorises companies owned by Provincial Governments to engage in the transmission of electric power within their respective territorial limits.
- (d) Section 19 provides for the grant of Special Purpose Transmission Licences.

4.2 NATIONAL GRID COMPANY

Under Section 17 of the NEPRA Act, the NTDC is licensed as the National Grid Company (NGC) responsible for the transmission of electric power across the country. NTDC manages the transmission of electricity at voltage levels of 220 kV and above. As per the NEPRA Act, only one entity can be licensed as the NGC, and NTDC currently holds this role under NEPRA's licensing framework.

The NGC has been mandated to operate and provide safe, and reliable transmission and interconnection services on a non-discriminatory basis to all users, including a BPC, who desire to directly connect to its facilities. NGC is, inter alia, responsible for the following:

- (a) to make available to the general public the tariff specifying the Authority's approved rates, charges and other terms and conditions for transmission and interconnection services, and
- (b) it shall not levy any rate or charge or impose any condition for the transmission of electric power which has not been approved by the Authority as a tariff.

The functions and responsibilities of NGC have been delineated under Section 18 of the NEPRA Act. As of June 30, 2024, NTDC is maintaining the following transmission facilities:

- (a) 19 Nos. of 500 kV Grid Stations with transformation capacity of 25,950 MVA.
- (b) 47 Nos. of 500/220 kV auto/power transformers installed at 500 kV grid stations.
- (c) 76 Nos. of 500 kV circuits having length of 9,198 km.
- (d) 50 Nos. of 220 kV Grid Stations with transformation capacity of 38,460 MVA.
- (e) 38 Nos. of 220/132 kV transformers installed at 500/220 kV grid stations.
- (f) 183 Nos. of 220/132 kV transformers installed at 220 kV grid stations.
- (g) 164 Nos. of 220 kV circuits having length of 12,131 km.

4.3 PROVINCIAL GRID COMPANIES AND SPECIAL PURPOSE TRANSMISSION LICENCES

Section 18A of the Amended NEPRA Act empowered the Authority to grant a licence authorising a company owned by a Provincial Government to engage in transmission of electric power within territorial limits of such Province. By the end of FY 2023-24, the Authority has granted PGC licences for the provinces of Sindh, Punjab and Khyber Pakhtunkhwa. The grant of PGC licences have provided an avenue to expedite the completion of critical transmission infrastructure projects in coordination with the NGC.

In addition to the above, the Authority is empowered under Section 19 of the NEPRA Act, to grant Special Purpose Transmission Licences. As of date, three SPTL licences have been granted namely to Fatima Transmission Company Limited, Sindh Transmission and Dispatch Company (Pvt.) Limited, and Pak Matiari-Lahore Transmission Company (Pvt.) Limited.

4.4 SYSTEM OPERATOR LICENCE

Under the NEPRA Act 1997, the functions of the system operator were performed by the NGC under its transmission licence. Later on, through amendments in the NEPRA Act promulgated on May 02, 2018, various new provisions were introduced to provide a framework for the development of a competitive electric power market in the country including, inter alia, the segregation of transmission and system operation services to be performed under different licences. In this regard, two new sections, namely, Section 23 (G) regarding grant of System Operator Licence and Section 23 (H) pertaining to the functions and responsibilities of the System Operator were introduced. Initially, a moratorium of five years was placed on Section 23 (G) and Section 23 (H), which was lapsed on April 27, 2023. Accordingly, the System Operator licence granted to NTDC in March, 2023 came into effect upon the coming into effect of Section 23 (G) and 23 (H).

The System Operator, under its licence, is responsible for, inter-alia, generation scheduling, commitment and dispatch, transmission scheduling and generation outage coordination, transmission congestion management, cross-border transmission coordination, procurement and scheduling of ancillary services, integrated power system planning with regard to availability of adequate transmission and generation capacity to meet the electric power demand of the country and such other activities as may be required for safe, secure, stable, reliable, and efficient system operations.

4.5 POWER BALANCES IN NTDC SYSTEM

From the below table, it is assumed that NTDC will have sufficient generation capability to meet its projected demand while also having adequate system reserves in place. However, given the existing system constraints and delay in timely completion of critical transmission projects, the robustness of NTDC system to adequately meet the projects remains a question mark. Even if NTDC is able to address its transmission network constraints, the recent negative demand growth trend presents a significant challenge. This decline not only threatens the financial viability and sustainability of the power system but also risks underutilizing the available generation and transmission capacity, potentially leading to inefficiencies and economic strain within the sector. In view thereof, a holistic and well-thought-out approach is required for the sustainability of the power sector in the future. A thorough analysis

encompassing an in-depth evaluation of recent demand trends, capacity and reserve requirements, and financial implications of underutilized capacity is required to be carried out to balance supply, demand, and fiscal sustainability in the energy sector.

A: Actual Figures						
FY ending 30 th June	System Generation Capability (MW)	Demand During NTDC’s System Peak Hours (MW) (including KE Supply)			Surplus/ (Deficit) (MW)	
2023	30,574	23,679			6,895	
2024	31,545	25,516			6,029	
B: Projected Figures						
FY ending 30 th June	Planned Generation Capability as per NTDC (MW)	NTDC Projected Demand Growth Rate (%)	NTDC’s Projected Demand during Peak Hours (MW)	NTDC Projected Demand Growth Rate (%)	NTDC’s Projected Demand during Peak Hours (MW)	Surplus/ (Deficit) (MW)
		Without Export to KE		With Export to KE		
2025	38,854		27,625		29,675	9,179
2026	40,595	5.62	29,177	5.23	31,227	9,368
2027	41,865	5.23	30,703	4.89	32,753	9,112
2028	43,180	5.49	32,388	5.14	34,438	8,742
2029	44,928	5.25	34,089	4.94	36,139	8,789

Source: NTDC

4.6 UNDER-UTILIZATION OF TRANSMISSION SYSTEM

The under-utilization of transmission resources is a significant indicator of inefficiency within any power system. When key infrastructure remains idle, valuable assets are not being used to their full potential, leading to suboptimal allocation of resources. This inefficiency can have long-term consequences, impacting the ability to invest in necessary upgrades and system expansions. Over time, this can slow modernization efforts and reduce the overall resilience and reliability of the power system. Additionally, under-utilization results in higher fixed costs per unit of transmitted electricity, ultimately increasing the financial burden on consumers.

In the case of NTDC, the issue of under-utilization presents a serious challenge. Despite having significant transmission capacity, delays in addressing system constraints and a recent decline in demand growth have left portions of the network operating below their potential. This inefficiency increases operational costs, as fixed expenses must be spread across a lower volume of electricity, raising the per-unit transmission cost. As a result, consumers face higher electricity prices, while the company's financial sustainability is threatened. NTDC must address these inefficiencies promptly to prevent further financial strain on both the system and its consumers. The latest statistics submitted by NTDC on system under-utilization further underscore this challenge.

Financial Year	No. of Under-utilized Power Transformers		No. of Under-utilized Transmission Lines	
	500 kV	220 kV	500 kV	220 kV
2022-23	9	48	53	65
2023-24	12	18	26	49

Source: NTDC

4.7 OVER-LOADING POSITION OF NTDC'S 500 KV AND 220 KV NETWORK

Over-loading of grid stations occurs when the electrical demand on a specific part of the power grid surpasses its designed capacity. This condition significantly increases the risk of system failures and blackouts, as transmission lines, substations, and related equipment are engineered to function within specific load limits. Exceeding these limits can lead to overheating, voltage instability, and equipment malfunctions, which not only disrupt electricity supply but can also trigger cascading failures throughout the grid. Overloading is particularly concerning during peak demand periods, such as during high summer temperatures or in industrial regions, where sudden demand spikes can push the network beyond its capacity, risking widespread outages.

In the case of NTDC, addressing grid station overloading is critical for maintaining system reliability and preventing disruptions. The current state of overloading at various NTDC grid stations highlights the urgent need for infrastructure upgrades and network capacity expansions to mitigate the risk of outages especially during maximum system stress hours. The table below provides data on the number of power transformers at NTDC's 500 kV and 220 kV grid stations that remained over-loaded (operating at 80% or above capacity) during FY 2023-24, underscoring the extent of this challenge.

Voltage Level	No. of Grid Stations	No. of Power Transformers	Loaded >80%
500/220 kV	19	47	32
220/132 kV	50	183	88
Total	69	230	120

Source: NTDC

It is important to highlight here that four 500/220 kV grid stations in the Hyderabad Region remained overloaded. While three grid stations of 500 kV in Islamabad Region, four in Lahore Region and three grid stations of 500 kV in Multan Region remained overloaded during FY 2023-24. Moreover, two grid stations of 220 kV in Hyderabad, one in Quetta, five in Islamabad, ten in Lahore, and three grid stations in the Multan Region remained overloaded for the same period.

Despite substantial investments, NTDC has not been able to remove critical system constraints including persistent over-loading of important grids like Gatti, New Multan, Sarfaraz Nagar, Muzaffargarh, and Lahore (Sheikhupura). This has led to the operation of costly power plants, in violation of the EMO principle stipulated in the Grid Code. Further, the said delay by NTDC in timely completion of projects have resulted in significant cost escalations.

The overloading of critical grids not only strain the existing infrastructure but also poses significant challenges with respect to reliable and efficient operations of the power system. It is essential to urgently rectify these issues for reliable and financially sustainable operations of the system.

In addition, a comprehensive performance review has become critical to identify and rectify the underlying causes of delays and cost overruns. By addressing these challenges, Pakistan's power transmission sector can move towards a more robust, cost-effective, and reliable energy infrastructure that aligns with the country's growing energy needs.

4.8 TRANSMISSION AND TRANSFORMATION LOSSES OF NTDC

Transmission and Transformation (T&T) Losses pertain to the energy losses in the power transformers and conductors operating at 220 kV and above voltage levels during transmission network operations. Minimising T&T losses is crucial to enhance the overall efficiency and reliability of the grid. The following table provides month-wise T&T losses for FY 2023-24, as reported by NTDC.

Month (FY 2023-24)	Energy Received by NTDC at CDPs (kWh)	Energy Delivered by NTDC at CDPs (kWh)	Units Lost (kWh)	T&T Losses (%)
July	16,080,579,482	15,711,998,751	368,580,731	2.29
August	16,704,706,902	16,305,176,876	399,530,026	2.39
September	14,404,173,188	14,057,456,271	346,716,917	2.41
October	10,347,637,096	10,089,873,778	257,763,318	2.49
November	7,828,381,238	7,620,592,823	207,788,415	2.65
December	7,912,253,211	7,664,105,205	248,148,006	3.14
January	8,797,961,930	8,473,047,043	324,914,887	3.69
February	7,309,057,769	7,105,185,797	203,871,972	2.79
March	8,467,108,157	8,252,302,324	214,805,833	2.54
April	9,182,780,806	8,971,295,385	211,485,421	2.30
May	13,090,079,963	12,808,234,811	281,845,152	2.15
June	13,690,224,937	13,378,327,901	311,897,036	2.28
Total	133,814,944,679	130,437,596,965	3,377,347,714	2.52

Note: Actual Month-wise T&T Losses.

Source: NTDC

4.9 INVESTMENT DETAILS OF NTDC

In accordance with the provisions of Section 32 of NEPRA Act and the NEPRA's Guidelines for determination of Revenue Requirement and Use of System Charges for Transmission Licensees, 2017 ("2017 Guidelines"), NTDC submitted its investment plan and losses assessment for FY 2022-23 to FY 2024-25. As per standard regulatory process, a public hearing involving NTDC, Provincial Energy Department, DISCOs and the general public was held on January 02, 2023. Subsequently, NTDC submitted its revised investment plan, with significant revisions in the proposed capital expenditure requirements for existing projects. Additionally, 18 new projects were also proposed in the revised submission.

Accordingly, the total investment requirements by NTDC escalated from Rs. 370 billion to Rs. 510 billion in this revised plan. Considering the substantial increase in the scope of the investment plan, the Authority initiated fresh proceedings in the matter.

The revised investment plan included schemes for removal of constraints as well as necessary measures to ensure system security and reliability. In this regard, thirty three (33) constraint removal projects were proposed. The summary of the projects under various heads of revised TIP is presented below:

S. No.	Head	Number of Projects	CAPEX (Million Rs.)	%
1	Constraints Removal Projects/ System Expansion Projects	51	172,681	34
2	Power Evacuation Projects	30	277,434	54
3	Projects for Special Economic Zones	5	30,369	6
4	Other Development Projects (Other)	13	29,621	6
Grand Total		99	510,105	100

4.10 FATAL AND NON-FATAL INCIDENTS IN TRANSMISSION LINE NETWORK

According to data provided by NTDC and KE for FY 2023-24, three (3) fatal incidents involving NTDC employees occurred within its North region, which includes the Islamabad, Peshawar, Lahore, and Multan circles. In contrast, there were no fatal or non-fatal incidents reported in the South region, which comprises the Hyderabad and Quetta circles.

On the other hand, KE reported a total of three (3) fatalities—one involving an employee and two involving members of the general public—alongside six (06) non-fatal incidents, which included one (01) employees and five (5) members of the public. Additionally, FTCL and STDC reported no fatal or non-fatal incidents during this period.

4.11 INVESTIGATION AGAINST NTDC ON ACCOUNT OF FATAL ACCIDENTS

On October 24, 2022, an incident occurred involving an electrician who was performing routine work at the 500 kV Dadu Grid Station. Subsequently, another fatal accident took place on March 15, 2023, during rehabilitation work on the 500 kV Guddu-Shikarpur Circuit-I, resulting in the loss of an LM-II employee. The Authority has constituted an inquiry committee to investigate the matter under Section 27A of the NEPRA Act. The proceedings are currently underway.

4.12 NEPRA PERFORMANCE STANDARDS (TRANSMISSION) RULES, 2005

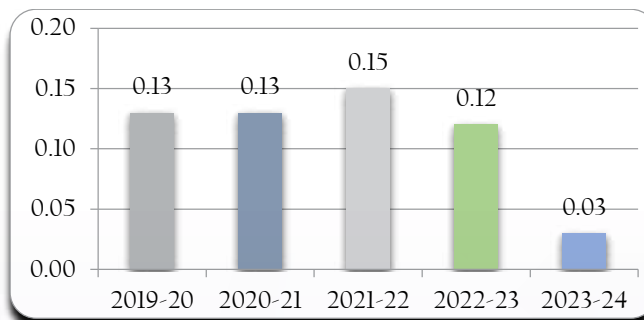
The Performance Standards (Transmission) Rules, 2005 (PSTR-2005) obligate each transmission licensee to furnish an Annual Performance Report (APR) in the manner specified by the Authority. In compliance, NTDC submitted its APR for FY 2023-24. This performance of NTDC was assessed against key performance parameters including System Duration of Interruption, System Frequency of Interruption, Energy Not Served, Loss of Supply Incidents, as well as instances of Voltage and Frequency limits violation specified in the PSTR-2005. A summary of the findings is presented hereunder:

(i) System Reliability

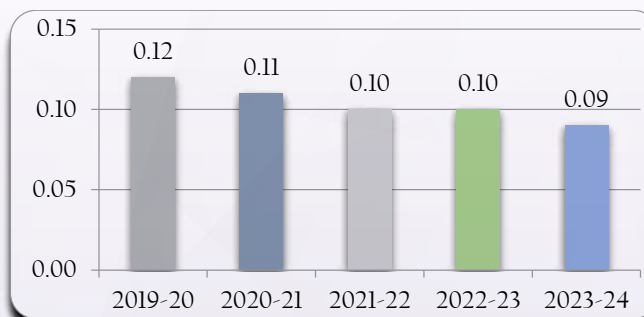
The System Reliability Indicators as reported by NTDC are as follows:

(a) System Duration of Interruption (Hrs./Point)

This indicator reflects the average duration of outages experienced at an interconnection point over the course of a year. In the FY 2023-24, this duration was recorded at 0.03 hours, signifying a significant 75% reduction compared to the preceding year, as shown in the graph.

**(b) System Frequency of Interruption (Nos./Circuit)**

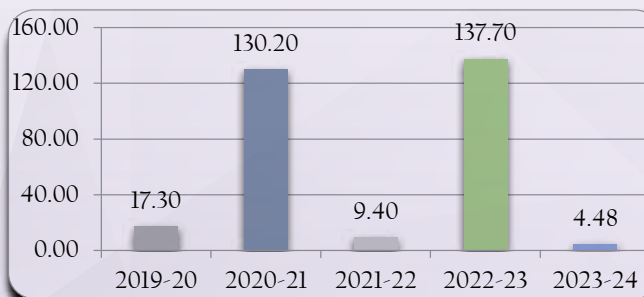
This metric indicates the average number of outages that occur on a circuit annually. In the FY 2023-24, this figure was recorded at 0.09, reflecting a significant 10% reduction compared to the previous year, as shown in the graph.

**(ii) System Security**

NTDC's reported System Security Indicators are as follows:

(a) Energy Not Served (ENS) (MkWh)

This indicator estimates the Total Energy Not Served (ENS) resulting from loss of supply incidents in the FY 2023-24.

**(b) Loss of Supply Incidents, Average ENS per Incident and Average Duration per Incident**

Financial Year	Loss of Supply Incidents (Nos.)	Average ENS per Incident (MkWh)	Average Duration per Incident (Hrs)
2019-20	62	0.30	1:10
2020-21	57	2.28	1:20
2021-22	51	0.20	1.60
2022-23	55	2.50	1.14
2023-24	51	0.09	0.37

Source: NTDC

(iii) Frequency

During FY 2023-24, seven instances were observed when the system frequency exceeded the upper permissible limit of 50.50 Hz, as stipulated in Rule 8 of the PSTR. The highest recorded frequency i.e., 50.62 Hz, was 1.24% above from the nominal frequency of 50 Hz in the FY 2023-24. The comparison of frequency limit violations for the past five years is presented below:

(a) NTDC System Frequency

Financial Year	Number of times Frequency remained outside the Limits			Time duration the Frequency remained outside the Limits		
	In a year	Average/month	Average/day	hours	Min.	% of year
2019-20	9	0.80	0.02	0.80	48	0.009
2020-21	4	0.30	0.01	0.60	36	0.007
2021-22	1	0.11	0.003	0.12	7	0.001
2022-23	15	1.25	0.041	1.70	102	0.013
2023-24	7	0.58	0.02	0.82	49.2	0.01

Source: NTDC

(b) NTDC Monthly Frequency Violating Limit (Hz) (Highest System)

Month	2019-20	2020-21	2021-22	2022-23	2023-24
July	50.62	50.72	50.59	50.66	50.61
August	50.55	NIL	NIL	50.61	50.55
September	NIL	50.54	50.54	50.65	NIL
October	50.59	NIL	NIL	NIL	NIL
November	NIL	NIL	NIL	NIL	NIL
December	NIL	NIL	NIL	50.53	NIL
January	50.58	NIL	NIL	50.57	50.54
February	NIL	NIL	NIL	NIL	NIL
March	NIL	NIL	NIL	NIL	NIL
April	NIL	NIL	NIL	50.57	NIL
May	50.60	NIL	50.61	50.55	NIL
June	50.54	NIL	50.66	50.56	50.62

Source: NTDC

It is added here that “NIL” lowest system frequency has been reported in the last five years.

4.13 TRANSMISSION NETWORK OF KE

KE holds a Transmission Licence granted under Section 16 of the NEPRA Act and is responsible for the ownership, operation, and maintenance of a transmission network spanning both 220 kV and 132 kV levels. Key information related to KE's transmission system is as below:

- (a) 436 km of 220 kV Transmission Lines (394 km overhead and 42 km underground)
- (b) 11 Nos. of 220 kV Grid Stations with transformation capacity of 5,500 MVA
- (c) 805 km of 132 kV Transmission Lines (640 km overhead and 165 km underground)
- (d) 60 Nos. of 132 kV Grid Stations having transformation capacity of 7,020 MVA
- (e) 03 Nos. of 66 kV Grid Stations having transformation capacity of 79 MVA

4.14 POWER BALANCES IN KE SYSTEM

The following table offers a glimpse of the demand-supply situation within the KE system. It indicates that KE failed in its obligation to meet the system peak.

A: Actual Figures			
Financial Year ending 30 th June	Generation Capability (MW) ^[1]	Demand During KE's System Peak Hours (MW)	Surplus/(Deficit) (MW) ^[2]
2023	3,409 (including IPPs + NTDC)	3,654	(245)
2024	3,550 (including IPPs + NTDC)	3,568	(18)

B: Projected Figures				
Financial Year ending 30th June	Planned Generation Capability as per KE (MW) ^[3]	KE's Projected Demand Growth Rate (%)	KE's Projected Demand during Peak hours (MW)	Surplus/ (Deficit) (MW)
2025	4,698	2.92	3,707	991
2026	4,698	2.92	3,806	892
2027	5,179	2.92	3,908	1,271
2028	4,950	2.92	4,002	948
2029	4,950	2.92	4,120	830

^[1] Based on maximum supply achieved in KE's System.

^[2] Deficit based on peak demand and maximum supply achieved during the year.

^[3] Includes extension in useful lives of Unit 1 & 2 of BQPS-I till FY 2027 as requested vide KE Letter dated April 02, 2024.

Source: KE

4.15 LOADING POSITION OF POWER TRANSFORMERS IN KE SYSTEM

KE operates and manages a transmission network consisting of 11 grid stations at the 220/132 kV level, with a total transformation capacity of 5,500 MVA. In addition, there are 60 grid stations functioning at the 132/11 kV level, hosting a fleet of 180 power transformers collectively offering a transformation capacity of 7,020 MVA. Furthermore, KE maintains three (03) grid stations operating at the 66/11 kV level, housing 4 power transformers, with an aggregate transformation capacity of which is 79 MVA.

According to the operational data reported by KE for the 220/132 kV grid stations, no instances of over-loading were observed during FY 2023-24. However, at the 132/11 kV level, around 20% power transformers were reported to be overloaded during the same period. Additionally, two power transformers at the 66/11 kV level exceeded 80% of their rated capacity. The situation necessitates that KE must closely monitor and manage transformer loads, and take appropriate actions to ensure optimal performance and prevent potential issues.

4.16 TRANSMISSION LOSSES OF 660 KV HVDC LINE

NEPRA has allowed a margin of 4.30% for the annual transmission losses on the 660 kV HVDC transmission line, operated by the PMLTC. The monthly transmission losses for the 660 kV HVDC transmission line reported during the FY 2023-24 are as below:

Month (FY 2023-24)	Energy Received by HVDC at CDPs (MWh)	Energy Delivered by HVDC at CDPs (MWh)	Utilization (MW)	Utilization of HVDC Line (%)	Units Lost (MWh)	Losses (%)
July	1,749,506.00	1,698,956.80	2,351	59	50,549.20	2.89
August	1,831,207.00	1,778,017.50	2,461	62	53,189.50	2.90
September	1,571,854.00	1,526,767.10	2,183	55	45,086.90	2.87
October	797,118.00	773,793.60	1,071	27	23,324.40	2.93
November	610,316.00	591,804.10	848	21	18,511.90	3.03
December	748,739.00	727,471.10	1,006	25	21,267.90	2.84
January	942,366.00	916,871.20	1,309	33	25,494.80	2.71
February	665,553.00	645,745.60	956	24	19,807.40	2.98
March	720,121.00	699,178.60	968	24	20,942.40	2.91
April	837,600.00	814,566.80	1,163	29	23,033.20	2.75
May	1,404,909.00	1,366,607.50	1,888	47	38,301.50	2.73
June	1,347,268.00	1,308,930.50	1,871	47	38,337.50	2.85
Total	13,226,557.00	12,848,710.40	1,510	38	377,846.60	2.86

Note: Actual Month-wise T&T Losses.

Source: CDP Metering Data of NTDC

PMLTC – 4,000 MW HVDC Transmission Line

Month (FY 2023-24)	Invoice Amount Billed by PMLTC (Rs.)	Energy Transmission Capability (kWh)	Actual Energy Transmitted (kWh)	Utilization Factor (%)	Losses + Aux. Consumption (%)
July	8,268,816,000	2,931,360,000	1,749,506,000	59.68	2.89
August	8,268,816,000	2,931,360,000	1,831,207,000	62.47	2.91
September	8,002,080,000	2,836,800,000	1,571,854,000	55.41	2.87
October	8,423,865,600	2,931,360,000	797,118,000	27.19	2.93
November	8,152,128,000	2,836,800,000	610,316,000	21.51	3.03
December	8,423,865,600	2,931,360,000	748,739,000	25.54	2.84
January	8,206,617,600	2,931,360,000	942,366,000	32.15	2.71
February	7,677,158,400	2,742,240,000	665,553,000	24.27	2.98
March	8,206,617,600	2,931,360,000	720,121,000	24.57	2.91
April	7,932,384,000	2,836,800,000	837,600,000	29.53	2.75
May	8,196,796,800	2,931,360,000	1,404,909,000	47.93	2.73
June	7,932,384,000	2,836,800,000	1,347,268,000	47.49	2.85
Total	97,691,529,600	34,608,960,000	13,226,557,000	38.22	2.86

Availability Factor per Annum = 98.50%

Source: PMLTC and Technical Department Data

4.17 TRANSMISSION LOSSES OF STDC

NEPRA has allowed a transmission loss of 2.0% to STDC for its 132 kV transmission line, connecting SNPC-I and SNPC-II power plants to the KDA-33 Grid Station of KE. For the FY 2023-24, following losses have been reported by the STDC:

Month	Energy Received from SNPC-I & II (MWh)	Energy Delivered at KDA-33 Grid Station (MWh)	Transmission Losses	
			MWh	%
July, 2023	40,465.00	39,804.00	661.00	1.63
August, 2023	42,660.00	41,770.00	890.00	2.09
September, 2023	42,264.00	41,552.00	712.00	1.68
October, 2023	61,412.00	60,074.00	1,338.00	2.18
November, 2023	45,428.00	44,842.00	586.00	1.29
December, 2023	42,101.00	41,631.00	470.00	1.12
January, 2024	42,284.00	41,720.00	564.00	1.33
February, 2024	45,318.00	44,707.00	611.00	1.35
March, 2024	52,916.00	52,028.00	888.00	1.68
April, 2024	57,359.00	56,308.00	1,051.00	1.83
May, 2024	62,727.00	61,391.00	1,336.00	2.13
June, 2024	64,403.00	62,955.00	1,448.00	2.25
Total	599,337.00	588,782.00	10,555.00	1.76

Note: Actual Month-wise T&T Losses.

Source: STDC

4.18 DURATION OF TRANSMISSION LINE OUTAGES OF STDC

The following table presents a month-wise breakdown of the number of transmission line outages, including duration of the outage and reasons thereof, for FY 2023-24:

Month (FY 2023-24)	No. of Outages	Duration of Outages	Reason(s) of Outages
July	4	28 Hours 41 Mins	Extreme Humid Weather Condition
August	6	41 Hours 35 Mins	Extreme Humid Weather Condition
September	4	14 Hours 19 Mins	Extreme Humid Weather Condition
October	7	22 Hours 12 Mins	Extreme Humid Weather Condition
November to March	0	No Outage	-
April	1	4 Hours 22 Mins	Extreme Humid Weather Condition
May	2	7 Hours 19 Mins	Extreme Humid Weather Condition
June	4	15 Hours 48 Mins	Extreme Humid Weather Condition
Total	28	134 Hours 16 Mins	-

Source: STDC

4.19 SCADA-III PROJECT OF NTDC

The SCADA system was deployed by the NTDC in the year 1992 to upgrade its capabilities as a system operator, however, due to inadequate hardware and software updates, several crucial components of SCADA have become outdated. In order to resolve the long standing issue of a fully functional SCADA system, NTDC initiated the SCADA-III project to expand its coverage to the entire transmission system. The key objectives of SCADA-III projects are to enhance the visibility/ operations and monitoring capabilities of the System Operator and establish real-time data acquisition and control from all power plants and Common Delivery Points (CDPs):

- (a) Upgradation of the existing SCADA System (Hardware and Software) at NPCC and Backup Control Centre at Jamshoro;
- (b) Integration of 116 RTUs with the new SCADA System at NPCC;
- (c) Integration of 49 RTUs left-over from LDS-II;
- (d) Microwave System (64 sites) as a backup mode of communication;
- (e) OPGW Live Line Installation of 3,600 kms (500 kV/220 kV/132 kV);
- (f) Data transportation from SMS Metres (246 sites original scope & 196 sites revised scope) over NTDC Telecom network;
- (g) Revamping of the telecom network (NTDC 500 kV/220 kV substations, SMS Sites at DISCOs 132 kV).

Originally, the SCADA-III project was required to become operational by June 24, 2024. However, due to a number of reasons including (i) approval of design documents (ii) installation of OPGW, and (iii) HESCO and SEPCO Transmission Tower, the project will now be completed by June 30, 2025. The work breakdown structure for operationalization of SCADA-III project as communicated by NTDC is as follows:

Description	Contractual Timelines	Expected Timelines
OPGW (Backbone)	January, 2024	31 st July, 2024 (already completed in May, 2024)
OPGW (Remaining)	February, 2024	30 th December, 2024
SCADA Go-Live	March, 2024	30 th December, 2024
Microwave	May, 2024	30 th June, 2025
SCADA Completion	May, 2024	30 th June, 2025
Overall (Project Completion)	24th June, 2024	30th June, 2025

SCADA-III Project has been divided into three (03) different zones, as explained below:

Zone 1: [Domain of Asset Management] (Field Processes: Transducers, Relays and auxiliary contacts, actuators)

Zone 2: [Domain of NTDC Telecom] (RTUs in field, PLCs, OPGW, MW up to the Front End Servers at NPCC)

Zone 3: [System Operator] Front End Servers to Operator Consoles at NPCC.

System Operator is responsible for Operation, Maintenance and Development of the SCADA system in the following areas:

- (a) Hardware (installed at NPCC) and Software Applications;
- (b) Archives, Database and Displays;
- (c) Signal Lists, Technical Data and Data Engineering;
- (d) Point to Point, End to End Testing, Verifications.

4.20 PERSISTENT TECHNICAL CONSTRAINTS AND OVERLOADING IN THE NTDC NETWORK

The NTDC transmission network has been identified as a critical bottleneck hindering the delivery of affordable and reliable electricity. Although there is a substantial amount of economic base load

generation such as nuclear, Thar coal, and renewable energy, primarily located in the southern regions, the current transmission and transformation infrastructure is inadequate for transporting this cost-effective power to key load centres.

To address these persistent issues, NTDC's transmission investment plan has outlined twenty eight (28) strategic projects aimed at resolving long-standing system constraints. These projects are crucial for enhancing grid stability, improving reliability, and alleviating overloading challenges within the network. The specifics of these projects, designed to remove technical limitations and boost overall performance, are detailed here below:

S. No.	Overloaded Grid Station/ Circuit	Constraint Removal Timeline	S. No.	Overloaded Grid Station/Circuit	Constraint Removal Timeline
(a) Transformation Constraints (Overloaded 500/220 kV Transformers)					
1	500 kV Jamshoro	2025	5	500 kV Multan	2027
2	500 kV Lahore Sheikhpura	2025	6	500 kV Muzaffargarh	2027
3	500 kV Gatti	2025-26	7	500 kV Yousafwala	2027
4	500 kV Shaikh Muhammadi	2026	8	500 kV Rawat	2026-27
(b) Transformation Constraints (Overloaded 220/132 kV Transformers)					
9	220 kV Sarfaraznagar	Subject to 220 kV Sundar Industrial Grid partially by December, 2023	16	220 kV ISB University	2027
10	* 500 kV Lahore Sheikhpura	December, 2024	17	220 kV Quetta Industrial	June, 2026
11	220 kV Ludewala	December, 2024	18	220 kV NK Lakhpat	June, 2026
12	* 500 kV Guddu	2024-25	19	220 kV KAPCO P/H	June, 2026
13	220 kV Jamshoro	2024-25	20	* 500 kV Yousafwala	August, 2026
14	220 kV T.M. Khan	2024-25	21	220 kV Sialkot	2026-27
15	220 kV Hala Road	August, 2025			
(c) Power Evacuation Problems from South to North (Overloaded 500 kV Transmission Lines)					
22	500 kV Jamshoro – China Hub – 500 kV HUBCO; K2/K3 – Jamshoro (Unable to Dispatch Power Plants K2/K3, China Hub, HUBCO on Full Load in this Loop)				June, 2024
	500 kV Jamshoro – China Hub and 500 kV HUBCO – K2/K3 (Unable to Dispatch Power Plants China Hub and HUBCO) on Full Load during outage of either 500 kV China Hub – Jamshoro or 500 kV HUBCO – K2/K3)				
		500 kV Jamshoro – Matiari Circuit 1 & 2; 500 kV Jamshoro – Dadu Circuit (Unable to Dispatch existing Power Plants in South on Full Load)			
23	500 kV Dadu – Shikarpur and 500 kV Moro - Rahim Yar Khan (Generation curtailment required from Southern Power Plants in case of N-0 as HVAC current carrying capacity from South to North is less than generation capacity in South)				August, 2025
24	500 kV Shikarpur - Guddu 1&2 500 kV Moro – RYK (Unable to Dispatch existing Power Plants in south on Full Load)				August, 2025
(d) Power Evacuation Problems in North and MID Center (Overloaded 500 kV Transmission Lines)					
25	500 kV Nokhar – Karot – Neelum Jhelum interconnection loop (Unable to Despatch Karot & Neelum Jhelum on Full Load in this Loop during outage of any circuit connected with Nokhar)				December, 2025
26	500 kV Yousafwala – Sahiwal Coal CFPP (Overloading occurred on June 18, 2023 unable to despatch Sahiwal Coal on Full Load)				June, 2026
27	500 kV Sheikh Muhammadi – Tarbela Circuit				June, 2026

(e) Power Evacuation Problem in South (Overloaded 220 kV Transmission Lines)		
28	220 kV Jamshoro – Hala Road Circuit No. 01 & 02	June, 2026

* 220/132 kV Power Transformers located at 500 kV Grid Stations.

It is observed that in most cases, NTDC frequently revises the timelines for the removal of constraints, which reflects ongoing inefficiencies in its operations. A prominent example is the transformation constraints at the Jamshoro Grid, which were initially scheduled for completion in 2018 but are now projected to be completed in 2025 according to the revised timeline. Similarly, the installation of a 600 MVA transformer at the Nokhar Grid, originally planned for completion by 2018, is still pending. Other instances of delayed transformation constraints at the 220/132 kV level include the Ludewala Grid Station and the 500 kV Sheikhpura Grid Station. These persistent delays highlight significant issues in NTDC's execution and planning processes.

As a result of these constraints, the system operator is compelled to curtail the use of economic base load plants and instead rely on more expensive RFO/RLNG-based plants at load centres; details of same is given hereunder:

S. No.	Constraint	Commitment of Generation
Overloading of Transformers		
1	at 500 kV Rawat Grid Station	Attock Gen.
2	at 500 kV Yousafwala Grid Station	Saif Power
3	at 220 kV Kassowal Grid Station	Fauji Kabirwala Power
4	Gakkhar – Sialkot Circuit	Nandipur and Narowal Energy
5	at 500 kV Nokhar Grid Station	Narowal Energy and Nandipur
6	at 500 kV Sheikhpura Grid Station	Saba Power, Halmore Power, Sapphire Electric Power
7	at 220 kV Sarfraznagar Grid Station	Nishat Power, Nishat Chunian and Kohinoor Energy
Transformation Congestion		
8	at 500 kV Gatti Grid Station	Liberty Power Tech.
9	at 500 kV Muzaffargarh and New Multan Grid Stations	Lal Pir Power, Pak Gen. Power, KAPCO
10	South to North Congestion HVDC and HVAC Limitation and Strategic Table for HVDC Operation for Winter/Summer	Curtailement of local Coal/Nuclear/ Wind, Operation of RLNG/RFO plants in North

PERFORMANCE OF THE DISTRIBUTION AND SUPPLY SECTOR

05

5.1 GENERAL

The distribution of electric power in Pakistan is a regulated activity governed by Section 20 of the NEPRA Act of 1997. Currently, there are ten DISCOs that are fully owned by the Federal Government, and KE, a privatised vertically integrated utility. These entities are licensed to perform the function of distribution of electric power within their designated territories under the licences granted by the NEPRA. Additionally, some private entities have also been issued distribution licences including DHA (EME), Lasbela Industrial Estates Development Authority, Aujla and Associates Town Developers (Pvt.) Limited to serve consumers within their specific service territories.

Before the NEPRA Act was amended in April 2018, the scope of electricity distribution encompassed both the physical infrastructure (wire business) and the sale of electricity to end-consumers (supply business). However, with the introduction of the NEPRA (Amendment) Act, 2018, the sale of electricity was separated from the distribution function. Under the amended Act, a distinct 'Electric Power Supply Licence' is now required for the supply of electricity, as stipulated in Section 23E of the Act. This amendment effectively decouples the distribution of electricity from its sale, providing a clear regulatory framework for these two essential aspects of the power sector.

Furthermore, according to Section 23E(1) of the NEPRA (Amendment) Act, 2018, the existing distribution licensees were deemed the holder of electric power supply licence for a period of five years from the effective date of the NEPRA (Amendment) Act, 2018. Upon expiry of 05 years period, the DISCOs approached NEPRA for the grant of Electric Power Supply Licences. The Authority has issued licences to all the DISCOs except SEPCO and TESCO, which are under regulatory proceedings.

5.2 CONSUMER BASE OF DISCO'S AND KE

In the FY 2023-24, both the public sector DISCOs and KE experienced an expansion of their consumer base. As of June 2024, the total number of electricity consumers nationwide surged to approximately 40,113,886 with 2,015,498 new consumers integrated into the network during the FY 2023-24. Out of this, around 1,876,949 consumers were added to the DISCOs network while 138,549 were connected to the KE system. Following the new electricity connection energised during FY 2023-24, the total number of electricity consumers, as on June 30, 2024, stands 36,409,536 for ten (10) DISCOs and 3,704,350 for KE.

However, despite this noteworthy growth in terms of the number of electricity consumers, an unexpected dip in sales figures has been observed for both the DISCOs and the KE system. A decline in electricity sales growth means a further under-utilization of the existing surplus generation capacity. This trend warrants a thorough analysis to pinpoint the underlying factors for this abnormal pattern. Although, at face, the decline in electricity sales can be attributed to the phenomenal increase in electricity tariff in the past couple of years as well as an exponential uptake in the installation of on-grid and off-grid solar solutions by industrial, agricultural, and residential consumers. However, a thorough analysis of the root-causes will be instrumental in formulating strategies to address and rectify the discrepancies and ensuring the sustainability and efficiency of the electric power sector in Pakistan.

5.3 SALES OF DISCOS AND KE

In the FY 2023-24, the sale of electricity to the National Grid, which includes the energy supplied to KE, saw a decrease of around 3% as in the previous FY 2022-23. These figures do not include KE's own generation and purchases from IPPs. Within KE itself, the sale of electricity also saw a reduction to 15,025.11 GWh in FY 2023-24, as against 15,553.83 GWh sales registered in the preceding FY. The category-wise trend of annual sales growth percentage across the country for the FY 2022-23 and FY 2023-24 is as follows:

Category	FY 2021-22	FY 2022-23		FY 2023-24	
	Units Sold (GWh)	Units Sold (GWh)	Growth (%)	Units Sold (GWh)	Growth (%)
Domestic	60,408.89	53,534.20	-11.38	54,042.25	0.95
Commercial	9,233.35	8,891.63	-3.70	9,073.20	2.04
Industrial	33,957.77	31,088.00	-8.45	27,776.75	-10.65
Agricultural	11,032.61	9,543.14	-13.50	8,578.05	-10.11
Public Lighting	408.59	521.28	27.58	653.48	25.36
Bulk Supply	4,078.89	4,443.93	8.95	4,656.35	4.78
General Services/Others	5,508.80	4,880.32	-11.41	4,927.78	0.97
Total	124,628.90	112,902.49	-9.41	109,707.85	-2.83
Supplied to KE	9,036.54	8,960.81	-0.84	8,538.07	-4.72

Source: DISCOs and KE

The pattern of change in electricity consumption given above provides insights into the factors that drive demand and consumption within the grid. A thorough analysis of the reasons for this trend is necessary to make informed, strategic decisions for optimization of both generation and distribution operations, tackling potential challenges, and ultimately elevating the efficiency of the entire power supply system. Such an approach will ensure a more reliable and responsive energy provision for consumers.

5.4 TRANSMISSION AND DISTRIBUTION LOSSES OF DISCOS

In the process of tariff determination for DISCOs, NEPRA establishes specific targets for T&D losses for each individual DISCO. These losses are unique to each DISCO and are determined after taking into account various factors, such as the consumer mix, feeder lengths, geographical coverage area, HT to LT ratio and many more. The T&D losses incurred by a DISCO beyond the target set by NEPRA cannot be passed on to consumers. Instead, these excess losses are reflected in the financial statements of the respective DISCO, contributing to the escalation of circular debt.

A detailed breakdown of the actual T&D losses for each DISCO against the NEPRA allowed T&D loss levels, along with their financial impact, is presented in the following table:

DISCO	Description	FY 2019-20	FY 2020-21	FY 2021-22	FY 2022-23	FY 2023-24
PESCO	Actual (%)	38.87	38.20	37.47	37.40	38.14
	Allowed (%)	21.33	21.33	20.73	20.16	29.71
	Financial impact of units lost beyond target (Rs. Million)	22,521	32,385	63,939	77,352	97,168
TESCO	Actual (%)	9.92	9.64	9.32	9.02	9.01
	Allowed (%)	11.96	9.60	9.31	9.21	8.59
	Financial impact of units lost beyond target (Rs. Million)				(164)	(226)
IESCO	Actual (%)	8.69	8.54	8.17	8.06	8.85
	Allowed (%)	8.60	8.50	8.15	7.80	7.31
	Financial impact of units lost beyond target (Rs. Million)	158	88	217	277	5,875

DISCO	Description	FY 2019-20	FY 2020-21	FY 2021-22	FY 2022-23	FY 2023-24
GEPCO	Actual (%)	9.51	9.23	9.07	8.61	11.54
	Allowed (%)	9.51	9.23	9.20	9.10	9.00
	Financial impact of units lost beyond target (Rs. Million)	(880)	(1,127)	(1,116)	(1,856)	9,217
LESCO	Actual (%)	12.40	11.96	11.52	11.29	15.92
	Allowed (%)	10.88	10.03	9.08	8.00	10.00
	Financial impact of units lost beyond target (Rs. Million)	5,859	7,693	9,279	21,785	47,635
FESCO	Actual (%)	9.56	9.28	9.09	8.59	9.86
	Allowed (%)	10.10	9.76	9.34	8.84	8.74
	Financial impact of units lost beyond target (Rs. Million)	(1,252)	(1,206)	(636)	(1,449)	5,040
MEPCO	Actual (%)	15.23	14.97	14.70	14.22	15.28
	Allowed (%)	14.90	13.12	12.79	12.34	11.83
	Financial impact of units lost beyond target (Rs. Million)	682	34	(902)	7,945	22,657
HESCO	Actual (%)	28.89	28.15	28.09	27.49	27.62
	Allowed (%)	19.47	19.43	19.07	18.57	18.06
	Financial impact of units lost beyond target (Rs. Million)	7,915	8,666	14,000	15,002	23,177
SEPCO	Actual (%)	36.27	35.31	35.63	34.39	34.91
	Allowed (%)	18.11	17.89	17.41	17.05	16.68
	Financial impact of units lost beyond target (Rs. Million)	5,955	9,174	21,370	20,380	29,058
QESCO	Actual (%)	26.68	27.97	28.06	26.72	29.77
	Allowed (%)	17.15	14.70	14.49	14.27	14.04
	Financial impact of units lost beyond target (Rs. Million)	10,933	13,421	18,588	21,214	36,746
Total	Actual (%)	17.82	17.32	16.85	16.45	18.31
	Allowed (%)	15.63	14.43	13.46	11.70	11.77
	Financial impact of units lost beyond target (Rs. Million)	51,891	69,128	124,739	160,486	276,349

Source: DISCOs

This comprehensive analysis not only provides a snapshot of the performance of each DISCO in managing losses but also presents a clear picture of the financial implications of these losses for both the DISCOs as well as the power sector as a whole. It serves as a critical reference point for decision makers to formulate targeted strategies aimed at reducing T&D losses to fortify the financial stability of the distribution sector.

5.5 RECOVERY RATIOS IN DISCOS SYSTEM

NEPRA establishes tariffs with the target of 100% recovery for the electricity units sold by DISCOs. Any shortfall in the amount billed is not shifted onto the consumers; under reference determined tariff instead, it is reflected on the DISCOs' balance sheets, which if remain unrecovered, ultimately contributes to the circular debt. The following table provides the actual recovery ratio (%) of each DISCOs during the last five years, along with the corresponding unrecovered amount of the sold units.

DISCO	Description	FY 2019-20	FY 2020-21	FY 2021-22	FY 2022-23	FY 2023-24
PESCO	Recovery Ratio (%)	87.65	101.87	91.79	91.65	91.91
	Amount not Recovered (Rs. Million)	19,829.85	-3,300.10	19,171.61	26,180.15	31,037.1
TESCO	Recovery Ratio (%)	68.16	83.27	66.22	85.15	105.66
	Amount not Recovered (Rs. Million)	8,754.97	5,123.10	14,657.41	7,145.82	-2,607.88
IESCO	Recovery Ratio (%)	90.27	116.87	95.62	104.98	97.03
	Amount not Recovered (Rs. Million)	19,552.52	-37,199.00	12,692.72	-19,181.22	15,487.45
GEPCO	Recovery Ratio (%)	94.36	105.10	98.19	98.00	96.21
	Amount not Recovered (Rs. Million)	9,481.37	-9,805.75	4,579.66	6,842.49	17,760.31
LESCO	Recovery Ratio (%)	94.48	98.72	96.69	94.33	96.11
	Amount not Recovered (Rs. Million)	21,384.00	5,529.93	19,419.33	45,183.25	39,464.26
FESCO	Recovery Ratio (%)	94.18	97.20	94.84	100.39	97.61
	Amount not Recovered (Rs. Million)	13,338.64	7,240.96	18,930.01	-1,876.57	14,826.77
MEPCO	Recovery Ratio (%)	92.94	102.15	92.08	98.27	97.20
	Amount not Recovered (Rs. Million)	17,937.69	-6,033.90	31,739.28	8,853.39	19,248.56
HESCO	Recovery Ratio (%)	73.19	75.63	73.72	74.42	76.40
	Amount not Recovered (Rs. Million)	17,728.83	17,551.62	23,361.68	29,132.97	36,779.04
SEPCO	Recovery Ratio (%)	56.54	64.48	63.78	66.50	65.41
	Amount not Recovered (Rs. Million)	20,787.67	17,865.74	22,895.13	27,209.75	38,188.89
QESCO	Recovery Ratio (%)	49.25	39.80	35.28	36.92	31.79
	Amount not Recovered (Rs. Million)	31,282.73	51,580.21	62,469.78	82,305.02	104,322
Total	Recovery Ratio (%)	88.77	97.30	90.51	93.39	92.44
	Amount not Recovered (Rs. Million)	180,078.27	48,552.81	229,916.60	211,795.04	314,506.45

Source: DISCOs

One of the persistent challenges in the power sector of Pakistan is the issue of non-recovery of sold electricity units by DISCOs. The unrecovered amounts directly affect DISCOs' revenue streams, leading to financial deficits and a reliance on subsidies or loans to cover operational costs. Moreover, this non-recovery contributes to the circular debt in Pakistan's power sector. The accumulated debt hampers the ability to invest in infrastructure improvements leading to a vicious cycle of financial instability. Enhanced governance and accountability at all levels within DISCOs is needed to address this challenge. Accurate billing to consumers is equally crucial for achieving full recovery. Resorting to fictitious billing as a means to handle T&D losses is a contributing factor to the shortfall. Deployment of AMI meters is one of the major tools to address the issue of inaccurate or factious billing by DISCOs.

AMI must be deployed in a targeted manner, starting with high-loss areas to combat theft and improve billing accuracy. Proper utilization of this technology can drastically reduce the human discretion involved in meter readings, thereby curbing opportunities for collusion between DISCO staff and consumers engaging in electricity theft.

In addition, governance reforms within DISCOs is also a pre-requisite to address the issue of non-recovery of electricity bills. The current governance model, characterised by external interference and lack of accountability, has perpetuated widespread mismanagement, contributing to electricity theft and low recoveries. DISCOs need to be granted greater autonomy from external influence, with

management practices reformed to emphasise transparency, merit-based hiring, and strict internal accountability mechanisms.

At the same time, stricter enforcement of anti-theft measures is crucial. Coordination between DISCOs and law enforcement agencies/district administrations in high-loss and high-theft areas is required to end this menace. By engaging local authorities, DISCOs can recover outstanding payments and enforce legal actions against defaulters, ultimately reducing losses and improving overall operational efficiency.

Public perception of the DISCOs is another obstacle to reducing electricity theft. Many consumers view non-payment of electricity bills as a necessity due to economic hardship or as an acceptable practice given the widespread inefficiencies within DISCOs. To address this, DISCOs need to launch targeted public awareness campaigns aimed at educating consumers about the financial and societal costs of non-payment of electricity bills, the penalties for illegal connections, and the benefits of regular bill payments.

Reforming existing subsidy structure is an important aspect that should be considered to improve recoveries. Indirect subsidies currently benefit large segments of the population indiscriminately, leading to market distortions and financial strain on the government. A direct subsidy system, focused on genuinely low-income households, will reduce the overall subsidy burden while encouraging well-off consumers to pay rates reflective of actual electricity costs. This reform must be implemented gradually to minimise social disruption but should be pursued as a matter of urgency.

At the same time, innovative payment solutions such as prepaid metering systems, flexible instalment plans, and microfinance schemes should be explored to help low-income consumers manage their electricity bills. These measures will reduce the risk of default and provide greater financial stability for DISCOs.

5.6 RECEIVABLES OF DISCOS

The receivables of DISCOs is the Achilles heel of the power sector of Pakistan. These receivables refer to the outstanding payments owed by different categories of consumers to DISCOs for the electricity supplied to them. Unfortunately, the power sector in Pakistan grapples with a substantial amount of receivables, for reasons, including but not limited to, poor governance at DISCOs, inefficiencies in billing and collection processes, non-payment or delayed payment by consumers etc. This accumulated backlog of receivables has a significant negative impact on the financial health of DISCOs. It hampers their ability to cover operational costs, invest in infrastructure upgrades and debt servicing. Moreover, it exacerbates the circular debt issue within the sector, which has vast ramifications for the entire energy landscape of the country. Effective strategy is required immediately to reduce these receivables for the sustainable operation and growth of the power sector in Pakistan. These strategic measures may include improved governance in DISCOs, improved billing systems, enhanced collection mechanisms, and stricter enforcement of payment policies. Additionally, fostering a culture of accountability and promoting awareness among consumers about the importance of timely payments can also contribute to mitigating the receivables challenge. The detail of receivable (Rs. in Million) of each DISCO as of June 30, 2024 is given in the following table:

Category	PESCO ^[1]	TESCO ^[2]	IESCO	GEPCO	LESCO	FESCO	MEPCO	HESCO	SEPCO	QESCO	TOTAL
Government Receivables											
Federal Government	2,228	967	14,137	2,826	6,673	1,725	2,189	5,534	9,134	2,400	47,811
AJ&K Government	0	0	0	0	0	0	0	0	0	0	0
Provincial Government	23,988	2,298	2,032	1,759	14,773	3,816	10,675	20,604	33,520	38,299	151,763
Government Receivables (06/2024)											
	33,335.58	3,265	61,521	8,884	21,446	5,541	12,864	26,138	42,654	40,698	256,346
Government Receivables (06/2023)											
	34,051	3,206	54,101	6,456	15,042	3,213	7,073	21,958	26,315	34,139	205,553
Private Receivables (Aging of Running Defaulters)											
1 month	9,806	395	5,617	4,477	18,285	5,737	7,753	1,692	2,775	684	57,221
2 months	1,182	271	505	321	5,334	883	892	402	149	187	10,127
3 months	1,781	91	48	56	5,370	559	742	482	329	270	9,727
4-6 months	5,604	73	162	0	6,987	228	297	1,105	444	640	15,541
Over 6 months and up to 01 year	5,563	79	19	0	1,349	11	0	2,523	766	794	11,104
1-3 years	22,213	300	1	0	0	0	0	10,479	2,706	2,216	37,916
Over 3 years	81,539	48,690	0	0	0	0	0	134,251	164,813	524,008	953,300
Running Defaulters (06/2024)											
	127,689	49,899	6,353	4,855	37,325	7,417	9,684	150,934	171,981	528,799	1,094,936
Running Defaulters (06/2023)											
	101,843	55,235	3,386	2,755	21,470	3,770	7,924	121,830	150,528	432,080	900,821
Aging of Disconnected Defaulters											
1 month	1,480	9	52	334	974	197	906	221	89	6	4,267
2 months	9	0	20	218	239	82	184	50	6	2	809
3 months	113	52	39	127	290	212	442	113	29	1	1,418
4-6 months	963	12	105	1,169	1,590	701	2,033	204	48	9	6,834
Over 6 months and up to 01 year	1,000	448	219	673	1,256	1,608	2,590	309	79	22	8,205
1-3 years	5,719	1,192	250	1,032	5,164	722	3,398	645	212	100	18,435
Over 3 years	60,376	8,218	113	768	13,870	603	6,080	18,294	13,232	2,365	123,920
Disconnected Defaulters (06/2024)											
	69,660	9,931	798	4,321	23,383	4,126	15,633	19,836	13,695	2,506	163,888
Disconnected Defaulters (06/2023)											
	64,743	8,724	895	2,258	21,632	2,118	8,810	18,197	13,639	2,373	143,388
Spill Over	8,414	2,441	17,401	31,707	85,845	45,622	44,048	6,469	3,429	7,541	252,917
Deferred Amount	5,162	16,217	2,594	4,726	24,540	890	7,929	166	31	160	62,416
Installments	73	0	1,116	500	3,064	1,377	908	63	12	7	7,121
Subsidies (Private)	4,250	3,419	2,413	6,388	37,335	22,133	39,896	6,140	4,788	73,386	200,149
Private Receivables	215,248	81,906	30,675	52,496	211,492	81,565	118,099	183,608	193,936	612,399	1,781,426

Category	PESCO ^[1]	TESCO ^[2]	IESCO	GEPCO	LESCO	FESCO	HESCO	SEPCO	QESCO ^[3]	TOTAL
Unidentified Cash/Credited Debtors										
	-2,477	-1,209	-2,749	-883	-8,290	-990	-2,092	-1,324	-288	-20,706
Total Private Receivables (06/2024)	212,771	80,697	27,926	51,614	203,203	80,576	116,007	192,612	612,112	1,760,720
Total Private Receivables (06/2023)	181,012	83,364	19,857	36,575	198,193	68,073	102,526	172,029	509,122	1,521,552
Increase/Decrease of Private Receivables (06/2023)	31,759	-2,667	8,069	15,039	5,009	12,503	13,481	20,583	102,990	239,168
Net Receivables in DISCOs (06/2024)	246,107	83,962	89,447	60,497	224,649	86,117	128,871	209,340	652,810	2,017,065
Net Receivables in DISCOs (06/2023)	215,063	86,570	73,958	43,031	213,235	71,286	109,599	172,759	543,260	1,727,104
Increase/Decrease of Net Receivables (06/2023)	31,044	-2,608	15,490	17,466	11,413	14,831	19,272	36,581	109,550	289,961
K-Electric Receivables										14,733
IPPs Receivables										5,098
Total Receivables										2,036,896

^[1] Provincial Government of KPK receivables includes Rs. 18.60 billion assessed for KPK consumers for the period 05-09-2008 to 15-09-2010 on account of Tariff Differential after withdrawal of KPK petition from PHC, the said amount has not been passed on to consumers. The payment of said receivables has been linked with the markup on NHP arrears payable to Government of KPK, as proposed by Government of KPK.

^[2] Total Private Receivables include FATA domestic consumer's receivables.

^[3] Total Private Receivables include Agriculture Tubewell Subsidies in Balochistan.

Source: PEPCO

5.7 OVER-LOADING POSITIONS IN DISCOS SYSTEM

Power delivery through networks of DISCO mainly depends on the adequacy of three major components including power transformers (mostly 132/11 kV transformers), 11 kV feeders and ultimately the distribution transformers.

The issue of distribution transformers' over-loading in DISCOs is a critical concern. This problem arises when transformers designed for specific capacity thresholds are subjected to loads that exceed their intended limits. Over-loading can result from various factors including increased demand for electricity, faulty equipment, or inadequate planning for capacity expansion. The consequences of over-loading are severe and multifaceted. Firstly, it leads to reduced operational efficiency and compromises the reliability of the distribution network. Over-loaded transformers are prone to overheating, which can lead to equipment failure, service disruptions, and in extreme cases, even fires. Additionally, over-loading accelerates wear and tear, necessitating more frequent maintenance and replacements, in turn incurring higher costs for DISCOs. Moreover, it poses a safety hazard to both personnel and the general public.

Similar is the case with over-loading of 11 kV feeders. This occurs when the demand for electricity surpasses the designed capacity of the 11 kV feeders, leading to an excess load that strains the system. Several factors contribute to this problem, including rapid urbanization, population growth, and increased industrial activity. The consequences of over-loading are far-reaching. It can lead to voltage drops, frequent tripping of circuit breakers, and in severe cases, equipment failures. This not only disrupts power supply to consumers but also places excessive stress on the distribution infrastructure. Furthermore, over-loading poses safety risks to both the public and maintenance personnel.

To address these issues, DISCOs must focus on proper utilization of the allowed investment to prioritize transformers and feeders capacity planning, invest in modern monitoring and control systems, and implement regular load-shifting and feeder-bifurcation measures to ensure transformers and feeders operate within their designated limits. By proactively addressing over-loading concerns, DISCOs can enhance the reliability and resilience of the power supply network, ultimately benefiting consumers and the overall power sector.

Loading position of 132/11 kV power transformers, 11 kV feeders and distribution transformers on overall basis in all DISCOs is given in the following paragraphs:

(i) Loading Position of Power Transformers

During the FY 2023-24 the over-loading position of all power transformers on overall basis is as under:

- (a) On an overall basis, over-loading on power transformers has decreased from 17.12% in FY 2022-23 to 14.52% in FY 2023-24.
- (b) On DISCO-to-DISCO comparison, PESCO with above 39.93%, has the highest number of over-loaded power transformers among all the DISCOs followed by SEPCO with 28.15% and HESCO with 16.30%.
- (c) PESCO, TESCO, GEPCO, LESCO, FESCO, MEPCO, and QESCO have shown decrease in percentage of over-loaded power transformers over last year.

(ii) Loading Position of 11 kV Feeders

During the FY 2023-24 the over-loading position of all 11 kV feeders on overall basis is as under:

- (a) On an overall basis, over-loading on 11 kV feeders has decreased from 17.87% of FY 2022-23 to 15.92% in FY 2023-24.
- (b) On individual DISCO level, TESCO has the highest percentage i.e. 43.70% of over-loaded 11 kV feeders followed by PESCO with 33.62% and QESCO with 31.36%.
- (c) The percentage of over-loaded feeders in TESCO, IESCO, LESCO, FESCO, MEPCO, and QESCO during FY 2023-24 has decreased showing improvement over last year.

(iii) Loading Position of Distribution Transformers

During the FY 2023-24 the over-loading position of all distribution transformers on overall basis is as under:

- (a) On overall basis, the over-loading of distribution transformers has decreased from 5.00% in FY 2022-23 to 4.31% during FY 2023-24.
- (b) On individual DISCO level, TESCO has the highest percentage i.e. 12.79% of over-loaded distribution transformers followed by LESCO with 8.87% and SEPCO with 8.78%.
- (c) The percentage of over-loaded distribution transformers in TESCO, LESCO, MEPCO, HESCO, SEPCO, and QESCO during FY 2023-24 has decreased showing improvement over last year.
- (d) The percentage of over-loaded distribution transformers in PESCO, IESCO, GEPCO, and FESCO has increased during FY 2023-24 showing decline in the loading position of distribution transformers.

5.8 FATAL ACCIDENTS-POOR SAFETY ENVIRONMENT IN DISCOS AND KE

Fatal accidents in electric power DISCOs are tragic events resulting in loss of precious lives. The loss of life not only deeply impacts the families of the victims but also leaves a lasting scar on the company and the community it serves. These incidents often occur due to a combination of factors, including high-voltage equipment, complex systems, and mostly due to poor safety culture and human error.

Occurrence of such accidents highlight the critical importance of following strict safety protocols and continuous training for employees working in the field. Proper equipment maintenance, regular inspections, and a culture of safety consciousness are paramount in preventing these tragic incidents. Thorough investigations should be carried out following a fatal accident to understand the root causes and implementing measures to prevent similar occurrences in the future.

DISCOs must prioritize the well-being and safety of their workforce as well as of the general public. A culture of safety needs to be fostered in the DISCOs. Proper training of workforce can help to minimize the risk of fatal accidents and ensure a safer working environment for all employees as well as the general public. The overall number of fatalities (146) has been decreased in FY 2023-24 as compared to FY 2022-23 (167), however, every single incident is taken seriously by the Authority. In light of the safety issues/hazards in the service areas of DISCOs that caused a number of fatal incidents, the Authority issued directions to undertake thorough investigations and commenced legal action against DISCOs in accordance with the NEPRA Act. The Authority has also started legal proceedings against HESCO, SEPCO and QESCO for non-operationalization of HSE Directorate. Further details of the investigations are given in the following paragraphs.

(i) Investigation on Account of Fatal Accidents in DISCOs

NEPRA has conducted an investigation in all fatal cases and on the basis of the outcome of the investigation, NEPRA levied substantial fines on DISCOs; SEPCO has been fined Rs. 15 million, FESCO Rs. 15 million, PESCO Rs. 62 million, HESCO Rs. 20 million, LESCO Rs. 23 million, IESCO Rs. 35 million, GEPCO Rs. 23 million, QESCO Rs. 12.5 million and KE Rs. 10 million. However, the Authority has accepted the response and exonerated TESCO on account of one fatal accident that occurred due to the victim's own negligence. For MEPCO, the proceedings are ongoing and will be decided in due course of time.

Moreover, the Authority has issued a directive to these DISCOs, mandating them to provide compensation to the families of deceased members of the public. This compensation is to be equivalent to the amount offered in the case of DISCOs own employees. Additionally, DISCOs are required to extend employment opportunities to the immediate next of kin of the deceased.

(ii) Investigation against LESCO on Account of Fatal Accidents occurred during Monsoon Spells

The Authority took notice and ordered an Investigation against LESCO on account of twelve (12) Fatal Accidents that occurred in its service territory due to monsoon spells in July, 2023. Based on the Investigation report, the Authority initiated legal proceedings against LESCO and after due diligence by the Authority, a fine amounting to Rs. 23 million was imposed on LESCO on account of fatalities. Furthermore, the Authority also directed LESCO to give compensation to the victim families of public person equal to the amount given to its own employees along with jobs to next of their kin.

(iii) Investigation against IESCO on Account of Non-Fatal Accidents of Ayesha Bibi

The Authority took notice and initiated legal proceedings against IESCO under Section 27A of the NEPRA Act, on account of a non-fatal accident of 08-year-old girl, who got electrocuted due to the less clearance and sagged 11 kV line, while plucking vegetables at their farm field along with her father. Furthermore, NEPRA also directed IESCO regarding the provision of compensation to the victim family. Whereas, IESCO has challenged the same in the NEPRA Appellate Tribunal and matter is under adjudication.

5.9 STATUS OF NET-METERING IN DISCOS SYSTEM

The following table presents data regarding the number of consumers of different categories across DISCOs who have embraced net-metering, along with the volume of electricity units these consumers have exported to the DISCOs. It also includes the quantity of electricity units they have imported during the FY 2023-24:

Net-Metering Consumers, Import and Export for FY 2023-24

DISCO	Tariff Category	No. of Consumers (As of June, 2024)	Exported Units (kWh)	Imported Units (kWh)	Net (Import-Export) (kWh)
			By Distributed Generators		
PESCO	Domestic	9,132	8,993,042	7,029,117	-1,963,925
	Commercial	493	550,588	1,373,071	822,483
	Industrial	143	884,956	4,553,129	3,668,173
	Agricultural	12	7,231	17,492	10,261
	General Services	120	212,155	545,501	333,346
	Total	9,900	10,647,972	13,518,310	2,870,338
TESCO	Domestic	5	6,252	104,414	98,162
	Commercial	0	0	0	0
	Industrial	4	5,967	726,712	720,745
	Agricultural	0	0	0	0
	General Services	3	41,493	525,394	483,901
	Total	12	53,712	1,356,520	1,302,808
IESCO	Domestic	31,733	212,824,212	175,344,468	37,479,744
	Commercial	1644	16,134,916	37,708,487	-21,573,571
	Industrial	362	8,968,014	36,691,494	-27,723,480
	Agricultural	74	638,395	656,917	-18,522
	General Services	349	8,916,497	30,073,534	-21,157,037
	Total	34,162	247,482,034	280,474,900	-32,992,866
GEPCO	Domestic	11,235	53,687,984	54,477,034	789,050
	Commercial	1,266	10,982,989	26,477,097	15,494,108
	Industrial	1,632	29,364,912	127,825,014	98,460,102
	Agricultural	201	700,544	1,603,855	903,311
	General Services	227	5,023,326	18,506,203	13,482,877
	Total	14,561	99,759,755	228,889,203	129,129,448
LESCO	Domestic	37,042	242,828,420	268,948,346	26,119,926
	Commercial	2118	25,815,057	82,977,519	57,162,462
	Industrial	1175	40,800,006	352,359,205	311,559,199
	Agricultural	117	474,579	1,448,924	974,345
	General Services	377	10,751,586	46,966,628	36,215,042
	Total	40,829	320,669,648	752,700,622	432,030,974

DISCO	Tariff Category	No. of Consumers (As of June, 2024)	Exported Units (kWh)	Imported Units (kWh)	Net (Import-Export) (kWh)
			By Distributed Generators		
FESCO	Domestic	10,064	56,676,927	61,983,656	33,685,985
	Commercial	1,579	10,600,651	30,919,829	6,763,804
	Industrial	1,504	30,050,661	190,322,419	23,003,395
	Agricultural	429	817,975	1,398,270	484,051
	General Services	546	5,430,550	15,316,036	3,195,600
	Total	14,122	103,576,764	299,940,210	67,132,835
MEPCO	Domestic	21,017	17,600,249	18,564,377	964,128
	Commercial	2,774	4,666,733	10,729,185	6,062,452
	Industrial	1952	12,292,820	22,296,373	10,003,553
	Agricultural	788	1,443,607	2,319,202	875,595
	General Services	365	1,249,507	5,003,961	3,754,454
	Total	26,896	37,252,916	58,913,098	21,660,182
HESCO	Domestic	308	2,216,268	2,600,612	384,344
	Commercial	40	805,909	1,660,665	854,756
	Industrial	35	3,156,181	12,794,687	9,638,506
	Agricultural	4	32,517	79,350	46,833
	General Services	4	157,638	87,489	-70,149
	Total	391	6,368,513	17,222,803	10,854,290
SEPCO	Domestic	47	798,298	783,337	14,961
	Commercial	12	87,615	634,152	-546,537
	Industrial	20	1,124,465	8,700,814	-7,576,349
	Agricultural	0	0	0	0
	General Services	6	598,956	2,017,168	-1,418,212
	Total	85	2,609,334	12,135,471	-9,526,137
QESCO	Domestic	66	57,297	57,840	543
	Commercial	19	33,859	92,546	58,687
	Industrial	2	41,800	5,640	-36,160
	Agricultural	0	0	0	0
	General Services	9	34,830	141,992	107,162
	Total	96	167,786	298,018	130,232
ALL DISCOs	Domestic	120,649	595,688,949	589,893,201	97,572,918
	Commercial	9,945	69,678,317	192,572,551	65,098,644
	Industrial	6,829	126,689,782	756,275,487	421,717,684
	Agricultural	1,625	4,114,848	7,524,010	3,275,874
	General Services	2,006	32,416,538	119,183,906	34,926,984
	Total	141,054	828,588,434	1,665,449,155	622,592,104

Source: DISCOs

Following the notification from the GOP under Section 14B(5) of the NEPRA Act, the Authority exempted the net-metering systems below 25 kW from licence/concurrence which are now processed by the respective DISCOs. The Authority has received a number of complaints regarding lack of consumer support from the DISCOs, resulting in substantial delays. The Authority has acknowledged this concern and has instructed the DISCOs to promptly assist consumers and process these cases within the specified timeframe.

5.10 STATUS OF PENDING CONNECTIONS

The delayed provision of electricity connections to potential consumers is a critical issue that bears significant consequences for individuals and the businesses. This delay arises from a combination of factors, including non-availability of material, insufficient infrastructure coupled with inefficiency at DISCO's level.

For individuals, the absence of a timely electricity connection can lead to disruptions in daily life, affecting everything from household chores to personal comfort. For businesses, the delay can impede operations, resulting in lost productivity and potential revenue. Moreover, it can discourage potential entrepreneurs from setting up business, which in turn hinders economic growth and development. On a larger scale, these delays strain the resources and reputation of DISCOs level.

The first and the foremost requirement to improve this situation is change of mind-set at DISCOs for customer orientation. DISCOs need to streamline their processes, invest in infrastructure and enhance coordination with stakeholders to avoid delays. The most important of all, DISCOs must train their officers and staff in field to prioritize consumer facilitation rather than focusing on ways to loot consumers. By prioritizing efficient and timely provision of electricity connections, DISCOs can not only ensure convenience for consumers but also help stimulate economic progress.

A critical issue identified in this regard is the unwarranted cancellation of applications by DISCOs staff, seemingly to artificially reduce the number of pending applications. It has been observed that applications are cancelled without valid justification, and in most cases, financial incentives are solicited to facilitate the processing of consumer applications. DISCOs' management is required to establish a robust monitoring mechanism to track all cancelled applications, ensuring transparency and accountability. Furthermore, strict disciplinary actions must be taken against any personnel involved in the improper cancellation of applications or engagement in unethical practices. The details of pending electricity connection along with age of pendency are given in the following table:

DISCO	Total Nos.	Total Load (MW)	Pending Connections after expiry of time limit given in PSDR-2005					
			Up to 1 month	Up to 2 months	Up to 3 months	Up to 6 months	Up to 1 year	above 1 year
PESCO	2,007	102.04	1,875	56	2	19	8	47
TESCO	6	7.624	0	0	0	1	0	5
IESCO	3,229	9.485	3,202	5	20	1	1	0
GEPCO	9,238	20.244	9,238	0	0	0	0	0
LESCO	44,181	173.070	32,883	11,285	7	6	0	0
FESCO	17,356	56.029	17,332	14	10	0	0	0
MEPCO	57,199	146.315	31,484	25,715	0	0	0	0
HESCO	894	38.477	791	25	13	12	5	48
SEPCO	40	5.736	17	1	3	10	4	5
QESCO	1,594	8.496	1,427	6	14	66	42	39
KE	2,124	13.179	1,923	44	19	33	37	68
Total	137,868	580.695	100,172	37,151	88	148	97	212

Source: DISCOs

5.11 TRANSMISSION AND DISTRIBUTION LOSSES IN KE

The allowed Transmission and Distribution losses of the KE as under:

Year	FY 2019-20	FY 2020-21	FY 2021-22	FY 2022-23
Allowed T&D Losses (%)	17.76	16.80	15.95	15.36
Actual T&D Losses (%)	19.73	17.54	15.35	15.27

Source: KE

5.12 RECOVERY OF BILLED AMOUNT IN KE SYSTEM

The overall recovery ratio, which stood at 92.76% in the preceding year, has experienced a dip, registering at 91.54% this year. This represents a decline of 1.22% in the recovery position.

Description	FY 2019-20	FY 2020-21	FY 2021-22	FY 2022-23	FY 2023-24
Recovery Ratio (%)	92.14	94.87	96.69	92.76	91.54
Amount not Recovered (Rs. Million)	20,030.00	16,200.44	12,900.46	38,882.06	63,687.49

Source: KE

The recovery performance from different sectors exhibits varying trends. The domestic, commercial, industrial, public lighting, and other sectors have all witnessed a decrease in recovery percentages. Conversely, the industrial and general services categories have shown marked improvements in the FY 2023-24 compared to the previous FY 2022-23.

The notable 1.22% decline in KE's recovery position is a matter of serious concern, as it is poised to significantly impact the financial stability of the utility. This decrease, rather than expected improvement, underscores a performance issue within KE. It highlights the urgency for focused efforts to address the underlying challenges affecting revenue collection and overall financial health of the utility.

5.13 OVER-LOADING POSITIONS IN KE SYSTEM

As of June 30, 2024, there has been an increase in the over-loading of power transformers in KE, standing at 21.20% for the FY 2023-24 compared to approximately 20.44% in the previous FY 2022-23. Additionally, a marginal decrease from 5.80% to 4.88% has been observed in the over-loading of 11 kV feeders, relative to the preceding year.

Furthermore, the percentage of total over-loaded distribution transformers has seen an increase in the FY 2023-24, amounting to 18.78% compared to the 17.94% recorded during the FY 2022-23. These statistics indicate a lack of progress in mitigating over-loading issues to enhance the stability and efficiency of the distribution network.

5.14 STATUS OF NET-METERING IN KE SYSTEM

Following table shows category-wise number of consumers in KE system who opted for net-metering along with details of electricity units exported to KE system.

Tariff Category	No. of Consumers (As of June, 2024)	Exported Units (kWh)	Imported Units (kWh)	Net (Import-Export) (kWh)
		By Distributed Generators		
Domestic	13,882	147,783,671	148,697,466	(913,795)
Commercial	602	29,902,879	9,461,978	20,440,902
Industrial	583	277,554,050	31,557,358	245,996,692
Agricultural	3	399,082	156,598	242,484
General Services	248	24,634,630	5,192,928	19,441,702
Total	15,318	480,274,312	195,066,328	285,207,984

5.15 RECEIVABLES OF KE

As of June 30, 2024, KE's total receivables amounted to Rs. 303.811 billion, marking a significant increase from Rs. 233.068 billion recorded on the same date in 2023. This reflects a substantial rise of Rs. 70.743 billion in receivables over the course of the reporting year in FY 2023-24. This increase underscores the need for effective strategies to manage and recover outstanding payments in order to maintain financial stability.

MONITORING OF THE POWER SECTOR

06

6.1 GENERAL

Monitoring and Enforcement is an important function of NEPRA to ensure compliance of NEPRA licensees with applicable documents. These monitoring activities are also carried out in alignment with NEPRA's decisions, determinations, and relevant documents on various matters. Consequently, the responsibilities of licensees are assessed in accordance with their roles across distinct phases, encompassing planning, design, implementation, and operation.

In the subsequent sections, comprehensive details regarding the monitoring and enforcement activities, including the legal actions against the licensees initiated by NEPRA in consequence to reported violations are provided. These details cover an evaluation of adherence by licensees to the relevant rules, regulations, terms and conditions specified in their licenses and other applicable documents.

6.2 MONITORING ACTIVITIES IN GENERATION SECTOR

6.2.1 Upgradation of Data Exchange Portal (Generation Module):

The Data Exchange Portal has been developed for online acquisition and monitoring of daily data pertaining to Key Performance Indicators (KPIs) from all operational power plants. All operational power plants have registered on the portal and upload data on regular basis for the operational parameters like availability, outage, service hours, dependable capacity etc. In case of non-submission of data on the portal in a timely manner by power plants, auto-emails are generated to concerned power plants. NEPRA has taken significant steps to enhance the monitoring of licensees performance and compliance through the use of advanced technology.

6.2.2 Performance Evaluation Reports of Thermal Power Plants:

The quarterly reports submitted by all operational power plants for the FY 2022-23, in accordance with the NEPRA Performance Standards (Generation) Rules, 2009, were meticulously reviewed. This comprehensive assessment culminated in the preparation of a detailed Performance Evaluation Report (PER). Following a thorough approval process, the report was subsequently uploaded on the NEPRA website. The PER for FY 2023-24 is being developed and will be published in the meantime.

This evaluation serves as a critical tool for assessing the operational efficiency and reliability of power generation facilities across the country. It provides insights into performance metrics, compliance with regulatory standards, and areas for potential improvement. By making this report publicly accessible, NEPRA aims to enhance transparency and accountability within the power sector, fostering a more informed dialogue among stakeholders.

6.2.3 Under-Utilization of Efficient Power Plants-Non-Compliance of EMO:

(a) National Transmission and Despatch Company Limited

NEPRA has been actively monitoring the system operations carried out by the System Operator in recent years. This oversight has revealed significant constraints within the transmission network that results in the operation of costly power plants, adversely affecting consumers and the overall energy economy.

In the FY 2023-24, NEPRA reported a substantial financial impact of Rs. 67,582 million, primarily resulting from the operation of inefficient power plants and the curtailment of more economical generation sources. A significant portion of this financial burden—Rs. 60,386 million—was attributed to constraints within the transmission system. The most pressing issue identified was the South-North constraint, which severely restricts the flow of electricity from economically viable generation resources located in the southern region to the northern demand centers.

In addition to these transmission challenges, Rs. 7,196 million of the total financial impact was linked to other factors, including lower utilization of generation plants due to contractual obligations, ineffective planning by the system operator, and instances of incorrect unit commitment decisions. These factors compound the reliance on more expensive generation options, further inflating electricity production costs.

NEPRA's diligent monitoring has highlighted the South-North constraint as a critical issue within the transmission network, resulting in exorbitant generation costs. The limitations of the HVDC and HVAC corridors are particularly pronounced. These constraints impede the efficient transfer of power from regions where it can be generated at lower costs to areas with higher demand, ultimately driving up costs for consumers and hindering optimal utilization of available energy resources.

(b) K-Electric Limited

NEPRA conducted a thorough monitoring of KE power plants and identified significant cost impacts primarily arising from lower gas and RLNG pressures, along with the reliance on more expensive units at BQPS-I. Additionally, NEPRA observed operational challenges at BQPS-III throughout the year. Despite being one of the most economical plants in KE's portfolio, BQPS-III was unable to operate at optimal levels due to technical issues affecting its turbine.

From July, 2023 to April, 2024, the financial repercussions of these operational challenges were notable. A total financial impact of Rs. 1,776 million was assessed due to lower gas and RLNG pressures on the KGTPS, SGTPs, and KCCPP, alongside the operation of BQPS-I units on residual fuel oil (RFO). Furthermore, an additional impact of Rs. 7.6 million was assessed due to the operation of KCCPP on high-speed diesel (HSD) and the underutilization of units at BQPS-I.

6.2.4 Legal Proceedings Concluded during FY 2023-24:

During the reporting period, NEPRA concluded legal proceedings against several generation licensees, resulting in the following actions:

- (a) NEPRA accepted CPPA-G's response to a Show Cause Notice regarding the non-submission of initialled PPAs, EPAs, and TPPAs for NEPRA's approval before executing these documents.
- (b) NEPRA accepted responses from the PEDO and CPPA-G regarding the explanations issued for delays in commissioning the Daral Khwar Hydropower Project.
- (c) NEPRA accepted the responses from PEDO and PESCO concerning delays in commissioning and the non-execution of the EPA for the Machai Hydropower Project.
- (d) The Authority imposed a fine of Rs. 50 million on CPGCL on account of acquisition of a gas booster compressor station from Engro Fertilizers without cost, in exchange for the utilization of gas quota, and its subsequent transfer to NPGCL for Rs. 1.242 billion.
- (e) The Authority accepted the responses submitted by Engro Powergen Thar and NPPMCL (Balloki) against the Explanation issued in lieu of the total power system collapse occurred on January 23, 2023.

- (f) CPGCL filed a review motion against Order of the Authority regarding imposition of fine on GPGCL in the matter of prolonged forced outage of unit 14 of Guddu 747. After due legal process, the Authority rejected the review motion and upheld its earlier decision.

6.2.5 Legal Proceedings Under Process:

The following legal proceedings initiated against various licensees are currently ongoing:

- (a) Show Cause Notice issued to CPGCL on account of tripping and fire incident involving ST-16 of the Guddu 747 CCPP.
- (b) Show Cause Notice issued to WAPDA on account of availing higher outages by some of its hydropower stations than allowed limit as specified in the PPA.
- (c) Show Cause Notice issued to CPPA-G for failing to impose LDs on WAPDA for the higher outages recorded at its hydropower stations.
- (d) Show Cause Notice issued to WAPDA regarding the non-performance of the Golen Gol Hydropower Project since its commissioning.
- (e) Show Cause Notices issued to CPPA-G and NTDC/NPCC regarding the non-finalization of operating procedures for several power plants, as well as the lack of signed black start procedures with various facilities.
- (f) Show Cause Notices issued to Huaneng Shandong Ruyi (Pakistan) Energy, Saba Power, Rousch (Pakistan) Power, Lucky Electric Power and KE in lieu of the total power system collapse occurred on January 23, 2023. Similarly, Explanations issued to Quaid-e-Azam Thermal Power, Port Qasim Electric Power, China Power Hub, CPGCL and Tapal Energy in lieu of the total power system collapse occurred on January 23, 2023.
- (g) Explanation issued to KAPCO regarding the extension of its PPA with CPPA-G by 485 days, which extends beyond the term of its generation license, prior to applying for its renewal.
- (h) Explanations were issued to several power plants—including Halmore Power, Narowal Energy, Lal Pir Power, NPGCL (Nandipur), Orient Power, Saif Power, Sapphire Power, and Tapal Energy—regarding delays in synchronizing with the national grid. These delays were notably linked to the blackout that occurred on January 23, 2023.
- (i) Explanation to WAPDA was also issued due to repeated tripping of its generating units thereby causing delay in system restoration in wake of the power system collapse occurred on January 23, 2023.

6.2.6 Operating Procedures and Black Start Facility:

The Authority has observed that the NTDC, along with NPCC and the CPPA-G, has not yet finalised the operating procedures with several power plants. Additionally, there has been a failure to activate black start facilities at various locations, which is critical for restoring power in the event of a blackout.

In light of these significant shortcomings, the Authority conducted a hearing to assess the positions presented by both NTDC/NPCC and CPPA-G regarding the delays in finalizing the operational procedures. Given the implications of these issues for the reliability and efficiency of the power system, the Authority determined that such lapses cannot be overlooked. As a result, the Authority has decided to issue Show Cause Notices to both NTDC/NPCC and CPPA-G.

6.3 MONITORING ACTIVITIES IN TRANSMISSION SECTOR

6.3.1 Data Exchange Portal (Transmission Module):

To ensure timely compliance and the submission of reports, as well as to enhance visibility for senior management regarding transmission licensees, NEPRA has introduced a three-level supervision mechanism. This framework is designed to enable management to effectively monitor compliance with regulatory requirements.

In this context, all transmission licensees have been instructed to provide the necessary information, pertaining to System Average Interruption Frequency Index (SAIFI), System Average Interruption Duration Index (SAIDI), ENS, number of interruptions, frequently violations etc. on monthly basis which is now accessible through the Data Exchange Portal.

6.3.2 Performance Evaluation Report of Transmission Sector:

The quarterly reports submitted by all transmission licensees for the FY 2022-23, in accordance with the NEPRA Performance Standards (Transmission) Rules, 2009, were meticulously reviewed. This thorough assessment led to the development of a comprehensive PER for FY 2022-23, which evaluates the performance of NTDC, KE, FTCL, and STDC based on parameters set forth in the Performance Standards (Transmission) Rules, 2005.

The report focuses on essential metrics such as System Reliability, Security of Supply, and Quality of Supply, providing a detailed analysis of the effectiveness of transmission networks throughout the reporting period. It highlights critical performance indicators and their implications for the transmission sector, offering valuable insights into the implementation and overall effectiveness of these standards. Notably, this evaluation marks the first inclusion of data from STDC and FTCL, alongside an analysis of various technical issues impacting performance.

The conclusion of the report presents actionable recommendations aimed to address identified challenges and enhance the efficiency of transmission operations. Following approval from the Authority, the PER for FY 2022-23 was published on the NEPRA website. Additionally, the recommendations and remedial measures outlined in the report have been communicated to all transmission licensees for prompt implementation. The PER for FY 2023-24 is under process.

6.3.3 Monitoring of Transmission System Constraints:

NEPRA is actively monitoring the progress of NTDC's system constraint removal plan. To enhance transparency and accessibility, a dedicated online portal has been established for NTDC to submit updated data for monitoring of system constraints in order to address the impact of network limitations on the optimal use of power generation capacity. These constraints led to the underutilization of efficient power plants and forced the operation of expensive, out-of-merit power plants, which violated the EMO. In this regard, NEPRA is closely monitoring the performance of NTDC and based on the reports, NEPRA has issued explicit directions to expedite the resolution of these constraints. To streamline reporting, an online portal was developed, allowing NTDC to submit updated data on system constraints, with automated features for monthly, quarterly, and annual progress tracking.

Additionally, NEPRA is implementing an automated data analysis process to generate progress reports on a monthly, quarterly, annual, and consolidated basis for all projects. This automation will ensure that data is presented in a clear and comprehensible format, thereby facilitating informed decision-making by the Authority.

6.3.4 Legal Proceeding Initiated Against Transmission Licensees:

The legal proceedings against the transmission licensee NTDC are as follows:

- (a) A fine of Rs. 10 million was imposed on NTDC following a partial blackout in September 2021 caused by a fault at the 500 kV Jamshoro grid station.
- (b) A fine of Rs. 10 million was imposed on NTDC due to the collapse of a tower resulting from cyclonic winds in the South region.
- (c) NEPRA imposed a fine of Rs. 10 million on NTDC in connection with a fatal accident. This decision was subsequently challenged by NTDC in the NEPRA Tribunal.
- (d) Regarding the under-construction and energised 220 kV Jhimpir-II grid station, the Authority has suspended ongoing legal proceedings pending verification of NTDC's claim that 90% of the electrical works have been completed. NTDC has been directed to complete the outstanding civil works, which are still in progress, within a six-month timeframe.

- (e) NEPRA issued an explanation to NTDC for non-compliance with the Authority's directives regarding the reimbursement of power dispersal costs to Nandipur.
- (f) Following a detailed inquiry into the total power blackout that occurred on October 13, 2022, NEPRA issued an explanation to NTDC.

6.3.5 Approval of Policies by NTDC: Handing Over/Taking Over of NTDC Assets and Compensation Policy for Right of Way and Land Acquisition:

NEPRA observed significant delays and incomplete works, accompanied by cost escalations and time overruns, were observed in both developmental and operational projects of NTDC grid stations and transmission lines. The Authority noted that the absence of a standardized policy or SOP for asset compensation and the formal handing and taking over of assets was contributing to these issues faced by NTDC. Therefore, the Authority directed NTDC to formulate a Handing/Taking Over and Asset Compensation Policy. In compliance with this directive, during FY 2023-24, NTDC submitted copies of the policies duly approved by Board of Directors (BOD) i.e. "Handing Over/Taking Over of NTDC Assets" and "the Compensation Policy for Right of Way and Land Acquisition". These policies will go in long way in eradicating the loop holes and bring transparency and efficiency in construction of development and operational projects of NTDC transmission system.

6.3.6 Establishment of Safety Directorate within all field formations of NTDC:

It is incumbent upon all licensees to establish an autonomous Directorate or Department of Occupational Health, Safety, and Environment. In light of NTDC's failure to constitute such a Safety Directorate, legal actions were initiated against the entity. In adherence to these regulatory requirements, NTDC has now appointed a Deputy Director/Executive Engineer at the circle level. This officer is tasked with the oversight of safety practices, as well as the instruction and training of both staff and officers, thereby ensuring the prompt adoption and enforcement of requisite safety standards as a matter of priority.

6.4 MONITORING ACTIVITIES IN DISTRIBUTION SECTOR

6.4.1 Data Exchange Portal (Distribution Module):

Through the Online Data Exchange Portal, crucial monthly data on the distribution network is collected from all DISCOs on monthly basis. This includes metrics on loading positions, TOU meters, damaged transformer, pending new electricity connections, defective meters, and power outage restoration times. The collected data is analysed to inform and implement strategic measures designed to enhance the performance of each DISCO. Additionally, a three-tier supervision mechanism has been introduced within the distribution segment to further strengthen oversight and accountability.

6.4.2 Performance Report Evaluation of Distribution Sector:

NEPRA established the Performance Standards for Distribution Regulation (PSDR) 2005, which mandates that every DISCO submit an Performance Evaluatino Report (PER) to NEPRA by August 31st of the following year. The PER provides a comprehensive overview of adherence to regulatory standards throughout the year, including System Performance Reports, Consumer Service Performance Reports, and each DISCO's assessments of their performance, along with plans and targets for improvement.

The PERs submitted by various DISCOs for the FY 2023-24 are currently under review. This assessment focuses on key performance parameters, including T&D Losses, Recovery Rates, SAIFI, SAIDI, timeframes for new connections, load-shedding incidents, nominal voltage levels, consumer complaints, safety metrics, and fault rates. This PER for FY 2022-23 is available on NEPRA website.

6.4.3 Establishment of Safety Directorate:

According to Section 7.1 of the NEPRA Power Safety Code, all licensees are mandated to establish independent Safety Directorates or Departments focused on Occupational Health, Safety, and Environmental management. In light of this requirement, legal proceedings have been initiated against HESCO, SEPCO, and QESCO for failing to establish their respective Safety Directorates.

6.4.4 Monitoring of Load-Shedding:

DISCOs are currently implementing load-shedding based on AT&C losses on their feeders. However, this approach is not aligned with NEPRA Performance Standards and has never been recognized by the Authority. NEPRA, through its Regional Offices, actively monitors load-shedding by assessing actual conditions in the field, randomly selecting feeders on a weekly basis to ensure compliance.

Data analysis has revealed that DISCOs have not only failed to comply with NEPRA's guidelines but have also strayed from their own policies by implementing extended load-shedding beyond the scheduled times. In response to these violations, the Authority took decisive action, initiating legal proceedings against HESCO, SEPCO, QESCO, PESCO, and KE. After following the due legal process, the Authority imposed fines of Rs. 50 million on each DISCO for non-compliance with NEPRA laws.

6.4.5 Earthing/Grounding of Distribution Network: A Safety Neglect by DISCOs:

NEPRA's investigations into fatal accidents at various DISCOs revealed that inadequate earthing and grounding of the distribution network was a key factor in these incidents. In response, NEPRA directed DISCOs to submit detailed plans with timelines to implement proper earthing and grounding for all high-tension (HT) and low-tension (LT) poles and structures.

However, DISCOs have made slow and insufficient progress in addressing this safety issue. As a result, NEPRA initiated legal action, issuing Show Cause Notices for non-compliance and imposing fines of Rs. 10 million on FESCO, LESCO, IESCO, and GEPCO, with other DISCO cases under advanced processing.

Despite receiving adequate funding under the investment and O&M budgets, DISCOs failed to address the earthing deficiencies, leaving both employees and the public at risk. NEPRA instructed DISCOs to conduct surveys, identify unsafe structures, and implement corrective plans, but many companies, even after collecting consumer deposits, have not completed the necessary grounding work. This negligence has led to fatal accidents and ongoing safety risks.

