NATIONAL TRANSMISSION & DESPATCH CO. LTD

General Manager (Technical)

No. GMT/NTDC/T-2(Tariff)/641-49 Dated: 23-09-2022

Shakil Ahmed
Additional Director,
Registrar office, NEPRA
Attaturk Avenue, G-5/1, Islamabad.

Subject: **SUBBMISSION OF INVESTMENT PLAN & LOSSES ASSESSMENT**

Ref:
i. NEPRA letter No. NEPRA/Consultant (RE/Tech)/LAT-01/9518 dated 09.06.2022
ii. NTDC letter No. CFO/NTDC/364-69 dated: 29.06.2022.
iii. NEPRA letter No. NEPRA/ADG(Trf)/TRF-100/17407 dated:15.09.2022.

With reference to the above-referred letter at [ii], it is apprised that due to the significant time involved in the conclusion of the determination of the prevailing Tariff Petition and its subsequent Motion for Leave for Review, NTDC is unable to follow the timelines as per guidelines.

In this regard, it is submitted that, in order to ensure NTDC's commitment in adherence to Authority's guidelines, the Company filed a Multiyear petition for three years i.e. FY 2019-20 to FY 2021-22. Similarly, the Company intends to file another Multiyear Tariff Petition for the next control period i.e. FY 2022-23 to FY 2024-25 which will hopefully close the gap in timelines.

In view of the above, please find annexed herewith the following 2 Nos. of information for the next tariff control period i.e. FY 2022-23 to FY 2024-25.

i. NTDC Transmission Investment Plan duly approved by BoD NTDC. **(Annex-A)**
ii. T&T Losses Assessment. **(Annex-B)**

This is issued with the approval of Dr. Rana Abdul Jabbar Khan, Managing Director NTDC.

DA / As Above:

NEPRA R & I Section
Morning Shift
Date: 26/9/22

23/09/2022
General Manager (Technical) NTDC

CC:
1. Managing Director, NTDC, 414-Wapda House, Lahore.
2. Dy. Managing Director (P&E) NTDC, 419-Wapda House, Lahore.
3. Dy. Managing Director (AD&M) NTDC, 435-Wapda House, Lahore.
4. Deputy Managing Director (SO) NPCC NTDC, NPCC Building, H-8/1, Islamabad.
5. General Manager (Power System Planning), NTDC, 4th Floor, PIA Tower, Lahore.
6. Chief Financial Officer (NTDC), 2nd Floor, Shaheen Complex, Lahore.
7. Chief Law Officer (NTDC), 2nd Floor, Shaheen Complex, Lahore.
8. Company Secretary (NTDC), 407-Wapda House, Lahore.

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NTDC TRANSMISSION INVESTMENT PLAN

FY 2023 – FY 2025

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1. BACKGROUND AND STATUORY PROVISIONS

Reference to the clause 6.2.(g) & 7.3.A.1. of NEPRA Guidelines for Determination of Revenue Requirement & Use of System Charges notified vide NEPRA/SAT-01/LAT-01/4781 & SRO 241 (I)/2017 dated 6th April 2017, NTDC is required to submit Approved Planning Documents and Assessment of Transmission Losses for next years.

NEPRA vide letter No. NEPRA/Consultant(RE/Tech)/LAT-01/9518 dated 09-06-2022 and subsequent correspondence thereof, has directed NTDC to submit following information for upcoming Tariff Control Period i.e. FY 2022-23, FY 2023-24, & FY 2024-25.

i. Transmission Investment Plan
ii. T&T Losses Assessment

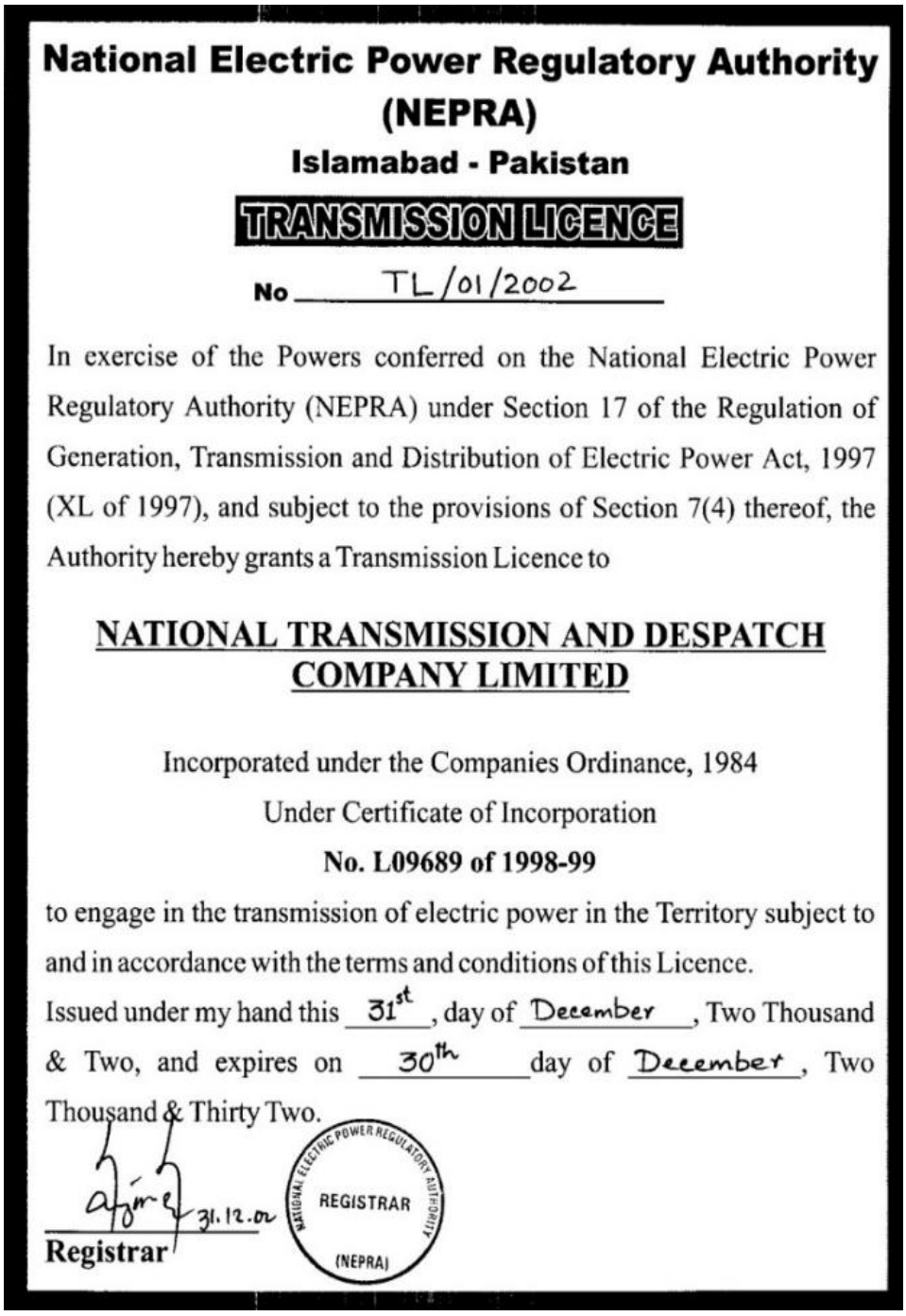
This submission is pursuant to the requirements laid down in Section 8.3 of the NEPRA Guidelines for determination of Revenue Requirement & Use of System Charges notified vide NEPRA/SAT-01/LAT-01/4781 & SRO 241 (I)/2017 dated 6th April 2017.

2. NTDC PROFILE

National Transmission and Despatch Company (NTDC) was incorporated on 6th November 1998 to plan, design, build, operate and maintain extra high-voltage electric power transmission system in Pakistan, and commenced its commercial operation on 1st March 1999. NEPRA granted Transmission License to NTDC vide No. T.L/01/2002 on 31st December 2002, shown in Figure 1.1, with the mandate to engage in the exclusive transmission business for a term of thirty years, pursuant to Section 17 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997.

NTDC is a public corporation established under the Companies Ordinance 1984 as an unlisted public company. The Government of Pakistan (GoP) is the majority and controlling shareholder of NTDC. The Ministry of Energy (MoE), the line ministry, is the agency within the Government charged with overseeing GOP's ownership of electricity sector entities including NTDC.

The transmission voltage as defined in the NTDC transmission license is 220 kV and above. NTDC is responsible for load forecasting, generation planning, expansion planning of the transmission network, prudent design of the transmission project, its development on ground, and operation and maintenance of the transmission network. NTDC currently acts as the transmission services provider, metering services provider and system planner for the power producers, DISCOs, and end users as well as it provides balancing services and interconnection services for the transmission network.



National Electric Power Regulatory Authority

(NEPRA)

Islamabad - Pakistan

TRANSMISSION LICENCE

No TL/01/2002

In exercise of the Powers conferred on the National Electric Power Regulatory Authority (NEPRA) under Section 17 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 (XL of 1997), and subject to the provisions of Section 7(4) thereof, the Authority hereby grants a Transmission Licence to

NATIONAL TRANSMISSION AND DESPATCH COMPANY LIMITED

Incorporated under the Companies Ordinance, 1984

Under Certificate of Incorporation

No. L09689 of 1998-99

to engage in the transmission of electric power in the Territory subject to and in accordance with the terms and conditions of this Licence.

Issued under my hand this 31st, day of December, Two Thousand & Two, and expires on 30th day of December, Two Thousand & Thirty Two.

31.12.02

Registrar

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY REGISTRAR (NEPRA)

2.1. CORE FUNCTIONS

As per License, NTDC performs two major functions i.e. Wire Business as well as System Operation and Despatch Services. The roles and responsibilities for each function include:

2.1.1. WIRE BUSINESS

The Wire Business of NTDC includes the following roles and responsibilities:

a) Operation and Maintenance of Transmission Assets
b) Project Development and Execution
c) Design and Engineering
d) Transmission and Generation Planning
e) Metering Service Provider

2.1.2. SYSTEM OPERATION BUSINESS

NTDCs' System Operation and Despatch function comprises the following:

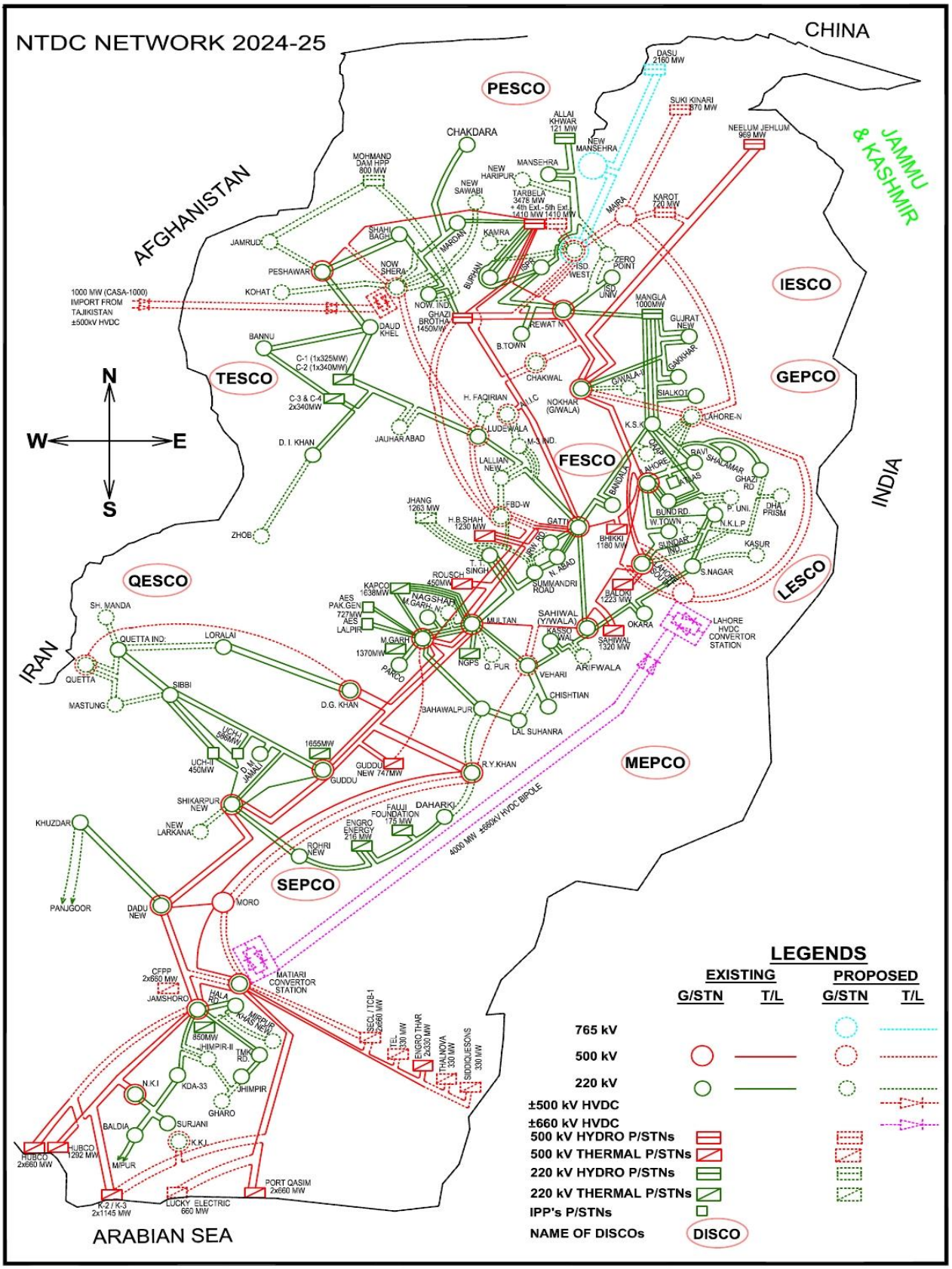
a) Economic Generation & Despatch
b) Power System Operation and Control

2.2. NTDC NETWORK STATISTICS AND FUTURE OUTLOOK

NTDC operates and maintains, as shown in table below, 18 Nos. 500 kV grid stations with total capacity of 27,260 MVA and 49 Nos. 220 kV grid stations with total capacity of 33,900 MVA, 8,388 km of 500 kV transmission line and 11,645 km of 220 kV transmission lines in Pakistan to evacuate power from an installed generation capacity of over 40,156 MW.

Further, by 2025, NTDC expects to expand its total transmission system length by upto 20% and total transformation capacity of its system by upto 48%.

Category	Grid Stations	Transmission Lines	Transformation Capacity
	Nos.	km	MVA
Existing System (2022)			
500 kV	18	8,388	27,260
220 kV	49	11,645	33,900
Total	**67**	**20,033**	**61,160**
Future System (2025)			
500 kV	25	10,276	37,410
220 kV	61	13,059.7	46,310
765 kV	2	509.3	6,000
±500 kV	1 (Converter Station)	113	1,576
Total	**89**	**23,958**	**91,296**

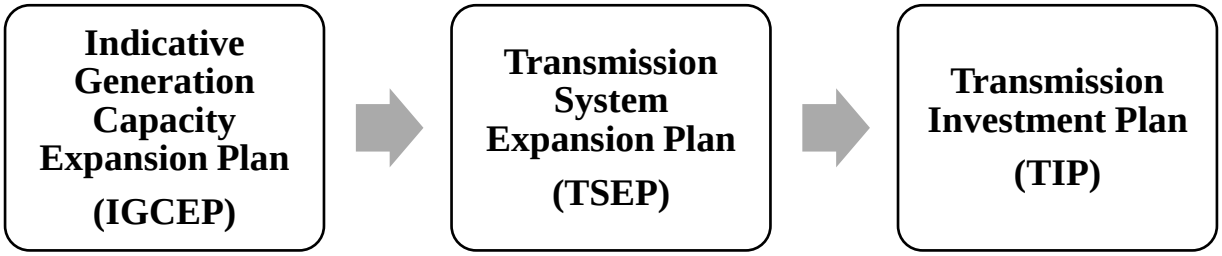

NTDC NETWORK 2024-25
CHINA
AFGHANISTAN
IRAN
INDIA
JAMMU & KASHMIR
ARABIAN SEA
PESCO
IESCO
GEPCO
FESCO
LESCO
MEPCO
SEPCO
TESCO
QESCO
DASU 2160 MW
SUKI KINARI 870 MW
NEELUM JEHLUM 969 MW
CHAKDARA
ALLAI KHWAR 121 MW
NEW MANSEHRA
MANSEHRA
MOHMAND DAM HPP 800 MW
NEW HARIPUR
NEW SAWABI
TARBELA 3478 MW + 4th Ext.- 5th Ext.- 1410 MW 1410 MW
MARA
KAROT 720 MW
JAMRUD
SHAHI BAGH
MARDAN
KAMRA
PESHAWAR
NOW SHERA
BUPHIAN
ISPR
ISD WEST
ZERO POINT
ISD UNIV
1000 MW (CASA-1000) IMPORT FROM TAJIKISTAN ±500kV HVDC
KOHAT
NOW. IND.
GHAZI BROTHA 1450MW
MANGLA 1000MW
GUJRAT NEW
REWAT N
B.TOWN
BANNU
DAUD KHEL
C-1 (1x325MW) C-2 (1x340MW)
C-3 & C-4 2x340MW
CHAKWAL
GUJRAT (GKKHAR)
G/WALA-II
SIALKOT
H. FAQIRIAN
NOKHAR (G/WALA)
LAHORE-N
K.S.K
D. I. KHAN
JAUHAR ABAD
LUDEWALA
M-3 IND.
LALLIAN NEW
RAVI
SHALAMAR
GHAZI RD
DHA PRISM
P. UNI.
BUND RD
W.TOWN
N.K.L.P
KASUR
S.NAGAR
JHANG 1263 MW
H.B.SHAH 1230 MW
FBD-W
GATTI
BHIKKI 1180 MW
SUNDAR IND.
ZHOB
T. T. SINGH
W. ABAD
SUMMANDRI ROAD
BALOKI 1223 MW
ROUSCH 450MW
KAPCO 1638MW
AES PAK GEN 727MW
AES LALPIR
NAGSHAH M.GARH-N
MULTAN
SAHIWAL (Y/WALA)
OKARA
SAHIWAL 1320 MW
KASSOWAL
LAHORE HVDC CONVERTOR STATION
SH. MANDA
QUETTA IND.
LORALAI
M.GARH
1370MW
NGPS
Q. PUR
VEHARI
ARIFWALA
QUETTA
SIBBI
MASTUNG
D.G. KHAN
CHISHTIAN
BAHAWALPUR
LAL SUHANRA
UCH-II 586MW
1655MW
UCH-I 450MW
P.M JAMALI
GUDDU
GUDDU NEW 747MW
R.Y.KHAN
SHIKARPUR NEW
NEW LARKANA
FAUJI FOUNDATION 175 MW
ENGRO ENERGY 216 MW
DAHARKI
KHUZDAR
ROHRI NEW
4000 MW ±660kV HVDC BIPOLE
PANJGOOR
DADU NEW
MORO
CFPP 2x660 MW
JAMSHORO
MATIARI CONVERTOR STATION
HALA RD
MIRPUR KHAS NEW
SCCL / TCP-1 2x660 MW
TEL 330 MW
ENGRO THAR 2x330 MW
THALNOVA 330 MW
SIDDIQUESONS 330 MW
850MW
JHIMPIR-II
TMK RD.
N.K.I
KDA-33
JHIMPIR
GHARO
BALDIA
SURJANI
K.K.I
HUBCO 2x660 MW
HUBCO 1292 MW
MPUR
K-2 / K-3 2x1145 MW
LUCKY ELECTRIC 660 MW
PORT QASIM 2x660 MW
N
W
E
S
LEGENDS
EXISTING
PROPOSED
G/STN
T/L
765 kV
500 kV
220 kV
±500 kV HVDC
±660 kV HVDC
500 kV HYDRO P/STNs
500 kV THERMAL P/STNs
220 kV HYDRO P/STNs
220 kV THERMAL P/STNs
IPP's P/STNs
NAME OF DISCOs
DISCO

3. NTDC TRANSMISSION INVESTMENT PLAN PROCESS

Pursuant to the regulatory framework, NTDC is mandated to produce the Transmission Investment Plan (TIP) as per the following criteria provided in the Grid Code:

> ***"A Detailed "Transmission Investment Plan" shall be prepared that is based on the "NTDC Twenty-Year Load Forecast", "Indicative Generation Capacity Expansion Plan (IGCEP or NTDC Plan)", and the Transmission System Expansion Plan (TSEP)" based on Annual System Reliability Assessment and Improvement Report (ASRAIR). The Plan shall be broken into several time periods. The Transmission Plan may be prepared for next one, three, five and ten years into the future."***

For preparing the NTDC Transmission Investment Plan, NTDC is required to study the financial, and security implications of a baseline scenario developed under NTDC TSEP to evacuate power from generation facilities proposed in the NTDC IGCEP. The general best practice process is as follows:



4. STATUS OF IGCEP AND NTDC TSEP

With the use of state-of-the-art generation planning and optimization tools, adherence to global best practices, NTDC has secured BoD approval for the IGCEP 2022 – 2031 and the same has been submitted to NEPRA on 20 September 2022 for review and approval.

Subsequently, Transmission System Expansion Plan (TSEP) Phase-I (2022 – 2026) based on the recently submitted IGCEP is in the process of internal approval and shall be submitted to NEPRA in the 1st week of October.