NEPRA has set a firm deadline of December 2024 for the completion of earthing on steel structures, with recurring financial penalties for non-compliance. The continued neglect of these safety measures signals a significant governance failure within DISCOs, prioritizing neither safety nor consumer welfare.

6.4.6 AMI/AMR in IESCO System:

During the MYT determination process for IESCO, it came to light that the DISCO has initiated a large-scale Advanced Metering Infrastructure (AMI) and Automated Meter Reading (AMR) project. This ambitious initiative aims to install AMR meters at both the distribution transformer level (PMT) and on an individual consumer basis, with a particular focus on the Rawalpindi and Cantt: Circles.

To facilitate this initiative, NEPRA held a meeting with IESCO, during which the utility presented a comprehensive overview of its AMI/AMR project. The Authority expressed appreciation for IESCO's proactive approach and the potential benefits of enhanced metering technology, including improved billing accuracy, reduced revenue losses, and better demand management. Recognizing the importance of effective implementation, the Authority directed IESCO to provide monthly progress reports on the execution of the AMI/AMR project.

6.4.7 AMI/AMR in KE System:

In light of KE's installation of AMI and AMR meters at the PMT level, the Authority directed KE to implement load-shedding strategies at the PMT level whenever necessary, in accordance with the provisions of the Applicable Documents.

To support this transition, KE was instructed to develop and submit a comprehensive load-shedding plan. However, KE identified several challenges in executing this directive. In response, multiple meetings were convened where the Authority emphasised the need to identify viable solutions for remote disconnection and reconnection of meters. KE was encouraged to explore innovative design and development opportunities to effectively tackle these challenges.

As a result of these collaborative efforts, KE has launched a pilot project on select medium-loss feeders, marking a significant step toward enhancing operational efficiency and improving service delivery for its customers.

6.4.8 Interconnection Issues in respect of Small Renewables Projects:

The Authority took notice of the delays in grid interconnection for Access Solar (Pvt.) Limited and Access Electric (Pvt.) Limited, which resulted in significant losses to the national exchequer. Consequently, legal proceedings were initiated against IESCO, and a Show Cause Notice was issued under the NEPRA (Fine) Regulation, 2021.

6.4.9 System Constraints of DISCOs:

DISCOs are currently facing numerous constraints that significantly impact their efficiency and reliability. Key issues include aging infrastructure, capacity limitations, and geographical challenges, all of which contribute to frequent power breakdowns and difficulties in supplying reliable electricity to certain areas. Additionally, technical challenges such as maintaining grid stability, minimizing T&D losses, and ensuring a consistent power supply further complicate the operational landscape for DISCOs.

To address these challenges, substantial funds have been allocated to DISCOs through their Investment Plans, aimed at upgrading infrastructure and enhancing service delivery. NEPRA is closely monitoring the optimal utilization of these funds to ensure they result in tangible improvements in performance and service quality for consumers.

6.5 SUMMARY OF ACTIONS TAKEN AND FINE IMPOSED ON LICENSEES WITH RESPECT TO NON-COMPLIANCE OF NEPRA'S APPLICABLE DOCUMENTS

NEPRA has remained vigilant and has taken strict actions against licensees for non-compliance of NEPRA rules, regulations, standards, codes and other applicable documents. The process of initiating and concluding legal proceedings against any violations of applicable regulations is cumbersome and time-consuming, often taking more than a year to resolve. Once concluded, the decisions are frequently challenged through reviews at the regulatory level, appeals to the NEPRA Appellate tribunal, and further litigation in the High Court and Supreme Court, which undermines deterrence measures.

It is pertinent to mention here that recovery rate of fines is notably low which shows disregard for regulatory decisions by public entities which contributes to financial, technical and regulatory indiscipline within power sector.

Below table present a summary of cases, fines imposed, challenging in high forums, under review in NEPRA and vis-à-vis amount deposited with effect from FY 2015-16 till June 30, 2024.

Description	Generation	Transmission	Distribution	Total
Total Number of Cases	39	08	47	94
Total Amount of Fine Imposed (Rs. Million)	699.05	56	1,125.55	1,880.60
Total Cases Challenged in NAT/High Courts	23	04	19	46
Total Amount of Fine (Rs. Million) Challenged in NAT/High Courts	259.05	26	469	754.05
Total Cases sent to Collector	08	01	07	16
Total Amount of Fine (Rs. Million) to be recovered by Deputy Collector	250	05	68	323
Total Number of Cases Win/Disposed	NIL	01	09	10
Total Amount of Fine Deposit (Rs. Million) in NEPRA	NIL	5.00	218.05	223.05
Total Number of Cases under Review in NEPRA	08	02	12	22
Total Amount of Fine (Rs. Million) under Review in NEPRA	190	20	370.50	580.50

* NAT = NEPRA Appellate Tribunal

MAJOR REGULATORY ACTIVITIES

07

7.1 COMPETITIVE TRADING BILATERAL CONTRACT MARKET

The concentration of power often leads to monopolization, malfeasance, and inefficiency, a principle that guided the Government of Pakistan's approval of "Power Sector Strategic Plan for Restructuring and Reform" in 1992. This plan aimed to unbundle the vertically integrated WAPDA into corporatized and privatised entities and to introduce competition in the generation and supply segment. Although the implementation faced delays, the recent efforts to accelerate implementation of the CTBCM presents a promising opportunity to make Pakistan's power sector more competitive and efficient.

The CTBCM is specifically designed to end the monopoly of DISCOs in the supply segment and foster a competitive electric power market which choice to consumers (initially at wholesale level with gradual transition towards retail electric power market). CTBCM is expected to encourage healthy competition in the supply segment, expanding consumer choice and allowing for more competitive electricity prices. The high-level design of the CTBCM was approved on December 5, 2019, followed by the approval of the Detailed Design on November 12, 2020.

Significant progress has been made since the approval of the CTBCM detailed design, including the issuance of licenses such as the Market Operator License, System Operator License, and Distribution and Supplier of Last Resort (SoLR) Licenses, along with the registration of the Independent Auction Administrator. Additionally, the approval of the Market Commercial Code and Grid Code has enhanced the operational framework, ensuring its robustness and reliability. Furthermore, the test-run of the CTBCM has been completed and the final test-run report is at regulatory approval level.

The CTBCM's development is anchored in a strong policy foundation established by the National Electricity Policy and the National Electricity Plan, both approved by GOP. This alignment ensures that the CTBCM is in harmony with broader national strategies and fosters a cohesive regulatory framework. For the FY 2023-24, the following regulatory activities have been undertaken under the CTBCM regime:

(i) CTBCM Final Test Run Report

In accordance with Sections 23A and 23B of the NEPRA Act, the Authority granted the Market Operator Licence to CPPA-G and approved the Market Commercial Code (MCC). As part of the Market Operator License, CPPA-G was mandated to conduct a six-month dry run to rigorously test and validate the MCC, along with the associated processes, IT systems, and methodologies, without any financial implications. Upon completing this dry run, CPPA-G was required to submit a comprehensive Final Test Run (FTR) report, including any proposed amendments to the MCC, for the Authority's approval.

Due to various factors, including the need for Cabinet Committee on Energy (CCoE) approval prior to submitting the FTR report to NEPRA, the report and proposed amendments were submitted on December 28, 2023—thirteen months later than originally planned which is in regulatory approval process.

(ii) Power Acquisition Programme

In compliance with Section 32 of the NEPRA Act, along with Regulation 12 of the Supplier Regulations and Regulations 6 and 7(3) of the Procurement Regulations, the DISCOs acting as SoLRs are required to submit their combined Power Acquisition Programme (PAP) to the Authority for approval. The PAP is a rolling five-year plan prepared by the SoLR that inter-alia include energy and peak demand requirements and plans for new and firm power procurement over the next three years. Furthermore, the PAP must align with the IGCEP, TSEP, network expansion plans, and the approved investment program of the relevant distribution licensee, ensuring compliance with capacity obligations as outlined in the MCC. After a rigorous regulatory process, the Authority approved the PAPs submitted by the DISCOs and KE in May, 2024.

(iii) Agency Code

Under the single-buyer regime, CPPA-G acted as the agent for DISCOs, primarily managing legacy contracts under the existing Commercial Code. Following the Authority's approval of the Market Commercial Code, which governs the Market Operator's activities in accordance with Sections 23A and 23B of the NEPRA Act, CPPA-G submitted the revised Agency Code which is in regulatory approval process.

(iv) Connection Agreement

AS a part of CTBCM Implementation Roadmap, the Authority directed the relevant entities to draft and submit the necessary Connection Agreements. MEPCO back in 2021, submitted initial draft Connection Agreement on behalf of all DISCOs which was returned by the Authority due to significant deficiencies. Now, DISCOs with the help of International Consultant engaged by PPIB have submitted the Connection Agreements (between DISCOs and NTDC and between DISCOs and BPCs) for the approval the Authority.

(v) Distribution Code

Following the approval of the CTBCM design, substantial revisions to the existing Distribution Code were necessary to incorporate provisions relevant to the competitive electric power market. These updates include non-discriminatory open access, coordination with the System Operator and Metering Service Provider, and improved short- to medium-term demand forecasting. To facilitate this comprehensive update, DISCOs have engaged a consultant to review and revise the Distribution Code of 2005.

(vi) Use of System Agreement

Pursuant to the NEPRA Open Access (Interconnection and Wheeling of Power) Regulations, 2022, DISCOs are mandated to prepare and submit draft Use of System Agreements (UoSAs) for the Authority's approval. These agreements outline the rights and obligations of open access users and the respective network licensees in providing open access services. The draft UoSAs submitted by the DISCOs are currently undergoing the regulatory approval process and are anticipated to be finalised in FY 2024-25.

(vii) Use of System Charges

The determination of Use of System Charges (UoSC) is a critical prerequisite for the commencement of the CTBCM, as mandated under the NEPRA Open Access (Interconnection and Wheeling of Power) Regulations, 2022. During the reporting period, the DISCOs submitted petitions for UoSC determination, which the Authority has been processing. However, with the upcoming tariff rebasing effective July 2024, revisions to these UoSC petitions will be necessary.

Additionally, the GOP has established a committee to finalize recommendations on optimal wheeling charges and related modalities. This includes strategies for gradually reducing stranded costs, implementing an annual cap, and assessing surplus capacity availability within the system. Given the Federal Government's role as a key stakeholder, its input is crucial in this process. The Authority will proceed with advancing the determination once the Federal Government's feedback has been received.

(viii) Capacity Building of Power Sector Entities

To enhance the expertise and preparedness of power sector entities for the CTBCM, the Authority designated CPPA-G as the lead agency to spearhead a comprehensive training and capacity-building initiative. Over the past fiscal year, a variety of targeted workshops, sessions, and consultations were meticulously organised to equip power sector professionals with the necessary knowledge, skills, and capabilities. This initiative aims to ensure that these individuals are fully prepared to assume their roles as market participants and service providers once the electricity market commences.

Specialised technical training programs were a key focus, including two comprehensive modules on Generation Planning and Transmission Planning. Additionally, the Electricity Market Training Program (EMTP), a flagship online initiative in collaboration with the International Association of Power Exchanges (APEX), was launched globally, attracting participation from market professionals in 40 countries. Recognizing the need for specialised training, five targeted sessions were conducted using remote training platforms to strengthen the capacity of the Contract Management and Regulatory Affairs Wing of MIRAD.

These extensive training and capacity-building programs ensure that power sector entities are well-prepared to operate within a robust regulatory framework, thereby facilitating the development of a competitive, efficient, and transparent electricity market.

7.2 COLLABORATIVE INITIATIVES WITH INTERNATIONAL ORGANIZATIONS

The Authority is actively collaborating with international agencies such as USAID, the World Bank, and GIZ to build capacity among its professionals and facilitate the transition of Pakistan's power sector from a single-buyer system to a competitive electricity market.

NEPRA's partnership with GIZ emphasizes technical assistance and capacity building, focusing on the adoption of best practices and advanced technologies. This collaboration aims to strengthen institutional frameworks and enhance the regulatory environment, promoting greater efficiency and innovation.

In conjunction with USAID, NEPRA is engaged in initiatives to improve energy efficiency, expand the deployment of renewable energy, and modernize grid infrastructure.

The World Bank's partnership offers comprehensive support for developing a robust regulatory framework and establishing the groundwork for the privatization of DISCOs.

Together, these collaborations are pivotal in advancing the power sector in Pakistan, ensuring a more efficient and competitive energy landscape.

7.3 INDICATIVE GENERATION CAPACITY EXPANSION PLAN

Under the relevant provisions of the Planning Code of the Grid Code (specifically PC-4), the NTDC/ System Operator is mandated to prepare an Integrated System Plan (ISP) annually. This plan includes both an IGCEP and a TSEP, which must be submitted for review and approval by the Authority.

The Authority approved the IGCEP for FY 2022-31 in its determination dated February 01, 2023. During this approval, the Authority highlighted the necessity for revised assumptions in future IGCEPs to prevent confusion. As a result, NTDC was directed to obtain approval for the assumptions to be used in the IGCEP 2023-32.

In compliance, NTDC submitted the assumption sets for the preparation of IGCEP 2023-32. However, the finalization of these assumptions was hindered by discrepancies, including the unavailability of reliable GDP growth rate data from relevant entities. Additionally, it is important to note that the Council of Common Interests (CCI), established several assumptions related to the IGCEP, which remain unresolved.

In light of the inability to finalize the Assumption Sets for IGCEP, the Federal Government formed a technical committee to assist in the development of the IGCEP. Subsequently, NTDC produced the latest iteration, IGCEP 2024-34, aligned with the newly approved Grid Code 2023 and the guidelines set forth in the National Electricity Policy 2021 and the National Electricity Plan 2023-2027. This iteration incorporates additional assumptions finalised by the technical committee and utilizes the PLEXOS generation capacity expansion planning tool to evaluate all existing, committed, and candidate power projects.

NTDC/System Operator has now submitted the ISP-2024, which encompasses both the IGCEP 2024-34 and the TSEP 2024-34, for the Authority's review and approval. The case was sent back to NTDC for further sensitivity analysis. However, NTDC delayed the submission of the required analysis, and as a result, the case is still pending with them.

7.4 LICENSING

(i) Generation Licenses

In accordance with the provisions of the NEPRA Act, NEPRA processed a total of thirteen (13) applications for generation licenses during FY 2023-24, representing an installed capacity of 1,048.558 MW. These applications are at various stages of processing. Eight (08) licenses, with a cumulative installed capacity of 255.56 MW, were issued. The remaining applications continue to progress through the approval process. Below is a list of the generation licenses issued during FY 2023-24:

S. No.	Name of Licensee	Installed Cap. (MW)	Fuel	Licence/ Concurrence	Date of Issuance
1	YDE SA (SMC-Private) Limited	5.0058	Solar	SGC/173/2023	September 27, 2023
2	PEDO for Gabral Kalam HPP	88.00	Hydel	GL(Hydel)/20/2023	November 30, 2023
3	Foundation Solar Energy (Pvt.) Limited-Nowshera	1.00	Solar	SGC/175/2024	February 12, 2024
4	Foundation Solar Energy (Pvt.) Limited-CMH Lahore	0.51516	Solar	SGC/176/2024	February 12, 2024
5	Foundation Solar Energy (Pvt.) Limited-Mangla	1.013	Solar	SGC/178/2024	February 12, 2024
6	Foundation Solar Energy (Pvt.) Limited-Patoki	1.512	Solar	SGC/174/2024	February 13, 2024
7	Foundation Solar Energy (Pvt.) Limited-Risalpur	1.512	Solar	SGC/177/2024	February 13, 2024
8	PEDO for Madyan HPP	157.00	Hydel	GL(Hydel)/21/2024	May 22, 2024
Total		255.558			

Source: NEPRA

(ii) Generation Concurrence

The NEPRA Act of 1997 was amended in 2018, with Section 15 replaced by Section 14B. This section stipulates that no person shall construct, own, or operate a generation facility without a licence issued by NEPRA, subject to specified conditions. Notably, Sub-section (5) of Section 14B allows the Federal Government, after consulting with NEPRA, to establish a mechanism for the gradual cessation of generation licenses over a five-year period from April 27, 2018.

The five-year period for the gradual cessation of generation licenses concluded on April 26, 2023. Since the notification for this mechanism has yet to be issued, NEPRA continued to grant generation licenses until that date and subsequently began issuing concurrences for generation companies.

Moreover, the first proviso of Section 14B (5) mandates that any generation company intending to establish a facility must submit a comprehensive scheme covering financial, geological, hydrological, technical, safety, and environmental aspects for NEPRA's concurrence.

In consideration of the above, NEPRA received six (06) applications for concurrences with a combined installed capacity of 1,711 MW. Notably, one (01) concurrence was granted to Maple Leaf Power Limited for its 25 MW PV-based generation facility, while the remaining applications are still under review.

(iii) **Distribution Licenses**

In FY 2023-24, the Authority in terms of Section 20 and 21 of the NEPRA Act, issued one (01) Distribution Licence to KE whereas, various applications are currently under process including six (06) projects of Punjab Industrial Estates Development and Management Company (PIEDMC) including Sundar Lahore Project, Bhalwal Project, Rahim Yar Khan Project, Quaid-e-Azam Business Park Sheikhpura Project, Vehari Project, Bahawalpur Project, one (01) application of Rashakai Special Economic Zone Development & Operations Company (Pvt.) Limited, one (01) application of Bahria Town (Pvt.) Limited (Rawalpindi/Islamabad), one (01) application of Bahria Town (Pvt.) Limited (Lahore) and one (01) application of Pakistan Expatriates Cooperative Housing Society (PECHS-Valancia), Lahore. These applications have been registered and are at various stages of processing.

(iv) **Transmission Licenses**

In accordance with Section 18(A) of the NEPRA Act, one (01) licence was issued to Punjab Grid Company Limited, designating it as the Provincial Grid Company (PGC) for the Province of Punjab.

(v) **Supplier Licenses**

In accordance with Section 23E of the amended NEPRA Act, the Authority granted nine (09) Electric Power Supply Licenses to IESCO, PESCO, GEPCO, LESCO, MEPCO, QESCO, FESCO, HESCO, and KE, enabling them to act as Suppliers of Last Resort in their designated service territories. Additionally, the Authority is currently processing twenty-six (26) applications for the grant of Supplier Licenses. These applications include those from SEPCO, TESCO, and multiple projects from the Punjab Industrial Estates Development and Management Company (PIEDMC), such as the Sundar Lahore, Bhalwal, Rahim Yar Khan, Quaid-e-Azam Business Park Sheikhpura, Vehari, and Bahawalpur Projects. Other applicants under consideration include Rashakai Special Economic Zone Development & Operations Company (Pvt.) Limited, two (02) applications from Maple Leaf Power Limited, Lucky Energy (Pvt.) Limited, Shams Power Limited, Innovative Energy Solutions (Pvt.) Limited, Aquagen (Pvt.) Limited, Nishat Mills Limited, AB Electric (Pvt.) Limited, Gul Ahmed Energy Limited, Jilani Energy (Pvt.) Limited, Etihad Sugar Mills Limited, Etihad Power Generation Limited, US Apparel & Textile (Pvt.) Limited, Grid Edge (Pvt.) Limited, Nishat Chunian Limited, Mughal Energy Limited, and Bulleh Shah Packaging (Pvt.) Limited.

(vi) **Net-Metering Licenses**

In the FY 2023-24, a total of 3,736 net-metering concurrences were issued, representing a cumulative installed capacity of 591.092 MW. The detailed breakdown of the net-metering Concurrences issued during this period is given in the following table:

DISCO	PESCO	TESCO	IESCO	GEPCO	LESCO	FESCO	MEPCO	HESCO	SEPCO	QESCO	KE
Net-Metering Lic. Issued (No.)	208	5	339	315	702	615	887	28	23	15	604
Installed Cap. (MW)	24.62	0.897	34.22	91.07	118.26	109.6	139.8	4.71	4.26	4.72	59.41

Source: NEPRA

(vi) **Modifications in the Existing Licenses**

The Authority processed a total of twenty-three (23) applications related to Licensee Proposed Modifications (LPMs) for existing generation licenses. Out of these, the processing of seven (07) LPM cases was successfully concluded, and modifications were issued. Below is a summary of the modified licenses:

S. No.	Name of Licensee	Licence No.	Modification/ Decision Issued
1	Helios Power (Pvt.) Limited	SPGL/20/2017	September 28, 2023
2	Meridian Energy (Pvt.) Limited	SPGL/22/2017	September 28, 2023
3	HND5 Energy (Pvt.) Limited	SPGL/21/2017	September 28, 2023
4	Engro Powergen Qadirpur Limited	IGSPL/13/2007	December 18, 2023
5	Water and Power Development Authority	GL(Hydel)/05/2004	March 01, 2024
6	Water and Power Development Authority	GL(Hydel)/05/2004	March 01, 2024
7	Altern Energy Limited	IPGL/021/2004	April 01, 2024

Source: NEPRA

(vii) Expired Licenses

During the reporting period, several licenses and registrations reached their expiration dates. This included four Generation Licenses with a combined installed capacity of 761.36 MW, the Distribution Licence for KE, and the Registration of the CPPA-G.

In light of the validity of the PPA, the review and renewal of the generation licence for Uch Power is currently under consideration.

The Distribution Licence for KE, which expired on July 20, 2023, was successfully replaced with a new Distribution Licence and a Supplier Licence, ensuring that operations continue under amended regulatory terms. To address the regulatory gap, the Registration of CPPA-G has been extended until a new Registration as a Special Purpose Agent (SPA) is granted under Section 25 of the NEPRA Act. Details regarding the expired licenses and registrations are summarised in the following table:

S. No.	Name of Licensee	Installed Cap. (MW)	Licence/ Registration	Expiry Date
1	Nadeem Power Generation (Pvt.) Limited	2.805	SGC/031/2004	July 04, 2023
2	K-Electric (Distribution)	-	09/DL/2003	July 20, 2023
3	Aquagen (Pvt.) Limited	7.357	SGC/79/2012	July 26, 2023
4	Uch Power Limited	586.2	IPGL/014/2003	August 25, 2023
5	Steel Corporation (Pvt.) Limited	165	SGC/41/2008	September 24, 2023
6	K-Electric Limited (BPQS Unit 1 & Unit 2)	420	GL/04/2002	October, 2023
7	CPPA-G – Registration	-	MOR/01/2018	November 15, 2023
8	Altern Energy Limited	31.232	IPGL/021/2004	April 01, 2024
9	CPGCL (TPS Guddu Unit 5 to 13)	1,015.00	GL/02/2002	June, 2024

Source: NEPRA

(viii) Registration of PPIB and AEDB as Independent Auction Administrator

PPIB and AEDB being the relevant entities (under their respective mandates i.e. AEDB for renewable technologies and PPIB for the remaining technologies), filed separate applications under Section-25A of the NEPRA Act for registration as IAA. The applications of AEDB and PPIB remained in parallel till an advanced stage of processing. However, upon promulgation of the PPIB (Amendment) Act, 2023 notified on June 10, 2023, AEDB merged with PPIB. Eventually, the services of AEDB were entrusted to PPIB by virtue of the operation of law. Accordingly, the Authority closed further proceedings on the application of AEDB and granted a single Registration to PPIB on January 12, 2024, to act as IAA.

(ix) Progress on Separation of System Operator and National Grid Company Functions of NTDC

Section 23G of the NEPRA Act mandates the separation of System Operator functions from the NGC. The System Operator is tasked with overseeing system operation, dispatch, and integrated planning of the country's power system. In line with this requirement, the Authority granted a System Operator Licence to the NTDC.

Currently, the Federal Government is prioritizing the establishment of the Independent System and Market Operator of Pakistan (ISMO). The operationalization of ISMO will necessitate the transfer of the Market Operator licence from the CPPA-G and the System Operator licence from NTDC. Once established, ISMO will serve as the technical and commercial backbone of the electricity wholesale market, facilitating integrated power planning across the sector.

(x) Progress on Separation of Market Operator as Special Purpose Agent Functions of CPPA-G

CPPA-G has historically performed both Market Operator and Agency functions under the Certificate of Registration granted by the Authority in accordance with Rule-3 of the NEPRA (Market Operator Registration, Standards and Procedure), Rules. With the issuance of the Market Operator Licence and the MCC on May 31, 2022, the Market Operator functions of CPPA-G are now formally regulated under these new frameworks.

When granting the Market Operator Licence, the Authority directed CPPA-G to undertake the following: (a) apply for registration as a SPA of DISCOs, along with submitting a draft Agency Code to facilitate its role as their agent; and (b) legally separate the SPA and Market Operator functions within one year of the decision's issuance. Until this separation occurs, CPPA-G must ensure that its operations maintain a clear distinction between the management responsible for Market Operations and its role as an agent for DISCOs, thereby ensuring that Market Operations are executed independently, transparently, and impartially.

In line with Section 25A of the NEPRA Act, CPPA-G submitted an application for registration as an SPA to act as the agent for DISCOs and oversee legacy contracts. Accompanying this application was a draft Agency Code intended to govern its agency functions. The Authority has reviewed both the application and the draft Agency Code, soliciting comments from stakeholders in the process. Various stakeholders have provided feedback on different clauses of the draft code.

Following an internal review and consideration of stakeholder observations, the Authority proposed substantial revisions and improvements to the draft. CPPA-G has been directed to address and incorporate these changes. Deliberations on the finalization of the Agency Code are ongoing, but the final version is still pending completion.

7.5 TARIFF

NEPRA, as the regulatory authority, is tasked with establishing tariffs for Generation, Transmission, Distribution, and Supply across various categories of licensees. The comprehensive procedure for tariff determination is detailed in the NEPRA (Tariff Standards & Procedure) Rules, 1998. During FY 2023-24, NEPRA finalized tariffs for a diverse range of generation technologies, as well as for electric power distribution and supply companies. This process ensures that tariffs reflect the operational costs while promoting transparency and sustainability within the energy sector.

(i) Hydropower Projects

During FY 2023-24, the Authority processed WAPDA Hydro electric's tariff petition for FY 2022-23 and issued a determination on September 06, 2023, approving an average tariff of Rs. 4.9587/kWh for its hydropower projects. Aggrieved with this decision, WAPDA Hydroelectric filed a motion for leave to review the determination. The Authority reviewed this motion and issued a decision on June 6, 2024, raising the approved average tariff to Rs. 6.1020/kWh for WAPDA Hydroelectric.

Subsequently, on June 14, 2024, the Authority issued a decision under the NEPRA Act, 1997, and the NEPRA (Review Procedure) Regulations, 2009. This decision included an annex detailing the Revenue Requirement, which accounted for Hydel levies related to the Chichoki, Renala, and Mangla hydropower projects.

Additionally, the Authority addressed a review motion filed by Star Hydropower Limited concerning its decision dated July 29, 2020. After review, the Authority approved a levelized tariff of Rs. 8.3191/kWh for this project. Throughout FY 2023-24, the Authority issued various Tariff Determinations, Modifications, Review Decisions, and Adjustments/Indexations.

List of Tariff Determinations, Modification and Review Decisions

S. No.	Name of the Plant	Capacity (MW)	Determination Date	Decision Sought
1	WAPDA	8,420	06-09-2023	Determination of the Authority – WAPDA Petition for FY 2022-23
			06-06-2024	Decision of the Authority – Motion for Leave for Review – WAPDA Petition for FY 2022-23
			14-06-2024	Decision of the Authority under NEPRA (Review Procedure) Regulations, 2009 – Motion for Leave for Review – WAPDA Petition for FY 2022-23
2	Patrind HPP	147	02-05-2024	Motion for Leave for Review

Source: NEPRA

List of Tariff Adjustments/Indexation of Tariff

S. No.	Name of Project
1	Laraib Hydropower Project: Decision Dates: 01-09-2023, 31-10-2023, 08-11-2023, 29-11-2023, 21-12-2023, 21-12-2023, 29-02-2024, 05-06-2024
2	Karot Hydropower Project: Decision Dates: 11-08-2023, 03-11-2023, 04-06-2024
3	Gulpur Hydropower Project: Decision Dates: 30-08-2023, 19-10-2023, 21-11-2023, 21-11-2023, 14-03-2024, 31-05-2024
4	Patrind Hydropower Project: Decision Dates: 19-10-2023, 14-11-2023, 18-04-2024, 06-06-2024
5	Malakand-III Hydropower Project: Decision Dates: 19-10-2023, 03-11-2023, 29-02-2024, 14-03-2024, 22-05-2024
6	Jagran-I Hydropower Project: Decision Date: 19-10-2023
7	Chianwali Hydropower Project: Decision Date: 05-06-2024
8	Marala Hydropower Project: Decision Date: 05-06-2024
9	Pak Pattan Hydropower Project: Decision Date: 05-06-2024

Source: NEPRA

(ii) Development of Projects through Competitive Bidding

In accordance with the provisions of the ARE Policy, 2019, the Authority has approved the following Request for Proposals (RFPs) submitted by the AEDB (now PPIB) and KE for the development of renewable energy projects in the country through a competitive bidding regime:

- AEDB (now PPIB): Competitive bidding for a 600 MW Solar PV Project in Muzaffargarh, Punjab. NEPRA also processed and issued a decision on the Review Motion related to this RFP.
- K-Electric: Competitive bidding for a 150 MW Solar PV Project in the Winder and Bela Districts, Balochistan.
- K-Electric: Competitive bidding for a 200 MW Site-Neutral Hybrid Project at the Dhabeji Grid Station.
- K-Electric: Competitive bidding for a 150 MW Solar PV Project in West Karachi.
- K-Electric: Competitive bidding for a 200 MW Solar PV Project in Malir, Karachi.

(iii) Solar Power Projects

During FY 2023-24, Zorlu Solar Pakistan Limited (ZSPL) submitted a modification petition for approval, which the Authority considered and issued a decision on. Subsequently, ZSPL filed another modification petition seeking an extension for the financial close and COD timelines. This case is currently under the Authority's consideration.

Additionally, Siachen Energy Limited submitted a tariff petition under the Cost plus Regime, which is also in process.

Atlas Solar Limited [formerly Zhenfa Pakistan New Energy Company (Pvt.) Limited] submitted a True-up application for tariff adjustment upon achieving COD during FY 2022-23. The Authority processed this True-up application and issued a decision during the reporting period.

(iv) Wind Power Projects

During FY 2023-24, the Authority processed the True-up application for Lucky Renewables (Pvt.) Limited, approving a levelized tariff of US Cents 4.5667/kWh (Rs. 7.2290/kWh). Verification of the claimed project costs, financial parameters, and the information submitted by Wind IPPs i.e. Gul Ahmed Electric Limited, Din Energy Limited, Act 2 Wind (Pvt.) Limited, Artistic Wind Power (Pvt.) Limited, Metro Wind Power Limited, NASDA Green Energy (Pvt.) Limited, Liberty Wind Power 1 (Pvt.) Limited, Liberty Wind Power 2 (Pvt.) Limited, Lakeside Energy (Pvt.) Limited and Indus Wind Energy Limited are currently ongoing.

In addition, two wind power projects—Western Energy (Pvt.) Limited (47.60 MW) and Trans Atlantic Energy (Pvt.) Limited (49.50 MW)—submitted tariff petitions for approval under the NEPRA (Tariff Standards and Procedure) Rules, 1998. These cases are currently under review and are expected to be concluded soon.

(v) Bagasse-based Power Projects

Following the Islamabad High Court judgment and the Appellate Tribunal's decision dated November 18, 2022, regarding the Suo Moto review of the bagasse pricing and adjustment mechanism for bagasse-based power projects, the matter was remanded to NEPRA for a fresh decision in accordance with the law. In response, the Authority initiated new proceedings.

After completing the necessary due process, the Authority issued a determination concerning the Appellate Tribunal's decision on modifying the fuel price mechanism for bagasse-based power projects.

(vi) Indexation/Adjustment of Tariff

In accordance with the indexation mechanism established by the Authority for wind, solar, hydel, and bagasse-based generation companies, the relevant tariff components were adjusted on a quarterly, bi-annual, and annual basis. These adjustments accounted for variations in the US Consumer Price Index (CPI), the General CPI, exchange rates, and KIBOR/LIBOR during the reporting period.

(vii) Nuclear Power Plants

During FY 2023-24, the Authority issued the following decisions and determinations:

- (a) A decision was made regarding the tariff petition filed by the Pakistan Atomic Energy Commission (PAEC) to modify the tariff determination dated January 14, 2022 for KANUPP Unit-2 (K-2).
- (b) A decision was also issued concerning the tariff petition filed by the PAEC for the modification of the tariff determination dated February 28, 2023 for KANUPP Unit-3 (K-3).

(viii) Gas-based Power Plants

During FY 2023-24, the Authority issued following decision or determinations:

- (a) A decision regarding the provisional tariff requested by KAPCO was issued on August 04, 2023.
- (b) The Authority approved the interim tariff for open cycle operations on gas, as requested by CPGCL for its Block-I and Block-II, in February, 2024.

- (c) On February 20, 2024, a decision was issued concerning the petition filed by Engro Powergen Qadirpur Limited for the modification of the fuel cost component in the reference tariff at the COD for its 226.52 MW project located in Qadirpur, District Ghotki, Sindh.

(ix) Coal-based Power Plants

During FY 2023-24, the Authority addressed the following petitions and applications related to coal-based power plants:

- (a) A decision was issued on July 26, 2023, regarding the tariff modification petition filed by CIHC Pak Power Company (Pvt.) Limited for its 300 MW coal-fired power generation project in Gwadar, Balochistan.
- (b) A decision was issued on May 14, 2024, concerning the request for an extension of the O&M Contract for the coal unloading jetty of Port Qasim Electric Power Company (Pvt.) Limited.
- (c) A decision was made on May 14, 2024, regarding the Motion for Leave for Review filed by CIHC Pak Power Company (Pvt.) Limited against the Authority's earlier decision dated July 26, 2023, related to the modification petition.

(x) Indexation/Adjustment of Thermal Tariffs

The Indexation/adjustments approved by the Authority during FY 2023-24 is given in the following table:

Adjustments	Quantity
Monthly Adjustment	315
Quarterly Adjustment	474
Annual Adjustment	50
Total	839

Source: NEPRA

(xi) Change of Base Year of Consumer Price Index

Pursuant to the Federal Government's notification of NEPRA's decision dated March 10, 2021, which changed the base year for the Consumer Price Index (CPI) from 2007-08 to 2015-16, the local O&M component of the tariffs for wind, solar, hydel, and bagasse-based projects was indexed and revised for the periods from October-December, 2020 through July-September, 2023. Decisions reflecting these adjustments were issued accordingly during the reporting period.

(xii) Transition from LIBOR to SOFR

Following the Government of Pakistan's approval to transition from LIBOR to SOFR, as communicated by the PPIB, NEPRA has decided to initiate Suo Moto proceedings on the matter. A hearing has been scheduled for September 5, 2024, and the case is currently under review.

(xiii) Distribution Companies

NEPRA determines different tariffs for each of the DISCOs, owing to their specific Distribution/ Supply Margin requirements, different T&D losses and consumer mix etc.; the GOP following its own socio economic objectives provides subsidy or levy surcharge in order to make the consumer end tariff uniform, all across the country. The Authority after incorporating the same in its determined consumer-end tariff, issues the decision in this regard. The GOP implements the said tariff by notifying it in the Official Gazette.

Based on above methodology NEPRA decided annual adjustment/indexations of seven DISCOs i.e. PESCO, GEPCO, MEPCO, HESCO, SEPCO, QESCO and TESCO for the FY 2023-24, under their MYT vide decisions dated July 14, 2023. The Authority also allowed Interim Tariff to three DISCOs i.e. IESCO, LESCO and FESCO for FY 2023-24 dated July 14, 2023, subject to adjustment and/or refund, based on the final determination of the Authority in the matter of MYT petitions of these DISCOs, which are under process with the Authority. The tariff so determined was intimated to the Federal Government on July 14, 2023 for filling of uniform tariff application.

In the said tariff determination base consumer-end tariff of FY 2023-24, Tariff on National Average basis has been increased by Rs. 4.96/kWh to Rs. 29.78/kWh as compared to National Average Tariff of Rs. 24.82/kWh previously determined for FY 2022-23. The increase of Rs. 4.96/kWh in tariff was primarily on account of increase in fuel prices and induction of new plant capacities (Coal, Nuclear and RLNG Power Plants etc.), exchange rate impact and inflation.

Decision Date	Decision of DISCOs during June, 2023 to July, 2024
14-07-2023	Decision of the Authority in the matter of Setting up of Power Purchase Price References for the FY 2023-24.
14-07-2023	Decision of the Authority in the matter of requests filed by IESCO, LESCO and FESCO for Determination of Interim Tariff for the FY 2023-24.
14-07-2023	Decision of the Authority in the matter of requests filed by PESCO, TESCO, GEPCO, MEPCO, HESCO, SEPCO, and QESCO for Adjustment/Indexation of Tariff for the FY 2023-24.

The detail of NEPRA Determined National Average Tariff for FY 2023-24, as compared to NEPRA Determined National Average Tariff for FY 2022-23 is tabulated below:

Description	FY 2022-23 (GWh)		FY 2023-24 (GWh)		Inc./ (Dec.) (GWh)	
Projected Sales of DISCOs	113,002		110,165		-2,837	
	(Rs. Million)	(Rs./kWh)	(Rs. Million)	(Rs./kWh)	(Rs. Million)	(Rs./kWh)
Energy Charge	1,152,357	10.20	840,462	7.63	-311,896	-2.57
Capacity Charge	1,250,959	11.07	1,874,334	17.01	623,375	5.94
Transmission and MOF	114,606	1.01	151,363	1.37	36,758	0.36
Power Purchase Price	2,517,922	22.28	2,866,159	26.02	348,237	3.73
DISCO Margin	244,189	2.16	341,403	3.10	97,214	0.94
PYA	42,409	0.38	73,599	0.67	31,191	0.29
Revenue Req. of DISCOs	2,804,520	24.82	3,281,162	29.78	476,641	4.96

In response thereof, the Federal Government filed Uniform Tariff Application and the same was decided by the Authority on July 25, 2023 and subsequently notified by the Federal Government on July 26, 2023 with effect from July 01, 2023.

The Authority on March 14, 2024, also issued MYT for IESCO, LESCO, and FESCO for five-year tariff control period i.e. FY 2023-24 to FY 2027-28 and intimated same to the Federal Government in light of NEPRA Act.

Decision Date	Decision of DISCOs during July, 2023 to June, 2024
14-03-2024	Determination of the Authority in matter of Petition filed by IESCO, LESCO, and FESCO for Determination of Distribution Tariff under MYT Regime for the FY 2023-24 to FY 2027-28.
14-03-2024	Determination of the Authority in matter of Petition filed by IESCO, LESCO, and FESCO for Determination of Supply Tariff under MYT Regime for the FY 2023-24 to FY 2027-28.

NEPRA Act and the notified decision of the DISCOs provides mechanism for certain adjustments to be made in the allowed tariff on monthly, and quarterly basis. In terms of second proviso to section 31(4) of the Act 1997, the Authority is required to make adjustments in approved tariff on account of fuel price, the Authority has determined the following monthly FCAs during the period under consideration:

Month of FCA's Decision	Rates (Rs./kWh)	Decision Date	Month of FCA's Decision	Rates (Rs./kWh)	Decision Date
July, 2023	1.4630	08-09-2023	January, 2024	7.0562	26-02-2024
August, 2023	1.7141	05-10-2023	February, 2024	4.9213	08-04-2024
September, 2023	0.4014	08-11-2023	March, 2024	2.8372	08-05-2024
October, 2023	3.0786	05-12-2023	April, 2024	3.3321	06-06-2024
November, 2023	4.1276	04-01-2024	May, 2024	3.3287	05-07-2024
December, 2023	4.5671	02-02-2024	June, 2024	2.5627	08-08-2024

In terms of proviso (ii) to section 31(7) of the Act 1997, the Authority may, on a quarterly basis and not later than a period of fifteen days, make quarterly adjustments in the approved tariff on account of capacity and transmission charges, impact of transmission and distribution losses, variable operation and maintenance and, policy guidelines as the Federal Government may issue and, intimate the tariff so adjusted to the Federal Government prior to its notification in the Official Gazette.

Pursuant to the above proviso, Quarterly Adjustments are determined and charged/passed on to the consumers in their monthly bills. Details of Quarterly Adjustments of DISCOs decided by the Authority for the period under consideration are tabulated below:

Decision Dated	Quarterly Adjustments Period	Allowed National Average (Rs./kWh)	Applicability Period (with effect from)
04-07-2023	FY 2022-23 (3 rd Quarter)	1.2489	July, 2023 to October, 2023
22-09-2023	FY 2022-23 (4 th Quarter)	3.2814	October, 2023 to March, 2024
20-12-2023	FY 2023-24 (1 st Quarter)	1.1502	January, 2024 to March, 2024
28-03-2024	FY 2023-24 (2 nd Quarter)	2.7492	April, 2024 to June, 2024

In addition to DISCOs also filed their Annual Adjustment/Indexation requests for determination of consumer-end tariff for FY 2024-25 and the same was also decided by the Authority vide decision dated 14-06-2024 and intimated same to the Federal Government for filing of Uniform Tariff application in light of NEPRA Act. In the said tariff determination base consumer-end tariff of FY 2024-25, on National Average basis has been increased by Rs. 5.72/kWh to Rs. 35.50/kWh as compared to National Average Tariff of Rs. 29.78/kWh previously determined for FY 2023-24.

The detail of NEPRA Determined National Average Tariff for FY 2024-25, as compared to NEPRA Determined National Average Tariff for FY 2023-24 is tabulated below:

Description	FY 2023-24 (GWh)		FY 2024-25 (GWh)		Inc./ (Dec.) (GWh)	
Projected Sales of DISCOs	110,165		106,152		-4,013	
	(Rs. Million)	(Rs./kWh)	(Rs. Million)	(Rs./kWh)	(Rs. Million)	(Rs./kWh)
Energy Charge	840,462	7.63	1,161,257	10.94	320,795	3.31
Capacity Charge	1,874,334	17.01	1,952,495	18.39	78,161	1.38
Transmission and MOF	151,363	1.37	163,755	1.54	12,391	0.17
Power Purchase Price	2,866,159	26.02	3,277,506	30.88	411,347	4.86
DISCO Margin	341,403	3.10	390,501	3.68	49,098	0.58
PYA	73,599	0.67	99,953	0.94	26,354	0.27
Revenue Req. of DISCOs	3,281,161	29.78	3,767,960	35.50	486,799	5.72

(xiv) **K-Electric Limited**

During the FY 2023-24, the Authority decided in the matter of monthly FCA requests filed by KE for the months of July, 2023 till June, 2024 as under:

Month of FCA's Decision	Rates (Rs./kWh)	Decision Date	Month of FCA's Decision	Rates (Rs./kWh)	Decision Date
July, 2023	1.7111	06-06-2024	January, 2024	2.9696	06-06-2024
August, 2023	0.6608	06-06-2024	February, 2024	-1.8180	06-06-2024
September, 2023	1.3946	06-06-2024	March, 2024	-1.9716	06-06-2024
October, 2023	4.4941	06-06-2024	April, 2024	-1.6716	05-07-2024
November, 2023	1.7704	06-06-2024	May, 2024	2.5934	21-08-2024
December, 2023	0.7930	06-06-2024	June, 2024	3.1688	21-08-2024

The Authority during the reporting period also decided (06) different motions/petitions, with respect to the consumer-end tariff of KE.

(xv) Market Operator Fee

On June 27, 2024, the Authority determined the Market Operator Fee for CPPA-G for FY 2023-24 and forwarded it to the Federal Government for notification in the Official Gazette of Pakistan.

7.6 CONSUMER AFFAIRS

NEPRA is responsible for receiving and resolving complaints from electricity consumers against DISCOs/ Licensees. To enhance consumer satisfaction, NEPRA has established ten (10) Regional Offices in various cities specifically dedicated to the receipt and processing of these complaints. Additionally, a substantial number of complaints are also received through Pakistan's Citizens Portal for resolution. The table below provides a DISCO-wise breakup of complaints received, processed, and resolved at both the NEPRA Head Office and its Regional Offices for FY 2023-24:

Status of Consumer Complaints (Head Office and Regional Offices) (July, 2023 to June, 2024)

DISCO	Total Complaints Received/Processed	Total Complaints Disposed Off	Total No. of Complaints under Process
PESCO	747	406	341
TESCO	3	1	2
IESCO	391	353	38
GEPCO	646	469	177
LESCO	3,056	1,975	1,081
FESCO	852	722	130
MEPCO	1,555	1,428	127
HESCO	1,737	1,586	151
SEPCO	1,202	1,100	102
QESCO	131	73	58
KE	6,862	6,376	486
Pakistan Citizen Portal	1,006	1,006	0
Total	18,188	15,495	2,693

Source: NEPRA

(i) Complaints and Hearings:

The Consumer Affairs Department (Head Office and Provincial/Regional Offices) received and processed a total of 18,188 complaints from July 01, 2023 to June 30, 2024. Of these, 15,495 complaints have been redressed or disposed of, while 2,693 complaints are still under process. Additionally, a total of 5,595 hearings were conducted during this period, including online sessions and those held at the Head Office and Regional Offices, with appropriate directions issued as a result.

(ii) Court Cases/Major Cases Processed/Decided:

The Consumer Affairs Department processed and resolved a total of 26 writ petitions, complaints, and cases referred by various courts of law during the period from July 01, 2023 to June 30, 2024. Additionally, the Complaints Resolution Committee addressed 220 major cases and complaints during the same timeframe, issuing directions and speaking orders accordingly.

(iii) Other Major Activities:

To prevent fatal incidents, all DISCOs including KE, have been directed to verify test reports submitted by consumers or applicants before energizing connections. Consumers must also submit a fresh test report in the event of any load modifications, such as extensions or reductions.

(a) The following directives have been issued to all DISCOs including KE:

- Detection bills must be issued separately, detailing the reason, number of units, period of the detection bill, and applicable taxes.
- A display board indicating timelines for new connections should be installed at each XEN and SDO office.

- Zoom facilities should be made available at every SDO and Regional Office for the prompt redressal of consumer complaints with NEPRA's intervention.
- (b) The Authority took serious notice of overcharging and excessive billing by DISCOs. A hearing was conducted on September 12, 2023, attended by the CEOs of all DISCOs including KE. Following the Inquiry Committee's report on the excessive billing violations in July and August 2023, the Authority issued explanations to the delinquent DISCOs and conveyed directives for bill adjustments based on the report's recommendations.
 - (c) To assist victims of human rights violations, all DISCOs including KE, have been directed to print the "Helpline 1099" number on electricity bills for the Zainab Alert Response and Recovery Agency (ZARRA).
 - (d) To maintain transparency and service quality, the Authority has directed NEPRA Regional Office teams to conduct audits of DISCOs regarding the backlog of new connections and the replacement of defective meters.
 - (e) All DISCOs have been instructed to refrain from disconnecting electricity supply for a single month's default on current bills.
 - (f) The Authority has addressed numerous complaints regarding delays in processing net-metering applications. Directions were issued to all DISCOs to prioritize the processing of applications from eligible consumers without discrimination.
 - (g) All DISCOs including KE, must process net-metering applications submitted by consumers—either in person or through registered vendors or installers—strictly in accordance with NEPRA's (Alternative & Renewable Energy) Distributed Generation and Net-Metering Regulations, 2015.
 - (h) The Authority has approved multiple amendments to the CSM.
 - (i) To facilitate consumers in lodging complaints against all DISCOs, a mobile application titled "NEPRA ASAAN APPROACH" is currently under development. At the time of publication of this report, the App is live and the same can be accessed through given QR Code.
 - (j) A webinar was held on January 29, 2024, to familiarize DISCO officials with the "NEPRA ASAAN APPROACH."
 - (k) To ensure uninterrupted power supply to medical facilities and hospitals with a load of 25 kW and above that include admission and operation theatre facilities, all DISCOs, including KE, have been directed to:
 - Exempt hospitals served by independent or dedicated feeders from load-shedding immediately.
 - Transfer hospitals from higher loss feeders to low loss feeders on a cost deposit basis.
 - Make arrangements to exempt hospitals from load-shedding, subject to technical feasibility, also on a cost deposit basis.
 - (l) KE has been directed to take all necessary measures to curb illegal electricity distribution within its jurisdiction. This includes issuing notices to consumers involved in obtaining illegal electricity from unauthorised sources (such as unlawfully installed generators) and reporting such activities to law enforcement agencies and Electric Inspectors for legal action.
 - (m) In response to multiple complaints, PESCO has been directed to approve the Standard Operating Procedure (SOP) for the payment of costs for exported units to distributed generators.
 - (n) PESCO has also been instructed to align its SOP for net-metering connections with NEPRA Net-Metering Regulations and to process applications from eligible consumers on a non-discriminatory basis.
 - (o) All DISCOs including KE, have been directed to reassess load-shedding practices, especially during examination periods.
 - (p) An explanation has been issued to FESCO under NEPRA (Fines) Rules, 2002, and NEPRA (Fine) Regulations, 2021, concerning its imposition of restrictions on net-metering connections for electricity consumers.

7.7 NEPRA APPELLATE BOARD

The Authority has established an Appellate Board to adjudicate appeals submitted to NEPRA against decisions made by the Provincial Offices of Inspection under Section 38 of the NEPRA Act, 1997. The table below presents the status of appeals and review petitions considered by the Appellate Board during FY 2023-24:

(i) Appeals

DISCO	Pending as on 01 July, 2023	Filed from 01 st July, 2023 to 30 th June, 2024	Total	Decided	Balance as on 30 th June, 2024
PESCO	9	9	18	10	8
TESCO	1	0	1	0	1
IESCO	9	5	14	4	10
GEPCO	21	7	28	16	12
LESCO	84	43	127	111	16
FESCO	27	26	53	43	10
MEPCO	15	11	26	14	12
HESCO	1	1	2	1	1
KE	4	9	13	4	9
Total	171	111	282	203	79

Source: NEPRA Appellate Board

(ii) Review Petitions

DISCO	Pending as on 01 July, 2023	Filed from 01 st July, 2023 to 30 th June, 2024	Total	Decided	Balance as on 30 th June, 2024
PESCO	0	2	2	0	2
IESCO	2	2	4	0	4
LESCO	4	3	7	5	2
FESCO	0	1	1	1	0
MEPCO	0	3	3	0	3
KE	1	1	2	1	1
Total	7	12	19	7	12

Source: NEPRA Appellate Board

7.8 HEALTH, SAFETY, AND ENVIRONMENT

In FY 2023-24, NEPRA adopted a proactive approach with its vision of “Power with Safety”, prioritizing Health, Safety, and Environment (HSE) initiatives within the power sector to protect lives, conserve the environment, and safeguard sector assets. NEPRA emphasised compliance with the Power Safety Code and legal obligations, aiming for a zero-incident goal.

Key Initiatives:

- NEPRA conducted a “Risk and Impact Assessment” workshop with OWS Consultants for capacity building of Distribution and Transmission HSE staff, teaching risk assessment techniques to mitigate hazards.
- The NEPRA Power Safety Code (2nd Edition) was reviewed to enhance safety measures for preventing electrical accidents. Licensees provided feedback for the forthcoming Third Edition, which aims to protect employees and the public across various settings.
- Continuous safety campaigns were launched on social and print media to raise public awareness under the “Power with Safety” initiative.
- Following a critical incident involving an 11 kV conductor falling on railway tracks, NEPRA directed DISCOs and transmission operators to address safety concerns regarding lines crossing railway tracks.
- NEPRA published the HSE Performance Evaluation Report on May 29, 2024, assessing the HSE performance of all licensees to ensure safety for employees, contractors, and the public.
- On June 06, 2024, NEPRA released two Incident Alerts summarizing incidents and lessons learned, which were shared with power sector companies for discussion in safety meetings.

7.9 LEGAL

(i) Promulgation of New Regulations/Guidelines and Amendments in NEPRA Rules/Regulations/Guidelines/Codes

In accordance with Section 47 of the NEPRA Amended Act, 2018, NEPRA is tasked with developing Regulations that govern the conduct, procedures, duties, responsibilities, and terms and conditions of licensees or registered entities, provided they do not conflict with the Act and Rules. In the FY 2023-24, NEPRA notified the following amendments in the existing Regulations in the Official Gazette of Pakistan:

- (a) Amendment in NEPRA (Uniform System of Accounts) Regulations, 2022 notified vide 1501(I)/2023 dated October 30, 2023; and
- (b) Amendment in NEPRA (Fees) Regulations, 2021 notified vide 567(I)/2024 dated April 09, 2024.

(ii) Status of Pending Legal Cases

As on June 30, 2024, status of the pending legal cases wherein either the decision of the Authority has been challenged or NEPRA is party. Out of 3,869 cases, 2,872 cases are pending at different Honourable Courts of Pakistan/Appellate Tribunal (NEPRA) and 997 have been disposed of.

Pending on 30 th June, 2023	Filed in FY 2023-24	Total (No.)	Decided/Disposed in FY 2023-24	Pending on 30 th June, 2024
2,816	1,053	3,869	997	2,872

Source: NEPRA

Regulatory compliance is a critical issue in Pakistan's power sector, where frequent legal challenges to NEPRA's decisions undermine both stability and growth. NEPRA is responsible for ensuring efficient and fair operation within the sector, yet its decisions are often contested in courts by stakeholders on key issues like tariff adjustments, penalties, and performance standards. This constant legal intervention delays necessary reforms, heightens uncertainty, and discourages much-needed investment. As a result, consumers face unreliable electricity, higher costs, and an increasingly inefficient power infrastructure.

This culture of non-compliance and persistent legal challenges has affected the efficient regulation of the power sector and is making it difficult for the power sector to achieve financial sustainability. This not only affects confidence of investors but also provide an excuse to licensees to avoid fulfilling their regulatory obligations, further straining the sector. This also undermines NEPRA's ability to enforce performance standards and implement carefully considered decisions that balance the interests of both consumers and industry players.

NEPRA Act already offers internal mechanisms, such as review by the Authority and Appellate Tribunal, where licensees can seek review of decisions and voice concerns without resorting to lengthy court battles. This process provides a fair and efficient avenue for dispute resolution. Moreover, NEPRA's efforts to promote compliance through penalties for violations and incentives for meeting regulatory standards strengthen accountability in the sector. However, there is an urgent need to review the legal framework to limit unnecessary legal challenges, while enhancing transparency in the decision-making process.

International examples show that when regulatory decisions are respected and implemented without frequent legal challenges, stability and growth follows. The UK's Office of Gas and Electricity Markets (OFGEM) and the Australian Energy Regulator (AER) have demonstrated how sound regulatory decisions can lead to improved performance and attract investment. Adopting such a model in Pakistan would help stabilize its power sector and foster much-needed growth.

INITIATIVES BY STAKEHOLDERS

08

8.1 GENERAL

The Private Power and Infrastructure Board (PPIB) operate at the federal level as one-window facilitator for investment in the power sector, in alignment with the relevant government policies. In order to create synergy in Power Sector, GOP has merged Alternative Energy Development Board (AEDB) with PPIB and the same was notified through Gazette of Pakistan on June 10, 2023. Additionally, there are provincial government agencies involved in facilitating investments in the power sector, including Punjab Power Development Board (PPDB), Pakhtunkhwa Energy Development Organization (PEDO), Energy Department (Government of Sindh), and Energy Department (Government of Balochistan).

All these agencies play important role in the power sector, and they have provided briefs on their respective activities during the FY 2023-24, as well as their future initiatives and planned activities. These details are included in following paragraphs:

8.2 PRIVATE POWER AND INFRASTRUCTURE BOARD (PPIB)

PPIB acts as a One-window facilitator on behalf of GOP and its ministries to promote, encourage and facilitate private investment in power sector and perform function which inter alia include execution of Implementation Agreements on behalf of President of Pakistan, issuance of GOP guarantees under PPA, coordination and facilitation of sponsors in obtaining consents from various federal, provincial and AJ&K and local governments. The merger of PPIB and AEDB is aimed at streamlining processes, one window facilitation for power sector investments, aligning goals and improving coordination for a stronger and unified power sector in Pakistan.

PPIB since its inception has been instrumental in attracting investments in energy sector on different technologies under various power generation policies. PPIB has so far achieved considerable progress through successful commissioning of one hundred (100) IPPs with cumulative capacity of around 24,958 MW including forty-six (46) multi-fuel based IPPs of 22,174 MW and fifty four (54) ARE IPPs of 2,784 MW. It has attracted over US\$ 33 billion as foreign direct investment. Successful Commissioning of Pakistan's first ever private sector and also the first +660 kV HVDC Matiari-Lahore Transmission Line Project of 4,000 MW transmission capability with the investment of US\$ 1.6 Billion is an achievement.

Three solar PV projects having installed capacity of 50 MW each namely HNDS Energy, Meridian Energy and Helios Energy have achieved commissioning during this fiscal year. These projects are owned by Scatec Solar, ASA, Norway along with Nizam Energy.

Moreover, PPIB announced financial close of 1,320 MW, Thar Coal based Shanghai project on December 13, 2023, which was commissioned on February 05, 2023. Additionally, the commissioning test on HSD for 1263 MW RLNG Based Punjab Thermal Power Project were successfully completed in December, 2023.

Suki Kinari Hydropower project which is so far the largest hydropower IPP in Pakistan has completed around 98% construction work by June, 2024 and is set to be operational in November, 2024. Similarly, 32 MW Shahtaj Sugar Mills bagasse based project will achieve COD in December, 2024.

(i) Future Plans and Targets:

Currently, PPIB portfolio consists of twenty-five (25) new multiple fuel (solar, wind, coal, hydro, RLNG/ Gas, bagasse) based IPPs with cumulative capacity of 7,490 MW. These 25 projects include 22 renewable energy projects (including hydropower) which highlights that around 88% of total under process projects are clean and green energy projects. This scenario testifies PPIB's steadfast approach for promotion of indigenization and implementation of RE based power projects in the country. Summarised form of the portfolio is as follows:

Portfolio of Upcoming 25 IPPs of 7,490 MW (No./MW)

Year	Hydel	Solar	Wind	Bagasse	Thar Coal	Imported Coal	Gas	Total Generation
2024	1/884*	-	-	1/32*	-	-	-	916.00
2025	-	2/110.27	-	1/30	-	1/300	-	440.27
2026	1/7.08	2/21.52	-	-	-	-	-	28.60
2027	1/8.00	-	-	-	-	-	-	08.00
2028	-	1/100	2/100	-	1/1320	-	-	1,520.00
2029	1/82.25	-	-	-	-	-	-	82.25
2031	2/432	-	-	-	-	-	-	432.00
2032	2/340.7	-	-	-	-	-	-	1,340.70
2034	1/1124	-	-	-	-	-	-	1,124.00
Other Projects	4/1578	-	-	-	-	-	1/20	1,598.00
Total	13/5,456	5/231.79	2/100	2/62	1/1,320	1/300	1/20	7,490.00

* Projects under Construction

Note: Under construction projects would be completed by end of 2024. For remaining projects, exact date for commissioning will be finalised as per the IGCEP which is under approval by NEPRA and subject to the resolution of various issues.

(ii) Independent Auction Administrator (IAA) under CTBCM Regime:

Pursuant to PPIB's registration as IAA in January, 2024 under CTBCM, PPIB has formally assumed the role of IAA. PPIB is actively participating in the CTBCM implementation and planning to conduct future power procurements in accordance with the IGCEP projections. Currently, the CTBCM Security Package Documents (SPDs) for solar technology are under preparation and review in collaboration with legal consultant engaged by the World Bank. The complete set of SPDs, including the Connection Agreement between the DISCO and the Power Generation Company will be soon shared with stakeholders.

(iii) Fast Track Solar Initiatives:

In order to reduce the impact of prevailing high prices of Oil and LNG in the international markets resulting in high electricity tariffs and drain of precious foreign exchange, the Government has approved the Framework Guidelines for Fast-Track Solar PV Initiatives 2022 for fast-track deployment of solar PV. In this regard, as a first step, a 600 MWp solar project is planned to be developed at Kot Addu/ Muzaffargarh on G2G mode and the same has been offered to Government of Kingdom of Saudi Arabia.

(iv) Category-III Wind and Solar IPPs:

In the light of CCoE's decision taken in February, 2019, Category-III wind (500 MW) and solar (2,500 MW) IPPs will be considered for further processing through competitive bidding after finalization of IGCEP and TSEP. An identification study for potential sites is being initiated under the CPEC for pumped storage hydropower projects.

(v) Conversion of Imported Coal based IPPs to Thar Coal:

Upon the direction of Ministry of Energy (Power Division), renowned Consultant (Fichtner) conducted a feasibility study for conversion of imported coal-based IPPs to Thar coal. The feasibility study suggested that as a first step, these IPPs may start on-site testing from 10% Thar coal blending with imported coal.

Hence, it is need of the hour to facilitate these IPPs towards conversion to Thar coal.

Subsequently, efforts are underway to start blending of Thar coal by three imported coal-based IPPs with a cumulative capacity of 3,960 MW which were implemented under CPEC regime, namely;

- (a) 1,320 MW Sahiwal Coal Power project located at Sahiwal;
- (b) 1,320 MW Port Qasim Coal Power Project located at Port Qasim; and
- (c) 1,320 MW Hub Coal Project located at Hub

8.3 NATIONAL ENERGY EFFICIENCY AND CONSERVATION AUTHORITY (NEECA)

NEECA, established under the NEECA Act of 2016, operates as a pivotal federal agency entrusted with the responsibility of initiating, catalyzing, and harmonizing EE&C endeavours across all sectors of the economy, with a particular focus on the power sector. Recognizing the pivotal role of EE&C in the Power Sector, the GOP has underscored its significance by incorporating EE&C as one of the six core guiding principles within the National Electricity Policy, 2021.

In addition to the initiatives taken by NEECA in previous year which were mentioned in previous SIR, NEECA has worked on Demand Side Management, Electric Vehicles. Details of which are discussed below:

(i) Electric Vehicles:

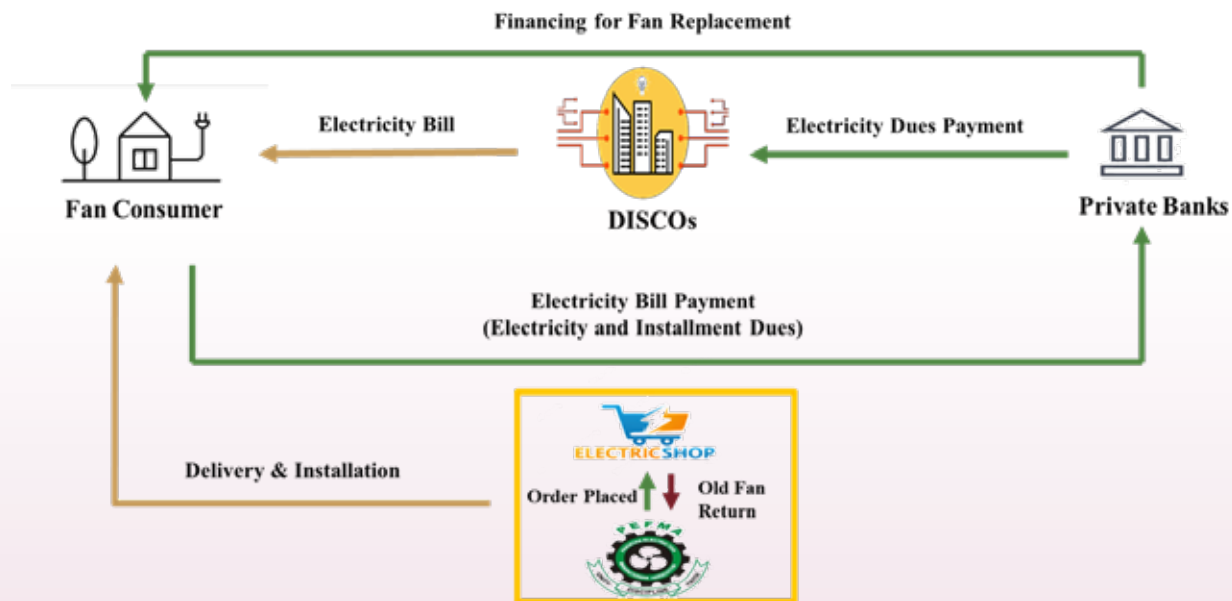
Pakistan is one of the most affected countries in the world by climate change and its two biggest cities of Karachi and Lahore are included in the list of most polluted cities of the world. Pakistan is spending almost US\$ 13 billion on the import of oil every year. On the other hand, in the electricity sector Pakistan is facing the challenge of Surplus Capacity/Capacity Trap. This is where Electric Vehicles (EVs) come into play as the best solution for the triple blow of ballooning oil import bill payments, environmental degradation, and capacity surplus/capacity trap. As per the mandate of EV Policy, 2019, NEECA has drafted EV Charging Infrastructure Regulations in collaboration and support of UNDP in year 2023. The EV Charging Infrastructure Regulations, 2024 are currently with the NEECA Board for approval. These EV charging regulations are a significant component of the Special Investment Facilitation Council's (SIFC) "Electric Vehicles Ecosystem", which aims to create a conducive environment for the growth and adoption of electric vehicles in Pakistan.

(ii) Prime Minister's Fan Replacement Program:

Pakistan's cooling demand exceeds 17,000 MW, with fans contributing approximately 65%, or around 11,700 MW, due to their widespread availability and use. Studies indicate that Pakistan has a stock of 147 million installed fans, with an estimated 60%, or 88 million fans, operating for considerable periods during the summer season. The Prime Minister's Fan Replacement Program, spearheaded by the Ministry of Energy (Power Division), is a landmark initiative aimed at replacing 88 million inefficient fans nationwide with NEECA-labelled energy-efficient fans. This program, spanning over a period of 10 years, will target twenty-two million individual electricity consumers who have maintained a good rating and have never defaulted on their electricity bill payments.

The implementation methodology involves a tripartite agreement among commercial banks, DISCOs, and consumers. Commercial banks will finance the program, DISCOs will share consumer creditworthiness with the banks and vendors through an IT-based online portal, and the consumers will be the third party in this agreement. The program will offer an on-bill financing mechanism to DISCOs customers, allowing them to replace their fans through easy instalments. This approach highlights the ease and accessibility of financing that the program will provide for fan replacement.

DISCOS ON-BILL FINANCING



(iii) **Collaboration with the Danish Energy Agency: The Danish Energy Transition Initiative:**

NEECA has partnered with the Danish Energy Agency (DEA) under the Danish Energy Transition Initiative (DETI) to enhance energy efficiency in Pakistan's energy-intensive industries. This collaboration aims to reshape Pakistan's energy landscape through technical expertise, sustainable energy solutions, and the successful Danish Energy Model.

(iv) **Training of Trainers (ToT) Program:**

NEECA is in process to approve the rules/regulations for Energy Auditors and Managers Regime. To execute that regime, the trainers for that program need to be developed. Therefore, Energy Conservation Fund (ECF) has launched ToT Program which prepares master trainers for Energy Managers and Auditors Training Regime that will become certified Auditors and Managers, with a particular topic or skill, or with training overall. ECF has successfully conducted Training of Trainer Program in which a total of 244 candidates successfully completed the required training. The candidates on successful clearance of NEECA examination conducted at the end of the trainings, were awarded NEECA Certified Master Trainer Certificates.

(v) **Registration of Energy Auditing Firms:**

To address the demand of industrial sector which has repeatedly approached to NEECA/ECF to provide or endorse organizations/firms offering quality energy auditing services, ECF has initiated the pre-qualification and enlistment of such Energy Auditing firm/Service companies having capabilities to undertake energy audits in various industries. Currently, eight companies/firms have been duly registered with NEECA after exhibiting the necessary expertise and tools for the successful and effective implementation of required energy efficiency initiatives keeping into perspective the best practices in the industry as well as globally.

(vi) **Energy Audits of Public Buildings based on Super ESCO Model:**

In order to implement, catalyze, and coordinate the energy efficiency and conservation programs and projects across all the major economic sectors of Pakistan i.e. buildings, industry, power, agriculture, and transport, ECF has come up with the model of Super ESCO; an entity set up by government/ public sector that coordinates/ supervise innovative financing mechanisms, to its clients, and subcontracts

project implementation to private-sector ESCOs that guarantee the deemed savings to be realized. UNDP, having worked extensively in this domain across the regions, is providing support to ECF in the structuring of the transactions, with private sector organizations.

(vii) MOUs/Collaboration for Energy Efficiency & Conservation Measures:

ECF under the umbrella of NEECA has jointly signed MOUs with prestigious educational institutions including Lahore University of Management Sciences, Foundation University, Balochistan University of Information Technology, Engineering and Management Sciences, Hazara University as well as leading entity in hospitality industry i.e. Hashoo Group as well as representative body of builders and developers in Pakistan i.e. Association of Builders and Developers, in order to roll-out the green initiatives culture across the country.

(viii) Public Registry System – (Appliance Information Management System):

With the support of United Nations Environment Program (UNEP), ECF has developed a web portal designed for the registration of energy efficient lighting manufacturers and their products, ensuring compliance with Minimum Energy Performance Standards (MEPS). This portal will also support the registration of energy efficient fans manufacturers and their products to be offered under the Prime Minister's Fan Replacement Program.

8.4 PUNJAB POWER DEVELOPMENT BOARD

Punjab Power Development Board (PPDB) is a statutory body that performs its functions as a one window facilitator for development of IPP based power projects in the province of Punjab. So far, PPDB has contributed in the capacity addition of 1,820 MW into the National Grid. Out of 630 MW grid connected solar power projects in Pakistan, PPDB has facilitated 500 MW Solar Power Projects in Punjab.

GoPb owned, Punjab Grid Company Limited (PGC) registered with SECP on January 03, 2023. NEPRA awarded the licence for PGC on November 08, 2023 under Section 18(A) of the NEPRA Act.

100 MW Zorlu Enerji Solar PV project is at advance stage for which tri-partite Letter of Support was signed between PPDB, AEDB (now PPIB) and ZSPL on June 26, 2023.

PPIB has so far issued LOIs for 8 solar PV projects and one (1) wind power project. Out of 8 LOIs issued for solar, 3 projects have achieved COD, one is at advanced stage while for remaining four (4) projects, competitive bidding is to be held by PPIB as IAA. For one Wind LOI projects, which was placed in Category-III, bidding round is yet to be initiated.

PPDB initiated development of Waste-to-Energy (WtE) project through private sector investment for off-grid sale of electricity to potential power purchaser such as Sundar Industrial Estate, Lahore Knowledge Park, and Orange Line Metro Train etc. Pre-qualification of private sponsors for Lahore 50 MW WtE project has been completed under Punjab Power Generation Policy 2009, as a side activity. The invitation of bids from the pre-qualified sponsors is under process as preparation of bidding documents and security package is underway.

PPDB, through a Consultant has completed detailed feasibility study to identify most suitable reaches/spans of small PV power plants on canal top and urban nullahs in the region of Gujranwala division and Rakh Branch Canal, Faisalabad.

PPDB is encouraging the development of small hydropower projects in captive mode for supply of generated energy for self-use of small new and existing enterprises with the vision to enhance the development of small industries and increase rural employment. In this regard, Captive Guidelines for small hydropower projects have been approved by Punjab Cabinet in 2022. Currently 06 projects of about cumulative capacity of 15 MW are under development and further issuance of three more LOIs in process for cumulative capacity of about 11 MW.

8.5 PAKHTUNKHWA ENERGY DEVELOPMENT ORGANIZATION

Pakhtunkhwa Energy Development Organization (PEDO) was established in 1986 to identify and explore the immense hydel potential located in Khyber Pakhtunkhwa with a vision to Energizing Khyber Pakhtunkhwa with affordable power. PEDO is an autonomous body of the Government of Khyber Pakhtunkhwa and responsible for fast-track development of the energy sector of the province. PEDO is working to explore all possible energy avenues including renewables like hydro, solar and wind energy. The highlights of PEDO Projects are as follows:

KPT&GSC has been established to evacuate power from PEDO's as well as private sector owned Projects located in the Chitral, Dir, Swat, Kohistan and other parts of the province.

PEDO has completed seven (07) hydropower projects with a total capacity of 160 MW. It includes Malakand-III, Daral Khwar, Pehur Ranolia, Reshun, Machai, and Shishi Hydel Station. In order to boost local industry and revive sick units in Khyber Pakhtunkhwa, PEDO is selling power from 18 MW Pehur HPP to five (05) industries of Khyber Pakhtunkhwa through wheeling arrangement.

Six (06) hydropower projects namely Koto, Karora, Lawi, Gorkin Matiltan, Mujahedeen and Chapri Charkhel with cumulative capacity of 226.13 MWs are under construction in public sector with a funding of (ADP/HDF).

Provincial Government has signed Loan Agreement with ADB for the construction of 300 MW Balakot HPP, District Mansehra.

Under access to clean energy investment program, the solarization of 8,000 schools and 53 basic health units have been completed and the rest of the projects will be completed by end of December, 2027.

The generation licence for the 88 MW Gabral Kalam HPP and 157 MW Madyan HPP have been approved, along with the grid interconnection study. The feasibility rate tariffs are under preparation and will be submitted to NEPRA for approval.

Currently Renewable Energy, Private Power Wing is processing around 2,225 MW of Hydel and Solar Projects under different modes of implementation.

8.6 ENERGY DEPARTMENT, GOVERNMENT OF SINDH

Directorate of Alternative Energy (DAE), Energy Department (Government of Sindh) has so far issued 60 Letters of Intent to foreign and local companies, in line with the Renewable Energy Policy 2006. These projects encompass various technologies. Details of which are as follows:

Name of Technology	LOI Issued		Projects Commissioned		Projects Awaiting Competitive Bidding	
	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)	No. of Projects	Capacity (MW)
Solar	25	1550	3	150	19	1,150
Wind	36	2,485	12	610	24	1,875
Hydropower*	1	15	-	-	-	-
WTE**	2	100	-	-	-	-

* The project is at tariff determination stage in NEPRA.

** The projects are at feasibility stage.

In addition, DAE has issued LOIs of 500 MW floating Solar at Kinjhar Lake and 1,200 MWs Solar & Wind Hybrid Power Plant for production of 150,000 kg/day Green Hydrogen at Thatta, Sindh. Moreover, two LOIs equivalent to 650 MWs Solar and Wind Hybrid Power Plant on Business to Business basis has also been issued.

Under Annual Development Program (ADP) Schemes, 225 health facilities, 656 government schools, 6 prisons, 15 water pumping stations have been solarized so far and 22 public offices of finance department and health facilities in Tharparkar will be solarized through ADP in FY 2024-25.

Under Sindh Solar Energy Project (SSEP) Component-I, the cabinet has granted approval for allocation of 1462 acres of land for development of solar PV projects at utility scale. For which the RFP documents have been approved by NEPRA for 120 and 150 solar PV project at Deh Halkani and Metha Ghar respectively. For 50 MW Manjhand project, the RFP document has been submitted to PPIB for further processing under relevant regulatory framework. Under Component-II, 33 targeted hospitals have been solarized, while installation works on 23 buildings is in progress. Under Component-III, the solar solutions were distributed among poor communities under BISP. Under Component-IV, 300 technicians were trained and testing laboratories are being established in NED University, Karachi and Mehran University, Jamhsoro.

(i) Sindh Transmission and Dispatch Company (Pvt.) Limited Progress Report on FY 2023-24:

The Government of Sindh has obtained the licence for PGC - STDC, marking a significant milestone. STDC has achieved a major accomplishment by completing the first provincial Transmission Line of 132 kV Double Circuit, extending from the two projects SNPC to KE KDA-33 Grid Station in Karachi. This line spans a length of 95.47 km. STDC's future endeavours include the following projects:

KWSB Greater Water Bulk Supply K-IV Project: Construction of 132 kV STDC grid station near K-IV pumping station and construction of around 20 kms 132 kV Double Circuit Transmission Line on loop-in & loop-out arrangement between HESCO Jhimpir and Thatta grid to supply 50 MW power to K-IV pumping station at Kinjhar Lake, or as proposed by technical consultant M/s OMS. STDC has hired consortium of technical, financial, legal and environmental consultant for construction of grid and transmission line for K-IV Power Component. The consultancy studies are in progress.

Go-Energy: MoU signed on 13th June 2024. Pakistan's first ever floating power Project has been initiated by M/s Go Energy (Pvt.) Limited in coordination with STDC, Alternative Energy Department of Energy Department, GoS and Irrigation Department, GoS. The STDC will lay 220 kV Transmission Line around 60 kms from Kinjhar Lake Power Project to Dhabeji Grid Station, Karachi.

Gul Ahmed Group: Gul Ahmed Group has planned to install 100 MW Wind Power Project in Jhimpir Wind Corridor to supply renewable energy to Gul Ahmed Industry in Landhi Industrial Area on B2B basis. STDC will construct around 60 kms double circuit transmission line. Gul Ahmed Group and STDC has already signed MoU on 15th July, 2024.

KE-STDC-NSCL: MoU Signed on 3rd July, 2024 between STDC, KE, and National Steel Complex Limited to construct 132 kV transmission line from Pipri Grid Station to NSCL to meet NSCL's 40 MW power load requirement at Port Qasim, Karachi.

(ii) Performance parameters of STDC during FY 2023-24:

- (a) Number of tripping is only 47.
- (b) Transmission Line losses are approximately 1.71% which is also within the permissible limit of 2% by NEPRA.

(iii) Sindh Coal Authority:

Sindh Coal Authority is responsible to accelerate the pace of activities relating to coal development and to promote joint-ventures with foreign investors for development of coal resources of Sindh Province. Sindh Coal Authority does not have any direct role in the power sector.

However, it may be noted that to facilitate mining operations in Thar, Sindh Coal Authority delineated Thar Coalfield. Until now, 12 blocks have been outlined out of which 05 are presently allocated to the companies and 02 blocks (Block-I & Block-II) are actively developing/expanding their open-pit mines for extraction of coal.

8.7 ENERGY DEPARTMENT, GOVERNMENT OF BALOCHISTAN

Energy Department (Government of Balochistan) (ED, GOB) has made substantial progress in renewable energy initiatives during the FY 2023-24. These efforts focus on improving the province's energy infrastructure and sustainability, also addressing the issue of energy crisis in the long term. The key initiatives and milestones of ED, GOB are as follows:

(i) Solarization Projects:

The GOB earmarked Rs. 3,120.708 million in the energy sector for solarization projects in Balochistan which include solarization of off-grid households, schools, basic health units, hospitals, public offices and installation of solar street lights across Balochistan. The impacts of these initiatives are expected to enhance energy access and reliability, particularly in rural and underserved areas.

(ii) Village Electrification:

The GOB also allocated Rs. 2,707.028 million in the energy sector towards the electrification of villages through the QESCO. The project aims to extend electricity to remote communities, fostering socio-economic development and improving quality of life.

(iii) Grid Station Developments:

The construction and enhancement of grid stations are in progress in the Districts of Kech, Awaran, Pishin, Ziarat, Jafferabad, and Chaman at a cumulative cost of Rs. 3,932.35 million to strengthen the electricity distribution network in these areas. This initiative is likely aimed at improving the power infrastructure in the province, addressing electricity supply issues, and enhancing overall energy distribution. These projects reflect the government's focus on boosting the energy sector to support development and meet the growing electricity demands of the province.

(iv) Tubewell Solarization Plan:

The GOB, through its Energy Department, has announced a strategic plan to solarize 29,000 tubewells across the province. The primary objective of this initiative is to eliminate the substantial subsidies currently borne by the government annually for tubewell electricity. By converting these tubewells to solar power, the government aims to achieve significant cost savings while promoting the use of renewable energy in the agricultural sector, ultimately contributing to the province's sustainability and energy efficiency. These initiatives reflect the GOB's commitment to advancing renewable energy and improving infrastructure, aiming to create a more sustainable and energy-efficient future for the province.

STATE OF THE INDUSTRY REPORT 2024 STATISTICAL DATA



TABLE 1
Primary Energy Supplies by Source (TOE)

Source	Unit	2018-19	2019-20	2020-21	2021-22	2022-23
Oil ^[1]	TOE	21,568,315	18,188,487	22,577,047	27,970,739	20,106,167
	% share	25.73	22.56	25.94	29.76	24.33
Gas	TOE	29,318,489	26,658,176	25,500,568	24,810,015	23,879,362
	% share	34.98	33.07	29.30	26.40	28.90
LPG ^[2]	TOE	953,834	1,026,048	1,116,597	1,522,345	1,561,764
	% share	1.14	1.27	1.28	1.62	1.89
Coal	TOE	12,933,087	14,711,973	16,530,528	16,202,444	12,574,353
	% share	15.43	18.25	18.99	17.24	15.22
Hydro Electricity ^[3]	TOE	6,525,607	8,016,386	8,007,673	7,806,686	8,746,313
	% share	7.79	9.94	9.20	8.31	10.59
Nuclear Electricity ^[3]	TOE	2,365,268	2,581,494	2,230,835	4,576,563	6,196,042
	% share	2.82	3.20	2.56	4.87	7.50
Renewable Electricity ^[4]	TOE	1,117,482	991,041	1,031,857	1,478,685	1,393,950
	% share	1.33	1.23	1.19	1.57	1.69
LNG Import ^[4]	TOE	8,913,006	8,320,497	9,920,947	9,499,119	8,051,421
	% share	10.63	10.32	11.40	10.11	9.74
Imported Electricity ^[5]	TOE	116,196	122,625	118,957	110,485	114,242
	% share	0.14	0.15	0.14	0.12	0.14
Total	TOE	83,811,284	80,616,727	87,035,009	93,977,081	82,623,614
	% share	100.00	100.00	100.00	100.00	100.00
Annual Growth Rate (%)		-2.88	-3.81	7.96	7.98	-12.08

^[1] Excluding petroleum products exports and bunkering.

^[2] Include imports and production from field plants.

^[3] Converted @ 10,000 Btu/kWh to represent primary energy equivalent of hydro and nuclear electricity as if this was generated by using fossil fuels.

^[4] LNG Imports and Renewable Generation reported for the first time in FY 2014-15.

^[5] WAPDA importing electricity from Iran since October, 2002.

Source: Pakistan Energy Yearbook, HDIP, Islamabad

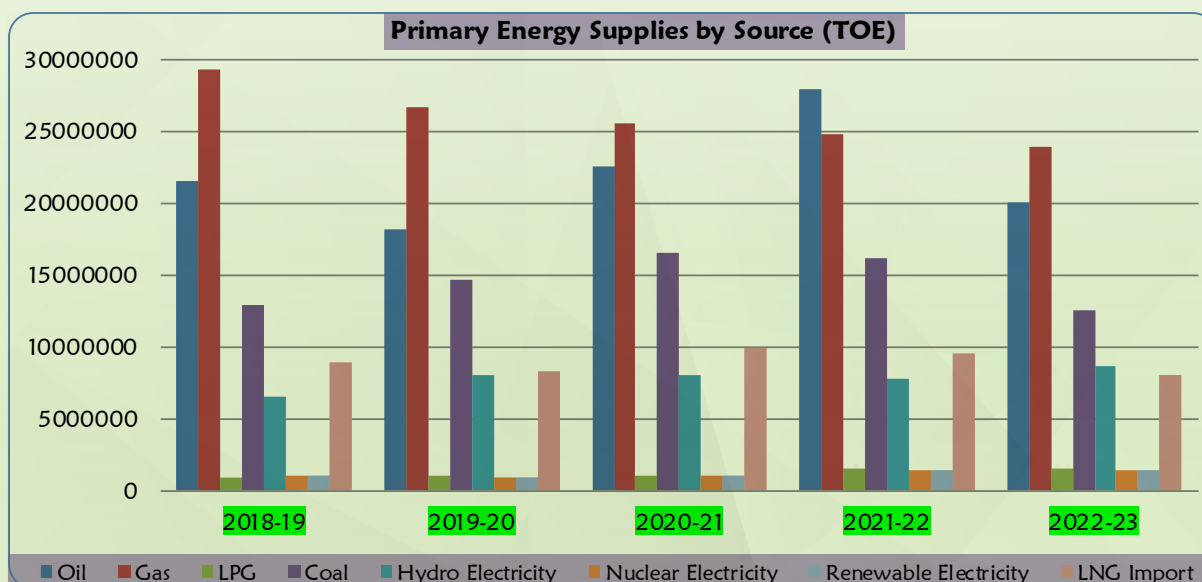


TABLE 2
Final Energy Consumption by Source (TOE)

Source	Unit	2018-19	2019-20	2020-21	2021-22	2022-23
Oil ^[1]	TOE	17,364,897	16,364,304	18,569,102	20,224,963	15,967,266
	% share	31.58	31.37	30.84	36.30	34.96
Gas ^[2]	TOE	17,275,180	15,944,781	18,346,902	16,577,599	14,239,041
	% share	31.41	30.56	30.47	29.75	31.18
LPG	TOE	1,148,380	1,196,005	1,371,416	1,381,531	1,497,906
	% share	2.09	2.29	2.28	2.48	3.28
Coal ^[2]	TOE	10,292,739	9,836,671	12,407,520	8,470,931	4,655,350
	% share	18.72	18.86	20.61	15.20	10.19
Electricity ^[3]	TOE	8,914,489	8,825,770	9,513,502	9,061,238	9,308,581
	% share	16.21	16.92	15.80	16.26	20.38
Total	TOE	54,995,685	52,167,531	60,208,442	55,716,262	45,668,144
	% share	100.00	100.00	100.00	100.00	100.00
Annual Growth Rate (%)		0.01	-5.14	15.41	-7.46	-18.03

^[1] Excluding consumption for power generation.

^[2] Excluding consumption for power generation and feedstock.

^[3] @ 3412 Btu/kWh being the actual energy content of electricity.