5. NTDC INVESTMENT PLAN (FY 2023 – FY 2025) AS APPROVED BY NTDC MANAGEMENT

NTDC is undertaking a huge amount (in surplus of 350 billion rupees) as investment in the coming years upto FY 2025 as per Board of Directors approved Development Budgets and Projects. These investments are categorized in the following project types:

1. Constraints Removal Projects
2. System Expansion Projects
3. Power Evacuation Projects
4. Projects for Special Economic Zones
5. Other Development Projects

The tabular detail of NTDC Transmission Investment Projects as per NEPRA's requirement is mentioned as Annexure. However, the enumeration of these projects is as follows:

5.1. CONSTRAINTS REMOVAL PROJECTS

Constraints Removal Projects	
1	Enhancement in Transformation Capacity of NTDC System by Extension and Augmentation of Existing Grid Stations
2	Extension/Augmentation at 500/220 kV Rawat Substation
3	Extension and Augmentation of existing 500kV and 220kV Grid Stations (New)
4	2nd source of supply to 220kV Jaranwala Road Substation
5	Construction of New 220kV Guddu-Uch-Sibbi Single Circuit Transmission Line for Improvement of Power Supply System in South Areas
6	Power Transmission Enhancement Project (Tranche-II) (SET)10 Sub projects (i) 9 Sub Projects of 500KV & 220KV S/S& T/Lines ADB Loan No. 2396-PAK
7	Power Transmission Enhancement Project Tranche-I (19 Sub Projects of 500/220 KV Sub Stations and T/ Lines) ADB Loan No. 2289 & 2290-PAK
8	220KV Transmission System Network Reinforcement in Islamabad & Burhan

5.2. EXPANSION PROJECTS TO REMOVE SYSTEM CONSTRAINTS

System Expansion Projects to Remove System Constraints	
9	220kV G/S & Allied T/L D.I Khan
10	220 KV G/S at Ghazi Road, Lahore with 220 KV D/C T/Line 132 KV Expansion System EDCF Loan No.PAK-2 & KFW
11	220 kV Nowshera S/S
12	220kV Arifwala Substation
13	220KV Chakdara S/S
14	220-KV Dera Ismail Khan - Zhob Transmission Line alongwith 220-KV Zhob Sub-Station.
15	220kV Dharki - Rahim Yar Khan - Bahawalpur D/C T/L
16	220kV Gujranwala-II Substation
17	220KV Head Faqirian G/S alongwith allied T/Ls.
18	220-kV Jamrud G/S alongwith allied T/Ls.
19	220-kV Jauharabad G/S alongwith allied T/Ls.
20	220kV Larkana Substation

21	220-kV Mastung G/S slongwtih allied T/Ls.
22	220kV Mirpur Khas G/S alongwith allied T/Ls
23	220Kv Sub Station Lalian
24	220kV Punjab University Grid Station
25	4 Nos New Projects to be financed by JBIC (i) 500 KV RY Khan G/S & T/L (ii)220 KV Chishtian T/L (iii) 220 KV Gujrat G/S & 220 KV T/L (iv) 220 KV Shalamar G/S & 220 KV T/L (4 Projects - JBIC Loan) (JICA Loan No. PK-58)
26	500 kV Vehari Grid Station
27	500/220kV Sialkot Substation
28	500kV Chakwal G/S alongwith allied T/Ls
29	500KV Faisalabad New (2x750)(Now 500KV Faisalabad West alongwith allied T/Ls)
30	500kV Islamabad West
31	500kV Lahore, North.
32	220kV Nag Shah Grid Station
33	500kV Ludewala G/S along with 500kV Nowshera-Ludewala-Faisalabad West D/C T/L
34	220 KV G/Station at Kassowal with 132 KV Expansion System (World Bank Loan No. 7565-Pk, Credit No. 4463-PK & 4464-PK)
35	New 220 KV G/Station at Khuzdar/220 kV Dadu - Khuzdar D/C T/Line JICA Loan No. PK-56
36	220-KV Kohat G/S alongwith allied T/Ls.
37	220-KV Kamra G/S alongwith allied T/Ls.

5.3.POWER EVACUATION PROJECTS

Power Evacuation Projects	
38	500kV HVAC T/Line for inter connection of HVDC Converter Station at Lahore with existing HVAC System.
39	500kV HVDC Transmission System between Tajikstan and Pakistan for Central Asia-South Asia Transmission Interconnection (CASA-1000)
40	Addition of 500/220KV Sub Station T/L for Strengthening the existing NTDC system i) 500KV Lahore New ii) 500KV Shikarpur iii) 220KV D.I.Khan (JICA-PK-61)
41	Evacuation of Power from 1224MW Wind Power Plants at Jhimpir Clusters
42	Evacuation of power from 1320MW Power Plant at Sahiwal
43	Evacuation of power from 2160MW Dasu HPP Stage-I
44	Evacuation of Power from Suki Kinari, Kohala, Mahal HPPs
45	Evacuation of Power from Tarbela 5th Extension.
46	Evacuation of power from wind power projects at Jhimpir and Gharo Wind Clusters
47	Interlinking of 765kV Mansehra with 220kV Mansehra

48	Evacuation of power from 816MW Mohmand Dam
49	500kV Ghazi Brotha-Faisalabad West T/L
50	220kV G/S Mansehra Tranche-III
51	3rd 500KV Jamshoro-Moro- R.Y Khan Single Circuit T/Line.Tranche-III
52	Inter-Connection- Thar Coal Based , 1200MW (Power Dispersal from 1200MW Thar Coal Power Plant - 500kV Thar - Matiari T/L & Matiari 500kV S/station)
53	Quaid-e-Azam Solar Park at Lal-Suhanra (Phase-II) Evacuation of 600 MW Solar (Proposed to be carried out by NTDC)
54	Transmission Scheme for Dispersal of power from Neelam-Jhelum, Karot and Azad Patan Hydro Power Project
55	Transmission Interconnection for Dispersal of Power From UCH-II Tranche-III
56	Evacuation of power from 1320MW Power Plant at Bin Qasim
57	Evacuation of power from 147MW Patrind HPP
58	Evacuation of Power from 1320 MW Hub Power Company Ltd.
59	Evacuation of Power from K2/K3 Nuclear Power near Karachi(In/Out of 500-KV Port Qasim to Matiari S/C and 500-KV Hub to Matiari S/C at K2/K3).
60	Evacuation of Power from 2x660 MW Thar Coal Based SSRL/SECL Power Plant at Thar
61	Evacuation of Power from 330 MW Siddiquesons Ltd.
62	Evacuation of Power from 660 MW from Lucky Electric Power Company Ltd.

5.4.PROJECTS FOR SPECIAL ECONOMIC ZONES

Projects for Special Economic Zones	
63	220/132 kV GIS Substation Dhabiji
64	220kV Haripur Substation
65	220kV Swabi Substation
66	220 kV Quaid-e-Azam Apparel and Business Park (QABP) Grid Station for Provision of Electricity to PIEDMC SEZ
67	500kV Allama Iqbal Industrial City for 600MW Demand of the Special Economic Zone in the FIEDMC area

5.5.OTHER DEVELOPMENT PROJECTS

Other Development Projects	
68	Feasibility study for enhancing the transmission capacity of NTDCs 500-KV Transmission System by applying series compensation
69	Improvement & Upgradation of Protection System to Avoid the Frequent Trippings in South Areas
70	Conversion from 220kV Substations at Bund Road, Kala Shah Kaku, Ravi and Nishatabad to GIS Technology
71	Installation of Pilot Battery Energy Storage System (BESS) at 220kV Jhimpir G/Station

72	Re-conductoring/Underground cabling of existing 220 kV Bund Road - NKLP D/C T/L (17 km)
73	Strengthening of TSG Centre for Grid System Operations and Maintenance.
74	Consultancy serivces for Feasibility Study of Solar Water Pumping in Balochistan area (NTDC) (Own Resources)
75	Enterprise Resource planning (ERP) (Now Implementation of Integrated Solution to improve Productivity and Control in NTDC by ERP System)
76	Upgradation/ Extension of NTDC's Telecommunication & SCADA System at NPCC
77	Installation of SVCs at 220kV Quetta Industrial
78	Provision of Secured Metering System at Delivery Point. (Local Bank)

6. NTDC INVESTMENT PLAN PROJECT PROFILES/BRIEFS

The Project Profiles/Briefs of all 78 Nos. projects in Section 5 are attached as Annexure.

7. NTDC HUMAN RESOURCE IMPROVEMENT PLAN

NTDC team comprises over 10,000 professionals stationed across the country and functioning in 39 departments, 20 job levels, 30 cadres (skill group) and 165 unique designations. Geographically, 129 locations are grouped in five regions. The Lahore region containing the head office constitute largest number of employees around 47%, whereas human resource in other regions include Islamabad 19%, Multan 13%, Hyderabad 16% and Quetta 5%.

Management to staff ratio is 11:89, and more than 76% are professional engineers at management level. Others include professionals from HR, Finance, audit, IT, Law, Environment, Media & PR and security streams

At present, NTDC HR is delivering on the following major functions:

a) Recruitment and selection of employees with the appropriate skills and competency profiles.
b) Posting job advertisements, sourcing candidates, screening applicants, conducting interviews and coordinating with user departments for final selection.
c) Ensure compliance with applicable labor laws and policies of the Company.
d) Managing compensation and benefits, terminal benefits and annual performance evaluation.
e) Property management.
f) Career development and succession planning.
g) Managing staff relations, employee welfare initiatives and disciplinary proceedings.

The budgeted amount on HR Training related functions over the period FY 2023 – 2025 are mentioned below:

Amounts in million Rs.

Sr. No.	Description	FY 2022-2023	FY 2023-2024	FY 2024-2025
1	**Budgeted Training Costs**	**148.2**	**163.02**	**179.322**
2	**Consultancy Costs for Capacity Building Trainings**	**25**	**30**	**36**

A brief detail on Learning and Development initiatives of NTDC HR for the period FY 2023 – 2025 is as follows:

Component	2022-2023	2023-2024	2024-2025
Mandatory Promotional Training	In-House Technical Mandatory Promotional Training (17 and Above) In-House all Mandatory Promotional Training (1 to 16) Clearing all backlog hindering promotions/ upgradation of officers and officials. Initiatives for developing Couse Contents as per requirement Leadership Trainings for Senior Management	In-House Technical Training for officers on revised/updated curriculum In-House Junior Management Course Technical Mandatory Trainings for other power sector entities Introduce competency based Mandatory trainings. Improvement of Mandatory Trainings Based on Feedback Analysis	Learning Management System for Mandatory Trainings Trainings through Gamification/Animation and Simulation Training Evaluation at Behavioral Level Linking TNA with ROTI MMC and SMC at State-of-the-Art best in the market training institute
Capacity Building Trainings, Seminars, Workshop etc.	Training Plan for Capacity Building of all officers	Framework for On-the- Job training	Functionalization of NTDC own Academy

	Nominations of officers in different recognized Institutions (Local or Abroad) Starting Train the Trainer concept Induction Training of all employees (Officers and Officials) Specialized Trainings on HVDC, CTBCM, ERP etc.	Formulating a pool of Internal Trainers. Specialized Trainings on HVDC, CTBCM, ERP etc. Initiatives for developing Couse Contents as per requirement Train Internal Trainers from Recognized institutions (Local or Abroad) Starting Capacity Building Program Through LMS	Structured and customized Professional Development Program Continuous Development Programs for professionals Advance development programs for professionals
Certification, Membership Etc.	Nominating officers for Certification from different institution. Sign MOU with Institutions like LUMS, NUST, IBA etc).	10 percent professionals will be certified from different Institutions. Membership of Training Institutes with International Libraries	20 percent professionals will be certified from different Institutions. Affiliation with Professional Bodies i.e HEC, IEEE, PEC UETs etc. Research Grants to the Professionals for Publications / Presentation of research paper
Training Infrastructure	Functionalization Of Regional Training Center	Establishment of New Training Center (Rawat, Multan etc.) Additional Classrooms in	Sate of the art Auditorium in all Training Centers

	Upgradation of existing Training Center Enhancing IT related Capabilities Dedicated Vehicles to Training Directorate Up-gradation of testing labs for research and educational purposes	existing training Centers. Fully Functional Libraries. Technical Arts tool and testing sets & equipment	Establishment of experimental and research Labs Establishment of Live line and Dead line infrastructure to be used as simulators for trainings. Fully Functional E-Training Module linked with LMS of ERP-HCM SAP Module

8. LOSSES IMPROVEMENT PLAN

NTDC has submitted a detailed T&T Losses Assessment Plan for FY 2023 – FY 2025, wherein the progress and timeline for a comprehensive Independent Consultant Study on T&T Losses has been submitted.

Upon the completion of study, NTDC shall submit a comprehensive and focused Losses Improvement Plan for quantifiable and definitive reduction in NTDC T&T Losses for the approval of Authority.

NTDC PROJECTS DETAIL OF INVESTMENTS

FY 2023 – FY 2025

National Transmission & Despatch Company

Investment Plan for 2022-23, 2023-24 and 2024-25

(Rs. in million)

Sr. No.	Name of Project	Approval Status	PC-I/Estimates Cost			Accumulated Expenditure upto June 2022			Progress (%) June-2022	Estimates 2022-23			Projection 2023-24			Projection 2024-25		
			Local	Foreign	Total	Local	Foreign	Total		Local	Foreign	Total	Local	Foreign	Total	Local	Foreign	Total
Constraints Removal Projects																		
1	Enhancement in Transformation Capacity of NTDC System by Extension and Augmentation of Existing Grid Stations	ECNEC 12.04.2017	4,539.00	11,987.00	16,526.00	154.58	4,942.25	5,096.83	15.0%	1,080.00	7,920.00	9,000.00	-	-	-	-	-	-
2	Extension/Augmentation at 500/220 kV Rawat Substation	CDWP 23.09.2014	216.00	733.00	949.00	788.98	6.14	795.12	100.0%	10.00	-	10.00	-	-	-	-	-	-
3	Extension and Augmentation of existing 500kV and 220kV Grid Stations (New)	PC-I under Approval	3,517.20	8,206.80	11,724.00	-	-	-	-	2,110.00	4,924.00	7,034.00	1,407.00	3,283.00	4,690.00	-	-	-
4	2nd source of supply to 220kV Jaranwala Road Substation	CDWP 09.06.2020	1,551.00	2,267.00	3,818.00	-	-	-	-	530.00	-	530.00	200.00	-	200.00	-	-	-
5	Construction of New 220kV Guddu-Uch-Sibbi Single Circuit Transmission Line for Improvement of Power Supply System in South Areas	ECNEC 24.11.2017	5,646.05	2,978.19	8,624.24	1,450.21	6,985.99	8,436.20	99.0%	100.00	437.50	537.50	100.00	-	100.00	25.00	-	25.00
6	Power Transmission Enhancement Project (Tranche-II) (SET)10 Sub projects (i) 9 Sub Projects of 500KV & 220KV S/S& T/Lines ADB Loan No. 2396-PAK	ECNEC 30.06.2012	11,710.00	13,330.00	25,040.00	8,706.87	14,604.67	23,311.54	Loralai G/S & T/L: 100% D.G.Khan G/S & T/L: 100%	100.00	-	100.00	-	-	-	-	-	-
7	Power Transmission Enhancement Project Tranche-I (19 Sub Projects of 500/220 KV Sub Stations and T/ Lines) ADB Loan No. 2289 & 2290-PAK	ECNEC 27.11.2006	4,503.00	8,114.00	12,617.00	7,479.62	9,861.65	17,341.27	100.0%	50.00	-	50.00	-	-	-	-	-	-
8	220KV Transmission System Network Reinforcement in Islamabad & Burhan	ECNEC 09.01.2016	1,855.00	1,684.00	3,539.00	496.33	61.97	558.30	52.0%	200.00	600.00	800.00	300.00	700.00	1,000.00	100.00	100.00	200.00

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			Local	Foreign	Total	Local	Foreign	Total		Local	Foreign	Total	Local	Foreign	Total	Local	Foreign	Total
System Expansion Projects to Remove System Constraints																		
9	220kV G/S & Allied T/L D.I Khan	ECNEC 09.12.2010	2,332.00	1,412.00	3,744.00	1,042.48	2,147.08	3,189.56	99.0%	320.00	-	320.00	-	-	-	-	-	-
10	220 KV G/S at Ghazi Road, Lahore with 220 KV D/C T/Line 132 KV Expansion System EDCF Loan No.PAK-2 & KFW	ECNEC 25.02.2005	1,325.00	1,267.00	2,592.00	2,522.36	3,328.35	5,850.71	100.0%	10.00	10.00	20.00	5.00	-	5.00	-	-	-
11	220 kV Nowshera S/S	ECNEC 02.06.2008	960.00	916.00	1,876.00	849.55	1,957.07	2,806.62	98.0%	300.00	-	300.00	-	-	-	-	-	-
12	220kV Arifwala Substation	PC-I under Approval	1,678.34	3,916.19	5,594.53	-	-	-	-	150.00	300.00	450.00	671.00	1,566.00	2,237.00	504.00	1,175.00	1,679.00
13	220KV Chakdara S/S	ECNEC 03.10.2014	2,480.00	1,917.00	4,397.00	1,862.13	2,273.08	4,135.21	99.0%	300.00	-	300.00	-	-	-	-	-	-
14	220-KV Dera Ismail Khan - Zhob Transmission Line alongwith 220-KV Zhob Sub-Station.	ECNEC 07.11.2016	3,784.51	3,094.00	6,878.51	5,336.18	7,686.31	13,022.49	T/L: 96.7% G/S: 14%	400.00	2,300.00	2,700.00	-	-	-	-	-	-
15	220kV Dharki - Rahim Yar Khan - Bahawalpur D/C T/L	ECNEC 02.10.2019	3,566.10	8,320.90	11,887.00	6.50	-	6.50	-	200.00	200.00	400.00	1,000.00	1,000.00	2,000.00	1,000.00	1,000.00	2,000.00
16	220kV Gujranwala-II Substation	Submitted to PC on 10.01.2020	2,838.90	6,624.10	9,463.00	105.77	-	105.77	Land Acq under process	50.00	-	50.00	300.00	500.00	800.00	500.00	1,000.00	1,500.00
17	220KV Head Faqirian G/S alongwith allied T/Ls.	ECNEC 15.07.2019	2,908.00	3,147.00	6,055.00	274.13	-	274.13	Land acquisition under process	40.00	10.00	50.00	600.00	900.00	1,500.00	500.00	1,000.00	1,500.00
18	220-kV Jamrud G/S alongwith allied T/Ls.	CDWP 19.10.2017	403.80	942.20	1,346.00	4.07	-	4.07	Land acquisition under process	1,000.00	-	1,000.00	400.00	600.00	1,000.00	400.00	600.00	1,000.00
19	220-kV Jauharabad G/S alongwith allied T/Ls.	CDWP 02.05.2018	1,203.00	1,758.00	2,961.00	190.20	-	190.20	3.0%	250.00	750.00	1,000.00	700.00	300.00	1,000.00	358.00	303.00	661.00
20	220kV Larkana Substation	CDWP 17.10.2019	1,483.20	3,460.80	4,944.00	-	-	-	-	100.00	50.00	150.00	519.00	1,211.00	1,730.00	512.00	1,195.00	1,707.00
21	220-kV Mastung G/S slongwtih allied T/Ls.	ECNEC 22.05.2018	1,433.10	3,345.90	4,779.00	92.29	-	92.29	-	100.00	300.00	400.00	706.00	1,672.00	2,378.00	527.00	1,230.00	1,757.00

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22	220kV Mirpur Khas G/S alongwith allied T/Ls	ECNEC 07.11.2016	2,002.00	1,855.00	3,857.00	229.09	206.89	435.98	12.0%	600.00	2,020.00	2,620.00	-	-	-	-	-	-
23	220Kv Sub Station Lalian	ECNEC 11.11.2011	646.00	935.00	1,581.00	1,322.96	2,298.45	3,621.41	G/S 93.3% T/L 92%	195.00	-	195.00	10.00	-	10.00	-	-	-
24	220kV Punjab University Grid Station	PC-I under preparation	754.20	1,759.80	2,514.00	-	-	-	-	5.00	5.00	10.00	339.00	792.00	1,131.00	227.00	528.00	755.00
25	4 Nos New Projects to be financed by JBIC (i) 500 KV RY Khan G/S & T/L (ii)220 KV Chishtian T/L (iii) 220 KV Gujrat G/S & 220 KV T/L (iv) 220 KV Shalamar G/S & 220 KV T/L (4 Projects - JBIC Loan) (JICA Loan No. PK-58)	ECNEC 27.10.2007	5,365.00	7,787.00	13,152.00	6,052.25	7,754.96	13,807.21	R.Y.Khan: 100% Shalamar 100% Vehari & Chistian 100% Gujrat 100%	300.00	-	300.00	30.00	-	30.00	-	-	-
26	500 kV Vehari Grid Station	PC-I under Approval	5,742.00	13,398.00	19,140.00	-	-	-	-	300.00	200.00	500.00	500.00	500.00	1,000.00	1,000.00	1,000.00	2,000.00
27	500/220kV Sialkot Substation	PC-I under Approval	4,200.00	9,800.00	14,000.00	-	-	-	Site selection under process	100.00	-	100.00	500.00	1,000.00	1,500.00	500.00	1,000.00	1,500.00
28	500kV Chakwal G/S alongwith allied T/Ls	CDWP 18.11.2019	3,323.85	5,602.54	8,926.39	474.00	-	474.00	2.0%	400.00	600.00	1,000.00	500.00	1,000.00	1,500.00	600.00	1,200.00	1,800.00
29	500KV Faisalabad New (2x750) (Now 500KV Faisalabad West alongwith allied T/Ls)	ECNEC 12.01.2015	3,688.73	5,690.77	9,379.51	3,804.24	9,467.41	13,271.65	500kV T/L: 100% 220kV T/L: 100% G/S: 98.9% (above progress is of phase 1 & only 1 line of 500 kV phase 2)	750.00	448.00	1,198.00	200.00	400.00	600.00	40.00	10.00	50.00
30	500kV Islamabad West	ECNEC 20.07.2016	3,621.00	4,667.00	8,288.00	-	-	-	Land under acquisition & Bids under evaluation	1,000.00	4,500.00	5,500.00	2,000.00	6,000.00	8,000.00	1,000.00	5,000.00	6,000.00
31	500kV Lahore, North.	ECNEC 24.11.2017	9,224.00	11,508.00	20,732.00	1,408.38	2,438.83	3,847.21	T/L 220kV: 44% 500kV: 38% G/S	1,500.00	5,000.00	6,500.00	100.00	-	100.00	-	-	-
32	220kV Nag Shah Grid Station	PC-I under preparation	1,573.47	3,671.43	5,244.90	-	-	-	-	5.00	5.00	10.00	629.00	1,469.00	2,098.00	551.00	1,285.00	1,836.00

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33	500kV Ludewala G/S along with 500kV Nowshera-Ludewala-Faisalabad West D/C T/L	PC-I under preparation	20,192.87	47,116.69	67,309.55	-	-	-	-	5.00	5.00	10.00	8,077.00	18,847.00	26,924.00	7,068.00	16,491.00	23,559.00
34	220 KV G/Station at Kassowal with 132 KV Expansion System (World Bank Loan No. 7565-Pk, Credit No. 4463-PK & 4464-PK)	ECNEC 25.02.2005	806.68	1,395.80	2,202.48	1,364.22	1,395.80	2,760.02	100.0%	200.00	-	200.00	-	-	-	-	-	-
35	New 220 KV G/Station at Khuzdar/220 kV Dadu - Khuzdar D/C T/Line JICA Loan No. PK-56	ECNEC 04.08.2006	4,380.00	4,160.00	8,540.00	9,183.23	2,939.18	12,122.41	100.0%	10.00	-	10.00	10.00	-	10.00	-	-	-
36	220-KV Kohat G/S alongwith allied T/Ls.	Submitted to PC on 22.11.2019	2,557.00	3,443.00	6,000.00	-	-	-	Land Acq under process	100.00	-	100.00	400.00	600.00	1,000.00	500.00	700.00	1,200.00
37	220-KV Kamra G/S alongwith allied T/Ls.	Submitted to PC on 22.11.2019	1,182.00	2,050.00	3,232.00					20.00	-	20.00	100.00	50.00	150.00	400.00	500.00	900.00