Source: Pakistan Energy Yearbook, HDIP, Islamabad

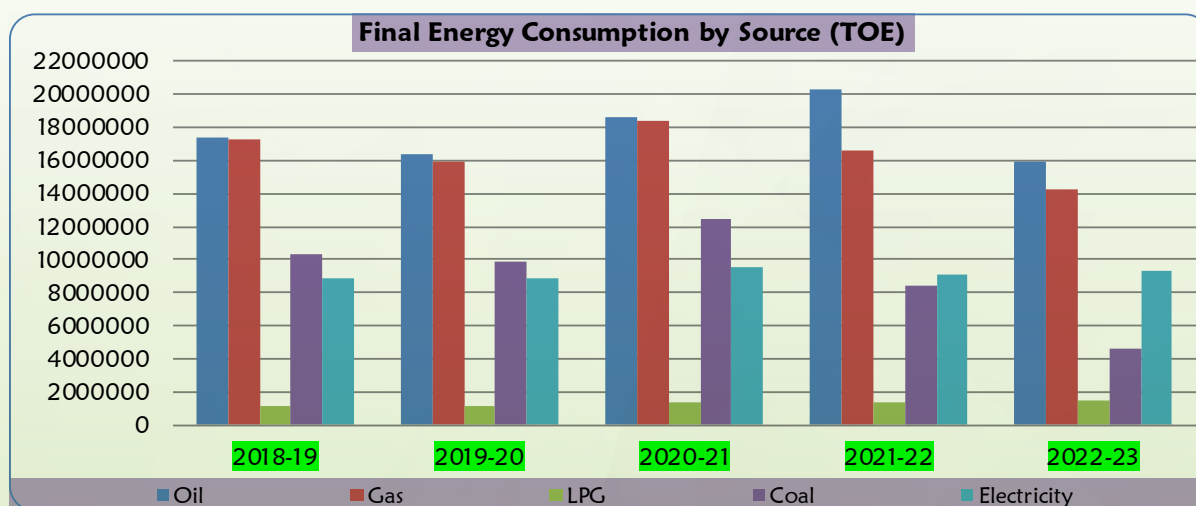


TABLE 3
Fuel Consumption for Thermal Power Generation (TOE)

Source	Unit	2018-19	2019-20	2020-21	2021-22	2022-23
Gas	TOE	10,050,101	8,426,767	8,648,124	7,292,032	7,308,466
	% share	65.35	56.98	57.34	39.14	43.37
Furnace Oil	TOE	2,661,528	1,474,895	2,206,605	3,346,890	1,561,085
	% share	17.31	9.97	14.63	17.97	9.26
Diesel Oil	TOE	27,383	12,683	103,427	258,652	64,759
	% share	0.18	0.09	0.69	1.39	0.38
Coal	TOE	2,640,347	4,875,302	4,123,008	7,731,514	7,919,004
	% share	17.17	32.96	27.34	41.50	46.99
Total	TOE	15,379,359	14,789,647	15,081,164	18,629,088	16,853,314
	% share	100.00	100.00	100.00	100.00	100.00
Annual Growth Rate (%)		-19.23	-3.83	1.97	23.53	-9.53

Source: Pakistan Energy Yearbook, HDIP, Islamabad

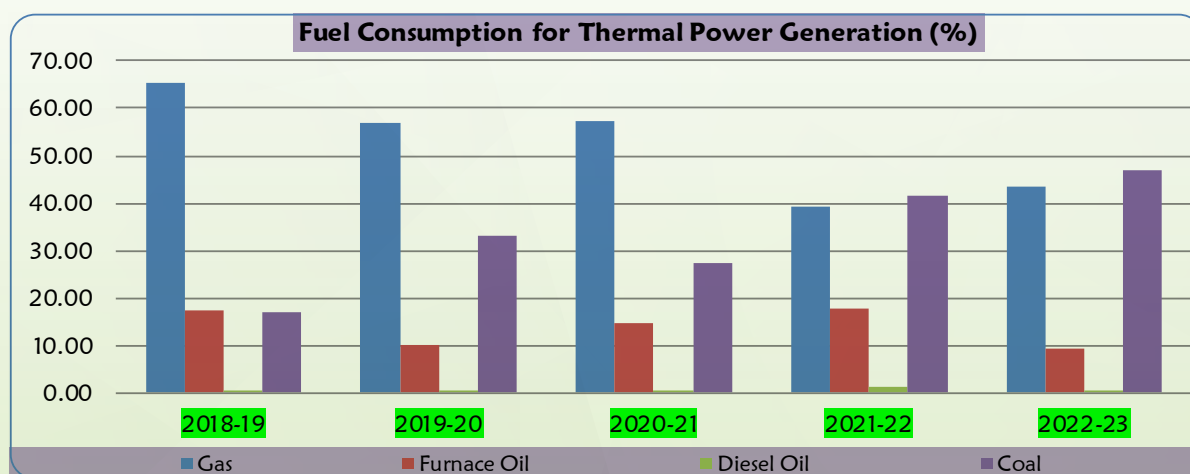


TABLE 4
Installed Capacity by Type (MW)

As on 30 th June	2020	2021	2022	2023	2024
HYDEL					
WAPDA Hydel	9,389	9,389	9,389	9,389	9,389
IPPs Hydel	472	526	1,246	1,246	1,246
Sub-Total	9,861	9,915	10,635	10,635	10,635
% Share (Hydel Installed Capacity)	25.47	24.93	24.26	23.15	23.01
THERMAL					
GENCOs: CPPA-G System	4,881	4,881	4,731	4,587	4,587
KE Own	2,294	2,084	2,345	2,816	2,816
IPPs: CPPA-G System	17,276	17,276	18,750	20,563	20,563
IPPs: KE System	366	366	366	366	366
SPPs/CPPs/N-CPPs: CPPA-G System	340	340	340	340	340
SPPs/CPPs/N-CPPs: KE System	87	151	151	94	94
Sub-Total	25,244	25,098	26,683	28,766	28,766
% Share (Thermal Installed Capacity)	65.20	63.11	60.87	62.62	62.24
NUCLEAR					
CHASNUPP (I, II, III and IV)	1,330	1,330	1,330	1,330	1,330
KANUPP (I, II & III)	137	1,282	2,290	2,290	2,290
Sub-Total	1,467	2,612	3,620	3,620	3,620
% Share (Nuclear Installed Capacity)	3.79	6.57	8.26	7.88	7.83
RENEWABLE ENERGY (WIND, SOLAR AND BAGASSE)					
Wind Power Plants	1,248	1,248	1,838	1,838	1,838
Solar Power Plants	430	430	530	530	680
Bagasse based Power Plants	369	369	369	249	249
RE Power Plants: CPPA-G System	2,047	2,047	2,737	2,617	2,767
Solar Power Plants: KE System	100	100	160	302	433
RE Power Plants: KE System	100	100	160	302	433
Sub-Total	2,147	2,147	2,897	2,919	3,200
% Share (RE Installed Capacity)	5.55	5.40	6.61	6.35	6.92
Total Installed Capacity of the Country	38,719	39,772	43,835	45,940	46,221

Source: WAPDA/GENCOs/IPPs/KE/CPPA-G

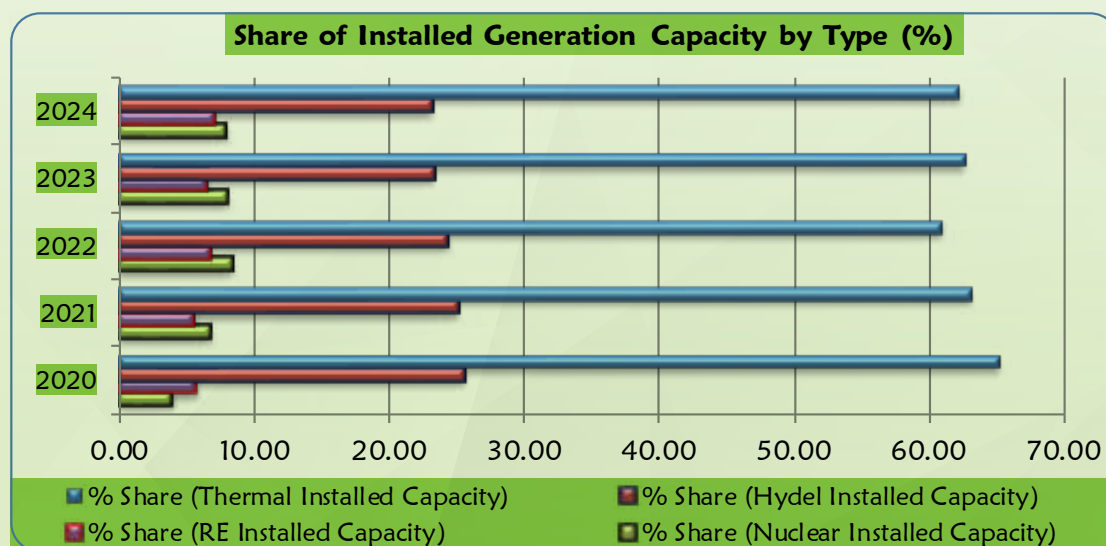


TABLE 5
Plant-wise Installed Capacity (MW) as on 30th June

Power Station	Plant Location	Type of Power Station	2020	2021	2022	2023	2024	Dependable Capacity as on 30-6-2024
A1: Hydel (WAPDA)								
Major Hydropower Units								
Tarbela	Tarbela, KPK	Reservoir	3,478	3,478	3,478	3,478	3,478	3,478
Tarbela 4 th Ext.	Tarbela, KPK	Reservoir	1,410	1,410	1,410	1,410	1,410	1,410
Ghazi Barotha	Ghazi Barotha, Punjab	Run of River	1,450	1,450	1,450	1,450	1,450	1,450
Mangla	Mangla, AJ&K	Reservoir	1,000	1,000	1,000	1,000	1,000	1,060
Warsak	Warsak, KPK	Run of River	243	243	243	243	243	243
Chashma	Chashma, Punjab	Run of River	184	184	184	184	184	184
Khan Khwar	Shangla, KPK	Reservoir	72	72	72	72	72	72
Allai Khwar	Battagram, KPK	Reservoir	121	121	121	121	121	121
Jinnah Hydel	Mianwali, Punjab	Run of River	96	96	96	96	96	36
Duber Khwar	Kohistan, KPK	Reservoir	130	130	130	130	130	130
Neelum Helum	Muzaffarabad, AJ&K	Run of River	969	969	969	969	969	969
Golen Gol	Chitral, KPK	Run of River	108	108	108	108	108	108
Small Hydropower Units								
Dargai	Dargai, KPK	Run of Canal	20	20	20	20	20	20
Rasul	Rasul, Punjab	Run of Canal	22	22	22	22	22	22
Shadiwal	Shadiwal, Punjab	Run of Canal	14	14	14	14	14	14
Chichoki Mallian	Chichoki Mallian, Punjab	Run of Canal	13	13	13	13	13	13
Nandipur	Nandipur, Punjab	Run of Canal	14	14	14	14	14	14
Kurram Garhi	Kurram Garhi, KPK	Run of Canal	4	4	4	4	4	4
Renala	Renala, Punjab	Run of Canal	1	1	1	1	1	1
Chitral	Chitral, KPK	Run of Canal	1	1	1	1	1	1
Gomal Zam	South Waziristan Agency, KPK	Reservoir	17	17	17	17	17	17
Malakand/Jabban	Malakand, KPK	Run of River	22	22	22	22	22	22
Total Hydel (WAPDA)			9,389	9,389	9,389	9,389	9,389	9,389
A2: Hydel (IPPs)								
Jagran (AJ&K)	Jagran, AJ&K	Hydro	30	30	30	30	30	30
Malakand-III (PEDO)	Malakand, KPK	Run of River/Canal	84	84	84	84	84	81
Pehur (PEDO)	Swabi, KPK	Canal Fall/Run of River	18	18	18	18	18	-
Laraib Energy (AJ&K)	Jhelum River, AJ&K	Hydro	84	84	84	84	84	84
Garam Chashma	Chitral, KPK	Hydro	1	1	1	1	1	-
Marala Hydro (PPDCL)	Sialkot, Punjab	Canal Fall/Run of River	8	8	8	8	8	8
Patrind Hydro (AJ&K)	Muzaffarabad, AJ&K	Run of River	147	147	147	147	147	147
Gulpur Hydropower Project	Gulpur, Kotli, AJK	Run of River	100	100	100	100	100	101
Daral Khwar	Swat, KPK	Run of River	--	37	37	37	37	37
Ranolia	Kohistan, KPK	High Head	--	17	17	17	17	17
Karot Power Company	Karot, Dist Rawalpindi	Run of River	--	--	720	720	720	720
Total Hydel (IPPs)			472	526	1,246	1,246	1,246	1,225
Total Hydel (A1+A2)			9,861	9,915	10,635	10,635	10,635	10,614
B1: Thermal (GENCOs: CPPA-G System)								
TPS Jamshoro	Jamshoro, Sindh	STs	880	880	880	880	880	300
TPS Guddu (Units 5-10)	Guddu, Sindh	GTs+CCPPs	600	600	600	600	600	640
TPS Guddu (Units 11-13)	Guddu, Sindh	GTs+OCPPs	415	415	415	415	415	
TPS Guddu (Units 14-16)	Guddu, Sindh	GTs+ST+CCPPs	747	747	747	747	747	721
TPS Quetta	Quetta, Balochistan	GT	28	28	28	28	28	25
TPS Muzaffargarh	Muzaffargarh, Punjab	STs	1,350	1,350	1,350	1,350	1,350	450
GTPS Faisalabad	Faisalabad, Punjab	GTs+CCPPs	144	144	144	0	0	0
TPS Nandipur	Gujranwala, Punjab	GTs+CCPPs	567	567	567	567	567	500
FBC Lakhra	Lakhra, Sindh	STs	150	150	0	0	0	0
Total Thermal (GENCOs: CPPA-G System)			4,881	4,881	4,731	4,587	4,587	2,636
B2: Thermal (IPPs: CPPA-G System)								
Lal Pir Power	Mehmood Kot, Punjab	ST	362	362	362	362	362	350
Pak Gen. Power	Mehmood Kot, Punjab	ST	365	365	365	365	365	350
Altern Energy	Fateh Jang, Punjab	GEs	31	31	0	0	0	0
Fauji Kabirwala	Kabirwala, Punjab	GTs+CCPP	170	170	170	170	170	151
Habibullah Coastal	Quetta, Balochistan	GTs+CCPP	155	155	155	0	0	0
Hub Power	Hub, Balochistan	STs	1,292	1,292	1,292	1,292	1,292	1,200
Japan Power	Raiwind, Punjab	DE	120	120	0	0	0	0
KAPCO	Kot Addu, Punjab	GTs+CCPPs	1,600	1,600	1,600	1,600	1,600	0
Kohinoor Energy	Raiwind, Punjab	DEs+ST	131	131	131	131	131	124

Power Station	Plant Location	Type of Power Station	2020	2021	2022	2023	2024	Dependable Capacity as on 30-6-2024
Rousch Power	Sidhnai, Punjab	GTs+ST	450	450	450	450	450	395
Saba Power	Farooqabad, Punjab	ST	136	136	136	136	136	125
Southern Electric	Raiwind, Punjab	DEs	117	117	0	0	0	0
Liberty Daharki Power	Daharki, Sindh	GTs+CCPP	235	235	235	235	235	212
Uch Power	Murad Jamali, Balochistan	GTs+ST	586	586	586	586	586	547
Attock Gen.	Attock Morgah, Punjab	DGs+ST	165	165	165	165	165	156
Atlas Power	Sheikhupura, Punjab	REs+ST	224	224	224	224	224	214
Engro Power Gen. Qadirpur	Qadirpur, Sindh	GT+ST	227	227	227	227	227	212
Saif Power	Sahiwal, Punjab	GTs+ST	225	225	225	225	225	204
Orient Power	Balloki, Punjab	GTs+ST	225	225	225	225	225	203
Nishat Power	Qasur, Punjab	REs+ST	202	202	202	202	202	195
Nishat Chunian	Qasur, Punjab	DEs+ST	202	202	202	202	202	196
Sapphire Electric	Muridke, Punjab	GTs+ST	235	235	235	235	235	202
Halmore Power	Bhikki, Punjab	GTs+ST	225	225	225	225	225	200
Narowal Energy	Narowal, Punjab	DEs+ST	214	214	214	214	214	214
Liberty Power Tech.	Faisalabad, Punjab	DEs+ST	202	202	202	202	202	196
Foundation Power	Daharki, Sindh	GT+ST	179	179	179	179	179	168
Davis Energen.	Jhang, Punjab	GEs	12	12	12	0	0	0
Uch-II Power	Murad Jamali, Balochistan	GTs+ST	404	404	404	404	404	372
Huaneng Shandong Ruyi (Sahiwal Imported Coal)	Sahiwal, Punjab	STs	1,320	1,320	1,320	1,320	1,320	1,244
QATPL (Bhikki)	Bhikki, Punjab	GTs+HRSGs+ST	1,231	1,231	1,231	1,231	1,231	1,163
NPPMCL (HBS)	HBS, Punjab	GTs+HRSGs+ST	1,277	1,277	1,277	1,277	1,277	1,172
NPPMCL (Balloki)	Balloki, Punjab	GTs+HRSGs+ST	1,276	1,276	1,276	1,276	1,276	1,165
Port Qasim Electric Power	Port Qasim, Sindh	ST+CB	1,320	1,320	1,320	1,320	1,320	1,243
Reshma Power	Raiwind, Punjab	Reciprocating Engine	97	97	0	0	0	0
Gulf Powergen	Gujranwala, Punjab	Reciprocating Engine	84	84	0	0	0	0
China Power Hub	Lasbella, Balochistan	ST+CB	1,320	1,320	1,320	1,320	1,320	1,249
Engro Powergen Thar	Tharparkar, Sindh	ST+CB	660	660	660	660	660	603
Lucky Electric Power	Bin Qasim Town, Karachi	ST+CB	--	--	660	660	660	605
Punjab Thermal Power	Trimmu, Punjab	GTs+HRSGs+ST	--	--	1,263	1,263	1,263	1,243
Thar Energy			--	--	--	330	330	300
Thar Coal Block-1 Power			--	--	--	1,320	1,320	1,230
ThalNova Power			--	--	--	330	330	303
Total Thermal (IPPs: CPPA-G System)			17,276	17,276	18,750	20,563	20,563	17,706
Total Thermal in CPPA-G System (B1+B2)			22,157	22,157	23,481	25,150	25,150	20,342
C: Nuclear								
CHASNUPP-I	Chashma, Punjab	STs	325	325	325	325	325	301
CHASNUPP-II	Chashma, Punjab	STs	325	325	325	325	325	315
CHASNUPP-III	Chashma, Punjab	STs	340	340	340	340	340	315
CHASNUPP-IV	Chashma, Punjab	STs	340	340	340	340	340	315
KANUPP	Karachi, Sindh	STs	137	137	0	0	0	0
KANUPP-II	Karachi, Sindh	STs	--	1,145	1,145	1,145	1,145	1,040
KANUPP-III	Karachi, Sindh	STs	--	--	1,145	1,145	1,145	1,040
Total Nuclear (C)			1,467	2,612	3,620	3,620	3,620	3,326
D: Renewable Energy (CPPA-G System)								
D1: Wind Power Projects								
Zorlu Enerji Pakistan	Thatta, Sindh	WTs	56	56	56	56	56	56
FFC Energy	Thatta, Sindh	WTs	50	50	50	50	50	50
Three Gorges First Wind Farm	Thatta, Sindh	WTs	60	60	50	50	50	50
Foundation Wind Energy-I	Thatta, Sindh	WTs	50	50	50	50	50	50
Foundation Wind Energy-II	Thatta, Sindh	WTs	50	50	50	50	50	50
Sapphire Wind	Thatta, Sindh	WTs	53	53	53	53	53	50
Yunus Energy	Thatta, Sindh	WTs	50	50	50	50	50	50
Metro Power Company	Thatta, Sindh	WTs	50	50	50	50	50	50
Gul Ahmad Wind	Thatta, Sindh	WTs	50	50	50	50	50	50
Master Wind Energy	Thatta, Sindh	WTs	50	50	50	50	50	50
Tenaga Generasi	Thatta, Sindh	WTs	50	50	50	50	50	50
HydroChina Dawood Power	Thatta, Sindh	WTs	50	50	50	50	50	50
Sachal Energy Development	Thatta, Sindh	WTs	50	50	50	50	50	50
UEP Wind Power	Thatta, Sindh	WTs	99	99	99	99	99	99
Artistic Wind Power	Thatta, Sindh	WTs	50	50	50	50	50	50
Act Wind	Thatta, Sindh	WTs	30	30	30	30	30	30
Hawa Energy	Thatta, Sindh	WTs	50	50	50	50	50	50

Power Station	Plant Location	Type of Power Station	2020	2021	2022	2023	2024	Dependable Capacity as on 30-6-2024
Jhimpir Power	Thatta, Sindh	WTs	50	50	50	50	50	50
Three Gorges Second Wind Farm	Thatta, Sindh	WTs	50	50	50	50	50	50
Three Gorges Third Wind Farm	Thatta, Sindh	WTs	50	50	50	50	50	50
Tricon Boston Consulting-A	Thatta, Sindh	WTs	50	50	50	50	50	50
Tricon Boston Consulting-B	Thatta, Sindh	WTs	50	50	50	50	50	50
Tricon Boston Consulting-C	Thatta, Sindh	WTs	50	50	50	50	50	50
Zephyr Power	Thatta, Sindh	WTs	50	50	50	50	50	50
Lucky Renewables	Thatta, Sindh	WTs	--	--	50	50	50	50
Master Green Energy	Thatta, Sindh	WTs	--	--	50	50	50	50
Act 2 Din Wind	Thatta, Sindh	WTs	--	--	50	50	50	50
Artistic 2 Wind Power	Thatta, Sindh	WTs	--	--	50	50	50	50
Indus Wind Energy	Thatta, Sindh	WTs	--	--	50	50	50	50
Lakeside Energy	Thatta, Sindh	WTs	--	--	50	50	50	50
Liberty Wind Power-I	Thatta, Sindh	WTs	--	--	50	50	50	50
Din Energy	Thatta, Sindh	WTs	--	--	50	50	50	50
Gul Ahmed Electric	Thatta, Sindh	WTs	--	--	50	50	50	50
Liberty Wind Power-II	Thatta, Sindh	WTs	--	--	50	50	50	50
NASDA Green Energy	Thatta, Sindh	WTs	--	--	50	50	50	50
Metro 2 Wind Power	Thatta, Sindh	WTs	--	--	50	50	50	60
Total Wind Power Projects			1,248	1,248	1,838	1,838	1,838	1,845
D2: Solar Power Projects								
Quaid-e-Azam Solar Park	Bahawalpur, Punjab	Solar	100	100	100	100	100	96
Appolo Solar Development	Bahawalpur, Punjab	Solar	100	100	100	100	100	96
Best Green Energy	Bahawalpur, Punjab	Solar	100	100	100	100	100	96
Crest Energy	Bahawalpur, Punjab	Solar	100	100	100	100	100	96
AJ Power	Khushab, Punjab	Solar	12	12	12	12	12	12
Harappa Solar	Sahiwal, Punjab	Solar	18	18	18	18	18	18
Atlas Solar	Layyah, Punjab	Solar	--	--	100	100	100	100
Helios Power	Sukkur, Sindh	Solar	--	--	--	--	50	50
Meridian Energy	Sukkur, Sindh	Solar	--	--	--	--	50	50
HNDS Energy	Sukkur, Sindh	Solar	--	--	--	--	50	50
Total Solar Power Projects			430	430	530	530	680	664
D3: Bagasse/Biomass Power Projects								
Jamal Din Wali-II	Rahim Yar Khan, Punjab	Bagasse+Biomass	26	26	26	26	26	24
Jamal Din Wali-III	Rahim Yar Khan, Punjab	Bagasse+Biomass	27	27	27	27	27	24
RYK Mills	Rahim Yar Khan, Punjab	Bagasse	40	40	40	40	40	24
Chiniot Power	Chiniot, Punjab	Bagasse	63	63	63	63	63	63
Fatima Energy	Muzaffargarh, Punjab	Biomass/Coal	120	120	120	0	0	45
Hamza Sugar Mills	Rahim Yar Khan, Punjab	Bagasse+Biomass	15	15	15	15	15	15
The Thal Industries Corporation	Layyah, Punjab	Bagasse	20	20	20	20	20	25
Almoiz Industries	Mianwali, Punjab	Bagasse	36	36	36	36	36	36
Chanar Energy	Faisalabad, Punjab	Bagasse+Biomass	22	22	22	22	22	22
Total Bagasse/Biomass Power Projects			369	369	369	249	249	278
Total Renewable Energy (D1+D2+D3) (CPPA-G system) (D)			2,047	2,047	2,737	2,617	2,767	2,787
E1: Thermal (KE Own)								
Bin Qasim TPS-I	Karachi, Sindh	STs	1,260	1,050	840	840	840	730
Bin Qasim TPS-II	Karachi, Sindh	GTs	572	572	572	572	572	526
Bin Qasim TPS-III	Karachi, Sindh	GTs	--	--	471	942	942	918
Korangi Town GTPS-II	Karachi, Sindh	GTs	107	107	107	107	107	96
Site GTPS-II	Karachi, Sindh	GTs	107	107	107	107	107	96
Korangi CCPP	Karachi, Sindh	GTs	248	248	248	248	248	227
Total Thermal (KE Own)			2,294	2,084	2,345	2,816	2,816	2,593
E2: Thermal (IPPs connected with KE System)								
Gul Ahmed	Karachi, Sindh	DE+ST	136	136	136	136	136	128
Tapal Energy	Karachi, Sindh	DE+ST	126	126	126	126	126	124
SNPCL-I (IPP-2002)	Jamshoro, Sindh	GEs+STs	52	52	52	52	52	51
SNPCL-II (IPP-2002)	Jamshoro, Sindh	GEs+STs	52	52	52	52	52	51
Total Thermal (IPPs connected with KE System)			366	366	366	366	366	354
E3: Thermal (Others connected with KE System)								
Anoud Power (IGC)	Karachi, Sindh	DGs	12	12	12	0	0	11
Intl. Steel Limited (CPP)	Karachi, Sindh	GEs+DGs	19	19	19	19	19	17
Intl. Ind. Limited (CPP)	Karachi, Sindh	GEs+ST	4	4	4	4	4	4
FFBL Power (Distributed Gen.)	Karachi, Sindh	CFB+STs	52	52	52	52	52	103
Lotte Chemicals	Karachi, Sindh	RLNG	--	48	48	14	14	41

Power Station	Plant Location	Type of Power Station	2020	2021	2022	2023	2024	Dependable Capacity as on 30-6-2024
Lucky Cement	Lakki Marwat, KPK	Waste Heat Recovery	--	16	16	5	5	15
Total Thermal (Others connected with KE System)			87	151	151	94	94	191
Total Thermal KE (E1+E2+E3)			2,747	2,601	2,862	3,276	3,276	3,138
E4: Renewable Energy (KE System)								
Oursun Pakistan	Thatta, Sindh	Solar	50	50	50	50	50	39
Gharo Solar	Thatta, Sindh	Solar	50	50	50	50	50	40
Net-Metering Import		Solar	--	--	60	202	333	0
Total RE (KE System)			100	100	160	302	433	79
Total KE (KE own and others connected with KE System)			2,847	2,701	3,022	3,578	3,709	3,217
F: SPPs/CPPs/N-CPPs: CPPA-G System [Contract Capacity (MW)]								
Total SPPs/CPPs/N-CPPs: CPPA-G System (F)			340	340	340	340	340	257
Grand Total (A+B+C+D+E+F)			38,719	39,772	43,835	45,940	46,221	40,543

Source: WAPDA/GENCOs/IPP/KE/CPPA-G

TABLE 6
Installed Capacity by Systems and by Sectors (MW)

As on 30 th June	2020	2021	2022	2023	2024
BY SYSTEM					
Total Installed Capacity: CPPA-G System	35,735	36,934	40,813	42,362	42,512
% Share (Installed Capacity: CPPA-G System)	92.29	92.86	93.11	92.21	91.98
Total Installed Capacity: KE System	2,984	2,838	3,022	3,578	3,709
% Share (Installed Capacity: KE System)	7.71	7.14	6.89	7.79	8.02
BY SECTOR					
Total Installed Capacity in Public Sector	19,588	20,733	22,991	22,847	22,847
% Share (Installed Capacity in Public Sector)	50.59	52.13	52.45	49.73	49.43
Total Installed Capacity in Private Sector	19,131	19,039	20,844	23,093	23,374
% Share (Installed Capacity in Private Sector)	49.41	47.87	47.55	50.27	50.57
Total Installed Capacity in the Country	38,719	39,772	43,835	45,940	46,221

Note: See tables 4 and 5 for breakup details.

Source: WAPDA/GENCOs/IPP/KE/CPPA-G

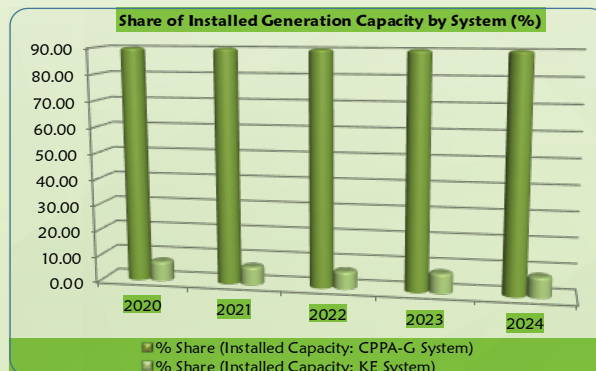
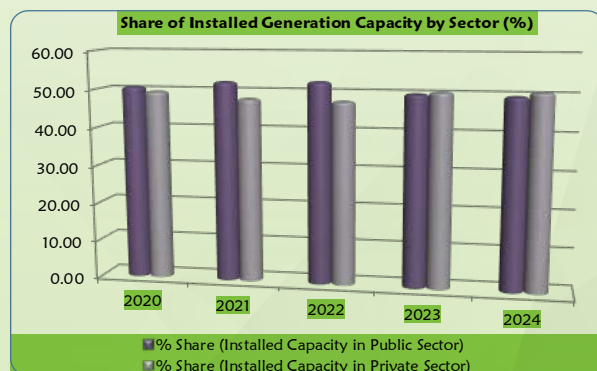


TABLE 7
Electricity Generation by Type (GWh) (Net)

As on 30 th June	2019-20	2020-21	2021-22	2022-23	2023-24
HYDEL					
WAPDA Hydel	37,136.04	36,856.88	32,522.88	31,399.16	35,032.87
IPPs Hydel	1,562.55	1,943.66	3,023.40	4,863.15	4,869.47
Sub-Total	38,698.59	38,800.54	35,546.28	36,262.31	39,902.34
% Share (Hydel Electricity Generation)	28.83	27.02	23.07	26.17	29.08
THERMAL					
GENCOs: CPPA-G System	7,907.85	6,802.93	6,349.56	5,957.03	3,489.59
KE Own	9,628.90	10,185.60	7,889.96	7,093.09	7,471.32
IPPs: CPPA-G System	60,720.31	68,708.63	76,280.90	56,208.19	54,463.99
IPPs Connected with KE	1,863.60	2,184.57	2,130.46	1,606.80	1,156.19
SPPs/CPPs/N-CPPs: CPPA-G System	170.99	216.80	136.31	150.02	314.19
SPPs/CPPs/N-CPPs connected with KE	534.30	578.90	482.94	406.90	348.33
Sub-Total	80,825.95	88,677.43	93,270.13	71,422.04	67,243.62
% Share (Thermal Electricity Generation)	60.21	61.76	60.54	51.55	49.01
NUCLEAR					
CHASNUPP (I, II, III and IV)	9,704.89	9,172.09	9,450.30	9,709.21	9,309.52
KANUPP (I, II and III)	193.13	1,917.96	8,843.25	14,345.35	13,845.29
Sub-Total	9,898.02	11,090.05	18,293.55	24,054.56	23,154.81
% Share (Nuclear Electricity Generation)	7.37	7.72	11.87	17.36	16.88
IMPORT					
Import from Iran	513.74	498.37	514.36	478.62	377.58
Sub-Total	513.74	498.37	514.36	478.62	377.58
% Share (Imported Electricity Generation)	0.38	0.35	0.33	0.35	0.28
RENEWABLE ENERGY (WIND, SOLAR AND BAGASSE)					
Wind Power Plants	2,882.48	2,899.94	4,584.17	4,086.05	3,941.07
Solar Power Plants	704.97	711.63	785.41	1,091.87	1,467.36
Bagasse based Power Plants	564.46	710.56	826.06	845.36	726.85
RE Power Plants: CPPA-G System	4,151.91	4,322.13	6,195.64	6,023.28	6,135.28
Solar Power Plants: KE System	153.28	199.56	236.22	298.19	382.45
RE Power Plants connected with KE	153.28	199.56	236.22	298.19	382.45
Sub-Total	4,305.19	4,521.69	6,431.86	6,321.47	6,517.73
% Share (RE Electricity Generation)	3.21	3.15	4.18	4.56	4.75
Total Electricity Generation of the Country	134,241.49	143,588.08	154,056.18	138,539.00	137,196.07

Source: WAPDA/GENCOs/IPPs/KE/CPPA-G

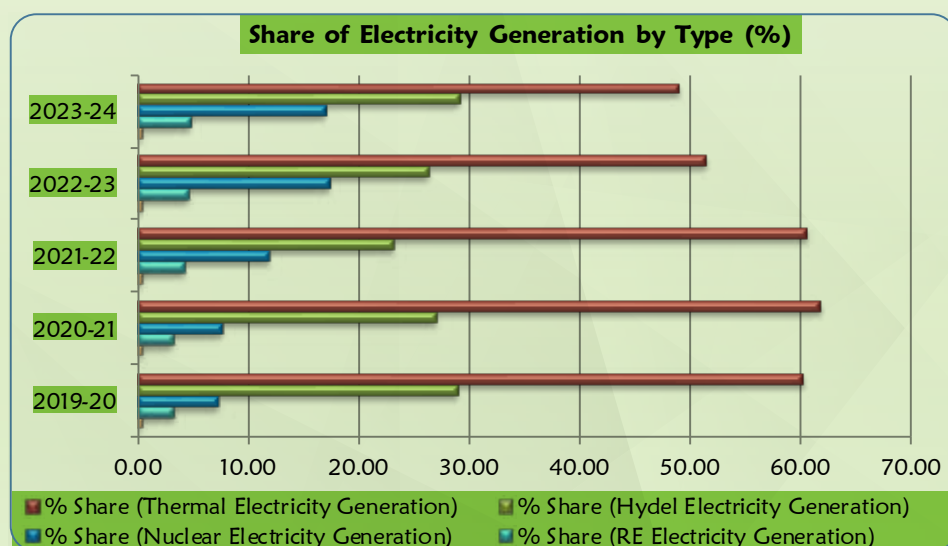


TABLE 8
Plant-wise Electricity Generation (GWh) (Net)

Power Station	Primary Fuel	Alternate Fuel	2019-20	2020-21	2021-22	2022-23	2023-24
A1: Hydel (WAPDA)							
Major Hydropower Units							
Tarbela	Hydel	Hydel	11,857.69	12,565.74	10,955.73	12,445.84	13,292.86
Tarbela 4 th Ext.	Hydel	Hydel	5,485.66	3,418.78	3,276.12	4,426.93	4,642.31
Ghazi Barotha	Hydel	Hydel	6,482.21	6,810.91	6,761.55	6,813.18	6,465.78
Mangla	Hydel	Hydel	4,589.33	5,313.83	4,200.26	3,838.38	5,173.26
Warsak	Hydel	Hydel	1,095.46	1,064.99	933.85	898.59	775.37
Chashma	Hydel	Hydel	747.16	772.32	795.68	876.34	973.58
Khan Khwar	Hydel	Hydel	273.88	231.19	162.44	263.29	245.76
Allai Khwar	Hydel	Hydel	469.47	438.78	373.03	485.37	457.40
Jinnah Hydel	Hydel	Hydel	176.58	235.02	256.06	206.70	205.12
Duber Khwar	Hydel	Hydel	609.40	640.78	616.96	494.96	453.75
Neelum Jhelum	Hydel	Hydel	4,842.30	4,784.16	3,620.23	107.72	1,774.04
Golen Gol	Hydel	Hydel	86.13	82.40	138.14	131.94	174.76
Small Hydropower Units							
Dargai	Hydel	Hydel	98.42	108.72	87.40	71.27	63.11
Rasul	Hydel	Hydel	34.04	76.63	58.90	54.12	72.24
Shadiwal	Hydel	Hydel	13.68	31.90	28.06	32.45	36.34
Chichoki Mallian	Hydel	Hydel	29.54	27.38	22.46	30.88	30.38
Nandipur	Hydel	Hydel	33.82	32.48	29.21	36.13	36.11
Kurram Garhi	Hydel	Hydel	15.11	19.71	10.95	14.45	15.83
Renala	Hydel	Hydel	1.03	1.96	1.81	1.74	1.61
Chitral	Hydel	Hydel	3.04	2.65	2.15	2.69	1.88
Gomal Zam	Hydel	Hydel	54.42	62.09	57.15	41.20	25.34
Malakand/Jabban	Hydel	Hydel	137.67	134.46	134.74	124.99	116.03
Total Hydel (WAPDA)			37,136.04	36,856.88	32,522.88	31,399.16	35,032.87
A2: Hydel (IPPs)							
Jagran (AJ&K)	Hydel	Hydel	86.25	113.23	121.27	103.61	113.18
Malakand-III (PEDO)	Hydel	Hydel	408.53	321.57	353.87	267.77	221.59
Pehur (PEDO)	Hydel	Hydel	50.59	0.00	0.00	0.00	0.00
Laraib Energy (AJ&K)	Hydel	Hydel	384.43	465.29	412.66	345.00	415.97
Marala Hydro (PPDCL)	Hydel	Hydel	32.16	36.59	26.61	22.79	0.00
Patrind Hydro (AJ&K)	Hydel	Hydel	566.25	624.45	1,160.15	548.60	564.85
Gulpur Hydropower	Hydel	Hydel	34.33	256.88	230.99	304.69	268.07
Daral Khwar	Hydel	Hydel	--	91.84	117.37	127.29	124.37
Ranolia	Hydel	Hydel	--	33.81	54.06	12.73	0.00
Karot Power Company	Hydel	Hydel	--	--	546.42	3,130.67	3,161.45
Total Hydel (IPPs)			1,562.55	1,943.66	3,023.40	4,863.15	4,869.47
Total Hydel (A1+A2)			38,698.59	38,800.54	35,546.28	36,262.31	39,902.34
B1: Thermal (GENCOs: CPPA-G System)							
TPS Jamshoro	RFO+Gas	RFO	209.90	199.55	245.53	25.40	0.00
TPS Guddu (Units 5-10)	Gas	-	1,294.84	1,477.11	1,385.84	1,948.96	341.73
TPS Guddu (Units 11-13)	Gas	-	311.56	223.96	148.16	19.42	0.00
TPS Guddu (Units 14-16)	Gas	HSD	4,315.35	3,123.82	2,609.95	2,635.92	2,209.13
TPS Muzaffargarh	Gas	RFO	299.86	282.26	220.43	50.91	15.23
GTPS Faisalabad	Gas	HSD	0.00	14.26	98.83	0.00	0.00
TPS Nandipur	Gas	HSD	1,476.33	1,481.98	1,640.82	1,276.42	923.50
Total Thermal (GENCOs: CPPA-G System)			7,907.85	6,802.93	6,349.56	5,957.03	3,489.59
B2: Thermal (IPPs: CPPA-G System)							
Lal Pir Power	RFO	-	186.32	620.78	1,022.68	397.59	358.99
Pak Gen. Power	RFO	-	149.76	445.54	1,304.35	443.74	211.00
Altern Energy	Gas	-	3.73	12.40	0.00	0.00	0.00
Fauji Kabirwala	Gas	HSD	346.32	389.96	357.21	66.33	92.01
Habibullah Coastal	Gas	HSD	108.37	0.00	0.00	0.00	0.00
Hub Power	RFO	-	32.38	112.91	1,219.58	204.78	0.00
KAPCO	Gas	RFO+HSD	3,476.67	3,562.24	5,142.00	587.84	0.00
Kohinoor Energy	RFO	-	363.86	337.07	515.84	329.16	207.62
Rousch Power	Gas	HSD	217.53	284.36	495.78	179.04	9.71
Saba Power	RFO	-	50.83	121.65	329.95	148.54	54.18
Liberty Daharki Power	Gas	HSD	896.74	983.33	1,054.06	1,001.19	903.87
Uch Power	Gas	HSD	4,087.33	4,088.44	4,300.52	3,901.33	3,965.85
Attock Gen.	RFO	-	320.96	384.03	721.93	483.59	206.64
Atlas Power	RFO	-	259.33	517.08	1,007.25	521.94	252.87
Engro Powergen. Qadirpur	Gas	HSD	700.74	648.50	791.03	935.42	813.48
Saif Power	Gas	HSD	476.28	639.40	734.99	538.22	220.59
Orient Power	Gas	HSD	338.00	597.92	836.38	604.79	541.20
Nishat Power	RFO	-	277.46	523.40	794.25	537.90	453.69
Nishat Chunian	RFO	-	351.23	537.57	882.46	386.13	240.45
Sapphire Electric	Gas	HSD	296.76	568.04	780.50	452.52	479.36
Halmore Power	Gas	HSD	347.69	509.79	675.93	287.05	207.55
Narowal Energy	RFO	-	338.08	496.06	867.49	469.88	200.96
Liberty Power Tech.	RFO	-	458.54	606.66	925.44	556.15	239.94

Power Station	Primary Fuel	Alternate Fuel	2019-20	2020-21	2021-22	2022-23	2023-24
Foundation Power	Gas	-	777.30	1,000.37	1,272.89	1,190.38	1,087.56
Uch-II Power	Low BTU Gas	-	2,148.02	2,339.37	2,828.67	2,776.43	2,025.72
Huaneng Shandong Ruyi (Sahiwal Imported Coal)	Bituminous Coal		6,167.19	7,342.70	6,881.38	2,876.85	2,075.55
QATPL (Bhikki)	RLNG	HSD	5,192.50	7,118.80	6,090.92	4,697.55	3,660.15
NPPMCL (Haveli Bahadur Shah)	RLNG	HSD	7,050.34	7,682.35	7,488.57	6,520.55	7,930.78
NPPMCL (Balloki)	RLNG	HSD	5,911.84	6,032.81	7,186.71	6,863.66	6,684.63
Port Qasim Electric Power	Bituminous Coal	HSD	8,969.74	8,372.38	7,478.64	3,203.00	782.26
Reshma Power	RFO/HSFO	-	2.07	0.00	0.00	0.00	0.00
China Power Hub	Imported Coal		6,136.20	7,923.41	6,764.89	1,546.82	476.55
Engro Powergen Thar	Thar Coal		4,280.22	3,909.30	3,676.95	3,646.06	3,766.21
Lucky Electric Power	Coal		--	--	1,774.10	3,316.14	1,688.68
Punjab Thermal Power	RLNG		--	--	77.56	152.62	3,197.29
Thar Energy	Thar Coal		--	--	--	1,205.57	1,948.50
Thar Coal Block-1 Power	Thar Coal		--	--	--	4,255.92	7,500.33
ThalNova Power	Thar Coal		--	--	--	923.53	1,979.84
Total Thermal (IPPs/SPPs/CPPs: CPPA-G System)			60,720.31	68,708.63	76,280.90	56,208.19	54,463.99
Total Thermal: CPPA-G System (B1+B2)			68,628.16	75,511.56	82,630.46	62,165.22	57,953.59
C: Nuclear							
CHASNUPP-I	NUC	NUC	2,044.64	2,244.33	2,512.58	2,298.98	1,959.76
CHASNUPP-II	NUC	NUC	2,636.12	2,067.98	2,437.86	2,437.89	2,520.36
CHASNUPP-III	NUC	NUC	2,322.85	2,403.62	2,320.38	2,500.37	2,331.33
CHASNUPP-IV	NUC	NUC	2,701.28	2,456.15	2,179.48	2,471.98	2,498.06
KANUPP	NUC	NUC	193.13	219.04	45.77	0.00	0.00
KANUPP-II	NUC	NUC	--	1,698.92	6,830.42	7,562.27	5,900.77
KANUPP-III	NUC	NUC	--	--	1,967.06	6,783.07	7,944.52
Total Nuclear (C)			9,898.02	11,090.05	18,293.55	24,054.56	23,154.81
D: Import							
Import from Iran (Tavanir)			513.74	498.37	514.36	478.62	377.58
Total Import: CPPA-G System (D)			513.74	498.37	514.36	478.62	377.58
E: Renewable Energy (CPPA-G System)							
E1: Wind Power Projects							
Zorlu Enerji Pakistan	Wind	Wind	143.55	109.66	128.63	95.69	115.96
FFC Energy	Wind	Wind	118.40	90.90	114.54	76.55	97.19
Three Gorges First Wind Farm	Wind	Wind	135.62	99.14	123.79	88.43	108.36
Foundation Wind Energy-I	Wind	Wind	239.29	123.24	127.14	88.92	110.98
Foundation Wind Energy-II	Wind	Wind		73.18	141.83	97.68	122.97
Sapphire Wind	Wind	Wind	89.70	104.01	129.94	81.42	79.43
Yunus Energy	Wind	Wind	89.86	108.84	135.73	89.81	83.29
Metro Power Company	Wind	Wind	153.06	120.11	147.63	106.75	125.17
Gul Ahmad Wind	Wind	Wind	91.15	110.38	137.87	87.18	83.27
Master Wind Energy	Wind	Wind	96.90	110.13	137.64	89.93	85.08
Tenaga Generasi	Wind	Wind	125.77	104.07	133.08	76.23	93.17
HydroChina Dawood Power	Wind	Wind	121.06	101.60	132.45	71.44	89.41
Sachal Energy Development	Wind	Wind	142.36	107.79	130.88	95.70	115.08
UEP Wind Power	Wind	Wind	179.13	203.64	254.06	172.73	169.57
Artistic Wind Power	Wind	Wind	132.16	166.05	192.09	127.06	168.09
Act Wind	Wind	Wind	64.76	74.68	88.39	53.80	72.55
Hawa Energy	Wind	Wind	115.45	140.96	169.85	117.07	100.50
Jhampir Power	Wind	Wind	119.18	143.91	166.01	115.78	102.25
Three Gorges Second Wind Farm	Wind	Wind	92.77	108.43	138.80	93.90	86.43
Three Gorges Third Wind Farm	Wind	Wind	95.18	112.54	142.76	97.67	88.43
Tricon Boston Consulting-A	Wind	Wind	124.95	149.90	181.46	125.44	111.16
Tricon Boston Consulting-B	Wind	Wind	117.64	144.15	177.71	121.04	108.15
Tricon Boston Consulting-C	Wind	Wind	117.47	143.56	178.69	121.42	107.63
Zephyr Power	Wind	Wind	177.05	149.07	189.43	110.75	121.77
Lucky Renewables	Wind	Wind	--	--	127.50	140.29	110.69
Master Green Energy	Wind	Wind	--	--	145.41	132.31	103.97
Act 2 Din Wind	Wind	Wind	--	--	86.89	138.67	115.20
Artistic 2 Wind Power	Wind	Wind	--	--	83.61	132.45	110.97
Indus Wind Energy	Wind	Wind	--	--	86.32	137.66	117.74
Lakeside Energy	Wind	Wind	--	--	73.55	139.46	114.95
Liberty Wind Power-I	Wind	Wind	--	--	69.85	123.89	109.25
Din Energy	Wind	Wind	--	--	72.89	131.07	108.96
Gul Ahmed Electric	Wind	Wind	--	--	84.43	143.93	118.72
Liberty Wind Power-II	Wind	Wind	--	--	42.92	125.06	110.90
NASDA Green Energy	Wind	Wind	--	--	62.56	143.10	115.86
Metro 2 Wind Power	Wind	Wind	--	--	47.84	195.76	157.97
Total Wind Power Projects			2,882.48	2,899.94	4,584.17	4,086.05	3,941.07

Power Station	Primary Fuel	Alternate Fuel	2019-20	2020-21	2021-22	2022-23	2023-24
E2: Solar Power Projects							
Quaid-e-Azam Solar Park	Solar	Solar	164.99	165.56	164.69	160.47	155.11
Appolo Solar Development	Solar	Solar	163.02	164.90	168.68	165.83	162.00
Best Green Energy	Solar	Solar	162.92	164.25	167.34	166.17	158.95
Crest Energy	Solar	Solar	165.31	166.97	169.18	169.83	163.24
AJ Power	Solar	Solar	18.03	18.50	65.37	18.35	17.59
Harappa Solar	Solar	Solar	30.69	31.45	18.78	31.07	30.28
Atlas Solar	Solar	Solar	--	--	31.37	197.12	191.87
Helios Power	Solar	Solar	--	--	--	--	49.48
Meridian Energy	Solar	Solar	--	--	--	--	50.76
HND5 Energy	Solar	Solar	--	--	--	--	49.62
Net-Metering	Solar	Solar	--	--	--	183.04	438.46
Total Solar Power Projects			704.97	711.63	785.41	1,091.87	1,467.36
E3: Bagasse/Biomass Power Projects							
Jamal Din Wali-II	Bagasse + Biomass		161.88	177.17	169.48	190.76	168.30
Jamal Din Wali-III	Bagasse + Biomass		129.21	144.44	136.74	186.04	180.44
RYK Mills	Bagasse	Bagasse	73.67	73.94	97.27	100.99	76.27
Chiniot Power	Bagasse	Bagasse	80.45	160.56	222.54	186.81	140.91
Hamza Sugar Mills	Bagasse + Biomass		45.03	39.99	61.06	53.48	59.19
The Thal Industries Corporation	Bagasse	FO	36.79	46.37	73.67	61.22	56.27
Almoiz Industries	Bagasse	Bagasse	15.10	29.83	17.38	25.02	29.10
Chanar Energy	Bagasse	Bagasse	22.34	38.26	47.92	41.05	16.37
Total Bagasse/Biomass Power Projects			564.46	710.56	826.06	845.36	726.85
Total Renewable Energy (E1+E2+E3) (CPPA-G System) (E)			4,151.91	4,322.13	6,195.64	6,023.28	6,135.28
F1: Thermal (KE Own)							
Bin Qasim TPS-I	Dual	RLNG	3,824.66	4,730.00	3,289.10	1,851.70	622.22
Bin Qasim TPS-II	Dual	RLNG	4,030.54	3,926.00	3,587.52	2,634.48	2,557.08
Bin Qasim TPS-III	RLNG	RLNG	--	--	243.50	2,522.58	4,178.13
Korangi Town GTPS-II	Gas	RLNG	299.73	365.23	114.52	10.18	1.59
Site GTPS-II	Gas	RLNG	397.23	215.67	102.86	24.41	0.17
Korangi CCPP	Gas	RLNG	1,076.74	948.70	552.46	49.74	112.13
Total Thermal (KE Own)			9,628.90	10,185.60	7,889.96	7,093.09	7,471.32
F2: Thermal (IPPs connected with KE System)							
Gul Ahmed	RFO	-	496.14	673.00	705.43	508.68	268.59
Tapal Energy	RFO	-	627.77	737.00	715.86	518.43	288.33
SNPCL-I (IPP-2002)	Gas	-	371.86	394.35	363.36	292.66	301.73
SNPCL-II (IPP-2002)	Gas	-	367.83	380.22	345.81	287.03	297.54
Total Thermal (IPPs connected with KE System)			1,863.60	2,184.57	2,130.46	1,606.80	1,156.19
F3: Thermal (Others connected with KE System)							
Anoud Power (IGC)	RFO/Gas	DO	59.52	12.00	0.00	0.00	0.00
Intl. Steel Limited (CPP)	Gas	-	51.21	43.00	28.54	26.89	15.77
Intl. Ind. Limited (CPP)	Gas	-	10.66	10.00	9.29	10.41	1.58
FFBL Power (Distributed Gen.)	Imported/Local Coal		412.91	452.88	406.69	346.26	324.54
Lotte Chemicals	Gas	Gas	--	61.00	35.44	21.08	3.08
Lucky Cement	Gas	Gas	--	0.02	2.98	2.26	3.36
Total Thermal (Others connected with KE System)			534.30	578.90	482.94	406.90	348.33
Total Thermal KE (F1+F2+F3)			12,026.80	12,949.07	10,503.36	9,106.79	8,975.84
F4: Renewable Energy (connected with KE System)							
Oursun Pakistan	Solar	Solar	88.28	90.87	89.58	89.32	88.08
Gharo Solar	Solar	Solar	65.00	108.69	102.64	101.69	99.30
Net-Metering	Solar	Solar	--	--	44.00	107.18	195.07
Total RE (connected with KE System)			153.28	199.56	236.22	298.19	382.45
Total KE (KE own and others connected with KE System)			12,180.08	13,148.63	10,739.58	9,404.98	9,358.29
G: SPPs/CPPs/N-CPPs: CPPA-G System							
Total SPPs/CPPs/N-CPPs: CPPA-G System (G)			170.99	216.80	136.31	150.02	314.19
Grand Total (A+B+C+D+E+F+G)			134,241.49	143,588.08	154,056.18	138,539.00	137,196.07

Source: WAPDA/GENCOs/IPPs/KE/CPPA-G

TABLE 9
Electricity Generation by Systems and by Sectors (GWh) (Net)

As on 30 th June	2019-20	2020-21	2021-22	2022-23	2023-24
BY SYSTEM					
Total Electricity Generation: CPPA-G System*	121,868.28	130,220.41	143,270.83	129,134.02	127,837.78
% Share (Generation: CPPA-G System)	90.78	90.69	93.00	93.21	93.18
Total Electricity Generation: KE System	12,373.21	13,367.67	10,785.35	9,404.98	9,358.29
% Share (Generation: KE System)	9.22	9.31	7.00	6.79	6.82
BY SECTOR					
Total Electricity Generation in Public Sector	74,321.88	76,803.28	79,352.20	80,863.89	84,282.08
% Share (Generation in Public Sector)	55.36	53.49	51.51	58.37	61.43
Total Electricity Generation in Private Sector	59,919.61	66,784.80	74,703.98	57,675.10	52,913.99
% Share (Generation in Private Sector)	44.64	46.51	48.49	41.63	38.57
Total Electricity Generation of the Country	134,241.49	143,588.08	154,056.18	138,539.00	137,196.07

Note: See tables 7 and 8 for details and explanations. * Include Import from Iran.

Source: WAPDA/GENCOs/KE/IPP/CPGA-G

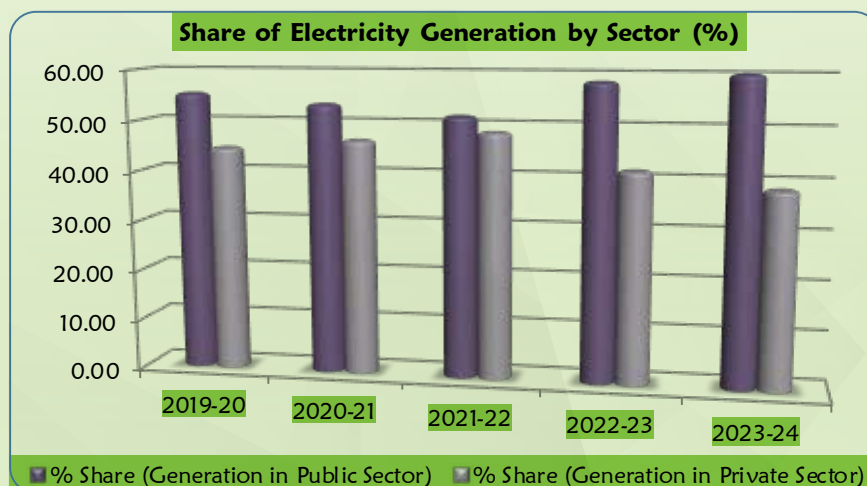
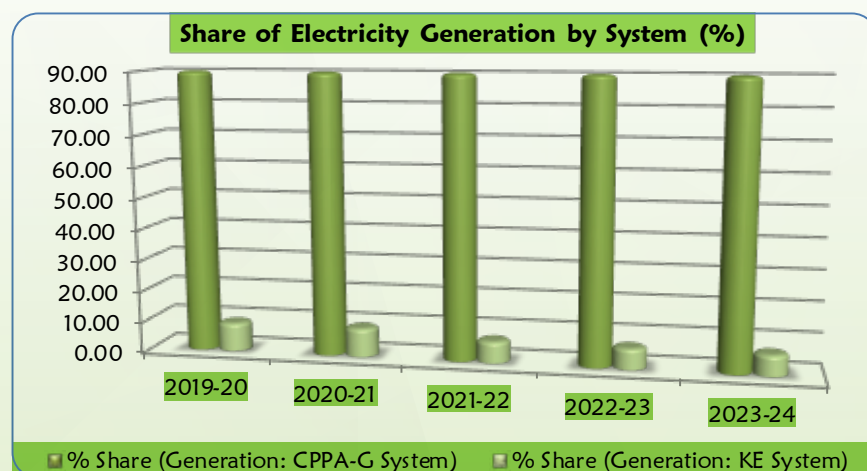


TABLE 10
Month-wise CPPA-G Electricity Generation Data (Net) (GWh) (2023-24)

Power Producers	July	August	September	October	November	December	January	February	March	April	May	June	Total
WAPDA	3,789.91	4,045.81	3,599.09	2,421.21	2,212.83	1,498.91	825.02	1,600.27	1,561.57	1,051.08	2,643.95	3,366.87	28,616.52
Tarbela 4 th Ext.	1,016.16	1,029.59	813.91	307.53	245.84	152.66	-	-	3.37	-	463.95	609.30	4,642.31
Jagran	18.18	17.59	13.17	5.80	2.49	2.22	1.18	0.79	3.84	11.17	18.18	18.56	113.18
Malakand-III	4.45	20.76	27.43	17.73	9.17	5.79	7.67	4.99	18.97	16.61	40.57	47.45	221.59
Larab Energy	5.80	17.02	39.48	48.96	50.54	29.34	4.82	47.13	42.99	26.30	51.74	51.86	415.97
Patind Hydro	77.69	78.75	39.91	24.57	18.06	15.09	12.08	11.95	22.61	58.62	100.90	104.62	564.85
Neelum Jhelum	-	394.87	299.99	156.28	113.43	81.20	19.83	-	276.15	401.44	0.86	-	1,744.04
Gulpur Hydropower	59.56	38.78	14.66	9.03	5.81	0.01	-	6.74	31.11	41.88	39.83	20.65	268.07
Daral Khwar	13.91	9.45	6.21	5.06	3.38	2.29	1.66	2.23	9.32	20.65	25.41	24.79	124.37
Karot Power	532.10	352.88	154.66	117.97	93.32	71.49	52.08	92.18	246.88	442.60	520.89	484.40	3,161.45
Total Hydel	5,517.77	6,005.50	5,008.52	3,114.14	2,754.86	1,859.01	924.34	1,766.26	2,216.81	2,070.35	3,906.27	4,728.50	39,872.34
GENCO-II	231.69	317.16	204.51	146.80	132.16	105.24	194.42	233.14	161.80	256.66	262.25	305.52	2,551.35
GENCO-III	224.80	257.83	150.69	28.23	-	-	0.89	-	-	1.75	112.10	155.73	932.01
Lal Pir Power	62.91	92.43	-	-	-	5.21	154.44	-	-	-	-	44.00	358.99
Pak Gen. Power	32.92	71.43	3.15	-	-	45.32	58.18	-	-	-	-	-	211.00
Fauji Kabinwala	34.02	-	12.44	-	-	-	-	-	-	-	4.08	41.47	92.01
Hub Power	(1.31)	(1.31)	(1.30)	-	-	-	(0.93)	-	-	-	-	-	(4.85)
Kohinoor Energy	27.42	20.28	43.66	-	-	13.28	58.00	-	-	-	16.78	28.19	207.62
Roush Power	-	-	-	-	-	-	-	-	-	-	9.71	-	9.71
Saba Power	3.68	22.38	10.07	-	0.28	-	17.78	-	-	-	-	-	54.18
Liberty Deharki	99.55	117.58	80.46	62.20	62.43	86.05	101.52	0.27	66.62	76.06	67.94	83.20	903.87
Uch Power	360.42	366.98	340.17	365.05	144.34	367.26	390.22	234.15	327.44	366.20	371.10	332.53	3,965.85
Attock Gen.	15.58	45.48	26.07	0.00	-	23.17	74.90	-	-	-	-	21.43	206.64
Atlas Power	16.50	60.32	25.33	-	-	28.94	91.56	-	-	-	-	30.21	252.87
Engro Powergen. Qadirpur	77.25	69.39	65.76	27.54	64.28	70.69	65.12	74.97	76.92	59.47	89.06	73.05	813.48
Saif Power	69.91	92.85	25.50	-	-	-	0.59	-	-	4.23	11.80	15.71	220.59
Orient Power	94.65	120.72	92.72	0.00	-	0.03	32.66	2.29	-	7.60	85.80	104.72	541.20
Nishat Power	49.47	125.07	56.55	0.07	-	23.38	87.93	-	-	-	42.66	68.56	453.69
Nishat Chunian	37.16	84.53	22.75	-	-	7.96	51.82	-	-	-	2.50	33.73	240.45
Sapphire Electric	87.17	107.11	84.91	5.63	-	2.78	0.60	-	0.54	6.70	82.41	101.51	479.36
Halmore Power	66.93	101.60	24.10	-	-	-	-	-	-	-	2.85	12.06	207.55
Narowal Energy	6.61	66.65	30.89	-	-	7.11	68.69	-	-	0.00	-	21.01	200.96
Liberty Power	43.61	61.89	23.43	-	-	13.84	81.33	-	-	-	-	15.83	239.94
Foundation Power	91.88	104.10	98.62	102.19	83.10	90.50	92.44	53.69	80.44	97.33	90.93	102.34	1,087.56
Uch-II Power	233.91	238.41	203.35	-	208.45	106.19	191.64	190.79	81.87	119.04	224.32	227.76	2,025.72
Punjab Thermal	595.58	750.10	442.09	248.43	1.89	18.13	-	-	4.19	155.22	527.03	454.63	3,197.29
QATPL	413.96	31.21	171.79	395.75	-	172.91	329.06	270.85	431.43	610.82	474.07	358.31	3,660.15
HBS	713.77	612.68	562.75	678.15	663.36	532.74	726.46	592.52	684.02	733.11	781.85	649.37	7,930.78
Balloki	651.33	666.49	573.25	582.52	132.74	547.71	525.79	584.15	538.26	637.74	659.93	584.72	6,684.63
Total Thermal	4,341.36	4,603.36	3,373.71	2,642.55	1,493.05	2,268.43	3,395.12	2,236.81	2,453.52	3,131.92	3,919.17	3,865.59	37,724.60
Huaneng Shandong Ruyi	149.28	257.92	154.05	-	-	168.22	567.06	128.10	-	21.16	243.33	386.42	2,075.55
Port Qasim Electric	79.26	95.27	163.18	49.34	84.20	186.62	-	-	-	-	62.51	61.88	782.26
China Power Hub	159.65	76.63	76.82	-	83.56	-	-	-	-	-	76.92	2.98	476.55
Engro PowerGen Thar	346.50	426.80	389.70	258.22	387.26	350.68	176.78	169.28	274.47	285.73	331.61	369.17	3,766.21
Lucky Electric	313.47	289.48	250.24	286.82	317.91	28.79	9.03	6.82	-	-	-	186.14	1,688.68
Thar Energy	207.83	215.05	185.02	200.08	194.29	177.29	169.34	38.89	160.53	144.31	102.16	153.70	1,948.50
Thar Coal Block-I	722.84	793.75	729.04	787.57	250.40	589.04	854.72	615.42	277.47	298.52	779.96	801.60	7,500.33
ThalNova Power	201.06	202.32	174.82	88.14	155.49	192.53	172.01	170.20	149.30	152.01	157.77	164.18	1,979.84
Total Coal	2,179.89	2,357.23	2,122.87	1,670.17	1,473.12	1,693.18	1,948.93	1,128.70	861.77	901.73	1,754.27	2,126.06	20,217.93

Power Producers	July	August	September	October	November	December	January	February	March	April	May	June	Total
CHASNUPP-I	192.72	146.30	208.76	196.44	214.77	141.35	-	79.88	136.66	210.11	220.74	212.03	1,959.76
CHASNUPP-II	229.50	230.02	218.69	225.17	209.33	216.38	233.20	198.61	214.98	221.98	200.50	212.00	2,520.36
CHASNUPP-III	-	99.85	224.89	233.59	224.36	234.53	235.16	193.10	220.37	220.29	227.21	217.98	2,331.33
CHASNUPP-IV	214.63	230.50	218.42	228.70	211.42	215.75	231.94	213.46	219.81	59.37	231.52	222.55	2,498.06
KANUPP-I	726.63	624.92	723.40	260.17	0.06	-	452.98	452.81	658.75	657.27	739.00	604.79	5,900.77
KANUPP-II	743.45	708.87	692.19	682.20	711.72	656.42	574.51	522.38	619.03	673.65	741.06	619.05	7,944.52
Total Nuclear	2,106.93	2,040.45	2,286.35	1,826.26	1,571.66	1,464.43	1,727.80	1,660.25	2,069.60	2,042.66	2,360.02	1,998.39	23,154.81
Tavanir Iran	28.85	26.20	24.23	22.54	29.73	28.20	29.09	25.66	28.38	37.09	49.96	47.65	377.58
Zorlu Energy	15.21	24.25	10.18	6.72	5.98	8.13	5.60	4.42	5.11	7.15	10.03	13.16	115.96
FFC Energy	11.84	21.24	7.94	4.89	6.15	8.72	5.38	3.86	4.01	5.10	7.59	10.47	97.19
Three Gorges First	13.63	22.70	8.87	6.43	6.76	8.23	5.61	4.12	4.79	6.46	9.03	11.73	108.36
Foundation Wind-I	14.27	23.07	11.10	5.62	4.64	5.63	4.63	3.76	5.47	9.33	12.20	11.26	110.98
Foundation Wind-II	15.41	25.37	11.60	5.84	6.53	7.87	5.78	4.22	5.50	9.55	12.81	12.51	122.97
Sapphire Wind	11.86	18.27	8.17	3.71	2.64	2.51	2.43	2.02	3.66	4.89	8.03	11.25	79.43
Younus Energy	12.20	17.91	8.61	3.91	3.12	3.05	2.64	1.95	4.16	5.64	8.62	11.45	83.29
Metro Power	14.36	23.71	10.35	6.53	9.72	11.37	7.47	4.83	6.26	7.72	10.08	12.78	125.17
Gul Ahmad Wind	12.22	17.36	8.90	3.99	3.20	3.05	2.74	2.02	4.23	5.73	8.62	11.19	83.27
Master Wind	13.00	19.15	8.72	3.92	2.84	2.60	2.63	2.20	4.01	5.06	8.71	12.25	85.08
Tenaga Generasi	13.63	19.61	10.73	3.94	2.44	2.20	2.30	2.19	4.97	7.79	11.75	11.63	93.17
HydroChina Dawood	12.43	18.94	10.58	3.92	2.32	2.17	2.22	2.13	4.53	7.23	9.46	11.70	89.41
Sachal Energy	13.66	22.00	9.21	6.53	8.53	9.31	6.98	4.59	5.61	7.16	9.46	12.03	115.08
UEP Wind	24.48	36.86	17.89	8.16	5.87	5.15	4.37	8.93	12.40	18.60	22.15	16.57	169.57
Artistic Wind	19.63	29.25	15.15	10.66	10.75	13.52	9.58	5.82	7.97	11.49	16.57	17.70	168.09
Act Wind	9.15	15.37	6.07	4.40	3.78	4.22	3.24	2.90	3.27	4.83	7.16	8.15	72.55
Hawa Energy	14.63	19.99	11.13	4.76	3.24	2.73	3.18	2.81	5.53	6.47	11.25	14.77	100.50
Jhimpir Wind	15.50	20.44	11.39	4.89	3.15	2.74	3.07	2.69	5.31	6.64	11.44	14.98	102.25
Three Gorges Second	12.74	18.21	9.08	4.30	2.97	2.63	2.60	2.29	4.48	5.87	9.30	11.96	86.43
Three Gorges Third	12.86	18.24	9.34	4.36	3.05	2.65	2.75	2.39	4.68	6.18	9.63	12.30	88.43
Tricon Boston-A	17.09	21.40	12.19	5.22	2.97	2.55	2.49	2.45	6.14	8.85	13.60	16.21	111.16
Tricon Boston-B	16.53	21.48	11.74	5.03	3.00	2.59	2.58	2.47	6.03	8.34	12.87	15.49	108.15
Tricon Boston-C	16.44	21.24	11.79	5.00	3.09	2.64	2.70	2.57	6.00	8.19	12.62	15.37	107.63
Zephyr Power	19.29	21.69	14.57	5.13	3.01	2.38	2.67	2.71	6.95	10.38	16.37	16.63	121.77
Lucky Renewables	16.03	22.14	12.42	4.95	3.10	2.61	2.84	2.77	5.93	7.53	13.39	16.97	110.69
Master Green	15.70	21.98	11.72	4.62	2.86	2.59	2.55	2.58	6.37	6.37	11.19	16.41	103.97
Act 2 Din	16.10	23.63	12.78	5.32	3.10	2.59	2.77	2.69	6.32	8.63	14.80	16.46	115.20
Artistic 2 Wind	15.43	22.88	11.90	4.97	3.09	2.63	2.81	2.70	6.06	8.49	14.43	15.58	110.97
Indus Wind	16.45	24.05	13.07	5.23	3.03	2.48	2.48	2.59	6.81	9.58	15.57	16.39	117.74
Lakeside Energy	16.27	23.46	12.70	5.10	3.07	2.57	2.40	2.60	6.64	9.23	14.89	16.03	114.95
Liberty Wind-1	15.50	23.94	11.75	4.77	3.12	2.54	2.47	2.38	5.72	8.59	13.70	14.79	109.25
Din Energy	15.41	22.95	12.30	4.79	3.26	2.63	2.64	2.77	6.01	8.22	13.36	14.61	108.96
Gul Ahmad Electric	16.14	23.82	13.16	5.67	2.97	2.58	2.51	2.47	6.78	10.28	16.07	16.27	118.72
Liberty Wind-2	15.92	24.31	12.05	4.87	3.05	2.50	2.41	2.20	5.78	8.47	13.93	15.41	110.90
NASDA Green	16.43	23.99	12.91	5.35	3.15	2.57	2.42	2.63	6.21	9.04	14.99	16.17	115.86
Metro 2 Wind	21.32	29.79	18.20	7.62	4.27	3.47	3.28	3.46	9.44	14.07	21.54	21.53	157.97
Total Wind	548.76	804.70	410.23	191.14	147.84	150.37	127.55	107.63	204.70	286.98	445.44	515.73	3,941.07
Quide-e-Azam Solar	12.96	14.74	13.82	13.90	9.22	10.61	6.69	12.89	15.34	14.89	15.61	14.46	155.11
Appolo Solar	13.62	15.12	14.34	14.57	9.62	11.22	7.23	13.19	15.94	15.56	16.33	15.26	162.00
Best Green Energy	12.64	14.94	14.00	13.87	9.54	11.03	7.25	13.08	15.77	15.47	16.18	15.17	158.95
Crest Energy	13.86	15.33	14.63	14.63	9.72	11.33	7.27	13.37	16.07	15.67	16.24	15.42	163.24
Harappa	2.78	3.24	2.91	2.37	1.33	1.56	0.79	2.17	2.83	3.22	3.69	3.37	30.28
AJ Solar	1.58	1.67	1.66	1.57	1.09	1.16	0.57	1.32	1.65	1.66	1.88	1.77	17.59

Power Producers	July	August	September	October	November	December	January	February	March	April	May	June	Total
Atlas Solar	17.75	19.04	17.74	15.08	9.27	9.70	6.43	13.65	17.61	20.50	23.78	21.32	191.87
Helios Power	-	-	-	-	-	1.33	3.24	6.86	8.79	8.57	10.42	10.26	49.48
Meridian Energy	-	-	-	-	-	1.42	4.13	6.87	8.79	8.73	10.54	10.30	50.76
HINDS Energy	-	-	-	-	-	2.45	4.33	6.76	7.19	8.47	10.21	10.20	49.62
Total Solar	75.19	84.07	78.79	76.00	49.78	61.82	47.94	90.17	109.98	112.75	124.87	117.54	1,028.90
JDV-II	3.28	17.90	17.36	14.27	6.75	15.25	15.35	12.97	16.34	17.40	13.96	17.47	168.30
JDV-III	17.03	17.67	17.12	10.07	4.06	15.00	15.46	14.77	17.10	17.32	17.72	17.11	180.44
RYK Mills	1.56	-	-	-	4.95	12.79	13.64	13.30	8.70	9.31	9.82	2.21	76.27
Chiniot Power	16.62	2.18	-	4.42	6.09	26.84	26.48	25.72	11.30	0.00	0.44	20.82	140.91
Hamza Sugar Mills	-	-	-	-	4.46	9.38	9.77	8.82	9.28	8.89	8.58	-	59.19
The Thal Industries	-	-	-	-	0.17	13.25	14.00	13.11	14.15	1.59	-	-	56.27
Almoiz Industries	1.48	0.00	0.03	0.00	0.14	5.80	5.22	4.89	1.64	1.34	6.42	2.13	29.10
Chanar Energy	-	-	-	-	0.05	2.91	6.44	6.96	-	-	-	-	16.37
Total Bagasse	39.97	37.76	34.52	28.76	26.68	101.24	106.37	100.53	78.50	55.85	56.94	59.74	726.85
Net-Metering	16.23	12.65	13.70	30.88	29.37	18.47	9.34	21.48	54.68	100.00	83.82	47.84	438.46
Mixed-Captives	27.69	27.45	28.63	32.13	30.80	23.45	23.11	23.08	25.97	25.52	24.57	21.77	314.19
Total	14,882.64	15,999.37	13,381.54	9,634.58	7,606.89	7,668.60	8,339.59	7,160.57	8,103.91	8,764.85	12,725.34	13,528.82	127,796.72

Source: CPPA-G

TABLE 11
Monthly Source-wise Actual and Projected Generation (GWh) (2023-24)

Source	July, 2023		August, 2023		September, 2023		October, 2023		November, 2023		December, 2023	
	Ref.	Actual	Ref.	Actual	Ref.	Actual	Ref.	Actual	Ref.	Actual	Ref.	Actual
Hydel	5,240.88	5,517.77	5,776.17	6,005.50	5,085.64	5,008.52	2,907.35	3,114.14	2,984.65	2,754.86	1,730.85	1,859.01
Coal (Local)	3,906.55	2,179.89	1,640.90	1,637.92	2,019.52	1,478.58	1,904.60	1,334.01	1,609.40	987.44	1,683.44	1,309.55
Coal (Imported)	-	-	1,980.94	719.31	1,580.13	644.28	1,494.47	336.16	824.34	485.68	723.79	383.63
HSD	-	-	-	-	-	-	-	-	-	-	-	6.31
RFO	732.55	294.55	481.90	649.16	767.62	240.61	3.64	0.07	0.18	0.28	225.02	168.22
Gas	1,432.60	1,094.70	1,449.70	1,213.61	1,290.15	1,005.29	1,405.58	703.78	1,277.58	694.77	1,076.19	825.91
RLNG	1,104.73	2,952.11	1,336.25	2,740.59	1,048.18	2,127.79	1,204.08	1,938.71	14.55	797.99	-	1,267.99
Nuclear	2,374.80	2,106.93	2,218.96	2,040.45	2,155.96	2,286.35	1,606.37	1,826.26	1,572.21	1,571.66	2,406.57	1,464.43
Import Iran	-	28.85	-	26.20	-	24.23	45.00	22.54	18.85	29.73	0.52	28.20
Mixed	9.88	-	16.98	-	16.18	-	11.87	-	11.84	-	7.88	-
Wind	880.63	548.76	587.63	804.70	366.73	410.23	199.54	191.14	233.19	147.84	307.89	150.37
Bagasse	-	39.97	-	37.76	-	34.52	39.18	28.76	48.74	26.68	192.71	101.24
Solar	164.57	75.19	197.75	84.07	226.48	78.79	216.05	76.00	191.26	49.78	193.06	61.82
Previous Adjustment in NEO	-	-	-	-	-	-	-	-	-	-	-	99.35
Total	15,847.19	14,838.72	15,687.18	15,959.27	14,556.59	13,339.19	11,037.73	9,571.57	8,786.79	7,546.72	8,547.92	7,726.03
Sale to IPPs	-	(28.93)	-	(28.67)	-	(21.64)	-	(37.99)	-	(30.60)	-	(36.71)
Transmission Losses	(466.48)	(419.13)	(462.27)	(452.72)	(430.93)	(391.80)	(339.99)	(281.09)	(279.19)	(226.30)	(274.51)	(269.42)
Net Delivered	15,380.71	14,390.66	15,224.91	15,477.88	14,125.66	12,925.75	10,697.74	9,252.49	8,507.60	7,289.82	8,273.41	7,419.90

Source	January, 2024		February, 2024		March, 2024		April, 2024		May, 2024		June, 2024	
	Ref.	Actual	Ref.	Actual	Ref.	Actual	Ref.	Actual	Ref.	Actual	Ref.	Actual
Hydel	901.09	924.22	2,158.56	1,766.29	1,892.22	2,216.81	2,989.30	2,070.35	4,521.94	3,906.27	5,036.94	4,728.50
Coal (Local)	1,670.53	1,372.85	1,553.03	993.79	1,297.79	861.77	1,688.86	880.57	1,570.93	1,371.51	1,543.14	1,488.66
Coal (Imported)	2,179.30	576.08	706.18	134.92	1,563.20	-	1,225.87	21.16	2,414.66	382.76	2,466.59	637.41
HSD	-	101.67	-	-	-	-	-	-	-	-	-	-
RFO	-	750.42	-	-	-	-	-	-	-	61.94	418.98	262.96
Gas	942.08	1,035.37	773.47	787.01	942.89	795.08	1,282.82	974.75	1,331.65	1,109.08	1,107.53	1,166.47
RLNG	-	1,514.38	-	1,449.81	242.24	1,658.44	233.88	2,157.75	241.62	2,747.55	1,213.39	2,436.76
Nuclear	2,086.29	1,727.80	2,165.62	1,660.25	2,071.47	2,069.60	2,146.62	2,042.66	2,422.44	2,360.02	2,338.93	1,998.39
Import Iran	1.07	29.09	-	25.66	-	28.38	-	37.09	0.01	49.96	0.34	47.65
Mixed	2.29	-	13.85	-	20.88	-	22.73	-	16.39	-	10.21	-
Wind	292.69	127.55	369.46	107.63	298.71	204.70	399.57	286.98	621.08	445.44	654.73	515.73
Bagasse	192.76	106.37	186.78	100.53	192.76	78.50	186.55	55.85	96.37	56.94	-	59.74
Solar	194.28	47.94	226.29	90.17	234.93	109.98	255.19	112.75	229.19	124.87	234.38	117.54
Previous Adjustment in NEO	-	-	-	14.04	-	-	-	-	-	-	-	-
Total	8,462.38	8,313.74	8,153.24	7,130.09	8,757.09	8,023.26	10,431.39	8,639.91	13,466.28	12,616.34	15,025.16	13,459.81
Sale to IPPs	-	(23.23)	-	(29.19)	-	(30.00)	-	(29.29)	-	(27.52)	-	(35.37)
Transmission Losses	(272.26)	(350.41)	(260.92)	(217.19)	(280.01)	(235.75)	(322.44)	(234.52)	(403.86)	(320.15)	(443.26)	(350.23)
Net Delivered	8,190.12	7,940.10	7,892.32	6,883.71	8,477.08	7,757.51	10,108.95	8,376.10	13,062.42	12,268.67	14,581.90	13,074.21

Source: CPPA-G

TABLE 12
Monthly Source-wise Actual and Projected Energy Purchase (Rs. in Million) (2023-24)

Source	July, 2023		August, 2023		September, 2023		October, 2023		November, 2023		December, 2023	
	Ref.	Actual	Ref.	Actual	Ref.	Actual	Ref.	Actual	Ref.	Actual	Ref.	Actual
Coal (Local)	50,196.16	24,013.25	16,286.32	11,477.59	20,195.55	11,270.34	18,871.27	16,146.86	15,298.48	14,437.20	15,997.68	16,069.31
Coal (Imported)	-	-	30,041.82	14,487.12	25,692.43	10,172.93	25,038.61	4,460.60	12,588.96	6,927.86	10,953.65	6,618.56
HSD	-	-	-	-	-	-	-	-	-	-	-	265.98
RFO	16,751.17	8,461.42	10,822.74	21,418.50	17,481.70	8,914.47	76.74	2.43	3.64	-	5,510.03	6,484.82
Gas	11,776.93	14,471.20	11,909.67	16,042.78	10,684.57	13,592.19	11,228.01	9,575.49	9,997.31	10,157.38	8,562.97	11,581.18
RLNG	24,819.62	69,743.84	29,787.72	64,992.46	23,569.98	51,466.51	26,100.87	45,757.51	301.63	18,926.13	-	33,250.45
Nuclear	2,483.52	2,457.43	2,331.78	2,392.46	2,260.19	2,737.87	1,783.20	2,241.22	1,745.37	1,897.13	2,512.31	1,927.54
Import Iran	-	681.23	-	657.56	-	576.70	1,112.78	522.18	466.13	824.49	12.86	934.32
Bagasse	-	239.11	-	225.86	-	206.49	234.38	172.07	291.57	159.59	1,152.83	605.62
Total	106,027.40	120,067.48	101,180.05	131,694.33	99,884.42	98,937.50	84,445.88	78,878.36	40,693.09	53,329.78	44,702.33	77,737.78
Arrears/Previous Adjustments	-	3,200.22	-	(329.97)	-	(851.61)	-	25,091.96	-	13,411.38	-	(1,426.47)
Sale to IPPs	-	(1,304.03)	-	(1,211.51)	-	(927.27)	-	(1,652.87)	-	(1,260.12)	-	(1,939.99)
Grand Total	106,027.40	121,963.67	101,180.05	130,152.85	99,884.42	97,158.62	84,445.88	102,317.45	40,693.09	65,481.04	44,702.33	74,371.32
Transmission Losses (Rs./kWh)	0.203	0.256	0.196	0.254	0.209	0.233	0.243	0.369	0.152	0.306	0.174	0.397

Source	January, 2024		February, 2024		March, 2024		April, 2024		May, 2024		June, 2024	
	Ref.	Actual	Ref.	Actual	Ref.	Actual	Ref.	Actual	Ref.	Actual	Ref.	Actual
Coal (Local)	15,789.08	16,287.74	14,643.19	14,098.55	12,180.81	14,458.71	15,946.19	13,938.02	14,869.96	16,059.84	14,601.47	16,419.13
Coal (Imported)	34,788.52	12,125.70	10,967.28	2,727.94	25,938.00	-	19,908.49	355.00	39,630.06	6,437.73	39,608.13	9,902.03
HSD	-	4,636.98	-	-	-	-	-	-	-	-	-	-
RFO	-	26,590.11	-	-	-	-	-	-	-	1,947.93	10,052.96	8,312.48
Gas	7,463.99	14,234.82	6,078.31	9,742.68	7,467.81	10,881.15	10,613.04	12,918.82	10,997.05	14,644.90	9,274.43	16,237.62
RLNG	-	36,792.00	-	31,933.75	5,775.10	36,803.66	5,779.58	47,722.70	5,973.01	65,955.73	28,132.88	64,156.41
Nuclear	2,118.00	2,294.64	2,186.20	2,193.75	2,091.75	3,205.30	2,152.56	3,133.54	2,526.69	3,617.29	2,440.33	3,048.62
Import Iran	26.46	954.12	-	697.80	-	861.89	-	1,018.18	0.25	1,303.50	8.41	1,270.20
Bagasse	1,153.13	636.31	1,117.36	601.40	1,153.13	469.60	1,115.98	334.10	576.50	340.64	-	357.37
Total	61,339.18	114,552.42	34,992.34	61,995.87	54,606.60	66,680.31	55,515.84	79,420.36	74,573.52	110,307.56	104,118.61	119,703.86
Arrears/Previous Adjustments	-	2,521.74	-	3,894.43	-	7,599.15	-	(3,063.91)	-	2,741.07	-	9,491.38
Supplemental Charges	-	-	-	-	-	-	-	-	-	-	-	-
Sale to IPPs	-	(1,142.79)	-	(1,101.70)	-	(1,532.05)	-	(1,287.31)	-	(1,161.43)	-	(1,663.27)
Grand Total	61,339.18	115,931.37	34,992.34	64,788.60	54,606.60	72,747.41	55,515.84	75,069.14	74,573.52	111,887.20	104,118.61	127,531.97
Transmission Losses (Rs./kWh)	0.241	0.656	0.142	0.325	0.206	0.311	0.170	0.273	0.171	0.251	0.211	0.279

Source: CPPA-G

TABLE 13
Month-wise KE Electricity Generation Data (GWh) (2023-24)

	July	August	September	October	November	December	January	February	March	April	May	June	Total
BQPS-I (RFO) Unit-1	7.05	-	-	-	-	-	-	-	-	-	16.76	14.30	38.11
BQPS-I (RFO) Unit-2	17.15	4.15	-	-	-	-	-	-	-	-	10.86	17.40	49.57
BQPS-I (RFO) Unit-5	45.31	5.35	27.37	10.93	18.42	-	5.48	5.77	8.66	-	12.46	26.27	166.02
BQPS-I (RFO) Unit-6	10.95	-	0.78	16.67	18.99	-	-	0.72	2.07	-	2.97	9.40	62.54
BQPS-I (Gas) Unit-5	-	-	-	-	12.52	-	-	-	-	-	-	-	12.52
BQPS-I (Gas) Unit-6	-	-	-	-	3.99	-	-	0.00	-	-	-	-	4.00
BQPS-I (RLNG) Unit-1	0.05	-	-	-	-	-	-	-	-	-	1.96	4.52	6.54
BQPS-I (RLNG) Unit-2	0.11	1.52	-	-	-	-	-	-	-	-	13.49	10.14	25.26
BQPS-I (RLNG) Unit-5	1.22	12.43	2.44	50.34	22.37	-	-	-	-	-	59.77	33.86	182.44
BQPS-I (RLNG) Unit-6	0.16	-	0.11	14.56	7.14	-	-	0.02	-	-	37.13	16.13	75.24
BQPS-II (Gas)	-	-	-	-	25.21	-	-	4.50	13.41	25.85	36.29	40.03	145.29
BQPS-II (RLNG)	274.28	175.16	151.25	297.28	299.73	262.63	73.79	102.69	84.08	149.57	279.94	261.38	2,411.79
BQPS-III (RLNG) (Unit-1)	302.10	311.26	297.78	326.25	45.00	-	182.92	210.83	196.59	194.08	95.75	221.08	2,383.65
BQPS-III (RLNG) (Unit-2)	298.51	289.81	279.72	-	-	-	0.71	1.48	152.44	210.64	286.21	261.03	1,780.54
BQPS-III (HSD)	-	-	-	-	-	1.08	7.71	2.18	2.96	-	-	-	13.93
KGTPS-II (RLNG)	-	-	-	0.06	-	-	-	-	-	-	1.03	0.50	1.59
SGTPS-II (RLNG)	0.03	-	-	0.10	0.04	-	-	-	-	-	-	-	0.17
Korangi CCPP (Gas)	-	-	-	-	1.75	-	-	-	-	0.10	-	-	1.85
Korangi CCPP (RLNG)	0.25	-	-	25.15	4.15	-	-	-	-	0.44	32.93	36.39	99.32
Korangi CCPP (HSD)	0.62	0.01	2.61	2.78	0.15	0.13	-	0.56	0.00	0.00	0.93	3.16	10.96
Tapal Energy (RFO)	46.08	29.25	48.76	50.00	26.98	4.41	22.45	7.29	6.21	0.75	30.91	15.24	288.34
Gul Ahmed (RFO)	43.47	20.00	47.25	58.36	27.25	1.53	10.43	3.89	2.56	0.37	27.94	25.54	268.58
CPPA-G (Mix)	772.23	753.46	710.86	711.40	689.79	709.39	683.67	613.89	702.50	710.24	757.88	722.76	8,538.06
ISL (Gas)	2.15	2.25	0.54	1.52	1.88	0.13	1.27	1.75	1.20	1.11	1.09	0.88	15.76
ILL (Gas)	0.31	1.26	0.00	-	-	-	-	-	-	-	-	-	1.58
FFBL (Coal)	15.17	25.23	37.25	40.54	36.06	28.78	1.06	4.27	28.53	30.68	39.29	37.68	324.53
SNPCL-I (Gas)	19.96	21.92	20.56	30.59	22.12	20.81	20.69	22.45	24.58	28.14	32.95	31.68	296.44
SNPCL-II (Gas)	19.85	19.85	21.00	29.48	22.72	20.82	21.03	22.26	27.45	28.16	28.44	31.28	292.34
Oursun Pakistan (Solar)	6.65	5.56	7.28	7.62	6.39	7.08	6.91	7.07	8.81	8.13	9.05	7.53	88.07
Charo Solar (Solar)	7.86	5.44	8.23	8.33	6.56	7.14	6.98	7.51	10.27	9.96	11.65	9.36	99.29
Lotte Chemicals (RLNG)	1.93	1.15	-	-	-	-	-	-	-	-	-	-	3.07
Lucky Cement	0.25	0.19	0.30	0.34	0.26	0.22	0.25	0.20	0.26	0.28	0.41	0.40	3.35
Net-Metering	2.94	1.73	2.77	3.79	3.49	5.99	7.79	9.11	12.42	11.98	11.60	5.07	78.68
Total	1,896.65	1,686.99	1,666.85	1,686.10	1,302.96	1,070.13	1,053.14	1,028.44	1,284.97	1,410.50	1,839.70	1,842.99	17,769.43

Source: KE

TABLE 14
Monthly Variation in Maximum Hydel Generating Capability (MW)

Month	Year	Tarbela	Tarbela 4 th Ext.	Ghazi Barotha	Mangla	Warsak	Chashma	Khan Khwar	Allai Khwar	Jinnah Hydel	Duber Khwar	Neelum Jhelum	Golen Gol	Small Hydels	Total Hydel (WAPDA)	Jagran	Malakand-III	Larail	Patrind Hydro	Daral Khwar	Gulpur	Karot Power	Total Hydel (IPPs)	Total Hydel (WAPDA+IPPs)
July	2019	3348		1032	346	147	90	33	63	11	125	783	8	65	6053	58	13	25	97	36	-	-	229	6282
	2020	3844		988	602	194	99	32	74	23	129	963	4	71	7023	25	61	43	121	34	38	-	322	7344
	2021	2977		1013	424	196	91	33	75	25	130	951	24	58	5997	26	52	33	146	23	59	-	340	6337
	2022	3500	1413	1071	491	211	119	60	122	37	132	973	28	59	8216	29	66	55	149	34	102	702	1077	9353
	2023	3493	1414	1055	290	176	146	71	121	21	131	0	89	54	7061	29	43	10	148	28	102	717	1077	8138
August	2019	4774		1024	275	181	72	34	58	10	106	865	0	56	7453	68	13	12	111	21	-	-	224	7678
	2020	4217		999	416	209	86	30	65	21	130	887	4	45	7108	26	64	25	109	22	45	-	291	7400
	2021	4340		1038	597	189	86	28	87	22	113	712	19	62	7295	26	62	44	75	11	47	-	266	7561
	2022	3506	1415	1084	271	217	94	70	122	9	131	0	31	55	7005	28	65	20	146	36	102	707	1104	8109
	2023	3497	1414	1085	845	182	150	63	122	24	131	902	70	57	8542	28	43	56	139	16	97	716	1095	9637
September	2019	4308		1052	570	152	114	12	26	10	77	477	23	69	6889	63	13	37	60	10	-	-	183	7072
	2020	3555		1008	905	148	96	32	72	15	56	602	4	65	6556	17	32	66	77	20	51	-	263	6819
	2021	4102		1036	755	148	101	5	51	36	82	453	32	67	6869	20	55	59	61	8	35	-	238	7107
	2022	3499	1415	1114	710	204	152	55	114	27	65	0	40	56	7451	20	35	58	94	10	95	429	741	8192
	2023	3219	1356	1107	960	182	159	45	70	35	80	567	55	69	7904	24	43	68	75	11	42	282	545	8449
October	2019	1474		784	313	93	107	12	22	28	38	245	24	45	3185	39	5	30	35	6	-	-	116	3300
	2020	1799		895	842	78	107	11	29	41	46	222	15	10	4095	10	21	63	40	6	10	-	149	4244
	2021	1408		816	505	82	109	11	36	37	42	275	18	61	3400	8	32	35	41	6	25	-	148	3547
	2022	2363	971	1103	956	119	157	43	44	41	69	0	38	137	6041	9	22	79	47	9	36	209	411	6452
	2023	1585	1256	1096	960	93	160	41	53	39	38	288	28	66	5703	11	34	71	40	12	41	208	417	6120
November	2019	1658		989	604	78	118	19	35	54	33	286	16	40	3930	32	5	56	32	8	-	-	133	4063
	2020	1772		958	797	73	122	14	24	50	33	153	15	55	4065	4	16	62	29	5	-	-	116	4181
	2021	1550		980	821	51	122	8	20	43	24	143	10	45	3817	5	16	72	25	4	5	-	128	3945
	2022	1215	698	1038	900	85	136	33	64	40	36	0	23	60	4328	5	21	80	44	13	41	222	426	4754
	2023	1335	642	1057	960	60	140	22	71	43	24	242	18	51	4665	7	24	75	43	7	29	226	411	5076
December	2019	725		511	523	69	80	2	21	28	23	204	11	30	2227	21	6	47	24	5	-	-	103	2331
	2020	729		523	590	74	66	17	27	38	30	163	11	5	2272	4	14	48	26	4	5	-	101	2374
	2021	899		678	423	21	88	5	16	31	17	90	8	32	2308	4	14	40	22	3	0	-	82	2390
	2022	1020	536	905	495	65	120	13	27	45	27	0	15	55	3323	6	21	48	27	6	10	140	240	3563
	2023	1032	415	916	707	50	120	13	23	42	19	173	13	48	3571	6	12	60	31	5	0	143	257	3828
January	2020	400		279	94	77	52	11	0	4	18	162	8	13	1120	13	4	12	22	4	2	-	58	1178
	2021	534		393	95	73	59	8	7	11	21	135	8	23	1367	4	14	7	21	3	23	-	71	1439
	2022	203		153	22	73	51	10	2	6	15	52	8	24	620	3	20	0	21	3	29	-	77	697
	2023	1061	411	893	130	78	104	15	29	14	21	0	11	34	2801	5	21	14	26	5	40	162	273	3074
	2024	1152	0	859	614	53	115	4	0	11	11	102	9	25	2955	4	19	58	20	3	0	93	197	3152
February	2020	1109		783	727	65	101	23	30	16	25	243	6	24	3153	26	4	68	22	7	14	-	141	3294
	2021	1056		833	683	57	89	15	0	16	30	109	8	25	2918	5	12	67	24	6	15	-	128	3047
	2022	782		673	350	51	83	14	18	16	16	77	7	19	2105	3	17	43	20	3	24	-	110	2215
	2023	1147	450	986	651	68	128	63	0	36	36	0	8	45	3618	7	28	71	30	8	34	320	498	4116
	2024	922	0	686	725	54	115	56	66	32	24	0	7	40	2727	4	16	76	23	5	77	382	583	3310
March	2020	234		176	492	104	47	61	72	26	47	494	6	54	1814	47	7	45	38	13	64	-	214	2027
	2021	397		343	592	87	47	41	56	18	57	460	6	39	2143	4	25	63	40	13	39	-	184	2327
	2022	401		365	473	60	58	45	68	25	55	484	6	58	2098	10	36	59	42	19	43	-	210	2307
	2023	1117	378	1023	603	109	126	50	72	41	58	0	8	64	3649	13	45	65	46	20	24	348	561	4210
	2024	851	81	728	682	121	116	71	121	44	109	960	6	58	3948	15	39	74	68	34	92	672	994	4942

Month	Year	Tarbela	Tarbela 4 th Ext.	Ghazi Barotha	Mangla	Warsak	Chashma	Khan Khwar	Allai Khwar	Jinnah Hydrel	Duber Khwar	Neslum Jhelum	Golen Gol	Small Hydels	Total Hydrel (WAPDA)	Jagran	Malakand-III	Laraib	Patrind Hydro	Daral Khwar	Gulpur	Karot Power	Total Hydrel (IPPs)	Total Hydrel (WAPDA + IPPs)
April	2020	549		368	747	164	72	69	112	30	95	923	6	64	3200	54	15	61	85	29	69	-	313	3512
	2021	657		572	643	106	77	51	96	31	87	923	7	73	3323	15	46	67	76	20	41	-	266	3588
	2022	620		574	541	96	82	29	58	40	103	849	7	67	3066	23	56	66	83	34	21	5	287	3354
	2023	895	291	892	729	169	135	70	122	33	131	0	9	67	3543	22	49	75	133	31	102	717	1129	4672
	2024	721	0	654	586	139	149	71	122	37	105	869	7	62	3522	25	42	54	137	35	100	718	1111	4633
May	2020	2217		993	893	205	88	64	118	15	117	964	7	67	5747	66	27	69	121	35	54	-	372	6119
	2021	1073		947	654	180	112	44	92	37	128	950	18	40	4275	25	65	73	140	16	40	-	361	4636
	2022	1114		1004	546	158	119	23	48	41	126	925	20	66	4192	24	57	66	121	34	17	327	648	4840
	2023	1571	372	1069	738	182	148	71	122	35	133	0	7	70	4518	28	51	77	148	36	86	716	1142	5660
	2024	2921	1193	1066	954	134	158	71	121	30	106	35	7	62	6858	29	75	81	148	37	100	717	1187	8045
June	2020	3000		976	849	172	89	40	92	17	129	962	8	65	6401	25	71	66	125	35	48	-	369	6770
	2021	2294		1000	609	191	104	29	70	30	130	967	17	68	5507	24	68	57	147	34	45	-	376	5883
	2022	1095		1038	415	160	107	15	38	37	121	860	32	48	3966	20	65	49	109	29	27	414	713	4679
	2023	3096	1331	1080	789	183	156	67	121	33	132	0	79	67	7134	29	60	76	148	36	90	716	1155	8289
	2024	2940	1204	1050	960	133	158	43	87	20	105	0	8	61	6769	29	70	80	148	37	46	718	1128	7897

Note: Errors and omissions expected, as this data is telephonically obtained by NPCC due to no live SCADA system.