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			Local	Foreign	Total	Local	Foreign	Total		Local	Foreign	Total	Local	Foreign	Total	Local	Foreign	Total
	Power Evacuation Projects																	
38	500kV HVAC T/Line for inter connection of HVDC Converter Station at Lahore with existing HVAC System.	ECNEC 07.11.2016	2,185.00	2,621.00	4,806.00	6,638.23	-	6,638.23	100.0%	100.00	-	100.00	10.00	-	10.00	-	-	-
39	500kV HVDC Transmission System between Tajikstan and Pakistan for Central Asia-South Asia Transmission Interconnection (CASA-1000)	ECNEC 29.08.2019	16,053.00	30,751.00	46,804.00	3,147.36	19,296.11	22,443.47	Convertor Station 60% T/L 51.13%	2,050.00	11,950.00	14,000.00	800.00	5,000.00	5,800.00	-	-	-
40	Addition of 500/220KV Sub Station T/L for Strengthening the existing NTDC system i) 500KV Lahore New ii) 500KV Shikarpur iii) 220KV D.I.Khan (JICA-PK-61)	ECNEC 09.12.2010	13,342.00	10,975.00	24,317.00	8,403.16	15,982.92	24,386.08	Shikarpur: 100% Lahore New: 99% Overall: 98%	200.00	-	200.00	20.00	-	20.00	-	-	-
41	Evacuation of Power from 1224MW Wind Power Plants at Jhimpir Clusters	ECNEC 24.11.2017	6,047.16	4,705.45	10,752.61	6,590.94	-	6,590.94	100% (G/S) 100% (132 kV T/L) 100% (220 kV T/L)	3,000.00	-	3,000.00	100.00	-	100.00	20.00	-	20.00
42	Evacuation of power from 1320MW Power Plant at Sahiwal	ECNEC 31.08.2015	437.00	976.00	1,413.00	455.58	1,557.47	2,013.05	T/L: 100% G/S: 100%	20.00	-	20.00	-	-	-	-	-	-
43	Evacuation of power from 2160MW Dasu HPP Stage-I	ECNEC 01.10.2020	20,021.02	112,228.74	132,249.76	1,663.84	1,016.80	2,680.64	<1 % in bidding stage	1,860.00	8,870.00	10,730.00	4,544.00	22,187.00	26,731.00	4,544.00	22,187.00	26,731.00
44	Evacuation of Power from Suki Kinari, Kohala, Mahal HPPs	ECNEC 14.11.2018	35,815.00	44,115.00	79,930.00	3,601.44	764.60	4,366.04	26.3%	7,000.00	3,800.00	10,800.00	1,500.00	3,500.00	5,000.00	2,000.00	2,500.00	4,500.00
45	Evacuation of Power from Tarbela 5th Extension.	ECNEC 24.11.2017	2,049.00	2,019.00	4,068.00	46.04	-	46.04	4.0%	400.00	1,100.00	1,500.00	400.00	1,100.00	1,500.00	150.00	350.00	500.00
46	Evacuation of power from wind power projects at Jhimpir and Gharo Wind Clusters	ECNEC 03.07.2014	7,038.20	5,534.46	12,572.66	11,976.20	33.44	12,009.64	Jhimpir-I: 100% Gharo: (T/L completed)	200.00	300.00	500.00	300.00	700.00	1,000.00	193.00	554.00	747.00
47	Interlinking of 765kV Mansehra with 220kV Mansehra	PC-I under preparation	2,308.50	5,386.50	7,695.00	-	-	-	-	5.00	5.00	10.00	923.00	2,155.00	3,078.00	808.00	1,885.00	2,693.00
48	Evacuation of power from 816MW Mohmand Dam	PC-I under preparation	2,202.86	5,140.00	7,342.86	-	-	-	-	5.00	5.00	10.00	881.00	2,056.00	2,937.00	771.00	1,799.00	2,570.00

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49	500kV Ghazi Brotha-Faisalabad West T/L	PC-I under preparation	13,636.74	31,819.06	45,455.80	-	-	-	-	5.00	5.00	10.00	5,455.00	12,728.00	18,183.00	4,773.00	11,137.00	15,910.00
50	220kV G/S Mansehra Tranche-III	CDWP 07.04.2011	905.00	-	905.00	536.93	1,009.00	1,545.93	100.0%	300.00	-	300.00	-	-	-	-	-	-
51	3rd 500KV Jamshoro-Moro- R.Y Khan Single Circuit T/Line.Tranche-III	ECNEC 28.08.2013	17,400.28	19,834.05	37,234.33	10,446.98	11,841.84	22,288.82	100.0%	310.00	-	310.00	-	-	-	-	-	-
52	Inter-Connection- Thar Coal Based , 1200MW (Power Dispersal from 1200MW Thar Coal Power Plant - 500kV Thar - Matiari T/L & Matiari 500kV S/station)	ECNEC 16.08.2012	4,008.00	16,045.00	20,053.00	17,083.23	-	17,083.23	100.0%	42.00	-	42.00	-	-	-	-	-	-
53	Quaid-e-Azam Solar Park at Lal-Suhanra (Phase-II) Evacuation of 600 MW Solar (Proposed to be carried out by NTDC)	ECNEC 12.02.2014	2,160.53	1,905.20	4,065.73	2,424.52	-	2,424.52	100.0%	28.00	-	28.00	-	-	-	-	-	-
54	Transmission Scheme for Dispersal of power from Neelam-Jhelum, Karot and Azad Patan Hydro Power Project	ECNEC 02.03.2015	10,425.00	11,272.00	21,697.00	21,054.21	-	21,054.21	Ph-I: 100% Ph-II: 97% Karot: 100%	200.00	-	200.00	-	-	-	-	-	-
55	Transmission Interconnection for Dispersal of Power From UCH-II Tranche-III	ECNEC 29.07.2011	1,133.00	1,197.00	2,330.00	324.67	2,024.84	2,349.51	100.0%	30.00	-	30.00	-	-	-	-	-	-
56	Evacuation of power from 1320MW Power Plant at Bin Qasim	ECNEC 13.05.2015	5,955.00	7,022.00	12,977.00	9,868.82	-	9,868.82	Ph-I: 100% Ph-II: 100%	50.00	-	50.00	-	-	-	-	-	-
57	Evacuation of power from 147MW Patrind HPP	CDWP 27.01.2015	617.00	349.00	966.00	659.70	-	659.70	Ph-I 100% Ph-II 100%	25.00	-	25.00	-	-	-	-	-	-
58	Evacuation of Power from 1320 MW Hub Power Company Ltd.	ECNEC 07.11.2016	8,482.00	7,933.00	16,415.00	22,010.75	-	22,010.75	100.0%	650.00	-	650.00	-	-	-	-	-	-
59	Evacuation of Power from K2/K3 Nuclear Power near Karachi(In/Out of 500-KV Port Qasim to Matiari S/C and 500-KV Hub to Matiari S/C at K2/K3).	ECNEC 12.04.2017	3,061.00	2,621.00	5,682.00	12,076.97	-	12,076.97	Hub-Jamshoro : 100% Port Qasim - Matiari : 58.1%	480.00	-	480.00	-	-	-	-	-	-
60	Evacuation of Power from 2x660 MW Thar Coal Based SSRL/SECL Power Plant at Thar	ECNEC 12.04.2017	10,303.00	11,480.00	21,783.00	7,468.91	-	7,468.91	34.4%	6,000.00	-	6,000.00	-	-	-	-	-	-
61	Evacuation of Power from 330 MW Siddiquesons Ltd.	CDWP 30.01.2020	817.00	1,537.00	2,354.00	35.62	-	35.62	100% (interim arrangement already completed)	10.00	-	10.00	-	-	-	-	-	-
62	Evacuation of Power from 660 MW from Lucky Electric Power Company Ltd.	CDWP 03.03.2020	564.00	751.00	1,315.00	1,025.43	-	1,025.43	100.0%	100.00	-	100.00	-	-	-	-	-	-

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Projects for Special Economic Zones																		
63	220/132 kV GIS Substation Dhabiji	CDWP 16.12.2020	1,525.02	2,731.28	4,256.30	43.00	-	43.00	3.0%	1,800.00	-	1,800.00	2,200.00	-	2,200.00	150.00	-	150.00
64	220kV Haripur Substation	CDWP 30.01.2020	1,378.00	2,428.00	3,806.00	125.00	-	125.00	3.0%	1,800.00	-	1,800.00	1,500.00	-	1,500.00	300.00	-	300.00
65	220kV Swabi Substation	CDWP 17.10.2019	2,581.80	3,818.04	6,399.84	385.91	-	385.91	4.0%	2,500.00	-	2,500.00	3,000.00	-	3,000.00	500.00	-	500.00
66	220 kV Quaid-e-Azam Apparel and Business Park (QABP) Grid Station for Provision of Electricity to PIEDMC SEZ	CDWP 19.04.2021	1,809.00	1,819.00	3,628.00	-	-	-	-	1,800.00	-	1,800.00	1,500.00	-	1,500.00	500.00	-	500.00
67	500kV Allama Iqbal Industrial City for 600MW Demand of the Special Economic Zone in the FIEDMC area	CDWP 25.05.2021	1,989.00	4,212.00	6,201.00	-	-	-	-	1,800.00	-	1,800.00	3,000.00	-	3,000.00	1,240.00	-	1,240.00

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Other Development Projects																		
68	Feasibility study for enhancing the transmission capacity of NTDCs 500-KV Transmission System by applying series compensation	CDWP 14.01.2016	26.35	106.83	133.18	67.61	-	67.61	40.0%	52.00	-	52.00	-	-	-	-	-	-
69	Improvement & Upgradation of Protection System to Avoid the Frequent Trippings in South Areas	CDWP 31.12.2018	232.00	655.00	887.00	36.89	1,053.84	1,090.73	92.0%	-	25.00	25.00	-	-	-	-	-	-
70	Conversion from 220kV Substations at Bund Road, Kala Shah Kaku, Ravi and Nishatabad to GIS Technology	ECNEC 07.03.2017	2,525.00	3,159.00	5,684.00	-	70.26	70.26	2.0%	500.00	1,000.00	1,500.00	100.00	100.00	200.00	-	-	-
71	Installation of Pilot Battery Energy Storage System (BESS) at 220kV Jhimpir G/Station	CDWP 25.05.2018	113.06	827.38	940.44	1.58	-	1.58	5.0%	200.00	600.00	800.00	-	-	-	-	-	-
72	Re-conductoring/Underground cabling of existing 220 kV Bund Road - NKLP D/C T/L (17 km)		1,426.00	2,139.00	3,565.00	-	-	-	-	350.00	1,350.00	1,700.00	-	-	-	-	-	-
73	Strengthening of TSG Centre for Grid System Operations and Maintenance.	CDWP 21.02.2015	290.00	651.00	941.00	92.92	821.64	914.56	99.0%	2.00	-	2.00	-	-	-	-	-	-
74	Consultancy serivces for Feasibility Study of Solar Water Pumping in Balochistan area (NTDC) (Own Resources)	CDWP 04.07.2019	124.60	29.80	154.40	91.11	-	91.11	Work completed on 30.06.2021	-	-	-	5.00	-	5.00	-	-	-
75	Enterprise Resource planning (ERP) (Now Implementation of Integrated Solution to improve Productivity and Control in NTDC by ERP System)	CDWP 19.03.2018	1,192.47	1,390.61	2,583.08	18.39	238.93	257.32	27.0%	299.00	1,526.00	1,825.00	-	-	-	-	-	-
76	Upgradation/ Extension of NTDC's Telecommunication & SCADA System at NPCC	ECNEC 07.03.2018	3,172.00	8,466.00	11,638.00	-	3,571.03	3,571.03	15.0%	1,000.00	5,000.00	6,000.00	800.00	4,000.00	4,800.00	-	-	-
77	Installation of SVCs at 220kV Quetta Industrial	PC-I under preparation	1,573.47	3,671.43	5,244.90	-	-	-	-	5.00	5.00	10.00	629.00	1,469.00	2,098.00	472.00	1,101.00	1,573.00
78	Provision of Secured Metering System at Delivery Point. (Local Bank)	ECNEC 04.08.2005	493.00	513.00	1,006.00	1,035.14	-	1,035.14	100.0%	110.00	-	110.00	-	-	-	-	-	-

Totals	PC-I/Estimates Cost			Accumulated Expenditure upto June 2022			Progress (%) June-2022	Estimates 2022-23			Projection 2023-24			Projection 2024-25		
	Local	Foreign	Total	Local	Foreign	Total		Local	Foreign	Total	Local	Foreign	Total	Local	Foreign	Total
	336,609.05	589,095.94	925,704.99	204,637.65	139,638.80	344,276.45		48,178.00	66,125.50	114,303.50	47,970.00	97,385.00	145,355.00	32,733.00	76,830.00	109,563.00

NTDC PROJECTS PROFILES/BRIEFS

FY 2023 – FY 2025

Project Sr. No. 1

1.	Name of Project	**Enhancement in Transformation Capacity of NTDC System by Extension and Augmentation of Existing Grid Stations**
2.	Location	Sindh, Balochistan & Southern Punjab
3.	Scope in Brief / Objectives	• Augmentation Works at 500 kV Multan New G/S (03x160 MVA to 03x250 MVA autotransformers) • 220 kV Vehari G/S (02x160 MVA to 02x250 MVA autotransformers) • Augmentation Works at 220 kV Shikarpur G/S (02x160 MVA to 02x250 MVA autotransformers) • Augmentation Works at 220 kV Quetta Industrial G/S (2x160 MVA to 2x250 MVA auto-transformers • Extension works at 220 kV Rohri G/S (1x250 MVA) • Augmentation works at 220 kV Daharki G/S (1x160 MVA to 1x250 MVA) • Augmentation works at 220 kV Bahawalpur G/S (1x160 MVA to 1x250 MVA) • Extension works at 220 kV Sibbi G/S (1x160 MVA) • Extension works at 220 kV Loralai G/S (1x250 MVA) • Augmentation works at 220 kV T.M Khan Road G/S (2x160 MVA to 2x250 MVA) • Augmentation works at 220 kV Hala Road G/S (2x160 MVA to 2x250 MVA) • Extension works at 500 kV Jamshoro G/S (1x160 MVA) As a result of this project, about 1,050 MVA (500/200 kV) & 6,096 MVA (220/132 kV) capacity will be added in the system at 28 existing 500 kV & 220 kV Grid Stations of NTDC system which will help to meet the power demand of the country in minimum possible time period as well as the system losses will also be reduced 37.6 MW.
4.	Category	Power Evacuation System Reliability ✓ **System Constraints**
5.	Type	✓ **Extension** ✓ **Augmentation** Development
6.	Funding:	World Bank
7.	Approval Forum	ECNEC (12.04.2017)
8.	Commencement Date	Multan & Vehari: 31-03-2021 Shikarpur: 04-08-2021 Quetta Industrial: 30-07-2021 Rohri, Daharki &Bahawalpur: 13-08-2021 Sibbi & Loralai: 20-09-2021 T.M.Khan, Hala Road & Jamshoro: 27-09-2021
9.	Actual Completion date	Multan & Vehari: 30-11-2022 Shikarpur: 04-02-2023 Quetta Industrial: 30-11-2022 Rohri, Daharki &Bahawalpur: 13-02-2023 Sibbi & Loralai: 27-03-2023 T.M.Khan, Hala Road & Jamshoro: 27-03-2023
10.	Physical progress:	
	Physical progress (major works done):	Multan & Vehari • Design/Drawings under approval (90% completed). • Geo Technical Investigation & Non-Destructive Testing carried out. • Augmentation of 01 No. Auto-Transformer (T-4) at Multan G/S has been completed & energized on 14-08-2022. Whereas, shutdown for augmentation of 2nd No. Auto-Transformer (T-5) has been applied from 25-08-2022 to 14-09-2022. Shikarpur

1.	Name of Project	**Enhancement in Transformation Capacity of NTDC System by Extension and Augmentation of Existing Grid Stations**
		• Design/Drawings under approval (82% completed). • Geo Technical Investigation & Non-Destructive Testing carried out. • Civil Design approved. Civil works are expected to commence in August-2022. <u>Quetta Industrial</u> • Design/Drawings under approval (95% completed). • Geo Technical Investigation & Non-Destructive Testing carried out. • Contractor mobilized at site. Civil works have been carried out. <u>Rohri, Daharki &Bahawalpur</u> • Design/Drawings under approval (95% completed). • Geo Technical Investigation & Non-Destructive Testing at Daharki & Bahawalpur carried out. • Contractor mobilized at Daharki & Bahawalpur site. • Civil works have been commenced at Daharki site. <u>Sibbi & Loralai</u> • Design/Drawings under approval (90% completed). • Geotechnical investigation has been carried out & civil design approved. <u>T.M.Khan, Hala Road & Jamshoro</u> • Design/Drawings under approval (90% completed). Geo Technical Investigation & Non-Destructive Testing carried out.
	Physical completion (in %age terms):	---
11.	Outcomes / Benefits of the project after completion	The enhancement of transformation capacity of NTDC system by installation of additional transformers & augmentation of transformers at various grid stations has been prepared for optimal utilization of existing grid stations to provide relief to overloaded transformers and to enhance the transformation capacity of NTDC system to meet the growing power demand of DISCOs.

Project Sr. No. 2

1.	Name of Project	**Extension/Augmentation at 500/220 kV Rawat Substation**
2.	Location	Punjab
3.	Scope in Brief / Objectives	1 x 750 MVA T/F at Rawat 500/220 kV substation The project will help in reduction of overall loading of transformers and will help increasing of overall power transfer capability of 500/220 kV Rawat Grid station.
4.	Category	• Power Evacuation • System Reliability • System Constraints
5.	Type	• Extension • Augmentation • Development
6.	Funding:	Asian Development Bank (ADB)
7.	Approval Forum	CDWP
8.	Commencement Date	23-06-2018
9.	Actual Completion date	05-04-2019
10.	Physical progress:	
	Physical progress (major works done):	Project completed. Retention money is pending.
	Physical completion (in %age terms):	100%
11.	Outcomes / Benefits of the project after completion	• The project will help in reduction of overall loading of transformers at 500/220 kV Grid Station Rawat. • The project will help increasing of overall power transfer capability of 500/220 kV Rawat grid station. • It will also help in improvement of overall voltage profile at/around Rawat grid station and grid station in adjacent areas.

Project Sr. No. 3

1.	Name of Project	**Addition & Augmentation of 500 kV and 220 kV Transformers at the existing Grid Stations for Removal of NTDC System Constraints**
2.	Location	Sindh & Punjab
3.	Scope in Brief / Objectives	• Addition of 500/220 kV 1x450 MVA transformer at 500 kV Dadu substation. • Addition of 500/220 kV 1x750 MVA transformer at 500 kV Faisalabad West substation. • Addition of 500/220 kV 1x600 MVA transformer at 500 kV Lahore (Sheikhpura) substation. • Addition of 500/220 kV 1x450 MVA transformer at 500 kV Multan substation. • Addition of 220/132 kV 1x250 MVA transformer at 500 kV Rahim Yar Khan Substation. • Augmentation of 220/132 kV transformers from 2x160 MVA to 2x250 MVA capacity at 500 kV Guddu substation. **The proposed scheme for installation of additional transformers & augmentation of existing transformers at various grid stations has been prepared for optimal utilization of existing grid stations to provide relief to overloaded transformers and to enhance the transformation capacity of NTDC system to meet the growing power demand of DISCOs. As a result of implementation of the proposed project, about 2,250 MVA (500/200 kV) & 430 MVA (220/132 kV) capacity will be added in the system at 06 existing 500 kV Grid Stations of NTDC system which will help to meet the power demand of the country in minimum possible time period as well as the system losses will also be reduced by 22.2 MW.**
4.	Category	Power Evacuation System Reliability ✓ **System Constraints**
5.	Type	✓ **Extension** ✓ **Augmentation** Development
6.	Funding:	Asian Development Bank (ADB)
7.	Approval Forum	ECNEC
8.	Commencement Date	Nov 2023 as per PC-I
9.	Actual Completion date	July 2025 as per PC-I
10.	Physical progress:	
	Physical progress (major works done):	PC-I under approval
	Physical completion (in %age terms):	PC-I under approval
11.	Outcomes / Benefits of the project after completion	• Increase in the available system capacity to meet future load growth. • Reduction in overloading of existing 500/220 kV & 220/132 kV transformers of NTDC system. • Improvement in reliability of NTDC system • Increase in power flow by 686.9 MW. • Reduction in transmission losses by 22.2 MW. • Increase in NTDC Transformation Capacity by 2680 MVA

Project Sr. No. 4

1.	Name of Project	**2nd Source of Supply to 220kV Jaranwala Road Substation**
2.	Location	Faisalabad, Punjab
3.	Scope in Brief / Objectives	220 kV Jaranwala-Sammundari Road T/L (Including U/G Cable Portion) – approx. 40 km
4.	Category	✓ **System Reliability**
5.	Type	✓ **Development**
6.	Funding:	NTDC's Own Resources
7.	Approval Forum	CDWP
8.	Commencement Date	N/A
9.	Actual Completion date	N/A
10.	Physical progress:	
	Physical progress (major works done):	Transmission Line • Tender No. TLE-01-2021 was floated in October-2021 and was scrapped due to non-participation of bidders. • Re-tendering will be carried out accordingly.
	Physical completion (in %age terms):	1%
11.	Outcomes / Benefits of the project after completion	• Enhance transmission capacity of NTDC system.

Project Sr. No. 5

1.	Name of Project	**Construction of New 220kV Guddu-Uch-Sibbi Single Circuit Transmission Line for Improvement of Power Supply System in South Areas**
2.	Location	Sindh & Balochistan
3.	Scope in Brief / Objectives	• 220kV Guddu to Interconnection point of 220kV Shikapur (108.4 km) • 220kV Shikarpur Interconnection point to Uch Power House (92.6km) • Uch Power House to 220kV Sibbi Substation (115 km) The main objective of this project is to strengthen the transmission line network in Balochistan, the least electrified province in Pakistan, in order to meet the demand for electric power which has been rapidly increasing in that province and to enhance the reliability of power facilities thus contributing to the development of the local economy and the stabilization of the people's livelihood.
4.	Category	Power Evacuation ✓ **System Reliability** System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	Asian Development Bank (ADB)
7.	Approval Forum	ECNEC (24.11.2017)
8.	Commencement Date	Lot-II: 09-07-2019 Lot-III: 26-06-2019 Lot-IV: 26-06-2019
9.	Actual Completion date	Lot-II: 31-08-2022 (subject to availability of shutdown) Lot-III: 23-03-2022 Lot-IV: 28-02-2022
10.	Physical progress:	
	Physical progress (major works done):	**LOT-II (Guddu-Shikarpur section)** • Concrete: 327/ 327 No. • Erection: 327 / 327 No. • Stringing: 109.6 /110 km **DC Hi-Pot test of 220 kV T/Line has been successfully carried out by TSG (S) NTDC on dated 13.04.2022 & 14.04.2022;** **LOT-III (Shikarpur-Uch section)** • Concrete: 277/277 No. • Erection: 277/277 No. • Stringing: 92.74/92.74 km **Completed & successfully energized on Load dated 23.03.2022'.** **LOT-IV (Uch-Sibbi section)** • Concrete: 341/ 341 No. • Erection: 341 / 341 No. • Stringing: 115/115 km **108 km of 220kV T/L UCH-II-Sibbi Circuit-I & II has been completed & successfully energized on Load dated 28/02/2022. Remaining 07 km portion energized on 18/06/2022 & 25/06/2022'.**
	Physical completion (in %age terms):	99%
11.	Outcomes / Benefits of the project after completion	• Stable and un-interrupted power supply to Balochistan & Sindh province. • Reduction in operational problems & system constraints. • Enhancement in transmission line capacity by installation of twin bundled configuration enabling utilization of full capacity of Uch Power Plants.