Source: National Power Control Centre, Islamabad

TABLE 15
Auxiliary Consumption and other Factors of Hydel Power Stations

Power Station	Year	Auxiliary Consumption		Maximum Load (MW)	Load Factor (%)	Capacity Factor (%)	Utilization Factor (%)	Availability Factor (%)
		(GWh)	(%)					
Tarbela	2019-20	15.60	0.13	3506	38.72	100.81	39.03	88.45
	2020-21	15.13	0.12	3506	41.06	41.39	41.39	82.54
	2021-22	27.79	0.25	3536	35.37	35.96	35.96	89.22
	2022-23	14.30	0.11	3478	40.98	100.00	40.98	87.42
	2023-24	13.68	0.10	3478	43.75	100.00	43.75	88.15
Tarbela 4 th Ext.	2019-20	12.36	0.22	1410	44.51	44.51	44.51	76.03
	2020-21	10.35	0.30	1410	27.75	27.75	27.75	37.51
	2021-22	6.77	0.21	1410	26.52	26.52	26.52	87.50
	2022-23	10.49	0.24	1410	35.93	100.00	35.93	89.30
	2023-24	11.69	0.25	1410	37.57	100.00	37.57	82.00
Ghazi Barotha	2019-20	6.63	0.10	1450	51.44	100.00	51.44	90.70
	2020-21	7.30	0.11	1450	54.25	54.25	54.25	91.12
	2021-22	75.88	1.11	1450	53.23	53.23	53.23	91.53
	2022-23	6.45	0.09	1450	54.22	100.00	54.36	90.75
	2023-24	7.70	0.12	1450	51.31	100.00	51.31	91.76
Mangla	2019-20	97.04	2.07	915	58.31	114.38	66.69	88.92
	2020-21	91.41	1.69	915	67.44	77.13	77.13	96.19
	2021-22	82.88	1.93	920	52.12	47.95	47.95	92.42
	2022-23	51.41	1.32	960	46.25	110.34	51.04	93.73
	2023-24	80.57	1.53	960	62.30	110.34	68.75	92.79
Warsak	2019-20	1.17	0.11	220	57.17	90.17	51.77	81.19
	2020-21	10.47	0.97	233	52.69	50.53	50.53	68.30
	2021-22	9.46	1.00	229	46.55	43.88	43.88	75.05
	2022-23	9.33	1.03	218	47.54	89.73	42.66	79.64
	2023-24	4.12	0.53	187	47.33	77.16	36.52	70.00
Chashma	2019-20	4.42	0.59	122	70.13	66.30	72.03	67.34
	2020-21	4.21	0.54	125	70.92	72.92	72.92	68.11
	2021-22	4.60	0.57	138	65.82	49.36	49.36	67.78
	2022-23	5.12	0.58	161	62.50	87.50	74.06	79.31
	2023-24	5.28	0.54	161	69.22	87.50	78.17	80.41
Khan Khwar	2019-20	4.76	1.70	72	44.25	44.25	44.25	85.50
	2020-21	2.09	0.89	72	37.43	35.97	35.97	92.34
	2021-22	3.81	2.29	72	25.76	25.76	25.76	92.61
	2022-23	3.81	2.29	72	26.36	27.64	26.36	90.83
	2023-24	5.18	1.89	72	43.26	43.34	43.26	91.94
Allai Khwar	2019-20	0.96	0.20	121	44.70	44.70	44.70	89.63
	2020-21	1.19	0.26	121	42.27	42.27	42.27	81.74
	2021-22	5.52	1.46	121	35.19	35.19	35.19	91.34
	2022-23	1.28	0.26	121	45.91	45.91	45.91	87.53
	2023-24	1.30	0.28	121	43.58	43.58	43.58	93.53
Jinnah Hydel	2019-20	3.08	1.69	69	30.24	21.67	65.58	47.42
	2020-21	3.32	1.40	64	43.41	65.96	65.96	59.07
	2021-22	6.98	2.65	55	53.34	30.45	30.45	58.32
	2022-23	3.17	1.48	48	50.59	50.00	25.30	57.00
	2023-24	2.92	1.38	46	51.85	48.22	25.00	50.24
Duber Khwar	2019-20	2.17	0.35	130	53.55	53.55	53.55	91.84
	2020-21	2.45	0.38	130	56.49	56.49	56.49	95.10
	2021-22	2.07	0.33	130	54.18	54.18	54.18	93.50
	2022-23	2.07	0.34	130	54.36	54.36	54.36	88.80
	2023-24	1.91	0.38	130	43.63	43.63	43.63	94.17
Golen Gol	2019-20	2.42	2.72	72	14.08	9.39	9.39	86.91
	2020-21	2.48	2.92	71	13.70	8.97	8.97	73.64
	2021-22	3.14	2.22	52	30.33	14.60	14.60	93.70
	2022-23	2.89	2.14	90	63.49	14.25	43.06	93.00
	2023-24	3.18	1.78	108	55.94	18.66	56.88	95.27
Dargai	2019-20	0.28	0.33	18	90.05	89.00	80.14	88.03
	2020-21	0.30	0.28	18	69.18	62.27	62.27	88.27
	2021-22	0.35	0.40	18	54.52	49.89	49.89	79.82
	2022-23	0.24	0.34	12	71.14	57.70	40.91	87.92
	2023-24	0.33	0.51	12	62.89	57.50	36.16	91.26

Power Station	Year	Auxiliary Consumption		Maximum Load (MW)	Load Factor (%)	Capacity Factor (%)	Utilization Factor (%)	Availability Factor (%)
		(GWh)	(%)					
Rasul	2019-20	0.52	1.41	13	32.02	59.09	18.92	73.30
	2020-21	0.73	0.92	15	60.48	41.24	41.24	86.75
	2021-22	2.88	4.67	13	51.72	30.56	30.56	67.80
	2022-23	2.78	4.89	13	49.97	59.09	29.53	76.94
	2023-24	0.88	1.18	13	65.58	59.09	38.75	75.59
Shadiwal	2019-20	0.32	2.25	5	34.52	34.81	12.01	94.82
	2020-21	0.49	1.52	6	62.00	27.56	27.56	94.22
	2021-22	0.63	2.21	6	58.24	23.73	23.73	94.40
	2022-23	0.69	1.37	7	58.20	48.15	28.02	94.72
	2023-24	0.78	1.37	6	69.46	45.19	31.39	94.68
Chichoki Malian	2019-20	0.34	0.98	7	49.51	53.03	26.25	90.50
	2020-21	0.53	1.89	8	42.48	24.14	24.14	89.21
	2021-22	0.44	1.92	6	42.72	19.42	19.42	72.90
	2022-23	0.48	1.54	9	39.78	68.18	27.12	88.18
	2023-24	0.41	1.32	9	39.05	68.18	26.63	94.21
Nandipur	2019-20	0.51	1.51	6	56.02	46.07	29.09	93.00
	2020-21	0.53	1.58	9	42.48	27.71	27.71	94.00
	2021-22	1.06	3.50	8	40.17	24.16	24.16	94.50
	2022-23	1.08	2.89	9	49.97	61.59	30.78	91.33
	2023-24	0.95	2.56	8	50.36	60.87	30.66	71.79
Kurram Garhi	2019-20	0.15	0.99	4	47.01	79.07	43.18	75.05
	2020-21	0.16	0.78	4	61.42	58.35	58.35	79.72
	2021-22	1.63	12.98	4	32.89	31.24	31.24	85.39
	2022-23	0.18	1.14	4	61.90	68.01	73.33	91.10
	2023-24	0.24	1.47	4	53.99	84.38	68.97	85.04
Renala	2019-20	0.05	2.28	1	43.08	50.00	21.54	76.17
	2020-21	0.05	2.50	1	42.44	20.83	20.83	79.01
	2021-22	0.05	2.76	1	41.36	18.80	18.80	79.00
	2022-23	0.06	3.54	1	41.17	45.45	18.71	94.61
	2023-24	0.07	4.14	0	42.52	40.91	17.40	94.74
Chitral	2019-20	0.01	0.21	1	48.16	34.82	84.93	93.89
	2020-21	0.01	0.23	1	48.46	85.37	85.37	97.02
	2021-22	0.01	0.27	1	38.70	24.58	24.58	98.96
	2022-23	0.01	0.21	1	43.78	30.88	92.07	99.18
	2023-24	0.01	0.30	1	34.22	21.55	77.03	95.53
Gomal Zam	2019-20	0.09	0.16	9	74.00	49.88	36.91	80.16
	2020-21	0.11	0.17	9	83.87	42.01	42.01	86.90
	2021-22	0.74	1.27	9	76.75	37.49	37.49	88.30
	2022-23	0.23	0.30	9	77.74	50.00	75.95	57.09
	2023-24	0.16	0.30	9	54.38	46.16	65.94	19.00
Malakand/Jabban	2019-20	1.35	1.14	22	76.20	71.20	71.20	78.16
	2020-21	1.60	1.22	22	77.33	69.82	69.82	72.20
	2021-22	1.36	1.00	22	69.91	69.91	69.91	93.70
	2022-23	1.28	1.02	22	67.04	98.18	65.50	93.50
	2023-24	1.17	0.99	21	64.01	95.00	60.81	89.18

Source: WAPDA

TABLE 16

Month-Wise WAPDA Hydroelectric Invoice for Capacity Charges and Cost Data (2023-24)

Month	Export (GWh)	Import (GWh)	NEO (GWh)	Variable Energy Charges (Mln. Rs.)	Capacity Charges (Mln. Rs.)	Water Use/ NHP Charges (Mln. Rs.)	IRSA Charge Amount (Mln. Rs.)	GST @ 17% (NEOxRatexGST Rate) (Mln. Rs.)
3,478 MW Tarbela								
July	2,439.469	0.054	2,439.415	104.895	1,467.507	741.58	12.20	18.88
August	1,489.078	-	1,489.078	64.030	1,467.507	452.68	7.45	11.53
September	1,881.193	0.002	1,881.191	80.891	1,467.507	571.88	9.41	14.56
October	861.410	6.923	854.487	36.743	1,467.507	259.76	4.27	6.61
November	752.092	13.871	738.221	31.744	1,467.507	224.42	3.69	5.71
December	623.718	108.652	515.066	22.148	1,467.507	156.58	2.58	3.99
January	628.276	242.291	385.985	16.597	1,467.507	117.34	1.93	2.99
February	655.667	72.287	583.380	25.085	1,467.507	177.35	2.92	4.52
March	572.274	74.427	497.847	21.407	1,467.507	151.35	2.49	3.85
April	344.748	121.133	223.615	9.615	1,467.507	67.98	1.12	1.73
May	1,054.274	33.557	1,020.717	43.891	1,467.507	310.30	5.10	7.90
June	1,636.960	2.691	1,634.269	70.274	1,467.507	496.82	8.17	12.65
1,410 MW Tarbela 4th Extension								
July	1,016.162	-	1,016.162	136.166	1,102.609	308.913	5.081	24.510
August	1,029.590	-	1,029.590	137.965	1,102.609	312.995	5.148	24.834
September	813.915	-	813.915	109.065	1,102.609	247.430	4.070	19.632
October	307.533	-	307.533	41.209	1,102.609	93.490	1.538	7.418
November	245.841	-	245.841	32.943	1,102.609	74.736	1.229	5.930
December	152.657	-	152.657	20.456	1,102.609	46.408	0.763	3.682
January	-	-	-	-	1,102.609	-	-	-
February	-	-	-	-	1,102.609	-	-	-
March	3.365	-	3.365	0.451	1,102.609	1.023	0.017	0.081
April	-	-	-	-	1,102.609	-	-	-
May	463.952	-	463.952	62.170	1,102.609	141.041	2.320	11.191
June	609.296	-	609.296	81.646	1,102.609	185.226	3.046	14.696
1,450 MW Ghazi Barotha								
July	1,869.082	1,132.551	736.531	58.186	1,127.954	174.558	3.683	10.473
August	1,921.606	1,180.520	741.086	58.546	1,127.954	175.637	3.705	10.538
September	1,642.397	890.773	751.624	59.378	1,127.954	178.135	3.758	10.688
October	900.620	275.227	625.393	49.406	1,127.954	148.218	3.127	8.893
November	828.788	205.757	623.031	49.219	1,127.954	147.658	3.115	8.860
December	642.580	195.737	446.843	35.301	1,127.954	105.902	2.234	6.354
January	611.467	349.374	262.093	20.705	1,127.954	62.116	1.310	3.727
February	504.035	75.017	429.018	33.892	1,127.954	101.677	2.145	6.101
March	485.546	83.425	402.121	31.768	1,127.954	95.303	2.011	5.718
April	296.746	115.128	181.618	14.348	1,127.954	43.043	0.908	2.583
May	1,000.332	437.693	562.639	44.448	1,127.954	133.345	2.813	8.001
June	1,352.875	649.095	703.780	55.599	1,127.954	166.796	3.519	10.008
1,000 MW Mangla								
July	469.721	271.502	198.219	13.281	715.090	29.733	0.991	2.391
August	581.244	247.090	334.154	22.388	715.090	50.123	1.671	4.030
September	670.628	89.502	581.126	38.935	715.090	87.169	2.906	7.008
October	680.101	23.232	656.869	44.010	715.090	98.530	3.284	7.922
November	642.364	22.868	619.496	41.506	715.090	92.924	3.097	7.471
December	391.213	35.649	355.564	23.823	715.090	53.335	1.778	4.288
January	203.901	129.424	74.477	4.990	715.090	11.172	0.372	0.898
February	488.692	41.521	447.171	29.960	715.090	67.076	2.236	5.393
March	420.540	45.063	375.477	25.157	715.090	56.322	1.877	4.528
April	327.582	41.560	286.022	19.163	715.090	42.903	1.430	3.449
May	696.305	85.053	611.252	40.954	715.090	91.688	3.056	7.372
June	726.870	93.442	633.428	42.440	715.090	95.014	3.167	7.639
242.96 MW Warsak								
July	104.279	1.693	102.586	10.977	181.782	31.186	0.513	1.976
August	111.734	4.537	107.197	11.470	181.782	32.588	0.536	2.065
September	107.913	0.032	107.881	11.543	181.782	32.796	0.539	2.078
October	52.157	0.529	51.628	5.524	181.782	15.695	0.258	0.994
November	38.660	1.863	36.797	3.937	181.782	11.186	0.184	0.709
December	39.165	4.649	34.516	3.693	181.782	10.493	0.173	0.665
January	42.766	7.442	35.324	3.780	181.782	10.738	0.177	0.680
February	35.689	14.639	21.050	2.252	181.782	6.399	0.105	0.405
March	48.255	6.061	42.194	4.515	181.782	12.827	0.211	0.813
April	76.107	0.290	75.817	8.112	181.782	23.048	0.379	1.460
May	79.406	1.420	77.986	8.345	181.782	23.708	0.390	1.502
June	86.194	3.801	82.393	8.816	181.782	25.047	0.412	1.587

Month	Export (GWh)	Import (GWh)	NEO (GWh)	Variable Energy Charges (Mln. Rs.)	Capacity Charges (Mln. Rs.)	Water Use/ NHP Charges (Mln. Rs.)	IRSA Charge Amount (Mln. Rs.)	GST @ 17% (NEOxRate) (Mln. Rs.)
184 MW Chashma								
July	76.096	-	76.096	14.534	280.495	18.035	0.380	2.616
August	90.086	0.001	90.085	17.206	280.495	21.350	0.450	3.097
September	104.130	0.045	104.085	19.880	280.495	24.668	0.520	3.578
October	97.932	0.002	97.930	18.705	280.495	23.209	0.490	3.367
November	87.849	0.003	87.846	16.779	280.495	20.820	0.439	3.020
December	66.495	0.650	65.845	12.576	280.495	15.605	0.329	2.264
January	46.090	1.742	44.348	8.470	280.495	10.510	0.222	1.525
February	67.949	0.001	67.948	12.978	280.495	16.104	0.340	2.336
March	68.248	0.003	68.245	13.035	280.495	16.174	0.341	2.346
April	58.677	1.157	57.520	10.986	280.495	13.632	0.288	1.978
May	108.771	0.008	108.763	20.774	280.495	25.777	0.544	3.739
June	104.874	0.006	104.868	20.030	280.495	24.854	0.524	3.605
72 MW Khan Khwar								
July	52.112	18.584	33.527	7.074	114.646	10.192	0.168	1.273
August	62.641	36.389	26.252	5.539	114.646	7.981	0.131	0.997
September	32.950	19.593	13.358	2.818	114.646	4.061	0.067	0.507
October	20.749	8.457	12.292	2.594	114.646	3.737	0.061	0.467
November	12.541	5.224	7.318	1.544	114.646	2.225	0.037	0.278
December	8.533	4.288	4.246	0.896	114.646	1.291	0.021	0.161
January	3.802	3.699	0.103	0.022	114.646	0.031	0.001	0.004
February	10.037	3.066	6.971	1.471	114.646	2.119	0.035	0.265
March	48.445	9.085	39.359	8.305	114.646	11.965	0.197	1.495
April	55.653	19.397	36.255	7.650	114.646	11.022	0.181	1.377
May	70.903	28.109	42.794	9.029	114.646	13.009	0.214	1.625
June	55.988	32.707	23.281	4.912	114.646	7.077	0.116	0.884
121 MW Allai Khwar								
July	137.332	68.905	68.427	14.712	182.573	20.802	0.342	2.648
August	154.798	102.407	52.391	11.264	182.573	15.927	0.262	2.028
September	75.832	51.482	24.350	5.235	182.573	7.402	0.122	0.942
October	48.466	29.986	18.480	3.973	182.573	5.618	0.092	0.715
November	32.912	16.891	16.021	3.445	182.573	4.870	0.080	0.620
December	21.471	10.068	11.403	2.452	182.573	3.466	0.057	0.441
January	7.971	8.169	(0.198)	(0.043)	182.573	(0.060)	(0.001)	(0.008)
February	23.151	11.982	11.169	2.401	182.573	3.395	0.056	0.432
March	108.304	60.036	48.268	10.378	182.573	14.673	0.241	1.868
April	159.355	83.683	75.672	16.269	182.573	23.004	0.378	2.928
May	193.131	110.164	82.967	17.838	182.573	25.222	0.415	3.211
June	140.413	91.960	48.453	10.417	182.573	14.730	0.242	1.875
96 MW Jinnah Hydel								
July	12.963	0.050	12.913	3.448	146.043	3.060	0.065	0.621
August	12.513	-	12.513	3.341	146.043	2.966	0.063	0.601
September	21.858	-	21.858	5.836	146.043	5.180	0.109	1.050
October	23.884	0.004	23.880	6.376	146.043	5.660	0.119	1.148
November	28.145	0.000	28.145	7.515	146.043	6.670	0.141	1.353
December	20.840	-	20.840	5.564	146.043	4.939	0.104	1.002
January	2.126	0.136	1.990	0.531	146.043	0.472	0.010	0.096
February	9.131	0.081	9.050	2.416	146.043	2.145	0.045	0.435
March	25.251	-	25.251	6.742	146.043	5.984	0.126	1.214
April	20.845	0.029	20.816	5.558	146.043	4.933	0.104	1.000
May	16.231	0.516	15.714	4.196	146.043	3.724	0.079	0.755
June	12.357	0.205	12.152	3.245	146.043	2.880	0.061	0.584
130 MW Duber Khwar								
July	46.408	2.770	43.638	9.382	229.877	13.266	0.218	1.689
August	83.989	0.003	83.987	18.057	229.877	25.532	0.420	3.250
September	44.318	0.000	44.318	9.528	229.877	13.473	0.222	1.715
October	21.289	0.021	21.268	4.573	229.877	6.466	0.106	0.823
November	12.762	0.014	12.748	2.741	229.877	3.875	0.064	0.493
December	8.976	0.036	8.940	1.922	229.877	2.718	0.045	0.346
January	6.212	0.197	6.015	1.293	229.877	1.829	0.030	0.233
February	7.225	0.443	6.782	1.458	229.877	2.062	0.034	0.262
March	27.688	1.958	25.730	5.532	229.877	7.822	0.129	0.996
April	52.292	0.243	52.049	11.191	229.877	15.823	0.260	2.014
May	73.017	0.028	72.989	15.693	229.877	22.189	0.365	2.825
June	75.288	-	75.288	16.187	229.877	22.887	0.376	2.914

Month	Export (GWh)	Import (GWh)	NEO (GWh)	Variable Energy Charges (Mln. Rs.)	Capacity Charges (Mln. Rs.)	Water Use/ NHP Charges (Mln. Rs.)	IRSA Charge Amount (Mln. Rs.)	GST @ 17% (NEOxRatexGST Rate) (Mln. Rs.)
108 MW Golen Gol								
July	43.721	0.213	43.508	14.967	264.226	13.226	0.218	2.694
August	41.380	0.250	41.130	14.149	264.226	12.503	0.206	2.547
September	28.842	-	28.842	9.922	264.226	8.768	0.144	1.786
October	16.647	-	16.647	5.726	264.226	5.061	0.083	1.031
November	10.883	0.015	10.868	3.738	264.226	3.304	0.054	0.673
December	8.119	0.393	7.726	2.658	264.226	2.349	0.039	0.478
January	6.530	0.696	5.833	2.007	264.226	1.773	0.029	0.361
February	5.127	1.038	4.089	1.407	264.226	1.243	0.020	0.253
March	3.466	0.015	3.450	1.187	264.226	1.049	0.017	0.214
April	3.660	-	3.660	1.259	264.226	1.113	0.018	0.227
May	4.366	-	4.366	1.502	264.226	1.327	0.022	0.270
June	4.642	-	4.642	1.597	264.226	1.411	0.023	0.287
20 MW Dargai								
July	6.805	0.003	6.802	0.599	16.535	2.068	0.034	0.108
August	5.756	0.008	5.748	0.506	16.535	1.747	0.029	0.091
September	6.652	-	6.652	0.585	16.535	2.022	0.033	0.105
October	6.838	-	6.838	0.602	16.535	2.079	0.034	0.108
November	5.006	-	5.006	0.441	16.535	1.522	0.025	0.079
December	3.999	-	3.999	0.352	16.535	1.216	0.020	0.063
January	1.473	0.001	1.472	0.129	16.535	0.447	0.007	0.023
February	1.804	0.066	1.738	0.153	16.535	0.528	0.009	0.028
March	5.725	0.004	5.721	0.503	16.535	1.739	0.029	0.091
April	5.752	0.005	5.747	0.506	16.535	1.747	0.029	0.091
May	6.737	0.001	6.736	0.593	16.535	2.048	0.034	0.107
June	6.656	0.002	6.654	0.586	16.535	2.023	0.033	0.105
22 MW Rasul								
July	6.429	0.221	6.208	0.975	19.702	1.471	0.031	0.175
August	7.256	0.176	7.080	1.112	19.702	1.678	0.035	0.200
September	6.452	0.204	6.248	0.981	19.702	1.481	0.031	0.177
October	5.403	0.013	5.390	0.846	19.702	1.277	0.027	0.152
November	5.271	-	5.271	0.828	19.702	1.249	0.026	0.149
December	4.478	0.474	4.004	0.629	19.702	0.949	0.020	0.113
January	1.763	1.928	(0.165)	(0.026)	19.702	(0.039)	(0.001)	(0.005)
February	4.481	0.870	3.611	0.567	19.702	0.856	0.018	0.102
March	8.732	0.001	8.731	1.371	19.702	2.069	0.044	0.247
April	8.565	0.001	8.564	1.345	19.702	2.030	0.043	0.242
May	8.886	0.038	8.848	1.389	19.702	2.097	0.044	0.250
June	8.466	0.011	8.455	1.327	19.702	2.004	0.042	0.239
13.5 MW Shadiwal								
July	2.476	-	2.476	0.441	11.257	0.587	0.012	0.079
August	3.060	-	3.060	0.545	11.257	0.725	0.015	0.098
September	3.325	-	3.325	0.592	11.257	0.788	0.017	0.107
October	3.508	-	3.508	0.624	11.257	0.831	0.018	0.112
November	3.753	-	3.753	0.668	11.257	0.889	0.019	0.120
December	3.700	-	3.700	0.659	11.257	0.877	0.018	0.119
January	1.439	0.048	1.391	0.248	11.257	0.330	0.007	0.045
February	1.631	0.030	1.601	0.285	11.257	0.379	0.008	0.051
March	3.903	-	3.903	0.695	11.257	0.925	0.020	0.125
April	3.631	-	3.631	0.646	11.257	0.861	0.018	0.116
May	3.216	-	3.216	0.572	11.257	0.762	0.016	0.103
June	2.777	-	2.777	0.494	11.257	0.658	0.014	0.089
13.20 MW Chichoki Mallian								
July	3.250	0.356	2.894	0.509	11.438	0.686	0.014	0.092
August	4.017	0.265	3.752	0.660	11.438	0.889	0.019	0.119
September	4.069	0.013	4.056	0.714	11.438	0.961	0.020	0.128
October	4.154	0.004	4.150	0.730	11.438	0.984	0.021	0.131
November	2.118	0.360	1.758	0.309	11.438	0.417	0.009	0.056
December	1.722	0.526	1.196	0.210	11.438	0.283	0.006	0.038
January	1.283	1.333	(0.050)	(0.009)	11.438	(0.012)	(0.000)	(0.002)
February	1.480	0.380	1.100	0.194	11.438	0.261	0.005	0.035
March	2.348	0.058	2.290	0.403	11.438	0.543	0.011	0.073
April	3.029	0.050	2.979	0.524	11.438	0.706	0.015	0.094
May	3.557	0.118	3.439	0.605	11.438	0.815	0.017	0.109
June	3.029	0.209	2.820	0.496	11.438	0.668	0.014	0.089

Month	Export (GWh)	Import (GWh)	NEO (GWh)	Variable Energy Charges (Mln. Rs.)	Capacity Charges (Mln. Rs.)	Water Use/ NHP Charges (Mln. Rs.)	IRSA Charge Amount (Mln. Rs.)	GST @ 17% (NEOxRate) (Mln. Rs.)
13.8 MW Nandipur								
July	3.825	0.004	3.821	0.504	11.507	0.906	0.019	0.091
August	4.913	-	4.913	0.649	11.507	1.164	0.025	0.117
September	4.844	-	4.844	0.639	11.507	1.148	0.024	0.115
October	3.883	-	3.883	0.513	11.507	0.920	0.019	0.092
November	1.478	0.011	1.467	0.194	11.507	0.348	0.007	0.035
December	1.018	0.019	0.999	0.132	11.507	0.237	0.005	0.024
January	0.127	0.052	0.076	0.010	11.507	0.018	0.000	0.002
February	1.415	0.007	1.408	0.186	11.507	0.334	0.007	0.033
March	2.712	0.001	2.711	0.358	11.507	0.643	0.014	0.064
April	3.238	0.001	3.237	0.427	11.507	0.767	0.016	0.077
May	4.560	-	4.560	0.602	11.507	1.081	0.023	0.108
June	4.190	-	4.190	0.553	11.507	0.993	0.021	0.100
4 MW Kurram Garhi								
July	3.902	2.828	1.074	0.274	7.700	0.326	0.005	0.049
August	3.913	2.766	1.147	0.292	7.700	0.349	0.006	0.053
September	3.801	2.438	1.363	0.348	7.700	0.414	0.007	0.063
October	3.523	1.931	1.591	0.406	7.700	0.484	0.008	0.073
November	3.606	2.314	1.292	0.329	7.700	0.393	0.006	0.059
December	3.007	2.134	0.874	0.223	7.700	0.266	0.004	0.040
January	3.376	3.134	0.242	0.062	7.700	0.073	0.001	0.011
February	3.945	2.784	1.161	0.296	7.700	0.353	0.006	0.053
March	3.837	2.173	1.664	0.424	7.700	0.506	0.008	0.076
April	3.476	1.759	1.717	0.438	7.700	0.522	0.009	0.079
May	4.332	2.446	1.885	0.481	7.700	0.573	0.009	0.087
June	4.165	2.340	1.825	0.465	7.700	0.555	0.009	0.084
1.1 MW Renala Khurd								
July	0.191	-	0.191	0.065	2.015	0.045	0.001	0.012
August	0.224	-	0.224	0.077	2.015	0.053	0.001	0.014
September	0.193	-	0.193	0.066	2.015	0.046	0.001	0.012
October	0.141	-	0.141	0.048	2.015	0.033	0.001	0.009
November	0.139	-	0.139	0.047	2.015	0.033	0.001	0.009
December	0.116	0.002	0.114	0.039	2.015	0.027	0.001	0.007
January	0.016	0.032	(0.016)	(0.005)	2.015	(0.004)	(0.000)	(0.001)
February	0.065	0.010	0.055	0.019	2.015	0.013	0.000	0.003
March	0.148	-	0.148	0.051	2.015	0.035	0.001	0.009
April	0.189	-	0.189	0.065	2.015	0.045	0.001	0.012
May	0.175	-	0.175	0.060	2.015	0.041	0.001	0.011
June	0.053	-	0.053	0.018	2.015	0.013	0.000	0.003
1 MW Chitral								
July	0.161	-	0.161	0.055	2.165	0.049	0.001	0.010
August	0.034	-	0.034	0.012	2.165	0.010	0.000	0.002
September	0.097	-	0.097	0.033	2.165	0.030	0.000	0.006
October	0.134	-	0.134	0.046	2.165	0.041	0.001	0.008
November	0.168	-	0.168	0.058	2.165	0.051	0.001	0.010
December	0.207	-	0.207	0.071	2.165	0.063	0.001	0.013
January	0.201	-	0.201	0.069	2.165	0.061	0.001	0.012
February	0.193	-	0.193	0.066	2.165	0.059	0.001	0.012
March	0.190	-	0.190	0.065	2.165	0.058	0.001	0.012
April	0.157	-	0.157	0.054	2.165	0.048	0.001	0.010
May	0.173	-	0.173	0.059	2.165	0.053	0.001	0.011
June	0.165	-	0.165	0.057	2.165	0.050	0.001	0.010
17.40 MW Gomal Zam								
July	-	0.038	(0.038)	(0.024)	53.806	(0.011)	(0.000)	(0.004)
August	-	0.055	(0.055)	(0.035)	53.806	(0.017)	(0.000)	(0.006)
September	1.103	0.054	1.049	0.665	53.806	0.319	0.005	0.120
October	6.133	0.000	6.133	3.888	53.806	1.864	0.031	0.700
November	5.744	0.001	5.743	3.641	53.806	1.746	0.029	0.655
December	5.663	0.002	5.661	3.589	53.806	1.721	0.028	0.646
January	2.718	0.058	2.659	1.686	53.806	0.808	0.013	0.303
February	-	0.070	(0.070)	(0.045)	53.806	(0.021)	(0.000)	(0.008)
March	-	0.051	(0.051)	(0.032)	53.806	(0.015)	(0.000)	(0.006)
April	-	0.049	(0.049)	(0.031)	53.806	(0.015)	(0.000)	(0.006)
May	0.579	0.053	0.526	0.334	53.806	0.160	0.003	0.060
June	3.846	0.005	3.841	2.435	53.806	1.168	0.019	0.438

Month	Export (GWh)	Import (GWh)	NEO (GWh)	Variable Energy Charges (Mln. Rs.)	Capacity Charges (Mln. Rs.)	Water Use/ NHP Charges (Mln. Rs.)	IRSA Charge Amount (Mln. Rs.)	GST @ 17% (NEOxRatexGST Rate) (Mln. Rs.)
27 MW Jabban								
July	11.466	0.000	11.466	3.153	63.392	3.486	0.057	0.568
August	12.441	0.002	12.440	3.421	63.392	3.782	0.062	0.616
September	12.633	0.000	12.633	3.474	63.392	3.840	0.063	0.625
October	10.569	-	10.569	2.906	63.392	3.213	0.053	0.523
November	7.740	-	7.740	2.129	63.392	2.353	0.039	0.383
December	7.166	-	7.166	1.971	63.392	2.178	0.036	0.355
January	3.115	0.000	3.115	0.857	63.392	0.947	0.016	0.154
February	2.877	0.004	2.873	0.790	63.392	0.873	0.014	0.142
March	8.326	0.002	8.324	2.289	63.392	2.530	0.042	0.412
April	11.865	0.002	11.863	3.262	63.392	3.606	0.059	0.587
May	14.205	0.001	14.204	3.906	63.392	4.318	0.071	0.703
June	13.540	0.000	13.539	3.723	63.392	4.116	0.068	0.670

Note: The Import of Tarbela+4th Extension is combined and shown under the column of Tarbela's Import, as reported by WAPDA.

Source: WAPDA

TABLE 17
Thermal Electricity Generation by Sector and by Fuel (GWh) (Net)

			2019-20	2020-21	2021-22	2022-23	2023-24
Thermal Generation by:							
GENCOs (I, II, III and IV)			7,907.85	6,802.93	6,349.56	5,957.03	3,489.59
KE Own Power Plants			9,628.90	10,185.60	7,889.96	7,093.09	7,471.32
IPPs: CPPA-G System			60,720.31	68,708.63	76,280.90	56,208.19	54,463.99
IPPs: KE System			1,863.60	2,184.57	2,130.46	1,606.80	1,156.19
Others (SPPs/CPPs/N-CPPs): CPPA-G System			170.99	216.80	136.31	150.02	314.19
Others (SPPs/CPPs/N-CPPs): KE System			534.30	578.90	482.94	406.90	348.33
Total Thermal Generation			80,825.95	88,677.43	93,270.13	71,422.04	67,243.62
Thermal Generation using:							
Gas	CPPA-G System ^[1]	Generation on Gas (GWh)	15,236.30	14,496.44	14,527.43	14,559.06	11,661.53
		Share of Gas Generation (%)	18.85	16.35	15.58	20.38	17.34
	KE System ^[2]	Generation on Gas (GWh)	5,087.56	3,420.59	1,353.51	931.70	762.89
		Share of Gas Generation (%)	6.29	3.86	1.45	1.30	1.13
	Total	Generation on Gas (GWh)	20,323.86	17,917.03	15,880.94	15,490.76	12,424.42
		Share of Gas Generation (%)	25.15	20.20	17.03	21.69	18.48
RLNG	CPPA-G System	Generation on RLNG (GWh)	23,830.59	26,983.52	27,156.62	21,532.51	23,844.98
		Share of RLNG Generation (%)	29.48	30.43	29.12	30.15	35.46
	KE System	Generation on RLNG (GWh)	2,795.90	4,777.93	4,449.66	4,968.91	6,966.61
		Share of RLNG Generation (%)	3.46	5.39	4.77	6.96	10.36
	Total	Generation on RLNG (GWh)	26,626.49	31,761.45	31,606.28	26,501.42	30,811.59
		Share of RLNG Generation (%)	32.94	35.82	33.89	37.11	45.82
RFO	CPPA-G System	Generation on RFO (GWh)	4,178.25	6,331.07	13,276.18	5,033.96	2,441.40
		Share of RFO Generation (%)	5.17	7.14	14.23	7.05	3.63
	KE System ^[3]	Generation on RFO (GWh)	3,730.43	4,264.85	4,024.28	2,831.61	897.00
		Share of RFO Generation (%)	4.62	4.81	4.31	3.96	1.33
	Total	Generation on RFO (GWh)	7,908.68	10,595.92	17,300.46	7,865.57	3,338.40
		Share of RFO Generation (%)	9.78	11.95	18.55	11.01	4.96
HSD	CPPA-G System	Generation on HSD (GWh)	0.67	369.25	1,153.02	216.27	101.67
		Share of HSD Generation (%)	0.00	0.42	1.24	0.30	0.15
	KE System	Generation on HSD (GWh)	0.00	33.00	269.22	28.29	24.89
		Share of HSD Generation (%)	0.00	0.04	0.29	0.04	0.04
	Total	Generation on HSD (GWh)	0.67	402.25	1,422.24	244.56	126.56
		Share of HSD Generation (%)	0.00	0.45	1.52	0.34	0.19
Coal	CPPA-G System	Generation on Coal (GWh)	25,553.34	27,547.78	26,653.52	20,973.90	20,217.91
		Share of Coal Generation (%)	31.62	31.07	28.58	29.37	30.07
	KE System	Generation on Coal (GWh)	412.91	453.00	406.69	346.26	324.54
		Share of Coal Generation (%)	1.59	1.62	1.50	1.62	1.58
	Total	Generation on Coal (GWh)	25,966.25	28,000.78	27,060.21	21,320.16	20,542.45
		Share of Coal Generation (%)	32.13	31.58	29.01	29.85	30.55
Total Thermal Generation			80,825.95	88,677.43	93,270.13	71,422.47	67,243.42

^[1] Including generation of SPPs/CPPs/N-CPPs in CPPA-G System. ^[2] Including generation of IPPs in KE system.

^[3] Including generation of IPPs/CPPs in KE System.

Source: GENCOs/IPPs/KE

TABLE 18
Fuel Consumption and Cost of Generation Data of GENCOs (Net)

Year	Gen. on Gas (GWh)	Gas Consumption		Gen. on RFO (GWh)	RFO Consumption		Cost of Generation (Paisa/kWh)	Overall Fuel Cost of Generation (Rs. Million)
		Total (MMCF)	Cft/kWh (Average)		(000 M.Ton)	(Kg/kWh)		
TPS Jamshoro (GENCO-I)								
2019-20	64.10	886.91	13.72	145.80	49.94	0.33	2,063.90	4,421.75
2020-21	0.00	0.00	0.00	199.55	64.94	0.33	1,952.40	3,895.94
2021-22	0.00	0.00	0.00	245.53	78.42	0.31	3,345.94	8,360.02
2022-23	0.00	0.00	0.00	25.40	8.75	0.34	5,462.88	1,387.79
2023-24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TPS Muzaffargarh (GENCO-III)								
2019-20	10.90	7.46	12.97	288.96	92.80	0.28	2,090.83	7,015.71
2020-21	(7.62)	0.00	0.00	289.84	82.75	0.26	1,918.63	6,012.81
2021-22	0.00	0.00	0.00	220.43	61.31	0.27	3,256.00	6,711.39
2022-23	0.00	0.00	0.00	50.91	14.86	0.29	5,001.00	2,471.62
2023-24	0.00	0.00	0.00	15.23	5.10	0.29	5,999.00	848.23

Power Station	Year	Gen. on Gas (GWh)	Gas Consumption		Cost of Generation (Paisa/kWh)	Overall Fuel Cost of Generation (Rs. Million)
			Total (MMCF)	Cft/kWh (Average)		
TPS Guddu (Units 5-10) (GENCO-II)	2019-20	1,294.84	20,020.65	15.16	1,033.77	13,648.88
	2020-21	1,477.11	23,253.11	15.74	991.80	14,650.08
	2021-22	1,385.84	21,394.19	15.44	1,023.71	14,185.59
	2022-23	1,948.96	27,164.96	13.94	1,118.55	21,800.07
	2023-24	341.73	5,954.82	17.43	1,331.00	4,548.43
TPS Guddu (Units 11-13) (GENCO-II)	2019-20	311.56	6,182.73	19.67	1,381.28	4,341.99
	2020-21	223.96	4,673.71	20.87	1,160.08	2,598.15
	2021-22	148.16	2,411.30	16.26	1,129.09	1,674.39
	2022-23	19.42	307.63	0.02	1,153.85	224.08
	2023-24	0.00	0.00	0.00	0.00	0.00
TPS Guddu (Units 14-16) (GENCO-II)	2019-20	4,315.35	41,643.01	9.43	729.98	31,501.33
	2020-21	3,123.82	30,291.33	9.70	695.86	21,737.45
	2021-22	2,609.95	25,472.57	9.76	687.11	17,933.18
	2022-23	2,635.92	36,421.06	13.82	1,036.59	27,323.74
	2023-24	2,209.13	30,528.93	13.82	1,185.69	26,193.00

Power Station	Year	Gen. on RLNG (GWh)	RLNG Consumption		Cost of Generation (Paisa/kWh)	Overall Fuel Cost of Generation (Rs. Million)
			Total (MMCF)	Cft/kWh (Average)		
GTPS Faisalabad (GENCO-III)	2020-21	14.26	197.48	12.66	2067.37	321.76
	2021-22	98.83	197.48	12.66	3,503.00	2,879.76
	2022-23				Plant de-licensed.	
TPS Nandipur (GENCO-III)	2019-20	1,476.33	12,030.47	7.88	1,108.49	16,933.94
	2020-21	1,481.98	0.00	0.00	9,620.00	14,813.81
	2021-22	1,640.82	13,383.40	8.12	2,039.00	33,615.00
	2022-23	1,276.42	10,809.07	8.21	27.97	36,842.00
	2023-24	923.50	7,979.41	8.28	28.28	27,240.00

Source: GENCOs

TABLE 19
Auxiliary Consumption and other Factors of GENCOs

Power Station	Year	Auxiliary Consumption		Maximum Load (MW)	Load Factor (%)	Capacity Factor (%)	Utilization Factor (%)	Availability Factor (%)
		(GWh)	(%)					
TPS Jamshoro (GENCO-I)	2019-20	25.56	10.25	320	75.49	45.07	0.94	74.57
	2020-21	24.17	10.28	290	66.01	40.85	0.88	95.83
	2021-22	23.29	8.35	355	84.87	50.00	4.40	90.25
	2022-23	4.35	14.31	125	100.00	62.50	2.70	91.78
	2023-24	0.00	0.00	0.00	0.00	0.00	0.00	77.78
TPS Guddu (Units 5-10) (GENCO-II)	2019-20	25.46	0.63	468	32.12	78.00	28.36	83.17
	2020-21	19.20	0.60	440	38.82	28.47	31.06	66.82
	2021-22	27.61	0.12	393	41.05	26.89	28.76	78.95
	2022-23	30.38	0.80	390	57.94	37.66	41.08	93.11
	2023-24	3.74	0.67	235	16.74	6.55	7.15	n.p.
TPS Guddu (Units 11-13) (GENCO-II)	2019-20	2.78	0.13	252	14.20	96.92	13.76	62.33
	2020-21	2.45	0.34	160	16.15	6.23	6.46	21.42
	2021-22	0.88	0.59	95	17.93	6.55	6.55	28.22
	2022-23	0.18	0.61	95	2.35	0.54	0.56	2.54
	2023-24	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TPS Guddu (Units 14-16) (GENCO-II)	2019-20	101.87	1.80	795	61.80	106.43	68.16	86.44
	2020-21	77.98	1.70	748	47.67	48.93	48.93	69.92
	2021-22	76.72	2.03	600	51.12	41.06	42.55	57.07
	2022-23	23.09	7.00	690	43.61	40.63	40.63	50.64
TPS Muzaffargarh (GENCO-III)	2023-24	21.76	0.73	486	52.27	34.34	34.34	n.p.
	2019-20	51.44	0.60	660	5.79	48.89	3.23	79.83
	2020-21	37.08	0.43	700	5.11	51.85	3.02	77.48
	2021-22	15.27	6.63	340	8.25	4.45	4.45	81.86
	2022-23	3.47	6.81	170	3.65	3.38	3.38	59.26
GTPS Faisalabad (GENCO-III)	2023-24	1.25	7.22	170	1.18	1.15	1.15	63.76
	2020-21	6.17	39.54	80	2.23	55.56	1.62	96.25
	2021-22	10.74	10.01	85	14.42	59.03	8.51	91.00
TPS Nandipur (GENCO-III)	2022-23	Plant de-licensed.						
	2019-20	52.10	2.89	541	32.23	30.87	33.47	95.31
	2020-21	57.51	2.87	541	32.48	31.10	33.73	95.03
	2021-22	50.53	3.07	541	35.84	34.31	37.21	90.81
	2022-23	50.55	3.96	557	26.99	26.61	28.86	94.85
	2023-24	41.65	4.32	506	21.73	19.46	21.11	93.17

Source: GENCOs

TABLE 20
Heat Rate and Plant Efficiency Data of GENCOs

Power Station	Year	Heat Rate (Btu/kWh)		Plant Efficiency (%)	
		On Gross Generation	On Net Export to NTDC	On Gross Generation	On Net Export to NTDC
TPS Jamshoro (GENCO-I)	2019-20	11,622.72	12,950.44	29.36	26.35
	2020-21	11,186.50	12,468.66	30.51	27.37
	2021-22	11,380.83	12,706.56	29.98	26.86
	2022-23	11,670.06	13,946.19	29.24	24.47
	2023-24	0.00	0.00	0.00	0.00
TPS Guddu (Units 5-10) (GENCO-II)	2019-20	10,075.00	10,280.00	33.88	33.20
	2020-21	10,526.00	10,663.00	32.42	32.01
	2021-22	9,687.00	9,880.00	35.23	34.54
	2022-23	9,200.00	9,343.00	37.09	36.52
	2023-24	9,374.00	9,477.00	36.40	36.00
TPS Guddu (Units 11-13) (GENCO-II)	2019-20	13,844.00	13,977.00	24.65	24.42
	2020-21	15,165.00	15,331.00	22.51	22.26
	2021-22	12,176.00	12,248.00	28.03	27.87
	2022-23	9,341.00	9,426.00	36.53	36.20
	2023-24	0.00	0.00	0.00	0.00
TPS Guddu (Units 14-16) (GENCO-II)	2019-20	5,933.00	6,097.00	57.53	55.98
	2020-21	5,994.00	6,144.00	56.94	55.55
	2021-22	6,091.00	9,270.00	56.03	54.43
	2022-23	6,279.00	6,334.00	54.34	53.87
	2023-24	9,374.00	9,470.00	36.40	36.03
TPS Muzaffargarh (GENCO-III)	2019-20	10,683.58	11,037.73	31.94	30.92
	2020-21	10,181.59	10,496.14	33.52	32.51
	2021-22	9,618.10	10,255.31	35.49	31.45
	2022-23	10,597.33	11,321.69	32.22	30.16
	2023-24	10,558.08	11,319.09	32.33	30.15
GTPS Faisalabad (GENCO-III)	2020-21	12,755.00	14,105.00	26.76	21.01
	2021-22	12,754.00	14,285.00	26.76	23.89
	2022-23	Plant de-licensed.			
TPS Nandipur (GENCO-III)	2019-20	7,032.00	7,281.00	48.52	46.87
	2020-21	7,060.00	7,334.00	48.34	46.53
	2021-22	6,831.00	7,037.00	48.50	49.96
	2022-23	6,609.00	6,848.00	51.63	49.83
	2023-24	6,636.00	6,858.00	51.43	49.76

Source: GENCOs

TABLE 21
Fuel Consumption and Cost of Generation Data of IPPs (Net)

(Residual Furnace Oil based Power Plant)						
Power Station	Year	Units Generated (GWh) (Net)	Quantity of RFO used (000 M. Tons)	Cost of Fuel (Rs. in Million)	Average Fuel Cost (Rs./kWh)	Overall Generation Cost (Rs./kWh)
Lal Pir Power	2019-20	186.32	48.24	n.p.	15.25	n.p.
	2020-21	620.78	151.87	n.p.	14.53	n.p.
	2021-22	1,022.68	244.37	28,504.67	27.87	n.p.
	2022-23	397.59	95.67	15,291.86	38.46	56.41
	2023-24	358.99	86.41	13,264.88	36.95	n.p.
Pak Gen. Power	2019-20	149.76	38.39	n.p.	15.49	n.p.
	2020-21	445.54	109.16	n.p.	15.05	n.p.
	2021-22	1,304.35	312.92	35,926.41	27.54	n.p.
	2022-23	443.74	107.96	16,788.38	37.83	53.94
	2023-24	211.00	51.12	8,202.19	38.87	n.p.
Hub Power	2019-20	32.38	9.62	n.p.	17.10	19.20
	2020-21	112.91	47.59	n.p.	17.32	19.50
	2021-22	1,219.58	303.62	29,837.88	24.28	26.71
	2022-23	204.78	50.73	8,276.07	40.41	43.13
	2023-24	0.00	0.00	0.00	0.00	0.00
Saba Power	2019-20	50.83	14.25	n.p.	18.23	40.06
	2020-21	121.65	33.15	n.p.	17.89	28.12
	2021-22	329.95	88.24	10,329.68	31.33	35.94
	2022-23	149.00	40.24	5,826.97	39.11	52.16
	2023-24	54.18	15.37	2,607.31	48.12	86.10
Kohinoor Energy	2019-20	363.86	70.11	n.p.	12.16	17.26
	2020-21	337.07	64.82	n.p.	11.99	16.00
	2021-22	515.84	99.68	11,515.57	22.33	25.27
	2022-23	329.16	63.55	9,139.91	27.77	33.46
	2023-24	207.62	39.71	6,445.68	31.05	42.72
Attock Gen.	2019-20	320.96	58.53	n.p.	10.12	20.24
	2020-21	384.03	71.94	n.p.	11.56	20.75
	2021-22	721.93	131.11	16,154.65	21.62	33.18
	2022-23	483.59	91.63	11,600.69	23.42	29.47
	2023-24	206.47	38.95	5,909.44	32.97	59.75
Atlas Power	2019-20	259.33	48.96	n.p.	n.p.	n.p.
	2020-21	517.08	102.33	n.p.	n.p.	n.p.
	2021-22	1,007.25	199.22	22,527.00	22.36	24.70
	2022-23	521.94	103.57	15,038.00	28.81	34.43
	2023-24	252.87	49.61	8,139.00	32.44	45.43
Nishat Power	2019-20	277.46	54.59	n.p.	13.83	13.83
	2020-21	523.40	102.96	n.p.	12.50	12.50
	2021-22	794.25	156.23	18,127.06	22.82	22.82
	2022-23	537.90	105.81	16,062.55	29.86	29.86
	2023-24	453.69	89.24	14,733.87	32.48	32.48
Nishat Chunian	2019-20	351.23	69.09	n.p.	14.19	23.40
	2020-21	537.57	105.74	n.p.	12.11	16.27
	2021-22	882.46	173.58	19,970.00	22.33	26.15
	2022-23	386.13	75.95	11,392.00	29.87	37.20
	2023-24	240.45	46.71	7,992.10	33.24	33.24
Liberty Power Tech.	2019-20	458.54	88.12	n.p.	n.p.	n.p.
	2020-21	606.66	116.07	n.p.	n.p.	n.p.
	2021-22	925.44	178.17	21,073.84	23.12	28.27
	2022-23	556.15	105.12	15,346.24	29.00	37.02
	2023-24	239.94	46.30	169,819.00	33.09	36.15
Narowal Energy	2019-20	338.08	67.32	n.p.	13.42	18.33
	2020-21	496.06	98.00	n.p.	12.35	16.83
	2021-22	867.49	170.42	19,985.40	22.71	26.35
	2022-23	469.88	96.22	14,471.82	29.01	31.12
	2023-24	200.96	39.54	7,057.38	37.30	40.19

(Gas based Power Plant)						
Power Station	Year	Units Generated (GWh) (Net)	Quantity of Gas used (MMBTU)	Cost of Fuel (Rs. in Million)	Average Fuel Cost (Rs./kWh)	Overall Generation Cost (Rs./kWh)
Liberty Daharki Power	2019-20	896.74	7946696	n.p.	12.26	15.63
	2020-21	983.33	8498852	n.p.	9.00	12.00
	2021-22	1,054.06	8815307	11,632.00	11.04	13.19
	2022-23	1,001.19	8430136	22,024.00	22.00	26.19
	2023-24	903.87	7693127	22,717.00	25.13	31.65
Engro Powergen. Qadirpur	2019-20	700.74	6077764	n.p.	7.68	8.99
	2020-21	648.50	6169067	n.p.	7.15	8.57
	2021-22	791.03	6634350	6,694.00	7.90	9.10
	2022-23	935.42	8264005	8,352.00	7.93	9.64
	2023-24	813.48	7347640	7,715.00	8.96	0.00
Foundation Power	2019-20	777.30	6578836	n.p.	n.p.	n.p.
	2020-21	1,000.37	8258762	n.p.	n.p.	n.p.
	2021-22	1,272.89	10020395	n.p.	6.76	8.47
	2022-23	1,190.38	9610632	9,546.90	8.02	10.38
	2023-24	1,087.56	9087394	9,848.95	9.05	11.59
Uch Power	2019-20	4,087.33	31456577	19,270.00	n.p.	5.05
	2020-21	4,088.44	31503489	27,776.00	n.p.	n.p.
	2021-22	4,300.52	32978917	34,986.03	7.32	8.25
	2022-23	3,901.33	30144743	39,909.61	8.34	9.42
	2023-24	3,965.85	31085313	43,596.74	9.11	10.33
Uch-II Power	2019-20	2,148.02	16349080	15,263.00	4.58	6.33
	2020-21	2,339.37	17715815	22,505.00	n.p.	n.p.
	2021-22	2,828.67	21106347	19,306.31	6.06	7.97
	2022-23	2,776.43	20673942	25,436.11	8.00	10.41
	2023-24	2,025.72	15128943	28,231.86	8.86	11.55

(RLNG based Power Plant)						
Power Station	Year	Units Generated (GWh) (Net)	Quantity of RLNG used (MMBTU)	Cost of Fuel (Rs. in Million)	Average Fuel Cost (Rs./kWh)	Overall Generation Cost (Rs./kWh)
Fauji Kabirwala	2019-20	346.32	2994671	n.p.	11.93	15.04
	2020-21	389.96	3518311	n.p.	9.35	12.24
	2021-22	357.21	3183962	8,690.00	24.33	26.60
	2022-23	66.33	586352	2,135.29	32.19	42.71
	2023-24	92.01	822360	2,996.67	32.57	40.52
Rousch Power	2019-20	217.53	1901263	n.p.	13.21	28.13
	2020-21	284.36	2403898	n.p.	12.25	23.61
	2021-22	495.78	4249152	12,525.50	25.26	31.81
	2022-23	179.04	1586681	5,543.26	30.96	51.57
	2023-24	9.71	79734	285.80	29.45	36.06
Punjab Thermal Power	2021-22	77.56	782592	3,077.00	0.00	0.00
	2022-23	152.62	1003965	3,395.00	22.24	22.55
	2023-24	3,197.29	20834853	72,616.00	22.92	34.32

(Coal based Power Plant)						
Power Station	Year	Units Generated (GWh) (Net)	Quantity of Coal used (000 M. Tons)	Cost of Fuel (Rs. in Million)	Average Fuel Cost (Rs./kWh)	Overall Generation Cost (Rs./kWh)
Huaneng Shandong Ruyi (Sahiwal Imported Coal)	2019-20	6,167.19	2,270.37		7.31	n.p.
	2020-21	7,342.70	2,750.14		7.87	n.p.
	2021-22	6,881.38	1,443.97		20.16	26.15
	2022-23	2,876.85	1,180.00		27.25	34.19
	2023-24	2,075.55	772.00		20.93	27.05
Port Qasim Electric Power	2019-20	8,969.74	4,023.93		5.93	14.62
	2020-21	8,372.34	3,618.00		5.39	13.14
	2021-22	7,478.64	3,318.74		13.09	25.12
	2022-23	3,203.00	1,751.77	154,459.66	16.70	48.22
	2023-24	782.26	368.09	157,986.68	16.00	27.41
China Power Hub	2019-20	6,136.20	2,252.72		5.60	n.p.
	2020-21	7,923.41	3,129.71		5.48	n.p.
	2021-22	6,764.89	2,619.61		12.26	12.79
	2022-23	1,546.82	620.28	43,027.72	29.55	37.74
	2023-24	476.55	131.77	9,536.82	21.63	34.83

Power Station	Year	Units Generated (GWh) (Net)	Quantity of Coal used (000 M. Tons)	Cost of Fuel (Rs. in Million)	Average Fuel Cost (Rs./kWh)	Overall Generation Cost (Rs./kWh)
Engro Powergen Thar	2019-20	4,280.22	3,776.90		5.98	9.56
	2020-21	3,909.30	3,612.93		5.94	11.89
	2021-22	3,676.95	3,347.68		2.50	3.59
	2022-23	3,646.06	3,270.64		3.33	4.52
	2023-24	3,766.20	3,429.20		3.80	4.80
Lucky Electric Power	2021-22	1,774.10	1,428.92		16.27	16.49
	2022-23	3,316.14	2,787.12	53,441.96	14.11	14.43
	2023-24	1,688.45	1,366.00	24,823.04	13.87	14.25
Thar Energy	2022-23	1,205.57	921.03	16,575.00	13.38	21.34
	2023-24	1,948.50	1,702.98	24,647.00	12.65	28.26
Thar Coal Block-I	2022-23	4,255.92	2,795.45	51,109.78	16.29	17.49
	2023-24	7,500.33	6,372.81	114,160.81	15.22	16.41
ThalNova Power	2022-23	923.54	682.75	10,862.00	11.50	27.53
	2023-24	1,979.84	1,733.37	25,030.00	12.64	27.42

Power Station	Year	RLNG			HSD			Average Fuel Cost (Rs./kWh)	Overall Generation Cost (Rs./kWh)
		Units Generated (GWh)	Quantity of RLNG used (MMBTU)	Cost of Fuel (Rs. in Million)	Units Generated (GWh) (Net)	Quantity of HSD used (000 Liters)	Cost of Fuel (Rs. in Million)		
Sapphire Electric	2019-20	296.54	2337975	3,546.50	0.22	2424	169.98	12.41	16.53
	2020-21	437.99	3544896	4,727.40	130.05	28700	2,573.97	12.85	14.71
	2021-22	700.18	5568946	15,644.76	80.32	17477	1,327.77	21.75	23.35
	2022-23	452.52	3758333	13,145.05	0.00	0	0.00	29.05	32.73
	2023-24	479.36	3887675	13,649.93	0.00	0	0.00	28.48	35.77
Halmore Power	2019-20	347.69	2846605	4,039.40	0.00	0	0.00	11.62	15.72
	2020-21	471.67	3816584	4,717.45	38.12	11088	941.84	10.89	13.52
	2021-22	627.95	4986056	14,539.00	47.98	10385	1,062.00	23.08	25.81
	2022-23	287.05	2380956	8,116.00	0.00	0	0.00	28.27	34.93
	2023-24	207.55	1745118	5,968.00	0.00	0	0.00	29.00	39.19
Saif Power	2019-20	476.18	3738827	5,027.09	0.12	53	3.73	12.03	21.68
	2020-21	605.62	4757884	5,969.31	33.79	7167	637.88	10.52	15.239
	2021-22	652.41	5105963	14,649.56	82.58	17951	2,061.73	23.58	28.13
	2022-23	538.22	4275013	15,190.85	0.00	0	0.00	28.44	35.42
	2023-24	220.59	1835685	6,388.89	0.00	0	0.00	28.84	47.28
Orient Power	2019-20	337.67	2735769	4,075.00	0.33	121	4.00	12.07	16.83
	2020-21	540.74	4334139	1,618.00	57.18	18413	5,670.00	11.69	14.58
	2021-22	774.29	6167599	17,318.00	62.09	13634	1,432.00	22.42	28.45
	2022-23	604.79	4978592	17,204.00	0.00	0	0.00	28.45	33.08
	2023-24	541.08	4361469	15,317.00	0.00	0	0.00	28.31	33.12
QATPL (Bhikki)	2019-20	5,192.50	33462106					8.81	11.18
	2020-21	7,118.80	45974433					7.79	8.36
	2021-22	5,680.52	37289685	102,320.00	410.41	82602	9,123.00	15.87	18.53
	2022-23	4,637.23	30817773	104,659.02	60.32	11960	1,649.96	21.08	28.42
	2023-24	3,564.79	23392754	80,679.16	95.36	18666	4129.49	22.04	30.67
NPPMCL (HBS)	2019-20	7,050.34	44350901					8.84	9.08
	2020-21	7,682.35	48283250					7.96	8.13
	2021-22	7,367.77	46730135	123,819.00	120.79	23431	2,025.00	16.80	17.02
	2022-23	6,437.19	40888370	137,239.00	83.36	16342	2,228.00	20.35	20.67
	2023-24	7,903.78	50545992	176,146.00	0.00	0	0.00	22.21	22.61
NPPMCL (Balloki)	2019-20	5,911.84	38060169					8.97	9.24
	2020-21	6,032.81	38407023					7.92	8.11
	2021-22	6,896.86	44274716	118,610.00	289.85	57818	6,702.00	17.44	17.68
	2022-23	6,791.06	44024060	148,957.00	72.59	13642	1,897.00	20.51	20.86
	2023-24	6,678.32	43432342	151,103.00	6.31	1212	176.00	22.63	23.07
Punjab Thermal Power	2021-22	77.56	782592	3,077.00	0.00	0.00			
	2022-23	152.62	1003965	3,395.00	22.24	22.55			
	2023-24	3,163.70	20834853	72,616.00	22.92	34.32			

Power Station	Year	RLNG			RFO			HSD			Average Fuel Cost (Rs./ kWh)	Overall Generation Cost (Rs./ kWh)
		Units Generated (GWh) (Net)	Quantity of RLNG used (MMBTU)	Cost of Fuel (Rs. in Million)	Units Generated (GWh) (Net)	Quantity of RFO used (000 M. Tons)	Cost of Fuel (Rs. in Million)	Units Generated (GWh) (Net)	Quantity of HSD used (000 Liters)	Cost of Fuel (Rs. in Million)		
KAPCO	2019-20	2,523.98	21678499	30,793.00	952.69	187.51	n.p.	0.00	3,918.94	302.00	12.70	14.40
	2020-21	2,313.21	20013290	23,701.00	1,138.92	223.25	n.p.	110.11	29,553.45	2,660.00	11.33	12.84
	2021-22	1,864.00	16158851	46,396.00	3,219.00	638.09	74,579.00	59.00	21,027.50	2,255.00	24.75	25.72
	2022-23	110.05	1059159	3,782.00	477.79	100.36	17,617.00	0.00	1,775.79	247.00	36.82	44.24
	2023-24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Source: IPPs

TABLE 22
Auxiliary Consumption and other Factors of IPPs

Power Station	Year	Auxiliary Consumption		Maximum Load (MW)	Load Factor (%)	Capacity Factor (%)	Utilization Factor (%)	Availability Factor (%)
		(GWh)	(%)					
Lal Pir Power	2019-20	15.34	7.61	350	44.60	6.08	n.p.	93.11
	2020-21	41.26	6.23	350	63.31	20.25	n.p.	96.91
	2021-22	68.38	6.27	350	77.85	33.36	100.00	92.61
	2022-23	27.08	6.38	350	78.68	12.97	100.00	79.30
	2023-24	23.62	6.17	350	69.61	11.68	12.10	96.17
Pak Gen. Power	2019-20	11.62	7.20	350	48.71	4.88	n.p.	83.77
	2020-21	31.32	6.57	350	63.99	14.53	n.p.	96.10
	2021-22	85.85	6.18	350	78.91	42.54	100.00	91.82
	2022-23	31.03	6.54	350	74.04	14.47	100.00	89.79
	2023-24	14.19	6.30	350	67.40	6.86	7.00	84.81
Fauji Kabirwala	2019-20	11.67	3.26	141	36.56	27.27	28.21	98.47
	2020-21	13.13	3.26	147	48.86	30.54	31.16	96.25
	2021-22	12.22	3.31	147	45.30	27.96	28.25	92.69
	2022-23	2.28	3.32	151	19.51	5.12	5.22	91.36
	2023-24	3.00	3.15	151	69.48	7.29	7.37	83.16
Hub Power	2019-20	4.00	10.06	1,200	0.34	0.34	0.37	n.p.
	2020-21	17.74	9.41	1,200	1.79	1.79	1.96	n.p.
	2021-22	104.03	7.81	1,200	11.69	11.69	12.84	91.04
	2022-23	18.20	8.16	1,200	1.94	1.94	2.17	92.34
	2023-24	0.00	0.00	1,200	0.00	0.00	0.00	92.57
KAPCO	2019-20	88.00	2.50	1,449	29.50	88.90	33.20	88.90
	2020-21	105.00	2.90	1,422	30.30	85.60	35.40	85.60
	2021-22	168.00	3.30	1,525	42.40	90.00	47.00	90.00
	2022-23	29.00	4.80	1,102	5.00	97.00	15.70	97.00
	2023-24	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kohinoor Energy	2019-20	11.55	3.08	124	86.89	33.41	36.16	98.01
	2020-21	10.60	3.05	124	86.03	31.04	33.85	97.71
	2021-22	16.35	3.07	124	90.82	47.49	51.76	92.38
	2022-23	10.49	3.09	124	90.20	30.30	32.94	98.19
	2023-24	6.73	3.14	124	88.85	19.06	21.09	98.07
Rousch Power	2019-20	11.73	5.39	411	7.41	6.29	7.06	97.00
	2020-21	12.80	4.51	413	9.05	8.20	8.70	97.00
	2021-22	17.74	4.00	429	28.40	14.30	27.80	91.00
	2022-23	9.98	5.57	421	5.90	5.17	5.66	84.79
	2023-24	0.17	1.78	409	0.42	0.28	0.40	93.90
Saba Power	2019-20	4.08	7.40	126	5.13	4.63	4.63	90.20
	2020-21	9.08	6.92	123	12.95	11.32	11.32	87.43
	2021-22	21.99	6.44	125	35.25	30.10	30.10	85.41
	2022-23	10.66	6.68	125	16.45	14.54	14.54	88.06
	2023-24	4.24	7.23	125	5.57	4.93	4.93	88.59
Liberty Daharki Power	2019-20	25.46	2.75	215	67.70	48.08	71.56	94.14
	2020-21	20.49	2.03	220	74.46	53.06	81.42	91.05
	2021-22	18.36	1.71	225	87.82	56.78	57.34	99.03
	2022-23	19.16	1.87	226	79.66	53.79	66.59	80.78
	2023-24	18.97	2.05	240	70.35	46.54	51.32	90.69
Uch Power	2019-20	72.87	1.75	551	84.41	85.32	94.06	89.83
	2020-21	72.60	1.74	550	84.97	86.38	90.17	94.54
	2021-22	75.80	1.73	551	89.17	90.22	94.87	94.20
	2022-23	70.80	1.79	547	81.48	82.03	92.45	90.02
	2023-24	71.10	1.76	548	82.45	83.47	91.08	90.57
Attock Gen.	2019-20	8.97	2.77	158	22.66	22.92	32.92	99.60
	2020-21	11.28	2.85	158	28.00	38.00	38.00	98.19
	2021-22	19.63	2.65	157	52.00	53.00	69.00	90.28
	2022-23	13.32	2.68	158	35.00	35.00	46.00	95.95
	2023-24	5.75	2.71	158	15.00	15.00	21.00	98.33
Atlas Power	2019-20	9.11	3.51	215	13.82	13.82	15.40	n.p.
	2020-21	19.55	3.83	215	27.27	27.27	30.34	n.p.
	2021-22	37.99	3.77	215	53.77	53.77	58.11	91.67
	2022-23	18.94	3.63	210	27.86	27.86	30.89	86.79
	2023-24	8.63	3.41	215	13.47	13.47	15.03	90.80

Power Station	Year	Auxiliary Consumption		Maximum Load (MW)	Load Factor (%)	Capacity Factor (%)	Utilization Factor (%)	Availability Factor (%)
		(GWh)	(%)					
Engro Power Gen. Qadirpur	2019-20	28.99	4.14	218	38.79	95.81	40.39	92.00
	2020-21	31.12	4.58	151	40.29	97.03	41.81	90.00
	2021-22	32.95	4.00	209	50.00	84.00	60.00	78.00
	2022-23	39.67	4.20	163	50.00	100.00	50.00	99.00
	2023-24	36.94	4.60	159	43.00	n.p.	46.00	100.00
Saif Power	2019-20	14.09	2.87	206	28.55	25.79	26.47	92.34
	2020-21	18.51	2.81	214	37.09	34.65	35.87	94.00
	2021-22	21.04	2.78	212	43.36	39.75	41.45	94.77
	2022-23	17.79	3.20	224	30.81	29.11	30.03	94.44
	2023-24	7.75	3.40	207	12.71	11.86	12.29	84.45
Orient Power	2019-20	12.82	3.79	210	18.41	18.14	27.51	93.00
	2020-21	20.04	3.21	214	33.21	33.46	48.57	93.00
	2021-22	24.14	2.89	218	43.87	44.89	59.37	92.00
	2022-23	19.84	3.28	217	31.87	32.46	50.44	92.00
	2023-24	17.03	3.15	223	27.70	29.04	40.85	93.00
Nishat Power	2019-20	8.22	2.88	195	17.29	16.27	17.29	95.22
	2020-21	14.93	2.77	195	32.65	30.73	32.65	96.37
	2021-22	22.41	2.74	195	51.33	46.61	51.33	93.70
	2022-23	15.03	2.72	195	32.51	31.56	32.51	94.00
	2023-24	12.36	2.65	195	28.70	26.24	28.70	95.49
Nishat Chunian	2019-20	9.79	2.71	196	54.73	20.43	21.84	89.09
	2020-21	14.58	2.64	196	66.26	31.35	47.95	95.89
	2021-22	23.41	2.58	196	71.77	51.47	56.04	91.54
	2022-23	10.44	2.63	196	83.88	22.52	23.13	91.40
	2023-24	6.39	2.59	196	55.92	13.99	25.13	93.77
Sapphire Electric Power	2019-20	13.22	4.41	208	17.90	16.12	16.62	95.32
	2020-21	20.28	3.57	221	35.73	30.57	31.47	88.89
	2021-22	24.30	3.11	222	48.08	42.01	43.19	91.14
	2022-23	16.97	3.75	223	26.75	24.35	25.13	95.41
	2023-24	17.17	3.58	210	28.69	25.80	26.59	92.06
Halmore Power	2019-20	14.27	4.10	204	20.04	20.04	19.99	99.02
	2020-21	19.06	3.67	215	32.06	32.06	33.54	82.67
	2021-22	20.27	3.00	211	39.73	39.73	41.94	89.00
	2022-23	11.93	4.15	221	21.56	21.56	19.29	88.94
	2023-24	9.50	4.58	197	13.17	13.19	11.88	89.09
Narowal Energy	2019-20	7.11	2.07	214	18.00	18.00	18.65	n.p.
	2020-21	10.03	1.98	214	26.41	26.41	27.97	n.p.
	2021-22	15.68	1.78	214	46.31	46.31	52.75	87.80
	2022-23	8.09	1.69	214	25.09	25.09	27.58	90.97
	2023-24	3.42	1.67	214	10.70	10.70	10.89	98.22
Liberty Power Tech.	2019-20	10.65	2.27	196	95.20	26.61	28.11	97.78
	2020-21	13.88	2.24	196	95.30	35.50	37.24	96.85
	2021-22	20.18	2.13	196	95.70	53.86	56.50	91.70
	2022-23	11.61	2.09	196	94.90	31.69	33.50	97.56
	2023-24	5.09	2.08	196	93.16	13.93	33.50	95.96
Foundation Power	2019-20	27.43	3.01	195	n.p.	52.74	51.60	92.86
	2020-21	28.99	2.63	196	n.p.	71.86	70.81	97.84
	2021-22	32.31	2.39	195	81.40	88.51	88.31	91.75
	2022-23	31.56	2.52	182	86.00	81.20	99.10	83.60
	2023-24	31.95	2.84	185	n.p.	71.82	92.56	93.50
Uch-II Power	2019-20	55.12	2.49	355	68.83	69.29	72.87	94.82
	2020-21	57.00	2.37	371	71.96	72.97	76.05	94.58
	2021-22	65.30	2.25	362	89.18	89.83	95.81	93.99
	2022-23	67.00	2.34	360	87.97	88.17	91.13	98.01
	2023-24	52.90	2.54	359	64.21	64.45	73.49	87.60
Huaneng Shandong Ruyi (Sahiwal Imported Coal)	2019-20	76.48	5.79	1,244	58.15	54.80	90.00	98.00
	2020-21	76.48	5.79	1,244	67.38	63.50	94.09	96.00
	2021-22	76.48	5.79	1,244	63.18	59.01	99.25	100.00
	2022-23	163.60	5.38	1,244	26.41	26.31	51.37	100.00
	2023-24	115.00	5.25	1,244	19.05	18.94	41.40	100.00

Power Station	Year	Auxiliary Consumption		Maximum Load (MW)	Load Factor (%)	Capacity Factor (%)	Utilization Factor (%)	Availability Factor (%)
		(GWh)	(%)					
QATPL (Bhikki)	2019-20	131.74	2.47	1,163	53.91	51.88	53.91	96.74
	2020-21	188.62	2.58	1,181	77.27	71.84	77.27	93.74
	2021-22	171.40	2.74	1,127	67.11	61.80	67.11	94.68
	2022-23	142.58	2.95	1,164	55.03	47.89	56.64	87.01
	2023-24	110.30	2.93	1,144	37.78	37.29	38.22	98.71
NPPMCL (Haveli Bahadur Shah)	2019-20	189.06	2.61	1,261	69.92	69.86	70.03	95.81
	2020-21	191.82	2.44	1,246	78.58	77.07	80.35	95.92
	2021-22	181.94	2.37	1,221	87.16	74.40	87.74	84.35
	2022-23	158.00	2.36	1,210	83.19	64.37	83.19	77.26
	2023-24	186.00	2.30	1,202	78.30	77.30	81.50	96.10
NPPMCL (Balloki)	2019-20	219.95	3.59	1,214	62.06	56.78	62.10	94.82
	2020-21	223.89	3.58	1,217	75.77	58.73	75.83	81.09
	2021-22	255.57	3.43	1,207	81.47	70.38	81.45	89.66
	2022-23	240.83	3.39	1,203	71.60	67.48	71.59	96.22
	2023-24	243.81	3.52	1,194	69.63	65.76	70.36	95.04
Port Qasim Electric Power	2019-20	558.13	5.86	1,243	86.34	94.16	77.36	99.59
	2020-21	483.97	5.47	1,243	89.44	94.16	72.41	98.96
	2021-22	444.94	5.62	1,243	84.27	94.16	64.68	88.00
	2022-23	247.61	7.22	1,243	70.45	94.16	27.70	92.27
	2023-24	93.35	11.08	1,243	57.89	94.16	6.77	93.24
China Power Hub	2019-20	364.91	6.09	660	59.02	59.32	82.95	95.44
	2020-21	465.01	5.55	660	72.41	72.49	93.74	94.57
	2021-22	376.74	5.28	660	61.83	61.65	94.88	73.00
	2022-23	127.47	7.73	660	14.14	14.25	22.55	91.00
	2023-24	24.50	7.18	660	2.90	2.90	13.90	99.99
Engro Powergen Thar	2019-20	403.11	9.00	612	80.90	n.p.	93.50	85.30
	2020-21	360.97	9.00	608	74.10	91.71	90.00	81.40
	2021-22	335.73	9.00	606	69.66	77.87	96.22	71.88
	2022-23	359.60	9.00	611	69.15	95.50	86.14	80.26
	2023-24	371.50	9.00	611	71.50	98.00	82.70	85.90
Lucky Electric Power	2021-22	88.36	7.63	607	71.97	71.97	71.64	75.74
	2022-23	284.27	8.57	607	62.53	91.89	73.73	85.13
	2023-24	141.36	8.37	614	31.73	100.00	35.77	92.03
Punjab Thermal Power	2022-23	4.73	2.63	1,203	73.00	64.00	88.00	88.00
	2023-24	103.23	2.80	1,232	35.08	29.07	35.16	85.79
Thar Energy	2022-23	95.13	8.30	301	53.34	53.01	63.60	83.87
	2023-24	183.07	8.59	301	73.76	73.53	78.60	93.55
Thar Coal Block-I	2022-23	231.59	6.87	660	72.69	73.44	85.56	88.32
	2023-24	540.07	6.72	660	69.26	69.27	67.47	91.75
ThalNova Power	2022-23	70.68	8.48	301	78.90	78.55	84.69	92.75
	2023-24	180.99	8.38	301	74.96	73.53	80.23	93.43

Source: IPPs

TABLE 23
Heat Rate and Plant Efficiency Data of IPPs

Power Station	Year	Heat Rate (Btu/kWh)		Plant Efficiency (%)	
		On Gross Generation	On Net Export to NTDC	On Gross Generation	On Net Export to NTDC
Lal Pir Power	2019-20	9,274.86	10,038.39	36.79	33.99
	2020-21	8,855.96	9,444.58	38.53	36.13
	2021-22	8,653.68	9,232.32	39.43	36.96
	2022-23	8,680.85	9,272.01	39.31	36.80
	2023-24	8,648.02	9,217.13	39.46	37.02
Pak Gen. Power	2019-20	9,224.70	9,940.67	36.99	34.33
	2020-21	8,835.67	9,456.69	38.62	36.09
	2021-22	8,697.58	9,270.03	39.24	36.81
	2022-23	8,757.70	9,370.18	38.97	36.42
	2023-24	8,723.11	9,309.71	39.12	36.66
Fauji Kabirwala	2019-20	7,685.32	7,944.45	44.40	42.95
	2020-21	7,863.36	8,128.24	43.39	41.98
	2021-22	7,764.49	8,030.02	43.94	42.49
	2022-23	7,700.36	7,964.25	44.31	42.84
	2023-24	7,797.42	8,051.77	43.75	42.37
Hub Power	2019-20	7,951.83	8,791.88	42.91	38.81
	2020-21	8,206.18	8,832.85	41.58	38.63
	2021-22	8,385.67	8,853.67	40.69	38.54
	2022-23	8,175.46	8,767.03	41.74	38.92
	2023-24	0.00	0.00	0.00	0.00
KAPCO	2019-20	7,920.00	8,102.00	45.50	44.40
	2020-21	7,882.00	8,095.00	45.70	44.50
	2021-22	8,039.00	8,301.00	44.80	43.40
	2022-23	8,187.00	8,301.00	44.00	43.40
	2023-24	0.00	0.00	0.00	0.00
Kohinoor Energy	2019-20	7,741.12	7,986.85	44.08	42.72
	2020-21	7,743.37	7,986.85	44.07	42.72
	2021-22	7,741.49	7,986.85	44.08	42.72
	2022-23	7,740.29	7,986.85	44.08	42.72
	2023-24	7,736.12	7,986.85	44.11	42.72
Rousch Power	2019-20	7,471.42	7,874.21	45.71	43.38
	2020-21	7,305.60	7,635.36	46.75	44.73
	2021-22	7,453.00	7,719.00	45.83	44.25
	2022-23	7,562.71	7,984.08	45.16	42.78
	2023-24	7,271.73	7,401.11	46.97	46.15
Saba Power	2019-20	10,376.00	11,205.00	32.88	30.45
	2020-21	10,131.69	10,894.47	33.68	31.32
	2021-22	10,018.35	10,707.41	34.06	31.87
	2022-23	10,203.95	10,934.32	33.44	31.20
	2023-24	10,680.12	11,513.19	31.95	29.64
Liberty Daharki Power	2019-20	8,589.48	8,861.71	39.72	38.50
	2020-21	8,428.61	8,627.99	40.48	39.55
	2021-22	8,201.29	8,363.17	41.60	40.80
	2022-23	8,231.55	8,415.30	41.45	40.55
	2023-24	8,305.90	8,509.06	41.08	40.10
Uch Power	2019-20	6,820.72	6,950.81	50.02	49.09
	2020-21	6,826.12	6,950.83	49.98	49.09
	2021-22	6,806.00	6,921.00	50.14	49.30
	2022-23	6,882.00	6,975.00	49.58	48.92
	2023-24	6,953.00	7,077.00	49.07	48.21
Attock Gen.	2019-20	7,366.00	7,582.00	46.33	45.00
	2020-21	7,360.00	7,582.00	46.37	45.00
	2021-22	7,376.00	7,582.00	46.27	45.00
	2022-23	7,373.00	7,582.00	46.29	45.00
	2023-24	7,371.00	7,582.00	46.30	45.00
Atlas Power	2019-20	7,400.00	7,584.00	46.10	45.00
	2020-21	7,400.00	7,584.00	46.10	45.00
	2021-22	7,400.00	7,584.00	46.10	45.00
	2022-23	7,400.00	7,584.00	46.10	45.00
	2023-24	7,400.00	7,584.00	46.10	45.00

Power Station	Year	Heat Rate (Btu/kWh)		Plant Efficiency (%)	
		On Gross Generation	On Net Export to NTDC	On Gross Generation	On Net Export to NTDC
Engro Power Gen. Qadirpur	2019-20	7,260.00	7,741.26	47.00	44.08
	2020-21	7,260.00	7,743.06	47.00	44.07
	2021-22	7,260.00	7,713.00	47.00	44.20
	2022-23	7,260.00	7,627.00	47.00	44.74
	2023-24	7,260.00	7,494.00	47.00	45.53
Nishat Power	2019-20	7,364.00	7,582.00	46.29	45.00
	2020-21	7,372.00	7,582.00	46.25	45.00
	2021-22	7,374.00	7,582.00	46.24	45.00
	2022-23	7,376.00	7,582.00	46.22	45.00
	2023-24	7,381.00	7,582.00	46.19	45.00
Nishat Chunian	2019-20	7,402.00	7,582.00	46.10	45.00
	2020-21	7,420.00	7,582.00	46.00	45.00
	2021-22	7,420.00	7,582.00	46.00	45.00
	2022-23	7,420.00	7,582.00	46.00	45.00
	2023-24	7,420.00	7,582.00	46.00	45.00
Narowal Energy	2019-20	7,749.92	7,887.43	46.45	45.65
	2020-21	7,744.22	7,887.14	46.48	45.64
	2021-22	7,747.91	7,884.41	46.48	45.68
	2022-23	7,767.58	7,900.89	46.42	45.63
	2023-24	7,753.32	7,885.25	46.44	45.66
Liberty Power Tech.	2019-20	7,417.70	7,582.54	46.00	45.00
	2020-21	7,417.70	7,582.54	46.00	46.00
	2021-22	7,417.70	7,582.54	46.00	45.00
	2022-23	7,417.70	7,582.54	46.00	45.00
	2023-24	7,417.70	7,582.54	46.00	45.00
Foundation Power	2019-20	7,314.41	7,569.29	46.64	45.08
	2020-21	7,141.27	7,359.02	47.78	46.36
	2021-22	6,899.48	7,090.02	49.45	48.12
	2022-23	7,083.00	7,289.55	48.17	46.81
	2023-24	7,307.88	7,512.68	46.69	45.42
Uch-II Power	2019-20	6,679.56	6,880.32	51.08	49.59
	2020-21	6,670.00	6,861.00	51.15	49.73
	2021-22	6,558.00	6,737.00	52.03	50.64
	2022-23	6,540.00	6,730.00	52.17	50.70
	2023-24	6,562.00	6,762.00	52.00	50.46
Huaneng Shandong Ruyi (Sahiwal Imported Coal)	2019-20	8,749.08	n.p.	39.00	n.p.
	2020-21	8,749.08	n.p.	39.00	n.p.
	2021-22	8,749.08	n.p.	39.00	42.94
	2022-23	8,749.08	n.p.	39.00	40.69
	2023-24	8,479.08	n.p.	39.00	n.p.
QATPL (Bhikki)	2019-20	5,422.95	5,531.97	62.92	61.68
	2020-21	5,428.99	5,539.16	62.85	61.60
	2021-22	5,426.43	5,537.62	62.88	61.62
	2022-23	5,424.71	5,537.32	62.90	61.62
	2023-24	5,425.57	5,538.29	62.89	61.61
NPPMCL (Haveli Bahadur Shah)	2019-20	5,524.69	5,672.84	61.78	60.16
	2020-21	5,530.16	5,668.24	61.72	60.21
	2021-22	5,416.00	5,551.00	63.00	61.47
	2022-23	5,420.00	5,535.00	62.95	61.65
	2023-24	5,409.00	5,527.00	63.10	61.76
NPPMCL (Balloki)	2019-20	5,603.60	5,805.54	60.89	58.77
	2020-21	5,593.32	5,795.28	61.00	58.86
	2021-22	5,486.00	5,661.00	62.19	60.27
	2022-23	5,507.00	5,677.00	61.96	60.11
	2023-24	5,480.00	5,639.00	62.28	60.53
Port Qasim Electric Power	2019-20	8,308.08	8,825.35	41.02	38.62
	2020-21	8,246.83	8,716.90	41.33	39.10
	2021-22	8,703.02	8,726.83	41.34	39.06
	2022-23	9,249.16	9,900.80	36.85	34.42
	2023-24	8,608.49	9,268.43	39.59	36.77

Power Station	Year	Heat Rate (Btu/kWh)		Plant Efficiency (%)	
		On Gross Generation	On Net Export to NTDC	On Gross Generation	On Net Export to NTDC
China Power Hub	2019-20	8,195.06	8,704.90	41.64	39.20
	2020-21	8,186.81	8,660.72	41.68	39.40
	2021-22	8,226.89	8,669.52	41.18	39.36
	2022-23	8,352.14	8,900.16	40.08	38.34
	2023-24	8,411.43	8,521.70	37.56	36.98
Engro Powergen Thar	2021-22	8,881.20	9,692.10	38.40	35.20
	2022-23	8,799.70	9,716.10	38.80	35.10
	2023-24	9,012.70	9,807.10	37.90	34.80
Lucky Electric Power	2021-22	8,042.02	8,706.66	42.43	39.19
	2022-23	8,658.21	9,400.44	40.55	37.35
	2023-24	8,545.43	9,260.87	41.13	37.95
Punjab Thermal Power	2022-23	5,488.32	5,579.00	62.17	61.16
	2023-24	5,488.32	5,579.00	62.17	61.16
Thar Energy	2022-23	8,575.10	9,378.76	39.67	36.38
	2023-24	8,594.81	9,401.53	39.70	36.29
Thar Coal Block-I	2022-23	8,749.00	8,648.63	39.00	39.31
	2023-24	8,749.00	8,648.63	39.00	39.31
ThalNova Power	2022-23	8,722.24	9,530.08	39.12	35.80
	2023-24	8,644.90	9,436.37	39.47	36.16

Power Station	Year	Heat Rate (Btu/kWh)				Plant Efficiency (%)			
		On Gross Generation		On Net Export to NTDC		On Gross Generation		On Net Export to NTDC	
		Gas	HSD	Gas	HSD	Gas	HSD	Gas	HSD
Saif Power	2019-20	6,466.00	6,825.00	6,666.00	7,037.00	52.78	50.01	51.20	48.50
	2020-21	6,466.00	6,825.00	6,666.00	7,037.00	52.78	50.01	51.20	48.50
	2021-22	6,466.00	6,825.00	6,666.00	7,037.00	52.78	50.01	51.20	48.50
	2022-23	6,466.00	6,825.00	6,666.00	7,037.00	52.78	50.01	51.20	48.50
	2023-24	6,466.00	6,825.00	6,666.00	7,037.00	52.78	50.01	51.20	48.50
Orient Power	2019-20	6,504.00	6,866.00	6,666.00	7,037.00	52.48	49.71	51.20	48.50
	2020-21	6,504.00	6,866.00	6,666.00	7,037.00	52.48	49.71	51.20	48.50
	2021-22	6,504.00	6,866.00	6,666.00	7,037.00	52.48	49.71	51.20	48.50
	2022-23	6,504.00	6,866.00	6,666.00	7,037.00	52.48	49.71	51.20	48.50
	2023-24	6,504.00	6,866.00	6,666.00	7,037.00	52.48	49.71	51.20	48.50
Sapphire Electric Power	2019-20	n.p.	6,830.00	6,666.00	7,037.00	52.74	49.96	51.20	48.50
	2020-21	n.p.	6,834.00	n.p.	7,037.00	n.p.	49.93	n.p.	48.50
	2021-22	6,474.00	6,834.00	6,666.00	7,037.00	52.71	49.93	51.20	48.50
	2022-23	6,474.00	6,834.00	6,666.00	7,037.00	52.71	49.93	51.20	48.50
	2023-24	6,474.00	6,834.00	6,666.00	7,037.00	52.71	49.93	51.20	48.50
Halmore Power	2019-20	6,478.00	6,839.00	7,391.00	n.p.	52.69	49.91	46.18	n.p.
	2020-21	6,478.00	6,839.00	7,367.00	7,248.00	52.69	49.91	46.33	47.09
	2021-22	6,478.00	6,839.00	6,666.00	7,037.00	52.69	49.91	n.p.	n.p.
	2022-23	6,478.00	6,839.00	6,666.00	7,037.00	52.69	49.91	n.p.	n.p.
	2023-24	6,478.00	6,839.00	6,666.00	7,037.00	52.69	49.91	n.p.	n.p.

Source: IPPs

TABLE 24
Monthly Source-wise Power Sent Out and Fuel Cost Data (2023-24)

		July	August	September	October	November	December	January	February	March	April	May	June	Total
		GW/h	GW/h	GW/h	GW/h	GW/h	GW/h	GW/h	GW/h	GW/h	GW/h	GW/h	GW/h	GW/h
Hydel	Generation	5,517.77	6,005.50	5,008.52	3,114.14	2,754.86	1,859.01	924.22	1,766.29	2,216.81	2,070.35	3,906.27	4,728.50	39,872.25
	%	37.18	37.63	37.55	32.54	36.50	24.38	11.12	24.82	27.63	23.96	30.96	35.13	31.38
	Fuel Cost	-	-	-	-	-	-	-	-	-	-	-	-	-
Coal (Local)	Generation	2,179.89	1,637.92	1,478.58	1,334.01	987.44	1,309.55	1,372.85	993.79	861.77	880.57	1,371.51	1,488.66	15,896.54
	%	14.69	10.26	11.08	13.94	13.08	17.17	16.51	13.97	10.74	10.19	10.87	11.06	12.51
	Fuel Cost	24,013.25	11,477.59	11,270.34	16,146.86	14,437.20	16,069.31	16,287.74	14,098.55	14,458.71	13,938.02	16,059.84	16,419.13	184,676.53
Coal (Imported)	Generation	11.02	7.01	7.62	12.10	14.62	12.27	11.86	14.19	16.78	15.83	11.71	11.03	11.62
	%	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fuel Cost	-	-	-	-	-	-	-	-	-	-	-	-	-
HSD	Generation	2,952.11	2,740.59	2,127.79	1,938.71	797.99	1,267.99	1,514.38	1,449.81	1,658.44	2,157.17	2,747.55	2,436.77	23,789.29
	%	19.89	17.17	15.95	20.25	10.57	16.63	18.22	20.37	20.67	24.97	21.78	18.10	18.72
	Fuel Cost	69,743.84	64,992.46	51,466.51	45,757.51	18,926.13	33,250.45	36,792.00	31,933.75	36,803.66	47,722.70	65,955.73	64,156.41	567,501.15
RLNC	Generation	23.63	23.71	24.19	23.60	23.72	26.22	24.30	22.03	22.19	22.12	24.01	26.33	23.86
	%	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fuel Cost	1,094.70	1,213.61	1,005.29	703.78	694.77	825.91	1,035.37	787.01	795.08	974.75	1,109.08	1,166.47	11,405.82
Gas	Generation	7.38	7.60	7.54	7.35	9.21	10.83	12.45	11.06	9.91	11.28	8.79	8.67	8.98
	%	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fuel Cost	14,471.20	16,042.78	13,592.19	9,575.49	10,157.38	11,581.18	14,234.82	9,742.68	10,881.15	12,918.82	14,644.90	16,237.62	154,080.21
Import Iran	Generation	13.22	13.22	13.52	13.61	14.62	14.02	13.75	12.38	13.69	13.25	13.20	13.92	13.51
	%	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fuel Cost	28.85	26.20	24.23	22.54	29.73	28.20	29.09	25.66	28.38	37.09	49.96	47.65	377.58
Nuclear	Generation	0.19	0.16	0.18	0.24	0.39	0.37	0.35	0.36	0.35	0.43	0.40	0.35	0.30
	%	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fuel Cost	681.23	657.56	576.70	522.18	824.49	934.32	954.12	697.80	861.89	1,018.18	1,303.50	1,270.20	10,302.17
Wind Power	Generation	23.62	25.10	23.80	23.17	27.73	33.13	32.80	27.20	30.37	27.45	26.09	26.66	27.28
	%	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fuel Cost	2,457.43	2,392.46	2,737.87	2,241.22	1,897.13	1,927.54	2,294.64	2,193.75	3,205.30	3,133.54	3,617.29	3,048.62	31,146.79
	Generation	1.17	1.17	1.20	1.23	1.21	1.32	1.33	1.32	1.55	1.53	1.53	1.53	1.35
	%	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fuel Cost	548.76	804.70	410.23	191.14	147.84	150.37	127.55	107.63	204.70	286.98	445.44	515.73	3,941.07
	Generation	3.70	5.04	3.08	2.00	1.96	1.97	1.53	1.51	2.55	3.32	3.53	3.83	3.10
	%	-	-	-	-	-	-	-	-	-	-	-	-	-
	Fuel Cost	-	-	-	-	-	-	-	-	-	-	-	-	-

		July	August	September	October	November	December	January	February	March	April	May	June	Total
		GW/h	84.07	78.79	76.00	49.78	61.82	47.94	90.17	109.98	112.75	124.87	117.54	1,028.90
Solar Power	Generation	%	0.51	0.59	0.79	0.66	0.81	0.58	1.27	1.37	1.31	0.99	0.87	0.81
	Fuel Cost	Mln. Rs. Rs./kW/h	-	-	-	-	-	-	-	-	-	-	-	-
Bagasse	Generation	GW/h	39.97	34.52	28.76	26.68	101.24	106.37	100.53	78.50	55.85	56.94	59.74	726.85
		%	0.27	0.24	0.30	0.35	1.33	1.28	1.41	0.98	0.65	0.45	0.44	0.57
		Mln. Rs.	239.11	206.49	172.07	159.59	605.62	636.31	601.40	469.60	334.10	340.64	357.37	4,348.16
	Fuel Cost	Rs./kW/h	5.98	5.98	5.98	5.98	5.98	5.98	5.98	5.98	5.98	5.98	5.98	5.98
Total	Generation	GW/h	14,838.72	13,339.20	9,571.57	7,546.72	7,626.68	8,313.73	7,116.05	8,023.26	8,639.32	12,616.35	13,459.81	127,050.70
		%	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
		Mln. Rs.	120,067.47	98,937.51	78,878.36	53,329.77	77,737.77	114,552.42	61,995.87	66,680.31	79,420.35	110,307.56	119,703.85	1,113,305.59
	Fuel Cost	Rs./kW/h	8.09	8.25	7.42	8.24	10.19	13.78	8.71	8.31	9.19	8.74	8.89	8.76

Source: CPPA-G

TABLE 25
Electricity Statistics of K-Electric Limited

1	Units Generated by KE Own (GWh)					
	Name of Plant	Year	Units Generated (Gross)	Auxiliary Consumption		Units Sent Out
				GWh	%	
1.1	Bin Qasim Thermal Power Station-I (BQTPS-I)	2019-20	4,195.00	370.34	8.83	3,824.66
		2020-21	5,130.00	400.00	7.80	4,730.00
		2021-22	3,590.67	301.57	8.40	3,289.10
		2022-23	2,033.37	181.67	8.93	1,851.70
		2023-24	675.80	53.58	7.93	622.22
1.2	Bin Qasim Thermal Power Station-II (BQTPS-II)	2019-20	4,278.00	247.46	5.78	4,030.54
		2020-21	4,173.00	247.00	5.92	3,926.00
		2021-22	3,820.55	233.03	6.10	3,587.52
		2022-23	2,806.95	172.47	6.14	2,634.48
		2023-24	2,700.58	143.49	5.31	2,557.09
1.3	Bin Qasim Thermal Power Station-III (BQTPS-III)	2021-22	256.10	12.60	4.92	243.50
		2022-23	2,595.58	72.75	2.80	2,522.83
		2023-24	4,283.48	105.35	2.46	4,178.13
1.4	Korangi Town Gas Turbine Power Station-II (KTGTPS-II)	2019-20	313.00	13.27	4.24	299.73
		2020-21	381.00	15.77	4.14	365.23
		2021-22	122.01	7.49	6.14	114.52
		2022-23	12.31	2.13	17.30	10.18
		2023-24	1.68	0.09	5.52	1.59
1.5	Site Gas Turbine Power Station-II (SGTPS-II)	2019-20	414.00	16.77	4.05	397.23
		2020-21	227.00	11.33	4.99	215.67
		2021-22	110.42	7.56	6.85	102.86
		2022-23	27.29	2.88	10.55	24.41
		2023-24	0.21	0.01	4.76	0.20
1.6	Korangi Combined Cycle Power Plant	2019-20	1,158.00	81.26	7.02	1,076.74
		2020-21	1,027.00	78.30	7.62	948.70
		2021-22	596.15	43.69	7.33	552.46
		2022-23	58.74	9.00	15.32	49.74
		2023-24	126.06	13.93	11.05	112.13
1.7	Total Units Generated from KE's Own Power Plants	2019-20	10,358.00	729.10	7.04	9,628.90
		2020-21	10,938.00	752.40	6.88	10,185.60
		2021-22	8,495.90	605.94	7.13	7,889.96
		2022-23	7,534.24	440.90	5.85	7,093.34
		2023-24	7,787.81	316.46	4.06	7,471.36
2	Units Purchased by KE (GWh)					
		2019-20	2020-21	2021-22	2022-23	2023-24
2.1	KANUPP ^[1]	193.00	219.00	45.77	0.00	0.00
2.2	Gul Ahmed	496.14	673.00	705.43	508.68	268.59
2.3	Tapal Energy	627.77	737.00	715.86	518.43	288.33
2.4	NTDC (Mixed Generation)	5,003.14	5,764.40	8,897.54	8,960.81	8,538.07
2.5	Anoud Power	59.52	12.00	0.00	0.00	0.00
2.6	International Steel Limited	51.21	43.00	28.54	26.89	15.77
2.7	International Industries Limited	10.66	10.00	9.29	10.41	1.58
2.8	FFBL Power	412.91	452.88	406.69	346.26	324.54
2.9	SNPCL-I	371.86	394.35	363.36	292.66	301.73
2.10	SNPCL-II	367.83	380.22	345.81	287.03	297.54
2.11	Oursun Pakistan	88.28	90.87	89.58	89.32	88.08
2.12	NTDC - 150 MW (Wind) ^[2]	423.00	353.64	139.00	0.00	0.00
2.13	Gharo Solar	65.00	108.69	102.64	101.69	99.30
2.14	Lotte Chemicals	--	61.00	35.44	21.08	3.08
2.15	Lucky Cement	--	0.02	2.98	2.26	3.36
2.16	Net-Metering Import	--	--	44.00	107.18	195.07
2.17	Total	8,170.32	9,300.07	11,931.93	11,272.70	10,425.04
3	Total Units Purchased by KE including Own Generation (GWh)	18,528.32	20,238.07	20,427.83	18,806.94	18,212.85
4	Units Available for Distribution (GWh)	17,799.22	19,485.67	19,821.89	18,366.04	17,896.40
5	Units Sold (GWh)	14,276.96	16,068.85	16,763.23	15,553.83	15,025.11
6	T&D Losses (excluding Auxiliary Consumption)	GWh	3,522.26	3,416.82	3,058.66	2,812.21
		%	19.79	17.54	15.43	15.31
7	Average Fuel Price					
7.1	Gas (Rs./MMBtu) ^[3]	824.00	846.00	857.00	911.19	1,050.00
7.2	RLNG (Rs./MMBtu) - SSGC	1,561.00	1,358.00	2,877.91	3,749.75	3,876.59
7.3	RLNG (Rs./MMBtu) - PLL ^[5]	--	--	5,253.00	3,347.65	3,409.10
7.4	Furnace Oil (Rs./M. Ton.)	62,130.00	60,285.00	121,886.72	154,077.73	156,079.39
7.5	HSD (Rs./Liters)	0.00	98.00	132.65	230.90	278.54

		2019-20	2020-21	2021-22	2022-23	2023-24
8	Cost of Fuel in KE Own System					
8.1	Cost of Fuel (Rs. in Million) ^[1]	116,186.00	126,409.00	212,615.00	212,132.18	201,270.00
8.2	Cost of Fuel (Paisa/kWh) ^{[3] & [4]}	1,207.00	1,241.00	2,695.00	2,990.72	2,693.90

^[1] Supply from KANUPP discontinued from August, 2021.

^[2] Supply from WPPs discontinued from September, 2021.

^[3] Exclusive GIDC which is under litigation.

^[4] Based on per unit sent out.

^[5] Supply from PLL initiated from February 08, 2022.

Source: KE

TABLE 26

Fuel Consumption and Cost of Generation Data of K-Electric and their IPPs (Net)

(Gas+RFO+RLNG based Power Plant)									
Year	Gen. on Gas (GWh) (Net)	Gas Consumption		Residual Furnace Oil		Gen. on RLNG (GWh) (Net)	RLNG Consumption		Overall Generation Cost (Rs./ kWh) ^{[1] & [2]}
		Total MMCFT	CFT/kWh (Average)	Gen. on RFO (GWh) (Net)	Quantity of RFO used (000 M. Tons)		Total MMCFT	CFT/kWh (Average)	
Bin Qasim TPS-I									
2019-20	761.00	8,552.00	11.24	2,548.00	734.00	516.00	5,821.00	11.28	16.03
2020-21	695.00	7,618.00	10.96	2,843.00	787.00	1,192.00	12,974.00	10.04	15.02
2021-22	156.12	1,744.33	11.17	2,526.74	694.71	606.24	6,784.63	11.19	31.46
2022-23	41.14	478.34	11.63	1,743.86	483.28	66.68	792.40	11.88	42.06
2023-24	16.51	189.22	11.46	316.29	87.21	289.48	3,297.68	11.35	42.05

(Gas+RLNG based Power Plant)								
Power Station	Year	Gen. on Gas (GWh) (Net)	Gas Consumption		Gen. on RLNG (GWh) (Net)	RLNG Consumption		Overall Generation Cost (Rs./kWh) ^{[1] & [2]}
			Total MMCFT	CFT/kWh (Average)		Total MMCFT	CFT/kWh (Average)	
Bin Qasim TPS-II	2019-20	2,387.00	19,729.00	8.27	1,643.00	13,554.00	8.25	9.51
	2020-21	1,277.00	10,448.00	8.18	2,649.00	21,671.00	8.18	9.87
	2021-22	375.68	3,094.83	8.24	3,211.84	26,470.14	8.24	23.05
	2022-23	299.56	2,505.14	8.36	2,334.92	19,134.44	8.19	27.27
	2023-24	145.26	1,219.87	8.40	2,411.82	19,834.24	8.22	30.62
Korangi Town GTPS-II	2019-20	196.00	1,900.00	9.69	104.00	1,006.00	9.67	9.75
	2020-21	130.00	1,261.00	9.70	235.00	2,269.00	9.66	10.75
	2021-22	24.58	251.12	10.22	89.94	923.66	10.27	22.26
	2022-23	2.53	29.31	11.60	7.65	89.12	11.64	34.59
	2023-24	0.00	0.00	0.00	1.59	17.03	10.71	40.94
Site GTPS-II	2019-20	254.00	2,283.00	8.99	143.00	1,292.00	9.03	9.91
	2020-21	79.00	744.00	9.42	137.00	1,303.00	9.51	11.28
	2021-22	20.90	203.03	9.71	81.96	796.61	9.72	23.31
	2022-23	4.93	49.11	9.96	19.48	195.21	10.02	32.07
	2023-24	0.00	0.00	0.00	0.20	1.71	9.92	44.68

(Gas+RLNG+HSD based Power Plant)									
Year	Gen. on Gas (GWh) (Net)	Gas Consumption		Gen. on RLNG (GWh) (Net)	RLNG Consumption		Gen. on HSD (GWh) (Net)	Quantity of HSD used (000 liters) [3]	Overall Generation Cost (Rs./ kWh) [1] & [2]
		Total MMCFT	CFT/kWh (Average)		Total MMCFT	CFT/kWh (Average)			
Korangi CCPP [3]									
2019-20	688.00	5,593.00	8.13	389.00	3,161.00	8.13	0.00	0.00	8.99
2020-21	351.00	2,903.00	8.27	565.00	4,677.00	8.28	33.00	7,949.00	10.08
2021-22	67.06	558.85	8.33	216.18	1,809.51	8.37	269.22	62,853.96	24.03
2022-23	3.85	39.13	10.18	17.60	180.89	10.28	28.29	8,442.00	53.85
2023-24	1.85	18.23	9.85	99.32	913.58	9.20	10.96	2,980.95	39.39

(RLNG based Power Plant)							
Power Station	Year	Gen. on HSD (GWh) (Net)	Quantity of HSD used (000 liters) ^[3]	Gen. on RLNG (GWh) (Net)	RLNG Consumption		Overall Generation Cost (Rs./kWh) ^{[1] & [2]}
					Total MMCFT	CFT/kWh (Average)	
Bin Qasim TPS-III ^[4]	2021-22	0.00	0.00	243.50	1,891.55	7.75	36.27
	2022-23	0.00	0.00	2,522.58	15,907.54	6.31	23.23
	2023-24	13.93	4,306.74	4,164.20	25,940.47	6.23	22.10

(Residual Furnace Oil based Power Plant)					
Power Station	Year	Gen. on RFO (GWh) (Net)	Quantity of RFO used (000 M. Tons)	Average Fuel Cost (Rs./kWh)	Overall Generation Cost (Rs./kWh) ^{[1] & [2]}
Gul Ahmed	2019-20	496.14	106.87	12.935	15.97
	2020-21	673.00	145.00	13.71	15.96
	2021-22	705.43	153.97	24.8	27.59
	2022-23	508.68	110.30	29.88	31.85
	2023-24	268.59	58.59	36.98	41.14
Tapal Energy	2019-20	627.77	135.85	12.78	13.84
	2020-21	737.00	160.18	13.73	14.87
	2021-22	715.86	156.37	24.84	26.70
	2022-23	518.43	115.03	29.51	33.00
	2023-24	288.33	63.41	36.89	41.45

(Gas based Power Plant)					
Power Station	Year	Gen. on Gas (GWh) (Net)	Quantity of Gas used (MMBTU)	Average Fuel Cost (Rs./kWh)	Overall Generation Cost (Rs./kWh) ^{[1] & [2]}
Sindh Nooriabad-I	2019-20	371.86	2999996	7.22	8.16
	2020-21	394.35	3232553	6.68	7.64
	2021-22	363.36	2954899	6.94	11.17
	2022-23	292.66	2432691	7.81	9.18
	2023-24	301.73	2525701	8.60	10.46
Sindh Nooriabad-II	2019-20	367.83	2978275	7.22	8.16
	2020-21	380.22	3105772	6.68	7.64
	2021-22	345.81	2872374	6.61	11.12
	2022-23	287.03	2397322	7.76	9.13
	2023-24	297.54	2475991	8.55	10.41

^[1] Based on Units Sent Out.

^[2] Increase in cost per unit sentout mainly due to significant increase in fuel prices and non-provision of indigenous gas.

^[3] Due to non-provision of indigenous gas, KE was forced to utilize HSD to ensure continuity of power supply.

^[4] BQPS-III was commissioned in FY 2022-23 (Unit-1 commissioned on May 10, 2023 and Unit-2 commissioned on March 9, 2023).

Source: KE/IPPs

TABLE 27

Auxiliary Consumption and other Factors of K-Electric and their IPPs

Power Station	Year	Auxiliary Consumption		Maximum Load (MW) ^[1]	Load Factor (%) ^[2]	Capacity Factor (%) ^[3]	Utilization Factor (%) ^[4]	Availability Factor (%) ^[5]
		(GWh)	(%)					
Bin Qasim TPS-I	2019-20	370.34	8.83	1,060	50.03	54.09	84.13	86.62
	2020-21	400.00	7.80	1,025	58.40	77.72	97.62	90.45
	2021-22	301.57	8.40	849	53.80	55.10	80.86	86.80
	2022-23	181.67	8.93	730	52.02	35.85	86.90	89.02
	2023-24	53.58	7.93	730	30.39	15.74	86.90	92.68
Bin Qasim TPS-II	2019-20	247.46	5.78	570	88.58	97.13	99.53	95.30
	2020-21	247.00	5.92	571	85.40	95.26	99.71	95.09
	2021-22	233.03	6.10	555	81.13	86.34	96.86	96.04
	2022-23	172.47	6.14	550	72.86	67.27	96.04	91.79
	2023-24	143.49	5.31	545	63.51	63.85	95.17	91.87
Bin Qasim TPS-III	2021-22	12.60	4.92	-	-	-	-	-
	2022-23	72.75	2.80	U1-455 U2-463	U1-95.8 U2-90.7	U1-94.5 U2-86.3	U1-96.6 U2-98.3	U1-99.8 U2-86.0
	2023-24	105.35	2.46	909	82.08	85.80	96.46	62.05
Korangi Town CTPS-II	2019-20	13.27	4.24	97	60.08	41.90	90.28	88.69
	2020-21	15.77	4.14	96	55.75	53.60	89.86	83.52
	2021-22	7.49	6.14	96	39.29	14.97	89.85	96.56
	2022-23	2.13	17.30	90	38.38	1.49	84.31	98.40
	2023-24	0.09	5.52	52	27.95	0.20	48.29	98.71
Site CTPS-II	2019-20	16.77	4.05	97	67.11	50.05	90.28	98.11
	2020-21	11.33	4.99	97	39.34	27.72	90.28	97.09
	2021-22	7.56	6.85	97	41.17	13.29	90.28	98.56
	2022-23	2.88	10.55	90	43.22	3.29	84.15	98.46
	2023-24	0.01	4.76	16	62.40	0.02	14.66	99.09
Korangi CCPP	2019-20	81.26	7.02	233	70.10	60.59	94.13	96.07
	2020-21	78.30	7.62	229	57.42	56.72	92.51	91.38
	2021-22	43.69	7.33	225	54.81	34.15	90.73	87.86
	2022-23	9.00	15.32	212	38.22	3.02	85.66	97.90
	2023-24	13.93	11.05	211	30.71	6.54	85.25	97.00
Gul Ahmed Energy	2019-20	17.45	3.41	128	96.38	50.60	52.23	n.p.
	2020-21	19.48	2.81	128	97.11	60.13	61.92	93.22
	2021-22	18.35	2.53	128	97.39	62.83	64.51	95.06
	2022-23	12.79	2.45	128	96.30	45.27	47.01	88.36
	2023-24	7.48	2.71	128	93.14	23.72	25.47	95.83
Tapal Energy	2019-20	9.94	1.56	124	58.69	57.78	56.41	96.90
	2020-21	11.23	1.50	124	69.14	68.10	66.89	96.30
	2021-22	11.11	1.53	124	67.20	66.17	62.57	92.02
	2022-23	8.89	1.69	124	48.74	47.92	43.88	92.77
	2023-24	5.43	1.85	124	27.92	27.40	22.40	93.55
Sindh Nooriabad-I	2019-20	6.78	1.82	51	93.34	84.01	98.40	88.49
	2020-21	7.51	1.85	51	87.93	89.09	96.51	88.21
	2021-22	7.13	1.96	51	98.91	79.49	83.27	80.37
	2022-23	6.32	2.16	51	96.30	65.31	71.40	67.82
	2023-24	6.59	2.19	51	95.34	67.33	73.94	67.33
Sindh Nooriabad-II	2019-20	6.31	1.72	51	90.17	83.10	99.10	87.76
	2020-21	5.90	1.54	51	84.77	85.90	93.00	84.62
	2021-22	5.87	1.70	52	97.25	76.61	83.45	78.78
	2022-23	5.20	1.81	52	96.56	63.59	70.15	65.85
	2023-24	5.50	1.85	52	94.62	65.92	74.02	69.67

^[1] Gross Load^[2] Load Factor = Gross Generation/(Maximum Load x Operating Hours)^[3] Capacity Factor = Gross Generation/(Available Capacity x Period Hours)^[4] Utilization Factor = Maximum Gross Load/(Installed Gross Capacity)^[5] Availability Factor = (Period hours - Planned Outage hours - Forced Outage Hours)/Period Hours^[6] Unit-wise Load Factor of U-1 and U-2 are 82% and 84% respectively. Complex Load Factor has been computed based on weighted operating hours.^[7] Decrease in Availability Factor mainly due to HSD Commissioning and certain works as per OEM Recommendation. Considering different COD Dates, unit wise information was provided in FY-2023 for BQPS-III.

Source: KE/IPPs

TABLE 28
Heat Rate and Plant Efficiency Data of K-Electric and their IPPs

Power Station	Year	Heat Rate (Btu/kWh) - LHV ^[1]		Plant Efficiency (%)	
		On Gross Basis	On Net Basis	On Gross Basis	On Net Basis
Bin Qasim TPS-I	2019-20	9,776.89	10,724.09	34.90	31.82
	2020-21	9,469.00	10,272.00	36.03	33.22
	2021-22	9,496.00	10,366.68	35.93	32.91
	2022-23	9,586.93	10,527.49	35.59	32.41
	2023-24	9,788.00	10,631.00	34.86	32.10
Bin Qasim TPS-II	2019-20	7,076.68	7,511.18	48.22	45.43
	2020-21	7,082.25	7,469.32	48.55	45.68
	2021-22	7,020.73	7,476.76	48.60	45.64
	2022-23	7,144.15	7,611.86	47.76	44.83
	2023-24	7,263.00	7,670.00	46.98	44.48
Bin Qasim TPS-III ^[2]	2022-23	5,753.15	5,891.31	59.31	57.92
	2023-24	5,868.00	6,016.00	58.15	56.72
Korangi Town GTPS-II	2019-20	7,987.81	8,341.41	42.72	40.91
	2020-21	7,955.00	8,304.27	42.89	41.09
	2021-22	8,238.77	8,777.44	41.42	38.87
	2022-23	8,257.92	9,983.51	41.32	34.18
	2023-24	8,521.00	9,020.00	40.04	37.83
Site GTPS-II	2019-20	7,832.50	8,162.82	43.56	41.80
	2020-21	8,205.00	8,677.00	41.36	39.32
	2021-22	8,255.46	8,861.89	41.33	38.50
	2022-23	8,238.25	9,209.88	41.42	37.05
	2023-24	8,290.00	8,876.00	41.16	38.44
Korangi CCPP	2019-20	6,931.99	7,455.34	49.22	45.77
	2020-21	7,010.00	7,588.00	48.68	44.97
	2021-22	7,201.87	7,771.53	47.38	43.91
	2022-23	8,295.86	9,797.15	41.13	34.83
	2023-24	7,521.00	8,455.00	45.37	40.36
Gul Ahmed Energy	2019-20	8,490.07	8,789.46	40.19	38.82
	2020-21	8,535.26	8,782.17	39.97	38.85
	2021-22	8,163.78	8,376.09	41.79	40.74
	2022-23	8,154.73	8,359.80	41.84	40.81
	2023-24	8,105.06	8,330.72	42.10	40.96
Tapal Energy	2019-20	8,613.24	8,749.90	39.62	39.00
	2020-21	8,604.72	8,735.85	39.66	39.06
	2021-22	8,253.28	8,381.33	41.34	40.71
	2022-23	8,391.19	8,535.13	40.66	39.98
	2023-24	8,296.11	8,452.29	41.13	40.37
Sindh Nooriabad-I	2019-20	7,923.36	8,067.49	43.06	42.29
	2020-21	7,966.91	8,197.08	42.83	41.62
	2021-22	7,975.55	8,132.12	42.78	42.12
	2022-23	8,136.50	8,312.28	41.93	41.05
	2023-24	8,191.62	8,370.65	41.65	40.76
Sindh Nooriabad-II	2019-20	7,960.82	8,097.06	42.86	42.14
	2020-21	8,125.23	8,168.42	41.99	41.77
	2021-22	8,167.70	8,306.24	41.77	41.08
	2022-23	8,203.51	8,352.03	41.59	40.85
	2023-24	8,170.47	8,321.49	41.76	41.00

^[1] Since most of the IPPs report heat rates on LHV basis, hence KE is also reporting on LHV using HHV-LHV factors for like to like comparison.

^[2] Includes impact of HSD commissioning.

Source: KE/IPP's

TABLE 29
K-Electric (Source-wise Own Generation and Fuel Cost Adjustments) (2023-24)

Description	July	August	September	October	November	December	January	February	March	April	May	June
Bin Qasim Thermal Power Station - I												
Units Sent Out (GWh)	82.01	23.44	30.69	92.51	83.43	0.00	5.48	6.51	10.73	0.00	155.41	132.01
Fuel Cost (Rs./kWh)	38.66	41.85	42.63	43.98	37.79	0.00	42.58	42.57	42.52	0.00	38.87	39.98
Fuel Cost (Mln Rs.)	3,170.21	981.18	1,308.16	4,068.13	3,152.37	0.00	233.22	277.19	456.05	0.00	6,040.34	5,278.10
Bin Qasim Thermal Power Station - II												
Units Sent Out (GWh)	274.28	175.16	151.25	297.28	324.94	262.63	73.79	107.19	97.48	175.42	316.23	301.42
Fuel Cost (Rs./kWh)	29.96	30.83	31.24	29.29	28.99	36.71	36.03	28.28	26.03	25.57	27.62	28.44
Fuel Cost (Mln Rs.)	8,216.41	5,400.69	4,724.33	8,708.52	9,420.64	9,640.23	2,658.75	3,031.74	2,537.75	4,485.42	8,732.91	8,573.11
Bin Qasim Thermal Power Station - III												
Units Sent Out (GWh)	600.61	601.08	577.50	326.25	45.00	1.08	191.34	214.48	351.99	404.72	381.96	482.10
Fuel Cost (Rs./kWh)	19.96	20.92	21.22	21.93	23.79	53.23	29.29	21.42	20.21	20.23	21.01	21.34
Fuel Cost (Mln Rs.)	11,985.41	12,572.48	12,256.10	7,154.93	1,070.42	57.26	5,604.76	4,593.98	7,115.33	8,189.32	8,026.29	10,290.00
Korangi Town Gas Turbine Power Station - II												
Units Sent Out (GWh)	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	1.03	0.50
Fuel Cost (Rs./kWh)	0.00	0.00	0.00	35.52	0.00	0.00	0.00	0.00	0.00	0.00	35.58	36.48
Fuel Cost (Mln Rs.)	0.00	0.00	0.00	2.25	0.00	0.00	0.00	0.00	0.00	0.00	36.70	18.09
Site Gas Turbine Power Station - II												
Units Sent Out (GWh)	0.03	0.00	0.00	0.10	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fuel Cost (Rs./kWh)	33.97	0.00	0.00	35.71	36.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fuel Cost (Mln Rs.)	1.10	0.00	0.00	3.49	1.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Korangi Combined Cycle Power Plant												
Units Sent Out (GWh)	0.87	0.01	2.61	27.93	6.05	0.13	0.00	0.56	0.00	0.55	33.86	39.55
Fuel Cost (Rs./kWh)	45.24	50.72	50.78	35.25	27.30	0.00	0.00	56.46	56.39	27.03	33.80	35.81
Fuel Cost (Mln Rs.)	39.43	0.71	132.44	984.55	165.17	6.92	0.00	31.75	0.18	14.85	1,144.54	1,416.56
Total												
Units Sent Out (GWh)	957.81	799.69	762.05	744.13	459.46	263.83	270.61	328.75	460.21	580.70	888.50	955.59
Fuel Cost (Rs./kWh)	24.44	23.70	24.17	28.12	30.06	36.78	31.40	24.14	21.97	21.85	26.99	26.76
Fuel Cost (Mln Rs.)	23,412.58	18,955.06	18,421.03	20,921.86	13,810.16	9,704.40	8,496.73	7,934.67	10,109.31	12,689.59	23,980.78	25,575.85

Source: KE

TABLE 30
K-Electric (Source-wise Power Purchase and Fuel Costs) (2023-24)

		July	August	September	October	November	December	January	February	March	April	May	June
CPPA-G													
Generation	GW/h	772.23	753.46	710.86	711.40	689.79	709.39	683.67	613.89	702.50	710.24	757.88	722.76
	%	82.25	84.92	78.57	75.52	81.78	87.98	87.37	87.74	85.18	85.59	79.68	81.45
Fuel Cost	Mil Rs.	6,464.22	6,307.08	5,327.44	7,858.98	6,196.00	7,110.39	9,982.14	5,777.84	6,587.86	6,365.41	6,911.14	7,050.16
	Rs./kW/h	8.37	8.37	7.49	11.05	8.98	10.02	14.60	9.41	9.38	8.96	9.12	9.75
Gul Ahmed Energy Limited													
Generation	GW/h	43.47	20.00	47.25	53.36	27.25	1.53	10.43	3.89	2.56	0.37	27.94	25.54
	%	4.63	2.25	5.22	6.20	3.23	0.19	1.33	0.56	0.31	0.04	2.94	2.88
Fuel Cost	Mil Rs.	1,401.07	730.07	2,069.36	2,398.15	1,010.08	55.00	374.44	136.85	81.97	11.71	923.32	860.93
	Rs./kW/h	32.23	36.51	43.80	41.09	37.07	36.04	35.91	35.15	32.03	31.57	33.05	33.71
Tapal Energy (Pvt.) Limited													
Generation	GW/h	46.08	29.25	48.76	50.00	26.98	4.41	22.45	7.29	6.21	0.75	30.91	15.24
	%	4.91	3.30	5.39	5.31	3.20	0.55	2.87	1.04	0.75	0.09	3.25	1.72
Fuel Cost	Mil Rs.	1,533.81	1,108.73	2,121.88	2,024.07	977.87	154.14	717.84	228.88	204.78	25.55	1,032.42	507.13
	Rs./kW/h	33.29	37.90	43.52	40.48	36.24	34.95	31.97	31.38	32.96	34.07	33.40	33.28
International Industries Limited & International Steel Limited													
Generation	GW/h	2.47	3.51	0.54	1.52	1.88	0.13	1.27	1.75	1.20	1.11	1.09	0.88
	%	0.26	0.40	0.06	0.16	0.22	0.02	0.16	0.25	0.15	0.13	0.11	0.10
Fuel Cost	Mil Rs.	25.33	41.06	6.39	17.81	40.12	2.33	30.99	26.09	11.25	1.38	20.03	13.66
	Rs./kW/h	10.27	11.69	11.76	11.76	21.40	17.63	24.50	14.93	9.40	1.24	18.41	15.47
Sindh Nooriabad Power Company Limited (I & II) Including Impact of STDC Losses Cost													
Generation	GW/h	39.80	41.77	41.55	60.07	44.84	41.63	41.72	44.71	52.03	56.31	61.39	62.96
	%	4.24	4.71	4.59	6.38	5.32	5.16	5.33	6.39	6.31	6.79	6.45	7.09
Fuel Cost	Mil Rs.	347.09	365.64	362.50	525.82	389.64	361.11	362.68	388.71	453.80	491.99	537.44	551.02
	Rs./kW/h	8.72	8.75	8.72	8.75	8.69	8.67	8.69	8.69	8.72	8.74	8.75	8.75
FFBL Power Company Limited													
Generation	GW/h	15.17	25.23	37.25	40.54	36.06	28.78	1.06	4.27	28.53	30.68	39.29	37.68
	%	1.62	2.84	4.12	4.30	4.28	3.57	0.14	0.61	3.46	3.70	4.13	4.25
Fuel Cost	Mil Rs.	324.84	545.24	673.55	795.94	717.57	572.67	21.11	84.91	567.62	610.48	781.70	749.75
	Rs./kW/h	21.41	21.61	18.08	19.64	19.90	19.90	19.90	19.90	19.90	19.90	19.90	19.90
Oursun Pakistan Limited													
Generation	GW/h	6.65	5.56	7.28	7.62	6.39	7.08	6.91	7.07	8.81	8.13	9.05	7.53
	%	0.71	0.63	0.81	0.81	0.76	0.88	0.88	1.01	1.07	0.98	0.95	0.85
Fuel Cost	Mil Rs.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Rs./kW/h	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gharo Solar													
Generation	GW/h	7.86	5.44	8.23	8.33	6.56	7.14	6.98	7.51	10.27	9.96	11.65	9.36
	%	0.84	0.61	0.91	0.88	0.78	0.89	0.89	1.07	1.25	1.20	1.22	1.05
Fuel Cost	Mil Rs.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Rs./kW/h	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lotte Chemicals													
Generation	GW/h	1.93	1.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	%	0.21	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fuel Cost	Mil Rs.	70.21	42.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Rs./kW/h	36.47	37.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		July	August	September	October	November	December	January	February	March	April	May	June
Lucky Cement													
Generation	GW/h	0.25	0.19	0.30	0.34	0.26	0.22	0.25	0.20	0.26	0.28	0.41	0.40
	%	0.03	0.02	0.03	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.05
Fuel Cost	Mil Rs.	2.66	1.99	3.14	3.56	5.67	4.92	5.43	4.93	6.16	6.67	9.86	9.67
	Rs./kW/h	10.55	10.55	10.55	10.55	21.98	21.98	21.98	24.18	24.18	24.18	24.18	24.18
Net-Metering													
Generation	GW/h	2.94	1.73	2.77	3.79	3.49	5.99	7.79	9.11	12.42	11.98	11.60	5.07
	%	0.31	0.20	0.31	0.40	0.41	0.74	1.00	1.30	1.51	1.44	1.22	0.57
Cost	Mil Rs.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Rs./kW/h	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Generation													
Generation	GW/h	938.84	887.30	904.80	941.97	843.50	806.30	782.53	699.69	824.77	829.80	951.20	887.41
	%	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Fuel Cost	Mil Rs.	10,169.22	9,142.69	10,564.27	13,624.33	9,336.96	8,260.56	11,494.62	6,648.22	7,913.45	7,513.19	10,215.91	9,742.32
	Rs./kW/h	10.83	10.30	11.68	14.46	11.07	10.25	14.69	9.50	9.59	9.05	10.74	10.98

Source: KE

TABLE 31
K-Electric (Fuel-wise Own Generation and Fuel Costs) (2023-24)

Gas		July	August	September	October	November	December	January	February	March	April	May	June
Generation	GWh	0.00	0.00	0.00	0.00	43.47	0.00	0.00	4.50	13.41	25.96	36.29	40.03
	%	0.00	0.00	0.00	0.00	9.46	0.00	0.00	1.37	2.91	4.47	4.08	4.19
	Mil Rs.	0.00	0.00	0.00	0.00	430.76	0.00	0.00	39.44	117.40	226.09	317.97	352.18
Fuel Cost		Rs./kWh	0.00	0.00	0.00	9.91	0.00	0.00	0.00	8.76	8.71	8.76	0.00
RFO													
Generation	GWh	80.46	9.49	28.14	27.60	37.41	0.00	5.48	6.49	10.73	0.00	43.06	67.37
	%	8.40	1.19	3.69	3.71	8.14	0.00	2.02	1.97	2.33	0.00	4.85	7.05
	Mil Rs.	3,105.11	382.44	1,193.35	1,188.95	1,607.52	0.00	233.22	276.34	456.05	0.00	1,817.33	2,815.63
Fuel Cost		Rs./kWh	38.59	40.28	43.07	42.97	0.00	42.58	42.59	42.52	#DIV/0!	42.21	41.79
RLNG													
Generation	GWh	876.72	790.18	731.29	713.75	378.44	262.63	257.42	315.01	433.11	554.74	808.23	845.02
	%	91.53	98.81	95.96	95.92	82.37	99.54	95.13	95.82	94.11	95.53	90.97	88.43
	Mil Rs.	20,275.82	18,571.90	17,095.24	19,580.71	11,763.58	9,640.23	7,838.98	7,468.86	9,375.79	12,463.42	21,792.49	22,228.26
Fuel Cost		Rs./kWh	23.13	23.50	23.38	31.08	36.71	30.45	23.71	21.65	22.47	26.96	26.31
HSD													
Generation	GWh	0.62	0.01	2.61	2.78	0.15	1.20	7.71	2.74	2.96	0.00	0.93	3.16
	%	0.07	0.00	0.34	0.37	0.03	0.46	2.85	0.83	0.64	0.00	0.10	0.33
	Mil Rs.	31.64	0.71	132.44	152.20	8.30	64.18	424.53	150.02	160.07	0.08	53.00	179.78
Fuel Cost		Rs./kWh	50.69	50.72	54.82	54.81	0.00	55.05	54.66	0.00	0.00	0.00	56.88
Total Generation													
Generation	GWh	957.81	799.69	762.05	744.13	459.46	263.83	270.61	328.75	460.21	580.70	888.50	955.59
	%	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	Mil Rs.	23,412.58	18,955.06	18,421.03	20,921.86	13,810.16	9,704.40	8,496.73	7,934.67	10,109.31	12,689.59	23,980.78	25,575.85
Fuel Cost		Rs./kWh	24.44	23.70	24.17	30.06	36.78	31.40	24.14	21.97	21.85	26.99	26.76

Source: KE

TABLE 32
K-Electric (Fuel-wise Power Purchases and Fuel Costs) (2023-24)

		July	August	September	October	November	December	January	February	March	April	May	June
CPPA-G	Generation	GW/h	772.23	753.46	710.86	711.40	689.79	709.39	683.67	613.89	702.50	710.24	757.88
	%		82.25	84.92	78.57	75.52	81.78	87.98	87.37	87.74	85.18	85.59	79.68
	Fuel Cost	Mil Rs.	6,464.22	6,307.08	5,327.44	7,858.98	6,196.00	7,110.39	9,982.14	5,777.84	6,587.86	6,365.41	6,911.14
		Rs./kW/h	8.37	8.37	7.49	11.05	8.98	10.02	14.60	9.41	9.38	8.96	9.12
Gas/RLNG	Generation	GW/h	44.45	46.62	42.39	61.93	46.98	41.99	43.23	46.66	53.48	57.69	62.89
	%		4.73	5.25	4.69	6.57	5.57	5.21	5.52	6.67	6.48	6.95	6.61
	Fuel Cost	Mil Rs.	439.62	444.25	365.93	536.67	430.40	364.33	394.25	414.50	463.60	491.02	556.58
		Rs./kW/h	9.89	9.53	8.63	8.67	9.16	8.68	9.12	8.88	8.67	8.51	8.85
RFO	Generation	GW/h	89.55	49.25	96.01	108.37	54.23	5.94	32.88	11.19	8.77	1.12	58.85
	%		9.54	5.55	10.61	11.50	6.43	0.74	4.20	1.60	1.06	0.14	6.19
	Fuel Cost	Mil Rs.	2,934.87	1,838.81	4,191.24	4,422.22	1,987.95	209.14	1,092.28	365.73	286.75	37.26	1,955.74
		Rs./kW/h	32.77	37.34	43.66	40.81	36.66	35.23	33.22	32.70	32.69	33.24	33.23
Coal	Generation	GW/h	15.17	25.23	37.25	40.54	36.06	28.78	1.06	4.27	28.53	30.68	39.29
	%		1.62	2.84	4.12	4.30	4.28	3.57	0.14	0.61	3.46	3.70	4.13
	Fuel Cost	Mil Rs.	324.84	545.24	673.55	795.94	717.57	572.67	21.11	84.91	567.62	610.48	781.70
		Rs./kW/h	21.41	21.61	18.08	19.64	19.90	19.90	19.90	19.90	19.90	19.90	19.90
Solar (including Net-Metering)	Generation	GW/h	17.45	12.74	18.29	19.74	16.44	20.20	21.68	23.69	31.49	30.07	32.30
	%		1.86	1.44	2.02	2.10	1.95	2.51	2.77	3.39	3.82	3.62	3.40
	Fuel Cost	Mil Rs.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Rs./kW/h	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
STDC Losses	Fuel Cost	Mil Rs.	5.67	7.31	6.11	10.52	5.03	4.03	4.84	5.24	7.62	9.01	10.75
Total Generation	Generation	GW/h	938.84	887.30	904.80	941.97	843.50	806.30	782.53	699.69	824.77	829.80	951.20
	%		100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
	Fuel Cost	Mil Rs.	10,169.22	9,142.69	10,564.27	13,624.33	9,336.96	8,260.56	11,494.62	6,648.22	7,913.45	7,513.19	10,215.91
		Rs./kW/h	10.83	10.30	11.68	14.46	11.07	10.25	14.69	9.50	9.59	9.05	10.74

Source: KE

TABLE 33
Capacity and Energy Invoiced by Generators (Rs. in Million)

Fuel Type	2019-20		2020-21		2021-22		2022-23		2023-24	
	Capacity Charges	Energy Charges	Capacity Charges	Energy Charges	Capacity Charges	Energy Charges	Capacity Charges	Energy Charges	Capacity Charges	Energy Charges
WAPDA Hydel	107,546.00	2,858.00	95,826.00	2,650.00	121,186.97	2,446.74	100,219.33	2,650.14	105,203.25	2,769.28
Thermal	40,113.00	77,841.00	31,661.00	58,582.00	33,453.40	83,125.59	22,779.10	86,947.23	22,754.25	57,392.14
Coal	199,489.00	180,522.00	205,636.00	201,925.00	224,825.99	360,937.36	431,781.29	337,456.09	725,013.34	312,836.44
Nuclear	94,984.00	9,842.00	91,329.00	11,264.00	202,559.48	19,879.86	273,953.24	26,021.86	401,938.69	37,609.84
IPP Hydel ⁽¹⁾	89,406.00	1,380.00	47,814.00	721.00	93,473.18	1,513.58	104,750.97	5,162.11	124,918.82	4,830.17
RFO	84,834.00	54,237.00	93,977.00	84,242.00	59,802.36	325,343.79	68,992.04	169,079.58	84,088.69	87,610.77
RLNG/Gas/HSD	132,494.00	302,169.00	126,091.00	304,278.00	114,285.47	607,394.87	149,872.64	632,863.59	221,984.30	667,715.82
Bagasse	2,283.00	3,878.00	5,718.00	4,989.00	4,466.71	5,603.52	5,215.12	5,970.52	5,334.75	5,472.48
Wind	85,815.00	--	75,975.00	--	94,788.33	--	119,529.43	--	172,859.88	--
Solar	18,505.00	--	18,150.00	--	19,309.83	--	31,349.63	--	35,555.98	--
Import	--	5,507.00	--	4,960.00	925.62	8,139.80	1,400.67	10,363.66	1,519.15	13,037.94
Mixed	625.00	1,142.00	753.00	1,260.00	587.52	686.49	551.42	757.96	-189.90	-311.40
Total	856,094.00	639,376.00	792,930.00	674,871.00	969,664.85	1,415,071.59	1,310,394.89	1,277,272.74	1,900,981.20	1,188,963.48

Note: The amount of EPP of Wind and Solar Power Plants have been included in CPP as per Regulatory requirement.

⁽¹⁾ IPP Hydel includes Neelum Jhelum, Larab Energy, Star Hydro, Mira Power, Jagran and Malakand.

Source: CPPA-G

TABLE 34
Energy Purchase Price (EPP) and Capacity Purchase Price (CPP) Data [Amount verified on account of EPP and CPP (Rs. in Million)]

Power Plant	2019-20			2020-21			2021-22			2022-23			2023-24		
	Energy Delivered (GWh)	EPP	CPP	Energy Delivered (GWh)	EPP	CPP	Energy Delivered (GWh)	EPP	CPP	Energy Delivered (GWh)	EPP	CPP	Energy Delivered (GWh)	EPP	CPP
WAPDA	26809.11	2023.70	55169.24	28654.17	2135.57	57421.72	25614.00	2007.68	68702.07	31284.91	2650.14	100219.33	33258.73	2769.28	105203.25
Tarbela 4 th Ext.	5485.66	833.82	5459.31	3417.40	514.59	7611.05	3276.00	439.00	24848.87	--	--	--	--	--	--
Neelum Jhelum	4843.09	44161.25	--	1809.62	16500.87	--	4306.00	--	66437.01	107.72	--	1174.53	1744.04	--	15902.89
Jagran	86.25	223.38	--	113.23	293.27	--	121.22	314.03	--	103.61	288.25	--	113.18	1522.96	4.28
Malakand-III	408.53	176.77	1577.50	321.57	101.84	1263.47	353.87	112.07	1263.47	267.77	544.32	5175.59	221.59	210.57	4490.76
Larailb Energy	384.43	6247.69	179.10	465.29	6216.27	223.76	412.67	142.56	4135.12	345.00	763.82	7345.12	415.97	426.14	11312.00
Patind Hydro	566.88	99.09	7760.55	624.45	109.28	5062.31	562.02	109.28	5062.31	548.60	146.78	14704.86	564.85	191.99	18380.65
Gulpur Hydro	183.18	35.56	1898.62	256.89	49.86	8664.38	243.95	47.35	7724.46	304.69	71.23	9809.41	268.07	125.21	17522.72
Karot Hydro	--	--	--	--	--	--	--	--	--	3161.74	1551.57	66545.73	3161.45	1368.32	57305.53
Ranolia Hydro	--	--	--	--	--	--	17.42	69.93	--	--	28.29	--	--	--	--
Daral Khwar	--	--	--	--	--	--	130.66	1074.15	--	127.29	1767.83	--	124.37	984.99	--
GENCO-I	213.05	3944.85	3992.07	199.55	3229.15	3432.44	245.51	7385.84	3381.92	24.38	1084.11	3409.83	--	39.82	3204.87
GENCO-II	5921.76	45246.00	24321.00	4825.00	34180.00	18836.00	3521.80	30342.98	16645.11	4604.30	46436.46	7605.18	2551.35	30941.35	3580.71
GENCO-III	1776.19	23492.00	14305.00	1777.00	21012.00	10546.00	685.56	45432.17	13511.39	1313.36	39426.66	11764.09	938.73	26410.96	15968.67
Lal Pir Power	186.32	2894.08	5820.04	620.78	9079.76	4601.98	1022.67	27300.90	3526.85	397.59	15430.17	6994.64	358.99	13453.44	8838.40
Pak Gen. Power	149.76	2358.61	5850.60	445.54	6828.03	5297.96	1304.35	36281.10	4311.02	443.74	16944.67	7094.56	211.00	8310.36	8861.73
Altern Energy	3.73	70.69	9.60	11.60	164.84	32.87	--	--	--	--	--	--	--	--	--
Fauji Kabirwala	346.32	4411.68	1557.29	389.96	4518.36	1965.48	357.21	8640.11	1365.99	66.33	2114.35	1152.41	92.01	3053.70	2337.12
Habibullah	108.37	807.74	493.02	--	--	68.84	--	1124.35	44.67	--	324.82	--	--	646.86	-62.29
Hub Power	33.25	679.73	20973.24	174.51	3587.31	22938.88	1219.71	29875.00	25537.00	200.66	7763.91	29470.63	--	-312.38	32150.63
KAPCO	3476.67	45730.84	27808.83	3562.24	41419.82	34153.64	4979.78	122082.19	1403.98	587.97	20498.29	-175.10	--	--	352.03
Kohinoor	363.86	5020.78	1651.45	342.85	4634.70	1752.83	515.81	12731.17	1631.83	329.16	10131.12	2041.91	207.62	7218.64	2525.64
Roush Power	209.35	2844.62	6079.49	283.64	3535.18	7876.64	495.90	12439.62	4607.02	179.04	5393.11	4935.81	9.71	226.49	8436.73
Saba Power	50.83	758.63	2243.95	121.63	1835.42	2353.45	329.67	8790.09	2208.02	148.47	4906.71	2241.09	54.18	2091.82	3266.72
Liberty Daharki	896.74	14133.51	2554.39	985.03	11076.22	2661.82	1054.06	13196.00	2213.00	1001.19	25863.46	3290.24	903.87	25084.49	4801.52
Uch Power	4087.33	21388.35	7486.68	4090.44	30533.43	6987.60	4300.52	38859.71	6613.33	3901.33	37565.36	8687.94	3965.85	54788.51	8033.18
Attock Gen.	314.38	3584.05	1936.41	383.98	4934.20	1929.71	721.82	18569.22	2378.96	483.65	13164.29	2332.06	206.64	6259.58	3377.28
Atlas Power	259.57	3803.49	4405.91	418.57	5768.60	3033.20	1007.74	20722.56	3543.77	521.94	16155.70	4093.78	252.87	8970.58	4630.65
Engro Powergen. Qadirpur	821.94	7163.08	4148.62	680.06	5904.60	2504.34	788.64	6959.71	2161.21	935.96	8898.15	3595.66	813.48	9149.28	4237.98
Saif Power	476.28	5483.57	4883.63	624.32	6796.30	3103.27	734.99	17436.07	2613.39	538.24	15656.20	3241.48	220.59	6962.54	4237.57
Orient Power	461.83	4420.97	4667.79	595.44	6824.99	3638.06	836.33	18907.47	3686.67	604.79	17214.81	3537.29	541.20	15926.80	5083.26
Nishat Power	276.42	4388.06	5224.05	523.36	7315.01	2736.17	794.25	16385.75	2930.35	537.90	17671.16	3606.40	453.69	16229.38	4542.18
Nishat Chunian	351.23	5494.46	5465.65	537.46	7318.53	2640.65	882.45	18071.26	2639.02	386.13	12610.93	3422.24	240.45	8947.18	4488.05
Sapphire	289.59	3759.40	5244.52	550.54	7234.66	3454.74	780.51	17866.76	1746.06	452.53	13388.90	3328.02	479.36	14367.56	4106.16
Halmore	347.69	4251.08	6179.73	5615.56	6780.17	6036.18	675.91	16214.39	4612.32	287.05	8239.79	4109.19	207.55	6595.83	5597.34
Narawal	338.02	5118.57	6819.13	442.09	6214.87	6641.96	867.50	18186.68	3935.30	469.88	15369.56	4405.71	200.96	7847.72	6173.25
Liberty Power	458.52	6604.90	6060.39	606.59	8563.92	4529.22	925.43	23032.97	3674.65	544.54	17041.38	3464.12	239.94	8590.39	4799.64
Foundation	769.63	6716.78	4566.34	997.11	7912.48	4810.39	1269.59	9727.85	2433.20	1196.12	10387.10	3709.38	1087.56	10923.80	4320.27
Uch-II Power	2146.98	16512.87	11649.43	2339.30	17905.61	11640.03	2827.98	22281.07	12722.15	2776.44	29744.42	21594.77	2025.72	32275.24	24917.86
Sahiwal Imp.	6156.54	55091.58	57721.81	7341.83	72193.83	51641.54	6882.11	116730.00	54909.00	2876.85	89522.05	99478.98	2075.55	45630.81	123185.43
Quaid-e-Azam Thermal	5192.50	50670.29	25996.48	7118.80	62720.36	19160.78	6090.89	110729.86	21383.22	4697.55	126545.52	36180.40	3660.15	69991.40	45217.40

Power Plant	2019-20			2020-21			2021-22			2022-23			2023-24		
	Energy Delivered (GWh)	EPP	CPP	Energy Delivered (GWh)	EPP	CPP	Energy Delivered (GWh)	EPP	CPP	Energy Delivered (GWh)	EPP	CPP	Energy Delivered (GWh)	EPP	CPP
HBS	7050.30	65400.36	20974.53	7682.35	64123.73	16545.69	7488.56	127962.96	18489.23	148145.24	5520.55	25112.27	7930.78	183906.66	34242.22
Balloki	5911.84	55888.67	21062.20	6032.81	49527.77	13627.66	7186.75	126556.08	17746.73	160748.12	6863.66	27397.77	6684.63	157463.03	33057.82
Port Qasim	8967.35	60327.41	57843.23	8371.36	55318.43	54352.58	7478.63	99892.00	58279.00	57629.20	3203.00	89268.76	782.26	12220.01	104418.45
China Power	5641.50	39814.01	38028.36	7923.40	55406.50	62849.94	6764.90	85199.00	58011.00	43879.36	1546.92	118982.57	476.55	11998.49	136662.99
Engro Powergen-Thar	4170.15	51853.17	28814.68	3902.65	53533.38	31073.58	3676.97	46979.00	33770.00	49069.18	3646.06	52013.95	3766.21	50537.77	63372.30
Reshma	2.07	44.42	2.81	--	--	--	--	--	--	--	--	--	--	--	--
Lucky Electric	--	--	--	--	--	--	1774.10	14826.00	7415.00	53545.52	3323.89	42966.03	1688.68	20233.51	56686.50
Punjab Thermal	--	--	--	--	--	--	78.42	--	--	19351.48	885.23	0.00	3197.29	76353.64	33420.15
Thar Energy	--	--	--	--	--	--	--	--	--	14786.68	1238.50	7752.33	1948.50	27738.50	38816.40
Thar Coal-I	--	--	--	--	--	--	--	--	--	20509.76	3991.44	17086.84	7500.33	116416.69	161453.08
ThalNova	--	--	--	--	--	--	--	--	--	8520.35	859.92	4231.83	1830.69	28060.66	40418.19
CHASNUPP-I	2044.64	1912.55	10939.25	2244.33	2182.16	11612.27	2512.57	3062.07	11709.75	2298.98	2298.98	11324.05	1959.76	3239.60	20894.09
CHASNUPP-II	2636.12	2559.68	19050.07	2067.98	2263.23	18146.56	2437.85	2752.33	19710.79	3602.91	2437.89	22107.61	2520.36	5601.74	30019.66
CHASNUPP-III	2322.85	2300.13	29862.04	2404.32	2281.76	30692.06	2320.37	3271.41	30425.67	3633.54	2500.37	36174.19	2331.33	4010.82	47782.07
CHASNUPP-IV	2701.28	3053.53	29461.62	2456.15	2926.54	30338.34	2179.48	2802.66	30438.59	3244.97	2471.98	36151.45	2498.06	4638.55	48450.66
KANUPP	--	--	--	1698.92	1573.88	9822.17	--	--	--	--	--	--	--	--	--
KANUPP-II	--	--	--	--	--	--	6043.60	6157.10	79357.21	7562.27	6755.46	88525.50	5900.77	10760.64	172643.86
KANUPP-III	--	--	--	--	--	--	1967.06	1782.94	15026.71	6783.07	5983.23	79670.45	7944.59	9358.49	82148.34
Tavanir-Iran	513.74	30.54	--	498.37	27.29	--	429.04	8061.00	--	10363.66	536.29	1400.67	440.04	13037.94	1519.15
Zorlu Enerji	145.33	3421.91	--	109.20	2293.30	--	128.64	2948.82	--	--	95.69	2924.23	111.35	--	2133.35
FFC Energy	141.23	3054.14	--	123.77	2503.28	--	114.54	2766.53	--	--	76.55	--	2892.64	--	2310.10
Three Gorges 1st	138.69	3689.87	--	138.69	3607.42	--	123.78	3756.12	--	--	88.43	--	108.36	--	4592.03
Foundation-I	144.60	3651.65	--	144.60	3494.83	--	127.16	3699.71	--	--	88.92	--	5078.88	--	6956.31
Foundation-II	143.60	3618.98	--	143.59	3481.41	--	141.83	3684.47	--	--	97.68	--	5035.84	--	6882.33
Sapphire Wind	132.11	3449.65	--	110.68	2739.76	--	129.95	3534.73	--	--	81.42	--	4219.07	--	6428.02
Yunus Energy	125.03	3333.32	--	119.00	2862.04	--	135.62	3579.12	--	--	89.81	--	3666.10	--	5067.90
Metro Power	141.14	3891.81	--	140.32	3380.62	--	147.64	3168.32	--	--	106.75	--	1728.48	--	4353.83
Gul Wind	128.75	3472.88	--	116.69	2885.80	--	137.86	3720.73	--	--	87.17	--	4180.16	--	5627.30
Master Wind	133.90	3614.53	--	118.61	2931.90	--	38.81	3705.88	--	--	89.93	--	4207.48	--	5695.05
Tenaga	126.00	3401.00	--	105.00	2632.00	--	133.08	3675.18	--	--	76.23	--	3921.70	--	6007.24
HydroChina	121.51	3285.35	--	102.26	2611.83	--	132.44	3740.47	--	--	71.44	--	3868.63	--	6099.56
Sachal Energy	136.28	3727.29	--	134.62	3404.26	--	130.89	3569.60	--	--	95.70	--	4868.54	--	6405.95
UEP Wind	256.95	6951.39	--	215.94	5511.32	--	254.07	7155.52	--	--	172.73	--	8870.96	--	12323.05
Artistic Wind	175.03	3040.58	--	172.40	2778.08	--	192.97	2991.93	--	--	126.84	--	1805.10	--	2445.79
Act Wind	85.07	2275.96	--	77.97	1865.04	--	88.37	1920.65	--	--	53.77	--	1848.57	--	2671.87
Hawa Energy	149.66	3079.26	--	154.77	3005.84	--	169.86	3559.69	--	--	117.07	--	4551.42	--	5809.09
Jhimpir Wind	155.72	3186.51	--	157.84	3069.46	--	166.01	3474.47	--	--	115.78	--	4483.12	--	5898.83
Three Gorges 2nd	135.00	2656.00	--	116.00	2290.00	--	138.81	3030.20	--	--	93.90	--	86.43	--	5349.00
Three Gorges 3rd	138.19	2709.00	--	120.00	2372.00	--	142.75	3113.26	--	--	97.67	--	3773.46	--	5477.50
Tricon Bostan-A	159.78	2992.92	--	164.63	3191.79	--	181.46	3838.88	--	--	105.98	--	4691.34	--	6730.65
Tricon Bostan-B	158.93	2969.00	--	151.19	2951.09	--	177.70	3759.73	--	--	111.58	--	4576.05	--	6612.93
Tricon Bostan-C	152.91	3837.50	--	159.07	3068.26	--	178.69	3779.41	--	--	121.42	--	4579.60	--	6691.67
Zephyr Wind	179.96	4037.69	--	149.34	2821.61	--	191.70	3876.47	--	--	113.07	--	3365.58	--	5895.27

Power Plant	2019-20			2020-21			2021-22			2022-23			2023-24		
	Energy Delivered (GWh)	EPP	CPP	Energy Delivered (GWh)	EPP	CPP	Energy Delivered (GWh)	EPP	CPP	Energy Delivered (GWh)	EPP	CPP	Energy Delivered (GWh)	EPP	CPP
Lucky Renewables	--	--	--	--	--	--	128.06	967.97	--	140.28	--	1093.59	110.69	--	3589.97
Master Green	--	--	--	--	--	--	127.51	974.20	--	130.86	--	2070.81	103.97	--	2423.11
Act 2 Din Wind	--	--	--	--	--	--	81.66	590.36	--	138.67	--	1947.59	115.20	--	2321.51
Artistic 2 Wind	--	--	--	--	--	--	83.20	597.04	--	132.27	--	2878.35	110.97	--	3955.81
Indus Wind	--	--	--	--	--	--	76.45	574.74	--	137.66	--	1707.49	117.74	--	2662.59
Lakeside Energy	--	--	--	--	--	--	63.98	472.95	--	139.46	--	1060.91	114.95	--	3182.09
Liberty Wind-I	--	--	--	--	--	--	23.65	466.44	--	123.89	--	981.00	109.25	--	3096.87
Din Energy	--	--	--	--	--	--	66.82	493.53	--	131.07	--	1546.58	108.96	--	2652.64
Gul Electric	--	--	--	--	--	--	71.45	533.86	--	143.93	--	1548.70	133.92	--	2721.43
Liberty Wind-II	--	--	--	--	--	--	28.99	238.96	--	154.05	--	986.72	110.90	--	3064.42
NASDA Green	--	--	--	--	--	--	52.31	392.38	--	134.82	--	1074.11	115.86	--	3188.04
Metro 2 Wind	--	--	--	--	--	--	27.20	233.74	--	195.06	--	4560.07	157.97	--	5536.78
Quaid-e-Azam Solar	165.05	4280.54	--	165.74	3691.30	--	164.67	3707.27	--	160.47	--	4992.86	155.11	--	6707.93
Appolo Solar	163.13	4197.30	--	164.91	4141.89	--	168.68	1920.65	--	165.83	--	6499.78	162.53	--	7649.13
Best Green	162.97	4367.55	--	164.45	4228.00	--	167.47	4632.04	--	166.16	--	6829.46	158.94	--	7832.28
Crest Solar	165.41	4463.19	--	167.12	4337.42	--	169.34	4715.61	--	169.82	--	6983.91	163.23	--	8103.74
AJ Power	18.12	356.80	--	18.59	350.44	--	18.80	340.91	--	17.38	--	475.80	16.61	--	580.21
Harappa Solar	30.76	620.72	--	28.37	613.24	--	31.38	581.17	--	31.06	--	779.23	30.27	--	948.95
Atlas Solar	--	--	--	--	--	--	56.00	380.63	--	194.18	--	1252.27	190.35	--	3811.61
Helios Power	--	--	--	--	--	--	--	--	--	--	--	--	44.90	--	315.36
HINDS Energy	--	--	--	--	--	--	--	--	--	--	--	--	46.17	--	323.87
Meridian Energy	--	--	--	--	--	--	--	--	--	--	--	--	46.86	--	328.21
JDW-II	161.88	1088.29	668.29	177.17	1193.04	588.27	169.47	1141.23	675.77	190.76	1446.55	873.68	168.30	1257.74	964.90
JDW-III	129.21	869.00	732.35	144.44	972.10	733.19	136.74	922.42	464.42	184.95	1200.99	869.18	180.44	1345.91	990.56
RYK Mills	73.67	494.84	510.87	73.94	498.14	446.64	97.26	657.23	573.37	100.99	711.43	631.59	76.27	577.93	612.34
Chiniot Power	80.45	539.49	566.71	160.56	1081.53	965.99	222.53	1523.86	1481.77	186.80	1338.36	1515.35	125.03	1083.85	1341.39
Hamza Sugar	45.22	303.71	318.79	39.99	269.68	238.79	61.21	412.62	367.30	53.48	377.40	408.17	59.19	442.38	488.94
The Thal Industries	36.79	255.36	291.62	46.37	217.82	191.98	73.68	498.17	448.70	61.22	431.72	401.21	54.68	421.92	508.89
Almoiz Industries	15.10	114.30	147.04	29.83	200.91	176.04	17.39	117.74	107.50	24.87	177.22	206.53	28.60	217.55	268.97
Chanar Energy	22.34	143.87	126.08	38.26	318.05	268.46	47.92	323.71	288.35	41.03	286.84	309.40	16.37	125.19	158.76
SPPs	--	--	--	--	--	--	172.32	686.00	588.00	--	757.96	551.42	--	-311.40	-189.90
Total	121989.09	799274.14	611561.40	132215.96	818975.07	613923.56	139605.52	1495070.75	775892.57	129261.82	1272598.30	1306858.58	126929.22	1188959.43	1901944.02

Source: CPPA-G

TABLE 35
Merit Order for Power Generation Plants (CPPA-G System)
(Based on the revised fuel prices effective from 16-06-2024)

Order in Merit	Plant Groups	Fuel Type	As on 16 th June, 2024		
			Fuel Cost (Rs./kWh)	O&M Cost (Rs./kWh)	Specific Cost (Rs./kWh)
1	Uch (upto 152,375 MWh)	Gas	2.359	0.749	3.109
2	Thar Coal Block-I	Coal	4.334	1.197	5.531
3	Engro Power Thar	Coal	4.246	1.321	5.566
4	ThalNova	Coal	4.275	1.321	5.596
5	Thar Energy	Coal	4.276	1.321	5.597
6	Liberty Power (upto 61,904 MWh)	Gas	4.601	1.036	5.637
7	747 MW Guddu (CC)	Gas	7.284	1.100	8.384
8	Guddu (CCP) B-I (Unit 11-13)	Gas	8.960	0.069	9.029
9	Foundation Power	Gas	8.391	1.223	9.613
10	Guddu (CCP) B-II (Unit 5-10)	Gas	9.955	0.069	10.024
11	Engro PowerGen	Gas	8.955	1.079	10.034
12	747 MW Guddu (OC)	Gas	10.871	1.100	11.971
13	Uch (above 152,375 MWh)	Gas	11.324	0.749	12.073
14	Lucky Electric Power	Coal	13.120	0.380	13.500
15	Guddu (OC) B-I (Unit 11-13)	Gas	13.439	0.069	13.508
16	Port Qasim	Coal	13.708	0.385	14.093
17	Uch-II	Gas	13.525	0.709	14.234
18	China Power Hub	Coal	13.703	0.706	14.409
19	Guddu (OC) B-II (Unit 5-10)	Gas	14.932	0.069	15.001
20	Sahiwal Imported Coal	Coal	17.469	0.380	17.849
21	NPPMC - HBS (CC)	RLNG	22.017	0.393	22.410
22	NPPMC - Baloki (CC)	RLNG	22.190	0.438	22.628
23	QATPL - Bhikki (CC)	RLNG	22.482	0.344	22.826
24	Punjab Thermal Power	RLNG	21.925	0.981	22.906
25	Liberty Power (Above 61,904 MWh)	Gas	23.005	1.036	24.041
26	Orient Power	RLNG	26.825	0.736	27.561
27	Sapphire Electric	RLNG	26.825	1.239	28.064
28	Saif Power	RLNG	26.827	1.253	28.080
29	Nandipur (CC)	RLNG	27.362	0.759	28.120
30	Halmore Power	RLNG	27.012	1.259	28.271
31	Rousch Power	RLNG	29.723	0.879	30.602
32	Kohinoor Energy	RFO	29.072	1.877	30.950
33	Altern Energy (Ph-II)	RLNG	28.954	2.419	31.373
34	Atlas Power	RFO	28.425	2.966	31.391
35	Attock Gen	RFO	28.551	3.007	31.557
36	Nishat Power	RFO	30.222	2.966	33.187
37	Narowal Power	RFO	30.531	2.665	33.195
38	Fauji Kabirwala Power	RLNG	30.889	2.360	33.249
39	Nishat Chunian Power	RFO	30.740	2.959	33.699
40	Liberty Power Tech.	RFO	31.092	3.258	34.350
41	Lalapir Power	RFO	35.223	0.538	35.761
42	Pakgen Power	RFO	35.681	0.538	36.219
43	Davis Energen	RLNG	35.970	1.102	37.072
44	Jamshoro B-I (Unit -1)	RFO	37.397	0.093	37.490
45	Muzaffargarh B-II (Unit 4)	RLNG	39.200	0.163	39.363
46	Muzaffargarh B-I (Unit -3)	RLNG	39.256	0.163	39.418
47	Altern Energy (Ph-I)	RLNG	37.203	2.419	39.622
48	Jamshoro B-II (Unit 4)	RFO	40.006	0.093	40.099
49	Muzaffargarh B-I (Unit -1)	RLNG	40.092	0.163	40.255
50	HUBCO	RFO	40.230	0.449	40.679
51	Muzaffargarh B-I (Unit -2)	RLNG	40.621	0.163	40.783
52	Jamshoro B-II (Unit 3)	RFO	40.867	0.093	40.959
53	Muzaffargarh B-III (Unit -5)	RLNG	41.662	0.163	41.824
54	Jamshoro B-II (Unit 2)	RFO	41.999	0.093	42.091
55	Muzaffargarh B-III (Unit -6)	RLNG	42.764	0.163	42.926
56	Saba Power	RFO	43.324	0.538	43.862
57	NPPMC - HBS (CC)	HSD	43.586	0.510	44.096
58	Jamshoro B-II (Unit 4)	RLNG	44.156	0.093	44.248
59	Muzaffargarh B-II (Unit 4)	RFO	44.810	0.163	44.973
60	Muzaffargarh B-I (Unit 3)	RFO	44.877	0.163	45.040

Order in Merit	Plant Groups	Fuel Type	As on 16 th June, 2024		
			Fuel Cost (Rs./kWh)	O&M Cost (Rs./kWh)	Specific Cost (Rs./kWh)
61	Jamshoro B-II (Unit 3)	RLNG	45.092	0.093	45.185
62	Muzaffargarh B-I (Unit 1)	RFO	45.863	0.163	46.026
63	Jamshoro B-II (Unit 2)	RLNG	46.303	0.093	46.396
64	Muzaffargarh B-I (Unit 2)	RFO	46.485	0.163	46.647
65	Muzaffargarh B-III (Unit 5)	RFO	47.714	0.163	47.877
66	Muzaffargarh B-III (Unit 6)	RFO	49.019	0.163	49.182
67	Punjab Thermal Power	HSD	49.550	0.444	49.994
68	QATPL - Bhikki (CC)	HSD	51.189	0.375	51.564
69	NPPMC - Baloki (CC)	HSD	52.680	0.556	53.236
70	Engro PowerGen	HSD	54.057	1.101	55.158
71	Orient Power	HSD	56.520	1.207	57.728
72	Sapphire Electric	HSD	56.512	1.788	58.300
73	Saif Power	HSD	56.504	1.808	58.312
74	Halmore Power	HSD	56.908	1.817	58.724

Note:

- (1) Fuel Index for HUBCO also includes Heat Rate & Calorific Value on the basis of 100% load. The PLAC payable to HUBCO must be kept in view by NPCC.
- (2) General Sales Tax is not included in the above calculations.
- (3) RFO rates are on per Metric Ton, HSD rates are on per litre, Gas rates are in MMBTU except KAPCO.
- (4) Other cost of Uch Power is due to Excise Duty on gas.
- (5) RFO Revised Rates are calculated on the basis of weighted average fuel stock as provided by relevant IPP is used for merit order. Where accurate fuel stock position is not available, latest FCC rate is used for merit order.
- (6) Latest available RLNG rates as notified by OGRA have been used.
- (7) Fixed costs have not been used for merit order compilation pursuant to SDC 14.3.2 of the Grid Code 2005.
- (8) Plant availability on any specific fuel must be confirmed before the dispatch is given.
- (9) The FCC rates have been assumed at 100% Plant Factor i.e. unity Part Load Correction Factor. These rates may vary at different operation/Dispatch level after application of Part Load Correction (PLAC) Factors given in the PPA. Therefore, PLAC be taken into account before issuing dispatch instructions.
- (10) The dedicated gas projects require minimum dispatch of 50% against their availability on gas under respective PPAs, otherwise, shortfall energy have to be paid.
- (11) Open Cycle Tariff included in line with NEPRA direction to NPCC to give dispatch to Open Cycle vide NPCC letter No. 10677-82 dated 16-04-2022.
- (12) JPCL's Jamshoro Units 2, 3 & 4 and Muzaffargarh Units 1, 2, 3, 4, 5 and 6 have tariff on gas fuel, there inclusion/exclusion of ranking on gas fuel in Merit Order will be finally decided once the disputes involving the Gas Supply Agreement have been resolved to the satisfaction of parties. During the dispute, dispatch on gas fuel will be given to these units, according to the tariff whenever gas fuel supplies from their Suppliers. As per NEPRA Authority direction during the FCA hearing held in NEPRA office on dated 31-05-2022, Gas and Mixed fuel firing Plants of GENCOs are being separated and please be considered the availability of these GENCOs' Plants on Gas, otherwise on RFO and other fuel as in regular Merit Order.

Source: National Power Control Centre, Islamabad

Table 36
Monthly Utilization Factor of Power Plants (%) (2023-24)

Power Producers	Fuel	Dep. Cap. (MW)	July	August	September	October	November	December	January	February	March	April	May	June
WAPDA	Hydel	6,942	73.38	98.27	88.29	46.88	49.19	31.98	15.97	33.12	30.30	21.03	60.17	79.55
Jagran	Hydel	30	81.45	0.00	60.98	25.99	11.52	9.96	5.30	3.79	17.19	51.73	81.44	85.92
Pehur	Hydel	18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Malakand-III	Hydel	81	7.39	0.00	47.03	29.42	15.72	9.61	12.73	8.84	31.48	28.48	67.31	81.36
Laraib Energy	Hydel	84	9.29	27.23	65.28	78.33	83.56	46.95	7.72	80.61	68.79	43.48	82.78	85.75
Patirind Hydro	Hydel	147	71.04	0.00	37.71	22.46	17.06	13.80	11.04	11.68	20.68	55.38	92.26	98.85
Marala Hydro	Hydel	8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Neelum Jhelum	Hydel	969	0.00	0.00	43.00	21.68	16.26	11.26	2.75	0.00	38.30	57.54	0.12	0.00
Tarbela 4 th Ext.	Hydel	1,410	96.87	0.00	0.00	29.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gulpur Hydropower	Hydel	100	80.06	52.12	20.36	12.14	8.07	0.01	0.00	9.69	41.82	58.17	53.54	28.68
Darat Khwar	Hydel	37	50.53	0.00	23.32	18.40	12.70	8.33	6.03	8.64	33.85	77.50	92.30	93.06
Karot Power Company	Hydel	720	99.33	65.88	29.83	22.02	18.00	13.35	9.72	18.39	46.09	85.38	97.24	93.44
Ranolia Hydropower	Hydel	17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Guddu 747 (CC)	Gas	721	22.53	27.81	27.18	27.37	25.46	19.62	36.24	46.46	30.16	49.44	48.89	58.85
Central Block 2 (CC)	Gas	640	23.28	35.28	13.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Block-3 Unit 5	RLNG	450	0.00	2.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nandipur	RLNG	500	60.43	67.02	41.86	7.59	0.00	0.00	0.24	0.00	0.00	0.49	30.14	43.26
Hub Power	RFO	1,200	-0.15	-0.15	-0.15	-0.14	0.00	0.00	-0.10	0.00	0.00	0.00	0.00	0.00
Kohinoor Energy	RFO	124	29.73	21.98	48.90	0.00	0.00	14.39	62.87	0.00	0.00	0.00	18.19	31.57
Lal Pir Power	RFO	350	24.16	35.50	0.00	0.00	0.00	2.00	59.31	0.00	0.00	0.00	0.00	17.46
Pak Gen Power	RFO	350	12.64	27.43	1.25	0.00	0.00	17.40	22.34	0.00	0.00	0.00	0.00	0.00
Fauji Kabinwala	Gas	151	30.28	0.00	11.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.64	38.14
Roush Power	RLNG	395	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.30	0.00
Saba Power	RFO	125	3.96	24.07	11.19	0.00	0.31	0.00	19.11	0.00	0.00	0.00	0.00	0.00
Uch-I	Gas	547	88.56	90.17	86.37	89.70	36.65	90.24	95.88	61.50	80.46	92.98	91.19	84.43
Altern Energy	Gas	372	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Liberty Daharki	Gas	212	63.11	74.54	52.71	39.44	40.90	54.56	64.36	0.18	42.24	49.83	43.07	54.51
Chashma Nuclear-I	Nuclear	301	86.06	65.33	96.33	87.72	99.10	63.12	0.00	38.13	61.03	96.95	98.57	97.84
Chashma Nuclear-II	Nuclear	315	97.93	98.15	96.42	96.08	92.30	92.33	99.51	90.59	91.73	97.87	85.55	53.79
Chashma Nuclear-III	Nuclear	315	0.00	42.60	99.16	99.67	98.92	100.07	100.34	88.08	94.03	97.13	96.95	96.11
Chashma Nuclear-IV	Nuclear	315	91.58	98.35	96.31	97.58	93.22	92.06	98.97	97.36	93.79	26.18	98.79	98.12
Karachi Nuclear (Unit-2)	Nuclear	1,040	93.91	80.76	96.61	33.62	0.01	0.00	58.54	62.56	85.14	87.78	95.51	80.77
Karachi Nuclear (Unit-3)	Nuclear	1,040	96.08	91.61	92.44	88.17	95.05	84.84	74.25	72.17	80.00	89.96	95.77	82.67
Attock Gen.	RFO	156	13.43	0.00	23.21	0.00	0.00	19.96	64.53	0.00	0.00	0.00	0.00	19.08
Atlas Power	RFO	214	10.36	0.00	16.44	0.00	0.00	18.18	57.51	0.00	0.00	0.00	0.00	19.61
Nishat Power	RFO	195	34.10	0.00	40.28	0.05	0.00	16.12	60.61	0.00	0.00	0.00	29.40	48.83
Foundation Power	Gas	168	73.51	83.29	81.53	81.75	68.70	72.40	73.96	45.92	64.36	80.46	72.75	84.61
Orient Power	RLNG	203	62.67	79.93	63.44	0.00	0.00	0.02	21.62	1.62	0.00	5.20	56.81	71.65
Nishat Chunian	RFO	196	25.48	0.00	16.12	0.00	0.00	5.46	35.54	0.00	0.00	0.00	1.71	23.90
Saif Power	RLNG	204	46.06	61.17	17.36	0.00	0.00	0.00	0.39	0.00	0.00	2.88	7.77	10.70
Engro Powergen Qadirpur	Gas	212	48.98	43.99	43.08	17.46	42.12	44.81	41.29	50.81	48.76	38.96	56.46	47.86
Sapphire Electric	RLNG	202	58.00	71.27	58.38	3.75	0.00	1.85	0.40	0.00	0.36	4.61	54.84	69.80
Narawal Energy	RFO	214	4.15	0.00	20.05	0.00	0.00	4.47	43.14	0.00	0.00	0.00	0.00	13.64
Liberty Power Tech.	RFO	196	29.91	0.00	16.60	0.00	0.00	9.49	55.77	0.00	0.00	0.00	0.00	11.22

Power Producers	Fuel	Dep. Cap. (MW)	July	August	September	October	November	December	January	February	March	April	May	June
Haimore Power	RLNG	200	44.98	68.28	16.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.92	8.37
Uch-II	Gas	372	84.52	86.14	75.92	0.00	77.83	38.37	69.24	73.69	29.58	44.44	81.05	85.04
JDW-II	Bagasse	24	18.35	100.26	100.49	79.90	39.05	85.42	85.97	77.62	91.50	100.69	78.21	101.08
JDW-III	Bagasse	24	95.39	98.96	99.10	56.42	23.49	84.02	86.59	88.42	95.75	100.22	99.23	99.04
RYK	Bagasse	24	8.72	0.00	0.00	0.00	28.62	71.65	76.38	79.60	48.71	53.86	55.02	12.80
Chiniot Power	Bagasse	63	35.46	0.00	0.00	9.44	13.44	57.26	56.49	58.66	24.10	0.00	0.94	45.89
Fatima Energy	Bagasse	45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hamza Sugar Mills	Bagasse	15	0.00	0.00	0.00	0.00	41.31	84.08	87.57	84.48	83.15	82.33	76.87	0.00
Almoiz Industries	Bagasse	36	5.54	0.00	0.11	0.00	0.55	21.67	19.50	19.52	6.12	5.18	23.96	8.21
Chanaar Energy	Bagasse	22	0.00	0.00	0.00	0.00	0.35	17.79	39.37	45.44	0.00	0.00	0.00	0.00
China Power Hub	Coal-Imported	1,249	17.18	0.00	8.54	0.00	9.29	0.00	0.00	0.00	0.00	0.00	8.28	0.33
Engro Power Gen. Thar	Coal-Local	603	77.23	0.00	89.76	57.56	89.20	78.17	39.40	40.33	61.18	65.81	73.92	85.03
Layyah Sugar Mills	Bagasse	25	0.00	0.00	0.00	0.00	0.95	71.23	75.26	75.35	76.09	8.82	0.00	0.00
QATPL (Bhikki)	RLNG	1,163	47.84	3.61	20.52	45.74	0.00	19.98	38.03	33.46	49.86	72.95	54.79	42.79
NPPMCL (HBS)	RLNG	1,172	81.86	70.26	66.69	77.77	78.61	61.10	83.31	72.64	78.45	86.88	89.67	76.95
Huaneng Shandong Ruyi	Coal-Imported	1,244	16.13	0.00	17.20	0.00	0.00	18.18	61.27	14.80	0.00	2.36	26.29	43.14
NPPMCL (Balloki)	RLNG	1,165	75.14	76.89	68.34	67.21	15.83	63.19	60.66	72.04	62.10	76.03	76.14	69.71
Port Qasim Electric	Coal-Imported	1,243	8.57	0.00	18.23	5.34	9.41	20.18	0.00	0.00	0.00	0.00	6.76	6.91
Lucky Electric Power	Coal-Imported	605	69.64	0.00	57.45	63.72	72.98	6.40	2.01	1.62	0.00	0.00	0.00	42.73
Punjab Thermal Power	RLNG	1,243	64.40	78.33	49.40	26.86	0.21	1.28	0.00	0.00	0.45	17.34	56.99	50.80
Thar Energy	Coal-Local	300	93.11	96.35	85.66	89.64	89.95	79.43	75.87	18.62	71.92	66.81	45.77	71.16
Thar Coal Block-1 Power	Coal-Local	1,230	78.99	86.74	82.32	86.06	28.27	64.37	93.40	71.89	30.32	33.71	85.23	90.52
ThalNova Power	Coal-Local	303	89.19	0.00	80.13	39.10	71.27	85.41	76.30	80.71	66.23	69.68	69.99	75.26
Zorlu Enerji Pakistan	Wind	56	36.26	0.00	25.08	16.02	14.72	19.37	13.35	11.26	12.18	17.61	23.90	32.40
FFC Energy	Wind	50	32.15	0.00	22.27	13.28	17.26	23.67	14.61	11.19	10.88	14.32	20.61	29.39
Three Gorges First	Wind	50	37.02	61.63	24.88	17.46	18.96	22.34	15.24	11.96	13.02	18.14	24.51	32.91
Foundation Wind Energy-I	Wind	50	38.76	62.64	31.14	15.27	13.02	15.29	12.56	10.91	14.86	26.17	33.12	31.60
Sapphire Wind Power	Wind	53	30.18	46.50	21.48	9.45	6.95	6.39	6.17	5.50	9.31	12.85	20.44	29.60
Yunus Energy	Wind	50	33.14	48.63	24.16	10.62	8.76	8.29	7.18	5.67	11.31	15.83	23.41	32.13
Metro Power Company	Wind	50	39.00	64.37	29.04	17.72	27.26	30.86	20.28	14.03	17.00	21.66	27.37	35.85
Gul Ahmad Wind	Wind	50	33.19	0.00	24.97	10.85	8.99	8.29	7.44	5.86	11.49	16.08	23.40	31.41
Master Wind Energy	Wind	50	35.29	52.00	24.47	10.65	7.97	7.05	7.13	6.40	10.89	14.19	23.64	34.37
Tenaga Generasi	Wind	50	37.01	0.00	30.10	10.69	6.85	5.97	6.26	6.35	13.48	21.87	31.90	32.64
Act Wind	Wind	31	40.33	0.00	27.64	19.41	17.21	18.61	14.26	13.68	14.40	22.00	31.54	37.12
HydroChina Dawood	Wind	50	33.75	51.42	29.67	10.65	6.51	5.90	6.03	6.18	12.29	20.28	30.53	32.83
Sachal Energy	Wind	50	37.09	59.73	25.85	17.74	23.93	25.29	18.95	13.32	15.24	20.10	25.69	33.74
UEP Wind	Wind	99	33.24	0.00	25.10	11.08	8.23	6.99	6.39	6.35	12.13	17.40	25.25	31.07
Quid-e-Azam Solar Park	Solar	100	17.42	19.81	19.19	18.68	12.80	14.26	8.99	18.52	20.62	20.68	20.98	20.08
Appollo Solar Park	Solar	100	18.30	0.00	19.92	19.59	13.36	15.08	9.72	18.95	21.43	21.61	21.95	21.20
Best Green Energy	Solar	100	16.99	20.08	19.44	18.65	13.25	14.83	9.75	18.80	21.19	21.49	21.75	21.07
Crest Energy	Solar	100	18.62	20.61	19.91	19.67	13.49	15.23	9.78	19.21	21.59	21.76	21.83	21.42
Harappa Solar	Solar	18	20.77	0.00	22.47	17.70	10.23	11.68	5.89	17.35	21.17	24.86	27.55	26.04
AJ Power	Solar	12	17.71	18.70	19.22	17.55	12.66	12.96	6.40	15.83	18.49	19.27	21.03	20.52
Artistic Wind Power	Wind	50	52.76	78.62	42.10	28.66	29.85	36.34	25.75	16.72	21.42	31.93	44.55	49.17
Jhampir Power	Wind	50	41.66	18.90	31.64	13.15	8.76	7.36	8.26	7.72	14.29	18.45	30.76	41.61
Hawa Energy	Wind	50	39.32	53.74	30.92	12.79	9.01	7.35	8.55	8.08	14.86	17.98	30.23	41.04

Power Producers	Fuel	Dep. Cap. (MW)	July	August	September	October	November	December	January	February	March	April	May	June
Three Gorges Third	Wind	50	34.93	49.52	26.19	11.83	8.57	7.20	7.47	6.95	12.70	17.35	26.14	34.51
Three Gorges Second	Wind	50	34.58	49.45	25.48	11.68	8.33	7.13	7.06	6.63	12.17	16.47	25.25	33.56
Tricon Boston Consulting-A	Wind	50	46.30	58.00	34.14	14.14	8.32	6.90	6.74	7.09	16.64	24.78	36.86	45.39
Tricon Boston Consulting-B	Wind	50	44.79	58.21	32.86	13.64	8.41	7.01	7.00	7.14	16.34	23.36	34.88	43.37
Tricon Boston Consulting-C	Wind	50	44.54	57.55	33.00	13.54	8.65	7.15	7.32	7.45	16.25	22.94	34.21	43.03
Zephyr Power	Wind	50	51.85	0.00	40.48	13.78	8.35	6.39	7.17	7.79	18.68	28.84	44.00	46.19
Master Green Energy	Wind	50	42.22	0.00	32.55	12.41	7.93	6.96	6.85	7.40	14.52	17.70	30.09	45.58
Lucky Renewables	Wind	50	43.09	59.52	34.50	13.30	8.62	7.01	7.63	7.97	15.95	20.92	35.99	47.14
Act 2 Din Wind	Wind	50	43.27	63.53	35.50	14.31	8.61	6.97	7.44	7.74	16.99	23.97	39.79	45.73
Artistic 2 Wind Power	Wind	50	41.49	61.50	33.05	13.37	8.58	7.08	7.55	7.76	16.29	23.59	38.80	43.27
Indus Wind Energy	Wind	50	44.22	64.64	36.29	14.07	8.43	6.66	6.68	7.44	18.30	26.62	41.87	45.54
Lakeside Energy Limited	Wind	50	43.74	0.00	35.27	13.72	8.54	6.90	6.44	7.48	17.85	25.64	40.02	44.52
Liberty Wind Power-I	Wind	50	41.66	64.35	32.63	12.82	8.66	6.82	6.63	6.85	15.39	23.85	36.82	41.08
DIN Energy	Wind	50	41.41	0.00	34.16	12.89	9.07	7.06	7.11	7.97	16.15	22.82	35.91	40.59
Gul Ahmed Electric	Wind	50	43.39	0.00	36.55	15.23	8.24	6.92	6.75	7.11	18.23	28.57	43.20	45.19
Atlas Solar	Solar	100	23.86	25.59	24.63	20.27	12.88	13.04	8.65	19.62	23.67	28.47	31.96	29.62
Liberty Wind Power-II	Wind	100	21.40	32.67	16.74	6.55	4.24	3.36	3.23	3.16	7.76	11.76	18.73	21.40
NASDA Green Energy	Wind	50	44.16	0.00	35.86	14.38	8.75	6.90	6.51	7.55	16.69	25.12	40.30	44.92
Metro 2 Wind Power	Wind	50	57.31	80.09	50.55	20.48	11.87	9.32	8.80	9.93	25.37	39.08	57.90	59.79
Foundation Wind Energy-II	Wind	50	41.42	68.19	32.22	15.69	18.13	21.15	15.54	12.14	14.78	26.52	34.44	34.74
Helios Power	Solar	50	0.00	0.00	0.00	0.00	0.00	3.58	8.72	19.72	23.64	23.80	28.00	28.51
Meridian Energy	Solar	50	0.00	0.00	0.00	0.00	0.00	3.81	11.10	19.74	23.62	24.25	28.32	28.60
HNDS Energy	Solar	50	0.00	0.00	0.00	0.00	0.00	6.60	11.63	19.44	19.33	23.54	27.46	28.34
Jamshoro (GENCO-I)	RFO	300	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tavanir Iran (Import)	Import	96	40.39	0.00	35.06	31.56	43.02	39.49	40.72	38.40	39.73	53.67	69.95	68.93

Source: CPPA-G

TABLE 37
Liquidated Damages against Power Plants

Name of Companies	Verified Amount on Account of Liquidated Damages against Power Plants (Rs. in Million)				
	2019-20	2020-21	2021-22	2022-23	2023-24
Malakand-III (PEDO)	--	--	123.95	209.10	--
Laraib Energy (AJ&K)	--	276.28	--	--	--
Gulpur Hydropower (\$)	1.02	0.07	--	--	--
GENCO-I	323.49	--	3,249.96	40.23	--
GENCO-II	604.00	--	0.00	6221.19	--
GENCO-III	2,510.00	--	1,574.38	2,579.48	1,418.99
Lal Pir Power	0.12	23.05	0.00	0.80	0.28
Pak Gen. Power	0.36	27.71	--	--	--
Fauji Kabirwala	581.86	--	813.43	28.00	31.37
Habibullah Coastal	3,494.10	314.16	--	--	--
Hub Power	--	2.05	--	--	--
Japan Power	214.32	1228.80	--	--	--
Kohinoor Energy	109.10	0.02	0.04	--	0.05
Rousch Power	--	0.01	0.10	--	--
Saba Power	14.32	--	353.66	124.47	--
Liberty Daharki Power	3.19	2.70	25.09	4.55	--
Uch Power	237.86	2.20	0.00	5.89	6.33
Atlas Power	--	--	--	--	2.92
Engro Powergen. Qadirpur (\$)	1.79	--	--	--	--
Narowal Energy	398.54	--	0.00	9.93	3.60
Davis Energen.	--	--	3.61	--	--
Sahiwal Imported Coal	--	--	665.60	--	--
Port Qasim Electric Power	--	--	--	4,703.20	--
China Power Hub	--	--	253.70	736.00	--
Lucky Electric Power	--	--	1,217.29	664.41	578.78
Thar Energy	--	--	596.12	1,126.13	--
Thar Coal Block-I Power	--	--	--	352.87	972.86
ThalNova Power	--	--	--	1,433.93	--
Lakeside Energy	--	--	--	11.30	--
Liberty Wind Power-I	--	--	--	8.17	--
HydroChina Dawood	77.50	--	--	--	--
Din Energy	--	--	--	8.02	--
Gul Ahmad Electric	--	--	--	10.19	--
Liberty Wind Power-II	--	--	--	18.82	--
NASDA Green Energy	--	--	--	9.34	--
Metro 2 Wind Power	--	--	--	46.87	--
Helios Power	--	--	--	--	273.85
HNDS Energy	--	--	--	--	249.46
Meridian Energy	--	--	--	--	259.44
Appolo Solar Development	251.18	--	--	--	--
Best Green Energy	351.33	--	--	--	--
Crest Energy	351.33	--	--	--	--
Total	9,522.60	1,876.98	8,876.94	18,352.90	3,797.93

Source: CPPA-G

TABLE 38
Claims Lodged by CPPA-G against Gas Supply Company (Rs. in Million)

IPP Name	Gas Supply Company (SNGP/SSGC)	2019-20	2020-21	2021-22	2022-23	2023-24
NPPMCL – Haveli Bahadur Shah	SNGPL	22.55	0.00	0.00	0.00	0.00
NPPMCL – Balloki	SNGPL	503.81	0.00	0.00	0.00	0.00
Quaid-e-Azam Thermal Power	SNGPL	0.00	0.00	0.00	0.00	0.00
Total		526.36	0.00	0.00	0.00	0.00

Source: CPPA-G

TABLE 39
Partial Load Adjustment Charges

Name of Company	Verified Charges on Account of Partial Load Adjustment (Rs. in Million)				
	2019-20	2020-21	2021-22	2022-23	2023-24
GENCO-I	177.74	41.73	--	--	39.82
GENCO-III	192.00	--	26.34	64.44	17.14
KAPCO	188.88	262.20	536.20	246.80	--
Hub Power	70.13	224.98	2,726.10	938.51	--
Attock Gen.	41.84	58.13	999.44	434.64	106.16
Atlas Power	99.56	1337.38	281.12	197.95	165.25
Engro Powergen. Qadirpur	453.89	674.48	556.07	718.10	1,145.97
Saif Power	419.62	489.50	1,208.84	1,548.54	1,165.97
Orient Power	444.99	538.67	1,190.79	1,546.74	1,721.89
Nishat Power	70.38	72.99	146.38	164.87	144.19
Nishat Chunian	96.83	92.84	223.17	251.60	296.28
Sapphire Electric	339.18	686.00	1,256.25	1,383.22	1,531.83
Halmore Power	388.91	442.17	1,031.31	963.06	999.72
Narowal Energy	79.11	68.00	189.80	147.09	111.06
Liberty Power Tech.	54.77	55.25	153.52	86.39	98.35
Foundation Power	764.15	678.99	468.91	648.12	791.13
Uch-II Power	715.67	557.25	713.18	1,158.89	5,148.02
Sahiwal Imported Coal	937.77	773.56	622.79	1,565.08	995.06
Quaid-e-Azam Thermal	3,774.47	4,172.34	8,291.00	10,154.53	7,439.65
NPPMCL – Haveli Bahadur Shah	4,387.76	4,007.62	8,353.00	10,134.17	14,993.24
NPPMCL – Balloki	4,432.36	3,074.56	8,306.00	13,626.21	13,795.82
Port Qasim Electric Power	573.44	406.08	916.68	612.80	705.26
China Power Hub	--	--	--	--	446.85
Punjab Thermal Power	--	--	--	--	3,812.62
Total	18,703.45	18,714.72	38,196.89	46,591.75	55,671.30

Note: PLAC of Uch-II Power includes differentials for October, 2020 to September, 2023.