Project Sr. No. 6

1.	Name of Project	**Power Transmission Enhancement Project (Tranche-II) (SET)10 Sub projects (i) 9 Sub Projects of 500KV & 220KV S/S& T/Lines ADB Loan No. 2396-PAK**
2.	Location	Balochistan & Punjab
3.	Scope in Brief / Objectives	The main objective of the project is enhancement in the Power Transmission system by extension, augmentation and expansion of existing 500kV and 220kV transmission system of NTDC to meet the requirements of growth of power demand in the country. It is not only to strengthen the existing transmission system but also to help evacuate additional power from IPPs. 220kV Loralai G/S & T/Lines 220/132kV, 2x250MVA Auto-transformer 220 kV D/C Twin Bundle D.G Khan - Loralai Transmission Line (227km) 500kV D.G.khan G/Station & T/Lines 500/220 kV, 2x600MVA ATB 220/132 kV, 2x250MVA ATF In & Out arrangement of 500kV Guddu-Multan 1st Circuit at 500kV D.G Khan Substation (26km)
4.	Category	Power Evacuation ✓ **System Reliability** System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	Asian Development Bank
7.	Approval Forum	ECNEC 30.06.2012
8.	Commencement Date	220kV Loralai G/S & T/L G/S: 14.03.2011 , T/L: 17.09.2010 500kV D.G.Khan G/S & T/L G/S: 19.03.2012 , T/L: 16.08.2011
9.	Actual Completion date	220kV Loralai G/S & T/L: 03.08.2014 500kV D.G.Khan G/S & T/L: G/S: 26.07.2014 ; T/L: 25.04.2014
10.	Physical progress:	
	Physical progress (major works done):	Completed & Energized
	Physical completion (in %age terms):	100%
11.	Outcomes / Benefits of the project after completion	220kV Loralai G/S & T/L • Reduction in the loading of 220/132kV transformers feeding QESCO load center. • Reduction in transmission line losses. • Better voltage control. • Improvement in system reliability of NTDC network feeding QESCO load center. 500kV D.G.Khan G/S & T/L • Enhancement of 500/220kV transmission network. • Reduction in transmission line losses. • Better voltage control. Improvement in reliability of NTDC system.

Project Sr. No. 7

1.	Name of Project	**Power Transmission Enhancement Project Tranche-I (19 Sub Projects of 500/220 KV Sub Stations and T/ Lines) ADB Loan No. 2289 & 2290-PAK** • Augmentation Work At 220kv New Kot Lakhpat Lahore • Extension Work At 220kv Bhawalpur Grid Station • Extension Work At 220kv Yousufwala Grid Station • Extension Work At 220kv Hala Road Grid Station Extension Work At 500kv Multan Grid Station
2.	Location	Sindh & Punjab
3.	Scope in Brief / Objectives	Kotlakhpat: Augmentation of 3x160 MVA with 3x250 MVA 'ATF' Bahawalpur: Addition of 1x160 MVA 'ATF' Yousufwala: Addition of 1x160 MVA 'ATF' Hala Road: Addition of 1x160 MVA 'ATF' Multan: Addition of 3x160 MVA 'ATF' The main objective of the project is to enhance the transformation capacity at different NTDC Grid Stations which will help to meet the power demand of the country as well as the system losses will also be reduced.
4.	Category	Power Evacuation System Reliability ✓ **System Constraints**
5.	Type	✓ **Extension** ✓ **Augmentation** Development
6.	Funding:	ADB
7.	Approval Forum	ECNEC 27.11.2006
8.	Commencement Date	Extension at Bahawalpur: 20-05-2008 Extension at Yousufwala: 01-07-2008 Extension at Hala Road: 20-05-2008 Augmentation at Kotlakhpat: June-2008 Extension at Multan: 09-05-2009
9.	Actual Completion date	Extension at Bahawalpur: 06-09-2009 Extension at Yousufwala: 15-12-2009 Extension at Hala Road: 05-10-2009 Augmentation at Kotlakhpat: 27-04-2011 Extension at Multan: 18-06-2010
10.	Physical progress:	
	Physical progress (major works done):	Completed & Energized
	Physical completion (in %age terms):	100%
11.	Outcomes / Benefits of the project after completion	The enhancement of transformation capacity of NTDC system by installation of additional transformers & augmentation of transformers at various grid stations prepared for optimal utilization of existing grid stations to provide relief to overloaded transformers and to enhance the transformation capacity of NTDC system to meet the growing power demand of DISCOs.

Project Sr. No. 8

1.	Name of Project	**220KV Transmission System Network Reinforcement in Islamabad & Burhan**
2.	Location	Punjab
3.	Scope in Brief / Objectives	• Replacement of existing 220 kV Tarbela - Burhan D/C Transmission line with a new line on twin bundled Rail conductor (35.). The main objective of the project is to help ease the stress on the Tarbela-Burhan-ISPR transmission line and will help create sufficient margin to meet future load growth. It will also help in evacuation of power from Tarbela 4th (1410 MW) and will help in voltage Profile improvement of IESCO region
4.	Category	✓ **Power Evacuation** ✓ **System Reliability** System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	JICA
7.	Approval Forum	ECNEC
8.	Commencement Date	---
9.	Actual Completion date	2024-25
10.	Physical progress:	
	Physical progress (major works done):	Land • .N/A Grid Station • N/A Transmission Line **Package-I (Procurement of transmission line material)** • **JICA vide letter No. JICA/July-28001/Projects dated 28-07-2022 has conveyed its concurrence for scraping of tenders and initiation of retendering process for procurement of material.** • **Higher management of NTDC has been approached for approval of crapping of tenders and initiation of retendering process.** **Package-II (construction of transmission line)** • JICA has advised NTDC to go for rebidding process. • Revised bidding documents are under preparation with consultant. The process for re-bidding of Package-II will be initiated subject to maturity of Package-I.
	Physical completion (in %age terms):	52%
11.	Outcomes / Benefits of the project after completion	• The stress on the Tarbela-Burhan-ISPR transmission line will reduce which will help create sufficient margin to meet future load growth. • It will also help in evacuation of power from Tarbela 4th (1410 MW). • Improvement in reliability of NTDC 220 kv network around IESCO. • Reduction transmission line losses • The project will help in voltage Profile improvement of IESCO region.

Project Sr. No. 9

1.	Name of Project	**220kV G/S & Allied T/L D.I Khan**
2.	Location	KPK
3.	Scope in Brief / Objectives	• 2 x 250 MVA 220/132kV Auto Transformer, • 220kV Line Bays 02 Nos • 132kV Line Bays 06 Nos. This project aims the installation of new 220 kV substation at D.I Khan to meet the upcoming load demand & voltage Profile improvement of PESCO Region
4.	Category	Power Evacuation ✓ **System Reliability** System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	Asian Development Bank (ADB)
7.	Approval Forum	ECNEC (24.11.2017)
8.	Commencement Date	06.11.2016
9.	Actual Completion date	Grid Station: 18-02-2019 T/Lines: 18-02-2019
10.	Physical progress:	
	Physical progress (major works done):	• Project completed and commissioned, retention money pending. NOA for construction of Residential Colony issued on 15-02-2022 (18 months completion period) and Contract made effective on 14-03-2022.
	Physical completion (in %age terms):	Grid Station: 100% Transmission Line: 100%
11.	Outcomes / Benefits of the project after completion	• Improvement of Power Supply Position at/around 220 kV D.I Khan G/S. • Increase in the system capacity to meet future load demand of the area. • Improvement in voltage profile of existing 132 kV grid station in the vicinity of D.I Khan. • Reduction in transmission system losses. • Improvement in reliability of NTDC and PESCO system networks.

Project Sr. No. 10

1.	Name of Project	**220 KV G/S at Ghazi Road, Lahore with 220 KV D/C T/Line 132 KV Expansion System EDCF Loan No.PAK-2 & KFW**
2.	Location	Punjab
3.	Scope in Brief / Objectives	**Grid Station** • 3x160MVA, 220/132 kV Auto Transformer **Transmission Line** 220 kV D/C T/B NKLP – Sarfraz Nager T/Line in/out at 220 kV Ghazi Road G/Station (30 KM)
4.	Category	Power Evacuation ✓ **System Reliability** System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	KFW
7.	Approval Forum	ECNEC
8.	Commencement Date	G/Station: 02.07.2015 T/Line: 07.05.2015
9.	Actual Completion date	G/Station: 18.04.2019 T/Line: 25.02.2020
10.	Physical progress:	
	Physical progress (major works done):	Completed & Energized
	Physical completion (in %age terms):	100%
11.	Outcomes / Benefits of the project after completion	Fulfilment of load demand of Lesco region. Improve voltage profile of Lesco region. Enhance transmission capacity of system.

Project Sr. No. 11

1.	Name of Project	**220 kV Nowshera S/S**
2.	Location	KPK
3.	Scope in Brief / Objectives	• 3 x 250 MVA 220/132kV Auto Transformer, • 220kV Line Bays 02 Nos. • 132kV Line Bays 06 Nos. This project aims the installation of new 220 kV substation at Nowshera to meet the upcoming load demand & voltage Profile improvement of Nowshera area in PESCO.
4.	Category	Power Evacuation ✓ **System Reliability** System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	Asian Development Bank (ADB)
7.	Approval Forum	ECNEC (07.11.2016)
8.	Commencement Date	220 kV Grid Station : 06.11.2016 220 kV T/L : 12.07.2016
9.	Actual Completion date	220 kV Grid Station : 19.04.2019 220 T/L : 18.12.2018
10.	Physical progress:	
	Physical progress (major works done):	• Project completed and commissioned, retention money pending. NOA for construction of residential colony issued on 18-03-2022. Works commenced on 06-05-2022."
	Physical completion (in %age terms):	Grid Station: 100% Transmission Line: 100%
11.	Outcomes / Benefits of the project after completion	• Improvement of Power Supply Position At/Around 220 kV Nowshera G/S. • Increase in the system capacity to meet future load demand of the area. • Improvement in voltage profile of existing 132 kV grid station in the vicinity of Nowshera G/S. • Reduction in transmission system losses. • Improvement in reliability of NTDC and PESCO networks

Project Sr. No. 12

1.	Name of Project	**220kV Arifwala Substation**
2.	Location	Arifwala, Punjab
3.	Scope in Brief / Objectives	3 x 250 MVA, 220 kV T/Fs
4.	Category	✓ **System Reliability**
5.	Type	✓ **Development**
6.	Funding:	N/A
7.	Approval Forum	CDWP
8.	Commencement Date	N/A
9.	Actual Completion date	N/A
10.	Physical progress:	
	Physical progress (major works done):	Land Acquisition is in progress for 56 Kanals (07 Acres) private land for which section 4 has been published in Punjab gazzette on 15.06.2022 whereas the case of remaining 38 Acres state land is in the office of ADCR pak pattan.
	Physical completion (in %age terms):	1%
11.	Outcomes / Benefits of the project after completion	This grid will fulfil the future demand of region along with strengthening the NTDC system.

Project Sr. No. 13

1.	Name of Project	**220KV Chakdara S/S**
2.	Location	KPK
3.	Scope in Brief / Objectives	2 x 250 MVA 220/132kV Auto Transformer, 220kV Line Bays 02 Nos. 132kV Line Bays 06 Nos. This project aims the installation of new 220 kV substation at Chakdara to meet the upcoming load demand & voltage Profile improvement of Chakdara area in PESCO region.
4.	Category	Power Evacuation ✓ **System Reliability** System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	Asian Development Bank (ADB)
7.	Approval Forum	ECNEC
8.	Commencement Date	Grid Station: 06.11.2016 Transmission Line: 12.07.2016
9.	Actual Completion date	Grid Station: 16.09.2018 Transmission Line: 16.09.2018
10.	Physical progress:	
	Physical progress (major works done):	• Project completed and commissioned, retention money pending. NOA for construction of Residential Colony issued on 15-02-2022 (18 months completion period) and Contract made effective on 15-03-2022.
	Physical completion (in %age terms):	Grid Station: 100% Transmission Line: 100%
11.	Outcomes / Benefits of the project after completion	• Improvement of Power Supply Position At/Around 220 kV Chakdara G/S. • Increase in the system capacity to meet future load demand of the area. • Improvement in voltage profile of existing 132 kV grid station in the vicinity of Chakdara G/S. • Reduction in transmission system losses. • Improvement in reliability of NTDC and PESCO networks.

Project Sr. No. 14

1.	Name of Project	**220-KV Dera Ismail Khan - Zhob Transmission Line alongwith 220-KV Zhob Sub-Station.**
2.	Location	KPK & Balochistan
3.	Scope in Brief / Objectives	• 220kV substation at Zhob consisting of two 220 kV transformer bays for 220/132kV, 2x160 MVA transformers, two 220 kV line bays and six 132 kV line bays along with allied equipment and accessories. • 220 kV single conductor double circuit transmission on Rail conductor from Dera Ismail Khan to Zhob (220 km) • Extension at 220 kV D.I Khan Grid Station (Two Line Bays) This project aims the installation of New 220 kV Substation at Zhob along with 220 kV Dera Ismail Khan – Zhob Transmission Lines to meet the growing power requirements of the areas including Qilla Saifullah, G.H. Zai, MusafirPur, Zhob, Mekhtar and Duki under the jurisdiction of Quetta Electric Supply Company (QESCO).
4.	Category	Power Evacuation ✓ **System Reliability** System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	Asian Development Bank (ADB)
7.	Approval Forum	ECNEC (07.11.2016)
8.	Commencement Date	Grid Station: 15.03.2021 Transmission Line: 31.05.2019
9.	Actual Completion date	Under construction.
10.	Physical progress:	
	Physical progress (major works done):	Land • 50 Acres of land for construction of grid station has been acquired. Grid Station • Survey & Soil Investigation completed. • Earth work, i.e. cutting & filling, has been completed. • Engineering & Design: 89.6% completed • Material Procurement/FATs/Shipment: 37.33% completed • Civil works: 19.25 % completed. Transmission Line • Concrete: 639/641 No. • Erection: 639/641 No. Stringing: 206.8/210.79 km
	Physical completion (in %age terms):	Grid Station: 39.3% Transmission Line: 97.2%
11.	Outcomes / Benefits of the project after completion	• Improvement in power supply position at/around 220 kV Zhob. • Increase in the system capacity to meet future load demand of the area. • Improvement in voltage profile of existing 132 kV grid station in the vicinity of Zhob. • Reduction in transmission system losses. • Improvement in reliability of NTDC and QESCO system networks.

Project Sr. No. 15

1.	Name of Project	**220kV Dharki - Rahim Yar Khan - Bahawalpur D/C T/L**
2.	Location	Sindh & Punjab
3.	Scope in Brief / Objectives	• 220kV D/C T/Line from 220kV Daharki to R.Y Khan G/S (105km) • 220kV D/C T/Line from 220kV R.Y Khan to Bahawalpur G/S (150km) • 220kV D/C T/Line for In/Out of Vehari – Chishtian S/C T/L at Lal Suhanra G/S (80km) • Extension at 220kV Daharki G/S (2x220kV L/Bays) • Extension at 220kV R.Y Khan G/S (4x220kV L/Bays) • Extension at 220kV Bahawalpur G/S (2x220kV L/Bays) • Extension at 220kV Lal Suhanra G/S (2x220kV L/Bays) The main objective of the project is interlinking of 220 kV Dharki, Rahim Yar Khan, Bahawalpur and Chishtian Grid Stations by construction of 220 kV Transmission lines for improvement of power supply system in southern areas.
4.	Category	Power Evacuation ✓ **System Reliability** System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	-
7.	Approval Forum	ECNEC (02.10.2019)
8.	Commencement Date	-
9.	Actual Completion date	2024-25
10.	Physical progress:	
	Physical progress (major works done):	• Work for survey & soil investigation work has been awarded to M/s NESPAK on 22-10-2021. • Detailed Survey and Soil Investigation has been completed. • Plan & Profile and Sub-Soil Investigation Report for lot-I has been approved. Plan & Profile and Sub-Soil Investigation Report for lot-II & lot-III is under review/approval.
	Physical completion (in %age terms):	-
11.	Outcomes / Benefits of the project after completion	• Improvement of Power Supply System in southern areas. • Alternate source of supply during contingency conditions. • Improvement in reliability & un-interrupted power supply.

Project Sr. No. 16

1.	Name of Project	**220kV Gujranwala-II Substation**
2.	Location	Punjab
3.	Scope in Brief / Objectives	• 2 x 250 MVA 220/132kV Auto Transformer, • 220kV T/Line In/Out from Mangla - KSK at Gujranwala-II • 220kV D/C T/L from Nokhar - Gujranwala-II The main objective of the project is the installation of new 220 kv substation Gujranwala-II to remove transmission constraint of Gujranwala and its surrounding and meet the growing demand of GEPCO.
4.	Category	✓ **Power Evacuation** System Reliability System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	To be sought
7.	Approval Forum	Submitted to PC on 10.01.2020 and under approval
8.	Commencement Date	-
9.	Actual Completion date	2024-2025
10.	Physical progress:	
	Physical progress (major works done):	Land • LAC EHV wrote to District Collector Gujranwala for requisite documents (Inquiry Report) regarding landowner's objections on 06-06-2022. Additional Deputy Commissioner (Rev) Gujranwala has written to Commissioner Gujranwala Division for the case of state land to onward submission to SMBR, Punjab for approval as per Govt. Policy on 11.06.2022. Which is in process.
	Physical completion (in %age terms):	2%
11.	Outcomes / Benefits of the project after completion	Improvement & enhancement in overall power system efficiency and reliability.

Project Sr. No. 17

1.	Name of Project	**220KV Head Faqirian G/S alongwith allied T/Ls.**
2.	Location	Punjab
3.	Scope in Brief / Objectives	• 2 x 160 MVA 220/132kV Auto Transformer. • 88 km 220kV D/C transmission line from existing 220kV Ludewala to Head Faqirian. This project aims the installation of new 220 kV substation at Head Faqirian to meet the upcoming load demand & voltage Profile improvement of FESCO area.
4.	Category	✓ **Power Evacuation** System Reliability System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	KfW
7.	Approval Forum	ECNEC
8.	Commencement Date	-
9.	Actual Completion date	2024-2025
10.	Physical progress:	
	Physical progress (major works done):	**Land** • Public Hearing under section-5A conducted at site by LAC on 15-01-2021. • Enquiry report forwarded to DC Mandi bahauddin on 18-01-2022, DC mandi bahauddin forwarded the case to ADCR on 20-01-2022. • Observations have been raised and case file for Section 5A(2) has been returned by AC (Rev) to DC Mandu Bahauddin as per direction of Commissioner Gujranwala on 22-02-2022.The same will be attended by the LAC for resubmission. • ADCR has returned the case file to LAC NTDC to serve the notices again under Section 5A(2) on 02-03-2022. Notices have been served again section 5A(2) to land owners on 03-02-2022 and the date for hearing under section 5A(2) is 10-03-2022. • Which has been conducted and report has been submitted to ADCR on 22-03-2022. AC revenue returned the hearing report with some observation which are been attended and will submitted again for approval.
	Physical completion (in %age terms):	3%
11.	Outcomes / Benefits of the project after completion	• Improvement of Power Supply Position At/Around 220 kV Head Faqirian. • Increase in the system capacity to meet future load demand of the area. • Improvement in voltage profile of existing 132 kV grid station in the vicinity of Head Faqirian. • Reduction in transmission system losses. Improvement in reliability of NTDC and FESCO system networks.

Project Sr. No. 18

1.	Name of Project	**220-kV Jamrud G/S alongwith allied T/Ls.**
2.	Location	KPK
3.	Scope in Brief / Objectives	• 2 x 250 MVA 220/132kV Auto Transformer. • 20 km 220kV D/C Transmission Line from Jamrud to Sheikh Muhammadi. This project aims the installation of new 220 kV substation at Jamrud to meet the upcoming load demand & voltage Profile improvement of PESCO/TESCO areas.
4.	Category	✓ **Power Evacuation** System Reliability System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	To be sought
7.	Approval Forum	CDWP
8.	Commencement Date	-
9.	Actual Completion date	2024-2025
10.	Physical progress:	
	Physical progress (major works done):	**Land** • Final Draft of Section-IV approved by DC Peshawar on 07-07-2022. • Proceeding for Section-V is in process. • Qoumi Commission was appointed/nominated on 16-08-2022 for assessment of cost and ownership determination **Transmission Line:** • For detailed survey and subsoil investigation of T/Lines, NOA was issued to M/s NESPAK on 25-10-2021.. • Detailed survey and soil investigation activities have been completed. Plan & Profile, Survey report and Soil investigation report are under review and approval process.
	Physical completion (in %age terms):	3%
11.	Outcomes / Benefits of the project after completion	• Improvement of Power Supply Position At/Around 220 kV Jamrud G/S. • Increase in the system capacity to meet future load demand of the area. • Improvement in voltage profile of existing 132 kV grid station in the vicinity of Jamrud. • Reduction in transmission system losses. Improvement in reliability of NTDC and PESCO/TESCO system networks.

Project Sr. No. 19

1.	Name of Project	**220-kV Jauharabad G/S alongwith allied T/Ls.**
2.	Location	Jauharabad , Punjab
3.	Scope in Brief / Objectives	3x160 MVA autotransformers along with allied equipment and accessories.
4.	Category	✓ **System Reliability**
5.	Type	✓ **Development**
6.	Funding:	Asian Development Bank (MFF-II, Tranche-II)
7.	Approval Forum	CDWP
8.	Commencement Date	07/07/2022
9.	Actual Completion date	06/03/2024
10.	Physical progress:	
	Physical progress (major works done):	Grid Station • Contract Agreement signed on 24/05/2022. • Site handed over to Contractor dated 05.07.2022 and soil investigation is being carried out by the contractor M/s. CNTIC under the supervision of M/s. Barqab.
	Physical completion (in %age terms):	5 %
11.	Outcomes / Benefits of the project after completion	Enhance of MVA capacity of NTDC system.