Source: CPPA-G

TABLE 40
Monthly Partial Load Adjustments Charges (FY 2023-24) (Rs. in Million)

Name of IPP	July	August	September	October	November	December	January	February	March	April	May	June	Total
GENCO-I	-	-	-	-	21.37	-	-	2.72	15.73	-	-	-	39.82
GENCO-III	-	0.94	-	-	-	-	16.20	-	-	-	-	-	17.14
Attock Gen.	11.07	19.49	7.46	-	-	21.11	33.56	-	-	-	-	13.47	106.16
Atlas Power	13.07	24.34	8.39	-	-	33.86	63.19	-	-	-	-	22.40	165.25
Engro Powergen. Qadirpur	99.56	111.85	110.66	39.57	115.71	111.20	115.35	90.24	103.14	86.64	80.18	81.87	1,145.97
Saif Power	256.10	313.71	137.80	-	-	339.91	2.80	3.50	-	12.08	36.95	63.11	1,165.96
Orient Power	263.28	174.22	265.16	-	-	58.16	75.93	409.72	-	20.35	163.15	291.90	1,721.87
Nishat Power	17.41	10.45	11.31	0.21	-	44.38	32.59	-	-	-	7.96	19.88	144.19
Nishat Chunian	25.14	83.99	75.69	-	-	17.44	60.80	-	-	-	3.20	30.02	296.28
Sapphire Electric	264.28	236.44	190.41	14.01	-	13.20	285.01	-	3.28	21.40	213.01	290.78	1,531.82
Halmore Power	262.70	326.76	107.85	-	-	231.98	9.58	-	-	-	10.46	50.38	999.71
Narowal Energy	3.88	14.50	8.88	-	-	10.71	62.86	-	-	-	-	10.22	111.05
Liberty Power Tech.	9.99	19.65	8.14	-	-	9.85	22.68	-	-	-	-	28.04	98.35
Foundation Power	51.26	36.01	61.68	66.67	65.61	91.82	75.27	61.03	123.70	64.14	40.25	53.70	791.14
Uch-II Power	379.20	370.05	319.65	-	176.50	84.56	3,271.96	151.86	62.94	75.94	130.80	124.57	5,148.03
Sahiwal Imported Coal	203.37	296.37	33.65	-	-	0.97	126.74	121.78	-	13.59	75.90	122.69	995.06
Quaid-e-Azam Thermal	1,095.27	87.13	476.69	919.85	-	209.76	615.37	515.74	778.11	1,194.16	871.30	676.28	7,439.66
Haveli Bahadur Shah	1,362.83	1,344.94	1,301.75	1,447.21	1,607.87	1,146.43	1,349.09	1,023.50	1,437.03	941.48	924.21	1,106.90	14,993.24
Balloki Power	1,545.52	1,633.72	1,325.51	1,211.05	258.97	1,038.31	1,143.42	1,177.26	1,269.08	1,131.29	935.57	1,126.14	13,795.84
Port Qasim Electric	87.50	75.17	119.13	65.53	65.74	162.62	-	-	-	-	70.70	58.87	705.26
China Power Hub	169.80	87.16	68.77	-	66.00	-	-	-	-	-	52.75	2.37	446.85
Punjab Thermal	679.63	484.29	261.28	100.40	-	-	-	-	11.70	373.97	913.66	987.71	3,812.64
Total	6,800.86	5,751.18	4,899.86	3,864.50	2,377.77	3,626.27	7,362.40	3,557.35	3,804.71	3,935.04	4,530.05	5,161.30	55,671.29

Source: CPPA-G

TABLE 41
Verified Amount on Account of Non-Project Missed Volume

Company Name	2019-20		2020-21		2021-22		2022-23		2023-24	
	(kWh)	(Million Rs.)	(kWh)	(Million Rs.)	(kWh)	(Million Rs.)	(kWh)	(Million Rs.)	(kWh)	(Million Rs.)
Zorlu Enerji Pakistan	2,445,173.00	30.94	--	--	--	--	--	--	--	--
FFC Energy	2,789.32	23.35	2,444.45	32.99	456.20	1.87	4,439.84	97.63	2,553,150.00	34.91
Three Gorges First Wind	529,055.00	32.25	1,512,069.00	39.93	91,518.00	2.39	4,741,468.00	181.89	3,815,303.00	75.35
Foundation Wind Energy-I	870,338.00	21.32	2,527,480.00	62.28	208,028.00	5.62	3,428,590.00	123.65	4,491,490.00	188.80
Foundation Wind Energy-II	184.96	4.67	2,695.95	66.63	204.51	5.52	3,297.24	101.38	4,269,755.00	176.22
Sapphire Wind	41,408.87	1,056.17	6,673.91	174.49	2,118.97	58.33	15,380.94	608.47	51,967,905.00	2,492.52
Yunus Energy	35,200,230.00	1,029.64	6,426,736.00	154.72	2,245,671.00	58.02	14,667,676.00	489.47	44,009,887.00	1,684.15
Metro Power Company	--	--	--	--	--	0.48	9,692,038.00	0.06	8,123,021.05	306.24
Gul Ahmed Wind	37,608,481.88	1,001.57	6,312,589.94	158.52	2,223,067.23	59.12	14,590,946.58	536.82	42,633,200.86	1,873.48
Master Wind Energy	36,998,562.00	985.40	6,767,356.00	169.73	2,227,017.00	59.05	14,161,038.00	523.08	42,285,450.00	1,859.69
Tenaga Generasi	456,898.00	12.50	507,511.00	12.93	2,789,646.00	74.43	21,967,321.00	901.23	34,996,300.17	1,627.68
HydroChina Dawood	457,990.04	12.61	667,229.81	17.38	2,157,495.69	65.62	20,281,166.59	908.14	31,280,506.82	1,558.82
Sachal Energy Development	47,300.00	1.26	34,035.00	0.85	26,294.00	0.65	15,419.00	0.63	318,285.89	14.58
UEP Wind Power	77,811,525.46	2,046.97	12,397,898.01	323.86	6,438,566.21	176.64	30,081,291.71	1,218.91	78,132,087.32	3,886.67
Artistic Wind Power	42,880,525.84	706.50	6,435,965.00	105.55	2,851,014.00	40.48	17,722,798.00	307.43	7,160,540.00	149.53
Act Wind	20,305,500.51	548.87	3,273,200.50	78.75	1,540,654.74	34.59	4,624,179.00	137.02	2,168,290.00	72.53
Hawa Energy	39,948,347.35	788.78	7,800,305.27	155.18	2,215,322.00	44.05	17,053,250.40	547.41	44,424,571.89	1,728.39
Jhampir Power	42,148,383.00	815.46	8,045,061.00	160.45	2,026,181.00	40.84	16,738,814.10	537.71	46,119,219.19	1,768.14
Three Gorges Second Wind	42,714,620.34	827.51	7,221,504.36	144.54	2,014,166.21	42.17	15,873,961.38	511.02	47,988,832.55	1,898.75
Three Gorges Third Wind	43,007,577.24	833.13	7,285,958.02	145.82	2,000,455.51	41.87	15,882,622.42	513.58	48,138,481.49	1,904.35
Tricon Bostan Consulting-A	42,592,933.00	844.29	6,965,637.00	134.21	2,468,146.00	51.73	16,927,454.00	554.61	55,716,858.87	2,184.16
Tricon Bostan Consulting-B	41,287,418.00	829.70	7,053,213.00	140.88	2,444,296.00	51.54	17,192,643.00	561.99	56,313,844.16	2,204.89
Tricon Bostan Consulting-C	43,939,568.00	885.21	7,021,250.00	134.56	2,445,255.00	51.52	17,316,115.00	565.77	58,359,749.00	2,288.47
Zephyr Power	--	--	--	--	--	74.80	2,208,956.00	59.96	25,840,968.00	917.94
Lucky Renewables	--	--	--	--	--	1,331,763.00	11,961,180.00	160.36	48,438,365.00	735.38
Master Green Energy	--	--	--	--	--	1,212,409.37	9,702,238.03	127.92	49,198,052.16	740.80
Act 2 Din Wind	--	--	--	--	--	216,619.00	10,604,486.60	111.29	50,471,219.26	695.71
Artistic 2 Wind Power	--	--	--	--	--	278,006.00	10,611,574.00	132.91	53,993,332.44	719.20
Indus Wind Energy	--	--	--	--	--	153,266.67	14,105,537.00	160.62	55,089,684.00	718.85
Lakeside Energy	--	--	--	--	--	--	10,335,894.00	129.31	45,336,691.00	647.77
Liberty Wind Power-I	--	--	--	--	--	33,137.00	13,853,372.00	178.31	45,583,825.00	668.00
Din Energy	--	--	--	--	--	166,528.00	11,517,144.00	146.28	47,732,428.00	702.05
Gul Ahmed Electric	--	--	--	--	--	--	10,577,562.68	118.55	49,797,135.80	675.60
Liberty Wind Power-II	--	--	--	--	--	15,675.00	13,265,487.00	170.65	46,171,298.00	677.00
NASDA Green Energy	--	--	--	--	--	--	10,717,581.00	134.55	46,878,087.00	641.98
Metro 2 Wind Power	--	--	--	--	--	--	14,064,446.00	200.09	55,406,063.00	953.18
Quaid-e-Azam Solar Park	159,711.00	4.23	186,667.00	3.97	102,664.00	2.14	495,833.00	14.02	202,283.00	6.58
Appollo Solar Development	105,898.00	2.71	179083.00	4.52	32,083.00	0.85	481,535.00	18.19	190,750.33	9.21
Best Green Energy	48,417.00	1.31	194,995.00	5.06	110,250.00	4.47	418,250.00	16.70	185,499.00	9.48
Crest Energy	100,829.00	2.74	172,615.00	4.54	155,749.00	4.43	523,249.00	21.02	183,167.00	9.42
AJ Power	92,905.00	1.86	97,709.00	1.85	43,656.00	817.12	85,761.00	2.05	17,214.00	0.50
Harappa Solar	76,242.00	1.54	154,735.00	3.03	100,175.00	1.90	150,563.00	3.61	99,176.00	3.12
Atlas Solar	--	--	--	--	64,530.00	0.41	627,375.00	4.03	368,754.00	5.38
Helios Power	--	--	--	--	--	--	--	--	254,031.00	1.76
HNDS Energy	--	--	--	--	--	--	--	--	336,639.00	2.33
Meridian Energy	--	--	--	--	--	--	--	--	255,970.00	1.77
Total	551,878,811.81	13,352.50	99,252,617.22	2,437.21	42,432,084.30	1,904.66	419,289,934.51	11,838.31	1,337,297,361.25	39,521.32

Source: CPPA-G

TABLE 42

Year-wise Details of the Circular Debt (Rs. in Million)

Description	2019-20	2020-21	2021-22	2022-23	2023-24
Due for Payments against verified invoices of Power Generation Companies	1,038,115.00	1,244,835.00	1,351,023.44	1,434,216.77	1,599,658.29
Payables to GENCOs (Invoices based)	48,040.00	-	101,473.38	110,527.13	110,458.68
Payables to Fuel Suppliers by GENCOs	105,092.00	105,314.00	-	-	-
Total (Payables to IPPs/GENCOs)	1,191,247.00	1,350,149.00	1,452,496.82	1,544,743.90	1,710,116.97
Energy Payable Swap by GOP through Loan from Commercial Banks by Power Holding (Pvt.) Limited	1,007,218.00	930,000.00	800,253.45	765,253.45	683,253.45
Grand Total (Circular Debt)	2,198,465.00	2,280,149.00	2,252,750.28	2,309,997.36	2,393,370.43
Increase/(Decrease) in Circular Debt	580,276.00	81,684.00	-27,398.72	57,247.08	83,373.07

Source: CPPA-G

TABLE 43

Investment Plan for Private Sector Power Generation Projects

Name of the Project	Capacity (MW)	Expected COD	Estimated Investment (Million US\$)	Latest Status of the Project
Hydel Power Projects:				
Suki Kinari Hydropower Project	884.00	November, 2024	1,707.00	Plant is under construction.
Rialli-II Hydropower Project	7.08	December, 2025	18.00	Letter of Support (LOS) issued. Financial Close (FC) in progress. Also under construction.
Kathai-II Hydropower Project	8.00	December, 2026	20.00	LOS issued. FC in progress.
Turtonas-Uzghor Hydropower Project	82.00	December, 2029	188.00	LOI issued. Feasibility Study (FS) completed and approved by POE. Further processing will be as per IGCEP.
Azad Pattan Hydel Project	700.00	September, 2030	1,357.16	LOS issued. FC in progress.
Kohala Hydropower Project	1124.00	March, 2031	2,364.05	LOS issued. FC in progress.
Ashkot Hydel Project	300.00	September, 2031	450.00	Project has been transferred by GoAJ&K to PPIB for further processing as per IGCEP.
Rajdhani Hydropower Project	132.00	December, 2031	303.60	To be processed as per the requirements of new capacity in the IGCEP.
Mahl Hydropower Project	640.00	December, 2032	1,472.00	LOI issued. FS completed and approved by POE. Tariff determined by NEPRA. Further processing will be as per IGCEP.
Athmuqam Hydropower Project	450.00	-	1,301.00	LOI issued. FS completed and approved by POE. Further processing will be as per IGCEP.
Kaigah Hydel Project	548.00	-	1,260.40	To be processed as per the requirements of new capacity in the IGCEP.
Chakothi-Hattian Project	500.00	-	1,150.00	
Neckherdm-Paur Project	80.00	-	184.00	
Coal Power Projects:				
Gwadar Imported Coal Power Project	300.00	December, 2025	444.49	LOS issued. FC in progress.
Oracle (Thar Coal Project)	1320.00	December, 2028	1,640.76	Project Proposal is Under Review. Further processing will be as per IGCEP.
Dedicated Gas Fields:				
Hatim Power Project	20.00	-	21.00	To be processed as per the requirements of new capacity in the IGCEP.
Wind Power Projects:				
Western Energy (Pvt.) Limited	50.00	June, 2028	63.12	IGCEP-2024 envisages evacuation of power from project in June, 2028. Tariff determination is awaited from NEPRA.
Transatlantic Energy (Pvt.) Limited	50.00	June, 2028	61.87	
Solar Power Projects:				
Zorlu Solar Pakistan Limited	100.00	October, 2025	68.97	TLOS issued. Company has filed tariff review motion to NEPRA, seeking 9-month extension in FC and 6-month for COD.
Access Solar (Pvt.) Limited	11.52	April, 2026	8.77	LOS Issued. The tariff awarded to the company has lapsed on January 07, 2024. The company is required to apply for fresh tariff.
Access Electric (Pvt.) Limited	10.00	April, 2026	7.54	
Siachen Energy Limited	100.00	June, 2028	61.08	IGCEP-2024 envisages evacuation of power from project in June, 2028. Tariff determination is awaited from NEPRA.
Safe Solar Pakistan (Pvt.) Limited	10.27	-	6.40	LOS issued. The company has requested for cancellation of LOS and return of PG.
Bagasse/Biomass Co-Generation Projects:				
Shahtaj Sugar Mills Limited	32.00	December, 2024	31.01	COD is set for August, 2024 as per IGCEP. Company has requested CPPA-G for an extension to December 31, 2024 due to delays on part of GEPCO and fuel shortages.
Tay Powergen Company (Pvt.) Limited	30.00	December, 2025	-	Cat-I project of CCOE decision. Company has to file petition at NEPRA for Tariff re-determination and has to follow other course of actions as stipulated in CCOE decision and RE Policy 2006.

Source: Private Power and Infrastructure Board, Islamabad

TABLE 44
Investment Plan for Power Generation Projects (K-Electric) (2024-25 to 2028-29) *

Name of Project	Capacity Addition/ (Deletion) (MW)	Expected Commissioning Year	Estimated Cost (US\$ Million) ^[2]
Plan to induct IPPs/Additional Supply from National Grid in KE System ^[1]			
Additional Supply from National Grid	950 ^[3]	2025	-
150 MW WUB Solar	150	2025	130
270 MW Solar Projects	270	2025	186
33 MW Solar (Negotiated Procurement)	33	2026	23
220 MW (AC) Hybrid Renewable Plant	220	2027	204
127 MW Solar Plant	127	2027	87
660 MW Coal Project	660	2027	940
300 MW Wind Plant (Category-III)	300	2028	420

* These are estimates and are subject to change.

^[1] These are indicative and subject to relevant government/regulatory approvals.

^[2] Cost estimates based on IGCEP 2024, where specific plant data is not available.

^[3] Power Purchase Agency Agreement (PPAA) and Interconnection Agreement (ICA) for supply of power to KE from National Grid have been executed in January, 2024. As per the agreements, KE will be supplied firm 1,000 MW and supply over and above firm 1,000 MW and up to the interconnection capacity will be on pro-rata basis. Accordingly, planned additions also include spinning reserve/contingency margins to cater the impact of curtailment in supply to KE from National Grid.

Source: KE

TABLE 45
Unit Received, Delivered and Transmission Losses in NTDC System (500/220 kV) (GWh)

	Unit	2019-20	2020-21	2021-22	2022-23	2023-24
Unit Received by NTDC at CDPs	GWh	125,941.00	132,299.00	140,346.58	132,008.55	133,815.00
Unit Delivered by NTDC at CDPs	GWh	122,471.00	128,620.00	136,674.56	128,811.01	130,438.00
NTDC Losses	GWh	3,470.00	3,679.00	3,672.02	3,197.53	3,377.00
NTDC Losses	%	2.76	2.78	2.62	2.42	2.52

Source: NTDC

TABLE 46
Grid Stations, Power Transformers and Transmission Lines with NTDC

(A) Number of Grid Stations and their MVA Capacity					
As on 30th June	2020	2021	2022	2023	2024
Number of Grid Stations (500 kV)	17	17	19	19	19
Number of Grid Stations (220 kV)	45	45	50	50	50
Number of Converter Station (HVDC)	-	-	-	2	2
(B) Number of Power Transformers and their MVA Capacity					
As on 30th June	2020	2021	2022	2023	2024
Installed at 500 kV Grid Stations					
Total No. of Power Transformers (500/220 kV)	43	44	46	47	47
Total Capacity (MVA) of Power Transformers (500/220 kV)	24,000	24,000	25,500	25,950	25,950
Total No. of Power Transformers (220/132 kV)	33	34	36	38	38
Total Capacity (MVA) of Power Transformers (220/132 kV)	6,450	6,610	7,200	8,150	8,150
Installed at 220 kV Grid Stations					
Total No. of Power Transformers (220/132 kV)	127	129	140	179	183
Total Capacity (MVA) of Power Transformers (220/132 kV)	31,900	32,220	35,360	37,190	38,460
Any Other Voltage Level (HVDC)					
Total No. of Power Transformers (HVDC)	-	-	-	4,000	4,000
(C) Number of Circuits and Length of Transmission Lines in NTDC System (km)					
As on 30th June	2020	2021	2022	2023	2024
No. of Circuits (500 kV)	53	61	67	71	76
Transmission Line (km) (500 kV)	7,414	8,071	8,431	8,825	9,201
No. of Circuits (220 kV)	152	156	163	159	164
Transmission Line (km) (220 kV)	11,120	11,467	11,565	11,634	12,136
No. of Circuits (HVDC)	-	-	-	2	2
Transmission Line (km) (HVDC)	-	-	-	1,772	1,772

Source: NTDC

TABLE 47

Loading Position of Transmission Lines and Power Transformers in NTDC System

(A) Loading Position of Transmission Lines						
		2019-20	2020-21	2021-22	2022-23	2023-24
Overloaded Transmission Lines/ Circuits (Nos.) (>80%)	500 kV	12	14	18	15	5
	220 kV	36	50	58	39	45
Underutilized Transmission Lines/ Circuits (Nos.) (<30%)	500 kV	40	39	43	53	26
	220 kV	101	59	71	65	49
(B) Loading Position of Power Transformers						
		2019-20	2020-21	2021-22	2022-23	2023-24
Overloaded Power Transformers (Nos.) (>80%)	500 kV	19	29	31	40	32
	220 kV	82	122	128	80	88
Underutilized Power Transformers (Nos.) (<30%)	500 kV	17	10	7	9	12
	220 kV	46	21	24	48	18

Source: NTDC

TABLE 48

Grid Stations and Transmission Lines with K-Electric Limited

(A) Number of Grid Stations in KE Transmission System											
As on 30 th June		2020		2021		2022		2023		2024	
		No.	MVA	No.	MVA	No.	MVA	No.	MVA	No.	MVA
KE's Owned Grid Stations	220 kV	10	4,500	10	4,500	10	4,500	10	4,500	11	5,500
	132 kV	57	6,373	58	6,674	58	6,824	58	6,986	60	7,116
	66 kV	3	79	3	79	3	79	3	79	3	79
Consumers Owned Grid Stations	220 kV	1	80	1	80	1	80	1	80	1	80
	132 kV	11	578	11	578	11	641	11	721	11	721
	66 kV	0	0	0	0	0	0	0	0	0	0
Total No. of Grid Stations		82	11,610	83	11,911	83	12,124	83	12,366	86	13,496
(B) Length of Transmission Lines in KE System (km)											
As on 30 th June		2019-20		2020-21		2021-22		2022-23		2023-24	
Overhead Lines	220 kV	323		323		321		321		394	
	132 kV	650		651		652		652		640	
	66 kV	152		152		152		152		152	
Underground Lines	220 kV	42		42		43		43		42	
	132 kV	151		182		186		186		165	
	66 kV	1		1		1		1		1	
Total Length (km)		1,319		1,351		1,354		1,354		1,394	

Source: KE

TABLE 49

Investment Details in Transmission System of K-Electric Limited

(A) Amount Injected to Reinforce/Expand 500 kV, 220 kV and 132 kV Transmission System of K-Electric Limited (Million Rs.)						
Description	During FY 2022-23 ^[1]			During FY 2023-24 ^[2 & 3]		
	FC	LC	Total	FC	LC	Total
Grid Stations	3,418.00	5,182.00	8,600.00	11,617.00	5,725.00	17,342.00
Transmission	619.00	3,146.00	3,765.00	3,840.00	3,497.00	7,337.00
SCADA	-	26.00	26.00	43.00	29.00	72.00
Reinforcement	823.00	701.00	1,524.00	665.00	443.00	1,108.00
Total	4,860.00	9,055.00	13,915.00	16,165.00	9,694.00	25,859.00
(B) Investment Plan in Transmission Line (500 kV, 220 kV and 132 kV) of K-Electric Limited (Million US\$) ^[4]						
Description	During FY 2024-25			During FY 2025-26		
	FC	LC	Total	FC	LC	Total
Grid Stations	58.348	63.415	121.763	61.411	62.240	123.651
Transmission	26.570	8.206	34.776	53.386	16.503	69.889
Reinforcement	9.604	16.592	26.196	9.255	15.761	25.016
Others	5.499	2.588	8.087	1.472	1.206	2.678
Total	100.021	90.801	190.822	125.524	95.710	221.234

^[1] Restated as per Audited Financial Statements 2023. ^[2] Provisional and Unaudited.^[3] PKR 594 million in Grid station and PKR 154 million in Transmission pertains to DHA-4 Grid which is consumer funded converted into CDS.^[4] Represents NEPRA approved investment plan numbers and subject to decision of the Authority on the review motion filed by KE dated May 13, 2024 in the matter of Investment Plan. These are prepared using FY 2021-22 macros i.e. US\$ to PKR 206, PAK CPI 158.48 and US CPI 282.03.

FC: Foreign Currency LC: Local Currency

Source: KE

TABLE 50

Surplus/Deficit in Demand and Supply during NTDC's System Peak Hours

(A) Actual Figures						
Financial Year ending 30 th June	Generation Capability (MW)	Demand During NTDC's System Peak Hours (MW)				Surplus/ (Deficit) (MW)
2023	30,574	23,679				6,895
2024	31,545	25,516				6,029
(B) Projected Figures						
Financial Year ending 30 th June	Planned Generation Capability as per NTDC (MW)	NTDC Projected Demand Growth Rate (%)	NTDC's Projected Demand during Peak Hours (MW)	NTDC Projected Demand Growth Rate (%)	NTDC's Projected Demand during Peak Hours (MW)	Surplus/ (Deficit) (MW)
		Without Export to KE		With Export to KE		
2025	38,854		27,625		29,675	9,179
2026	40,595	5.62	29,177	5.23	31,227	9,368
2027	41,865	5.23	30,703	4.89	32,753	9,112
2028	43,180	5.49	32,388	5.14	34,438	8,742
2029	44,928	5.25	34,089	4.94	36,139	8,789

* 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: NTDC

TABLE 51

Surplus/Deficit in Demand and Supply during K-Electric's System Peak Hours

Surplus/Deficit in Demand and Supply during K-Electric System Peak Hours				
(A) Actual Figures				
Financial Year ending 30 th June	Generation Capability (MW) ^[1]	Demand During KE's System Peak Hours (MW)		Surplus/(Deficit) (MW) ^[2]
2023	3,409 (including IPPs + NTDC)	3,654		(245)
2024	3,550 (including IPPs + NTDC)	3,568		(18)
(B) Projected Figures				
Financial Year ending 30 th June	Planned Generation Capability as per KE (MW) ^[3]	KE's Projected Demand Growth Rate (%)	KE's Projected Demand during Peak hours (MW)	Surplus/ (Deficit) (MW)
2025	4,698	4.70	3,857	841
2026	4,698	4.70	4,064	634
2027	5,179	4.70	4,203	976
2028	4,950	4.70	4,308	642
2029	4,950	4.70	4,489	461

^[1] Based on maximum supply achieved in KE's System.

^[2] Deficit based on peak demand and maximum supply achieved during the year.

^[3] Includes extension in useful lives of Unit 1 & 2 of BQPS-I till FY 2027 as requested vide KE Letter dated April 02, 2024.

Source: KE

Table 52

Overloading (above 80% load) of 500 kV and 220 kV Power Transformers installed at 500 kV Grid Stations (2023-24)

Region	Name of Grid Station	Auto and Power T/F	Voltage Level	Capacity (MVA)	Capacity (Ampere)	Load (Ampere)	Overload (above 80%)
Islamabad	Sheikh Muhammadi Peshawar	T-1	500/220	450	1180	1040	88.14
		T-2	500/220	450	1180	1040	88.14
		T-3	500/220	450	1180	1040	88.14
		T-5	220/132	250	1093	910	83.26
		T-6	220/132	250	1093	910	83.26
		T-7	220/132	250	1093	910	83.26
		T-8	220/132	250	1093	910	83.26
	Rawat	T-1	500/220	450	1125	1000	88.89
		T-2	500/220	450	1125	1000	88.89
		T-3	500/220	450	1125	1000	88.89
		T-5	220/132	250	1093	990	90.58
		T-6	220/132	250	1093	990	90.58
		T-7	220/132	250	1093	990	90.58
		T-8	220/132	250	1093	990	90.58

Region	Name of Grid Station	Auto and Power T/F	Voltage Level	Capacity (MVA)	Capacity (Ampere)	Load (Ampere)	Overload (above 80%)
Lahore	Yousafwala	T-1	500/220	600	1575	1320	83.81
		T-2	500/220	600	1575	1320	83.81
		T-9	500/220	600	1575	1320	83.81
	Sheikhupura	T-1	500/220	600	1575	1490	94.60
		T-2	500/220	600	1575	1490	94.60
		T-3	500/220	600	1575	1490	94.60
		T-4	500/220	600	1575	1490	94.60
	Gatti	T-1	500/220	450	1181	1080	91.45
		T-2	500/220	450	1181	1090	92.29
		T-3	500/220	450	1181	1063	90.01
		T-4	500/220	450	1181	1063	90.01
Multan	Multan	T-1	500/220	450	1125	1053	93.60
		T-2	500/220	450	1125	1067	94.84
		T-7	500/220	450	1125	1090	96.89
	Muzaffargarh	T-1	500/220	600	1500	1430	95.33
		T-2	500/220	600	1500	1500	100.00
	Rahim Yar Khan	T-5	220/132	250	1093	953	87.19
Hyderabad	Jamshoro	ATF T-1	500/220	450	1125	1040	92.44
		ATF T-2	500/220	450	1125	1040	92.44
		ATF T-8	500/220	450	1125	1040	92.44
		ATF T-3	220/132	160	700	670	95.71
		ATF T-7	220/132	160	700	670	95.71
	Dadu	ATF T-4	500/220	450	1125	1035	92.00
		ATF T-1	220/132	160	700	630	90.00
		ATF T-5	220/132	250	1093.5	950	86.88
	NKI	ATF T-1	500/220	600	1500	1295	86.33
		ATF T-2	500/220	600	1500	1295	86.33
	Shikarpur	ATF T-2	220/132	250	1100	1030	93.64
		ATF T-3	220/132	250	1100	980	89.09

Source: NTDC

Table 53

Overloading (above 80% load) of 220 kV Power Transformers installed at 220 kV Grid Stations (2023-24)

Region	Name of Grid Station	Auto and Power T/F	Voltage Level	Capacity (MVA)	Capacity (Ampere)	Load (Ampere)	Overload (above 80%)
Islamabad	Mardan	T-1	220/132	250	1093	940	86.00
		T-2	220/132	250	1093	940	86.00
		T-3	220/132	250	1093	940	86.00
	Daudkhel	T-1	220/132	160	700	660	94.29
		T-2	220/132	160	700	660	94.29
	Bannu	T-1	220/132	250	1093	900	82.34
		T-5	220/132	250	1093	900	82.34
	Sangjani	T-1	220/132	160	700	575	82.14
		T-2	220/132	160	700	575	82.14
		T-3	220/132	160	700	630	90.00
		T-4	220/132	160	700	610	87.14
		T-7	220/132	160	700	610	87.14
	Mansehra	T-1	220/132	250	1093	940	86.00

Region	Name of Grid Station	Auto and Power T/F	Voltage Level	Capacity (MVA)	Capacity (Ampere)	Load (Ampere)	Overload (above 80%)
Lahore	Nokhar	T-4	220/132	160	700	620	88.57
		T-5	220/132	160	700	620	88.57
		T-6	220/132	160	700	620	88.57
		T-7	220/132	250	1093	1000	91.49
	Gakkhar	T-3	220/132	160	700	680	97.14
		T-4	220/132	160	700	680	97.14
	Yousafwala	T-3	220/132	160	700	663	94.71
		T-4	220/132	160	700	663	94.71
		T-5	220/132	160	700	663	94.71
		T-6	220/132	160	700	663	94.71
	Band Road	T-1	220/132	250	1093	885	80.97
		T-3	220/132	250	1093	885	80.97
	Kala Shah Kaku	T-1	220/132	160	700	640	91.43
		T-2	220/132	160	700	640	91.43
		T-3	220/132	160	700	640	91.43
		T-4	220/132	160	700	640	91.43
	Kassowal	T-4	220/132	250	1095	900	82.19
	NKLP	T-1	220/132	250	1095	1060	96.80
		T-2	220/132	250	1095	1060	96.80
		T-3	220/132	250	1095	1060	96.80
	Sarfranz Nagar	T-1	220/132	160	700	690	98.57
		T-2	220/132	160	700	690	98.57
		T-3	220/132	160	700	690	98.57
		T-6	220/132	160	700	690	98.57
	WAPDA Town	T-1	220/132	250	1093	890	81.43
		T-2	220/132	160	700	660	94.29
		T-3	220/132	160	700	660	94.29
	Ghazi Road	T-1	220/132	250	1093	910	83.26
		T-2	220/132	250	1093	950	86.92
		T-3	220/132	250	1093	950	86.92
	New Okara	T-1	220/132	250	1093	1000	91.49
		T-2	220/132	160	1093	1000	91.49
	Sheikhupura	T-5	220/132	160	700	600	85.71
		T-6	220/132	160	700	630	90.00
		T-7	220/132	160	700	690	98.57
		T-8	220/132	160	700	665	95.00
	Ludewala	T-1	220/132	160	700	631	90.14
		T-2	220/132	250	1095	980	89.50
		T-3	220/132	250	1095	980	89.50
Multan	Muzaffargarh	T-1	220/132	160	700	635	90.71
		T-2	220/132	160	700	575	82.14
		T-4	220/132	160	700	635	90.71
	Chistian	T-1	220/132	160	700	565	80.71
		T-2	220/132	160	700	565	80.71
		T-4	220/132	160	700	565	80.71
	NGPS Multan	T-1	220/132	160	700	632	90.29
		T-5	220/132	160	700	632	90.29
		T-3	220/132	160	700	632	90.29
Hyderabad	Hala Road	ATF T-1	220/132	160	700	580	82.86
		ATF T-2	220/132	160	700	565	80.71
		ATF T-3	220/132	250	1093.5	1045	95.56
	T. M. Khan	ATF T-1	220/132	160	700	628	89.71
		ATF T-2	220/132	160	700	628	89.71
		ATF T-3	132/11	10/13	653	540	82.70
		ATF T-4	132/11	10/13	653	580	88.82
Quetta	NTDC Quetta	T-1 (Auto)	220	250	1095	950	87.00
		T-2 (Auto)	220	160	630	700	90.00
		T-3 (Auto)	220	250	1095	950	87.00
		T-6 (Power)	132	40/35	2008	1750	87.00

Source: NTDC

TABLE 54
Main Electricity Statistics of the Country

	2019-20	2020-21	2021-22	2022-23	2023-24
(A) Maximum Energy Demand (MW)					
CPPA-G System	24,790	26,349	29,131	28,865	27,385
KE System	3,604	3,604	3,670	3,654	3,568
(B) Auxiliary Consumption and System Losses (in percentage)					
CPPA-G System					
Auxiliary Consumption	0.05	0.05	n.p.	n.p.	n.p.
Transmission Losses	2.76	2.78	2.62	2.42	2.52
Distribution Losses	18.86	17.96	17.14	16.77	18.26
KE System					
Auxiliary Consumption (KE Own)	7.04	6.88	7.13	5.85	4.06
T&D Losses (excluding Auxiliary Consumption)	19.79	17.54	15.43	15.31	16.04
(C) Average Sales Price (Rs./kWh)					
CPPA-G System	17.49	18.29	23.03	33.24	n.p.
KE System ⁽¹⁾	18.13	19.64	23.34	27.14	36.31
(D) Per Capita Electricity Consumption					
CPPA-G System					
Energy Sale (GWh)	98,216.89	105,490.59	116,902.21	106,309.47	103,220.81
Per Capita Electricity Consumption (kWh)	462.00	486.00	517.00	458.00	n.p.
Average Sale/Consumer (kWh)	3,097.43	3,152.61	3,249.97	2,807.27	2,589.99
KE System					
Energy Sale (GWh)	14,276.96	16,068.85	16,763.23	15,553.83	15,025.11
Per Capita Electricity Consumption (kWh)	889.00	1,001.00	1,044.34	763.00	737.00
Average Sale/ Consumer (kWh)	4,824.77	5,044.64	4,922.64	4,361.94	4,056.00

⁽¹⁾ Excluding Government Taxes, Duties and Surcharges.

Source: NTDC/DISCOs/KE

TABLE 55
Hourly System Demand (MW) (January - December, 2023)

Hours of the day	Maximum Demand (MW)		System Demand for a Typical day in Summer		System Demand for a Typical Day in Winter	
	Summer (24-06-2023)	Winter (26-01-2023)	Working day (22-08-2023)	Non-Working day (27-08-2023)	Winter (26-01-2023)	Non-Working day (29-01-2023)
01:00	28,681	12,801	27,842	23,246	12,801	9,871
02:00	27,972	12,432	27,442	22,717	12,432	9,198
03:00	27,316	12,246	27,062	22,324	12,246	9,057
04:00	27,144	11,943	26,482	21,874	11,943	8,818
05:00	27,034	12,551	26,344	21,490	12,551	8,867
06:00	26,608	14,445	27,109	21,648	14,445	10,535
07:00	26,877	15,928	26,594	21,661	15,928	11,801
08:00	27,131	16,517	26,352	22,030	16,517	11,460
09:00	28,015	17,428	28,075	22,820	17,428	12,191
10:00	28,282	17,591	27,790	23,060	17,591	12,655
11:00	28,378	17,215	27,970	23,373	17,215	12,588
12:00	28,633	17,477	28,461	23,638	17,477	12,975
13:00	29,094	17,233	28,657	24,095	17,233	12,726
14:00	29,463	17,255	29,194	24,087	17,255	12,394
15:00	30,132	17,611	30,150	24,794	17,611	12,428
16:00	29,971	18,207	30,033	24,644	18,207	12,218
17:00	30,189	17,775	29,363	24,558	17,775	11,623
18:00	29,567	18,713	28,362	23,554	18,713	12,019
19:00	27,259	17,848	27,709	23,698	17,848	11,940
20:00	27,643	17,942	28,478	24,399	17,942	11,960
21:00	28,340	17,304	29,233	25,194	17,304	11,713
22:00	28,291	15,530	29,389	25,007	15,530	11,143
23:00	28,240	14,224	29,507	25,300	14,224	9,234
0:00	28,502	13,679	29,752	25,250	13,679	9,297

(i) Highlighted area indicates maximum demand of the day.

(ii) Summer months are May to September and Winter months are December to February.

Source: National Power Control Centre, Islamabad

TABLE 56
Monthly System Peak Demand (MW)

Month	2019-20	2020-21	2021-22	2022-23	2023-24
July	24,927	26,085	28,650	28,447	29,890
August	25,198	26,781	27,410	27,573	30,150
September	25,753	23,931	26,140	25,906	27,870
October	19,328	20,857	23,100	22,416	20,893
November	16,704	15,962	16,795	17,234	17,048
December	15,973	17,177	17,751	17,707	17,350
January	15,938	17,012	17,602	18,794	19,760
February	15,489	16,433	17,337	17,348	16,548
March	14,746	17,617	21,477	18,671	18,369
April	18,516	21,322	27,047	21,280	19,353
May	21,191	23,847	27,474	26,364	26,003
June	24,349	26,682	30,231	29,051	27,474

Note: Monthly System Peak Demand (MW) is absolute maximum and may occur during Off-Peak Hours.

Source: National Power Control Centre, Islamabad

TABLE 57
Number of Circles, Divisions, Sub-Divisions, 11 kV Feeders and their Loading Position

DISCO	As on 30 th June	Circles	Divisions	Sub-Divisions	11 kV Feeders	Loading Position of 11 kV Feeders (Nos.)				%age
						80-90%	91-100%	Above 100%	Total	
PESCO	2020	8	39	187	1,089	99	118	124	341	31.31
	2021	8	39	187	1,138	110	145	180	435	38.22
	2022	8	39	190	1,193	118	119	149	386	32.36
	2023	9	40	193	1,249	119	123	146	388	31.06
	2024	9	40	193	1,294	125	169	141	435	33.62
TESCO	2020	1	9	18	245	193	0	0	193	78.78
	2021	1	5	15	266	40	70	34	144	54.14
	2022	1	5	15	302	23	28	90	141	46.69
	2023	1	5	15	318	41	25	79	145	45.60
	2024	1	5	15	341	43	31	75	149	43.70
IESCO	2020	5	19	109	1,166	28	20	17	65	5.57
	2021	6	20	109	1,221	6	9	11	26	2.13
	2022	6	20	110	1,293	31	18	0	49	3.79
	2023	6	20	114	1,335	16	8	12	36	2.70
	2024	6	20	116	1,365	26	8	1	35	2.56
GEPCO	2020	5	24	118	876	37	20	0	57	6.51
	2021	5	24	118	910	64	42	0	106	11.65
	2022	5	24	119	949	87	56	13	156	16.44
	2023	5	24	119	978	32	16	0	48	4.91
	2024	6	24	119	1,032	42	10	3	55	5.33
LESCO	2020	8	39	199	1,923	205	195	58	458	23.82
	2021	8	42	201	2,011	141	104	40	285	14.17
	2022	8	42	201	2,058	124	151	182	457	22.21
	2023	8	41	201	2,154	193	157	160	510	23.68
	2024	8	41	201	2,200	168	152	96	416	18.91
FESCO	2020	5	26	140	1,150	40	14	2	56	4.87
	2021	5	26	140	1,185	54	19	2	75	6.33
	2022	5	26	140	1,198	80	45	4	129	10.77
	2023	5	26	140	1,272	59	33	1	93	7.31
	2024	6	29	148	1,305	41	10	0	51	3.91
MEPCO	2020	9	37	181	1,508	91	127	11	229	15.19
	2021	9	37	181	1,652	207	104	12	323	19.55
	2022	9	38	181	1,726	180	119	19	318	18.42
	2023	9	38	184	1,762	184	82	13	279	15.83
	2024	9	40	188	1,819	143	56	3	202	11.11

DISCO	As on 30 th June	Circles	Divisions	Sub-Divisions	11 kV Feeders	Loading Position of 11 kV Feeders (Nos.)				%age
						80-90%	91-100%	Above 100%	Total	
HESCO	2020	4	15	69	556	45	23	1	69	12.41
	2021	4	15	69	570	58	19	0	77	13.51
	2022	4	15	69	583	60	33	0	93	15.95
	2023	4	17	71	597	51	17	0	68	11.39
	2024	4	17	72	624	46	48	0	94	15.06
SEPCO	2020	7	29	96	541	47	28	28	103	19.04
	2021	7	29	97	548	24	39	20	83	15.15
	2022	7	30	94	562	24	39	20	83	14.77
	2023	9	30	94	575	31	19	34	84	14.61
	2024	9	30	96	589	42	38	45	125	21.22
QESCO	2020	6	14	55	652	455	130	67	652	100.00
	2021	6	14	55	688	494	131	63	688	100.00
	2022	6	14	55	714	88	238	0	326	45.66
	2023	6	14	55	725	103	205	0	308	42.48
	2024	6	14	56	778	91	146	7	244	31.36
Total in CPPA-G System	2020	58	251	1,172	9,706	1,240	675	308	2,223	22.90
	2021	59	251	1,172	10,189	1,198	682	362	2,242	22.00
	2022	59	253	1,174	10,578	815	846	477	2,138	20.21
	2023	62	255	1,186	10,965	829	685	445	1,959	17.87
	2024	64	260	1204	11,347	767	668	371	1,806	15.92
KE	As on 30 th June	IBCs		11 kV Feeders		Loading Position of 11 kV Feeders (Nos.)				%age
					80-90%	91-100%	Above 100%	Total		
	2020	30		1,890		43	7	2	52	2.75
	2021	30		1,937		17	5	2	24	1.24
	2022	30		2,001		72	19	23	114	5.70
	2023	30		2,068		87	18	15	120	5.80
	2024	30		2,112		71	24	8	103	4.88

Source: Distribution Companies / KE

TABLE 58
Status of Distribution Lines (km)

DISCO	As on 30 th June	132 kV	66 kV	33 kV	11 kV	Total HT Lines	Total LT Lines (0.4 kV)
PESCO	2020	2,764	494	75	36,935	40,269	45,204
	2021	2,967	494	75	37,177	40,713	45,371
	2022	3,000	494	75	37,694	41,263	45,627
	2023	3,077	494	75	38,592	42,239	47,705
	2024	3,117	414	75	38,810	42,416	46,900
TESCO	2020	408	384	123	10,316	11,231	6,285
	2021	441	384	123	10,434	11,382	6,285
	2022	441	384	132	10,543	11,500	6,290
	2023	488	233	213	10,702	11,636	6,321
	2024	613	182	213	10,923	11,931	6,342
IESCO	2020	3,030	528	69	25,804	29,431	27,299
	2021	3,482	312	44	26,237	30,075	27,624
	2022	3,512	312	44	26,932	30,800	28,160
	2023	3,581	312	44	27,269	31,206	28,344
	2024	3,581	312	44	27,542	31,479	28,589
GEPCO	2020	2,611	179	0	24,231	27,021	18,381
	2021	2,611	179	0	24,659	27,449	18,456
	2022	2,682	123	0	24,996	27,801	18,494
	2023	2,676	123	0	25,266	28,065	18,585
	2024	2,751	115	0	25,459	28,325	18,672
LESCO	2020	3,012	410	0	30,005	33,427	15,000
	2021	3,051	15	0	30,055	33,121	15,000
	2022	3,110	0	0	31,562	34,672	15,533
	2023	3,184	0	0	32,148	35,332	15,591
	2024	3,268	0	0	32,769	36,037	15,701
FESCO	2020	2,288	1,130	0	44,397	47,815	30,695
	2021	2,337	1,124	0	45,690	49,151	31,979
	2022	2,322	881	0	46,281	49,484	32,054
	2023	2,525	845	0	46,797	50,167	32,145
	2024	2,609	845	0	47,082	50,536	32,614
MEPCO	2020	4,031	702	0	78,309	83,042	50,110
	2021	4,072	635	0	79,837	84,544	50,332
	2022	4,110	635	0	80,962	85,707	50,451
	2023	4,135	635	0	82,237	87,007	50,664
	2024	4,215	635	-	82,664	87,514	50,714
HESCO	2020	2,771	687	0	28,413	31,871	15,049
	2021	2,771	687	0	28,471	31,929	15,057
	2022	2,778	687	0	28,502	31,967	15,058
	2023	2,851	687	0	28,557	32,095	15,058
	2024	2,851	687	0	28,834	32,372	15,089
SEPCO	2020	2,241	687	0	25,571	28,499	13,350
	2021	2,262	687	0	24,722	27,671	13,349
	2022	2,308	687	0	24,856	27,851	13,353
	2023	2,284	687	0	24,912	27,883	13,354
	2024	2,344	687	0	25,490	28,521	13,310
QESCO	2020	5,420	106	1,981	39,745	47,252	16,681
	2021	5,500	106	1,981	40,822	48,409	17,476
	2022	6,258	207	0	41,606	48,071	17,908
	2023	6,854	207	1,673	42,786	51,520	19,377
	2024	7,305	107	1,818	45,086	54,316	19,377
Total in CPPA-G System	2020	28,577	5,307	2,248	343,726	379,859	238,053
	2021	29,495	4,623	2,223	348,104	384,445	240,928
	2022	30,521	4,411	251	353,933	389,116	242,927
	2023	31,656	4,224	2,005	359,266	397,150	247,144
	2024	32,654	3,984	2,150	364,659	403,447	247,308
KE	2020	801	153	0	10,204	11,158	18,367
	2021	833	153	0	10,283	11,269	18,509
	2022	838	153	0	10,520	11,511	18,936
	2023	838	153	0	10,891	11,882	19,370
	2024	805	153	0	11,298	12,256	30,871

Source: Distribution Companies / KE

TABLE 59
Status of Grid Stations (Nos.)

DISCO	As on 30 th June	132 kV			66 kV			33 kV			Total
		DISCO Owned	Cons. Owned	Sub-Total	DISCO Owned	Cons. Owned	Sub-Total	DISCO Owned	Cons. Owned	Sub-Total	
PESCO	2020	81	12	93	11	0	11	2	0	2	106
	2021	83	12	95	11	0	11	2	0	2	108
	2022	85	12	97	11	0	11	2	0	2	110
	2023	92	11	103	11	0	11	2	0	2	116
	2024	94	11	105	11	0	11	2	0	2	118
TESCO	2020	10	0	10	9	1	10	0	0	0	20
	2021	11	0	11	9	1	10	0	0	0	21
	2022	13	0	13	6	1	7	0	0	0	20
	2023	14	0	14	5	1	6	0	0	0	20
	2024	15	0	15	5	1	6	0	0	0	21
IESCO	2020	82	26	108	1	1	2	2	0	2	112
	2021	85	26	111	0	1	1	2	0	2	114
	2022	89	25	114	0	1	1	2	0	2	117
	2023	89	29	118	0	1	1	2	0	2	121
	2024	90	30	120	0	1	1	2	0	2	123
GEPCO	2020	59	0	59	1	0	1	0	0	0	60
	2021	59	0	59	1	0	1	0	0	0	60
	2022	59	0	59	1	0	1	0	0	0	60
	2023	60	0	60	1	0	1	0	0	0	61
	2024	61	1	62	1	0	1	0	0	0	63
LESCO	2020	116	46	162	0	0	0	0	0	0	162
	2021	117	50	167	0	0	0	0	0	0	167
	2022	120	52	172	0	0	0	0	0	0	172
	2023	121	61	182	0	0	0	0	0	0	182
	2024	122	63	185	0	0	0	0	0	0	185
FESCO	2020	78	20	98	15	0	15	0	0	0	113
	2021	81	21	102	14	0	14	0	0	0	116
	2022	86	22	108	16	0	16	0	0	0	124
	2023	88	28	116	16	0	16	0	0	0	132
	2024	91	28	119	15	0	15	0	0	0	134
MEPCO	2020	120	10	130	7	0	7	0	0	0	137
	2021	123	11	134	6	0	6	0	0	0	140
	2022	123	12	135	6	0	6	0	0	0	141
	2023	125	12	137	6	0	6	0	0	0	143
	2024	127	13	140	6	0	6	0	0	0	146
HESCO	2020	61	9	70	15	0	15	0	0	0	85
	2021	61	9	70	15	0	15	0	0	0	85
	2022	62	10	72	15	0	15	0	0	0	87
	2023	63	10	73	15	0	15	0	0	0	88
	2024	63	10	73	15	0	15	0	0	0	88
SEPCO	2020	57	1	58	9	1	10	0	0	0	68
	2021	58	2	60	9	1	10	0	0	0	70
	2022	60	2	62	8	1	9	0	0	0	71
	2023	59	3	62	8	0	8	0	0	0	70
	2024	61	3	64	7	0	7	0	0	0	71
QESCO	2020	71	1	72	3	0	3	32	0	32	107
	2021	73	0	73	3	0	3	32	0	32	108
	2022	75	0	75	3	0	3	32	0	32	110
	2023	76	0	76	3	0	3	40	0	40	119
	2024	80	0	80	3	0	3	44	0	44	127
Total in CPPA-G System	2020	735	125	860	71	3	74	36	0	36	970
	2021	751	131	882	68	3	71	36	0	36	989
	2022	772	135	907	66	3	69	36	0	36	1,012
	2023	787	154	941	65	2	67	44	0	44	1,052
	2024	804	159	963	63	2	65	48	0	48	1,076
KE	2020	57	11	68	3	0	3	0	0	0	71
	2021	58	11	69	3	0	3	0	0	0	72
	2022	58	11	69	3	0	3	0	0	0	72
	2023	58	11	69	3	0	3	0	0	0	72
	2024	60	11	71	3	0	3	0	0	0	74

Source: Distribution Companies / KE

TABLE 60
Category-wise Number of Consumers

DISCO	As on 30 th June	Domestic	Commercial	Industrial	Agricultural	Public Lighting	Bulk Supply	General Services	Others	Total
PESCO	2020	3,193,810	362,183	26,919	22,968	1,119	886	42,196	49	3,650,130
	2021	3,374,867	377,986	27,591	23,049	1,163	890	43,355	50	3,848,951
	2022	3,546,157	393,995	28,205	23,121	1,203	897	44,684	51	4,038,313
	2023	3,692,630	407,191	28,521	23,145	1,239	900	45,567	51	4,199,244
	2024	3,852,895	420,019	28,782	23,215	1,242	915	46,145	52	4,373,265
TESCO	2020	402,004	28,790	4,271	6,194	5	67	0	1,434	442,765
	2021	402,072	29,061	4,276	6,234	5	68	0	1,464	443,180
	2022	402,084	29,763	4,362	6,252	5	72	0	1,608	444,146
	2023	404,199	30,165	4,444	3,634	5	86	2,687	0	445,220
	2024	407,011	28,423	4,504	3,557	9	95	3,292	0	446,891
IESCO	2020	2,649,394	426,132	16,359	7,068	1,914	845	18,318	159	3,120,189
	2021	2,783,354	437,335	17,016	7,242	2,039	848	19,263	167	3,267,264
	2022	2,972,324	464,632	17,664	7,391	2,240	854	20,342	170	3,485,617
	2023	3,158,346	484,058	18,107	7,503	2,525	853	21,766	173	3,693,331
	2024	3,331,983	500,424	18,488	7,579	2,630	845	22,968	179	3,885,096
GEPCO	2020	3,192,199	379,270	74,244	50,460	590	150	0	20,930	3,717,843
	2021	3,387,411	394,245	76,337	52,960	620	148	0	21,365	3,933,086
	2022	3,591,198	410,372	80,524	54,982	673	148	0	21,815	4,159,712
	2023	3,817,077	425,043	83,312	56,291	703	138	22,669	31	4,405,264
	2024	4,102,446	439,338	85,392	57,153	747	139	23,625	31	4,708,871
LESCO	2020	4,374,998	643,245	86,138	63,671	2,564	488	0	16,090	5,187,194
	2021	4,688,342	664,548	87,918	66,101	2,613	469	0	17,863	5,527,854
	2022	5,018,720	687,951	89,934	68,250	2,726	459	0	19,208	5,887,248
	2023	5,283,943	704,392	91,150	69,934	2,779	453	19,693	271	6,172,615
	2024	5,676,254	725,430	92,201	71,563	2,843	451	20,116	272	6,589,130
FESCO	2020	3,861,027	413,352	50,911	45,978	1,860	226	0	28,110	4,401,464
	2021	4,081,137	427,149	52,253	49,738	1,882	229	0	29,414	4,641,802
	2022	4,291,224	440,006	53,475	51,922	1,913	231	0	30,371	4,869,142
	2023	4,516,894	451,958	54,363	53,345	1,955	235	30,938	147	5,109,835
	2024	4,801,242	464,121	55,165	54,328	1,987	235	31,844	152	5,409,074
MEPCO	2020	6,090,985	579,011	57,541	93,884	1,592	457	0	37,840	6,861,310
	2021	6,415,415	600,662	59,514	99,127	1,666	458	0	40,835	7,217,677
	2022	6,788,616	618,271	60,717	102,709	1,742	464	0	42,434	7,614,953
	2023	7,068,151	635,962	60,768	106,349	1,816	471	44,161	129	7,917,807
	2024	7,484,491	654,755	61,280	107,939	1,917	473	45,437	129	8,356,421
HESCO	2020	933,377	166,213	14,852	15,522	572	344	0	13,800	1,144,680
	2021	958,338	169,007	15,193	15,660	572	345	0	13,875	1,172,990
	2022	978,572	171,843	15,490	15,729	573	346	0	13,941	1,196,494
	2023	1,001,748	175,246	15,866	15,904	587	351	13,931	114	1,223,747
	2024	1,018,884	177,694	16,029	15,922	587	351	13,983	116	1,243,566
SEPCO	2020	628,208	123,808	13,133	9,346	442	532	0	13,347	788,816
	2021	643,103	125,388	13,382	9,370	535	445	0	13,494	805,717
	2022	650,565	126,818	13,533	9,377	540	449	0	13,496	814,778
	2023	652,594	126,948	13,585	9,260	470	539	13,410	20	816,826
	2024	658,826	127,788	13,726	10,106	486	542	12,585	20	824,079
QESCO	2020	477,757	123,504	3,719	29,599	274	271	0	7,852	642,976
	2021	491,006	127,814	3,802	29,639	279	282	0	9,346	662,168
	2022	503,579	131,817	3,832	29,623	283	299	0	9,958	679,391
	2023	513,399	135,039	3,834	29,608	286	305	11,025	4	693,500
	2024	534,281	140,986	3,888	29,602	288	309	11,373	6	720,733
Total in CPPA-G System	2020	25,803,759	3,245,508	348,087	344,690	10,932	4,266	60,514	139,611	29,957,367
	2021	27,225,045	3,353,195	357,282	359,120	11,374	4,182	62,618	147,873	31,520,689
	2022	28,743,039	3,475,468	367,736	369,356	11,898	4,219	65,026	153,052	33,189,794
	2023	30,108,981	3,576,002	373,950	374,973	12,365	4,331	225,847	940	34,677,389
	2024	31,868,313	3,678,978	379,455	380,964	12,736	4,355	231,368	957	36,557,126
KE	2020	2,447,129	470,777	22,553	2,271	90	175	0	16,104	2,959,099
	2021	2,651,527	490,652	23,244	2,164	88	170	0	17,487	3,185,332
	2022	2,851,946	509,334	23,706	2,093	180	176	0	17,897	3,405,332
	2023	3,001,648	519,001	23,618	2,096	185	196	19,057	0	3,565,801
	2024	3,125,561	532,825	23,430	1,655	181	206	20,492	0	3,704,350

Source: Distribution Companies / KE

TABLE 61
Category-wise Sanctioned Load (MW)

DISCO	As on 30 th June	Domestic	Commercial	Industrial	Agricultural	Public Lighting	Bulk Supply	General Services	Others	Total
PESCO	2020	4563.34	825.96	1691.51	164.81	50.88	282.76	412.18	3.87	7995.31
	2021	4930.64	871.10	1764.04	166.15	50.69	293.52	451.12	4.21	8531.47
	2022	5291.42	925.50	1872.00	167.40	50.78	301.66	473.47	4.30	9086.53
	2023	5607.70	986.92	1946.72	167.95	50.57	310.87	506.54	4.31	9581.58
	2024	5964.90	1022.64	2016.10	169.20	50.62	313.27	524.41	4.33	10065.47
TESCO	2020	768.15	37.62	227.11	70.51	1.00	7.00	0.00	16.00	1127.40
	2021	770.00	40.00	260.00	70.00	1.00	7.00	0.00	16.00	1164.00
	2022	768.29	40.52	295.16	71.60	0.10	7.75	0.00	19.72	1203.14
	2023	787.11	42.55	319.12	47.52	0.10	15.62	28.91	0.00	1240.93
	2024	791.11	40.67	336.65	45.95	0.18	20.85	33.61	0.00	1269.02
IESCO	2020	4698.09	1250.58	1105.28	59.31	101.33	541.48	421.75	309.00	8486.82
	2021	4970.00	1267.00	1152.00	62.00	103.00	557.00	453.18	375.82	8940.00
	2022	5407.62	1396.10	1195.20	64.81	106.13	574.97	484.22	319.37	9548.42
	2023	5845.07	1478.37	1222.33	67.21	109.48	585.49	516.24	325.35	10149.53
	2024	6282.19	1559.00	1255.72	68.81	111.77	585.88	542.69	338.29	10744.35
GEPCO	2020	4863.10	871.38	1923.47	369.14	22.33	75.65	0.00	177.58	8302.65
	2021	5241.09	920.91	2033.03	397.76	22.54	75.44	0.00	192.08	8882.85
	2022	5653.50	974.04	2168.16	419.08	22.83	75.44	0.00	200.34	9513.39
	2023	6122.84	1031.80	2263.78	432.56	23.25	79.35	197.18	30.75	10181.52
	2024	6722.36	1078.97	2370.14	440.39	23.76	79.36	210.55	30.76	10956.27
LESCO	2020	6914.42	1850.13	4930.40	614.73	111.57	343.05	0.00	488.85	15253.15
	2021	7471.08	1931.16	5226.09	644.81	109.22	333.87	0.00	600.73	16316.97
	2022	8121.77	2042.68	5526.34	673.62	110.57	346.07	0.00	645.11	17466.17
	2023	8652.97	2183.27	5758.92	697.31	111.12	370.77	635.83	54.39	18464.58
	2024	9473.00	2269.48	5942.27	734.72	112.17	348.35	711.85	54.46	19646.30
FESCO	2020	9655.00	1046.00	2394.00	533.00	11.00	222.00	0.00	253.00	14114.00
	2021	10315.00	1109.00	2525.00	587.00	12.00	231.00	0.00	269.00	15048.00
	2022	10947.00	1172.00	2660.00	631.00	12.00	231.00	0.00	282.00	15935.00
	2023	11629.00	1225.00	2837.00	636.00	12.00	226.00	293.00	9.00	16867.00
	2024	12489.00	1277.00	2942.00	651.00	13.00	226.00	305.00	9.00	17912.00
MEPCO	2020	9049.00	1235.28	2657.97	1543.54	15.76	150.21	0.00	337.64	14989.40
	2021	9729.66	1314.19	2776.20	1656.29	16.24	152.43	0.00	359.11	16004.12
	2022	10469.45	1378.99	2903.89	1729.59	16.67	160.95	0.00	380.82	17040.36
	2023	11204.39	1548.87	2864.79	1810.20	16.94	170.93	394.85	25.11	18036.08
	2024	12322.20	1620.54	2973.94	1845.12	19.07	181.60	416.35	25.17	19403.99
HESCO	2020	1247.80	329.99	945.76	210.20	24.05	77.49	0.00	173.11	3008.40
	2021	1291.52	344.43	983.02	214.02	24.05	78.44	0.00	178.63	3114.11
	2022	1331.64	357.31	1046.88	216.29	24.06	80.72	0.00	184.70	3241.59
	2023	1378.19	370.48	1118.67	219.37	24.14	81.97	180.87	9.91	3383.61
	2024	1414.37	382.51	1170.99	219.93	24.14	83.97	185.51	10.09	3491.51
SEPCO	2020	678.66	222.57	462.47	111.51	13.04	75.31	0.00	120.18	1683.75
	2021	700.75	231.71	481.85	111.81	13.14	84.58	0.00	121.78	1745.62
	2022	715.43	238.56	496.46	111.47	13.15	86.78	0.00	122.50	1784.35
	2023	723.66	242.89	543.44	110.22	13.66	89.24	120.78	2.25	1846.12
	2024	735.11	247.50	563.64	121.17	13.89	93.78	111.79	2.25	1889.11
QESCO	2020	687.06	205.48	194.90	996.27	5.68	70.94	0.00	116.89	2277.21
	2021	693.43	214.01	215.15	996.52	5.77	79.50	0.00	138.15	2342.52
	2022	710.54	220.21	219.98	996.23	5.81	89.86	0.00	148.99	2391.62
	2023	724.31	226.75	225.37	995.89	6.05	92.80	159.93	0.01	2431.12
	2024	752.68	239.76	239.01	995.78	6.06	121.51	167.14	0.02	2521.95
Total in CPPA-G System	2020	43124.62	7874.99	16532.88	4673.03	356.64	1845.89	833.92	1996.12	77238.09
	2021	46113.17	8243.51	17416.38	4906.36	357.65	1892.78	904.30	2255.51	82089.65
	2022	49416.66	8745.92	18384.07	5081.09	362.10	1955.19	957.69	2307.85	87210.56
	2023	52675.25	9336.89	19100.13	5184.23	367.31	2023.04	3034.13	461.09	92182.07
	2024	56946.91	9738.07	19810.45	5292.06	374.65	2054.57	3208.90	474.36	97899.97
KE	2020	6457.89	1938.25	2378.36	42.09	1.63	183.45	0.00	247.04	11248.71
	2021	6948.36	2039.96	2675.16	42.35	1.41	191.66	0.00	281.56	12180.46
	2022	6975.04	1754.34	2680.85	30.79	1.65	137.91	0.00	305.16	11885.74
	2023	7313.95	1771.55	2836.17	30.49	1.78	148.48	336.37	0.00	12438.79
	2024	7651.12	1837.38	2933.54	24.91	1.82	209.80	372.50	0.00	13031.07

Source: Distribution Companies / KE

TABLE 62
Peak Demand of Distribution Companies (MW)

DISCO	2019-20	2020-21	2021-22	2022-23	2023-24
PESCO	2,967	3,307	3,622	2,636	2,595
Peak Demand Growth Rate over Last Year	(99.98)	11.46	9.53	(27.22)	(1.56)
TESCO	805	857	983	1,082	1,103
Peak Demand Growth Rate over Last Year	0.75	6.46	14.70	10.07	1.94
IESCO	2,671	2,406	2,921	3,254	2,965
Peak Demand Growth Rate over Last Year	6.33	(9.92)	21.40	11.40	(8.88)
GEPCO	2,429	2,948	2,985	2,796	2,625
Peak Demand Growth Rate over Last Year	5.20	21.37	1.26	(6.33)	(6.12)
LESCO	5,004	4,835	5,995	6,099	5,917
Peak Demand Growth Rate over Last Year	8.41	(3.38)	23.99	1.73	(2.98)
FESCO	2,925	3,342	3,802	3,740	3,063
Peak Demand Growth Rate over Last Year	0.72	14.26	13.76	(1.63)	(18.10)
MEPCO	4,115	4,635	4,735	5,181	4,880
Peak Demand Growth Rate over Last Year	0.00	12.64	2.16	9.42	(5.81)
HESCO	1,228	1,399	1,365	1,400	1,546
Peak Demand Growth Rate over Last Year	1.57	13.93	(2.43)	2.56	10.43
SEPCO	1,124	1,191	1,223	1,338	1,472
Peak Demand Growth Rate over Last Year	(12.12)	5.96	2.69	9.40	10.01
QESCO	1,522	1,429	1,500	1,339	1,219
Peak Demand Growth Rate over Last Year	(15.44)	(6.11)	4.97	-10.73	(8.96)
Peak Demand in CPPA-G System	24,790	26,349	29,131	28,865	27,385
Peak Demand Growth Rate over Last Year	(0.20)	6.29	10.56	(0.91)	(5.13)
KE	3,604	3,604	3,670	3,654	3,568
Peak Demand Growth Rate over Last Year	2.10	0.00	1.83	-0.44	(2.35)

Source: Distribution Companies / KE

TABLE 63
Energy Volume Consumed by Demand

DISCO	2019-20		2020-21		2021-22		2022-23		2023-24	
	Energy Delivered at 132 kV (GWh)	Consumption (%)	Energy Delivered at 132 kV (GWh)	Consumption (%)	Energy Delivered at 132 kV (GWh)	Consumption (%)	Energy Delivered at 132 kV (GWh)	Consumption (%)	Energy Delivered at 132 kV (GWh)	Consumption (%)
PESCO	14,792.33	12.48	15,542.00	12.28	16,561.55	11.90	15,254.53	12.12	14,146.00	11.47
TESCO	2,001.22	1.69	2,227.00	1.76	2,284.45	1.64	1,719.83	1.37	1,406.90	1.14
IESCO	11,435.47	9.65	11,965.00	9.45	13,026.76	9.36	11,723.84	9.32	11,978.20	9.71
GEPCO	10,991.33	9.27	12,032.00	9.50	12,678.20	9.11	11,440.06	9.09	11,813.23	9.58
LESCO	23,528.33	19.85	25,388.00	20.05	28,334.35	20.36	26,032.44	20.69	25,093.63	20.34
FESCO	14,510.32	12.24	15,985.00	12.63	17,511.52	12.59	16,040.95	12.75	15,632.88	12.67
MEPCO	19,324.88	16.30	20,541.00	16.23	22,511.51	16.18	19,505.57	15.50	19,699.22	15.97
HESCO	5,470.78	4.62	5,591.00	4.42	5,610.33	4.03	4,916.84	3.91	5,040.92	4.09
SEPCO	4,252.76	3.59	4,291.00	3.39	4,489.77	3.23	3,868.50	3.07	3,829.45	3.10
QESCO	6,603.99	5.57	6,629.00	5.24	6,716.42	4.83	6,004.55	4.77	5,844.42	4.74
KE	5,426.00	4.58	6,118.00	4.83	9,036.34	6.49	8,960.81	7.12	8,538.06	6.92
IPPs	193.00	0.16	289.00	0.23	375.31	0.27	349.19	0.28	352.33	0.29
Total	118,530.41	100.00	126,598.00	100.00	139,136.49	100.00	125,817.11	100.00	123,375.25	100.00

Source: CPPA-G

TABLE 64
Maximum Demand and Energy Data of all DISCOs (FY 2023-24)

Peshawar Electric Supply Company Limited (PESCO)							
Month	Energy Units (kWh)	MDI (kW)	Capacity Transfer Charges (Rs.)	Energy Transfer Charges (Rs.)	GST on Energy Transfer Charges (Rs.)	Transmission Charges (Rs.)	Market Operator Charges (Rs.)
July, 2023	1,737,237.906	3,656.892	12,211,676.289	17,999,867.090	3,230,072.457	1,677,259.407	14,634.882
August, 2023	1,769,669.397	3,205.091	18,198,104.579	18,100,216.037	3,247,545.422	1,472,958.479	12,826.774
September, 2023	1,495,736.297	3,059.274	12,414,523.411	14,001,674.104	2,517,740.580	1,845,069.528	12,243.215
October, 2023	957,552.517	2,319.255	15,835,123.471	11,973,387.073	2,245,382.696	1,365,610.461	9,281.659
November, 2023	866,599.137	2,282.297	15,383,423.009	6,577,536.495	1,115,086.124	1,434,924.772	9,133.753
December, 2023	997,390.507	2,508.659	18,809,875.486	12,667,299.494	2,168,607.523	1,561,279.573	10,039.653
January, 2024	1,033,979.738	2,929.578	18,566,566.546	15,045,776.183	2,741,770.386	1,748,092.638	11,724.171
February, 2024	925,073.597	2,891.417	19,330,760.920	7,741,395.349	1,528,929.699	1,739,183.406	11,571.451
March, 2024	915,003.404	2,560.957	17,603,686.681	8,991,766.883	1,539,932.602	1,574,192.533	10,248.950
April, 2024	832,260.343	2,482.482	15,881,651.584	11,155,351.273	1,996,656.393	1,452,761.975	9,934.893
May, 2024	1,201,767.487	2,439.314	12,840,917.942	12,133,285.874	2,218,202.408	1,281,436.861	9,762.135
June, 2024	1,413,729.305	2,924.896	15,204,586.880	16,069,741.736	2,541,458.485	1,470,052.297	11,705.434
Tribal Area Electric Supply Company Limited (TESCO)							
Month	Energy Units (kWh)	MDI (kW)	Capacity Transfer Charges (Rs.)	Energy Transfer Charges (Rs.)	GST on Energy Transfer Charges (Rs.)	Transmission Charges (Rs.)	Market Operator Charges (Rs.)
July, 2023	116,945.701	545.366	1,821,173.021	1,211,697.642	217,438.893	250,135.977	2,182.555
August, 2023	123,160.508	553.467	3,142,516.187	1,259,688.282	226,013.596	254,355.933	2,214.975
September, 2023	118,505.860	525.518	2,132,550.244	1,109,340.219	199,478.353	316,943.578	2,103.123
October, 2023	113,634.137	552.299	3,770,919.049	1,420,899.097	266,462.800	325,201.538	2,210.301
November, 2023	117,945.972	561.921	3,787,530.037	895,216.603	151,765.576	353,290.725	2,248.808
December, 2023	121,718.172	575.071	4,311,870.966	1,545,874.487	264,649.545	357,899.023	2,301.434
January, 2024	138,968.095	584.354	3,703,416.474	2,022,170.045	368,497.170	348,686.714	2,338.585
February, 2024	131,823.574	593.939	3,970,818.741	1,103,153.745	217,873.451	357,253.503	2,376.944
March, 2024	121,482.381	665.381	4,573,742.803	1,193,811.133	204,452.441	409,002.495	2,662.855
April, 2024	99,595.393	644.634	4,124,039.001	1,334,944.772	238,936.986	377,243.325	2,579.825
May, 2024	100,261.714	528.818	2,783,777.957	1,012,262.398	185,061.402	277,802.234	2,116.330
June, 2024	102,854.181	514.020	2,672,047.741	1,169,134.798	184,900.766	258,346.376	2,057.108
Islamabad Electric Supply Company Limited (IESCO)							
Month	Energy Units (kWh)	MDI (kW)	Capacity Transfer Charges (Rs.)	Energy Transfer Charges (Rs.)	GST on Energy Transfer Charges (Rs.)	Transmission Charges (Rs.)	Market Operator Charges (Rs.)
July, 2023	1,407,151.460	2,769.288	9,247,647.622	14,579,775.844	2,616,337.785	1,270,153.547	11,082.690
August, 2023	1,497,257.464	3,019.646	17,145,171.135	15,313,981.022	2,747,638.419	1,387,733.821	12,084.623
September, 2023	1,261,789.186	2,619.136	10,628,444.915	11,811,681.649	2,123,942.465	1,579,619.224	10,481.782
October, 2023	820,556.578	1,883.212	12,857,962.812	10,260,368.334	1,924,138.372	1,108,862.116	7,536.614
November, 2023	683,033.263	1,666.178	11,230,580.850	5,184,261.122	878,884.921	1,047,558.704	6,668.044
December, 2023	762,225.048	1,815.890	13,615,507.248	9,680,594.408	1,657,291.665	1,130,130.465	7,267.192
January, 2024	844,367.240	1,936.600	12,273,444.425	12,286,662.922	2,238,981.102	1,155,578.108	7,750.273
February, 2024	698,179.483	1,737.316	11,614,941.822	5,842,652.325	1,153,926.942	1,044,993.219	6,952.739
March, 2024	698,468.359	1,558.034	10,709,723.894	6,863,870.267	1,175,508.411	957,706.627	6,235.252
April, 2024	695,677.786	1,598.696	10,227,640.265	9,324,642.392	1,668,984.363	935,565.598	6,397.981
May, 2024	1,208,192.925	2,456.056	12,929,050.363	12,198,158.386	2,230,062.375	1,290,231.881	9,829.136
June, 2024	1,401,304.666	2,942.074	15,293,883.865	15,928,511.913	2,519,122.735	1,478,685.958	11,774.180
Total Amount Payable (Rs.)							
							35,133,510,125
							41,031,651,291
							30,791,250,838
							31,428,785,360
							24,520,104,153
							35,217,101,729
							38,113,929,924
							30,351,840,825
							29,719,827,649
							30,496,356,118
							28,483,605,220
							35,297,544,832

Gujranwala Electric Power Company Limited (GEPCO)								
Month	Energy Units (kWh)	MDI (kW)	Capacity Transfer Charges (Rs.)	Energy Transfer Charges (Rs.)	GST on Energy Transfer Charges (Rs.)	Transmission Charges (Rs.)	Market Operator Charges (Rs.)	Total Amount Payable (Rs.)
July, 2023	1,395,666.475	3,070.208	10,272,563.777	14,482,301.582	2,598,846.048	1,408,172.635	12,310.985	28,774,195.027
August, 2023	1,566,997.787	3,134.207	17,761,566.873	16,006,039.229	2,871,807.680	1,440,382.434	12,519.084	38,092,315.300
September, 2023	1,294,289.794	3,041.616	12,342,867.308	12,115,921.723	2,178,650.036	1,834,419.865	12,172.547	28,484,031.479
October, 2023	808,848.464	2,389.590	16,315,348.116	10,113,968.238	1,896,683.798	1,407,024.713	9,563.139	29,742,588.004
November, 2023	637,788.440	1,608.298	10,840,450.852	4,840,850.355	820,666.684	1,011,168.415	6,436.409	17,519,572.715
December, 2023	642,124.287	1,980.218	14,847,635.336	8,155,261.754	1,396,158.826	1,232,401.021	7,924.832	25,639,381.769
January, 2024	739,367.766	2,101.246	13,316,909.018	10,758,781.353	1,960,557.418	1,253,823.132	8,409.186	27,298,480.107
February, 2024	601,053.679	1,729.546	11,562,994.970	5,029,863.753	993,400.767	1,040,319.575	6,921.643	18,633,500.708
March, 2024	694,798.912	1,704.170	11,714,243.828	6,827,810.497	1,169,332.804	1,047,534.843	6,820.088	20,765,742.060
April, 2024	776,919.032	2,284.182	14,613,029.491	10,413,574.052	1,863,888.343	1,336,715.736	9,141.296	28,236,348.918
May, 2024	1,247,607.186	2,932.816	15,438,787.132	12,596,092.680	2,302,812.561	1,540,686.656	11,737.130	31,890,116.159
June, 2024	1,407,767.597	3,117.527	16,205,947.193	16,001,975.505	2,530,741.134	1,566,868.610	12,476.343	36,318,008.785

Lahore Electric Supply Company Limited (LESCO)								
Month	Energy Units (kWh)	MDI (kW)	Capacity Transfer Charges (Rs.)	Energy Transfer Charges (Rs.)	GST on Energy Transfer Charges (Rs.)	Transmission Charges (Rs.)	Market Operator Charges (Rs.)	Total Amount Payable (Rs.)
July, 2023	2,825,259.366	5,899.012	19,698,920.551	29,273,073.600	5,253,047.053	2,705,623.618	23,607.846	56,954,272,668
August, 2023	3,293,264.855	6,388.824	36,274,941.113	33,683,582.619	6,043,517.067	2,936,101.496	25,568.074	78,963,710,369
September, 2023	2,679,747.816	5,870.867	23,823,958.173	25,085,274.508	4,510,761.579	3,540,760.914	23,495.210	56,984,250,384
October, 2023	1,885,909.128	4,229.401	28,876,982.930	23,581,703.951	4,422,303.369	2,490,331.701	16,926.063	59,388,248,014
November, 2023	1,442,027.060	4,136.488	27,881,272.541	10,945,066.996	1,855,511.155	2,600,690.926	16,554.225	43,299,095,843
December, 2023	1,431,914.675	4,160.466	31,195,091.650	18,185,948.142	3,113,385.294	2,589,291.960	16,650.185	55,100,367,231
January, 2024	1,607,380.263	4,508.908	28,575,767.715	23,389,514.117	4,262,237.878	2,690,486.097	18,044.650	58,936,050,457
February, 2024	1,351,753.330	3,673.316	24,558,198.759	11,312,026.389	2,234,131.229	2,209,494.595	14,700.611	40,328,551,583
March, 2024	1,544,394.931	3,593.150	24,698,847.656	15,176,816.975	2,599,186.073	2,208,670.392	14,379.786	44,697,900,882
April, 2024	1,685,747.739	4,324.674	27,667,054.859	22,595,223.171	4,044,238.113	2,530,822.757	17,307.345	56,854,646,245
May, 2024	2,598,074.908	5,986.806	31,515,452.532	26,230,685.987	4,795,483.386	3,145,029.253	23,959.198	65,710,610,356
June, 2024	2,748,153.805	6,002.012	31,200,464.190	31,238,032.445	4,940,350.873	3,016,610.344	24,020.052	70,419,477,904

Faisalabad Electric Supply Company Limited (FESCO)								
Month	Energy Units (kWh)	MDI (kW)	Capacity Transfer Charges (Rs.)	Energy Transfer Charges (Rs.)	GST on Energy Transfer Charges (Rs.)	Transmission Charges (Rs.)	Market Operator Charges (Rs.)	Total Amount Payable (Rs.)
July, 2023	1,911,991.911	4,011.996	13,397,496.132	19,810,528.055	3,554,995.196	1,840,130.370	16,056.008	38,619,205,761
August, 2023	2,078,711.326	3,934.577	22,340,034.564	21,261,103.426	3,814,672.652	1,808,207.178	15,746.177	49,239,763,997
September, 2023	1,700,465.291	3,890.076	15,785,915.081	15,918,154.074	2,862,356.471	2,346,132.020	15,568.084	36,928,125,730
October, 2023	1,241,903.310	3,080.347	21,031,613.634	15,528,954.051	2,912,162.156	1,813,752.298	12,327.549	41,298,809,688
November, 2023	894,221.160	3,187.890	21,487,413.942	6,787,189.213	1,150,628.434	2,004,288.807	12,757.936	31,442,278,332
December, 2023	856,461.637	2,864.258	21,476,149.744	10,877,440.666	1,862,188.517	1,782,588.828	11,462.761	36,009,830,516
January, 2024	910,111.866	2,678.740	16,976,849.385	13,243,334.404	2,413,313.985	1,598,416.452	10,720.317	34,242,634,543
February, 2024	802,353.267	2,722.812	18,203,540.964	6,714,421.284	1,326,101.775	1,637,767.727	10,896.694	27,892,728,444
March, 2024	966,085.933	3,193.007	21,948,316.508	9,493,756.482	1,625,903.486	1,962,706.823	12,778.414	35,043,461,713
April, 2024	1,063,062.467	2,819.479	18,037,586.224	14,248,949.075	2,550,368.389	1,649,974.453	11,283.555	36,498,161,696
May, 2024	1,562,042.749	3,483.719	18,338,823.870	15,770,697.266	2,883,192.485	1,830,090.730	13,941.843	38,836,746,194
June, 2024	1,645,470.972	3,617.461	18,804,771.198	18,703,929.714	2,958,060.039	1,818,135.364	14,477.079	42,299,373,394

Multan Electric Power Company Limited (MEPCO)									
Month	Energy Units (kWh)	MDI (kW)	Capacity Transfer Charges (Rs.)	Energy Transfer Charges (Rs.)	GST on Energy Transfer Charges (Rs.)	Transmission Charges (Rs.)	Market Operator Charges (Rs.)	Total Amount Payable (Rs.)	
July, 2023	2,506,812.690	5,363.442	17,917,138.612	25,978,703.532	4,661,873.020	2,460,031.098	21,472.499	51,039,218,761	
August, 2023	2,670,455.456	5,171.934	29,354,236.618	27,308,421.499	4,899,684.018	2,376,857.330	20,690,076	63,959,889,541	
September, 2023	2,211,631.313	5,109.451	20,734,134.654	20,703,208.811	3,722,791.187	3,081,545.603	48,262,128,278	48,262,128,278	
October, 2023	1,582,457.929	4,028.612	27,506,060.540	19,787,302.497	3,710,735.012	2,372,104.270	16,122.505	53,392,324,824	
November, 2023	1,054,657.178	3,299.562	22,240,119.490	8,004,907.669	1,357,067.570	2,074,499.178	13,204.847	33,689,798,754	
December, 2023	935,731.582	3,571.396	26,778,256.460	11,884,203.942	2,034,543.676	2,222,680.572	14,292.727	42,933,977,377	
January, 2024	1,028,345.660	3,636.274	23,045,340.728	14,963,792.878	2,726,830.685	2,169,781.384	14,552.369	42,920,298,044	
February, 2024	901,346.809	3,106.574	20,769,207.373	7,542,839.853	1,489,714.883	1,868,600.050	12,432.509	31,682,794,668	
March, 2024	1,161,984.613	3,292.916	22,635,078.032	11,418,838.898	1,955,597.084	2,024,119.804	13,178.250	38,046,832,068	
April, 2024	1,408,354.582	3,572.946	22,857,883.158	18,877,134.074	3,378,750.655	2,090,907.441	14,298.930	47,218,974,258	
May, 2024	2,143,017.779	4,941.522	26,012,919.414	21,636,337.833	3,955,546.518	2,595,913.622	19,775.971	54,220,493,358	
June, 2024	2,094,424.932	5,098.690	26,504,694.553	23,807,151.500	3,765,143.720	2,562,600.841	20,404.957	56,659,995,571	

Hyderabad Electric Supply Company Limited (HESCO)									
Month	Energy Units (kWh)	MDI (kW)	Capacity Transfer Charges (Rs.)	Energy Transfer Charges (Rs.)	GST on Energy Transfer Charges (Rs.)	Transmission Charges (Rs.)	Market Operator Charges (Rs.)	Total Amount Payable (Rs.)	
July, 2023	593,829.570	1,653.842	5,562,691.355	6,215,770.223	1,115,418.692	758,546.343	6,666.516	13,659,093,129	
August, 2023	558,912.963	1,522.324	8,575,691.365	5,654,399.107	1,014,513.744	699,611.975	6,044.501	15,950,260,692	
September, 2023	506,130.575	1,685.370	6,839,225.686	4,737,917.626	851,958.657	1,016,458.424	6,744.851	13,452,305,244	
October, 2023	443,521.457	1,515.236	10,345,541.628	5,545,861.961	1,040,021.709	892,192.593	6,063.974	17,829,681,865	
November, 2023	303,822.218	1,255.596	8,463,124.824	2,306,027.829	390,939.623	789,417.768	5,024.895	11,954,534,939	
December, 2023	265,244.116	1,090.188	8,174,208.028	3,368,717.301	576,715.320	678,485.300	4,362.932	12,802,488,881	
January, 2024	272,840.146	1,358.548	8,609,967.663	3,970,185.894	723,481.326	810,651.827	5,436.909	14,119,723,619	
February, 2024	246,497.115	1,301.202	8,699,272.630	2,062,788.978	407,401.920	782,671.239	5,207.410	11,957,342,177	
March, 2024	340,829.698	1,534.462	10,547,693.019	3,349,344.033	573,609.630	943,217.174	6,140.917	15,420,004,773	
April, 2024	426,608.740	1,568.644	10,035,382.922	5,718,127.015	1,023,467.086	917,979.004	6,277.713	17,701,233,740	
May, 2024	535,963.468	1,581.528	8,325,402.663	5,411,194.799	989,272.441	830,818.942	6,329.275	15,563,018,120	
June, 2024	546,722.667	1,606.240	8,349,772.310	6,214,550.430	982,842.299	807,295.987	6,428.172	16,360,889,198	

Sukkur Electric Power Company Limited (SEPCO)									
Month	Energy Units (kWh)	MDI (kW)	Capacity Transfer Charges (Rs.)	Energy Transfer Charges (Rs.)	GST on Energy Transfer Charges (Rs.)	Transmission Charges (Rs.)	Market Operator Charges (Rs.)	Total Amount Payable (Rs.)	
July, 2023	510,801.000	1,130.774	3,879,941.456	5,489,826.142	985,148.175	518,637.501	4,649.851	10,878,203,125	
August, 2023	524,794.239	1,264.122	7,000,898.795	5,172,827.275	928,110.002	580,950.500	4,934.522	13,687,721,094	
September, 2023	434,796.048	1,007.560	4,088,675.028	4,070,150.987	731,882.790	607,666.477	4,032.255	9,502,407,537	
October, 2023	290,275.812	764.258	5,218,106.588	3,629,654.346	680,673.147	450,006.023	3,058.561	9,981,498,665	
November, 2023	185,258.547	509.670	3,435,341.327	1,406,122.856	238,379.230	320,439.500	2,039.699	5,402,322,612	
December, 2023	162,918.535	628.030	4,708,956.499	2,069,137.275	354,230.723	390,858.387	2,513.376	7,525,696,260	
January, 2024	183,948.694	542.202	3,436,272.908	2,676,697.403	487,770.759	323,534.422	2,169.892	6,926,445,384	
February, 2024	154,017.806	635.474	4,248,503.749	1,288,884.183	254,555.312	382,236.750	2,543.167	6,176,723,161	
March, 2024	201,544.379	900.700	6,191,295.127	1,980,582.875	339,195.197	553,650.536	3,604.601	9,068,328,336	
April, 2024	297,141.077	814.382	5,209,999.984	3,982,783.896	712,864.233	476,580.778	3,259.157	10,385,488,048	
May, 2024	412,209.068	1,115.880	5,874,161.142	4,161,745.526	760,848.631	586,201.598	4,465.752	11,387,422,649	
June, 2024	471,746.946	1,116.610	5,804,511.940	5,362,307.735	848,058.588	561,208.021	4,468.673	12,580,554,957	

Month	Energy Units (kWh)	MDI (kW)	Capacity Transfer Charges (Rs.)	Energy Transfer Charges (Rs.)	GST on Energy Transfer Charges (Rs.)	Transmission Charges (Rs.)	Market Operator Charges (Rs.)	Total Amount Payable (Rs.)
July, 2023	610,510.918	1,480.001	4,942,255.095	6,325,624.915	1,135,132.093	678,812.937	5,922.964	13,087,748,004
August, 2023	635,129.086	1,469.116	8,341,456.329	6,496,113.730	1,165,534.398	675,159.260	5,879.402	16,684,143,119
September, 2023	508,102.789	1,317.266	5,345,460.915	4,756,379.635	855,278.443	794,452.330	5,271.699	11,756,843,022
October, 2023	396,648.031	1,416.121	9,668,816.446	4,959,749.280	930,107.341	833,832.266	5,667.316	16,398,172,649
November, 2023	412,900.997	1,465.414	9,877,366.287	3,133,941.935	531,295.443	921,334.449	5,864.587	14,469,802,701
December, 2023	533,063.767	1,413.756	10,600,314.482	6,770,145.032	1,159,030.578	879,859.863	5,657.852	19,415,007,807
January, 2024	495,260.120	1,485.590	9,415,112.209	7,206,691.431	1,313,265.126	886,458.371	5,945.331	18,827,472,468
February, 2024	449,524.462	1,450.871	9,699,894.698	3,761,805.104	742,958.509	872,696.940	5,806.386	15,083,161,637
March, 2024	408,686.482	1,376.356	9,460,892.856	4,016,174.758	687,811.253	846,031.128	5,508.177	15,016,418,172
April, 2024	378,988.606	1,306.920	8,361,006.480	5,079,841.980	909,222.732	764,816.696	5,230.294	15,120,118,182
May, 2024	499,993.227	1,480.892	7,795,639.533	5,048,032.023	922,879.169	777,952.160	5,926.530	14,550,429,415
June, 2024	515,610.618	1,401.306	7,284,456.891	5,860,902.394	926,912.228	704,296.189	5,608.027	14,782,175,729

K-Electric (650 MW) (Settlement Summary from NTDC)								
Month	Energy Units (kWh)	MDI (kW)	Capacity Transfer Charges (Rs.)	Energy Transfer Charges (Rs.)	GST on Energy Transfer Charges (Rs.)	Transmission Charges (Rs.)	Market Operator Charges (Rs.)	Total Amount Payable (Rs.)
July, 2023	772,225,000	1,304,000	4,354,524,520	8,001,176,647	1,435,809,508	598,088,832	5,218,608	14,394,818,115
August, 2023	753,462,000	1,166,000	6,620,401,711	7,706,425,278	1,382,688,808	535,856,731	4,666,332	16,250,038,860
September, 2023	710,856,000	1,226,000	4,975,103,800	6,654,364,186	1,196,568,540	739,409,167	4,906,452	13,570,352,145
October, 2023	711,400,000	1,212,000	8,275,144,237	8,895,457,338	1,668,175,083	713,642,906	4,850,424	19,557,269,988
November, 2023	689,786,000	1,142,000	7,697,450,891	5,235,514,778	887,573,925	717,997,741	4,570,284	14,543,107,619
December, 2023	709,393,000	1,156,000	8,667,665,100	9,009,604,089	1,542,419,931	719,443,809	4,626,312	19,943,759,241
January, 2024	683,671,000	1,148,000	7,275,593,411	9,948,319,557	1,812,868,118	685,016,869	4,594,296	19,726,392,251
February, 2024	613,887,000	1,122,000	7,501,205,725	5,137,258,248	1,014,611,236	674,881,479	4,490,244	14,332,446,932
March, 2024	702,498,000	1,252,000	8,606,085,820	6,903,469,674	1,182,290,217	769,590,841	5,010,504	17,466,447,056
April, 2024	710,243,000	1,253,040	8,016,309,766	9,519,869,859	1,703,927,429	733,285,826	5,014,666	19,978,407,546
May, 2024	757,883,000	1,314,860	6,921,621,966	7,651,738,957	1,398,887,816	690,731,112	5,262,070	16,668,241,921
June, 2024	722,759,000	1,335,140	6,940,503,911	8,215,540,575	1,299,302,481	671,041,167	5,343,230	17,131,731,364

Source: CPPA-G

TABLE 65
Total Units Purchased, Sold and Losses

DISCO	Year	Unit Purchased (GWh)					Losses		
		Through NTDC	Through CPPs, SPPs etc.	Through Net-Metering	Unit Purchased		Unit Sold	GWh	%age
PESCO	2019-20	14750.30	0.00	0.25	14750.55		9043.05	5707.50	38.69
	2020-21	15540.90	0.00	2.59	15543.49		9607.54	5935.95	38.19
	2021-22	16560.19	0.00	9.29	16569.48		10355.18	6214.30	37.50
	2022-23	15254.61	0.00	25.03	15279.64		9548.86	5730.78	37.51
	2023-24	14133.54	0.00	62.88	14196.42		8803.06	5393.36	37.99
TESCO	2019-20	2151.00	0.00	0.00	2151.00		1802.76	348.24	16.19
	2020-21	2226.00	0.00	0.00	2226.00		2012.65	213.35	9.58
	2021-22	2284.00	0.00	0.00	2284.00		2071.59	212.41	9.30
	2022-23	1719.83	0.00	0.78	1720.61		1564.66	155.95	9.00
	2023-24	1407.00	0.00	1.30	1408.30		1286.09	122.21	8.68
IESCO	2019-20	11435.52	0.00	0.00	11435.52		10442.03	993.49	8.69
	2020-21	11966.00	0.00	0.00	11966.00		10944.00	1022.00	8.54
	2021-22	13027.00	0.00	0.00	13027.00		11961.92	1065.08	8.18
	2022-23	11723.84	0.00	114.43	11838.27		10778.51	1059.76	8.95
	2023-24	11977.17	0.00	247.47	12224.64		11154.58	1070.06	8.75
GEPCO	2019-20	10991.19	0.00	0.00	10991.19		9945.63	1045.56	9.51
	2020-21	12032.48	0.00	0.00	12032.48		10922.10	1110.38	9.23
	2021-22	12678.20	0.00	0.00	12678.20		11528.76	1149.44	9.07
	2022-23	11417.30	22.77	37.94	11478.01		10454.80	1023.21	8.91
	2023-24	11813.23	31.11	99.76	11944.09		10573.24	1370.85	11.48
LESCO	2019-20	23528.33	0.00	0.00	23528.33		20610.00	2918.33	12.40
	2020-21	25387.87	0.00	0.00	25387.87		22352.15	3035.72	11.96
	2021-22	28334.00	0.00	0.00	28334.00		25070.75	3263.25	11.52
	2022-23	26032.47	0.00	158.97	26191.44		23092.17	3099.27	11.83
	2023-24	25093.78	0.00	321.11	25414.89		21400.01	4014.88	15.80
FESCO	2019-20	13870.33	640.00	0.00	14510.33		13123.24	1387.09	9.56
	2020-21	14874.48	1110.00	0.00	15984.48		14501.20	1483.28	9.28
	2021-22	16112.53	1400.00	0.00	17512.53		15918.79	1593.74	9.10
	2022-23	16040.95	0.00	46.79	16087.74		14662.69	1425.05	8.86
	2023-24	15632.88	0.00	103.57	15736.45		14190.93	1545.52	9.82
MEPCO	2019-20	14972.84	4351.84	0.00	19324.68		16381.93	2942.75	15.23
	2020-21	16065.16	4467.05	0.00	20532.21		17466.10	3066.11	14.93
	2021-22	18518.35	4030.36	0.00	22548.71		19202.42	3346.29	14.84
	2022-23	16332.94	3172.63	94.11	19599.68		16732.36	2867.32	14.63
	2023-24	16827.82	2880.87	220.35	19929.04		16904.35	3024.69	15.18
HESCO	2019-20	3853.27	2958.37	0.00	6811.64		3890.00	2921.64	42.89
	2020-21	4419.93	2112.65	0.00	6532.58		4014.18	2518.40	38.55
	2021-22	4836.97	1173.95	0.00	6010.92		4034.50	1976.42	32.88
	2022-23	3974.83	909.19	2.35	4886.37		3576.57	1309.80	26.81
	2023-24	2564.05	2528.49	6.37	5098.91		3709.36	1389.55	27.25
SEPCO	2019-20	4252.20	0.28	0.00	4252.48		2710.10	1542.38	36.27
	2020-21	4290.96	0.00	0.00	4290.96		2777.63	1513.33	35.27
	2021-22	4489.77	0.00	0.00	4489.77		2890.17	1599.60	35.63
	2022-23	3835.86	31.74	4.30	3871.90		2538.19	1333.71	34.45
	2023-24	3823.55	199.87	9.52	4032.94		2625.59	1407.35	34.90
QESCO	2019-20	6604.01	0.00	0.00	6604.01		4842.01	1762.00	26.68
	2020-21	6624.56	0.00	0.00	6624.56		4775.00	1849.56	27.92
	2021-22	6716.30	0.00	0.00	6716.30		4831.60	1884.70	28.06
	2022-23	6004.55	0.00	0.77	6005.32		4399.85	1605.47	26.73
	2023-24	5844.40	0.00	1.17	5845.57		4035.53	1810.04	30.96
Total in CPPA-G System	2019-20	106408.99	7950.49	0.25	114359.73		92790.76	21568.97	18.86
	2020-21	113428.34	7689.70	2.59	121120.63		99372.55	21748.08	17.96
	2021-22	123557.31	6604.31	9.29	130170.91		107865.68	22305.23	17.14
	2022-23	112337.18	4136.33	485.46	116958.98		97348.66	19610.32	16.77
	2023-24	109117.42	5640.34	1073.50	115831.26		94682.74	21148.51	18.26
KE	As on 30 th June	Unit Purchased (GWh)					Unit Sold (GWh)	Losses	
		KE Own	Through NTDC	Through Net-Metering	Through CPPs + Others	Total Unit Purchased		GWh	%age
	2019-20	9628.90	5426.14	0.00	2744.18	17799.22	14276.96	3522.26	19.79
	2020-21	10185.60	6118.04	0.00	3182.03	19485.67	16068.85	3416.82	17.54
	2021-22	7889.96	9036.54	44.00	2851.39	19821.89	16763.23	3058.66	15.43
	2022-23	7093.34	8960.81	107.18	2204.71	18366.04	15553.83	2812.21	15.31
	2023-24	7471.36	8538.07	195.07	1691.90	17896.40	15025.11	2871.29	16.04

Source: Distribution Companies / KE

TABLE 66
Units Billed, Amount of Units Billed and Amount Realized in all DISCOs (2023-24)

	DISCO	Unit	Domestic	Commercial	Industrial	Agricultural	Public Lighting	Bulk Supply	General Services	Others	Total
PESCO	Units Billed	GW/h	4822.47	868.26	1892.60	45.24	12.33	719.02	441.56	1.58	8803.06
	Amount of Units Billed	Rs. Min.	162105.87	57233.95	102847.83	1961.83	691.06	35166.73	23780.09	85.79	383863.15
	Amount Realized and %age	Rs. Min.	132716.31	56262.46	101466.04	2064.48	683.95	34185.59	25238.19	209.02	352826.04
	Recovery to Billed Amount	%	81.87	98.32	98.66	105.23	98.97	97.21	106.13	243.65	91.91
TESCO	Units Billed	GW/h	966.84	7.69	246.40	18.97	0.00	33.93	12.26	0.00	1286.09
	Amount of Units Billed	Rs. Min.	31457.42	393.67	11243.35	661.84	0.00	1694.47	625.88	0.00	46076.63
	Amount Realized and %age	Rs. Min.	34974.84	387.80	10728.47	645.76	0.00	1441.81	497.42	0.00	48676.10
	Recovery to Billed Amount	%	111.18	98.51	95.42	97.57	0.00	85.09	79.48	0.00	105.64
IESCO	Units Billed	GW/h	5342.36	1304.69	1244.65	28.44	71.78	1661.27	547.75	953.64	11154.58
	Amount of Units Billed	Rs. Min.	199909.422	90642.508	68826.30	1236.890	4251.314	53403.08	29468.60	74426.46	522164.57
	Amount Realized and %age	Rs. Min.	193749.36	89924.41	68939.14	1219.27	2420.76	77300.15	25750.90	47371.04	506675.03
	Recovery to Billed Amount	%	96.92	99.21	100.16	98.58	56.94	144.75	87.38	63.65	97.03
GEPSCO	Units Billed	GW/h	6299.23	732.26	2467.07	460.92	14.63	154.95	166.57	277.61	10573.24
	Amount of Units Billed	Rs. Min.	227791.93	51596.50	138576.36	18709.36	880.35	8875.49	9491.23	12614.28	468535.50
	Amount Realized and %age	Rs. Min.	218083.11	50177.06	135183.93	17978.26	731.78	7517.02	7982.69	13121.35	450775.19
	Recovery to Billed Amount	%	95.74	97.25	97.55	96.09	83.12	84.69	84.11	104.02	96.21
LESFO	Units Billed	GW/h	9329.22	1806.73	7552.88	1055.13	156.52	703.31	777.61	18.61	21400.01
	Amount of Units Billed	Rs. Min.	360221.47	127850.80	397880.68	40481.60	7173.63	39129.75	40905.55	1064.33	1014707.81
	Amount Realized and %age	Rs. Min.	335317.85	124993.69	395767.31	37081.17	3905.97	36061.00	41020.71	1095.07	975242.77
	Recovery to Billed Amount	%	93.09	97.77	99.47	91.60	54.45	92.16	100.28	102.89	96.11
FESCO	Units Billed	GW/h	6972.12	795.67	4857.98	1125.80	17.11	183.17	234.18	4.90	14190.93
	Amount of Units Billed	Rs. Min.	231236.86	54137.25	253219.53	43754.58	1069.15	9728.40	13036.49	264.04	606446.30
	Amount Realized and %age	Rs. Min.	228232.48	53862.52	256254.81	43045.70	1052.05	9146.55	12403.07	293.63	604290.81
	Recovery to Billed Amount	%	98.70	99.49	101.20	98.38	98.40	94.02	95.14	111.21	99.64
MEPCO	Units Billed	GW/h	9601.52	1147.19	2684.40	2780.00	41.86	278.73	364.58	6.07	16904.35
	Amount of Units Billed	Rs. Min.	316691.05	77394.37	143280.28	110964.35	2218.60	15643.27	20087.96	340.49	686620.37
	Amount Realized and %age	Rs. Min.	307095.19	76509.34	141779.54	108367.08	1464.12	14595.13	17155.23	398.39	667364.02
	Recovery to Billed Amount	%	96.97	98.86	98.95	97.66	65.99	93.30	85.40	117.00	97.20
HESCO	Units Billed	GW/h	1985.75	245.24	952.07	172.64	23.73	84.22	243.01	2.70	3709.36
	Amount of Units Billed	Rs. Min.	61723.20	16854.80	50457.80	7577.70	1254.50	4745.40	13108.10	142.30	155863.80
	Amount Realized and %age	Rs. Min.	29986.60	16262.00	50265.10	6267.30	254.60	4475.70	11623.80	147.80	119282.90
	Recovery to Billed Amount	%	48.58	96.48	99.62	82.71	20.29	94.32	88.68	103.87	76.53
SEPCO	Units Billed	GW/h	1265.76	190.82	449.75	90.63	245.50	172.77	209.73	0.64	2625.59
	Amount of Units Billed	Rs. Min.	36110.57	12885.78	25174.77	3671.88	12555.36	9711.86	10172.30	34.29	110416.81
	Amount Realized and %age	Rs. Min.	15766.25	12437.65	22167.69	2921.90	5860.27	6143.71	8177.96	34.30	73509.72
	Recovery to Billed Amount	%	43.66	96.52	88.06	79.57	46.31	63.26	80.39	100.01	66.57
QESCO	Units Billed	GW/h	557.58	152.48	184.29	2781.13	12.31	146.09	199.76	1.89	4035.53
	Amount of Units Billed	Rs. Min.	18267.29	10330.78	10515.04	112444.96	728.82	8568.99	11463.65	142.57	172662.10
	Amount Realized and %age	Rs. Min.	12025.64	10091.92	10409.98	16027.82	24.95	7787.09	6602.23	143.56	63113.19
	Recovery to Billed Amount	%	65.83	95.83	99.00	14.25	3.42	90.88	57.59	100.69	36.55
Total in CIPA-C System	Units Billed	GW/h	47142.85	7251.03	22532.09	8558.90	595.77	4137.45	3197.02	1267.63	94682.74
	Amount of Units Billed	Rs. Min.	1645515.08	499510.41	1202021.94	341464.99	30922.78	186667.44	172139.85	89114.55	4167357.04
	Amount Realized and %age	Rs. Min.	1507947.62	490908.85	1192962.01	235618.74	16398.44	198653.74	156452.20	62814.16	3861755.77
	Recovery to Billed Amount	%	91.64	98.28	99.25	69.00	53.03	106.42	90.89	70.49	92.67
KE	Units Billed	GW/h	6899.40	1822.17	5244.66	19.15	57.71	518.90	463.13	0.00	15025.11
	Amount of Units Billed	Rs. Min.	286751.26	124881.76	283554.37	1590.16	3057.73	26657.79	26688.03	0.00	753181.11
	Amount Realized and %age	Rs. Min.	235096.92	119678.74	283100.05	385.86	1464.55	25891.38	23876.12	0.00	689493.62
	Recovery to Billed Amount	%	81.99	95.83	99.84	24.27	47.90	97.13	89.46	0.00	91.54

Source: Distribution Companies / KE

TABLE 67
Category-wise Electricity Sold (GWh)

DISCO	Year	Domestic	Commercial	Industrial	Agricultural	Public Lighting	Bulk Supply	General Services	Others	Total
PESCO	2019-20	5099.18	774.96	2008.00	69.27	12.93	651.58	425.70	1.43	9043.05
	2020-21	5372.61	801.62	2274.06	78.97	13.02	641.42	424.62	1.22	9607.54
	2021-22	5688.78	874.45	2527.90	77.18	12.37	698.14	474.98	1.38	10355.18
	2022-23	5128.21	875.37	2236.23	55.71	12.32	783.91	455.68	1.43	9548.86
	2023-24	4822.47	868.26	1892.60	45.24	12.33	719.02	441.56	1.58	8803.06
TESCO	2019-20	1415.14	4.90	329.71	32.50	0.00	10.30	0.00	10.23	1802.76
	2020-21	1401.58	5.01	553.82	30.99	0.00	12.48	0.00	8.77	2012.65
	2021-22	1468.63	5.45	547.31	26.27	0.00	12.98	0.00	10.95	2071.59
	2022-23	1110.73	6.13	394.33	21.53	0.00	20.93	11.01	0.00	1564.66
	2023-24	966.84	7.69	246.40	18.97	0.00	33.93	12.26	0.00	1286.09
IESCO	2019-20	5028.18	1098.90	1487.49	26.92	77.35	919.43	441.89	1361.87	10442.03
	2020-21	5325.00	1166.00	1521.00	35.00	81.00	918.00	471.73	1426.27	10944.00
	2021-22	5757.32	1305.56	1685.74	35.67	83.47	1034.07	546.85	1513.24	11961.92
	2022-23	5155.61	1224.19	1389.79	28.28	78.09	1468.08	516.47	918.00	10778.51
	2023-24	5342.36	1304.69	1244.65	28.44	71.78	1661.27	547.75	953.64	11154.58
GEPCO	2019-20	5944.20	593.84	2397.03	474.66	7.29	156.82	0.00	371.79	9945.63
	2020-21	6372.55	671.74	2775.92	542.03	9.71	160.05	0.00	390.10	10922.10
	2021-22	6816.69	757.73	2797.44	535.09	9.92	177.32	0.00	434.57	11528.76
	2022-23	6098.01	698.77	2531.64	521.62	16.01	159.90	167.38	261.48	10454.80
	2023-24	6299.23	732.26	2467.07	460.92	14.63	154.95	166.57	277.61	10573.24
LESCO	2019-20	9259.00	1563.00	7381.00	1116.00	117.00	627.00	0.00	547.00	20610.00
	2020-21	9663.64	1662.38	8351.36	1187.71	139.70	654.33	0.00	693.03	22352.15
	2021-22	10353.55	1867.70	9775.38	1332.18	138.82	720.49	0.00	882.63	25070.75
	2022-23	9088.78	1807.05	9145.70	1347.15	143.01	682.40	859.61	18.46	23092.17
	2023-24	9329.22	1806.73	7552.88	1055.13	156.52	703.31	777.61	18.61	21400.01
FESCO	2019-20	6656.34	712.71	4133.46	1138.95	10.47	255.43	0.00	215.88	13123.24
	2020-21	7061.51	769.75	4937.35	1267.71	13.42	237.80	0.00	213.66	14501.20
	2021-22	7390.64	847.89	5821.99	1367.22	17.72	213.72	0.00	259.61	15918.79
	2022-23	6549.92	784.61	5669.39	1209.18	17.31	194.58	233.29	4.41	14662.69
	2023-24	6972.12	795.67	4857.98	1125.80	17.11	183.17	234.18	4.90	14190.93
MEPCO	2019-20	9469.57	903.24	2509.25	2916.57	18.04	275.93	0.00	289.33	16381.93
	2020-21	9825.38	980.72	2860.58	3201.47	20.20	275.51	0.00	302.24	17466.10
	2021-22	10243.68	1077.49	3460.11	3736.51	23.35	294.09	0.00	367.19	19202.42
	2022-23	9100.37	1081.70	2999.15	2906.14	25.33	261.93	351.47	6.27	16732.36
	2023-24	9601.52	1147.19	2684.40	2780.00	41.86	278.73	364.58	6.07	16904.35
HESCO	2019-20	2394.05	261.82	717.34	214.13	3.49	106.62	0.00	192.55	3890.00
	2020-21	2408.50	265.05	823.94	200.58	4.96	105.86	0.00	205.29	4014.18
	2021-22	2298.04	263.53	914.43	208.11	8.09	113.39	0.00	228.92	4034.50
	2022-23	1998.94	236.35	836.94	162.95	29.14	91.27	218.31	2.67	3576.57
	2023-24	1985.75	245.24	952.07	172.64	23.73	84.22	243.01	2.70	3709.36
SEPCO	2019-20	1765.85	209.33	365.13	81.11	16.41	159.78	0.00	112.49	2710.10
	2020-21	1795.88	227.32	375.13	84.90	165.92	22.85	0.00	105.63	2777.63
	2021-22	1794.92	235.94	412.22	87.03	40.06	206.06	0.00	113.94	2890.17
	2022-23	1371.99	215.02	373.75	77.98	139.67	174.51	184.64	0.63	2538.19
	2023-24	1265.76	190.82	449.75	90.63	245.50	172.77	209.73	0.64	2625.59
QESCO	2019-20	611.92	136.78	160.63	3572.06	9.60	126.94	0.00	224.08	4842.01
	2020-21	587.89	138.38	191.79	3485.96	10.57	130.47	0.00	229.94	4775.00
	2021-22	591.97	151.15	172.46	3516.63	10.97	140.79	0.00	247.63	4831.60
	2022-23	561.93	144.44	160.89	3146.29	12.86	136.99	234.94	1.51	4399.85
	2023-24	557.58	152.48	184.29	2781.13	12.31	146.09	199.76	1.89	4035.53
Total in CPPA-G System	2019-20	47643.43	6259.48	21489.04	9642.17	272.58	3289.83	867.59	3326.65	92790.76
	2020-21	49814.54	6687.97	24664.95	10115.32	458.50	3158.77	896.35	3576.15	99372.55
	2021-22	52404.21	7386.89	28114.97	10921.89	344.77	3611.05	1021.83	4060.07	107865.68
	2022-23	46164.48	7073.63	25737.81	9476.83	473.75	3974.50	3232.80	1214.87	97348.66
	2023-24	47142.85	7251.03	22532.09	8558.90	595.77	4137.45	3197.02	1267.63	94682.74
KE	2019-20	7489.18	1615.20	4158.29	116.11	112.03	467.74	0.00	318.41	14276.96
	2020-21	8041.32	1708.58	5220.99	121.70	98.04	454.31	0.00	423.91	16068.85
	2021-22	8004.68	1846.46	5842.80	110.72	63.82	467.84	0.00	426.91	16763.23
	2022-23	7369.71	1818.00	5350.19	66.31	47.53	469.42	432.66	0.00	15553.83
	2023-24	6899.40	1822.17	5244.66	19.15	57.71	518.90	463.13	0.00	15025.11

Source: Distribution Companies / KE

TABLE 68
Category-wise Energy Sales in CPPA-G and K-Electric System

		2019-20	2020-21	2021-22	2022-23	2023-24
CPPA-G System						
Domestic	GWh	47,643.43	49,814.54	52,404.21	46,164.48	47,142.85
Percentage share	%	48.51	47.22	44.83	43.42	45.67
Commercial	GWh	6,259.48	6,687.97	7,386.89	7,073.63	7,251.03
Percentage share	%	6.37	6.34	6.32	6.65	7.02
Industrial	GWh	21,489.04	24,664.95	28,114.97	25,737.81	22,532.09
Percentage share	%	21.88	23.38	24.05	24.21	21.83
Agricultural	GWh	9,642.17	10,115.32	10,921.89	9,476.83	8,558.90
Percentage share	%	9.82	9.59	9.34	8.91	8.29
Public Lighting	GWh	272.58	458.50	344.77	473.75	595.77
Percentage share	%	0.28	0.43	0.29	0.45	0.58
Bulk Supply	GWh	3,289.83	3,158.77	3,611.05	3,974.50	4,137.45
Percentage share	%	3.35	2.99	3.09	3.74	4.01
General Services	GWh	867.59	896.35	1,021.83	3,232.80	3,197.02
Percentage share	%	0.88	0.85	0.87	3.04	3.10
Others	GWh	3,326.65	3,576.15	4,060.07	1,214.87	1,267.63
Percentage share	%	3.39	3.39	3.47	1.14	1.23
Supplied to KE	GWh	5,426.14	6,118.04	9,036.54	8,960.81	8,538.07
Percentage share	%	5.52	5.80	7.73	8.43	8.27
Total in CPPA-G area	GWh	98,216.90	105,490.59	116,902.22	106,309.47	103,220.81
Percentage share	%	87.31	86.78	87.46	87.24	87.29
KE System						
Domestic	GWh	7,489.18	8,041.32	8,004.68	7,369.71	6,899.40
Percentage share	%	52.46	50.04	47.75	47.38	45.92
Commercial	GWh	1,615.20	1,708.58	1,846.46	1,818.00	1,822.17
Percentage share	%	11.31	10.63	11.01	11.69	12.13
Industrial	GWh	4,158.29	5,220.99	5,842.80	5,350.19	5,244.66
Percentage share	%	29.13	32.49	34.85	34.40	34.91
Agricultural	GWh	116.11	121.70	110.72	66.31	19.15
Percentage share	%	0.81	0.76	0.66	0.43	0.13
Public Lighting	GWh	112.03	98.04	63.82	47.53	57.71
Percentage share	%	0.78	0.61	0.38	0.31	0.38
Bulk Supply	GWh	467.74	454.31	467.84	469.42	518.90
Percentage share	%	3.28	2.83	2.79	3.02	3.45
General Services	GWh	0.00	0.00	0.00	432.66	463.13
Percentage share	%	0.00	0.00	0.00	2.78	3.08
Others	GWh	318.41	423.91	426.91	0.00	0.00
Percentage share	%	2.23	2.64	2.55	0.00	0.00
Total in KE area	GWh	14,276.96	16,068.85	16,763.23	15,553.83	15,025.11
Percentage share	%	12.69	13.22	12.54	12.76	12.71
Country						
Domestic	GWh	55,132.61	57,855.86	60,408.89	53,534.20	54,042.25
Percentage share	%	49.01	47.59	45.19	43.93	45.70
Commercial	GWh	7,874.68	8,396.55	9,233.35	8,891.63	9,073.20
Percentage share	%	7.00	6.91	6.91	7.30	7.67
Industrial	GWh	25,647.33	29,885.94	33,957.77	31,088.00	27,776.75
Percentage share	%	22.80	24.59	25.41	25.51	23.49
Agricultural	GWh	9,758.28	10,237.02	11,032.61	9,543.14	8,578.05
Percentage share	%	8.67	8.42	8.25	7.83	7.25
Public Lighting	GWh	384.61	556.54	408.59	521.28	653.48
Percentage share	%	0.34	0.46	0.31	0.43	0.55
Bulk Supply	GWh	3,757.57	3,613.08	4,078.89	4,443.93	4,656.35
Percentage share	%	3.34	2.97	3.05	3.65	3.94
General Services	GWh	867.59	896.35	1,021.83	3,665.45	3,660.14
Percentage share	%	0.77	0.74	0.76	3.01	3.10
Others	GWh	3,645.06	4,000.06	4,486.98	1,214.87	1,267.63
Percentage share	%	3.24	3.29	3.36	1.00	1.07
Supplied to KE by CPPA-G	GWh	5,426.14	6,118.04	9,036.54	8,960.81	8,538.07
Percentage share	%	4.82	5.03	6.76	7.35	7.22
Total in the Country	GWh	112,493.86	121,559.44	133,665.45	121,863.30	118,245.92
Percentage share	%	100.00	100.00	100.00	100.00	100.00

Source: Distribution Companies /KE

TABLE 69
Category-wise Consumers and their Electricity Consumption (%)

		2019-20	2020-21	2021-22	2022-23	2023-24
CPPA-G System (Consumers and Consumption in percentage to the total)						
Domestic	Consumers	86.13	86.37	86.60	86.83	87.17
	Consumption	48.51	47.22	44.83	43.42	45.67
Commercial	Consumers	10.83	10.64	10.47	10.31	10.06
	Consumption	6.37	6.34	6.32	6.65	7.02
Industrial	Consumers	1.16	1.13	1.11	1.08	1.04
	Consumption	21.88	23.38	24.05	24.21	21.83
Agricultural	Consumers	1.15	1.14	1.11	1.08	1.04
	Consumption	9.82	9.59	9.34	8.91	8.29
Public Lighting	Consumers	0.04	0.04	0.04	0.04	0.03
	Consumption	0.28	0.43	0.29	0.45	0.58
Bulk Supply	Consumers	0.01	0.01	0.01	0.01	0.01
	Consumption	3.35	2.99	3.09	3.74	4.01
General Services	Consumers	0.20	0.20	0.20	0.65	0.63
	Consumption	0.88	0.85	0.87	3.04	3.10
Others	Consumers	0.47	0.47	0.46	0.00	0.00
	Consumption	3.39	3.39	3.47	1.14	1.23
Supplied to KE	Consumption	5.52	5.80	7.73	8.43	8.27
KE System (Consumers and Consumption in percentage to the total)						
Domestic	Consumers	82.70	83.24	83.75	84.18	84.38
	Consumption	52.46	50.04	47.75	47.38	45.92
Commercial	Consumers	15.91	15.40	14.96	14.55	14.38
	Consumption	11.31	10.63	11.01	11.69	12.13
Industrial	Consumers	0.76	0.73	0.70	0.66	0.63
	Consumption	29.13	32.49	34.85	34.40	34.91
Agricultural	Consumers	0.08	0.07	0.06	0.06	0.04
	Consumption	0.81	0.76	0.66	0.43	0.13
Public Lighting	Consumers	0.00	0.00	0.01	0.01	0.00
	Consumption	0.78	0.61	0.38	0.31	0.38
Bulk Supply	Consumers	0.01	0.01	0.01	0.01	0.01
	Consumption	3.28	2.83	2.79	3.02	3.45
General Services	Consumers	0.00	0.00	0.00	0.53	0.55
	Consumption	0.00	0.00	0.00	2.78	3.08
Others	Consumers	0.54	0.55	0.53	0.00	0.00
	Consumption	2.23	2.64	2.55	0.00	0.00
Country (Consumers and Consumption in percentage to the total)						
Domestic	Consumers	85.83	86.08	86.34	86.58	86.92
	Consumption	49.01	47.59	45.19	43.93	45.70
Commercial	Consumers	11.29	11.08	10.89	10.71	10.46
	Consumption	7.00	6.91	6.91	7.30	7.67
Industrial	Consumers	1.13	1.10	1.07	1.04	1.00
	Consumption	22.80	24.59	25.41	25.51	23.49
Agricultural	Consumers	1.05	1.04	1.02	0.99	0.95
	Consumption	8.67	8.42	8.25	7.83	7.25
Public Lighting	Consumers	0.03	0.03	0.03	0.03	0.03
	Consumption	0.34	0.46	0.31	0.43	0.55
Bulk Supply	Consumers	0.01	0.01	0.01	0.01	0.01
	Consumption	3.34	2.97	3.05	3.65	3.94
General Services	Consumers	0.18	0.18	0.18	0.64	0.63
	Consumption	0.77	0.74	0.76	3.01	3.10
Others	Consumers	0.47	0.48	0.47	0.00	0.00
	Consumption	3.24	3.29	3.36	1.00	1.07
Supplied to KE by CPPA-G	Consumption	4.82	5.03	6.76	7.35	7.22

Source: Distribution Companies /KE

TABLE 70
Annual Growth Rate of Electricity Consumption

		2019-20	2020-21	2021-22	2022-23	2023-24
CPPA-G System						
Domestic	GWh	47,643.43	49,814.54	52,404.21	46,164.48	47,142.85
	%	4.50	4.56	5.20	-11.91	2.12
Commercial	GWh	6,259.48	6,687.97	7,386.89	7,073.63	7,251.03
	%	-5.18	6.85	10.45	-4.24	2.51
Industrial	GWh	21,489.04	24,664.95	28,114.97	25,737.81	22,532.09
	%	-11.51	14.78	13.99	-8.46	-12.46
Agricultural	GWh	9,642.17	10,115.32	10,921.89	9,476.83	8,558.90
	%	-0.34	4.91	7.97	-13.23	-9.69
Public Lighting	GWh	272.58	458.50	344.77	473.75	595.77
	%	-5.81	68.21	-24.81	37.41	25.76
Bulk Supply	GWh	3,289.83	3,158.77	3,611.05	3,974.50	4,137.45
	%	-11.37	-3.98	14.32	10.06	4.10
General Services	GWh	867.59	896.35	1021.83	3,232.80	3,197.02
	%	0.00	3.31	14.00	216.37	-1.11
Others	GWh	3,326.65	3,576.15	4,060.07	1,214.87	1,267.63
	%	12.32	7.50	13.53	-70.08	4.34
Supplied to KE	GWh	5,426.14	6,118.04	9,036.54	8,960.81	8,538.07
	%	947.00	12.75	47.70	-0.84	-4.72
Total	GWh	98,216.90	105,490.59	116,902.22	106,309.47	103,220.81
Percentage change	%	-0.63	7.41	10.82	-9.06	-2.91
KE System						
Domestic	GWh	7,489.18	8,041.32	8,004.68	7,369.71	6,899.40
	%	2.61	7.37	-0.46	-7.93	-6.38
Commercial	GWh	1,615.20	1,708.58	1,846.46	1,818.00	1,822.17
	%	-9.29	5.78	8.07	-1.54	0.23
Industrial	GWh	4,158.29	5,220.99	5,842.80	5,350.19	5,244.66
	%	-5.54	25.56	11.91	-8.43	-1.97
Agricultural	GWh	116.11	121.70	110.72	66.31	19.15
	%	-13.54	4.81	-9.02	-40.11	-71.12
Public Lighting	GWh	112.03	98.04	63.82	47.53	57.71
	%	-30.19	-12.49	-34.90	-25.52	21.41
Bulk Supply	GWh	467.74	454.31	467.84	469.42	518.90
	%	-1.99	-2.87	2.98	0.34	10.54
General Services	GWh	0.00	0.00	0.00	432.66	463.13
	%	0.00	0.00	0.00	0.00	7.04
Others	GWh	318.41	423.91	426.91	0.00	0.00
	%	393.05	33.13	0.71	-100.00	0.00
Total	GWh	14,276.96	16,068.85	16,763.23	15,553.83	15,025.11
Percentage change	%	-0.29	12.55	4.32	-7.21	-3.40
Country						
Domestic	GWh	55,132.61	57,855.86	60,408.89	53,534.20	54,042.25
	%	4.24	4.94	4.41	-11.38	0.95
Commercial	GWh	7,874.68	8,396.55	9,233.35	8,891.63	9,073.20
	%	-6.05	6.63	9.97	-3.70	2.04
Industrial	GWh	25,647.33	29,885.94	33,957.77	31,088.00	27,776.75
	%	-10.60	16.53	13.62	-8.45	-10.65
Agricultural	GWh	9,758.28	10,237.02	11,032.61	9,543.14	8,578.05
	%	-0.53	4.91	7.77	-13.50	-10.11
Public Lighting	GWh	384.61	556.54	408.59	521.28	653.48
	%	-14.50	44.70	-26.58	27.58	25.36
Bulk Supply	GWh	3,757.57	3,613.08	4,078.89	4,443.93	4,656.35
	%	-10.30	-3.85	12.89	8.95	4.78
General Services	GWh	867.59	896.35	1,021.83	3,665.45	3,660.14
	%	0.00	3.31	14.00	258.72	-0.14
Others	GWh	3,645.06	4,000.06	4,486.98	1,214.87	1,267.63
	%	18.79	9.74	12.17	-72.92	4.34
Supplied to KE by CPPA-G	GWh	5,426.14	6,118.04	9,036.54	8,960.81	8,538.07
	%	9.47	12.75	47.70	-0.84	-4.72
Total	GWh	112,493.86	121,559.44	133,665.45	121,863.30	118,245.92
Percentage change	%	-0.59	8.06	9.96	-8.83	-2.97

Source: Distribution Companies /KE

TABLE 71
Average Annual Electricity Consumption per Connection (kWh)

DISCO	Year	Domestic	Commercial	Industrial	Agricultural	Public Lighting	Bulk Supply	General Services	Others	Overall
PESCO	2019-20	1596.58	2139.69	74594.15	3015.94	11554.96	735417.61	10088.73	29174.82	2477.46
	2020-21	1591.95	2120.77	82420.35	3426.18	11196.96	720696.63	9793.93	24362.24	2496.14
	2021-22	1604.21	2219.44	89625.95	3338.09	10282.63	778305.46	10629.65	27106.94	2564.23
	2022-23	1388.77	2149.78	78406.44	2407.00	9943.50	871011.11	10000.15	28110.22	2273.95
	2023-24	1251.65	2067.19	65756.40	1948.84	9927.82	785809.11	9569.06	30290.50	2012.93
TESCO	2019-20	3520.20	170.09	77196.68	5246.37	0.00	153671.64	0.00	7135.98	4071.60
	2020-21	3485.89	172.40	129518.24	4971.13	0.00	183529.41	0.00	5990.44	4541.38
	2021-22	3652.55	183.11	125472.26	4201.86	0.00	180277.78	0.00	6809.70	4664.21
	2022-23	2747.98	203.22	88733.12	5924.60	0.00	243372.09	4097.51	0.00	3514.35
	2023-24	2375.46	270.56	54706.93	5333.15	0.00	357157.89	3724.18	0.00	2877.86
IESCO	2019-20	1897.86	2578.78	90927.93	3808.72	40412.75	1088082.84	24123.27	8565220.13	3346.60
	2020-21	1913.16	2666.15	89386.46	4832.92	39725.36	1082547.17	24488.92	8540538.92	3349.59
	2021-22	1936.98	2809.88	95433.65	4826.14	37263.39	1210854.80	26882.80	8901411.76	3431.79
	2022-23	1632.38	2529.02	76754.29	3769.16	30926.73	1721078.55	23728.29	5306358.38	2918.37
	2023-24	1603.36	2607.17	67322.05	3752.47	27292.78	1966000.00	23848.40	5327597.77	2871.12
GEPCO	2019-20	1862.10	1565.74	32285.84	9406.66	12355.93	1045466.67	0.00	17763.50	2675.11
	2020-21	1881.24	1703.86	36364.02	10234.71	15661.29	1081418.92	0.00	18258.83	2776.98
	2021-22	1898.17	1846.45	34740.45	9732.09	14739.97	1198108.11	0.00	19920.70	2771.53
	2022-23	1597.56	1644.00	30387.42	9266.42	22770.98	1158681.16	7383.56	8434903.23	2373.25
	2023-24	1535.48	1666.74	28891.08	8064.72	19587.68	1114741.01	7050.71	8955000.00	2245.39
LESCO	2019-20	2116.34	2429.87	85688.08	17527.60	45631.83	1284836.07	0.00	33996.27	3973.25
	2020-21	2061.21	2501.52	94990.33	17968.11	53463.45	1395159.91	0.00	38796.95	4043.55
	2021-22	2062.99	2714.88	108695.00	19519.12	50924.43	1569699.35	0.00	45951.27	4258.48
	2022-23	1720.07	2565.40	100336.84	19263.22	51462.04	1506410.60	43650.54	68118.08	3741.07
	2023-24	1643.55	2490.56	81917.55	14744.07	55054.52	1559445.68	38656.29	68419.12	3247.77
FESCO	2019-20	1723.98	1724.22	81189.92	24771.63	5629.03	1130221.24	0.00	7679.83	2981.56
	2020-21	1730.28	1802.06	94489.31	25487.76	7130.71	1038427.95	0.00	7263.89	3124.05
	2021-22	1722.27	1927.00	108873.12	26332.19	9262.94	925194.81	0.00	8547.96	3269.32
	2022-23	1450.09	1736.02	104287.66	22667.17	8854.22	828000.00	7540.57	30000.00	2869.50
	2023-24	1452.15	1714.36	88062.72	20722.28	8610.97	779446.81	7353.98	32236.84	2623.54
MEPCO	2019-20	1554.69	1559.97	43608.04	31065.68	11331.66	603785.56	0.00	7646.14	2387.58
	2020-21	1531.53	1632.73	48065.67	32296.65	12124.85	601550.22	0.00	7401.49	2419.91
	2021-22	1508.95	1742.75	56987.50	36379.58	13404.13	633814.66	0.00	8653.20	2521.67
	2022-23	1287.52	1700.89	49354.10	27326.44	13948.24	556114.65	7958.83	48604.65	2113.26
	2023-24	1282.86	1752.09	43805.48	25755.29	21836.20	589281.18	8023.86	47054.26	2022.92
HESCO	2019-20	2564.93	1575.21	48299.22	13795.26	6101.40	309941.86	0.00	13952.90	3398.33
	2020-21	2513.21	1568.28	54231.55	12808.43	8671.33	306840.58	0.00	14795.68	3422.18
	2021-22	2348.36	1533.55	59033.38	13230.97	14115.18	327719.65	0.00	16420.84	3371.94
	2022-23	1995.45	1348.69	52750.54	10245.85	49647.36	260019.94	15670.81	23421.05	2922.64
	2023-24	1948.95	1380.13	59396.72	10842.86	40425.89	239943.02	17378.96	23275.86	2982.84

DISCO	Year	Domestic	Commercial	Industrial	Agricultural	Public Lighting	Bulk Supply	General Services	Others	Overall
SEPCO	2019-20	2810.93	1690.76	27802.48	8678.58	37126.70	300338.35	0.00	8428.11	3435.66
	2020-21	2792.52	1812.93	28032.43	9060.83	310130.84	51348.31	0.00	7827.92	3447.40
	2021-22	2759.02	1860.46	30460.36	9281.22	74185.19	458930.96	0.00	8442.50	3547.19
	2022-23	2102.36	1693.76	27511.74	8420.84	297174.47	323771.80	13768.90	31600.00	3107.38
	2023-24	1921.24	1493.23	32766.14	8967.54	505148.15	318761.99	16664.92	32100.00	3186.09
QESCO	2019-20	1280.82	1107.49	43191.72	120681.78	35036.50	468413.28	0.00	28537.95	7530.62
	2020-21	1197.32	1082.67	50444.50	117613.95	37885.30	462659.57	0.00	24603.04	7211.16
	2021-22	1175.53	1146.67	45005.22	118712.82	38763.25	470869.57	0.00	24867.44	7111.66
	2022-23	1094.53	1069.62	41964.01	106264.86	44965.03	449147.54	21309.75	377500.00	6344.41
	2023-24	1043.61	1081.53	47399.69	93950.75	42743.06	472783.17	17564.49	315000.00	5599.20
Total in CPPA-G System	2019-20	1846.38	1928.66	61734.67	27973.44	24934.14	771173.46	14337.08	23828.01	3097.43
	2020-21	1829.73	1994.51	69034.96	28166.96	40311.42	755325.20	14314.51	24183.92	3152.61
	2021-22	1823.20	2125.44	76454.23	29570.09	28976.97	855902.58	15714.10	26527.37	3249.97
	2022-23	1533.25	1978.08	68826.87	25273.36	38313.47	917686.91	14314.10	1292412.36	2807.27
	2023-24	1479.30	1970.94	59380.13	22466.43	46778.76	950046.69	13817.88	1324589.45	2589.99
KE	2019-20	3060.39	3430.92	184378.57	51127.26	1244777.78	2672800.00	0.00	19772.11	4824.77
	2020-21	3032.71	3482.26	224616.68	56238.45	1114090.91	2672411.76	0.00	24241.44	5044.64
	2021-22	2806.74	3625.24	246469.25	52900.14	354555.56	2658181.82	0.00	23853.72	4922.64
	2022-23	2455.22	3502.88	226530.32	31638.55	256937.84	2395020.92	22703.32	0.00	4361.95
	2023-24	2207.41	3419.82	223843.85	11572.51	318835.36	2518909.71	22600.37	0.00	4056.07

Source: Distribution Companies / KE

TABLE 72
Distribution Losses (voltage category-wise)

DISCO	Losses of	2019-20		2020-21		2021-22		2022-23		2023-24	
		GWh	%	GWh	%	GWh	%	GWh	%	GWh	%
PESCO	132 kV system (including 66 & 33 kV)	273.70	1.90	235.60	1.50	322.67	1.95	160.92	1.06	205.61	1.50
	11 kV and below system	5433.50	37.50	5697.60	37.20	5843.37	35.99	5498.76	36.46	5124.88	36.80
	Overall system	5707.50	38.69	5935.95	38.19	6214.30	37.50	5730.78	37.51	5393.36	37.99
TESCO	132 kV system (including 66 & 33 kV)	87.76	4.08	39.85	1.79	2284.45	1.20	1719.83	9.02	1406.90	8.59
	11 kV and below system	260.24	12.61	173.50	7.94	2251.01	7.97	1698.38	7.90	1396.38	7.90
	Overall system	348.24	16.19	213.35	9.58	212.41	9.30	155.95	9.06	122.21	8.68
IESCO	132 kV system (including 66 & 33 kV)	199.00	1.74	137.00	1.15	128.00	0.99	124.67	1.05	110.96	0.91
	11 kV and below system	795.00	7.07	885.00	7.48	937.00	7.26	934.94	7.98	959.10	7.92
	Overall system	993.49	8.69	1022.00	8.54	1065.08	8.18	1059.76	8.95	1070.06	8.75
GEPSCO	132 kV system (including 66 & 33 kV)	120.87	1.10	115.16	0.96	115.69	0.91	103.68	0.90	96.03	0.80
	11 kV and below system	924.71	8.51	995.21	8.35	1033.75	8.23	919.52	8.08	1274.81	10.76
	Overall system	1045.56	9.51	1110.38	9.23	1149.44	9.07	1023.21	8.91	1370.85	11.48
LESOCO	132 kV system (including 66 & 33 kV)	114.91	0.50	74.91	0.30	138.65	0.50	180.96	0.70	99.00	0.40
	11 kV and below system	2802.65	12.00	2960.83	11.70	3125.07	11.10	2759.37	10.70	3595.00	14.30
	Overall system	2918.33	12.40	3035.72	11.96	3263.25	11.52	3099.27	11.83	4014.88	15.80
FESCO	132 kV system (including 66 & 33 kV)	218.42	1.50	225.36	1.40	248.68	1.42	154.44	0.96	182.54	1.16
	11 kV and below system	1168.66	8.20	1257.81	8.00	1346.58	7.80	1271.48	7.98	1360.00	8.76
	Overall system	1387.09	9.56	1483.28	9.28	1593.74	9.10	1425.05	8.86	1545.52	9.82
MEPCO	132 kV system (including 66 & 33 kV)	292.07	1.51	321.38	1.57	383.87	1.69	118.30	0.60	218.23	1.10
	11 kV and below system	2650.66	13.90	2744.74	13.60	2962.42	13.30	2655.72	13.50	2806.46	14.20
	Overall system	2942.75	15.23	3066.11	14.93	3346.29	14.84	2867.32	14.63	3024.69	15.18
HESCO	132 kV system (including 66 & 33 kV)	157.64	2.88	145.60	2.61	102.20	1.84	98.58	2.02	92.31	1.81
	11 kV and below system	1423.22	26.04	1414.70	26.06	1423.00	26.50	1220.11	25.50	1290.88	25.82
	Overall system	2921.64	42.89	2518.40	38.55	1976.42	32.88	1309.80	26.81	1389.55	27.25
SEPCO	132 kV system (including 66 & 33 kV)	76.03	1.79	75.32	1.76	87.49	1.95	67.93	1.76	84.53	2.10
	11 kV and below system	1423.40	34.44	1412.9	33.73	1454.27	33.47	1265.77	32.69	1322.82	32.80
	Overall system	1542.38	36.27	1513.33	35.27	1599.60	35.63	1333.71	34.45	1407.35	34.90
QESCO	132 kV system (including 66 & 33 kV)	127.10	1.90	114.91	1.70	126.71	1.90	15.47	0.30	218.80	3.70
	11 kV and below system	1634.91	25.20	1734.4	26.60	1758.01	26.70	1587.36	26.50	1590.11	28.30
	Overall system	1762.00	26.68	1849.56	27.92	1884.70	28.06	1605.47	26.73	1810.04	30.96
Total Distribution Losses in CPPA-G System		21568.97	18.86	21748.08	17.96	22305.23	17.14	19610.32	16.77	21148.51	18.26
KE	220 kV & 132 kV system (including 66 kV)	198.16	1.11	208.00	1.07	164.41	0.83	157.19	0.86	134.29	0.75
	11 kV and below system	3311.38	18.83	3210.00	16.65	2874.59	14.64	2645.50	14.54	2727.28	15.36
	Overall system	3522.26	19.79	3416.82	17.54	3058.66	15.43	2812.21	15.31	2871.286	16.04

Source: Distribution Companies / KE

TABLE 73

DISCOs' Billing, Collection and Percentage of Recovery against Computed Billing

DISCO	FY	Billing (Rs. in Million)			Collection (Rs. in Million)			%age of Collection		
		Government	Private	Total	Government	Private	Total	Government	Private	Total
PESCO	2019-20	25655.13	134829.74	160484.87	21838.78	118959.50	140798.28	85.12	88.23	87.73
	2020-21	26085.99	149987.73	176073.72	39300.85	141973.17	181274.02	150.66	94.66	102.95
	2021-22	33716.95	198912.01	232628.96	31700.19	182719.49	214419.68	94.02	91.86	92.17
	2022-23	46958.67	265016.19	311974.86	51075.45	236230.22	287305.67	108.77	89.14	92.09
	2023-24	57641.54	324940.11	382581.65	58463.16	294362.89	352826.05	101.43	90.59	92.22
TESCO	2019-20	940.60	26847.10	27787.70	727.96	5051.32	5779.28	77.39	18.82	20.80
	2020-21	715.43	29468.12	30183.55	652.17	8475.67	9127.84	91.16	28.76	30.24
	2021-22	1302.22	41107.73	42409.95	1098.64	27628.96	28727.60	84.37	67.21	67.74
	2022-23	1900.73	47457.25	49357.98	1536.02	39430.00	40966.02	80.81	83.09	83.00
	2023-24	2549.83	42663.15	45212.98	2183.70	46500.83	48684.53	85.64	109.00	107.68
IESCO	2019-20	58096.00	143613.00	201709.00	42364.00	139041.00	181405.00	72.92	96.82	89.93
	2020-21	62450.00	155904.00	218354.00	97902.00	159841.00	257743.00	156.77	102.53	118.04
	2021-22	79036.63	211166.14	290202.77	66812.50	210472.16	277284.66	84.53	99.67	95.55
	2022-23	102974.63	282246.56	385221.19	130243.50	274158.59	404402.09	126.48	97.13	104.98
	2023-24	142812.34	379352.23	522164.57	135417.41	371257.62	506675.03	94.82	97.87	97.03
GEPCO	2019-20	11422.67	155525.30	166947.97	9382.33	149261.88	158644.21	82.14	95.97	95.03
	2020-21	12638.14	177724.79	190362.93	19149.48	183045.64	202195.12	151.52	102.99	106.22
	2021-22	16134.85	233013.74	249148.59	15989.04	232418.32	248407.36	99.10	99.74	99.70
	2022-23	21121.32	315385.02	336506.34	27194.12	308846.06	336040.18	128.75	97.93	99.86
	2023-24	27266.37	427731.13	454997.50	26119.20	424655.95	450775.15	95.79	99.28	99.07
LESCO	2019-20	26270.56	356035.93	382306.49	23939.14	342529.91	366469.05	91.13	96.21	95.86
	2020-21	29356.20	397310.87	426667.07	26575.26	399496.97	426072.23	90.53	100.55	99.86
	2021-22	27136.98	585816.12	612953.10	26575.49	533012.27	559587.76	97.93	90.99	91.29
	2022-23	46971.08	774200.94	821172.02	62239.00	708829.95	771068.95	132.50	91.56	93.90
	2023-24	58597.00	927795.00	986392.00	54611.49	920632.11	975243.60	93.20	99.23	98.87
FESCO	2019-20	12513.30	246482.21	258995.51	11449.36	240305.21	251754.57	91.50	97.49	97.20
	2020-21	12506.79	229123.46	241630.25	11446.92	234916.46	246363.38	91.53	102.53	101.96
	2021-22	15854.00	350853.00	366707.00	15295.00	332482.00	347777.00	96.47	94.76	94.84
	2022-23	20468.65	424286.15	444754.80	20371.23	416248.41	436619.64	99.52	98.11	98.17
	2023-24	24450.98	581995.54	606446.52	23052.19	581238.71	604290.90	94.28	99.87	99.64
MEPCO	2019-20	15391.32	224018.62	239409.94	14601.86	210938.55	225540.41	94.87	94.16	94.21
	2020-21	16415.69	256160.34	272576.03	15465.82	266938.30	282404.12	94.21	104.21	103.61
	2021-22	21753.73	342325.10	364078.83	21062.28	342032.95	363095.23	96.82	99.91	99.73
	2022-23	27915.53	458049.02	485964.55	26022.28	450843.06	476865.34	93.22	98.43	98.13
	2023-24	40141.01	636548.43	676689.44	35307.85	632056.15	667364.00	87.96	99.29	98.62
HESCO	2019-20	8948.73	57176.51	66125.24	4680.62	43718.77	48399.39	52.30	76.46	73.19
	2020-21	9719.55	62307.38	72026.93	8097.82	46377.55	54475.37	83.31	74.43	75.63
	2021-22	11924.19	76968.38	88892.57	8258.76	57272.08	65530.84	69.26	74.41	73.72
	2022-23	17224.21	92487.76	109711.97	13559.56	69692.67	83252.23	78.72	75.35	75.88
	2023-24	22871.20	130513.00	153384.20	19183.10	99863.00	119046.10	83.87	76.52	77.61
SEPCO	2019-20	9086.48	38780.76	47867.24	4175.64	23156.53	27332.17	45.95	59.71	57.10
	2020-21	9105.61	40992.00	50097.61	6847.01	25587.24	32434.25	75.20	62.42	64.74
	2021-22	12550.67	49771.01	62321.68	9338.77	30975.67	40314.44	74.41	62.24	64.69
	2022-23	25263.24	53937.00	79200.24	19563.32	34445.11	54008.43	77.44	63.86	68.19
	2023-24	39202.50	68429.10	107631.60	25188.00	47039.90	72227.90	64.25	68.74	67.11
QESCO	2019-20	10489.18	60175.97	70665.15	5340.74	13548.81	18889.55	50.92	22.52	26.73
	2020-21	10525.65	57714.92	68240.57	9482.33	15537.55	25019.88	90.09	26.92	36.66
	2021-22	31211.70	64932.00	96143.70	15455.30	18665.70	34121.00	49.52	28.75	35.49
	2022-23	17081.79	113397.68	130479.47	12283.87	35890.64	48174.51	71.91	31.65	36.92
	2023-24	40367.70	132294.40	172662.10	28646.10	34467.10	63113.20	70.96	26.05	36.55
Total in CPPA-G System	2019-20	178813.97	1443485.14	1622299.11	138500.43	1286511.48	1425011.91	77.46	89.13	87.84
	2020-21	189519.05	1556693.61	1746212.66	234919.66	1482189.55	1717109.21	123.96	95.21	98.33
	2021-22	250621.92	2154865.23	2405487.15	211585.97	1967679.60	2179265.57	84.42	91.31	90.60
	2022-23	327879.85	2826463.57	3154343.42	364088.35	2574614.71	2938703.06	111.04	91.09	93.16
	2023-24	455900.47	3652262.09	4108162.56	408172.20	3452074.26	3860246.46	89.53	94.52	93.97
KE	2019-20	25826.00	229060.00	254886.00	22769.00	212087.00	234856.00	88.16	92.59	92.14
	2020-21	28154.00	287719.00	315873.00	27617.00	272056.00	299673.00	98.09	94.56	94.87
	2021-22	32989.01	357246.72	390235.73	36407.91	340927.00	377334.91	110.36	95.43	96.69
	2022-23	40406.85	496752.20	537159.05	40709.87	457566.49	498276.36	100.75	92.11	92.76
	2023-24	56685.89	696495.23	753181.11	48732.20	640761.42	689493.62	85.97	92.00	91.54

Source: Distribution Companies / KE

TABLE 74
DISCOs' Actual Technical and Commercial Losses

DISCO	FY	T&D Losses			Commercial Losses			Combined Technical & Commercial Losses (%)
		Units Purchased (MWh)	Units Billed (MWh)	Losses (%)	Billing (Computed) (Rs. in Million)	Collection (Rs. in Million)	Losses (%)	
PESCO	2019-20	14791.90	9043.10	38.86	160627.34	140798.28	12.34	46.41
	2020-21	15540.95	9607.69	38.18	176816.03	181273.88	-2.52	36.62
	2021-22	16560.19	10394.15	37.23	232628.96	214419.68	7.83	42.15
	2022-23	15243.61	9583.92	37.13	311974.86	287305.67	7.91	42.10
	2023-24	14133.54	8803.06	37.72	382581.64	352826.05	7.78	42.56
TESCO	2019-20	2001.32	1802.77	9.92	30625.54	18745.13	38.79	39.20
	2020-21	2226.2	2012.67	9.59	27499.78	25501.88	7.27	23.60
	2021-22	2284.45	2071.59	9.32	42409.95	28727.60	32.26	38.60
	2022-23	1719.83	1564.66	9.02	49357.98	40966.02	17.00	24.50
	2023-24	1406.89	1286.08	8.59	45212.98	48684.53	-7.68	1.57
IESCO	2019-20	11436.00	10442.00	8.69	201709.00	181405.00	10.07	17.88
	2020-21	11966.00	10943.00	8.55	218353.00	257742.00	-18.04	-7.95
	2021-22	13026.93	11961.96	8.18	290202.77	277284.66	4.45	12.26
	2022-23	11838.13	10778.52	8.95	385221.19	404402.09	-4.98	4.42
	2023-24	12224.64	11154.57	8.75	522164.57	506675.03	2.97	11.46
GEPSCO	2019-20	10991.19	9945.62	9.51	166947.97	158644.21	4.97	14.49
	2020-21	12032.48	10922.11	9.23	190363.93	202195.12	-6.22	3.01
	2021-22	12678.20	11528.75	9.07	249148.59	248407.15	0.30	9.34
	2022-23	11478.01	10454.80	8.91	336506.28	336040.19	0.14	9.04
	2023-24	11944.09	10573.24	11.48	454997.50	450775.15	0.93	12.30
LESCO	2019-20	23528.32	20610.77	12.40	382306.49	366469.05	4.14	16.03
	2020-21	25387.87	22352.13	11.96	426667.07	426072.23	0.14	12.12
	2021-22	28334.45	25070.73	11.52	571563.62	567879.83	0.64	12.10
	2022-23	26032.47	23092.14	11.29	783469.41	751642.42	4.06	14.90
	2023-24	25093.78	21400.01	14.72	1014723.63	1003308.94	1.12	15.80
FESCO	2019-20	14510.33	13123.23	9.56	229297.52	215959.00	5.82	14.82
	2020-21	15984.48	14501.28	9.28	258995.51	251754.57	2.80	11.82
	2021-22	17512.55	15919.00	9.10	328930.00	327371.00	0.47	9.57
	2022-23	16088.00	14663.00	8.86	480556.00	482431.00	-0.39	8.90
	2023-24	15736.00	14192.00	9.81	619116.00	604291.00	2.39	11.60
MEPCO	2019-20	19324.68	16381.95	15.23	239409.94	225540.41	5.79	20.14
	2020-21	20532.21	17466.09	14.93	272576.03	282404.12	-3.61	11.87
	2021-22	22733.91	19202.42	15.53	364078.83	363095.23	0.27	14.90
	2022-23	19599.68	16732.37	14.63	485964.55	476865.34	1.87	16.20
	2023-24	19929.05	16904.36	15.18	676689.44	667364.00	1.38	16.30
HESCO	2019-20	5470.77	3890.01	28.89	65357.05	45707.20	30.07	50.29
	2020-21	5574.40	4014.10	27.99	70839.90	54302.40	23.34	44.79
	2021-22	5559.80	4034.50	27.43	86037.60	64650.00	24.86	45.50
	2022-23	4884.04	3565.34	27.00	109711.90	83252.20	24.12	44.60
	2023-24	5098.90	3709.40	27.25	153384.20	119046.10	22.39	43.50
SEPCO	2019-20	4252.50	2710.08	36.27	47867.24	27049.55	43.49	63.60
	2020-21	4290.96	2775.76	35.31	50097.61	32434.25	35.26	58.10
	2021-22	4489.77	2890.18	35.63	62321.68	40314.44	35.31	77.27
	2022-23	3871.90	2538.14	34.45	79200.24	54008.43	31.81	55.30
	2023-24	4032.95	2625.59	34.90	107631.60	72227.90	32.89	56.31
QESCO	2019-20	6594.90	4841.95	26.58	70665.20	18889.50	73.27	80.00
	2020-21	6615.8	4775.373	27.82	68240.57	25019.88	63.34	74.00
	2021-22	6716.30	4831.57	28.06	96144.00	34121.00	64.51	74.46
	2022-23	6002.60	4399.90	26.70	109237.06	35423.79	67.57	76.23
	2023-24	5745.07	4035.52	29.76	172662.10	63113.20	63.45	74.32
Total in CPPA-G System	2019-20	112901.91	92791.48	17.81	1594813.29	1399207.33	12.27	30.08
	2020-21	120151.35	99370.20	17.30	1760449.43	1738700.33	1.24	18.37
	2021-22	129896.55	107904.85	16.93	2323466.00	2166270.59	6.77	23.70
	2022-23	116758.27	97372.79	16.60	3131199.47	2952337.15	5.71	22.41
	2023-24	115344.91	94683.83	17.91	4149163.66	3888311.90	6.29	23.41
KE	2019-20	17786.51	14277.42	19.73	254886.00	234855.00	7.86	26.00
	2020-21	19487.42	16068.83	17.54	315873.00	299672.00	5.13	218.00
	2021-22	19802.21	16763.22	15.35	390235.00	377335.00	3.31	18.10
	2022-23	18356.53	15553.83	15.27	537159.00	498276.00	7.24	21.40
	2023-24	17885.81	15025.11	15.99	753181.11	689493.62	8.46	23.10

Source: Distribution Companies / KE

TABLE 75
Receivables of Distribution Companies including K-Electric Limited

DISCO	Category	June, 2023 (Rs. in Million)			June, 2024 (Rs. in Million)				
		Opening Balance of Receivables at begin of Month (1 st of June)	Billing during Month	Collection during Month	Closing Balance of Receivables at end of Month (30 th of June)	Opening Balance of Receivables at begin of Month (1 st of June)	Billing during Month	Collection during Month	Closing Balance of Receivables at end of Month (30 th of June)
PESCO	Federal Govt.	29,372.70	1,982.77	22,939.80	8,415.72	22,979.98	2,837.67	16,658.61	9,225.27
	Provincial Govt.	6,673.22	1,612.31	1,505.11	6,781.09	5,358.84	2,067.27	2,173.02	5,255.83
	Private	172,146.00	23,051.32	20,005.80	176,761.06	202,304.41	26,993.72	23,692.43	208,520.74
	Total	208,191.92	26,646.40	44,450.71	191,957.87	230,643.23	31,898.66	42,524.06	223,001.84
TESCO	Federal Govt.	792.46	86.67	113.75	721.03	969.09	111.43	114.83	966.64
	Provincial Govt.	2,466.98	73.25	99.99	2,484.61	2,389.78	91.04	187.62	2,297.98
	Private	81,550.01	2,659.20	844.89	83,364.31	83,905.77	3,571.97	6,774.54	80,697.47
	Total	84,809.45	2,819.12	1,058.63	86,569.95	87,264.64	3,774.44	7,076.99	83,962.09
IESCO	Federal Govt.	88,699.00	8,659.00	43,025.00	54,334.00	70,153.27	13,825.24	24,505.09	59,488.98
	Provincial Govt.	1,371.00	382.00	1,988.00	(233.00)	2,095.75	718.19	781.77	2,032.29
	Private	22,751.00	30,006.00	32,900.00	19,856.00	19,404.13	46,532.07	37,994.41	27,926.24
	Total	112,821.00	39,047.00	77,913.00	73,957.00	91,653.15	61,075.50	63,281.27	89,447.51
GEPCO	Federal Govt.	11,196.46	1,535.40	6,324.19	6,407.68	9,199.66	2,196.94	4,271.59	7,125.01
	Provincial Govt.	939.08	587.67	1,478.70	48.05	1,598.82	815.17	655.44	1,758.55
	Private	42,082.80	33,788.79	39,297.02	36,574.57	43,740.91	51,699.38	43,826.79	51,613.50
	Total	54,218.34	35,911.86	47,099.91	43,030.30	54,539.39	54,711.48	48,753.82	60,497.06
LESCO	Federal Govt.	4,749.00	658.00	1,453.00	3,955.00	5,907.00	1,992.00	1,228.00	6,673.00
	Provincial Govt.	15,366.00	(311.00)	3,971.00	11,087.00	16,192.00	4,268.00	5,693.00	14,773.00
	Private	194,190.00	70,264.00	66,258.00	198,193.00	190,895.00	103,721.00	91,405.00	203,203.00
	Total	214,305.00	70,611.00	71,682.00	213,235.00	212,994.00	109,981.00	98,326.00	224,649.00
FESCO	Federal Govt.	541.86	694.69	942.60	292.09	1,141.64	1,337.47	753.61	1,724.80
	Provincial Govt.	3,108.83	1,440.48	1,636.85	2,921.02	4,557.89	1,472.06	2,216.01	3,815.95
	Private	93,385.43	44,925.87	39,940.26	68,072.63	72,985.45	62,381.67	54,790.39	80,575.89
	Total	97,036.12	47,061.04	42,519.71	71,285.74	78,684.98	65,191.20	57,760.01	86,116.64
MEPCO	Federal Govt.	928.18	908.86	726.17	1,087.70	2,035.39	1,201.24	1,047.67	2,188.80
	Provincial Govt.	6,375.78	2,156.03	911.04	5,985.10	12,312.70	2,378.61	4,017.44	10,674.87
	Private	115,677.02	49,235.55	62,386.29	102,525.99	113,064.20	68,198.66	65,258.02	116,007.43
	Total	122,980.98	52,300.44	64,023.50	109,598.79	127,412.30	71,778.51	70,323.14	128,871.10
HESCO	Federal Govt.	5,019.24	452.80	397.38	5,074.82	5,121.50	548.60	136.30	5,533.90
	Provincial Govt.	15,675.17	1,209.57	1.24	16,883.50	18,922.90	1,682.40	1.00	20,604.10
	Private	148,297.77	10,896.10	8,392.67	150,801.05	178,059.00	14,516.10	9,372.90	183,202.20
	Total	168,992.18	12,558.47	8,791.29	172,759.37	202,103.40	16,747.10	9,510.20	209,340.20
SEPCO	Federal Govt.	4,860.21	518.93	770.39	4,646.27	8,424.85	600.79	162.63	9,124.87
	Provincial Govt.	19,615.70	2,383.55	1,240.80	21,115.48	28,623.29	3,531.48	121.26	32,976.13
	Private	163,773.53	6,016.42	4,045.33	165,966.04	184,839.81	7,161.15	4,712.66	187,824.14
	Total	188,249.44	8,918.90	6,056.52	191,727.79	221,887.95	11,293.42	4,996.55	229,925.14
QESCO	Federal Govt.	1,947.20	510.57	708.28	1,749.49	2,533.47	697.72	873.57	2,357.62
	Provincial Govt.	32,794.87	949.61	1,306.92	32,437.56	39,083.10	844.33	1,678.62	38,248.81
	Private	506,737.50	10,477.21	8,073.00	509,141.71	607,232.79	12,277.60	7,307.02	612,203.37
	Total	541,479.57	11,937.39	10,088.20	543,328.76	648,849.36	13,819.65	9,859.21	652,809.80

DISCO	Category	FY 2022-23 (Rs. in Million)					
		Opening Balance of Receivable as at July, 2022	Billing due	Collection	Billing not due	Adjustments	Closing Balance of Receivable as at June, 2023
KE	Federal Govt.	3,727.43	19,432.29	(19,926.19)	361.74	(331.61)	3,263.66
	Provincial Govt.	44,581.53	20,974.51	(20,783.67)	1,999.69	(720.35)	46,051.71
	Private	149,572.88	496,752.20	(457,566.49)	12,618.23	(17,624.00)	183,752.82
	Total	197,881.84	537,159.00	(498,276.35)	14,979.66	(18,675.96)	233,068.19
	Category	FY 2023-24 (Rs. in Million)					
		Opening Balance of Receivable as at July, 2023	Billing due	Collection	Billing not due	Adjustments	Closing Balance of Receivable as at June, 2024
KE	Federal Govt.	3,263.66	24,675.89	(24,776.58)	1,009.40	(147.96)	4,024.41
	Provincial Govt.	46,051.71	32,010.00	(23,955.63)	3,492.33	(1.23)	57,597.19
	Private	183,752.82	696,495.23	(640,761.42)	5,438.08	(2,735.15)	242,189.55
	Total	233,068.19	753,181.11	(689,493.62)	9,939.81	(2,884.34)	303,811.15

Note 1: Adjustments include write-offs, internal transfers etc. Note 2: All figures are inclusive of taxes, duties and LPS.
Source: Distribution Companies / KE

TABLE 76
Province-wise Electricity Consumption by Economic Groups of the Country (GWh)

Category	Year	Punjab ^[1]	Sindh ^[2]	Khyber Pakhtunkhwa ^[3]	Balochistan ^[4]	K-Electric Limited	Total
Domestic	2019-20	36357.29	11649.08	6514.32	611.92	7489.18	62621.79
	2020-21	38248.08	12245.70	6774.19	587.89	8041.32	65897.18
	2021-22	40561.88	12097.64	7157.41	591.97	8004.68	68413.57
	2022-23	35992.69	10740.64	6238.94	561.93	7369.71	60903.91
	2023-24	37544.45	10150.91	5789.31	557.58	6899.40	60941.64
Commercial	2019-20	4871.69	2086.35	779.86	136.78	1615.20	9489.88
	2020-21	5250.59	2200.95	806.63	138.38	1708.58	10105.13
	2021-22	5856.37	2345.93	879.90	151.15	1846.46	11079.81
	2022-23	5596.32	2269.37	881.50	144.44	1818.00	10709.63
	2023-24	5786.54	2258.22	875.95	152.48	1822.17	10895.36
Industrial	2019-20	17908.23	5240.76	2337.71	160.63	4158.29	29805.62
	2020-21	20446.21	6420.06	2827.88	191.79	5220.99	35106.93
	2021-22	23540.66	7169.45	3075.21	172.46	5842.80	39800.57
	2022-23	21735.67	6560.88	2630.56	160.89	5350.19	36438.19
	2023-24	18806.98	6646.48	2139.00	184.29	5244.66	33021.41
Agricultural	2019-20	5673.10	411.35	101.77	3572.06	116.11	9874.39
	2020-21	6233.92	407.18	109.96	3485.96	121.70	10358.72
	2021-22	7006.67	405.86	103.45	3516.63	110.72	11143.33
	2022-23	6012.37	307.24	77.24	3146.29	66.31	9609.46
	2023-24	5450.29	282.42	64.21	2781.13	19.15	8597.21
Public Lighting	2019-20	230.15	131.93	12.93	9.60	112.03	496.64
	2020-21	264.03	268.92	13.02	10.57	98.04	654.58
	2021-22	273.28	111.97	12.37	10.97	63.82	472.41
	2022-23	279.75	216.35	12.32	12.86	47.53	568.81
	2023-24	301.90	326.94	12.33	12.31	57.71	711.19
Bulk Supply	2019-20	2234.61	734.14	661.88	126.94	467.74	4225.31
	2020-21	2245.69	583.02	653.90	130.47	454.31	4067.39
	2021-22	2439.69	787.29	711.12	140.79	467.84	4546.73
	2022-23	2766.89	735.20	804.84	136.99	469.42	4913.35
	2023-24	2981.43	775.88	752.95	146.09	518.90	5175.24
General Services	2019-20	441.89	0.00	425.70	0.00	0.00	867.59
	2020-21	471.73	0.00	424.62	0.00	0.00	896.35
	2021-22	546.85	0.00	474.98	0.00	0.00	1021.83
	2022-23	2128.22	835.61	466.69	234.94	432.66	4098.11
	2023-24	2090.69	915.86	453.82	199.76	463.13	4123.27
Others	2019-20	2785.87	623.45	11.66	224.08	318.41	3963.47
	2020-21	3025.30	734.83	9.99	229.94	423.91	4423.97
	2021-22	3457.24	769.77	12.33	247.63	426.91	4913.89
	2022-23	1208.62	3.30	1.43	1.51	0.00	1214.87
	2023-24	1260.83	3.34	1.58	1.89	0.00	1267.63
Total	2019-20	70060.94	20877.06	10420.11	4842.01	14276.96	120477.08
	2020-21	75713.82	22860.66	11195.57	4775.00	16068.85	130613.90
	2021-22	83135.79	23687.90	11951.79	4831.60	16763.23	140370.32
	2022-23	73592.31	20832.99	10646.83	4164.91	15121.18	124358.22
	2023-24	72132.42	20444.20	9635.32	3835.77	14561.98	120609.69

^[1] Islamabad Capital Territory is included

^[2] Consumption in KE Area is not included

^[3] FATA is included

^[4] Area served by KE is excluded

Source: Distribution Companies / KE

TABLE 77
Province-wise Electricity Consumption by Economic Groups of the Country (%)

Category	Year	Punjab ^[1]	Sindh ^[2]	Khyber Pakhtunkhwa ^[3]	Balochistan ^[4]	K-Electric Limited	Total
Domestic	2019-20	51.89	55.80	62.52	12.64	52.46	51.98
	2020-21	50.52	53.57	60.51	12.31	50.04	50.45
	2021-22	48.79	51.07	59.89	12.25	47.75	48.74
	2022-23	48.91	51.56	58.60	13.49	48.74	48.97
	2023-24	52.05	49.65	60.08	14.54	47.38	50.53
Commercial	2019-20	6.95	9.99	7.48	2.82	11.31	7.88
	2020-21	6.93	9.63	7.20	2.90	10.63	7.74
	2021-22	7.04	9.90	7.36	3.13	11.01	7.89
	2022-23	7.60	10.89	8.28	3.47	12.02	8.61
	2023-24	8.02	11.05	9.09	3.98	12.51	9.03
Industrial	2019-20	25.56	25.10	22.43	3.32	29.13	24.74
	2020-21	27.00	28.08	25.26	4.02	32.49	26.88
	2021-22	28.32	30.27	25.73	3.57	34.85	28.35
	2022-23	29.54	31.49	24.71	3.86	35.38	29.30
	2023-24	26.07	32.51	22.20	4.80	36.02	27.38
Agricultural	2019-20	8.10	1.97	0.98	73.77	0.81	8.20
	2020-21	8.23	1.78	0.98	73.00	0.76	7.93
	2021-22	8.43	1.71	0.87	72.78	0.66	7.94
	2022-23	8.17	1.47	0.73	75.54	0.44	7.73
	2023-24	7.56	1.38	0.67	72.51	0.13	7.13
Public Lighting	2019-20	0.33	0.63	0.12	0.20	0.78	0.41
	2020-21	0.35	1.18	0.12	0.22	0.61	0.50
	2021-22	0.33	0.47	0.10	0.23	0.38	0.34
	2022-23	0.38	1.04	0.12	0.31	0.31	0.46
	2023-24	0.42	1.60	0.13	0.32	0.40	0.59
Bulk Supply	2019-20	3.19	3.52	6.35	2.62	3.28	3.51
	2020-21	2.97	2.55	5.84	2.73	2.83	3.11
	2021-22	2.93	3.32	5.95	2.91	2.79	3.24
	2022-23	3.76	3.53	7.56	3.29	3.10	3.95
	2023-24	4.13	3.80	7.81	3.81	3.56	4.29
General Services	2019-20	0.63	0.00	4.09	0.00	0.00	0.72
	2020-21	0.62	0.00	3.79	0.00	0.00	0.69
	2021-22	0.66	0.00	3.97	0.00	0.00	0.73
	2022-23	2.89	4.01	4.38	5.64	2.86	3.30
	2023-24	2.90	4.48	4.71	5.21	3.18	3.42
Others	2019-20	3.98	2.99	0.11	4.63	2.23	3.29
	2020-21	4.00	3.21	0.09	4.82	2.64	3.39
	2021-22	4.16	3.25	0.10	5.13	2.55	3.50
	2022-23	1.64	0.02	0.01	0.04	0.00	0.98
	2023-24	1.75	0.02	0.02	0.05	0.00	1.05
Total	2019-20	100.00	100.00	100.00	100.00	100.00	100.00
	2020-21	100.00	100.00	100.00	100.00	100.00	100.00
	2021-22	100.00	100.00	100.00	100.00	100.00	100.00
	2022-23	100.00	100.00	100.00	100.00	100.00	100.00
	2023-24	100.00	100.00	100.00	100.00	100.00	100.00

^[1] Islamabad Capital Territory is included

^[2] Consumption in KE Area is not included

^[3] FATA is included

^[4] Area served by KE is excluded

Source: Distribution Companies / KE

Table 78
Safety (Number of Fatal Accidents for Both Employees and Public)

DISCO	2019-20			2020-21			2021-22			2022-23			2023-24		
	Employees	Public	Total	Employees	Public	Total	Employees	Public	Total	Employees	Public	Total	Employees	Public	Total
PESCO	14	17	31	7	16	23	10	29	39	12	29	41	7	13	20
TESCO	0	0	0	0	0	0	0	0	0	0	1	1	2	1	3
IESCO	6	11	17	5	17	22	10	17	27	8	16	24	5	21	26
GEPCO	9	3	12	7	2	9	3	7	10	3	6	9	4	3	7
LESCO	8	0	8	9	2	11	9	18	27	8	3	11	9	9	18
FESCO	3	5	8	4	3	7	5	0	5	3	3	6	4	3	7
MEPCO	10	3	13	6	7	13	4	4	8	4	1	5	1	2	3
HESCO	6	2	8	2	30	32	3	32	35	4	10	14	1	8	9
SEPCO	4	9	13	2	12	14	2	8	10	6	3	9	1	4	5
QESCO	1	6	7	3	3	6	4	4	8	4	6	10	3	8	11
Total DISCOs	61	56	117	45	92	137	50	119	169	52	78	130	37	72	109
KE	0	43	43	0	39	39	0	27	27	0	37	37	3	34	37

Source: Distribution Companies / KE

TABLE 79
New Connections Sanctioned, Load and Pending

DISCO	Year	All Category excluding Net-Metering			Net-Metering Connections		
		Connection		Applications Pending (Nos.)	Connection		Applications Pending (Nos.)
		Sanctioned (Nos.)	Load (kW)		Sanctioned (Nos.)	Load (kW)	
PESCO	2019-20	180,789	454,197	17,667			
	2020-21	173,012	637,325	4,664			
	2021-22	171,607	632,149	7,134			
	2022-23	147,168	566,138	14,464			
	2023-24	176,814	680,734	2,007	5,837	82,070	127
TESCO	2019-20	112	23,340	0			
	2020-21	280	31,446	55			
	2021-22	393	31,430	57			
	2022-23	877	30,373	19			
	2023-24	1,531	18,050	6	15	734	2
IESCO	2019-20	134,510	784,476	24,623			
	2020-21	163,575	454,310	44,225			
	2021-22	204,951	607,246	38,201			
	2022-23	207,714	601,283	26,337			
	2023-24	191,764	594,817	21,323	8,499	90,674	4
GEPSCO	2019-20	183,495	434,495	50,467			
	2020-21	216,378	510,388	51,030			
	2021-22	232,001	615,489	11,114			
	2022-23	239,077	597,409	24,945			
	2023-24	317,365	717,312	9,238	4,871	85,590	70
LESCO	2019-20	287,736	985,887	92,115			
	2020-21	345,825	1,063,820	107,866			
	2021-22	357,818	1,149,193	12,827			
	2022-23	309,040	998,417	52,615			
	2023-24	412,629	1,181,699	44,181	11,427	161,100	126
FESCO	2019-20	208,040	727,937	23,495			
	2020-21	254,965	848,446	54,278			
	2021-22	191,387	693,825	96,880			
	2022-23	261,939	1,081,439	68,418			
	2023-24	285,797	961,895	66,956	2,914	47,505	0
MEPSCO	2019-20	359,506	1,067,923	67,065			
	2020-21	352,712	1,018,929	218,012			
	2021-22	384,812	1,658,540	117,684			
	2022-23	276,142	1,003,729	185,721			
	2023-24	441,133	1,161,510	73,633	6,466	110	897
HESCO	2019-20	29,020	148,070	4,707			
	2020-21	28,310	105,713	3,069			
	2021-22	23,504	127,480	2,448			
	2022-23	25,635	135,706	1,606			
	2023-24	19,819	107,909	1,563	150	4,468	0
SEPCO	2019-20	26,684	62,547	2,397			
	2020-21	16,901	61,864	524			
	2021-22	9,061	38,738	394			
	2022-23	8,808	77,610	337			
	2023-24	7,253	42,987	42	61	5,187	9
QESCO	2019-20	18,051	87,351	3,888			
	2020-21	18,171	65,350	470			
	2021-22	14,826	49,100	713			
	2022-23	12,791	44,768	1,307			
	2023-24	23,618	70,734	1,594	38	1,049	0
KE	2019-20	209,747	800,119	-47,635			
	2020-21	200,835	837,708	17,705			
	2021-22	212,595	629,099	43,378			
	2022-23	147,710	458,985	34,548			
	2023-24	127,236	383,983	37,784	3,677	79,996	992
					5.522	109,789	3.855

Source: Distribution Companies / KE

TABLE 80
DISCOs' Power Transformers, Capacities and their Loading Positions

DISCO	As on 30 th June	No. of Power Transformers			Capacity of Power Transformers (MVA)			No. of Over-Loaded Power Transformers (above 80%)					% age
		132 kV	66 kV	33 kV	Total	132 kV	66 kV	33 kV	Total	132 kV	66 kV	33 kV	
PESCO	2020	210	24	5	6,148.50	217.95	23.00	6,389.45	80	6	0	86	35.98
	2021	221	26	5	6,658.50	243.95	23.00	6,925.45	81	11	3	95	37.70
	2022	230	24	5	7,103.90	238.35	23.00	7,365.25	79	12	4	95	36.68
	2023	238	24	5	7,368.40	238.35	23.00	7,629.75	94	10	3	107	40.07
	2024	242	21	5	7,486.40	197.35	23.00	7,706.75	94	9	4	107	39.93
TESCO	2020	31	24	0	592.30	242.80	0.00	835.10	8	1	0	9	16.36
	2021	34	21	0	711.30	263.30	0.00	974.60	13	1	0	14	25.45
	2022	40	17	0	1,066.40	176.70	0.00	1,243.10	8	0	0	8	14.04
	2023	39	16	0	1,118.30	171.20	0.00	1,289.50	6	0	0	6	10.91
	2024	43	14	0	1,138.00	163.70	0.00	1,301.70	1	0	0	1	1.75
IESCO	2020	253	4	6	6,425.00	73.00	24.00	6,522.00	8	0	1	9	3.42
	2021	260	1	6	6,651.00	46.00	24.00	6,721.00	8	0	1	9	3.37
	2022	266	1	6	6,867.00	46.00	25.00	6,938.00	23	0	0	23	8.42
	2023	272	1	6	7,139.50	46.00	25.00	7,210.50	5	0	2	7	2.51
	2024	277	1	6	7,278.00	46.00	25.00	7,349.00	13	0	4	17	5.99
GEPSCO	2020	171	2	0	4,939.30	26.00	0.00	4,965.30	15	0	0	15	8.67
	2021	172	2	0	5,084.80	26.00	0.00	5,110.80	34	0	0	34	19.54
	2022	179	2	0	5,229.30	26.00	0.00	5,255.30	50	1	0	51	28.18
	2023	181	1	0	5,298.80	13.00	0.00	5,311.80	56	1	0	57	31.32
	2024	184	1	0	5,529.30	13.00	0.00	5,542.30	29	1	0	30	16.22
LESICO	2020	403	1	0	12,128.00	37.50	0.00	12,165.50	66	0	0	66	16.34
	2021	427	1	0	12,916.00	37.50	0.00	12,953.50	74	0	0	74	17.29
	2022	441	0	0	13,443.50	0.00	0.00	13,443.50	70	0	0	70	15.87
	2023	452	0	0	13,813.50	0.00	0.00	13,813.50	56	0	0	56	12.39
	2024	460	0	0	14,093.50	0.00	0.00	14,093.50	51	0	0	51	11.09
FESCO	2020	212	24	0	5,673.00	272.00	0.00	5,945.00	18	7	0	25	10.59
	2021	217	23	0	5,778.00	261.00	0.00	6,039.00	39	6	0	45	18.75
	2022	223	26	0	5,961.00	299.60	0.00	6,260.60	38	7	0	45	18.07
	2023	228	26	0	6,295.00	299.60	0.00	6,594.60	21	4	0	25	9.84
	2024	234	23	0	6,478.00	268.60	0.00	6,746.60	19	5	0	24	9.34
MEPCO	2020	294	8	0	8,245.00	118.80	0.00	8,363.80	16	21	0	37	12.25
	2021	301	11	0	8,602.00	118.80	0.00	8,720.80	30	0	0	30	9.62
	2022	308	9	0	8,897.00	93.00	0.00	8,990.00	45	1	0	46	14.51
	2023	311	9	0	8,996.70	92.80	0.00	9,089.50	13	0	0	13	4.06
	2024	318	11	0	9,192.70	118.80	0.00	9,311.50	4	0	0	4	1.22
HESCO	2020	106	16	0	2,628.40	136.90	0.00	2,765.30	25	1	0	26	21.31
	2021	106	16	0	2,654.40	136.90	0.00	2,791.30	14	0	0	14	11.48
	2022	124	4	0	2,831.30	103.50	0.00	2,934.80	24	1	0	25	19.53
	2023	117	16	0	2,956.90	136.90	0.00	3,093.80	21	0	0	21	15.79
	2024	118	17	0	3,039.00	149.90	0.00	3,188.90	22	0	0	22	16.30

DISCO	As on 30 th June	No. of Power Transformers			Capacity of Power Transformers (MVA)			No. of Over-Loaded Power Transformers (above 80%)						
		132 kV	66 kV	33 kV	Total	132 kV	66 kV	33 kV	Total	132 kV	66 kV	33 kV	Total	% age
SEPCO	2020	110	22	0	132	2,687.10	228.40	0.00	2,915.50	9	7	0	16	12.12
	2021	111	22	0	133	2,782.10	228.40	0.00	3,010.50	14	6	0	20	15.04
	2022	112	22	0	134	2,873.10	228.40	0.00	3,101.50	24	8	0	32	23.88
	2023	113	21	0	134	2,859.10	223.40	0.00	3,082.50	18	6	0	24	17.91
	2024	114	21	0	135	2,872.10	223.40	0.00	3,095.50	34	4	0	38	28.15
QESCO	2020	133	4	40	177	3,221.00	33.10	160.00	3,414.10	49	2	0	51	28.81
	2021	135	4	40	179	3,267.00	38.60	160.00	3,465.60	47	2	0	49	27.37
	2022	145	3	40	188	3,504.60	32.30	160.00	3,696.90	51	2	0	53	28.19
	2023	146	3	40	189	3,570.60	32.30	160.00	3,762.90	49	1	0	50	26.46
	2024	154	3	44	201	3,903.30	32.30	176.00	4,111.60	23	0	0	23	11.44
CPA-C System Total in	2020	1,923	129	51	2,103	52,687.60	1,386.45	207.00	54,281.05	294	45	1	340	16.17
	2021	1,984	127	51	2,162	55,105.10	1,400.45	207.00	56,712.55	354	26	4	384	17.76
	2022	2,068	108	51	2,227	57,777.10	1,243.85	208.00	59,228.95	412	32	4	448	20.12
	2023	2,097	117	51	2,265	59,416.80	1,253.55	208.00	60,878.35	339	22	5	366	16.16
	2024	2,144	112	55	2,311	61,010.30	1213.05	224.00	62,447.35	290	19	8	317	13.72
KE	2020	163	4	0	167	6,273.00	79.00	0.00	6,352.00	39	1	0	40	23.95
	2021	168	4	0	172	6,457.00	79.00	0.00	6,536.00	49	1	0	50	29.07
	2022	175	4	0	179	6,724.00	79.00	0.00	6,803.00	46	2	0	48	26.82
	2023	177	4	0	181	6,886.00	79.00	0.00	6,965.00	36	1	0	37	20.44
	2024	180	4	0	184	7,016.00	79.00	0.00	7,095.00	37	2	0	39	21.20

Source: Distribution Companies / KE

TABLE 81
DISCOs' Distribution Transformers, Capacities and their Loading Positions