Project Sr. No. 20

1.	Name of Project	**220kV Larkana Substation**
2.	Location	Sindh
3.	Scope in Brief / Objectives	• 3x250MVA 220/132kV Transformers • 220kV D/C T/L from 220kV Larkana to Shikarpur Substation (65km) • Extension works at Shikapur Substation (2x220kV L/Bays) The main objective of the project is installation of Larkana New Grid Station at 220kV level along with associated transmission lines to meet with the additional load demand & voltage profile improvement of SEPCO area.
4.	Category	Power Evacuation ✓ **System Reliability** System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	-
7.	Approval Forum	CDWP (17.10.2019)
8.	Commencement Date	-
9.	Actual Completion date	2024-25
10.	Physical progress:	
	Physical progress (major works done):	Land • Notification under Section 04 of Land Acquisition Act, 1894 (36 Acres) published in the Sindh Government Gazette on February 14, 2022. Further proceedings are under process. Transmission Line • Work for survey & soil investigation work of T/Line has been awarded to M/s NESPAK on 07-03-2022. • Route alignment, Detailed Survey and Soil Investigation has been carried out. Preparation of Plan and Profile and Soil Investigation Report is in progress.
	Physical completion (in %age terms):	-
11.	Outcomes / Benefits of the project after completion	• Improvement in voltage profile at/around Larkana • Reduction in transmission system losses • Reduction in loading of 500/220kV and 220/132kV transformers at Shikarpur, Dadu & Rohri G/S • Improvement in reliability of NTDC and SEPCO system networks • Provision of N-1 contingency Increase in available system capacity to meet future load growth at/around proposed project

Project Sr. No. 21

1.	Name of Project	**220-kV Mastung G/S alongwtih allied T/Ls.**
2.	Location	Balochistan
3.	Scope in Brief / Objectives	• 220kV substation at Mastung with 3x250MVA 220/132kV transformers with allied equipment and accessories. • 220kV D/C T/Lines on twin bundle Rail conductor from Mastung to Sibbi (120km) • 220kV D/C T/Lines on twin bundle Rail conductor from Mastung to Quetta (50km) • 220kV D/C T/Lines on twin bundle Rail conductor from Quetta to Loralai (170km) • Extension of 220kV Sibbi & Loralai for construction of 2x220kV Line Bays at each substation • Extension at 220kV Quetta for construction of 4x220kV Line Bays. The main objective of the project is upgradation of existing 132kV Mastung Grid Station to 220kV level along with associated transmission line to meet with the additional load demand & voltage profile improvement of QESCO area.
4.	Category	Power Evacuation ✓ **System Reliability** System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	-
7.	Approval Forum	ECNEC (22.05.2018)
8.	Commencement Date	-
9.	Actual Completion date	2024-25
10.	Physical progress:	
	Physical progress (major works done):	Land • Notification under Section 04 of Land Acquisition Act, 1894 (30 Acres) has been issued on 14.06.2019. Addendum issued on 28.07.2020 **(direct approach path included)**. • Cost of land has been intimated by DC Mastung. Arrangement of funds is under process. Transmission Line • Work for survey & soil investigation work of T/Line has been awarded to M/s NESPAK on 14-02-2022. T/L Route Alignment has been carried out. Detailed survey and soil investigation is under process.
	Physical completion (in %age terms):	-
11.	Outcomes / Benefits of the project after completion	• Improvement in power supply position at/around 220kV Mastung G/Station. • Improvement in voltage profile of existing 132kV Grid Station in the vicinity of 220kV Mastung Grid Station. • Increase in the system capacity to meet future load demand of QESCO. Reduction in transmission line losses.

Project Sr. No. 22

1.	Name of Project	**220kV Mirpur Khas G/S alongwith allied T/Ls**
2.	Location	Sindh
3.	Scope in Brief / Objectives	• 220kV substation at Mirpurkhas with two 220/132kV, 250MVA transformers with allied equipment and accessories. • 220kV D/C transmission line on twin bundle Rail Conductor for looping In/Out of proposed Hala Road - Jamshoro 220kV S/C transmission line as Mirpurkhas (Lot-I: 70km) • 220kV D/C transmission line on twin bundle Rail Conductor for looping In/Out of one circuit of the existing Jamshoro – T.M.Khan Road 220kV D/C T/L at Hala Road (Lot-II: 10 km) • Extension at 220kV Hala Road Grid Station (Two Line Bays) This project aims the installation of new 220kV Substation at Mirpur Khas alonwith associated transmission lines & a 2nd source of supply to 220kV Hala Road Grid Station to meet the growing power requirements of the areas including Mirpur Khas, Mir Wah Gorchani, Sultanabad, Kandiari, Sanghar, Shah Pur Chakar, Jam Nawaz, Tando Jam, Samaro & T.A Yar under the jurisdiction of Hyderabad Electric Supply Company (HESCO).
4.	Category	Power Evacuation ✓ **System Reliability** System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	Asian Development Bank (ADB)
7.	Approval Forum	ECNEC (07.11.2016)
8.	Commencement Date	Grid Station: 17.01.2020 Transmission Line: Yet to commence
9.	Actual Completion date	Grid Station: 30.06.2023 Transmission Line: Lot-I: 18 months from the date of commencement Lot-II: 24 months from the date of commencement
10.	Physical progress:	
	Physical progress (major works done):	Land • 52 Acres 37 Ghuntas of land for construction of grid station has been acquired. Grid Station • Soil investigation has been completed. • Earth Work (Cutting & Filling) also completed. • Civil works at Hala Road Grid Station 98% completed. • Civil works at Mirpurkhas site are expected to commence next week. • Engineering & Design: 97% completed • Material Procurement/FATs/Shipment: 5.15% completed • Civil works: 42.6% completed. Transmission Line Lot-I: Work has been awarded to M/s SA-RA Energy on 25-03-2022. Lot-II: Tender scrapped due to non-participation of bidders. Revised tendering to be carried out in due course of time.
	Physical completion (in %age terms):	Grid Station: 40%; Transmission Line: -
11.	Outcomes / Benefits of the project after completion	• Improvement in power supply position at/around 220kV Mirpurkhas. • Increase in the system capacity to meet future load demand of the area. • Improvement in voltage profile of existing 132kV grid station in the vicinity of Mirpurkhas. • Reduction in transmission system losses. • Reduction in the loading of 220/132kV transformers at T.M.Khan Road, Hala Road & Jamshoro. • Elimination of overloading of 132kV T/Lines from Tando Jam to T.A Yar & from hala Road to Matiari. • Improvement in reliability of NTDC and HESCO system networks.

Project Sr. No. 23

1.	Name of Project	**220kV Sub Station Lalian**
2.	Location	Chinot District, Punjab
3.	Scope in Brief / Objectives	• 2×250 MVA, 220/132 kV T/Fs 220 kV Gatti-Ludewala D/C T/L (4+4km) feed from Lalian
4.	Category	✓ **System Constraints**
5.	Type	✓ **Development**
6.	Funding:	Loan No. ADB-3203-PAK (MFF-I, Tranche-IV) Now on NTDC Own Resources
7.	Approval Forum	ECNEC
8.	Commencement Date	**17/05/2021 established as effectiveness date**
9.	Actual Completion date	Priority work has been completed and grid has been energized. The remaining work expected to be completed in September 2022.
10.	Physical progress:	
	Physical progress (major works done):	Grid Station • **250 MVA autotransformer # 02 successfully energized on NO LOAD at 05:26 Hrs on 16/06/2022** • 04 Line Bays (E04,E05, E14 & E15) of 132 kV successfully energized on load through 132 kV BB-I on 22/06/2022. • 10/13 MVA power transformer (132/11.5 kV) successfully energized through 132 kV BB-I at 00:50 Hrs on 22/06/2022. Transmission Line 220 kV Gatti-Ludewala circuit 2 will be energized through 220 kV Dia No. 3, will be energized by 15.08.2022.
	Physical completion (in %age terms):	92 %
11.	Outcomes / Benefits of the project after completion	It is system constraint project, necessary to fulfil load demand of Chinot region.

Project Sr. No. 24

1.	Name of Project	**220kV Punjab University Grid Station**
2.	Location	Lahore, Punjab
3.	Scope in Brief / Objectives	• 220kV GIS substation at Punjab University with three 220/132kV, 250 MVA transformers along with allied equipment and accessories. • Two 220kV Double Circuit Transmission Lines on single Rail conductor for In/Out of NKLP-Bund Road D/C T/L (2+2km) Lahore is the capital of Punjab and it has a population of about 10 million. Other than this huge domestic load it is also the main hub of commercial and industrial activity. Keeping this in view, NTDC has planned installation of a new 220kV GIS Grid Station at Punjab University to not only meet the future demand of LESCO but also provide relief to the existing 132kV Grid Stations.
4.	Category	Power Evacuation System Reliability ✓ **System Constraints**
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	Yet to be arranged
7.	Approval Forum	-
8.	Commencement Date	-
9.	Actual Completion date	2024-25
10.	Physical progress:	
	Physical progress (major works done):	-
	Physical completion (in %age terms):	-
11.	Outcomes / Benefits of the project after completion	• Improvement in power supply position at/around 220kV Punjab University Grid Station • Improvement in voltage profile of existing 132 kV grid station in the vicinity of 220 kV Punjab University Grid Station • Increase in the system capacity to meet future load demand of LESCO • Reduction in transmission system losses.

Project Sr. No. 25

1.	Name of Project	**4 Nos New Projects to be financed by JBIC (i) 500 KV RY Khan G/S & T/L (ii)220 KV Chishtian T/L (iii) 220 KV Gujrat G/S & 220 KV T/L (iv) 220 KV Shalamar G/S & 220 KV T/L (4 Projects - JBIC Loan) (JICA Loan No. PK-58)**
2.	Location	Punjab
3.	Scope in Brief / Objectives	**500 KV Sub-station R.Y Khan.** • 2x600 MVA, 500/220 KV T/F with controlling switch gear on both side. • 500KV S/C T/L with line controlling equipment for In/Out of 500KV Guddu to Multan 3rd Circuit at R.Y Khan (30+30km). • 2X250 MVA 220/132KV T/Fs with controlling switch gear on both sides. • 6.3 MVA 132/11 KV T/Fs with controlling switch gear for auxiliary services. • Six 132KV line bays for interconnection of 132KV T/Ls. **220KV Substation Gujrat.** • 3x250MVA, 220/132KV T/Fs with controlling switch gear on both sides. • 220KV D/C T/L with line controlling equipment for In/Out of existing 220 KV Mangla-Ghakkar D/C at Gujrat New (2+2km). • 6.3 MVA 132/11 KV T/Fs with controlling switch gear for auxiliary services. • Eight 132KV line bays for interconnection of 132KV T/Ls. **220KV GIS Substation Shalamar Lahore.** • 3x160MVA, 220/132KV T/Fs with controlling switch gear on both sides. • 220KV D/C T/L with line controlling equipment for In/Out of one circuit of Ravi K.S.K T/L at Shalamr (9km long overhear T/L and 3+3km underground cable. • 6.3 MVA 132/11 KV T/Fs with controlling switch gear for auxiliary services. • Six 132KV line bays for interconnection of 132KV T/Ls. **220KV Substation Chistian.** • 3x250MVA, 220/132KV T/Fs with controlling switch gear on both sides. • 220KV Chistian-Vehari D/C T/L with line controlling equipment (65km) on both sides. • 6.3 MVA 132/11 KV T/Fs with controlling switch gear for auxiliary services. • Eight 132KV line bays for interconnection of 132KV T/Ls.
4.	Category	Power Evacuation ✓ **System Reliability** System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	JICA
7.	Approval Forum	ECNEC 27.10.2007
8.	Commencement Date	Chishtian : 12.03.2012 Gujrat: 27.09.2013 Shalamar : 22.12.2010 500kV R.Y.Khan: G/Station: 09.11.2010 ; T/Line: 08.10.2016
9.	Actual Completion date	Chishtian: 24.10.2016 Gujrat: 27.04.2017 Shalamar: 07.03.2014 500kV R.Y.Khan GS & TL: 03.02.2018
10.	Physical progress:	
	Physical progress (major works done):	**220kV G/S Gujrat, 220 kV G/S Shalamar and 220kV G/S Chistian completed and in operation** **Recently Completed:** **500kV Rahim Yar Khan** Grid Station Civil Works: 100%

		Installation Works: 100% Testing & Commissioning 100% Transmission Line Towers Concreted = 105/105 Nos. Towers Erected = 105/105 Nos. Stringing = 60/60 km
	Physical completion (in %age terms):	100%
11.	Outcomes / Benefits of the project after completion	• Improvement of voltage profile of Lesco, Mepco and Gepco regions. • To fulfilment of future load demand. • Reduction in the loading of 220/132kV transformers at Guddu and Bahawalpur substations feeding R.Y.Khan and its surrounding network. • Removal of 132kV transmission bottlenecks in MEPCO network feeding R.Y.Khan and its surrounding network. • Reduction in transmission line losses. • Improvement in voltage profile. Improvement in system reliability especially at/around R.Y.Khan.

Project Sr. No. 26

1.	Name of Project	**500 kV Vehari Grid Station**
2.	Location	Punjab
3.	Scope in Brief / Objectives	The main objective of the project is upgradation of existing 220 kV Vehari substation to 500 kV Vehari substation to meet with the additional load demand & voltage profile improvement of the areas which fall under the jurisdiction of Multan Electric Supply Company (MEPCO). The scope of work for the proposed project is as follows: i) 500 kV GIS substation consisting of two 500/220 kV, 750 MVA AutoTransformer Banks with two 500 kV transformer bays, two 220 kV transformer bays, two 500 kV line bays along with allied equipment and accessories. ii) 500 kV quad bundled double circuit transmission line on Drake Conductor for in/out of 500 kV Multan – Yousafwala (Sahiwal) singlecircuit transmission line at 500 kV Vehari substation (35 km)
4.	Category	✓ **System Reliability**
5.	Type	✓ **Development**
6.	Funding:	AFD (proposed)
7.	Approval Forum	CDWP
8.	Commencement Date	---
9.	Actual Completion date	2024-25
10.	Physical progress:	---
	Physical progress (major works done):	—
	Physical completion (in %age terms):	--
11.	Outcomes / Benefits of the project after completion	As a result of project implementation 1500 MVA capacity will be added in existing transmission network of NTDC for improvement in power supply system to meet with the future power demand of MEPCO area.

Project Sr. No. 27

1.	Name of Project	**500/220kV Sialkot Substation**
2.	Location	Punjab
3.	Scope in Brief / Objectives	• 2 x 750 MVA 500/220kV Auto Transformers. • 3 x 250 MVA 220/132kV Auto Transformer. • 500kV T/L In/Out of Maira - Lahore North at Sialkot. • 220kV T/Line from Sahuwala - Sialkot (12km). • 220kV T/Line from Gujranwala-II -Sialkot (36km). The main objective of the project is the installation of new 500 kV substation Sialkot to remove transmission constraint of Sialkot and its surrounding and meet the growing demand of GEPCO.
4.	Category	✓ **Power Evacuation** System Reliability System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	To be sought
7.	Approval Forum	ECNEC
8.	Commencement Date	-
9.	Actual Completion date	2024-2025
10.	Physical progress:	
	Physical progress (major works done):	**Land** Topographic Survey/Contour plan studies of selected site of 500 kV Sialkot grid station has been completed.
	Physical completion (in %age terms):	2%
11.	Outcomes / Benefits of the project after completion	Improvement & enhancement in overall power system efficiency and reliability.

Project Sr. No. 28

1.	Name of Project	**500kV Chakwal G/S alongwith allied T/Ls**
2.	Location	KPK
3.	Scope in Brief / Objectives	• 2 x 450 MVA 500/220kV Auto Transformer. • 4 x 160 MVA 220/132kV Auto Transformer. • 3 km 500kV D/C Transmission line on Tri Bundle Drake for In/Out of existing 500kV Ghazi Barotha – Gatti Circuit. • 30 km 500kV D/C Transmission Line on Quad Bundle Drake for In/Out of existing 500kV Ghakkar – Rawat Circuit. This project aims the installation of new 220 kV substation at Chakwal to meet the upcoming load demand & voltage Profile improvement of IESCO region.
4.	Category	✓ **Power Evacuation** System Reliability System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	KfW Germany
7.	Approval Forum	ECNEC
8.	Commencement Date	---
9.	Actual Completion date	2024-2025
10.	Physical progress:	
	Physical progress (major works done):	**Land** • The possession of land has been further given to NTDC Civil Department on 16-07-2022 for construction of boundary wall. **Grid Station:** • Boundary wall under construction. **Transmission Line:** Survey and Soil investigation activities in process
	Physical completion (in %age terms):	5%
11.	Outcomes / Benefits of the project after completion	• Improvement of Power Supply Position At/Around 220 kV Chakwal G/S. • Increase in the system capacity to meet future load demand of the area. • Improvement in voltage profile of existing 132 kV grid station in the vicinity of Chakwal • Reduction in transmission system losses. • Improvement in reliability of NTDC and IESCO system networks.

Project Sr. No. 29

1.	Name of Project	**500KV Faisalabad New (2x750)** **(Now 500KV Faisalabad West alongwith allied T/Ls)**
2.	Location	Faisalabad, Punjab
3.	Scope in Brief / Objectives	2x500/220 kV, 750 MVA T/Fs 3x220/132 kV, 250 MVA T/Fs
4.	Category	✓ **System Constraints**
5.	Type	✓ **Development**
6.	Funding:	JICA (PK-P58)
7.	Approval Forum	ECNEC
8.	Commencement Date	24-Oct-2019
9.	Actual Completion date	Project already completed except one 250 MVA T/F. The remaining work will expected to be completed in September 2022.
10.	Physical progress:	
	Physical progress (major works done):	Grid Station • **500kV** Auto Transformer Bank - 2 of 500kV G/S Faisalabad West successfully **energized on no-load at 11:15 pm dated 25/01/2022**. • **500kV** Auto Transformer Bank - 3 of 500kV G/S Faisalabad West successfully **energized on no-load at 06:50 pm dated 31/03/2022**. **220kV** 250 MVA T/F attained **NO LOAD** energized on **31/1/2022** and put **ON LOAD** on **1/2/2022.** Second 250 MVA, 220/132 kV Transformer energized on 12.04.2022.
	Physical completion (in %age terms):	97 %
11.	Outcomes / Benefits of the project after completion	• The project fulfil the load demand of FESCO region. • Reduce voltage dip of FESCO region. Remove constraint of system (over loading of respective region T/Fs).

Project Sr. No. 30

1.	Name of Project	**500kV Islamabad West**
2.	Location	Fateh Jang, Punjab
3.	Scope in Brief / Objectives	Construction of 5 Nos. 765kV, 11 Nos. 500 kV, 7 Nos. 220kV and 11 Nos. 132kV line/transformer bays with associated control/ Residential buildings.
4.	Category	✓ **Power Evacuation** ✓ **System Reliability** System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	World Bank
7.	Approval Forum	ECNEC
8.	Commencement Date	Contract not yet Awarded
9.	Actual Completion date	August 2025
10.	Physical progress:	
	Physical progress (major works done):	**Land** • **Land Acquisition for Islamabad West GS**: Proceedings for Section-VII &VIII under-process **Grid Station** **Lot-IV:** Technical Bid Evaluation Report (BER) is under review/approval with NTDC management for onward submission to World Bank. Price Bids will be opened after conclusion of technical bid evaluation report.
	Physical completion (in %age terms):	< 1%
11.	Outcomes / Benefits of the project after completion	1. System stability (improvement in voltage profile) 2. Relief to existing of 500kV Rawat Grid station transformers 3. To meet the power demand of the area 4. Reduction in transmission system losses

Project Sr. No. 31

1.	Name of Project	**500/220/132 kV Lahore North G/S**
2.	Location	(Lahore & Gujranwala) Punjab
3.	Scope in Brief / Objectives	Grid Station: • 500/220/132 kV Lahore North G/S with **3X750 MVA**, 500kV and **3X250 MVA**, 220/132 kV T/Fs along with allied equipment and accessories • Extension at 500 kV Lahore Convertor station & 500 kV Gujranwala (future) for construction of 02 No. 500 kV Line Bays at each substation 220kV Lines • 220 kV D/C T/Line for IN/OUT of KSK-Ghazi Road S/C T/Line (15 km) – (Package-I) • 220 kV D/C T/Line for IN/OUT of KSK-Ravi S/C T/Line (15 km) – (Package-II) • 220 kV D/C T/Line for IN/OUT of Lahore-Ravi S/C T/Line (9 km) – (Package-III)
4.	Category	✓ **System Reliability**
5.	Type	✓ **Development**
6.	Funding:	ADB (MFF-II, Tranche-III)
7.	Approval Forum	ECNEC
8.	Commencement Date	Station: 01/07/2022 Lines: 01/11/2019
9.	Actual Completion date	Station : 22/03/2024 Lines: 31/03/2023
10.	Physical progress:	
	Physical progress (major works done):	Grid Station: • Notification of Award issued on 12/04/2022. • Contract signed on 06/06/2022. • Contractor mobilized at Nokhar G/S on 21/06/2022. Transmission Line • Package-I (15 km): towers concreted = 40/44 Erection =16/44 • Package-II (15 km): towers concreted = 42/52 Erection=15/52 Package-III (9 km): towers concreted = 27/30 Erection=9/30
	Physical completion (in %age terms):	Station: 6 % Lines: 47.5%
11.	Outcomes / Benefits of the project after completion	• Fulfillment of future demand of load. • Reduce voltage dip of LESCO region. • Enhance Transmission capacity of NTDC network.

Project Sr. No. 32

1.	Name of Project	**220kV Nag Shah Grid Station**
2.	Location	Punjab
3.	Scope in Brief / Objectives	• In/Out of Multan – M.garh New S/C at Nagshah (5 km) • In/Out of Multan – M.garh-II at S/C Nagshah (5 km) • 220kV substation with three 220/132kV, 250 MVA transformers along with allied equipment and accessories. This project will relieve the overloading in the neighboring grid stations of Multan and Muzaffargarh and improve the voltage profile in MEPCO. The project will reduce the loading on the 132kV transmission lines of MEPCO as well, which otherwise get overloaded under N-1 contingency.
4.	Category	Power Evacuation System Reliability ✓ **System Constraints**
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	Yet to be arranged
7.	Approval Forum	-
8.	Commencement Date	-
9.	Actual Completion date	2025-26
10.	Physical progress:	
	Physical progress (major works done):	PC-I Under Preparation
	Physical completion (in %age terms):	PC-I Under Preparation
11.	Outcomes / Benefits of the project after completion	• Reduction in loading of T/Fs at 220kV Muzaffargarh and 500kV Multan, which are otherwise overloaded under N-1 contingency • Improvement in voltage profile in the MEPCO • The project will reduce the loading on the 132kV transmission lines of MEPCO as well, which otherwise get overloaded under N-1 contingency.

Project Sr. No. 33

1.	Name of Project	**500kV Ludewala G/S along with 500kV Nowshera-Ludewala-Faisalabad West D/C T/L**
2.	Location	Punjab
3.	Scope in Brief / Objectives	• 500 kV D/C T/L Ludewala – Nowshera (325 km) • 500 kV D/C T/L Ludewala – Faisalabad West (100 km) • 500kV substation with two 500/220kV, 600 MVA transformers along with allied equipment and accessories. This project is required to meet the future demand. The project also helps in evacuation of power from C-5. The project also reduces the loading of Faisalabad West grid station in future.
4.	Category	Power Evacuation System Reliability ✓ **System Constraints**
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	Yet to be arranged
7.	Approval Forum	-
8.	Commencement Date	-
9.	Actual Completion date	2027-28
10.	Physical progress:	
	Physical progress (major works done):	PC-I Under Preparation
	Physical completion (in %age terms):	PC-I Under Preparation
11.	Outcomes / Benefits of the project after completion	• This project is required to meet the future demand. • The project helps in evacuation of power from C-5. • The project also reducing the loading of Faisalabad West grid station in future.

Project Sr. No. 34

1.	Name of Project	**220 KV G/Station at Kassowal with 132 KV Expansion System (World Bank Loan No. 7565-Pk, Credit No. 4463-PK & 4464-PK)**
2.	Location	Punjab
3.	Scope in Brief / Objectives	**Grid Station** • 3x200MVA, 500/220kV Auto Transformer **Transmission Line** **02 X 220KVTWIN BUNDLE, DOUBLE CIRCUIT T/LINES FOR IN & OUT OF EXISTING 220KV VEHARI-YOUSAFWALA D/C T/ LINE. (AAPROX. 70 KM ,206 TOWERS**
4.	Category	Power Evacuation ✓ **System Reliability** System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	**WORLD BANK**
7.	Approval Forum	ECNEC **PKR. 2067 MILLION (02.02.2005)**
8.	Commencement Date	G/Station: **01.06.2011** T/Line: **12.09.2009**
9.	Actual Completion date	G/Station: 17.04.2015 T/Line: **06.08.2012**
10.	Physical progress:	
	Physical progress (major works done):	Completed & Energized
	Physical completion (in %age terms):	100%
11.	Outcomes / Benefits of the project after completion	• Reduction in the loading of 500/220kV transformers at Sahiwal and Vehari regions. • Reduction in transmission line losses. Improvement in overall system reliability of NTDC network with respect to export of southern generation to the northern load centers.

Project Sr. No. 35

1.	Name of Project	**New 220 KV G/Station at Khuzdar/220 KV Dadu - Khuzdar D/C T/Line JICA Loan No. PK-56**
2.	Location	Sindh & Baluchistan
3.	Scope in Brief / Objectives	The project is envisaged to meet power demand of remote areas of Baluchistan and various development activities in Khuzdar and surrounding areas. According to the load flow simulation of the existing QESCO system network, voltage profile of the system at Khuzdar and in its vicinity is extremely low. The completion of this project will strengthen the power supply situation which is presently through 132 kV line from Quetta. • 2x220/132kV, 160 MVA Auto-Transformer • 220kV Transmission Line Dadu-Khuzdar (274km)
4.	Category	Power Evacuation ✓ **System Reliability** System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	JICA
7.	Approval Forum	ECNEC 04.08.2006
8.	Commencement Date	**Transmission Line: Lot-I**: 01-07-2008 , **Lot-II**: 30-06-2008 **Grid Station**: 30-06-2008
9.	Actual Completion date	09-06-2014
10.	Physical progress:	
	Physical progress (major works done):	Completed & Energized
	Physical completion (in %age terms):	100%
11.	Outcomes / Benefits of the project after completion	• Increase in reliability of power supply to QESCO load center. • Alternate source of supply to QESCO network. Improvement in voltage profile & stabilization of power supply.

Project Sr. No. 36

1.	Name of Project	**220-KV Kohat G/S alongwith allied T/Ls.**
2.	Location	KPK
3.	Scope in Brief / Objectives	• 2 x 250 MVA 220/132kV Auto Transformer. • 220kV T/Line from 500kV Nowshera to Kohat. The main objective of the project is the installation of new 220 kV substation Kohat to remove transmission constraint will also help in improvement of power supply and loss reduction in PESCO region.
4.	Category	✓ **Power Evacuation** System Reliability System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	To be sought
7.	Approval Forum	Submitted to PC on 22.11.2019 and under approval
8.	Commencement Date	---
9.	Actual Completion date	2024-2025
10.	Physical progress:	
	Physical progress (major works done):	**Land** • MD NTDC has approved the proposal of transfer of land to NTDC. • The decision has been conveyed to DC, Kohat for further necessary action as per General Financial Rules for transfer of land to NTDC. Through Secretary Revenue. Assessment of land is under progress according to state land policy.
	Physical completion (in %age terms):	1%
11.	Outcomes / Benefits of the project after completion	Improvement & enhancement in overall power system efficiency and reliability.

Project Sr. No. 37

1.	Name of Project	**220-KV Kamra G/S alongwith allied T/Ls.**
2.	Location	Punjab
3.	Scope in Brief / Objectives	• 2 x 250 MVA 220/132kV Auto Transformers. • 220kV Transmission Line for In/Out of 220kV Tarbela – ISPR T/Line at 220kV Kamra Grid Station.
4.	Category	✓ **System Reliability**
5.	Type	✓ **Development**
6.	Funding:	To be Sought
7.	Approval Forum	CDWP
8.	Commencement Date	---
9.	Actual Completion date	2025-26
10.	Physical progress:	---
	Physical progress (major works done):	**Land Acquisition:** • Site for construction of 220kV Kamra selected by NTDC Siting & Layout Board on 21.10.2019. • Section-4 notified on 22.12.2020. • Corrigendum for Section-4 published 11.02.2021. • DPAC conducted on 18.02.2021, and rates notified on 24.02.2021. • Total Area of the land is 30 Acres. • Demand amounting to rupees 151million has been released. Proceedings for Section-V are under progress
	Physical completion (in %age terms):	--
11.	Outcomes / Benefits of the project after completion	Improvement of Power Supply and meeting the increasing load demand of the Region.

Project Sr. No. 38

1.	Name of Project	**500kV HVAC T/Line for inter connection of HVDC Converter Station at Lahore with existing HVAC System.**
2.	Location	Punjab
3.	Scope in Brief / Objectives	Line1 : Length of T/Line= 2.587 KM • 500kV Double Circuit Quad Bundled Transmission Line SKP-Lahore (South) CCT-II In & OUT at HVDC Converter Station. • NO. of Towers = 11 Nos. Line2: Length of T/Line: 10 KM • 500kV Double Circuit Quad Bundled Transmission Line SKP-Lahore (South) CCT-I In & OUT at HVDC Converter Station.
4.	Category	Power Evacuation ✓ **System Reliability** System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	NTDC own Resources.
7.	Approval Forum	ECNEC
8.	Commencement Date	Line1: 22.08.2019 Line2: 15.11.2019
9.	Actual Completion date	Line1: 28.05.2020 Line2: 24.09.2020
10.	Physical progress:	
	Physical progress (major works done):	Completed & Energized
	Physical completion (in %age terms):	100%
11.	Outcomes / Benefits of the project after completion	• Enhance transmission capacity of system. • Reduce line losses of system. • Interconnection of HVDC and HVAC system.

Project Sr. No. 39

1.	Name of Project	**500kV HVDC Transmission System between Tajikstan and Pakistan for Central Asia-South Asia Transmission Interconnection (CASA-1000)**
2.	Location	Pak-Afghan Torkham Border to Aza Khel Nowshera, District Nowshera of KPK and Electrode Station in Charsadda along with Electrode Line from Nowshera to Charsadda.
3.	Scope in Brief / Objectives	**HVDC Component Scope:** i) ±500 kV HVDC bipolar transmission line from Pak – Afghan border to Nowshera (113 km) ii) Converter Station at Nowshera (1300 MW) iii) Grounding Electrode Station at Charsadda and Electrode Line iv) 500 kV Nowshera (Aza khel) G/S with 500 kV, **3X250 MVA** T/Fs along with allied equipment and accessories **Objectives:** CASA-1000 is a transmission project has been designed to transmit 1300 MW of surplus electricity from existing Hydel power resources in the Central Asian countries, Tajikistan and Kyrgyz Republic through Afghanistan to Pakistan.
4.	Category	✓ **Power Evacuation**
5.	Type	✓ **Development**
6.	Funding:	**World Bank:** 185 Million USD **Islamic Development Bank IsDB:** 35 Million USD
7.	Approval Forum	Ministry of Energy (Power Division)
8.	Commencement Date	Converter Station: 03.04.2021 Transmission Line: 06.11.2020 HVAC Grid Station Nowshera: 28.02.2022
9.	Actual Completion date	**Converter Station**: August-2024 (as per revised timelines) **Transmission Line:** June-2023 **HVAC Grid Station Nowshera:** February-2024
10.	Physical progress:	
	Physical progress (major works done):	**Converter Station (TW01):** **Overall Progress: 61.5%** Engineering & Design: 89.2% Procurement of Material: 96.4% Civil Works: 61.6% Installation: 11.5% **Transmission Line (TW02):** **Overall Progress: 55.8%** Engineering & Design: 100% Procurement of Material: 86.8% Civil Works: 79 % Erection of Towers: 48.8% **HVAC Grid Station Nowshera:** **Overall Progress: 6.6%**
	Physical completion (in %age terms):	**TW01- Converter Station:** 61.5% **TW02- Transmission Line:** 55.8% **HVAC Grid Station Nowshera:** 6.6%
11.	Outcomes / Benefits of the project after completion	The benefits associated with CASA-1000 project include: i) Inclusion of 1300MW power to the National Grid thereby greatly improving the supply/deficit ratio in summer season. ii) Increase in the available system capacity to meet future load growth at/around proposed project. iii) Serve as a 2nd 500kV source of power to feed PESCO load centers. iv) Improvement in the power supply position of PESCO. v) Community development program.

Project Sr. No. 40

1.	Name of Project	**Addition of 500/220KV Sub Station T/L for Strengthening the existing NTDC system** **i) 500KV Lahore New** **ii) 500KV Shikarpur** **iii) 220KV D.I.Khan (JICA-PK-61)**
2.	Location	Sindh
3.	Scope in Brief / Objectives	**Grid Station** • 3x200MVA, 500/220kV Auto Transformer **Transmission Line** • 500kV D/C T/Lines for In & Out of 500kV Dadu-Guddu T/Line Circuits I & II (32.3km) and 220kV D/C T/Line for In & Out of 220kV Guddu-Sibbi T/Line at 500kV Shikarpur G/Station (52.8km) The project aims at enhancing the capacity if the transmission system by upgradation of existing 220kV Shikarpur substation to 500kV new Substation alongwith associated T/Line to meet the growing power requirement of Shikarpur District and adjoining areas for industrial, agricultural and economic development, and to improve the overall efficiency of the power distribution network of SEPCO. Also it will increase its capacity to meet the economic growth target and to evacuate power from new IPPs including Uch-II, Engro and Fauji Fertilizer Power Plants. Implementation of the project will also help to meet power demand of the SEPCO area.
4.	Category	Power Evacuation ✓ **System Reliability** System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	JICA
7.	Approval Forum	ECNEC 09.12.2010
8.	Commencement Date	G/Station: 03.08.2012 T/Line: 27.06.2013
9.	Actual Completion date	G/Station: 23.05.2016 T/Line: 15.05.2016
10.	Physical progress:	
	a) Physical progress (major works done):	Completed & Energized
	b) Physical completion (in %age terms):	100%
11.	Outcomes / Benefits of the project after completion	• Reduction in the loading of 500/220kV transformers at Guddu Power House. • Reduction in transmission line losses. Improvement in overall system reliability of NTDC network with respect to export of southern generation to the northern load centres.

Project Sr. No. 41

1.	Name of Project	**Evacuation of Power from 1224MW Wind Power Plants at Jhimpir Clusters**
2.	Location	Sindh
3.	Scope in Brief / Objectives	Grid Station • 220/132kV Jhimpir-II Substation with 4x250MVA 220/132kV transformers alongwith associated equipment including 6x220kV Line Bays and 4x132kV Line Bays. 132kV Transmission Lines • **Lot-I:** 132 kV D/C T/L for connection of five (05) Wind Power Plants with 220 kV Jhimpir-II Grid Station (34 km) • **Lot-II:** 132 kV D/C T/L for connection of the Six (06) Wind Power Plants with 220 kV Jhimpir-II Grid Station (47 km) 220kV Transmission Lines • **Line-I:** 220 kV D/C T/B T/Line for looping In/Out both Circuits of existing 220 kV Jamshoro-KDA 33 D/C T/Line at 220 kV Jhampir-II Grid Station (220kV Jamshoro-Jhampir-II T/L - 19km) • **Line-II:** 220 kV D/C T/B T/Line for looping In/Out both Circuits of existing 220 kV Jamshoro-KDA 33 D/C T/Line at 220 kV Jhampir-II Grid Station (220 kV KDA 33-Jhampir-II T/L - 20km) • **Line-III:** 220kV D/C T/B T/Line for looping In/Out of 220kV Gharo-Jhampir-I T/Line at 220kV Jhampir-II G/Station (2.2km) The main objective of the project is evacuation of 1224MW Power from the WPPs envisaged to be installed at Jhimpir wind cluster.
4.	Category	✓ **Power Evacuation** ✓ **System Reliability** System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	NOR
7.	Approval Forum	ECNEC 24.11.2017
8.	Commencement Date	Grid Station: 11.03.2020 220KV T/L: 08-02-2021 132KV T/L: 28-08-2020
9.	Actual Completion date	Grid Station: 20-02-2022 220KV T/L: 31-03-2022 132KV T/L: 28-12-2021
10.	Physical progress:	
	c) Physical progress (major works done):	Completed & Energized
	d) Physical completion (in %age terms):	100%
11.	Outcomes / Benefits of the project after completion	• Environment friendly power will be available for the country. • Dispersal of power from upcoming WPPs reliably. • Improvement in voltage profile of HESCO and NTDC Grid System. • Improvement in reliability of NTDC & HESCO networks at/around Jhimpir-I and Gharo New.

Project Sr. No. 42

1.	Name of Project	**EVACUATION OF POWER FROM 1320MW POWER PLANT AT SAHIWAL** **EXTENSION WORKS AT 500KV SAHIWAL (YOUSAFWALA) SUBSTATION**
2.	Location	Punjab
3.	Scope in Brief / Objectives	1X600MVA, 500kV/220kV Auto Transformer Bay (Extension Works)
4.	Category	✓ **Power Evacuation** System Reliability System Constraints
5.	Type	✓ **Extension** Augmentation Development
6.	Funding:	Asian Development Bank Loan – ADB-100-2017
7.	Approval Forum	ECNEC
8.	Commencement Date	21.02.2019
9.	Actual Completion date	22.07.2020
10.	Physical progress:	
	e) Physical progress (major works done):	Completed & Energized
	f) Physical completion (in %age terms):	100%
11.	Outcomes / Benefits of the project after completion	Evacuation of power from Sahiwal power plant.

Project Sr. No. 43

1.	Name of Project	**Evacuation of power from 2160MW Dasu HPP Stage-I**
2.	Location	KPK and Punjab
3.	Scope in Brief / Objectives	1. Double circuit 765kV transmission line Dasu-MAnsehra **(Lot-I 157 KM)** 2. Double circuit 765kV transmission line Mansehra-Islamabad **(Lot-II 97.6 KM)** 765/220 kV Mansehra Grid Station **(Lot-III)**
4.	Category	✓ **Power Evacuation** ✓ **System Reliability** System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	World Bank
7.	Approval Forum	ECNEC
8.	Commencement Date	Contract not yet Awarded
9.	Actual Completion date	Transmission Line – April 2026 Grid Station – June 2025
10.	Physical progress:	
	Physical progress (major works done):	**Land** • **Land Acquisition for Mansehra**: Proceedings for Section-V under-process **Grid Station** • **Lot-III:** NOL on Bid Evaluation Report (BER) / Award of Contract given by World Bank (WB), NTDC BOD approval under-process. **Transmission Line** • **Lot-I, II:** NOL on Bid Evaluation Report (BER) / Award of Contract given by World Bank (WB), NTDC BOD approval under-process.
	Physical completion (in %age terms):	< 1%
11.	Outcomes / Benefits of the project after completion	Evacuation of 2160 MW power in Stage-I from Dasu HPP, Clean and Green Energy

Project Sr. No. 44

1.	Name of Project	**Evacuation of Power from Suki Kinari, Kohala, Mahal HPPs**
2.	Location	KPK, AJK
3.	Scope in Brief / Objectives	500 kV Double-Circuit Quad-Bundle Transmission Line from 870MW Suki Kinari HPP to Neelum Jhelum Interconnection Point using ACSR Bunting Conductor (Approx. 75 km) The main objective of the project is to provide interconnection facility for evacuation of bulk amount of power from the upcoming power plant, which are falling in the KPK/AJK region under China Pakistan Economic Corridor projects.
4.	Category	✓ **Power Evacuation** System Reliability System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	NTDC Own Resources
7.	Approval Forum	ECNEC
8.	Commencement Date	02-06-2021
9.	Actual Completion date	10-06-2023
10.	Physical progress:	
	Physical progress (major works done):	Land • .N/A Grid Station • N/A Transmission Line • Engineering Design = 96.4 % completed • Procurement of Material = 51.1 % completed • Towers released = 198/198, • Towers stacked = 198/198, • Tower Excavation = 97/198, • Towers concreted = 94.50/198 Access road for 130 No. towers has been completed.
	Physical completion (in %age terms):	28.23%
11.	Outcomes / Benefits of the project after completion	• Evacuation of bulk amount of power From Upcoming HPP in KPK/AJK area. • Improvement of Power Supply Position in the country • Improvement in reduction of load shedding in the country. • Improvement in the reliability of NTDC network Improvement in voltage profile of existing system

Project Sr. No. 45

1.	Name of Project	**Evacuation of Power from Tarbela 5th Extension.**
2.	Location	KPK
3.	Scope in Brief / Objectives	• 500kV D/C Transmission Line for Evacuation of Power from Tarbela 5th Extension Switchyard to Islamabad West Substation (50km Approx.). • 500kV S/C Interconnector from Tarbela-T5 Switchyard to Tarbela 1-4 Switchyards (Approx. 2.8km This project will help evacuation of 1410 Mw power from Tarbela 5th extension which will help in improvement of overall power supply position in the country.
4.	Category	✓ **Power Evacuation** ✓ **System Reliability** System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	World Bank
7.	Approval Forum	ECNEC
8.	Commencement Date	To be Declared (24 Months from date of Commencement
9.	Actual Completion date	September-2024
10.	Physical progress:	
	Physical progress (major works done):	Land N/A Grid Station N/A Transmission Line • The Contractor Advance Payment Guarantee APG has been verified from Bank. • Contractor has been mobilized for survey and soil investigation activities. For construction supervision, the Consultant already engaged.
	Physical completion (in %age terms):	2 %
11.	Outcomes / Benefits of the project after completion	• The project will help in evacuation of power from 1410 Mw Tarbela 5th extension • It will help improve overall power supply position in the country and will help eliminate the load shedding in the country. • Improvement in the reliability of the NTDC system. • Addition of cheap energy into the system.

Project Sr. No. 46

1.	Name of Project	**Evacuation of power from wind power projects at Jhimpir and Gharo Wind Clusters**
2.	Location	Sindh
3.	Scope in Brief / Objectives	• 220kV GIS Gharo Substation. • Two 220/132 kV, 250MVA transformers with transformer bays at both ends. • Two 220 kV line bays for double circuit T/L towards 220 kV Jhimpir. • Four 132 kV line bays for interconnection of WPPs at Gharo cluster. The main objective of the project is evacuation of Power from the WPPs envisaged to be installed at Jhimpir & Gharo wind clusters.
4.	Category	✓ **Power Evacuation** ✓ **System Reliability** System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	KFW
7.	Approval Forum	ECNEC (03.07.2014)
8.	Commencement Date	Jhampir G/S Commencement: 28/09/2015 Gharo G/S : Yet to be awarded
9.	Actual Completion date	Jhampir G/S Completion: 11/08/2017
10.	Physical progress:	
	Physical progress (major works done):	• KfW has signed EPC Construction Supervision Consultancy Contract with association of "M/s GOPA, M/s NESPAK and M/s EnMasse" (Consultant) on 06/08/2021. • Advance payment has been made & Consultant has commenced consultancy services **(procurement phase)** w.e.f. 12/01/2022. • Finalization of Design Report is under process.
	Physical completion (in %age terms):	• All components (Jhampir G/S) completed other than Gharo G/S
11.	Outcomes / Benefits of the project after completion	• Dispersal of power from WPPs reliably. • Improvement in voltage profile of HESCO & NTDCL Grid System. • Reduction in T/Line Losses of HESCO & NTDCL Grid System. • Improvement in reliability of NTDCL & HESCO networks at/around Jhampir & Gharo. • Reduction in the loading of 220/132 kV transformers at T.M Khan Road 220 kV Substation. • Provision of more reliable supply of electricity to the consumers. • Creation of small business services. • Creation of new job opportunities for local communities.

Project Sr. No. 47

1.	Name of Project	**Interlinking of 765kV Mansehra with 220kV Mansehra**
2.	Location	KPK Province
3.	Scope in Brief / Objectives	• 220kV D/C transmission line from 765kV Mansehra to 220kV Mansehra (10km) • 2x1200MVA, 765/220kV transformers The project will help evacuate power from DASU and other generation in its vicinity.
4.	Category	✓ **Power Evacuation** System Reliability System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	
7.	Approval Forum	-
8.	Commencement Date	-
9.	Actual Completion date	-
10.	Physical progress:	
	Physical progress (major works done):	PC-I under preparation
	Physical completion (in %age terms):	PC-I under preparation
11.	Outcomes / Benefits of the project after completion	The project will help evacuate power from DASU and other generation in its vicinity.

Project Sr. No. 48

1.	Name of Project	**Evacuation of power from 816MW Mohmand Dam**
2.	Location	KPK
3.	Scope in Brief / Objectives	• Mohmand District, Khyber Pakhtunkhwa Province • A 220 kV D/C transmission line on twin bundled Rail conductor from Mohmand HPP to Nowshera Industrial substation (70 km). • A 220 kV D/C transmission line on twin bundled Rail conductor from Mohmand HPP to proposed Jamrud substation (65 km). • Extensions of two No. of line bays each at 220 kV Nowshera Industrial and Jamrud substations. The project aims the construction of 220kV transmission lines to provide interconnection of 816 MW Mohmand Hydro Power Plant (HPP) with the National Grid System.
4.	Category	✓ **Power Evacuation** System Reliability System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	NTDC own resources/Local Banks Borrowing
7.	Approval Forum	Departmental Development Working Party
8.	Commencement Date	Civil works to be started in October,2023 as per PC-I
9.	Actual Completion date	December, 2025 as per PC-I
10.	Physical progress:	
	Physical progress (major works done):	• Work for detailed survey and Sub soil investigation of 220 kV Transmission lines has been awarded to M/s. NESPAK on 09-12-2021. • Detailed Survey and soil investigation activities are in progress.
	Physical completion (in %age terms):	2%
11.	Outcomes / Benefits of the project after completion	• Inclusion of 816 MW power to the National Grid thereby will greatly improve the supply/deficit ratio. • Enhancement of indigenous resources to reduce the import bill of the country for imported fuel including coal, RFO, RLNG & Deisel etc. • Increase in the available system capacity to meet future load growth at/around proposed project.

Project Sr. No. 49

1.	Name of Project	**500kV Ghazi Brotha-Faisalabad West T/L**
2.	Location	KPK & Punjab Provinces
3.	Scope in Brief / Objectives	In/Out of one of the proposed 500kV Islamabad West-Ghazi Brotha circuits at Faisalabad West (330 km) The project is required for power dispersal from future hydel power project in the north. The project provides improved system reliability under N-1 contingency scenarios.
4.	Category	✓ **Power Evacuation** System Reliability System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	Yet to be arranged
7.	Approval Forum	-
8.	Commencement Date	-
9.	Actual Completion date	2025-26
10.	Physical progress:	
	Physical progress (major works done):	PC-I under preparation
	Physical completion (in %age terms):	PC-I under preparation
11.	Outcomes / Benefits of the project after completion	The project is required for power dispersal from future hydel power project in the north. The project provides improved system reliability under N-1 contingency scenarios.