DISCO	As on 30 th June	No. of Distribution Transformers	Capacity of Distribution Transformers (kVA)	Loading Position of Distribution Transformers (Nos.)				
				80-90%	91-100%	Above 100%	Total	%age
PESCO	2020	77,307	6,091,795	1,474	968	1,035	3,477	4.50
	2021	79,437	6,264,345	892	738	811	2,441	3.07
	2022	81,149	6,424,565	1,108	540	794	2,442	3.01
	2023	83,093	6,591,035	976	602	756	2,334	2.81
	2024	84,084	6,682,535	1,933	1,029	973	3,935	4.68
TESCO	2020	18,903	1,441,000	2,335	4,133	214	6,682	35.35
	2021	18,903	2,093,400	3,491	890	1,850	6,231	32.96
	2022	19,194	1,440,705	893	1,910	699	3,502	18.25
	2023	19,412	1,474,760	1,452	1,257	783	3,492	17.99
	2024	19,486	1,492,040	1,419	615	458	2,492	12.79
IESCO	2020	50,210	4,121,000	1,248	174	241	1,663	3.31
	2021	51,988	4,279,000	529	215	206	950	1.83
	2022	53,616	4,395,000	215	393	895	1,503	2.80
	2023	55,242	4,546,000	420	181	20	621	1.12
	2024	56,779	4,689,000	265	331	387	983	1.73
GEPCO	2020	72,007	4,538,000	1,080	720	142	1,942	2.70
	2021	76,125	4,745,000	1,065	685	133	1,883	2.47
	2022	80,085	4,798,000	1,170	501	301	1,972	2.46
	2023	93,854	6,570,075	1,408	563	252	2,223	2.37
	2024	95,447	6,653,182	1,494	535	248	2,277	2.39
LESCO	2020	116,030	8,885,600	12,991	9,250	3,502	25,743	22.19
	2021	122,124	9,245,095	10,393	7,330	2,724	20,447	16.74
	2022	126,758	9,479,195	9,354	5,764	2,757	17,875	14.10
	2023	132,211	9,902,000	7,951	4,612	2,050	14,613	11.05
	2024	134,005	11,985,000	6,759	3,471	1,657	11,887	8.87
FESCO	2020	113,079	7,291,000	473	133	46	652	0.58
	2021	120,446	7,628,000	1,055	110	33	1,198	0.99
	2022	124,801	7,934,146	1,230	130	23	1,383	1.11
	2023	128,948	8,280,716	1,186	120	18	1,324	1.03
	2024	130,723	8,495,360	1,371	79	16	1,466	1.12
MEPCO	2020	179,577	8,769,045	3,499	1,750	583	5,832	3.25
	2021	187,791	9,102,165	2,270	1,787	0	4,057	2.16
	2022	223,922	12,960,060	5,711	1,021	0	6,732	3.01
	2023	230,606	13,390,490	6,915	1,268	0	8,183	3.55
	2024	236,213	13,612,720	6,894	1,217	0	8,111	3.43
HESCO	2020	37,896	1,881,556	682	408	121	1,211	3.20
	2021	43,873	2,680,585	635	405	74	1,114	2.54
	2022	44,317	2,720,905	637	420	76	1,133	2.56
	2023	44,865	2,776,095	831	598	250	1,679	3.74
	2024	49,785	3,300,855	833	597	275	1,705	3.42
SEPCO	2020	38,616	2,163,805	1,365	735	576	2,676	6.93
	2021	39,076	2,178,305	1,378	718	581	2,677	6.85
	2022	39,444	2,167,720	4,261	1,816	1,076	7,153	18.13
	2023	40,169	2,332,690	4,089	1,743	805	6,637	16.52
	2024	40,410	2,392,000	1,697	1,320	530	3,547	8.78
QESCO	2020	62,337	3,213,540	3,828	1,869	1,117	6,814	10.93
	2021	64,119	3,339,400	3,088	1,301	954	5,343	8.33
	2022	66,119	3,466,225	3,024	1,212	788	5,024	7.60
	2023	68,074	3,584,750	2,459	789	472	3,720	5.46
	2024	69,993	3,693,750	2,156	579	421	3,156	4.51
Total in CPPA-G System	2020	765,962	48,396,341	28,975	20,140	7,577	56,692	7.40
	2021	803,882	51,555,295	24,796	14,179	7,366	46,341	5.76
	2022	859,405	55,786,521	27,603	13,707	7,409	48,719	5.67
	2023	896,474	59,448,611	27,687	11,733	5,406	44,826	5.00
	2024	916,925	62,996,442	24,821	9,773	4,965	39,559	4.31
KE	2020	28,842	7,915,705	987	591	672	2,250	7.80
	2021	29,702	8,153,340	1,018	649	900	2,567	8.64
	2022	29,971	8,685,305	1,983	1,474	2,740	6,197	20.68
	2023	31,261	8,807,605	1,989	1,302	2,317	5,608	17.94
	2024	31,422	8,963,725	1,938	1,331	2,633	5,902	18.78

Source: Distribution Companies / KE

TABLE 82
Feeders Outages Statistics of DISCOs (2023-24)

DISCO	Nature of Tripping	132 kV Feeders		66 kV Feeders		33 kV Feeders		11 kV Feeders		All Feeders	
		No. of Tripping	Duration (Min.)	No. of Tripping	Duration (Min.)	No. of Tripping	Duration (Min.)	No. of Tripping	Duration (Min.)	No. of Tripping	Duration (Min.)
PESCO	Planned	412	120241	21	7825	7	3260	16055	4040092	16495	4171418
	Forced	391	59882	117	22413	0	0	38387	3230458	38895	3312753
	Total	803	180123	138	30238	7	3260	54442	7270550	55390	7484171
TESCO	Planned	6	3324	4	2072	0	0	7601	124700	7611	130096
	Forced	227	48558	170	21746	1	67	14262	2455109	14660	2525480
	Total	233	51882	174	23818	1	67	21863	2579809	22271	2655576
IESCO	Planned	486	300630	0	0	4	1920	82247	7841340	82737	8143890
	Forced	148	7128	0	0	15	724	3443	176100	3606	183952
	Total	634	307758	0	0	19	2644	85690	8017440	86343	8327842
GEPCO	Planned	11	2808	7	2100	0	0	6166	1188322	6184	1193230
	Forced	69	44825	4	132	0	0	44446	3664408	44519	3709365
	Total	80	47633	11	2232	0	0	50612	4852730	50703	4902595
LESCO	Planned	450	142486	0	0	0	0	0	0	450	142486
	Forced	3208	125275	0	0	0	0	0	0	3208	125275
	Total	3658	267761	0	0	0	0	0	0	3658	267761
FESCO	Planned	212	58954	65	18575	0	0	7436	1466921	7713	1544450
	Forced	19	2021	6	138	0	0	50231	661735	50256	663894
	Total	231	60975	71	18713	0	0	57667	2128656	57969	2208344
MEPCO	Planned	1493	372873	41	11805	0	0	34963	5587003	36497	5971681
	Forced	149	17321	13	4435	0	0	99044	2256976	99206	2278732
	Total	1642	390194	54	16240	0	0	134007	7843979	135703	8250413
HESCO	Planned	128	3949	32	11845	0	0	964	304454	1124	320248
	Forced	738	115702	42	9180	0	0	64674	1171109	65454	1295991
	Total	866	119651	74	21025	0	0	65638	1475563	66578	1616239
SEPCO	Planned	879	301179	95	34075	0	0	5135	1351493	6109	1686747
	Forced	203	114276	29	4425	0	0	30648	14816940	30880	14935641
	Total	1082	415455	124	38500	0	0	35783	16168433	36989	16622388
QESCO	Planned	225	59257	12	1560	33	5075	3609	418699	3879	484591
	Forced	571	47581	25	1895	669	80280	33985	407820	35250	537576
	Total	796	106838	37	3455	702	85355	37594	826519	39129	1022167
KE	Planned	11	4356	0	0	0	0	10991	277408	11002	281764
	Forced	11	2262	0	0	0	0	112697	6745675	112708	6747937
	Total	22	6618	0	0	0	0	123688	7023083	123710	7029701

Source: Distribution Companies / KE

TABLE 83
Village Electrification in all Distribution Companies

DISCO	As on 30 th June	Total Number of Villages in DISCO	Total Villages Electrified in DISCO	Remaining Villages in DISCO	Percentage of Total Electrified Villages in DISCO
PESCO	2020	32,940	26,492	6,448	80.43
	2021	33,761	27,301	6,460	80.87
	2022	34,344	28,371	5,973	82.61
	2023	34,433	29,065	5,368	84.41
	2024	34,671	29,331	5,340	84.60
TESCO	2020	483	277	206	57.35
	2021	4,196	2,421	1,775	57.70
	2022	4,196	2,521	31,430	60.08
	2023	400	350	50	87.50
	2024	198	150	48	75.76
IESCO	2020	816	260	556	31.86
	2021	913	633	280	69.33
	2022	691	272	419	39.36
	2023	816	314	502	38.48
	2024	602	460	142	76.41
GEPSCO	2020	7,854	7,608	246	96.87
	2021	7,854	7,744	110	98.60
	2022	8,330	7,919	411	95.07
	2023	8,434	8,097	337	96.00
	2024	8,797	8,360	216	95.03
LESCO	2020	246	212	34	86.18
	2021	246	215	31	87.40
	2022	495	32	463	6.46
	2023	463	71	392	15.33
	2024	498	282	216	56.63
FESCO	2020	27,916	26,661	1,255	95.50
	2021	29,282	27,589	1,693	94.22
	2022	31,929	28,544	3,385	89.40
	2023	34,716	29,319	5,397	84.45
	2024	36,836	30,467	6,369	82.71
MEPCO	2020	41,579	31,858	9,721	76.62
	2021	44,603	34,703	9,900	77.80
	2022	48,761	35,806	12,955	73.43
	2023	52,643	47,188	5,455	89.64
	2024	57,773	49,111	8,662	85.01
HESCO	2020	23,803	19,181	4,622	80.58
	2021	23,803	19,315	4,488	81.15
	2022	23,803	19,435	4,368	81.65
	2023	23,803	19,695	4,108	82.74
	2024	23,803	19,799	4,004	83.18
SEPCO	2020	23,263	18,423	4,840	79.19
	2021	23,263	18,475	4,788	79.42
	2022	23,263	18,475	4,788	79.42
	2023	23,263	18,593	4,670	79.93
	2024	23,263	18,640	4,623	80.13
QESCO	2020	25,023	19,059	5,964	76.17
	2021	29,692	19,262	10,430	64.87
	2022	2,560	1,134	1,426	44.30
	2023	2,460	1,380	1,080	56.10
	2024	2,460	1,457	1,003	59.23
Total in CPPA-G System	2020	183,923	150,031	33,892	81.57
	2021	197,613	157,658	39,955	79.78
	2022	178,372	142,509	35,863	79.89
	2023	181,431	154,072	27,359	84.92
	2024	188,901	158,057	30,844	83.67
KE	2020	954	913	41	95.70
	2021	954	938	16	98.32
	2022	976	958	18	98.16
	2023	976	969	7	99.28
	2024	1,005	984	21	97.91

Source: Distribution Companies / KE

TABLE 84
WAPDA Hydroelectric Tariff (2023-24)

Power Stations	Province	Capacity (MW)	NEO (GWh)	Variable Rate (Rs./kWh)	Fixed Charges (Rs./kW/M)			Hydel Levies			
					Fixed Rate	Revenue Gap	Interest on Loans for NHP	NHP Regular (Rs./kWh)	WUC (Rs./kWh)	NHP Ar-rears (Rs./kW/M)	IRSA (Rs./kWh)
Tarbela	KPK	3,474	12,446.000	0.040	589.910	27.923	--	1.548	--	282.761	0.005
Warsak	KPK	242	899.000	0.108	1,002.320	70.959	--	1.548	--	282.761	0.005
Duber Khwar	KPK	130	495.000	0.323	2,319.073	872.715	--	1.548	--	282.761	0.005
Allai Khwar	KPK	121	481.000	0.218	1,742.092	261.391	--	1.548	--	282.761	0.005
Khan Khwar	KPK	72	263.000	0.291	2,062.473	969.723	--	1.548	--	282.761	0.005
Jabban	KPK	22	125.000	0.276	2,869.849	-406.853	--	1.548	--	282.761	0.005
Dargai	KPK	20	71.000	0.185	1,426.061	602.416	--	1.548	--	282.761	0.005
Kuram Garhi	KPK	4	14.000	0.539	3,426.977	1,394.116	--	1.548	--	282.761	0.005
Chitral	KPK	1	3.000	1.303	7,241.005	9,160.685	--	1.548	--	282.761	0.005
Tarbela 4th Ext.	KPK	1,407	4,427.000	0.123	978.021	525.635	--	1.548	--	282.761	0.005
Golen Gol	KPK	108	132.000	1.597	3,464.622	4,514.854	--	1.548	--	282.761	0.005
Gomal Zam	KPK	17	41.000	1.236	5,085.284	-425.345	--	1.548	--	282.761	0.005
Ghazi Barotha	Punjab	1,447	6,813.000	0.073	911.291	-24.603	--	1.474	--	1133.720	0.005
Chashma	Punjab	183	876.000	0.204	1,908.714	196.967	--	1.474	--	1133.720	0.005
Jinnah HPP	Punjab	95	207.000	0.417	1,798.014	444.141	--	1.474	--	1133.720	0.005
Rasul	Punjab	22	54.000	0.229	1,271.670	416.807	--	1.474	--	1133.720	0.005
Nandipur	Punjab	14	36.000	0.307	1,660.933	983.774	--	1.474	--	1133.720	0.005
Shadiwal	Punjab	13	32.000	0.303	1,527.775	677.708	--	1.474	--	1133.720	0.005
Chichoki	Punjab	13	31.000	0.285	1,450.690	622.819	--	1.474	--	1133.720	0.005
Renala Khurd	Punjab	1	2.000	1.664	5,632.486	4,882.747	--	1.474	--	1133.720	0.005
Mangla	AJK	997	3,838.000	0.107	1,017.230	251.911	--	--	1.100	--	0.005

Source: NEPRA

TABLE 85 (A)
Indexed/Adjusted Tariff of GENCOs on Quarterly Basis (Rs./kWh) As on 1st of

Power Plant	Year	Fuel	July			October			January			April		
			FCC	VOM	CPP	FCC	VOM	CPP	FCC	VOM	CPP	FCC	VOM	CPP
GENCO-I														
Block-1 (Unit-1)	2019-20	RFO	19.753			22.550			13.874			13.874		
	2020-21		13.874			13.874			17.040			19.912		
	2021-22		21.511			26.862			30.734			30.733		
	2022-23		45.356											
Block-2 (Unit-2)	2019-20	RFO	22.550											
	2020-21							19.136						
	2021-22		24.158		30.167		34.515		34.514					
	2022-23		50.937											
	2019-20	Gas	10.918											
Block-2 (Unit-3)	2019-20	RFO	25.325									19.136		
	2020-21						18.621							
	2021-22		23.507		29.354		33.585							
	2022-23		49.564											
	2019-20	Gas	10.633											
Block-2 (Unit-4)	2019-20	RFO	24.642											
	2020-21						18.229							
	2021-22		23.012		28.736		32.878		32.877					
	2022-23		48.521											
	2019-20	Gas	10.412											
Kotri (Unit 3-7)	2019-20	RFO	24.123											
	2019-20	Gas	9.4590*											
			14.1885**											

Power Plant	Year	Fuel	July			October			January			April		
			FCC	VOM	CPP	FCC	VOM	CPP	FCC	VOM	CPP	FCC	VOM	CPP
GENCO-II														
Guddu 747 (Block-I)	2019-20	Gas	7.884	1.514			1.458			1.458			1.540	
	2020-21			1.554			1.540			0.853			0.845	
	2022-23		7.680			7.680				8.960				
	2023-24		8.960		0.351	8.960		0.351	8.960		0.351	8.960		0.351
Guddu 747 (Block-II)	2019-20	Gas	8.760											
	2021-22			0.542	0.857		0.595	1.202		0.630	1.245		0.662	1.280
	2021-22			0.542	0.857		0.595	1.202		0.630	1.245		0.662	1.280
	2022-23		8.533			8.533				9.955				
2023-24	9.955		0.351	9.955		0.351	9.955		0.351	9.955		0.351		
Guddu 747 (Block-III)	2018-19	Gas	6.330			8.313								
	2019-20		10.512											
Guddu 747 (Block-IV)	2018-19	Gas	6.782			8.906								
	2019-20		11.263											
GENCO-III														
Nandipur	2019-20	RLNG	11.204	0.606	0.311		0.579	0.305		0.575	0.307	11.163	0.621	0.324
	2020-21		7.544	0.623	0.326	8.843	0.622	0.326		0.602	0.319	10.874	0.581	0.312
	2021-22		14.980	0.613	0.323	19.565	0.673	0.343	16.215	0.712	0.356	20.833	0.748	0.369
	2022-23		26.000	0.526	0.501	23.263	0.594	0.543	23.308	0.590	0.540	26.898	0.744	0.634
	2023-24		25.076	0.765	0.779	26.882	0.778	0.803	27.474	0.761	0.812	25.714	0.759	0.820
Muzaffargarh (Unit-1)	2019-20	RFO/ RLNG	10.442											
	2021-22		22.456			28.238			31.518			31.518		
	2022-23		46.540											
Muzaffargarh (Unit-2)	2019-20	RFO/ RLNG		0.163	0.503	41.603	0.163	0.503	31.032	0.163	0.503		0.163	0.503
	2019-20		10.579											
	2021-22		22.760			28.621			31.945			31.945		
	2022-23		47.170											
Muzaffargarh (Unit-3)	2019-20	RFO/ RLNG		0.163	0.503	42.167	0.163	0.503	31.453	0.163	0.503		0.163	0.503
	2019-20		10.224											
	2021-22		21.973			27.631			30.841			30.841		
	2022-23		45.539											
Muzaffargarh (Unit-4)	2019-20	RFO/ RLNG		0.163	0.503	40.709	0.163	0.503	30.365	0.163	0.503		0.163	0.503
	2019-20		10.209											
	2021-22		21.940			27.590			30.795			30.795		
	2022-23		45.472											
Muzaffargarh (Unit-5)	2019-20	RFO/ RLNG		0.163	0.503	40.648	0.163	0.503	30.320	0.163	0.503		0.163	0.503
	2019-20		10.850											
	2021-22		23.362			29.378			32.790			32.790		
	2022-23		48.418											
Muzaffargarh (Unit-6)	2019-20	RFO/ RLNG		0.163	0.503	43.282	0.163	0.503	32.285	0.163	0.503		0.163	0.503
	2019-20		11.137											
	2021-22		24.001			30.181			33.687			33.687		
	2022-23		49.742											
GTPS Faisalabad (Units 5-9)	2019-20	RFO/ RLNG		0.163	0.503	44.466	0.163	0.503	33.168	0.163	0.503		0.163	0.503
	2019-20		8.376											
	2021-22		18.684			24.412			20.225			20.225		
	2023-24			0.163	0.503		0.163	0.503		0.163	0.503		0.163	0.503

* CCP ** without CCP

Source: NEPRA

TABLE 85 (B)

Indexed/Adjusted Tariff of Hydel Power Plants on Quarterly Basis (Rs./kWh) As on 1st of

Power Plant	Year	July			October			January			April		
		WUC	VOM	CPP	WUC	VOM	CPP	WUC	VOM	CPP	WUC	VOM	CPP
Jagran	2020-21		1.200	1.390		1.327	1.390		1.327	1.390		1.327	1.390
	2021-22		1.327	1.390		1.444	1.390		1.444	1.390		1.444	1.390
	2022-23		1.663	1.390		1.663	1.390		1.663	1.390		1.663	1.390
	2023-24		2.152	1.390		2.152	1.390		2.152	1.390		2.152	1.390
Malakand-III	2019-20	0.321	0.337	4.879	0.361	0.322	4.665	0.321	0.319	4.633	0.321	0.344	4.964
	2020-21	0.321	0.347	5.010	0.321	0.346	4.961	0.377	0.335	4.802	0.377	0.323	4.604
	2021-22	0.377	0.341	4.756	0.377	0.374	5.132	0.377	0.395	5.347	0.377	0.416	5.517
	2022-23	0.377	0.481	6.207	0.377	0.544	6.920	0.377	0.540	6.837	0.377	0.632	8.522
	2023-24	0.535	0.698	8.783	0.703	0.710	8.875	0.700	0.693	8.699	0.700	0.691	8.603
Laraib Energy	2019-20	0.378	0.063	13.020	0.393	0.065	13.538	0.403	0.067	13.016	0.410	0.068	13.037
	2020-21	0.412	0.069	13.627	0.412	0.069	13.779	0.412	0.069	12.858	0.412	0.069	12.774
	2021-22	0.412	0.579	12.173	0.412	0.069	13.315	0.412	0.069	14.182	0.412	0.069	12.851
	2022-23	0.412	0.069	14.762	0.412	0.069	16.028	0.412	0.069	16.324	0.412	0.069	17.935
	2023-24	0.898	0.069	20.465	0.753	0.125	21.929	0.791	0.131	20.847	0.822	0.137	20.773
Patrind Hydro	2019-20	0.150	0.025	2.144	0.150	0.025	2.128	0.150	0.025	2.364			
	2021-22	0.187	0.043	13.823	1.187	1.188	13.923	0.188	0.043	14.965	1.188	0.043	15.108
	2022-23	0.188	0.043	10.918	0.188	0.043	18.450	0.188	0.043	21.873	0.188	0.043	23.390
	2023-24	0.243	0.073	17.569	0.241	0.110	17.569	0.315	0.078	17.733	0.315	0.085	17.805
Neelum Jhelum	2021-22		0.722	8.396		0.722	8.396		0.722	8.396		0.722	8.396
Gulpur Hydro	2022-23	0.150	0.044	17.311	0.150	0.044	20.134	0.150	0.044	22.218	0.331	0.097	13.628
	2023-24	0.331	0.104	16.187	0.241	0.110	16.320		0.115	16.500		0.120	16.456
Karot Hydro	2021-22										0.150	0.264	13.914
	2022-23	0.150	0.281	17.757	0.150	0.297	18.487	0.150	0.296	21.142	0.202	0.333	22.868
	2023-24	0.202	0.337	27.498	0.351	0.468	27.794	0.195	0.480	22.580	0.195	0.488	22.589
Marala Hydro	2023-24		0.826	17.953		0.867	18.124		0.918	18.012		0.943	17.950
Chianwali Hydro	2023-24		1.001	16.290		1.050	16.424		1.111	16.533		1.141	16.602
Pakpattan Hydro	2023-24		0.698	15.120		0.733	15.265		0.775	15.171		0.796	15.120

Source: NEPRA

TABLE 85 (C)

Indexed/Adjusted Tariff of Gas-based Power Plants on Quarterly Basis (Rs./kWh) As on 1st of

Power Plant	Year	July			October			January			April		
		FCC	VOM	CPP	FCC	VOM	CPP	FCC	VOM	CPP	FCC	VOM	CPP
Uch-II	2019-20	7.080	0.343	3.574	7.572	0.332	3.393	7.495	0.332	3.405	7.494	0.354	3.612
	2020-21	7.843	0.355	3.585	7.215	0.355	3.585	6.942	0.346	3.563	6.847	0.336	3.364
	2021-22	6.680	0.351	3.477	7.104	0.380	3.750	7.535	0.398	3.954	7.667	0.415	4.082
	2022-23	8.413	0.472	4.575	9.668	0.526	5.147	9.610	0.522	5.299	11.209	0.645	6.619
	2023-24	13.303	0.701	7.116	13.542	0.716	7.140	13.240	0.708	7.100	13.068	0.709	7.004
Foundation Power	2019-20	7.148	0.591	2.935	7.148	0.572	2.888	7.148	0.572	2.887	7.148	0.611	2.968
	2020-21	7.148	0.613	2.924	6.630	0.613	2.911	6.630	0.596	2.899	6.630	0.579	1.399
	2021-22	6.630	0.605	1.439	6.630	0.655	1.538	6.630	0.687	1.603	6.630	0.716	1.652
	2022-23	6.630	0.814	1.843	6.630	0.908	2.032	8.123	0.901	2.014	8.123	1.113	2.469
	2023-24	8.123	1.209	2.911	8.123	1.235	2.474	8.123	1.221	2.455	8.123	1.223	2.450
Engro PowerGen. Qadirpur	2019-20	7.681	0.522	2.694		0.505	2.590		0.505	2.572		0.539	1.313
	2020-21		0.541	1.311		0.542	1.300		0.527	1.267		0.512	1.228
	2021-22	7.124	0.535	1.255	7.124	0.578	1.329	7.124	0.607	1.379	7.124	0.633	1.415
	2022-23	7.124	1.336	0.720	7.124	1.343	0.803	8.728	1.347	0.797	8.728	1.375	0.985
	2023-24	8.728	1.068	1.868	8.728	1.091	1.895	8.728	1.079	1.906	8.728	1.080	1.924
SNPC-I	2023-24	8.604	1.875	4.732	8.604	1.927	4.721	8.604	1.937	4.641	8.604	1.953	4.631
SNPC-II	2023-24	8.551	1.875	4.698	8.551	1.927	4.687	8.551	1.937	4.607	8.551	1.953	4.598

Source: NEPRA

TABLE 85 (D)

Indexed/Adjusted Tariff of RFO-based Power Plants on Quarterly Basis (Rs./kWh) As on 1st of

Power Plant	Year	July			October			January			April		
		FCC	VOM	CPP	FCC	VOM	CPP	FCC	VOM	CPP	FCC	VOM	CPP
Attock Gen.	2019-20	13.668	1.451	1.344	15.590	1.408	1.301	9.877	1.410	1.300	6.467	1.501	1.379
	2020-21	9.219	1.507	1.392	9.801	1.508	1.381	11.697	1.469	1.344	14.246	1.428	1.299
	2021-22	15.629	1.490	1.336	20.589	1.606	1.425	18.859	1.681	1.477	28.131	1.752	1.519
	2022-23	31.447	1.982	1.490	24.136	2.202	1.602	20.018	2.187	1.591	23.501	2.687	1.854
	2023-24	28.060	2.959	2.215	34.669	3.025	2.249	27.735	2.999	2.244	28.958	3.007	2.124
Atlas Power	2019-20	14.048	1.431	3.018		1.388	2.984	11.518	1.390	1.499		1.481	1.550
	2020-21	12.014	1.487	1.510	12.619	1.487	1.497	12.398	1.448	1.457	11.484	1.408	1.413
	2021-22	15.923	1.470	1.450	18.893	1.585	1.548	22.273	1.660	1.639	23.832	1.730	1.702
	2022-23	33.800	1.959	1.698	31.650	2.179	1.748	29.818	2.163	1.763	18.623	2.662	1.925
	2023-24	26.735	2.921	2.287		2.986	2.309	33.501	2.959	2.415	28.105	2.966	2.432
Nishat Power	2019-20	14.863	1.431	3.012	14.25	1.388	2.992	15.523	1.390	2.978		1.481	3.006
	2020-21	11.238	1.487	1.369	11.954	1.487	1.359	11.487	1.448	1.324	12.005	1.408	1.287
	2021-22	16.304	1.470	1.320	19.524	1.585	1.407	23.432	1.660	1.492	21.637	1.730	1.551
	2022-23	34.294	1.959	1.563	31.487	2.179	1.615	31.296	2.163	1.630	30.024	2.661	1.797
	2023-24	28.173	2.921	2.264	36.531	2.986	2.286	33.904	2.959	2.297	33.904	2.966	2.313
Nishat Chunian	2019-20	14.743	1.428	3.178	13.742	1.385	3.156	13.881	1.386	3.142	11.698	1.477	3.171
	2020-21	10.748	1.483	2.696	11.876	1.484	1.399		1.445	1.354	11.733	1.405	1.315
	2021-22	15.049	1.466	1.349	18.623	1.581	1.439	22.983	1.656	1.524	25.220	1.726	1.583
	2022-23	33.204	1.954	1.589	35.301	2.173	1.640	31.799	2.158	1.655	30.467	2.655	1.819
	2023-24	28.815	2.914	2.392		2.979	2.415	38.265	2.952	2.411	38.265	2.959	2.321
Narowal Energy	2019-20	14.577	1.274	3.519	13.700	1.255	3.480	12.510	1.265	3.455		1.331	3.486
	2020-21	12.851	1.337	3.386	12.479	1.336	3.385	12.202	1.312	3.347	11.728	1.284	3.305
	2021-22	15.898	1.327	1.844	19.799	1.407	1.981	22.760	1.459	2.111	24.570	1.508	2.200
	2022-23	35.837	1.667	2.203	32.425	1.819	2.777	29.505	1.809	2.300	21.493	2.155	2.542
	2023-24	28.540	2.560	2.959		2.631	2.973	37.382	2.644	2.945	37.382	2.665	2.958
Liberty Power	2019-20	13.244	1.568	3.413	13.246	1.528	3.391	11.543	1.532	3.375		1.627	3.403
	2020-21	11.638	1.634	3.337	12.606	1.635	3.348	11.362	1.594	3.329	12.042	1.553	1.498
	2021-22	15.879	1.616	1.540	20.049	1.736	1.649	22.520	1.813	1.748	28.284	1.886	1.817
	2022-23	33.027	2.122	1.819	31.209	2.349	1.879	26.653	2.334	1.894	20.818	2.849	2.083
	2023-24	29.936	3.188	2.458		3.264	2.582	33.386	3.246	2.602		3.258	2.551

Source: NEPRA

TABLE 85 (E)

Indexed/Adjusted Tariff of HSD-based Power Plants on Quarterly Basis (Rs./kWh) As on 1st of

Power Plant	Year	July			October			January			April		
		FCC	VOM	CPP	FCC	VOM	CPP	FCC	VOM	CPP	FCC	VOM	CPP
Saif Power	2019-20		0.881	2.816		0.841	2.773		0.836	2.760		0.903	2.824
	2020-21	20.888	0.905	1.432	18.675	0.905	1.418	19.770	0.876	1.377	20.293	0.845	1.329
	2021-22	20.438	0.892	1.368	23.175	0.979	1.468	23.175	1.035	1.541	30.137	1.088	1.595
	2022-23		1.260	1.565		1.425	1.633		1.413	1.635		1.788	1.813
	2023-24	30.137	1.827	2.152	30.137	1.857	2.169	30.137	1.814	2.159	30.137	1.808	2.155
Sapphire Electric	2019-20		0.872	2.757		0.832	2.720		0.827	2.706		0.893	2.760
	2020-21	18.904	0.895	2.740		0.895	2.775	19.5726 20.0947	0.866	1.387	19.665	0.836	1.338
	2021-22	20.237	0.882	1.377	22.971	0.968	1.474	27.879	1.023	1.553	29.920	1.075	1.607
	2022-23		1.246	1.574		1.409	1.644		1.398	1.647		1.768	1.831
	2023-24	54.694	1.807	2.123	54.694	1.837	2.149	54.694	1.794	2.138	54.694	1.788	2.143
Orient Power	2019-20		0.589	2.572		0.562	2.534	22.679	0.558	2.527		0.603	2.417
	2020-21	18.115	0.604	1.560	18.575	0.604	1.546	19.6700 20.1920	0.585	1.504	19.7621 19.7621	0.564	1.455
	2021-22	20.334	0.595	1.496	23.066	0.653	1.599	26.290	0.691	1.674	26.290	0.726	1.731
	2022-23		0.841	1.704		0.951	1.839		0.944	1.833		1.194	2.171
	2023-24	30.021	1.220	2.404	30.021	1.240	2.609	30.021	1.211	2.597	30.021	1.207	2.427
Halmore Power	2019-20		0.886	3.303		0.845	3.270		0.840	3.253		0.961	3.293
	2020-21	18.041	0.910	3.228	18.518	0.909	3.233	20.124	0.880	3.205	19.695	0.849	3.173
	2021-22	20.717	0.896	1.596	23.001	0.983	1.714	27.764	1.040	1.800	27.764	1.093	1.864
	2022-23		1.266	1.818		1.432	2.008		1.420	1.997		1.797	2.472
	2023-24	29.951	1.836	2.968	29.951	1.866	2.997	29.951	1.823	2.912	29.951	1.817	2.899
Engro PowerGen. Qadirpur	2019-20		0.533	2.751		0.516	2.644		0.516	2.626		0.551	1.340
	2020-21		0.553	1.339		0.553	1.327		0.538	1.294		0.522	1.253
	2021-22		0.546	1.281		0.590	1.356	30.130	0.619	1.408	31.439	0.646	1.445
	2022-23	45.717	1.364	0.735	52.687	1.371	0.819		1.375	0.813		1.404	1.005
	2023-24	52.687	1.091	1.907	69.400	1.114	1.934	69.400	1.101	1.945	69.400	1.103	1.964
QATPL (Bhikki)	2023-24	46.057	0.379	3.762	46.057	0.385	3.523	50.132	0.376	3.424	50.132	0.375	3.499
NPPMCL (HBS)	2021-22	17.314	0.251	1.802	17.314	0.276	1.929	23.900	0.292	2.133	27.501	0.306	2.230
	2022-23	50.289	0.355	2.687		0.402	2.850		0.398	2.816		0.504	3.353
	2023-24	27.501	0.515	3.689	27.501	0.523	3.627	27.501	0.511	3.412	27.501	0.510	3.496
NPPMCL (Balloki)	2021-22	17.727	0.274	1.700	17.727	0.301	1.821	24.481	0.318	2.007	26.316	0.334	2.081
	2022-23		0.387	2.552		0.438	2.682		0.435	2.576		0.550	3.192
	2023-24	43.759	0.562	3.471	43.759	0.571	3.436	43.759	0.558	3.231	51.591	0.556	3.271
Punjab Thermal	2023-24	46.694			46.694			59.550			59.550		

Source: NEPRA

TABLE 85 (F)

Indexed/Adjusted Tariff of RLNG-based Power Plants on Quarterly Basis (Rs./kWh) As on 1st of

Power Plant	Year	July			October			January			April		
		FCC	VOM	CPP	FCC	VOM	CPP	FCC	VOM	CPP	FCC	VOM	CPP
Saif Power	2019-20	11.841	0.611	2.765	11.149	0.583	2.720		0.579	2.708	10.661	0.625	2.780
	2020-21	7.212	0.627	1.4	8.481	0.627	1.387		0.607	1.346	10.423	0.586	1.296
	2021-22	14.269	0.618	1.336	18.781	0.678	1.435	18.876	0.717	1.499	19.960	0.754	1.548
	2022-23	24.892	0.873	1.508	22.272	0.987	1.573	22.315	0.979	1.571	25.752	1.239	1.732
Sapphire Electric	2023-24	24.007	1.266	2.068	26.726	1.287	2.086	26.310	1.257	2.080	24.619	1.253	2.074
	2019-20	11.84	0.604	2.704	11.148	0.576	2.664	10.798	0.573	2.651		0.618	2.714
	2020-21	7.211	0.620	2.707	8.480	0.62	2.743	9.749	0.600	1.354	10.422	0.579	1.305
	2021-22	14.268	0.611	1.344	18.779	0.670	1.444	15.540	0.709	1.509	19.958	0.745	1.558
Orient Power	2022-23	24.890	0.863	1.514	22.270	0.976	1.582	22.313	0.968	1.580	25.749	1.225	1.746
	2023-24	24.005	1.252	2.036	25.734	1.272	2.063	26.308	1.243	2.056	26.616	1.239	2.059
	2019-20	11.84	0.359	2.520	11.175	0.343	2.478	10.798	0.341	2.472	8.018	0.368	2.370
	2020-21	7.211	0.369	1.527	8.480	0.369	1.514	9.749	0.357	1.472	10.422	0.344	1.421
Halmore Power	2021-22	14.268	0.363	1.463	18.779	0.399	1.564	15.670	0.421	1.631	19.958	0.443	1.682
	2022-23	24.890	0.513	1.644	22.270	0.580	1.776	22.313	0.576	1.766	25.749	0.728	2.087
	2023-24	24.005	0.744	2.317	26.723	0.756	2.522	26.308	0.739	2.514	26.616	0.736	2.343
	2019-20	11.841	0.614	3.241	11.149	0.585	3.204	10.799	0.582	3.188	10.66	0.628	3.238
QATPL (Bhikki)	2020-21	7.212	0.630	3.190	8.481	0.630	3.194	9.750	0.609	3.167	10.422	0.588	3.133
	2021-22	14.269	0.621	1.557	18.780	0.681	1.673	19.233	0.720	1.748	19.960	0.757	1.806
	2022-23	24.891	0.877	1.747	22.271	0.992	1.934	22.314	0.984	1.918	25.751	1.245	2.373
	2023-24	24.007	1.272	2.865	25.220	1.293	2.895	25.220	1.263	2.814	25.220	1.259	2.799
NPPMCL (HBS)	2019-20	2.643			2.679			2.646			2.547		
	2020-21	2.233			2.204			2.197			1.999		
	2021-22	11.919	0.542	2.025	15.567	0.595	2.213	13.024	0.630	2.502	16.576	0.662	2.606
	2022-23	20.921	0.766	3.205	18.719	0.867	3.375	18.755	0.860	3.364	21.644	0.340	3.091
NPPMCL (Balloki)	2023-24	20.178	0.348	3.453	21.631	0.354	3.234	22.108	0.345	3.143	20.691	0.344	3.212
	2019-20	2.070			2.065			2.042			1.929		
	2020-21	1.748			1.7316 1.5644			1.543			1.539		
	2021-22	11.805	0.194	1.579	15.418	0.213	1.691	12.886	0.225	1.869	16.418	0.236	1.954
Punjab Thermal	2022-23	20.489	0.274	2.355	18.332	0.310	2.497	18.368	0.307	2.468	21.197	0.389	2.938
	2023-24	19.761	0.397	3.233	21.184	0.403	3.178	21.651	0.394	3.069	20.264	0.393	3.064
	2019-20	2.015			2.026			1.951			1.876		
	2020-21	1.697			1.6819 1.5201			1.503			1.492		
Thar Energy	2021-22	11.898	0.216	1.543	15.539	0.237	1.653	12.988	0.251	1.821	16.547	0.264	1.888
	2022-23	20.650	0.305	2.316	18.476	0.345	2.433	18.512	0.343	2.338	21.363	0.433	2.896
	2023-24	19.916	0.443	3.150	21.350	0.450	3.117	21.821	0.440	2.932	20.423	0.438	2.968
	2023-24	20.093	0.991	3.832	21.540	1.008	3.826	23.857	0.984	3.682	20.604	0.981	3.621

Source: NEPRA

TABLE 85 (G)

Indexed/Adjusted Tariff of Coal Fired Power Plants on Quarterly Basis (Rs./kWh) As on 1st of

Power Plant	Year	July			October			January			April		
		FCC	VOM	CPP	FCC	VOM	CPP	FCC	VOM	CPP	FCC	VOM	CPP
China Hub Power	2021-22	6.356	0.509	5.711	6.638	0.522	6.141	12.034	0.530	6.730	11.290	0.538	7.212
	2022-23	28.629	0.564	8.597	25.888	0.588	10.513	29.370	0.586	10.174		0.642	13.795
	2023-24	23.591	0.694	13.060		0.703	13.044		0.688	12.627		0.690	12.475
HSR (Sahiwal Coal)	2021-22	11.083	0.189	4.789	12.849	0.201	5.238	16.344	0.209	5.779	23.956	0.217	6.139
	2022-23	27.997	0.241	7.906	28.446	0.264	8.529	29.685	0.263	8.645	32.175	0.316	11.226
	2023-24	27.761	0.367	12.041		0.377	11.378	20.579	0.378	10.451	16.775	0.380	10.345
Engro Power-Gen Thar	2021-22	5.677 2.485	1.078	5.816	6.135 2.408	1.090	6.253	6.345 2.518	1.098	6.641	6.816 2.528	1.105	6.976
	2022-23	10.266	1.128	7.869	8.227	1.151	9.236	8.200	1.150	9.402	9.547	1.203	11.874
	2023-24	9.625	1.208	11.867	10.193	1.318	12.112	10.039	1.318	11.875	10.083	1.321	11.686
Port Qasim	2021-22	7.303	0.192	4.780	10.731	0.204	5.188	16.691	0.212	5.768	15.306	0.220	6.177
	2022-23	12.873	0.244	7.657	18.151	0.268	8.452	17.876	0.266	8.775	16.251	0.320	10.975
	2023-24	14.890	0.372	11.058	16.373	0.382	10.726		0.382	10.437		0.385	10.303
Lucky Electric	2021-22	15.374	0.367	10.378	12.779	0.377	10.710	13.761	0.378	10.320	13.761	0.380	10.392
	2023-24	9.625	0.734	12.449	10.207	0.790	12.717	10.015	0.791	12.475	10.084	0.793	12.279
	2023-24	9.625	0.781	12.345	10.191	0.790	12.666	10.022	0.791	12.423	10.083	0.793	12.228
Thar Coal Block-I	2023-24	9.731	0.657	12.439	9.791	0.667	12.556	10.328	0.667	12.288	10.182	0.670	12.126

Source: NEPRA

TABLE 85 (H)

Indexed/Adjusted Tariff of Wind Power Plants on Quarterly Basis (Rs./kWh) As on 1st of

Power Plant	Year	July	October	January	April
Zorlu Enerji Pakistan	2019-20	23.603	23.199	22.288	22.971
	2020-21	23.287	23.166	22.329	21.916
	2021-22	22.082	22.837	24.640	24.968
	2022-23	28.565	29.996	31.098	34.497
	2023-24	19.281	19.528	19.269	19.123
FFC Energy	2019-20	21.515	21.244	21.067	21.576
	2020-21	19.980	19.896	19.825	19.524
	2021-22	19.855	18.9647*	19.713	19.914
	2022-23	20.875	21.729	9.617	11.639
	2023-24	13.707	13.935	13.873	13.839
Three Gorges First Wind	2019-20	27.063	26.6905 26.5770	25.103	25.682
	2020-21	26.710	26.620	25.500	25.145
	2021-22	25.122	25.776	28.242	28.541
	2022-23	33.425	34.663	36.968	39.893
	2023-24	47.490	47.724	17.873	17.766
Foundation Wind Energy-I	2019-20	25.147	24.760	23.894	24.6497 24.9775
	2020-21	24.457	24.346	23.532	23.084
	2021-22	23.363	24.267	26.295	26.728
	2022-23	30.941	32.656	34.115	38.143
	2023-24	43.206	43.454	42.006	41.828
Foundation Wind Energy-II	2019-20	25.037	24.5439 24.8512	24.084	24.887
	2020-21	24.543	24.427	23.610	23.147
	2021-22	23.440	24.370	26.342	26.786
	2022-23	30.848	32.612	33.897	38.043
	2023-24	42.889	43.140	41.726	41.540
Sapphire Wind	2019-20	27.540	26.061	24.905	27.172
	2020-21	26.657	26.295	25.445	24.349
	2021-22	25.118	27.112	28.293	29.565
	2022-23	33.955	38.604	38.491	48.066
	2023-24	48.549	48.701	47.267	46.386
Younus Energy	2019-20	27.240	27.167	26.845	26.299
	2020-21	24.243	24.148	23.815	23.525
	2021-22	23.886	25.011	26.801	27.818
	2022-23	30.808	32.711	32.828	38.559
	2023-24	38.865	38.692	37.568	37.192
Metro Power	2019-20	22.752	22.328	22.302	22.976
	2020-21	21.508	21.408	20.801	20.409
	2021-22	20.688	21.466	23.337	23.704
	2022-23	23.704	28.855	30.073	33.539
	2023-24	37.726	38.587	37.300	37.144
Gul Ahmad Wind	2019-20	27.552	26.770	26.412	26.844
	2020-21	25.462	25.230	24.639	23.946
	2021-22	24.506	26.067	27.584	28.792
	2022-23	32.620	36.046	36.147	44.463
	2023-24	44.463	44.476	43.173	42.550
Master Wind Energy	2019-20	27.552	26.770	26.412	26.844
	2020-21	25.462	25.230	24.639	23.946
	2021-22	24.506	26.067	27.584	28.792
	2022-23	32.620	36.046	36.147	44.003
	2023-24	44.463	44.476	43.173	42.550
Tenaga Generasi	2019-20	27.648	26.503	26.129	27.069
	2020-21	26.060	25.759	25.038	24.142
	2021-22	24.803	26.580	27.933	29.222
	2022-23	33.434	37.613	37.691	46.551
	2023-24	47.073	47.179	45.797	45.040
Act Wind	2019-20	27.360	27.304	26.978	26.393
	2020-21	24.268	24.172	23.839	23.554
	2021-22	23.911	21.2522*	22.963	23.902
	2022-23	26.532	28.010	28.207	33.018
	2023-24	34.533	34.354	33.329	33.031
HydroChina Dawood	2019-20	27.843	26.320	25.921	27.354
	2020-21	26.657	26.284	25.435	24.333
	2021-22	25.093	27.082	28.276	29.692
	2022-23	34.389	39.457	39.593	49.595
	2023-24	50.228	50.449	48.976	49.595
Sachal Energy	2019-20	27.977	27.614	25.570	26.178
	2020-21	26.368	26.278	24.560	24.208
	2021-22	24.216	24.908	26.689	27.045
	2022-23	32.852	34.168	36.489	39.587
	2023-24	47.868	48.096	45.414	45.339

Power Plant	Year	July	October	January	April
UEP Wind	2019-20	27.843	26.320	25.921	27.354
	2020-21	26.657	26.284	25.435	24.333
	2021-22	25.093	27.082	28.276	29.692
	2022-23	34.389	39.457	39.593	49.595
	2023-24	50.228	50.449	48.976	48.081
AEP Wind	2019-20	17.071	16.781	16.659	16.938
	2020-21	16.478	16.393	16.110	15.799
	2021-22	16.094	14.863	15.515	15.939
	2022-23	10.354	11.659	11.755	13.959
	2023-24	-	-	-	-
Jhimpir Power	2019-20	20.907	19.718	19.402	20.482
	2020-21	19.873	19.587	18.934	18.088
	2021-22	18.677	20.210	21.139	22.288
	2022-23	26.024	30.081	30.274	38.133
	2023-24	39.683	39.882	38.731	38.044
Hawa Energy	2019-20	20.907	19.718	19.402	20.482
	2020-21	19.873	19.587	18.934	18.088
	2021-22	18.677	20.210	21.139	22.288
	2022-23	26.024	30.081	30.274	38.133
	2023-24	39.683	39.882	38.731	37.037
Three Gorges Second Wind	2019-20	20.001	19.005	18.809	20.112
	2020-21	20.114	19.859	19.195	18.321
	2021-22	18.915	20.467	21.408	22.588
	2022-23	26.407	30.565	30.791	38.801
	2023-24	39.846	40.057	38.887	38.189
Three Gorges Third Wind	2019-20	20.001	19.005	18.809	20.112
	2020-21	20.114	19.859	19.195	18.321
	2021-22	18.915	20.467	21.408	22.588
	2022-23	26.407	30.565	30.791	38.801
	2023-24	39.846	40.057	38.887	38.189
Tricon Boston Consulting-A	2019-20	21.279	20.064	19.738	20.823
	2020-21	20.164	19.871	19.209	18.349
	2021-22	18.944	20.497	21.441	22.640
	2022-23	26.503	30.717	30.980	30.048
	2023-24	40.171	40.390	38.679	37.978
Tricon Boston Consulting-B	2019-20	21.279	20.064	19.738	20.823
	2020-21	20.164	19.871	19.209	18.349
	2021-22	18.944	20.497	21.441	22.640
	2022-23	26.503	30.717	30.980	30.048
	2023-24	40.171	40.390	38.679	37.978
Tricon Boston Consulting-C	2019-20	21.279	20.064	19.738	20.823
	2020-21	20.164	19.871	19.209	18.349
	2021-22	18.944	20.497	21.441	22.640
	2022-23	26.503	30.717	30.980	30.048
	2023-24	40.171	40.390	38.679	37.978
Zephyr Power	2019-20	21.172	20.576	20.272	20.475
	2020-21	19.117	18.927	18.463	17.933
	2021-22	18.355	19.578	20.906	22.004
	2022-23	25.336	28.273	28.567	35.224
	2023-24	35.743	35.800	34.703	34.272
Act 2 Din Wind Power	2022-23	10.354	11.659	11.755	13.959
	2023-24	14.550	14.689	14.324	14.165
Din Energy	2022-23	10.492	11.815	11.911	14.122
	2023-24	14.716	14.856	14.488	14.326
Gul Ahmad Electric	2022-23	-	-	-	13.866
	2023-24	14.466	14.611	14.352	14.104
Indus Wind Energy	2022-23	10.516	11.842	11.939	14.154
	2023-24	14.749	14.889	14.520	14.357
Lakeside Energy	2022-23	8.960	11.417	11.624	13.831
	2023-24	14.425	14.570	14.310	14.064
Liberty Wind Power-I	2022-23	10.279	11.606	11.825	-
	2023-24	14.654	14.801	14.537	14.285
Liberty Wind Power-II	2022-23	10.279	11.606	11.825	-
	2023-24	14.654	14.801	14.537	14.285
Master Green Energy	2022-23	10.757	12.040	12.268	14.468
	2023-24	14.978	15.177	14.924	14.783
Metro 2 Wind Power	2022-23	10.085	11.368	11.579	13.681
	2023-24	0.844	14.418	17.622	17.348
NASDA Green Energy	2022-23	10.143	11.452	11.668	13.865
	2023-24	14.460	14.605	14.343	14.096
Lucky Renewables	2023-24	15.136	15.274	15.013	14.857
Artistic Wind Power	2023-24	14.550	14.689	14.324	14.165
Artistic Energy	2023-24	22.656	22.703	22.250	22.041

* Revised Tariff after negotiations.
Source: NEPRA

TABLE 85 (I)

Indexed/Adjusted Tariff of Solar Power Plants on Quarterly Basis (Rs./kWh) As on 1st of

Power Plant	Year	July	October	January	April
Quid-e-Azam Solar	2019-20	26.764	26.613	26.279	25.846
	2020-21	24.041	23.923	23.557	21.025
	2021-22	21.298	22.169	23.569	24.339
	2022-23	26.646	28.077	28.055	32.363
	2023-24	32.458	32.590	31.660	31.237
Appollo Solar	2019-20	26.868	25.492	25.185	26.782
	2020-21	26.541	26.189	25.317	24.212
	2021-22	24.995	27.001	28.169	29.316
	2022-23	33.501	37.903	37.684	47.148
	2023-24	47.674	48.298	47.031	46.290
Best Green Energy	2019-20	28.225	26.687	23.199	27.803
	2020-21	27.169	26.790	25.906	24.769
	2021-22	25.558	27.613	28.837	30.225
	2022-23	34.917	39.926	39.929	50.021
	2023-24	50.590	51.157	49.692	48.797
Crest Energy	2019-20	28.408	26.882	26.505	28.063
	2020-21	27.513	27.129	26.233	25.090
	2021-22	25.891	27.973	29.208	30.566
	2022-23	35.227	40.191	40.145	50.287
	2023-24	50.861	51.450	50.008	49.136
Harappa Solar	2019-20	20.390	19.687	19.548	20.344
	2020-21	20.068	19.881	19.441	18.865
	2021-22	19.259	18.3647*	18.914	19.569
	2022-23	21.740	24.104	24.196	28.849
	2023-24	29.982	31.501	31.000	30.675
AJ Power	2019-20	20.073	19.380	19.243	20.033
	2020-21	19.757	19.575	19.142	18.574
	2021-22	18.967	18.0936*	18.642	19.298
	2022-23	21.461	23.819	23.918	28.549
	2023-24	29.188	30.532	28.717	29.401
Gharo Solar	2022-23	12.365	14.115	14.373	17.444
	2023-24	17.804	18.504	18.156	17.953
Oursun Pakistan	2022-23	25.020	27.050	23.373	32.718
	2023-24	33.872	35.114	34.266	34.021
Atlas Solar	2022-23	9.362	10.554	10.974	14.082
	2023-24	14.928	15.018	14.627	14.593

* Revised Tariff after negotiations.

Source: NEPRA

TABLE 85 (J)

Indexed/Adjusted Tariff of Bagasse-based Power Plants on Quarterly Basis (Rs./kWh) As on 1st of

Power Plant	Year	FCC	July	October	January	April
Almoiz Industries	2019-20		7.899	8.002	7.931	7.569
	2020-21		6.732	6.716	6.645	6.627
	2021-22		6.689	6.2498*	6.880	7.213
	2022-23	11.8846	8.063	8.422	8.609	10.065
	2023-24	12.4788	10.573	10.551	10.297	10.311
RYK Mills	2019-20		7.719	7.769	7.706	7.471
	2020-21		6.863	6.852	6.786	6.751
	2021-22		6.825	6.3624*	6.807	7.035
	2022-23	11.8846	7.641	7.940	8.000	9.032
	2023-24	12.4788	9.446	9.405	9.211	9.142
Chiniot Power	2019-20		7.750	7.810	7.744	7.487
	2020-21		6.841	6.829		6.730
	2021-22		6.802	7.047	7.543	7.808
	2022-23	11.8846	8.535	8.926	8.998	10.298
	2023-24	12.4788	10.782	10.757	10.538	10.474
The Thal Industries	2019-20		7.855	7.945	7.876	7.545
	2020-21		6.764	6.749	6.679	6.657
	2021-22		6.722	6.279	6.862	7.170
	2022-23	11.8846	7.96	8.304	8.461	9.814
	2023-24	12.4788	10.303	10.273	10.033	10.027

Power Plant	Year	FCC	July	October	January	April
Jamal Din Wali-II	2019-20		7.719	7.769	7.706	7.471
	2020-21		6.863	6.852	6.786	6.751
	2021-22		6.825	6.3685*	6.807	7.035
	2022-23	11.8846	7.641	7.940	8.000	9.032
	2023-24	12.4788				
Jamal Din Wali-III	2019-20		7.719	7.769	7.706	7.471
	2020-21		6.863	6.852	6.786	6.751
	2021-22		6.825	6.3685*	6.807	7.035
	2022-23	11.8846	7.641	7.940	8.000	9.032
	2023-24	12.4788				
Hamza Sugar	2019-20		7.818	7.898	7.830	7.525
	2020-21		6.791	6.777	6.708	
	2021-22		6.750	6.3029*	6.847	7.134
	2022-23	11.8846	7.874	8.207	8.337	9.604
	2023-24	12.4788	10.072	10.040	9.812	9.789
Channar Energy	2021-22		6.689	6.2498*	6.880	7.213
	2022-23	11.8846	8.063	8.422	8.609	10.065
	2023-24	12.4788	10.577	10.550	10.297	10.312

* Revised Tariff after negotiations.

Source: NEPRA

TABLE 86
Insurance Cost Component

Company Name	Insurance Premium (Rs. in Million)		Insurance Component (Rs./kWh)		Period
	Reference	Revised	Reference	Revised	
Appolo Solar	66,707,000	52,510,736	0.435	0.343	May 31, 2020 to May 30, 2021
	66,707,000	85,283,901	0.435	0.556	May 31, 2021 to May 30, 2022
Best Green	20,518,000	24,310,091	0.134	0.159	August 01, 2020 to July 31, 2021
	20,518,000	22,920,947	0.134	0.150	July 31, 2021 to July 30, 2022
Crest Energy	19,583,000	23,126,315	0.128	0.151	August 01, 2020 to July 31, 2021
	19,583,000	21,804,814	0.128	0.151	July 31, 2021 to July 30, 2022
Three Gorges 1 st	74,157,000	70,856,437	0.535	0.511	November 26, 2020 to November 25, 2021
	74,157,000	82,361,457	0.535	0.594	November 26, 2021 to November 25, 2022
	74,157,000	11,373,404	0.535	0.751	November 26, 2023 to November 25, 2024
Zorlu Enerji	56,790,000	110,767,164	0.668	0.697	January 01, 2021 to December 31, 2021
Zephyr Power	96,554,760	73,061,170	0.635	0.477	March 28, 2021 to March 27, 2022
	97,335,000	118,932,014	0.635	0.477	March 28, 2022 to March 27, 2023
Act Wind	44,669,719	70,219,390	0.548	0.862	October 08, 2021 to October 07, 2022
	63,813,884	104,912,890	0.783	1.288	October 08, 2023 to October 07, 2024
Harappa Solar	12,849,379	15,646,010	0.481	0.584	October 14, 2020 to October 13, 2021
	12,849,379	17,277,160	0.481	0.645	October 14, 2021 to October 13, 2022
	12,863,755	26,783,330	0.481	0.999	October 14, 2023 to October 13, 2024
Tricon Boston-A	96,554,760	34,948,169	0.635	0.229	November 22, 2020 to November 21, 2021
	96,554,760	47,121,195	0.635	0.309	November 22, 2021 to November 21, 2022
	96,814,320	81,579,870	0.635	0.535	November 22, 2022 to November 21, 2023
Tricon Boston-B	96,554,760	34,948,169	0.635	0.229	November 22, 2020 to November 21, 2021
	96,554,760	47,121,195	0.635	0.309	November 22, 2021 to November 21, 2022
	96,814,320	81,579,870	0.635	0.535	November 22, 2022 to November 21, 2023
Tricon Boston-C	96,554,760	34,948,169	0.635	0.229	November 22, 2020 to November 21, 2021
	96,554,760	47,121,195	0.635	0.309	November 22, 2021 to November 21, 2022
	96,814,320	81,579,870	0.635	0.535	November 22, 2022 to November 21, 2023
Oursun Pakistan	96,554,760	37,550,940	0.635	0.476	November 30, 2021 to November 29, 2022
	57,371,868	60,416,194	0.728	0.768	November 30, 2023 to November 29, 2024
AJ Power	7,034,305	5,488,860	0.394	0.307	December 14, 2020 to December 13, 2021
	6,195,668	5,488,860	0.347	0.307	December 14, 2021 to December 13, 2022
	6,195,668	5,714,986	0.347	0.320	December 14, 2022 to December 13, 2023
Gharo Solar	29,290,000	23,853,150	0.301	0.297	December 23, 2021 to December 22, 2022
	29,290,000	51,093,980	0.301	0.525	December 23, 2023 to December 22, 2024
FFC Energy	69,874,959	54,195,702	0.487	0.378	January 01, 2022 to December 31, 2022
	69,874,959	104,712,282	0.487	0.729	July 01, 2023 to June 30, 2024
Hawa Energy	96,817,558	66,138,233	0.635	0.434	March 15, 2021 to March 14, 2022
	96,819,125	120,984,666	0.635	0.793	March 15, 2022 to March 14, 2023
	96,819,125	153,447,326	0.635	1.006	March 15, 2023 to March 14, 2024
Jhimpir Power	96,817,558	66,281,550	0.635	0.435	March 16, 2021 to March 15, 2022
	96,819,125	117,140,272	0.635	0.768	March 16, 2022 to March 15, 2023
	96,819,125	153,439,972	0.635	1.006	March 16, 2023 to March 15, 2024
Artistic Wind	67,179,530	71,233,632	0.444	0.471	March 16, 2021 to March 15, 2022
	67,179,530	114,455,320	0.444	0.757	March 16, 2022 to March 15, 2023
	95,967,548	161,966,780	0.635	1.000	March 16, 2024 to March 15, 2025
Three Gorges 2 nd	96,360,090	43,053,387	0.635	0.284	June 20, 2021 to June 19, 2022
	96,360,090	54,840,971	0.635	0.361	June 20, 2022 to June 19, 2023
	96,356,868	72,091,317	0.635	0.475	June 20, 2023 to June 19, 2024
Three Gorges 3 rd	96,360,090	43,054,329	0.635	0.284	June 09, 2021 to June 08, 2022
	96,360,090	54,840,971	0.635	0.361	June 09, 2022 to June 08, 2023
	96,356,868	72,091,317	0.635	0.475	June 09, 2023 to June 08, 2024
Foundation Wind-I	47,555,000	64,949,535	0.329	0.450	July 01, 2021 to June 30, 2022
	47,555,000	41,435,248	0.3291	0.600	July 01, 2022 to December 31, 2022
	47,555,000	96,833,743	0.329	0.670	January 01, 2024 to December 31, 2024
Foundation Wind-II	47,555,000	64,949,532	0.331	0.452	July 01, 2021 to June 30, 2022
	47,555,000	41,435,248	0.331	0.604	July 01, 2022 to December 31, 2022
	47,555,000	96,833,743	0.331	0.674	January 01, 2024 to December 31, 2024
Master Green	36,687,608	53,143,184	0.218	0.315	August 21, 2022 to August 20, 2023
	36,687,608	65,076,345	0.218	0.386	August 21, 2023 to August 20, 2024
Metro Power	61,436,000	105,617,984	0.432	0.742	September 16, 2021 to September 15, 2022
	61,433,587	135,467,827	0.432	0.952	September 16, 2022 to September 15, 2023
	61,433,587	171,535,312	0.432	1.205	September 16, 2023 to September 15, 2024
Sachal Energy	66,547,000	67,482,923	0.488	0.494	April 11, 2021 to April 10, 2022
	66,547,000	124,300,752	0.488	0.911	April 11, 2023 to April 10, 2024
	66,547,000	130,147,430	0.488	0.954	April 11, 2024 to April 10, 2025

Source: NEPRA

Table 87
Use of Transmission System Charges

(A) National Transmission and Despatch Company Limited		Rs./kW/Month
Description		
FY 2019-20		199.64
FY 2020-21		224.12
FY 2021-22		235.30
FY 2022-23		-
FY 2023-24		-

Note: No petition for determination of Use of System Charges for FY 2022-23 is submitted by NTDC, therefore, the notified tariff of FY 2021-22 is applicable till revision/modification of transmission tariff.
Source: NEPRA

(B) Pak Matari-Lahore Transmission Company (Pvt.) Limited (PMLTC)

Description	Jul-Sep 2021	Oct-Dec 2021	Jan-Mar 2022	Apr-Jun 2022	Jul-Sep 2022	Oct-Dec 2022	Jan-Mar 2023	Apr-Jun 2023	Jul-Sep 2023	Oct-Dec 2023	Jan-Mar 2024	Apr-Jun 2024
	Reference (Rs./kW/Hr)	Allowed	Allowed	Allowed	Allowed	Allowed	Allowed	Allowed	Allowed	Allowed	Allowed	Allowed
Fixed O&M ITC (Foreign)	0.044	0.075	0.082	0.087	0.091	0.105	0.119	0.118	0.150	0.153	0.152	0.151
ITC O&M (Local)	0.032	0.042	0.042	0.042	0.042	0.042	0.042	0.042	0.042	0.056	0.081	0.083
NTDC O&M (Local)	0.041	0.053	0.053	0.053	0.053	0.053	0.053	0.053	0.053	0.072	0.103	0.106
Land Lease	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007
Insurance	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041
ROE	0.168	0.255	0.275	0.286	0.295	0.332	0.370	0.365	0.457	0.462	0.454	0.448
ROEDC	0.039	0.059	0.064	0.066	0.068	0.077	0.086	0.084	0.106	0.107	0.105	0.104
Principal	0.304	0.461	0.461	0.518	0.518	0.634	0.634	0.698	0.698	0.934	0.919	0.919
Interest	0.219	0.273	0.273	0.321	0.321	0.527	0.527	0.741	0.741	0.926	0.875	0.875
Sinasure Fee	0.025	0.025	0.025	0.025	0.025	0.023	0.023	0.023	0.023	0.021	0.021	0.021
Total Tariff (PKR/kW/hr)	0.920	1.290	1.323	1.446	1.461	1.840	1.902	2.173	2.318	2.779	2.758	2.754
Total Tariff (US Cents/kWh)	0.881	0.815	0.774	0.813	0.798	0.893	0.827	0.958	0.816	0.968	0.976	0.989

Source: NEPRA

(C) Sindh Transmission and Despatch Company (Pvt.) Limited (STDC)

Description	Reference (Rs./kW/Hr)	July - December, 2021 (Rs./kW/Hr)	January - June, 2021 (Rs./kW/Hr)	July - December, 2022 (Rs./kW/Hr)	January - June, 2022 (Rs./kW/Hr)	July - December, 2023 (Rs./kW/Hr)	January - June, 2023 (Rs./kW/Hr)	July - December, 2024 (Rs./kW/Hr)
O&M	0.182	0.197	0.221	0.221	0.221	0.275	0.275	0.357
Insurance	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019
ROE	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094
Debt Servicing	0.213	0.229	0.264	0.296	0.304	0.340	0.391	0.391

Source: NEPRA

TABLE 88

National Average Uniform Determined Tariff with PYA along-with GOP Applicable Tariff

A-1 GENERAL SUPPLY TARIFF - RESIDENTIAL

	Tariff Category/Particulars	Fixed Charges (Rs./kW/M)	Unifrom Determined with PYA Variable Charges (Rs./kWh)		GOP Applicable July, 2023 Variable Charges (Rs./kWh)	
Protected	For Sanctioned load less than 5 kW	-	6.76		3.95	
	Up to 50 Units - Life Line	-	11.41		7.74	
	51 - 100 Units - Life Line	-	13.51		7.74	
	001 - 100 Units	-	15.78		10.06	
Un-Protected	001 - 100 Units	-	22.51		16.48	
	101 - 200 Units	-	27.16		22.95	
	201 - 300 Units	-	30.00		27.14	
	301 - 400 Units	-	33.04		32.03	
	401 - 500 Units	-	35.26		35.24	
	501 - 600 Units	-	36.50		36.66	
	601 - 700 Units	-	37.90		37.80	
	Above 700 Units	-	42.95		42.72	
	For Sanctioned load 5 kW & above		Peak	Off-Peak	Peak	Off-Peak
	Time Of Use	-	38.54	32.25	41.89	35.57

As per Authority's decision only protected residential consumers will be given the benefit of one previous slab.

As per Authority's decision, residential life line consumer will not be given any slab benefit.

Under tariff A-1, there shall be minimum monthly customer charge at the following rates even if no energy is consumed.

a) Single Phase Connections: Rs. 75/- per consumer per month

b) Three Phase Connections: Rs. 150/- per consumer per month

A-2 GENERAL SUPPLY TARIFF - COMMERCIAL

	Tariff Category/Particulars	Fixed Charges (Rs./kW/M)	Unifrom Determined with PYA Variable Charges (Rs./kWh)		GOP Applicable July, 2023 Variable Charges (Rs./kWh)	
	For Sanctioned load less than 5 kW		37.37		37.75	
	For Sanctioned load 5 kW & above	500.00	39.73		39.43	
			Peak	Off-Peak	Peak	Off-Peak
	Time Of Use	500.00	40.18	34.25	41.35	35.38
	Electric Vehicle Charging Station		37.10		39.43	

Under tariff A-2 (a), there shall be minimum monthly charges at the following rates even if no energy is consumed.

a) Single Phase Connections: Rs. 175/- per consumer per month

b) Three Phase Connections: Rs. 350/- per consumer per month

Fixed Charges shall be billed based on 50% of Sanctioned Load or Actual MDI for the month which ever is higher. In such case there would be no minimum monthly charges even if no energy is consumed.

A-3 GENERAL SERVICES

	Tariff Category/Particulars	Fixed Charges (Rs./kW/M)	Unifrom Determined with PYA Variable Charges (Rs./kWh)		GOP Applicable July, 2023 Variable Charges (Rs./kWh)	
	General Services	-	37.74		37.31	

Under tariff A-3, there shall be minimum monthly charges at the following rates even if no energy is consumed.

a) Single Phase Connections: Rs. 175/- per consumer per month

b) Three Phase Connections: Rs. 350/- per consumer per month

B - INDUSTRIAL SUPPLY TARIFFS

	Tariff Category/Particulars	Fixed Charges (Rs./kW/M)	Unifrom Determined with PYA Variable Charges (Rs./kWh)		GOP Applicable July, 2023 Variable Charges (Rs./kWh)	
B1	Upto 25 kW (at 400/230 Volts)	-	34.38		34.33	
B2(a)	Exceeding 25-500 kW (at 400 Volts)	500.00	34.22		33.83	
	Time Of Use		Peak	Off-Peak	Peak	Off-Peak
B1(b)	Up to 25 kW		37.47	31.80	37.89	32.33
B2(b)	Exceeding 25-500 kW (at 400 Volts)	500.00	37.20	31.49	37.83	32.12
B3	For All Loads up to 5000 kW (at 11, 33 kV)	460.00	36.41	30.84	37.83	32.03
B4	For All Loads (at 66, 132 kV & above)	440.00	36.38	30.20	37.83	31.93

For B1 & B1(b) consumers there shall be a fixed minimum charge of Rs. 350 per month.

Fixed Charges shall be billed based on 50% of Sanctioned Load or Actual MDI for the month which ever is higher. In such case there would be no minimum monthly charges even if no energy is consumed.

C - SINGLE-POINT SUPPLY

Tariff Category/Particulars	Fixed Charges (Rs./kW/M)	Unifrom Determined with PYA Variable Charges (Rs./kWh)		GOP Applicable July, 2023 Variable Charges (Rs./kWh)	
C1 For supply at 400/230 Volts					
C1(a) Sanctioned load less than 5 kW	-		44.23		38.43
C1(b) Sanctioned load 5 kW & up to 500 kW	500.00		43.18		37.93
C2(a) For supply at 11, 33 kV up to and including 5000 kW	460.00		36.63		37.73
C3(a) For supply at 66 kV & above and sanctioned load above 5000 kW	440.00		35.89		37.63
Time Of Use		Peak	Off-Peak	Peak	Off-Peak
C1(c) For supply at 400/230 Volts 5 kW & up to 500 kW	500.00	43.07	36.79	41.35	34.75
C2(b) For supply at 11, 33 kV up to and including 5000 kW	460.00	40.46	34.01	41.35	34.55
C3(b) For supply at 66 kV & above and sanctioned load above 5000 kW	440.00	35.87	29.10	41.35	34.45

Fixed Charges shall be billed based on 50% of Sanctioned Load or Actual MDI for the month which ever is higher.

D - AGRICULTURE TARIFF

Tariff Category/Particulars	Fixed Charges (Rs./kW/M)	Unifrom Determined with PYA Variable Charges (Rs./kWh)		GOP Applicable July, 2023 Variable Charges (Rs./kWh)	
D1(a) SCARP less than 5 kW	-		37.73		34.43
D2(a) Agricultural Tube Wells	200.00		31.34		24.10
		Peak	Off-Peak	Peak	Off-Peak
D1(b) SCARP 5 kW & above	200.00	46.80	38.54	37.35	30.10
D2(b) Agricultural 5 kW & above	200.00	24.68	24.58	24.10	24.10

Under this tariff, there shall be minimum monthly charges Rs. 2,000/- per consumer per month, even if no energy is consumed.

Note: The consumers having Sanctioned Load less than 5 kW can opt for TOU metering.

E - TEMPORARY SUPPLY TARIFFS

Tariff Category/Particulars	Fixed Charges (Rs./kW/M)	Unifrom Determined with PYA Variable Charges (Rs./kWh)		GOP Applicable July, 2023 Variable Charges (Rs./kWh)	
E1(i) Residential Supply	-		37.89		42.03
E1(ii) Commercial Supply	-		35.47		38.14
E2 Industrial Supply	-		33.62		35.41

For the categories of E-1(i&ii) above, the minimum bill of the consumers shall be Rs. 50/- per day subject to a minimum of Rs. 500/- for the entire period of supply, even if no energy is consumed.

F - SEASONAL INDUSTRIAL SUPPLY TARIFF

(125% of relevant Industrial Tariff)

Note: Tariff-F consumers will have the option to convert to Regular Tariff and vice versa. This option can be exercised at the time of a new connection or at the beginning of the season. Once exercised, the option remains in force for at least one year.

G - PUBLIC LIGHTING

Tariff Category/Particulars	Fixed Charges (Rs./kW/M)	Unifrom Determined with PYA Variable Charges (Rs./kWh)		GOP Applicable July, 2023 Variable Charges (Rs./kWh)	
Street Lighting	-		38.53		37.43

Under Tariff G, there shall be a minimum monthly charge of Rs.500/- per month per kW of lamp capacity installed.

H - RESIDENTIAL COLONIES ATTACHED TO INDUSTRIAL PREMISES

Tariff Category/Particulars	Fixed Charges (Rs./kW/M)	Unifrom Determined with PYA Variable Charges (Rs./kWh)		GOP Applicable July, 2023 Variable Charges (Rs./kWh)	
Residential Colonies attached to industrial premises	-		37.75		37.43

K - SPECIAL CONTRACTS

Tariff Category/Particulars	Fixed Charges (Rs./kW/M)	Unifrom Determined with PYA Variable Charges (Rs./kWh)		GOP Applicable July, 2023 Variable Charges (Rs./kWh)	
Azad Jammu & Kashmir (AJK)	440.00		27.63		34.65
		Peak	Off-Peak	Peak	Off-Peak
Time Of Use	440.00	36.07	29.06	40.35	33.45
Rawat Lab			30.22		37.43

H - RAILWAY TRACTION

Tariff Category/Particulars	Fixed Charges (Rs./kW/M)	Unifrom Determined with PYA Variable Charges (Rs./kWh)		GOP Applicable July, 2023 Variable Charges (Rs./kWh)	
Railway Traction	-		39.30		37.43

Note: This tariff shall remain applicable for the period of one year from the date of notification.

Source: NEPRA

Table 89

Consumer-end Determined Tariff for K-Electric

Description	Fixed Charges (Rs/kW/M)	Applicable Uniform Tariff (Rs./kWh)
A-1 General Supply Tariff - Residential		
Upto 50 Units (Lifeline)	-	3.95
050-100 Units (Lifeline)	-	7.74
001-100 units (Protected)	-	7.74
101-200 units (Protected)	-	10.06
001-100 units	-	16.48
101-200 units	-	22.95
201-300 units	-	27.14
301-400 units	-	32.03
401-500 units	-	35.24
501-600 units	-	36.66
601-700 units	-	37.80
Above 700 units	-	42.72
Time of Use		
Peak	-	41.89
Off-Peak	-	35.57
E-1 (i) Temporary Residential	-	42.03
A-2 General Supply Tariff - Commercial		
For sanctioned load less than 5 kW	-	37.75
For sanctioned load 5kW & Above	500	39.43
Peak	-	41.35
Off-Peak	500	35.38
E-1 (ii) Temporary Commercial	-	38.14
Electric Vehicle Charging Station (EVCS)	-	39.43
A-3 General Services		
	-	37.31
B - Industrial Supply Tariff		
B-1 less than 5 kW/25 kW (at 400/230 volts) - Note	-	34.33
Peak	-	37.89
Off-Peak	-	32.33
B-2 5-500 kW/25-500 kW (at 400 Volts) - Note	500	33.83
Peak	-	37.83
Off-Peak	500	32.12
B-3 for all loads upto 500 kW (at 11, 33 kV)	460	34.55
Peak	-	37.83
Off-Peak	460	32.03
B-4 for all loads (at 66 kV, 132 kV and above)	440	34.05
Peak	-	37.83
Off-Peak	440	31.93
B-5 for all loads (at 220 kV & above)	-	37.83
Peak	420	31.05
Off-Peak	-	35.41
E-2 (i) Temporary Industrial	-	35.41
C - Bulk Supply Tariff		
C-1 For supply at 400/230 Volts		
a) Sanctioned load less than 5 kW	-	38.43
b) Sanctioned load 5 kW and upto 500 kW	500	37.93
Peak	-	41.35
Off-Peak	500	34.75
C-2 For supply at 11, 33 kV upto and including 5000 kW	460	37.73
Peak	-	41.35
Off-Peak	460	34.55
C-3 For supply at 132 kV and above upto and including 5000 kW	440	37.63
Peak	-	41.35
Off-Peak	440	34.45
E-2 (ii) Temporary Bulk Supply		
(a) at 400 Volts	-	41.09
(b) at 11 kV	-	41.09
D - Agriculture Tariff		
D-1 For all loads	200	24.10
D-2 For all loads - Time of Use		
Peak	-	24.10
Off-Peak	200	24.10
G - Public Lighting		
Street Lighting	-	37.43
H - Residential Colonies attached to Industrial Premises		
	-	37.43

Note: NEPRA determined rates for residential non-protected non-ToU consumers are inclusive of one previous slab benefit whereas proposed applicable uniform tariff is without one slab benefit for residential non-protected non-ToU category.

Source: NEPRA

TABLE 90 (A)
Monthly Fuel Price Adjustment in respect of all DISCOs and K-Electric
 Monthly Fuel Price Adjustment of CPPA-G System (Rs./kWh)

Year	FY 2019-20				FY 2020-21				FY 2021-22				FY 2022-23				FY 2023-24			
	Act. Fuel Cost (Rs.)	Ref. Fuel Cost (Rs.)	Variation	Ref. Fuel Cost (Rs.)	Act. Fuel Cost (Rs.)	Variation	Ref. Fuel Cost (Rs.)	Act. Fuel Cost (Rs.)	Variation	Ref. Fuel Cost (Rs.)	Act. Fuel Cost (Rs.)	Variation	Ref. Fuel Cost (Rs.)	Act. Fuel Cost (Rs.)	Variation	Ref. Fuel Cost (Rs.)	Act. Fuel Cost (Rs.)	Variation	Ref. Fuel Cost (Rs.)	Variation
July	5.322	3.542	1.780	1.662	4.380	4.380	3.542	6.657	0.838	5.280	1.377	10.631	6.288	4.344	8.357	6.894	1.463			
August	4.866	3.205	1.662	3.687	3.687	3.687	3.205	6.687	0.483	4.733	1.954	10.085	9.893	0.192	8.360	6.646	1.714			
September	4.668	2.841	1.827	3.955	3.955	3.955	2.841	7.550	1.114	5.023	2.527	9.993	9.911	0.082	7.473	7.071	0.401			
October	5.324	3.758	1.566	4.051	4.051	4.051	3.758	9.918	0.293	5.173	4.745	8.849	9.171	-0.321	10.972	7.894	3.079			
November	3.470	2.488	0.982	3.527	3.527	3.527	2.488	8.040	0.770	3.738	4.302	6.265	6.076	0.189	8.911	4.783	4.128			
December	6.338	4.460	1.878	5.996	5.996	5.996	4.460	8.632	1.536	5.535	3.097	7.003	9.319	-2.317	9.970	5.403	4.567			
January	8.868	5.758	3.111	6.653	6.653	6.653	5.758	12.461	0.895	6.512	5.949	11.032	10.554	0.478	14.546	7.489	7.056			
February	5.176	3.971	1.205	4.783	4.783	4.783	3.971	9.105	0.642	4.252	4.853	7.211	7.212	-0.001	9.355	4.434	4.921			
March	5.108	5.001	0.107	5.586	5.586	5.586	5.001	9.097	-0.643	6.230	2.868	9.504	8.712	0.792	9.279	6.442	2.837			
April	4.532	5.236	-0.704	6.172	6.172	6.172	5.236	10.601	-0.437	6.609	3.992	9.995	8.388	1.608	8.824	5.492	3.332			
May	3.794	5.046	-1.252	5.668	5.668	5.668	5.046	13.836	-0.264	5.932	7.904	9.732	7.828	1.904	9.038	5.709	3.329			
June	4.055	5.115	-1.058	5.741	5.741	5.741	5.115	15.832	-0.193	5.934	9.897	9.318	7.508	1.810	9.703	7.140	2.563			
Year	FY 2019-20				FY 2020-21				FY 2021-22				FY 2022-23				FY 2023-24			
	Act. Fuel Cost (Rs.)	Ref. Fuel Cost (Rs.)	Variation	Ref. Fuel Cost (Rs.)	Act. Fuel Cost (Rs.)	Variation	Ref. Fuel Cost (Rs.)	Act. Fuel Cost (Rs.)	Variation	Ref. Fuel Cost (Rs.)	Act. Fuel Cost (Rs.)	Variation	Ref. Fuel Cost (Rs.)	Act. Fuel Cost (Rs.)	Variation	Ref. Fuel Cost (Rs.)	Act. Fuel Cost (Rs.)	Variation	Ref. Fuel Cost (Rs.)	Variation
July	11.307	10.096	1.211	0.758	8.618	7.892	8.618	11.581	-0.748	10.892	0.689	23.868	27.985	-4.117	17.706	15.995	1.711			
August	10.854	10.096	0.758	0.307	8.200	7.892	8.200	11.653	0.753	10.892	0.761	23.099	27.985	-4.886	16.656	15.995	0.661			
September	10.403	10.096	0.307	0.102	8.602	7.892	8.602	14.649	0.308	10.892	3.757	22.859	27.985	-5.126	17.389	15.995	1.395			
October	10.505	10.403	0.102	-0.127	8.573	8.602	8.573	15.724	0.710	14.649	1.075	20.405	22.859	-2.454	20.489	15.995	4.494			
November	8.276	10.403	-2.127	-1.759	7.501	8.602	7.501	13.890	-0.029	14.649	-0.759	15.428	22.859	-7.431	17.765	15.995	1.770			
December	8.644	10.403	-1.759	0.943	9.101	8.602	9.101	12.056	-0.102	14.649	-2.594	12.061	22.859	-10.798	16.788	15.995	0.793			
January	9.586	8.644	0.943	0.509	10.351	10.351	9.101	15.334	1.251	12.056	3.278	13.772	12.061	1.711	18.964	15.995	2.970			
February	9.153	8.644	0.509	-0.004	11.199	11.199	9.101	13.442	2.098	12.056	1.386	12.640	12.061	0.580	14.177	15.995	-1.818			
March	8.640	8.644	-0.004	-0.787	11.043	11.043	9.101	16.883	1.942	12.056	4.827	15.995	12.061	3.934	14.023	15.995	-1.972			
April	7.853	8.640	-0.787	-1.354	10.493	10.493	11.043	22.155	-0.550	16.883	5.272	15.948	15.995	-0.047	14.320	15.992	-1.672			
May	7.286	8.640	-1.354	-0.748	10.093	10.093	11.043	26.401	-0.950	16.883	9.518	17.441	15.995	1.447	18.590	15.997	2.593			
June	7.892	8.640	-0.748		10.892	10.892	11.043	27.985	0.151	16.883	11.102	18.306	15.995	2.311	19.160	15.991	3.169			

Source: NEPRA

TABLE 90 (B)
Detail of Quarterly Adjustments of DISCOs

Quarterly Adjustments of DISCOs			
Quarterly Adjustments Period	Decision Dated	Allowed National Average (Rs./kWh)	Applicability Period (with effect from)
FY 2019-20 (2 nd & 3 rd Quarter)	24-09-2020	1.624	October, 2020 to September, 2021
FY 2019-20 (4 th Quarter)	10-02-2021	0.828	October, 2021 to September, 2022
FY 2020-21 (1 st & 2 nd Quarter)	02-07-2021	0.897	October, 2021 to September, 2022
FY 2020-21 (3 rd Quarter)	30-07-2021	-0.067	October, 2021 to September, 2022
FY 2020-21 (4 th Quarter)	30-12-2021	-0.991	February, 2022 to April, 2022
FY 2021-22 (1 st Quarter)	09-05-2022	0.572	June, 2022 to August, 2022
FY 2021-22 (2 nd Quarter)	16-06-2022	1.550	July, 2022 to September, 2022
FY 2021-22 (3 rd Quarter)	29-07-2022	0.509	September, 2022 to November, 2022
FY 2021-22 (4 th Quarter)	14-10-2022	3.297	October, 2022 to January, 2023
FY 2022-23 (1 st Quarter)	17-01-2023	3.081	February, 2023 to March, 2023
FY 2022-23 (2 nd Quarter)	12-04-2023	0.469	April, 2023 to June, 2023
FY 2022-23 (3 rd Quarter)	04-07-2023	1.249	July, 2023 to October, 2023
FY 2022-23 (4 th Quarter)	22-09-2023	3.281	October, 2023 to March, 2024
FY 2023-24 (1 st Quarter)	20-12-2023	1.150	January, 2024 to March, 2024
FY 2023-24 (2 nd Quarter)	28-03-2024	2.749	April, 2024 to June, 2024

Source: NEPRA

TABLE 91
CPI (General/US), Exchange Rate, KIBOR and LIBOR

Quarter	CPI (General)*	CPI (US)	PKR/USD	KIBOR (3 Month) (%)	LIBOR (3 Month) (%)
July, 2019 – September, 2019	245.94	256.09	164.50	12.97	2.32
October, 2019 – December, 2019	255.94	256.56	156.70	13.85	2.09
January, 2020 – March, 2020	263.59	257.21	155.35	13.55	1.91
April, 2020 – June, 2020	266.20	258.68	166.75	11.22	1.45
July, 2020 – September, 2020	269.27	256.39	168.75	7.26	0.30
October, 2020 – December, 2020	136.23	259.92	166.40	7.25	0.23
January, 2021 – March, 2021	141.83	260.23	160.80	7.29	0.24
April, 2021 – June, 2021	143.09	263.01	153.60	7.59	0.19
July, 2021 – September, 2021	145.24	269.20	158.30	7.45	0.16
October, 2021 – December, 2021	147.61	273.57	170.95	7.78	0.16
January, 2022 – March, 2022	158.18	277.95	177.95	10.52	0.34
April, 2022 – June, 2022	160.61	283.72	183.20	11.89	0.34
July, 2022 – September, 2022	165.23	292.30	206.00	15.32	2.94
October, 2022 – December, 2022	187.84	296.17	229.95	15.71	2.94
January, 2023 – March, 2023	195.89	297.71	226.90	17.06	5.14
April, 2023 – June, 2023	211.28	300.84	284.10	22.08	5.14
July, 2023 – September, 2023	227.96	304.13	287.10	22.91	5.545
October, 2023 – December, 2023	239.27	307.03	289.10	22.66	5.657
January, 2024 – March, 2024	253.15	307.05	282.40	21.46	5.593
April, 2024 – June, 2024	260.01	310.33	278.50	21.99	5.56

* From October - December, 2020 quarter NCPI values were used for the indexation purpose. Pakistan Bureau of Statistics has discontinued the publication of CPI for base year 2007-08 with effect from July, 2020 and replaced it with National CPI for new base year 2015-16.

Source: NEPRA

TABLE 92
CPA-G Market Operator Fee

Description	FY 2019-20	FY 2020-21	FY 2021-22	FY 2022-23	FY 2023-24
Revenue Requirement (Rs. in Million)	236.90	468.07	863.67	1,152.00	673.00
Average Monthly MDI (MW)	23,640.00	23,693.00	26,535.00	27,588.00	27,288.00
Market Operation Fee (Rs./kW/Month)	0.84	1.71	2.71	3.48	2.06

Source: NEPRA

ACRONYMS AND ABBREVIATIONS

ADCT	Annual Dependable Capacity Test
AMI	Advanced Metering Infrastructure
AMRS	Automated Meter Reading System
AQTA	Annual Quarterly Tariff Adjustments
AT&C	Aggregate Technical and Commercial
BPC	Bulk Power Consumer
BQTPS	Bin Qasim Thermal Power Station
BTPL	Bahria Town (Pvt.) Limited
CCI	Council of Common Interests
CCOE	Cabinet Committee on Energy
CCPP	Combined Cycle Power Plant
CDP	Common Delivery Point
COD	Commercial Operation Date
CPGCL	Central Power Generation Company Limited
CPI	Consumer Price Index
CPP	Capacity Purchase Price
CPPA-G	Central Power Purchasing Agency (Guarantee) Limited
CSM	Consumer Service Manual
CTBCM	Competitive Trading Bilateral Contract Market
DISCO	Distribution Company
EMO	Economic Merit Order
EPP	Energy Purchase Price
EV	Electric Vehicle
FDI	Foreign Direct Investment
FESCO	Faisalabad Electric Supply Company Limited
FPA	Fuel Price Adjustment
FY	Financial Year
GDP	Gross Domestic Product
GENCO	Generation Company
GEPCO	Gujranwala Electric Power Company Limited
GHG	Greenhouse Gas
GOP	Government of Pakistan
GTPS	Gas Turbine Power Station
GWh	Giga Watt per hour
HDIP	Hydrocarbon Development Institute of Pakistan
HESCO	Hyderabad Electric Supply Company Limited
HPP	Hydropower Project
HSE	Health, Safety and Environment
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
IA	Implementation Agreement
IAA	Independent Auction Administrator
IBC	Integrated Business Centre

IESCO	Islamabad Electric Supply Company Limited
IGCEP	Indicative Generation Capacity Expansion Plan
IPP	Independent Power Producer
ISMO	Independent System and Market Operator
ISP	Industrial Support Package
KCCPP	Korangi Combined Cycle Power Plant
KE	K-Electric Limited
KIBOR	Karachi Interbank Offered Rate
KTGTPS	Korangi Town Gas Turbine Power Station
KPI	Key Performance Indicators
KPT&GC	Khyber Pakhtunkhwa Transmission & Grid Company
kV	Kilo Volt
KVA	Kilovolt Ampere
kWh	Kilowatt/hours
LCOE	Levelized Cost of Electricity
LD	Liquidated Damages
LESCO	Lahore Electric Supply Company Limited
LIBOR	London Interbank Offered Rate
MEPCO	Multan Electric Power Company Limited
MMBTU	Metric Million British Thermal Unit
MMCFT	Metric Million Cubic Feet
MTOE	Million Tones of Oil Equivalent
MVA	Megavolt Ampere
MW	Megawatt
MWh	Megawatt/hour
MYT	Multi-year Tariff
n.a.	Not Available
n.p.	Not Provided
NEECA	National Energy Efficiency and Conservation Authority
NEPRA	National Electric Power Regulatory Authority
NHP	Net Hydel Profit
NPCC	National Power Control Centre
NPGCL	Northern Power Generation Company Limited
NPMV	Non-Project Missed Volume
NTDC	National Transmission and Despatch Company Limited
O&M	Operation and Maintenance
PAEC	Pakistan Atomic Energy Commission
PEDO	Pakhtunkhwa Energy Development Organization
PESCO	Peshawar Electric Supply Company Limited
PGC	Provincial Grid Company
PIEDMC	Punjab Industrial Estates Development and Management Company
PLAC	Partial Load Adjustment Charges
PMLTC	Pak Matari-Lahore Transmission Company Limited
PPA	Power Purchase Agreement
PPDB	Punjab Power Development Board
PPIB	Private Power and Infrastructure Board
PPP	Public-Private Partnership

QESCO	Quetta Electric Supply Company Limited
RFO	Residual Furnace Oil
RLNG	Regasified Liquefied Natural Gas
SCADA	Supervisory Control and Data Acquisition
SCARP	Salinity Control and Reclamation Project
SEPCO	Sukkur Electric Power Company Limited
SEZ	Special Economic Zone
SGTPS	Site Gas Turbine Power Station
SMS	Secured Metering System
SPA	Special Purpose Agent
SPP	Small Power Producer
SPTL	Special Purpose Transmission Licence
STDC	Sindh Transmission and Dispatch Company Limited
T&D	Transmission and Distribution
TDS	Tariff Differential Subsidy
TESCO	Tribal Area Electricity Supply Company Limited
TIP	Transmission Investment Plan
TOD	Time of Day
TOU	Time of Use
TRS	Tariff Rationalization Surcharge
TSEP	Transmission System Expansion Plan
WAPDA	Water and Power Development Authority
ZRIR	Zero Rated Industrial Rebate

SOURCE OF INFORMATION

The following sources of information have been used in the compilation of this State of Industry Report 2024:

- (i) K-Electric Limited
- (ii) All Distribution Companies
- (iii) All Independent Power Producers
- (iv) Public Sector Generation Companies
- (v) National Power Control Centre, NTDC
- (vi) Water and Power Development Authority
- (vii) Central Power Purchasing Agency (Guarantee) Limited
- (viii) National Transmission and Despatch Company Limited
- (ix) National Energy Efficiency and Conservation Authority
- (x) Pakhtunkhwa Energy Development Organization
- (xi) Hydrocarbon Development Institute of Pakistan
- (xii) Energy Department, Government of Balochistan
- (xiii) Energy Department, Government of Sindh
- (xiv) Private Power and Infrastructure Board
- (xv) Punjab Power Development Board
- (xvi) Others



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NEPRA Asaan Approach