Project Sr. No. 50

1.	Name of Project	**220kV G/S Mansehra Tranche-III**
2.	Location	KPK
3.	Scope in Brief / Objectives	• 3 x 250 MVA 220/132kV Auto Transformer, • 220kV Line Bays 02 Nos. This project aims the installation of new 220 kV substation at Nowshera to meet the upcoming load demand & voltage Profile improvement of Nowshera area in PESCO.
4.	Category	Power Evacuation ✓ **System Reliability** System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	Asian Development Bank (ADB) Trench-III
7.	Approval Forum	CDWP 07.04.2011
8.	Commencement Date	
9.	Actual Completion date	G/S 10.02.2018 T/L 16.11.2017
10.	Physical progress:	Completed
	Physical progress (major works done):	Project completed and commissioned. EOT & variations cases pending. Tender for Residential colony tenders evaluated, Board has accorded the approval for award of work, NOA will be issued in Second week of February (On completion of stand still period) and Contractor commenced services on 22-03-2022
	Physical completion (in %age terms):	Grid Station: 100% Transmission Line: 100%
11.	Outcomes / Benefits of the project after completion	• Improvement of Power Supply Position At/Around 220 kV Mansehra G/S. • Increase in the system capacity to meet future load demand of the area. • Improvement in voltage profile of existing 132 kV grid station in the vicinity of Mansehra G/S. • Reduction in transmission system losses. • Improvement in reliability of NTDC and PESCO networks

Project Sr. No. 51

1.	Name of Project	**3rd 500KV Jamshoro-Moro- R.Y Khan Single Circuit T/Line. Tranche-III**
2.	Location	Sindh
3.	Scope in Brief / Objectives	The main objective of 500kV Transmission line in association of substations is to transfer of power to be generated from power generation plants in south areas to enhance the capacity of transmission line, and provide the transmission link between South & North in order to facilitate transfer of bid blocks of power to either side under different generation scenarios, which contributes to increase the electrification, development of industries and alleviate poverty of the area. Package-I: Transmission Line (600km) Package-II: 500kV Moro Switching Station & Extension works at 500kV Jamshoro, 500kV Dadu and 500kV R.Y.Khan Grid Stations
4.	Category	Power Evacuation ✓ **System Reliability** System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	Asian Development Bank
7.	Approval Forum	ECNEC 26.08.2013
8.	Commencement Date	**Package-I** Lot-I: 20.01.2015 Lot-II: 07.01.2015 Lot-III: 28.01.2015 **Package-II:** 28.01.2015
9.	Actual Completion date	**Package-I:** 24-01-2019 (Lot-I) 06-09-2019 (Lot-II) 22-05-2019 (Lot-III) **Package II:** 02-05-2019
10.	Physical progress:	
	Physical progress (major works done):	Completed & Energized
	Physical completion (in %age terms):	100%
11.	Outcomes / Benefits of the project after completion	Dispersal of power in Southern part of the country from Coal Power Plants and system stability (N-1) criterion.

Project Sr. No. 52

1.	Name of Project	**Inter-Connection- Thar Coal Based, 1200MW (Power Dispersal from 1200MW Thar Coal Power Plant - 500kV Thar - Matiari T/L & Matiari 500kV S/station)**
2.	Location	Sindh
3.	Scope in Brief / Objectives	The primary objective of making effective use of the ample coal reserves in the Thar Desert to meet Pakistan's power generation needs, spur economic development, and bring energy security to the country, the benefits of the project is to enhance the capacity of transmission line, and to provide the transmission link between various Sub-Station in order to facilitate transfer bid block of power to either side under different generation scenarios, which contributes to increase the electrification, to fulfill energy demands, development of industries, reduce load shedding and to alleviate poverty of the area. 500kV D/C T/Line Thar – Matiari (247 km)
4.	Category	✓ **Power Evacuation** System Reliability System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	NTDC Own Resources
7.	Approval Forum	ECNEC 16.08.2012
8.	Commencement Date	**Lot-I**: 25.01.2016 **Lot-II:** 03.06.2016
9.	Actual Completion date	31.07.2018
10.	Physical progress:	
	Physical progress (major works done):	Completed & Energized
	Physical completion (in %age terms):	100%
11.	Outcomes / Benefits of the project after completion	• Improvement in transmission system reliability. Smooth transmission of power to the National Grid which will help bridge the demand-supply gap for elimination of load shedding in country.

Project Sr. No. 53

1.	Name of Project	**Quaid-e-Azam Solar Park at Lal-Suhanra (Phase-II) Evacuation of 600 MW Solar** **(Proposed to be carried out by NTDC)**
2.	Location	Punjab
3.	Scope in Brief / Objectives	**Grid Station** • 1x250MVA, 500/220kV Auto Transformer **Line** • Construction Of 220 kV D/C T/B T/Line from Quaid-e-Azam Solar Park to 220 kV Bahawalpur G/Station (38.2 KM)
4.	Category	✓ **Power Evacuation** System Reliability System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	Grid Station : ADB Line : NTDC Own Resources
7.	Approval Forum	ECNEC
8.	Commencement Date	Grid Station : 19.03.2015 Line : 28.02.2015
9.	Actual Completion date	Grid Station : 15-02-2018 Line: 20-10-2017
10.	Physical progress:	
	Physical progress (major works done):	Completed & Energized
	Physical completion (in %age terms):	100%
11.	Outcomes / Benefits of the project after completion	• Evacuation of power from Quied a Azam solar park.

Project Sr. No. 54

1.	Name of Project	**Transmission Scheme for Dispersal of power from Neelam-Jhelum, Karot and Azad Patan Hydro Power Project**
2.	Location	AJK/Punjab
3.	Scope in Brief / Objectives	• 500 kV D/C transmission line on Quad Bundle from Neelum Jhelum HP to Gujranwala. • Two 500 kV Line bays along with 3 x 37 MVA shunt reactors at 500 kV grid station Gujranwala. • In/out of one circuit o Neelum Jhelum to Gujranwala T/L at karot. • In/out of One circuit of Neelum – Jehlum Gujranwala T/L at Azad Pattan. This project aims to help evacuate more than 2000 MW of power from upcoming HPPSs, which will helps in reduction of severe load shedding in the country.
4.	Category	Power Evacuation ✓ **System Reliability** ✓ **System Constraints**
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	NTDC Own Resources
7.	Approval Forum	ECNEC 02.03.2015
8.	Commencement Date	
9.	Actual Completion date	Ph-I: 02.04.2018 Ph-II: 13.01.2022 Karot:13.01.2022 Pattan:2023-24
10.	Physical progress:	Phase-I Completed Phase-II Completed Karot TL: completed
	Physical progress (major works done):	Project completed. Retention money is pending.
	Physical completion (in %age terms):	100%
11.	Outcomes / Benefits of the project after completion	• Evacuation of Power from Neelum Jhelum, Karot and Azad Pattan HPP. • Smooth supply of power to the national grid to eliminate severe load shedding condition in the country. • Improvement & enhancement in overall power system efficiency and reliability.

Project Sr. No. 55

1.	Name of Project	**Transmission Interconnection for Dispersal of Power From UCH-II Tranche-III**
2.	Location	Baluchistan
3.	Scope in Brief / Objectives	The main objective of 220kV Transmission Line is to transmit power generating from Uch-II Power Plant to Sibbi G/station and thereby strengthening the existing NTDC integrated system. 220kV D/C T/Line Uch-II to Sibbi (113.4km)
4.	Category	✓ **Power Evacuation** System Reliability System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	ADB
7.	Approval Forum	ECNEC 29.07.2011
8.	Commencement Date	01.01.2015
9.	Actual Completion date	05.05.2018
10.	Physical progress:	
	Physical progress (major works done):	Completed & Energized
	Physical completion (in %age terms):	100%
11.	Outcomes / Benefits of the project after completion	Dispersal of power from UCH-II power plant and stability for N-1 criterion.

Project Sr. No. 56

1.	Name of Project	**Evacuation of power from 1320MW Power Plant at Bin Qasim**
2.	Location	Sindh
3.	Scope in Brief / Objectives	For dispersal of Power from Port Qasim Power Plant. Phase-I: 500kV T/L Port Qasim-Hub Jamshoro T/L CCT-I (54.5km) Phase-II: 500kV Hub Jamshoro T/L CCT-I – 500kV Matiari (118 km)
4.	Category	✓ **Power Evacuation** System Reliability System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	NOR
7.	Approval Forum	ECNEC 13.05.2015
8.	Commencement Date	**Phase-I:** 28.07.2016 **Phase-II:** **Lot-I:** 19.09.2017, **Lot-II:** 03.04.2017, **Lot-III:** 06.04.2017
9.	Actual Completion date	**Phase-I**: 01.11.2017 **Phase-II:** **Lot-I:** 20.04.2019 **Lot-II:** 24.06.2019 **Lot-III:** 02-11-2020
10.	Physical progress:	
	Physical progress (major works done):	Completed & Energized
	Physical completion (in %age terms):	100%
11.	Outcomes / Benefits of the project after completion	• Addition of 1,320 MW Power in National Grid which will help to bridge the demand supply gap and to eliminate the severe load shedding of the country. • Improvement in power supply position resulting improvement in overall economic condition of the country. • Additional source of income for NTDCL in the shape of Use of System Charges. • Additional Income for National Ex-chequer in the shape of duties and taxes. • Improvement in reliability of NTDCL system.

Project Sr. No. 57

1.	Name of Project	**Evacuation of power from 147MW Patrind HPP**
2.	Location	KPK
3.	Scope in Brief / Objectives	Construction of 132kV T/Line for Evacuation of Power from Parind HPP to Mansehra New Grid Station (40km approx)
4.	Category	Power Evacuation System Reliability ✓ **System Constraints**
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	NTDC OWN Resources + USAID Grant
7.	Approval Forum	CDWP 27/01/2015
8.	Commencement Date	07.06.2016
9.	Actual Completion date	31.07.2020
10.	Physical progress:	
	Physical progress (major works done):	Project completed and commissioned, EOT & Variation Order pending.
	Physical completion (in %age terms):	Transmission Line: 100%
11.	Outcomes / Benefits of the project after completion	• Evacuation of Power from 147MW Patrind HPP. • Smooth supply of power to the national grid to eliminate severe load shedding condition in the country. Improvement & enhancement in overall power system efficiency and reliability.

Project Sr. No. 58

1.	Name of Project	**Evacuation of Power from 1320 MW Hub Power Company Ltd.**
2.	Location	Sindh
3.	Scope in Brief / Objectives	The main objective of the project is evacuation of 1320 MW power from the proposed Hub Power Plant envisaged to be installed near existing 1292 MW Thermal Power Station at Hub. i) 500 kV double circuit quad bundle transmission line on Greeley conductor from Hub Power Plant to 500 kV Matiari switching station (220 km). ii) Extension at 500 kV Matiari switching station (Two Line Bays with Shunt Reactors)
4.	Category	✓ **Power Evacuation** System Reliability System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	NOR
7.	Approval Forum	ECNEC 17.11.2016
8.	Commencement Date	20.08.2018
9.	Actual Completion date	**Lot-I**: 17-09-2020 **Lot-II**: 29-03-2020 **Lot-III**: 19-03-2020 **Lot-IV:** 28-06-2020
10.	Physical progress:	
	Physical progress (major works done):	Completed & Energized
	Physical completion (in %age terms):	100%
11.	Outcomes / Benefits of the project after completion	• Addition of 1,320 MW Power in National Grid which will help to eliminate the severe load shedding in the Country. • Improvement in overall power supply position in NTDC system. • Additional source of income for NTDC as a result of use of system charges. • Additional revenues to Government exchequer from the levy of taxes on finished goods, electricity duty due to additional sale of power & GST etc. • Creation of new jobs during construction & afterwards. Overall uplift of the area.

Project Sr. No. 59

1.	Name of Project	**Evacuation of Power from K2/K3 Nuclear Power near Karachi (In/Out of 500-KV Port Qasim to Matiari S/C and 500-KV Hub to Matiari S/C at K2/K3).**
2.	Location	Sindh
3.	Scope in Brief / Objectives	• 500kV D/C Quad Bundle Transmission Line for Interconnection of K2/K3 Power Plant with 500kV Port Qasim – Matiari Circuit (102 km) The main objective is evacuation of power from 2x1100MW K2/K3 Nuclear Power Plants.
4.	Category	✓ **Power Evacuation** System Reliability System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	NTDC Own Resources
7.	Approval Forum	ECNEC (12.04.2017)
8.	Commencement Date	28-10-2020
9.	Actual Completion date	30-11-2022
10.	Physical progress:	
	Physical progress (major works done):	• Concrete: 185/317 No. • Erection: 161/317 No. • Stringing: 17.02/102 km **500kV D/C Transmission Line (17.03km) has been energized through existing 500kV S/C T/L Hub-Jamshoro Circuit-II (Interim Arrangement) on 23/03/2022 & 25/03/2022 respectively.**
	Physical completion (in %age terms):	58.4%
11.	Outcomes / Benefits of the project after completion	• Addition of 2200 MW Power in National Grid which will help to eliminate the severe load shedding in the Country. • Improvement in overall power supply position in NTDC system. • Additional source of income for NTDC as a result of use of system charges. • Additional revenues to Government exchequer from the levy of taxes on finished goods, electricity duty due to additional sale of power & GST etc. • Creation of new jobs during construction & afterwards. Overall uplift of the area.

Project Sr. No. 60 & 61

1.	Name of Project	**Evacuation of Power from 2x660 MW Thar Coal Based SSRL/SECL Power Plant at Thar** **&** **Evacuation of Power from 330 MW Siddiquesons Ltd.**
2.	Location	Sindh
3.	Scope in Brief / Objectives	• **Lot-I:** 500 kV D/C T/L from SECL plant up to 86th km **(86 km)** • **Lot-II:** 500 kV D/C T/L from 86th km up to 157th km **(71 km)** • **Lot-III:** 500 kV D/C T/L from 157th km up to Matiari Converter Station **(64 km)** The main objective of the project is evacuation of 2x660 MW power from Shanghai Electric Power Plant (SSRL/SECL) to be installed in Thar area of Sindh Province to National Grid for transfer of power to upcountry load centers.
4.	Category	✓ **Power Evacuation** System Reliability System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	NTDC Own Resources
7.	Approval Forum	ECNEC (12.04.2017)
8.	Commencement Date	05-07-2021
9.	Actual Completion date	31-12-2022
10.	Physical progress:	
	Physical progress (major works done):	**Lot-I:** Concrete: 39 / 268 No. **Lot-II:** Concrete: 131/212 No., Erection: 31/212 No. **Lot-III:** Concrete: 168/189 No., Erection: 66/189 No.
	Physical completion (in %age terms):	34.8%
11.	Outcomes / Benefits of the project after completion	• Addition of 1320 MW Power in National Grid which will help to bridge the demand supply gap and to eliminate the severe load-shedding of the country. • Improvement in power supply position resulting improvement in overall economic condition of the country. • Additional Income for National Exchequer in the shape of duties and taxes. • Improvement in reliability of NTDC system.

Project Sr. No. 62

1.	Name of Project	**Evacuation of Power from 660 MW from Lucky Electric Power Company Ltd.**
2.	Location	Sindh
3.	Scope in Brief / Objectives	Tower Locations: 39 No. Length of T/Line: 13.2 km The main objective of the project is the evacuation of power from 660MW Lucky Electric Coal Power Plant.
4.	Category	✓ **Power Evacuation** System Reliability System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	NTDC Own Resources
7.	Approval Forum	CDWP 03.03.2020
8.	Commencement Date	18.11.2020
9.	Actual Completion date	09.11.2021
10.	Physical progress:	
	Physical progress (major works done):	Completed & energized
	Physical completion (in %age terms):	100%
11.	Outcomes / Benefits of the project after completion	• Addition of 660 MW Power in National Grid which will help to improve the power supply system in the Country. • Additional source of income for NTDC as a result of use of system charges. • Additional revenues to Government exchequer from the levy of taxes on finished goods, electricity duty due to additional sale of power & GST etc. • Creation of new jobs during construction & afterwards. Overall uplift of the area

Project Sr. No. 63

1.	Name of Project	**220/132 kV GIS Substation Dhabiji**
2.	Location	Sindh
3.	Scope in Brief / Objectives	• 220kV GIS Dhabeji Grid Staion (2x160MVA, 220/132kV Auto Transformer) • 220kV Double Circuit Twin Bundled Transmission Line for Looping In/Out of 220kV Gharo –Jhampir S/C at 220kV Dhabeji SEZ Substation (12.4km) The main objective of the project is construction of 220kV Substation at Dhabeji along with associated transmission lines for provision of electricity at the doorstep of Dhabeji Special Economic Zone (DSEZ) as per decision of the Federal Government.
4.	Category	Power Evacuation ✓ **System Reliability** System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	Government of Pakistan Grant
7.	Approval Forum	CDWP (16.12.2020)
8.	Commencement Date	Grid Station: Yet to commence Transmission Line: 12-05-2022
9.	Actual Completion date	Grid Station: 540 days from the date of commencement Transmission Line: 31-10-2022
10.	Physical progress:	
	Physical progress (major works done):	Land • 07 Acres of land for construction of grid station has been allotted. Grid Station • Soil Investigation has been carried out. • Bids opened on 17/03/2022, evaluation completed & work is in award stage. • RFP for Construction Supervision Consultancy Services opened on 07-04-2022 & is under financial evaluation. Transmission Line • Work has been awarded to M/s Potential Engineers (Pvt.) Ltd. on 25/03/2022. • Contractor mobilized at site & commenced the work. Tower stacking & excavation work (06/43 No.) in progress.
	Physical completion (in %age terms):	Grid Station: - Transmission Line: 10%
11.	Outcomes / Benefits of the project after completion	• Provision of reliable supply of electricity to Special Economic Zones. • Socio economic uplifts of the community such as improved production, incomes and market activities. • Development of industries in the area will create gainful employment to the increasing work force. Additional revenues to government exchequer from the levy of taxes on finished goods, electricity duty due to additional sale of power & GST, etc.

Project Sr. No. 64

1.	Name of Project	**220kV Haripur Substation**
2.	Location	KPK
3.	Scope in Brief / Objectives	• 3 x 250MVA Auto Transformers • 220kV Double Circuit Twin Bundle Transmission Line In/out at existing 220kV Mansehra – ISPR Transmission Line (12 km approx.) This project aims the installation of new 220 kV Substation at Haripur to meet the upcoming power demand of industrial estate at Hattar SEZ
4.	Category	✓ **Power Evacuation** ✓ **System Reliability** System Constraints
5.	Type	✓ **Extension** Augmentation ✓ **Development**
6.	Funding:	Government of Pakistan Through CDL
7.	Approval Forum	CDWP
8.	Commencement Date	To be Declared
9.	Actual Completion date	July -2023
10.	Physical progress:	Land **KPK Portion:** 1. Section-4 notified on 24/09/2020. 2. Section-6 & 17 approved on 23/08/2021. 3. Section-11 issued on 22-02-2022. **Punjab Portion:** • Proceedings under Section-11 are in progress **Grid Station** • Consultancy Agreement signed with M/s Barqaab (Pvt) Ltd on 07-07-2022. • The completion schedule is 365 days. • The drawing of GLO has been issued by Civil department. **Transmission Line** • Report containing Plan & Profile, Survey report, Stringing Chart, Detail of BoQ and Soil Investigation report has been completed. Tender Documents for Civil Works and material for T/Line are under preparation.
	Physical progress (major works done):	1%
	Physical completion (in %age terms):	To meet the additional load demand of Hattar special economic zone region which falls under CPEC. The proposed project will also improve power supply system & voltage profile around Haripur, Hattar and Wah area.
11.	Outcomes / Benefits of the project after completion	• 3 x 250MVA Auto Transformers • 220kV Double Circuit Twin Bundle Transmission Line In/out at existing 220kV Mansehra – ISPR Transmission Line (12 km approx.) This project aims the installation of new 220 kV Substation at Haripur to meet the upcoming power demand of industrial estate at Hattar SEZ

Project Sr. No. 65

1.	Name of Project	**220kV Swabi Substation**
2.	Location	KPK
3.	Scope in Brief / Objectives	• 3 x 250 MVA 220/132kV Auto Transformer. • 220kV Double Circuit Twin Bundle Transmission Line from 500kV Nowshehra Grid Station to 220kV Swabi Grid Station (55 k.m. appox. This project aims the installation of new 220 kV Substation at Swabi to meet the upcoming power demand of industrial estate Rashakai SEZ.
4.	Category	✓ **Power Evacuation** System Reliability System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	Government of Pakistan through CDL
7.	Approval Forum	CDWP
8.	Commencement Date	26-07-2022
9.	Actual Completion date	July 2023
10.	Physical progress:	
	Physical progress (major works done):	**Land Acquisition:** • Project site has been handed over to Contractor, M/s Potential Engineers on 25-07-2022. **Grid Station:** • For construction of Grid Station, Contract Agreement has been signed with M/s Potential Engineers on 29-06-2022. • Commencement has been declared on 26-07-2022 • Soil investigation activities are in progress at site. • Procurement of material for Grid Station is under process. **Transmission Line:** • Plan & Profile, Survey report and Soil investigation report have been approved. • Tender Documents for Construction services and procurement of material for Transmission Line is under preparation.
	Physical completion (in %age terms):	4%
11.	Outcomes / Benefits of the project after completion	To meet the additional load demand & voltage profile Improvement of industrial estate Rashakai SEZ and Swabi.

Project Sr. No. 66

1.	Name of Project	**220 kV Quaid-e-Azam Apparel and Business Park (QABP) Grid Station for Provision of Electricity to PIEDMC SEZ**
2.	Location	Sheikhupura, Punjab
3.	Scope in Brief / Objectives	220 kV G/Station with 2x250 MVA, 220/132 kV T/Fs2x220 kV Line Bays for IN/OUT of 220 kV KSK-Bandala Ccts-I & II T/Line. 220 kV D/C T/L (2+2 km) for IN/OUT of existing 220 kV KSK-Bandala Ccts-I & II T/L (completed on 30/11/2020 on cost deposit basis and energized on no-load).
4.	Category	✓ **System Reliability**
5.	Type	✓ **Development**
6.	Funding:	Federal Govt. PSDP as CDL
7.	Approval Forum	CDWP
8.	Commencement Date	02.07.2022
9.	Actual Completion date	September-2023
10.	Physical progress:	
	Physical progress (major works done):	Grid Station • Work has been awarded to M/s. Transmark vide C.E MP&M letter No. 30326-42 dated 02.06.2022. • Site has been handed over on 02.07.2022. While soil investigation, bore holes & coordinates have been carried out by the contractor. M/s. NESPAK is the lowest evaluator consultant which is under approval.
	Physical completion (in %age terms):	5 %
11.	Outcomes / Benefits of the project after completion	This project provides power supply to "Quaid-e-Azam" Special Economic Zone Sheikhupura.

Project Sr. No. 67

1.	Name of Project	**500kV Allama Iqbal Industrial City for 600MW Demand of the Special Economic Zone in the FIEDMC area**
2.	Location	Faisalabad, Punjab
3.	Scope in Brief / Objectives	• 3 x 250 = 750 MVA , 500 /220/132 kV Auto T/F along with associated T/F bays • 2 Nos of 500 kV line bays • 8 Nos. of 132 kV line bays • One 132/ 11 kV 20/26 MVA Auxiliary Power T/F 500 kV D/C T/L on three bundle Greely conductor, from 500 kV AIIC Grid Station for In/Out on the existing Gatti- Ghazi Barotha Circuit-II (Chakwal) 500 kV single circuit T/L
4.	Category	✓ **System Reliability**
5.	Type	✓ **Development**
6.	Funding:	Federal Govt. PSDP as grant from Govt. of Pakistan
7.	Approval Forum	CDWP
8.	Commencement Date	N/A
9.	Actual Completion date	24/06/2024
10.	Physical progress:	
	Physical progress (major works done):	Transmission Line • Contract signed with M/s. Nespak-Barqaab (JV) on 06/01/2022. Commencement date is 06/01/2022. • IFB for EPC tender (G/S) published on 05/03/2022, technical bids opened on 16/05/2022, bids evaluated & under review. • Assignment Account opened in the name of PD (EHV-1) Lahore with NBP on 27.05.2022
	Physical completion (in %age terms):	3%
11.	Outcomes / Benefits of the project after completion	This project provides power supply to “Allama Iqbal” Special Economic Zone Faisalabad.

Project Sr. No. 68

1.	Name of Project	**Feasibility study for enhancing the transmission capacity of NTDCs 500-KV Transmission System by applying series compensation**
2.	Location	NTDC 500 kV Network –Southern Part
3.	Scope in Brief / Objectives	Consultancy services for carrying out Feasibility study for enhancing transmission capacity of NTDC's 500 kV transmission system by applying series compensation To enhance the transmission capacity of NTDC's 500kV transmission system by exploring the impacts of introducing advanced technology such as Flexible AC Transmission System (FACTS) including series/shunt compensation and Power System Stabilizers (PSSs)
4.	Category	✓ Power Evacuation ✓ **System Reliability** System Constraints
5.	Type	✓ Extension ✓ Augmentation ✓ Development ✓ **Feasibility Consultancy Services**
6.	Funding:	NTDC Own Resources
7.	Approval Forum	-
8.	Commencement Date	May 2019
9.	Actual Completion date	Study in progress
10.	Physical progress:	
	Physical progress (major works done):	
	Physical completion (in %age terms):	
11.	Outcomes / Benefits of the project after completion	• NTDC is the sole national entity responsible for reliable power transmission from country's power generating stations to the network of distribution utilities through an integrated system of 220kV & 500kV transmission lines and grid stations. The existing generation capacity of the NTDC system will be increasing with the inclusion of bulk power generation in the north and south of the country. Strengthening of the existing transmission network by enhancing power transmission capacity of existing lines and addition of new lines of prime importance for reliable power transmission • For this purpose NTDC has hired the services of international consultants for carrying out feasibility study for enhancing transmission capacity of NTDC's 500kV transmission system by exploring impacts of introducing advanced technology such Flexible AC Transmission Systems (FACTS) including series/shunt compensation and Power System Stabilizers (PSSs)

Project Sr. No. 69

<table>
<tr><td>1.</td><td>Name of Project</td><td>Improvement & Upgradation of Protection System to Avoid the Frequent Trippings in South Areas</td></tr>
<tr><td>2.</td><td>Location</td><td>Sindh and Baluchistan</td></tr>
<tr><td>3.</td><td>Scope in Brief / Objectives</td><td>The summary of the equipment is given below:
<table>
<tr><th>Sr. No.</th><th>Description</th><th>Qty</th><th>Unit</th></tr>
<tr><td>1-</td><td>Fault Recorder Panels</td><td>13</td><td>No.</td></tr>
<tr><td>2-</td><td>Event Recorder Panels</td><td>08</td><td>No.</td></tr>
<tr><td>3-</td><td>Under Frequency Relays</td><td>08</td><td>No.</td></tr>
<tr><td>4-</td><td>Distance Protection Relays</td><td>27</td><td>No.</td></tr>
<tr><td>5-</td><td>Over Current & Earth Fault Relays</td><td>57</td><td>No.</td></tr>
<tr><td>6-</td><td>Over Load Relays</td><td>03</td><td>No.</td></tr>
<tr><td>7-</td><td>Transformer Differential Relays</td><td>22</td><td>No.</td></tr>
<tr><td>8-</td><td>Design of interfacing and wiring diagram (schematic) for installation of Event & Fault Recorder Panels at respective grids and its Testing & Commissioning as per NTDCL specification with existing Grid Station Scheme.</td><td>09</td><td>Lot</td></tr>
<tr><td>9-</td><td>Interfacing and wiring diagram (Schematic) and Installation of loose relays in the existing panels at respective grids keeping in view NTDCL specification and existing Grid Station Scheme.</td><td>11</td><td>Lot</td></tr>
</table></td></tr>
<tr><td>4.</td><td>Category</td><td>Power Evacuation
✓ <u>System Reliability</u>
System Constraints</td></tr>
<tr><td>5.</td><td>Type</td><td>Extension
Augmentation
✓ <u>Development</u></td></tr>
<tr><td>6.</td><td>Funding:</td><td>ADB-103</td></tr>
<tr><td>7.</td><td>Approval Forum</td><td>CDWP (31.12.2018)</td></tr>
<tr><td>8.</td><td>Commencement Date</td><td>14-03-2019</td></tr>
<tr><td>9.</td><td>Actual Completion date</td><td>-</td></tr>
<tr><td rowspan="3">10.</td><td>Physical progress:</td><td></td></tr>
<tr><td>Physical progress (major works done):</td><td>The work is completed except the followings:
• One set of Fault Recorder Panels for 220/132 kV Guddu as per scope of work is pending on Contractor’s end.
• The Project is complete from Protection & Control Design point of view.</td></tr>
<tr><td>Physical completion (in %age terms):</td><td>95% Completed as it is gradual progress.</td></tr>
<tr><td>11.</td><td>Outcomes / Benefits of the project after completion</td><td>• Improvement of Protection System to avoid indiscriminate trippings, and to improve Sensitivity.
• The Obsolete Electromechanical and Static Type Protection Relays are replaced with modern Microprocessor based numerical / digital relays.
• Event and Fault recorders are installed for better fault analysis and to find root cause in case of tripping and suggest remedies.</td></tr>
</table>

Project Sr. No. 70

1.	Name of Project	**Conversion from 220kV Substations at Bund Road, Kala Shah Kaku, Ravi and Nishatabad to GIS Technology**
2.	Location	Bund Road Lahore, Kala Shah Kaku, Ravi Road Lahore and Nishatabad
3.	Scope in Brief / Objectives	Project scope is the conversion of four 220/132 kV Air Insulated Substations to Gas Insulated Substation (GIS). The objective of the proposed project is conversion of four 220/132 kV Air Insulated Substations to Gas Insulated Substation (GIS) which become deteriorated due to aging factor as well as due to extraordinary pollution from nearby running drain and Chemical Industries causing erosion of all metal parts and differential settlement of the equipment foundations.
4.	Category	Power Evacuation ✓ **System Reliability** System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	World Bank Loan No. 8814-PK
7.	Approval Forum	ECNEC: 17-03-2017
8.	Commencement Date	07-05-2018 (Hiring of Project Design and Procurement Consultant)
9.	Actual Completion date	31-01-2024
10.	Physical progress:	
	Physical progress (major works done):	Evaluation for Ravi Road G/S completed. BOD directed to revise the PC-1. The office of GM (PSP) is revising the PC-1. Evaluation completed for Bund Road G/S which is to be presented to BOD for approval. KSK bids are under technical evaluation. Nishatbad excluded from NTMP-I due to insufficient funds. Process started for hiring of Project Supervision Services. Contracts to be awarded on EPC basis.
	Physical completion (in %age terms):	Currently, the tender documents are under evaluation for EPC contracts.
11.	Outcomes / Benefits of the project after completion	The benefit of the proposed project is conversion of four 220/132 kV Air Insulated Substations to Gas Insulated Substation (GIS) which become deteriorated due to aging factor as well as due to extraordinary pollution from nearby running drain and Chemical Industries causing erosion of all metal parts and differential settlement of the equipment foundations.

Project Sr. No. 71

1.	Name of Project	**Installation of Pilot Battery Energy Storage System (BESS) at 220kV Jhimpir G/Station**
2.	Location	Sindh
3.	Scope in Brief / Objectives	• Installation of Battery Energy Storage System with capacity of 20MW at Jhampir-I • Capacity Buildings in various stakeholders The main objectives of project are: • Develop a Pilot BESS to improve the frequency regulation capability of NPCC • Voltage support for the southern part of the NTDC grid, especially during contingencies. • Capacity building in energy storage systems which will form an essential part of future energy systems. Battery
4.	Category	Power Evacuation ✓ **System Reliability** System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	-
7.	Approval Forum	CDWP (25.05.2018)
8.	Commencement Date	05-07-2022
9.	Actual Completion date	August-2023
10.	Physical progress:	
	Physical progress (major works done):	• Work awarded to M/s. ZTT-ZEST-JSPDI (Consortium) on 06-05-2022. • Contract Agreement signed on 06-06-2022. • Work yet to commence.
	Physical completion (in %age terms):	-
11.	Outcomes / Benefits of the project after completion	• Improved load frequency control for NPCC and associated benefits. • Use of wind power to charge the BESS instead of paid curtailments. • Faster arrest of frequency drops in a contingency. • Fuel saving through improved efficiency of RLNG plants • Improved Voltage Profile in the Southern section of NTDC network

Project Sr. No. 72

1.	Name of Project	**Re-conductoring/Underground cabling of existing 220 kV Bund Road - NKLP D/C T/L (17 km)**
2.	Location	Lahore, Punjab
3.	Scope in Brief / Objectives	Reconductoring of 220 kV New Kot Lakhpat-Bund Road T/L (10 km U/G+ 5 km O/H)
4.	Category	✓ **System Reliability**
5.	Type	✓ **Augmentation**
6.	Funding:	Asian Development Bank
7.	Approval Forum	--
8.	Commencement Date	N/A
9.	Actual Completion date	N/A
10.	Physical progress:	
	Physical progress (major works done):	Transmission Line • Case was put up to BOD Procurement Committee in its 103rd meeting on 17/12/2021. However, the Procurement Committee deferred the agenda with the advice to seek the alternative of U/G cable or present technical justification for this project. • Case was again presented in 105th meeting of BOD Procurement Committee on 10/02/2021. However, by this time the bid validity of lowest evaluated bidder had expired and evaluated bid price of 2nd lowest bidder was 20.5 % on the higher side. • The agenda was again deferred with the advice to explore ways to complete this project without incurring additional cost. But BOD on 16/05/2022 allowed for scrapping the tender.
	Physical completion (in %age terms):	1%
11.	Outcomes / Benefits of the project after completion	By re-conductoring, the system (transmission) losses will be reduced.

Project Sr. No. 73

1.	Name of Project	**Strengthening of TSG Centre for Grid System Operations and Maintenance.**
2.	Location	NKLP Lahore
3.	Scope in Brief / Objectives	The Main objective of this project is to enhance the technical skills and knowledge of NTDC Staff through hands on job training in operation and maintenance of 132kV and 220kV substation through Training GSO and P&I Simulators and 220/132kV Training Purpose Model Grid station
4.	Category	✓ **Training**
5.	Type	✓ **Development**
6.	Funding:	Phase-I by JICA Grant Aid Phase-II by NTDC
7.	Approval Forum	CDWP 21.02.2015
8.	Commencement Date	Phase-I by JICA 24th May 2017 Phase-II by NTDC 2nd Aug 2017
9.	Actual Completion date	Phase I inaugurated on 22nd February 2019 Phase II Inaugurated on 2nd August 2022
10.	Physical progress:	
	Physical progress (major works done):	Phase-I by JICA a. Construction of JICA Simulator building and GSO and P&I Simulator has been completed. b. One year warranty period for inspection of Construction work of the project has been completed on July 2019 c. one year warranty period inspection report for the equipment issued on OCT. 2019) d. Operation Training to the TSG Staff has been conducted on 24th September to 28th September Phase-II by NTDC Self-Financed: • Construction work and installation of AIS 220kV/132kV Equipment has been completed • Additional Work in Progress
	Physical completion (in %age terms):	Phase-I by JICA: 100% Phase-II by NTDC Self-Financed: 99%
11.	Outcomes / Benefits of the project after completion	• Improvement in Skills of Trainees • Practical Knowledge through GSO and P&I Simulators • Practical knowledge through Training Purpose Model Grid Station • Technical Induction Training Courses, Technical Refresher Courses, Sector Specific Courses, Promotion Criteria Courses of Grid Operation and Maintenance, Protection & Instrumentation, Transmission lines, Skill Enhancement courses and other short courses are being taught through state-of-the-art GSO and P&I Simulators and Training Purpose Model Grid Station.

Project Sr. No. 74

1.	Name of Project	**Consultancy services for Feasibility Study of Solar Water Pumping in Balochistan area (NTDC) (Own Resources)**
2.	Location	Balochistan
3.	Scope in Brief / Objectives	• Preparation of new PC-1 for 10,000 tubewells connected through QESCO with Pilot Phase and Roll-Out for the option of Mini-Grid Solar solution among others. PC-1 shall include financial and economic analysis along with sensitivity for all options of Pilot Phase. • Preparation of new PC-1 for 28,088 agriculture tubewells instead of previous requirement of 10,000 tubewell connected through QESCO for the option of Off-Grid Solar only. • Addition of 1434 tubewells in PC-1 connected through Karachi Electric (KE). • PC-1 shall be based on the on-going projects of Energy Department, G0B instead of QESCO, Details of Ongoing / Completed Project s and lessons learnt shall be revised accordingly. • The consultant shall assist the Energy Department, GoB in PDWP/CDWP meetings
4.	Category	N/A
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	NTDC's Own Resources
7.	Approval Forum	CDWP
8.	Commencement Date	05-09-2019
9.	Actual Completion date	30-06-2021
10.	Physical progress:	
	Physical progress (major works done):	100% Feasibility Study done by NESPAK/NTDC Project will be completed by QESCO and Gov of Balochistan
	Physical completion (in %age terms):	
11.	Outcomes / Benefits of the project after completion	To resolve Water supply issues in Baluchistan.

Project Sr. No. 75

1.	Name of Project	**Enterprise Resource planning (ERP)** **(Now Implementation of Integrated Solution to improve Productivity and Control in NTDC by ERP System)**
2.	Location	Country Wide
3.	Scope in Brief / Objectives	• To implement a complete and transparent suit of software to integrate different core functions of the company such as ▪ Supply Chain Management ▪ Human Resource Management ▪ Projects Management ▪ Enterprise Asset Management ▪ IT ▪ Finance • To connect 130+ Sites country wide through network to implement ERP, Office Automation and to decrease time cost of day-to-day work.
4.	Category	✓ **System Reliability/Implementation**
5.	Type	✓ **Development/Implementation**
6.	Funding:	2583.35 (Rs. In Millions)
7.	Approval Forum	World Bank
8.	Commencement Date	CDWP (19.03.2018)
9.	Actual Completion date	**Data Center:** Dec-2021**, Network:** Feb-2022**, Office Automation:** Dec-2021, **ERP:** Aug 2022
10.	Physical progress:	**Data Center:** Nov-2022 **Network: Major sites:** Dec-2022**, Remaining Sites:** Aug-2023 **Office Automation:** Mar-2023 **ERP:** January 2024
	Physical progress (major works done):	**Overall:** 33%
	Physical completion (in %age terms):	• **Data Centre:** Construction is at last stage. • **Network:** Major sites are half way done. • **Office Automation:** Data Collection has been completed for ECM, FSDs are in progress. MS Office License installations is in progress. Documentation for E-Governess has been submitted by the Vendor and is under review by NTDC. **ERP:** Phase-I Implementation is in progress
11.	Outcomes / Benefits of the project after completion	**Data Center:** 95% **Network:** 35% **Office Automation:** 40% **ERP: 2**0%

Project Sr. No. 76

1.	Name of Project	**Upgradation/ Extension of NTDC's Telecommunication & SCADA System at NPCC**
2.	Location	All over Pakistan
3.	Scope in Brief / Objectives	i) Addition and upgradation of existing SCADA system by installation of hardware and software for data base to perform system operation at National Power Control Center Islamabad & establishing backup control center at Jamshoro Old RCC building. ii) RTU/SAS/DCS Interfacing with Main SCADA System iii) Backup of NTDC's telecom network
4.	Category	✓ **System Upgradation**
5.	Type	✓ **Development**
6.	Funding:	ADB
7.	Approval Forum	ECNEC
8.	Commencement Date	25-06-2021
9.	Actual Completion date	24-06-2024
10.	Physical progress:	
	Physical progress (major works done):	1. Base design of SCADA completed. Manufacturing is in process. 2. Base design of Telecom (SDH/PLC) completed. FAT of Lot-I completed. 3. Integrated FAT of complete system done. 4. OPGW Lot-I FAT completed. Lot-II, III FAT ongoing.
	Physical completion (in %age terms):	15%
11.	Outcomes / Benefits of the project after completion	As a result of project implementation, Main SCADA system at NPCC shall be upgraded, Backup Control Centre at Jamshoro shall be constructed, Visibility of all grid stations/HPPs/IPPs, etc. shall be possible at Control Centre. Telecom network of NTDC revamping shall be completed. SMS meters data transportation upto NPCC shall be made.

Project Sr. No. 77

1.	Name of Project	**Installation of SVCs at 220kV Quetta Industrial**
2.	Location	Quetta, Balochistan Province
3.	Scope in Brief / Objectives	259 MVAR SVS (+150/-150 MVAR STATCOM & 100 MVAR Switched Shunt Capacitor) at Quetta Industrial Baluchistan is fed through long transmission lines which when under loaded create voltage stability issues. This project is required to resolve voltage stability issues and provide the necessary reactive compensation.
4.	Category	Power Evacuation ✓ **System Reliability** System Constraints
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	Asian Development Bank
7.	Approval Forum	-
8.	Commencement Date	-
9.	Actual Completion date	2025-26
10.	Physical progress:	
	Physical progress (major works done):	PC-I under preparation
	Physical completion (in %age terms):	PC-I under preparation
11.	Outcomes / Benefits of the project after completion	Baluchistan is fed through long transmission lines which when under loaded create voltage stability issues. This project is required to resolve voltage stability issues and provide the necessary reactive compensation.

Project Sr. No. 78

1.	Name of Project	**Provision of Secured Metering System at Delivery Point. (Local Bank)**
2.	Location	All over country
3.	Scope in Brief / Objectives	The main objective of the project is to install accurate and secured metering system with dedicated CTs/PTs of 0.2 accuracy class at all. Metering Delivery Point located at various grid stations and power stations in separate air conditioned rooms, with provision for remote meter reading / data collection through the Public Switched Telephone Network (PSTN) and/or SCADA.
4.	Category	✓ **Metering**
5.	Type	Extension Augmentation ✓ **Development**
6.	Funding:	NOR
7.	Approval Forum	ECNEC 04.08.2005
8.	Commencement Date	July-2009
9.	Actual Completion date	-
10.	Physical progress:	
	Physical progress (major works done):	Already installed at existing points. Project is on-going upon identification of new CDPs.
	Physical completion (in %age terms):	100%
11.	Outcomes / Benefits of the project after completion	Accurate recording of the energy flow and the power demand at the points of the energy exchange between two companies.

NTDC T&T LOSSES ASSESSMENT

FY 2023 – FY 2025

TABLE OF CONTENTS

1. BACKGROUND

Reference to NEPRA letter No. NEPRA/Consultant(RE/Tech)/LAT-01/9518 dated 09-06-2022 and subsequent correspondence thereof, NTDC has been directed by NEPRA to submit following information for upcoming Tariff Control Period i.e. FY 2022-23, FY 2023-24, & FY 2024-25.

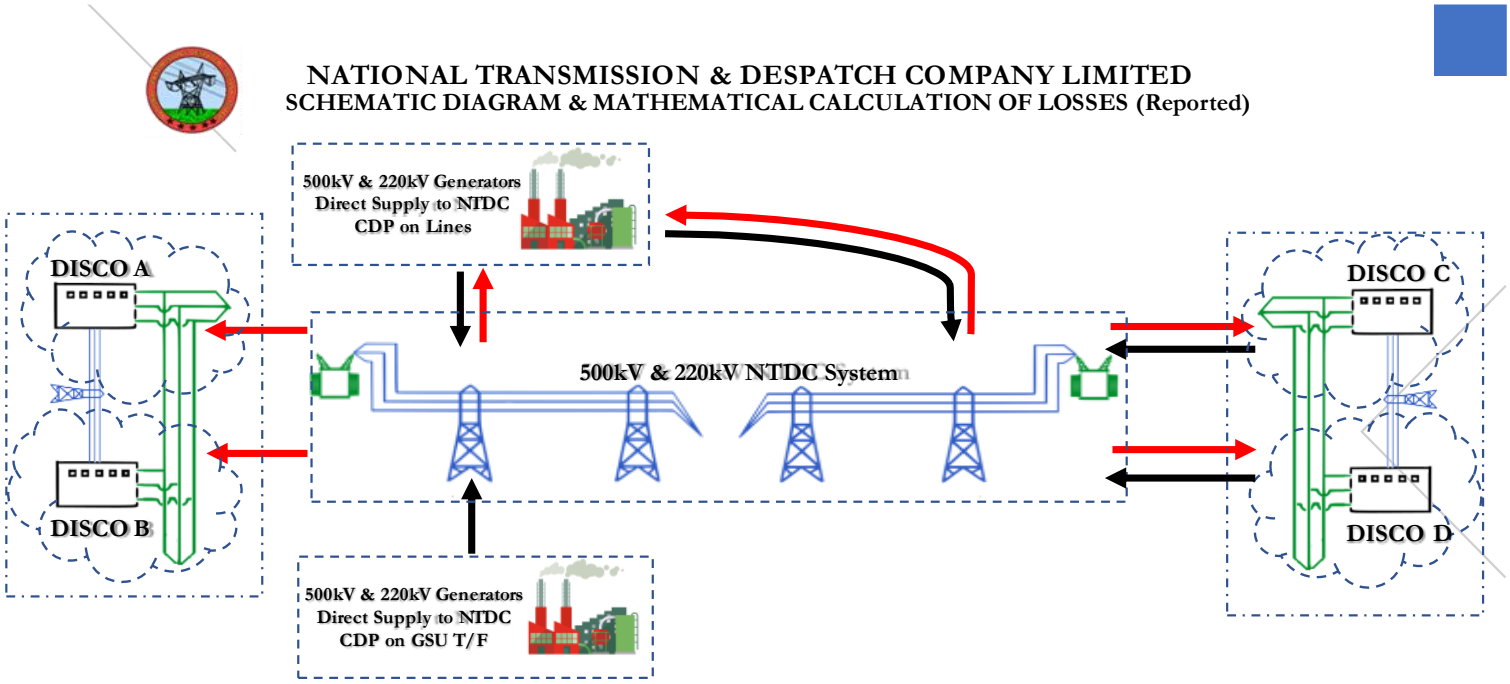
i. Transmission Investment Plan
ii. T&T Losses Assessment

Pursuant to the requirements laid down in Section 8.3 of the NEPRA Guidelines for determination of Revenue Requirement & Use of System Charges notified vide NEPRA/SAT-01/LAT-01/4781 & SRO 241 (I)/2017 dated 6th April 2017, the NTDC T&T losses assessment for the upcoming tariff control period(s) is detailed as following:

2. REPORTING OF NTDC T&T LOSSES:

NEPRA vide NTDC Tariff Determinations [NTDC Tariff No. NEPRA/TRF-277/NTDC-2014 dated 23-04-2015 vide para 30.2] has allowed for ***"consideration of NTDC T&T losses limit as an annual target, and not a monthly limit"***.

Thereby, NTDC reports its 500 & 220kV T&T Losses kWh **on a monthly basis**, which is later finalized at the end of Financial Year on aggregate basis. The simplified diagrammatical representation is as follows:



$$\%\,Losses = \frac{\left[\sum(Energy\ \ Received\ \ by\ NTDC\ at\ CDPs) - \sum(Energy\ \ Deliverd\ \ by\ NTDC)\ at\ CDPs\right]}{\sum(Energy\ \ Received\ \ by\ NTDC)\ at\ CDPs}$$

11

3. NATURE OF NTDC LOSSES:

NTDC T&T losses are purely technical in nature and depend on technical factors including:

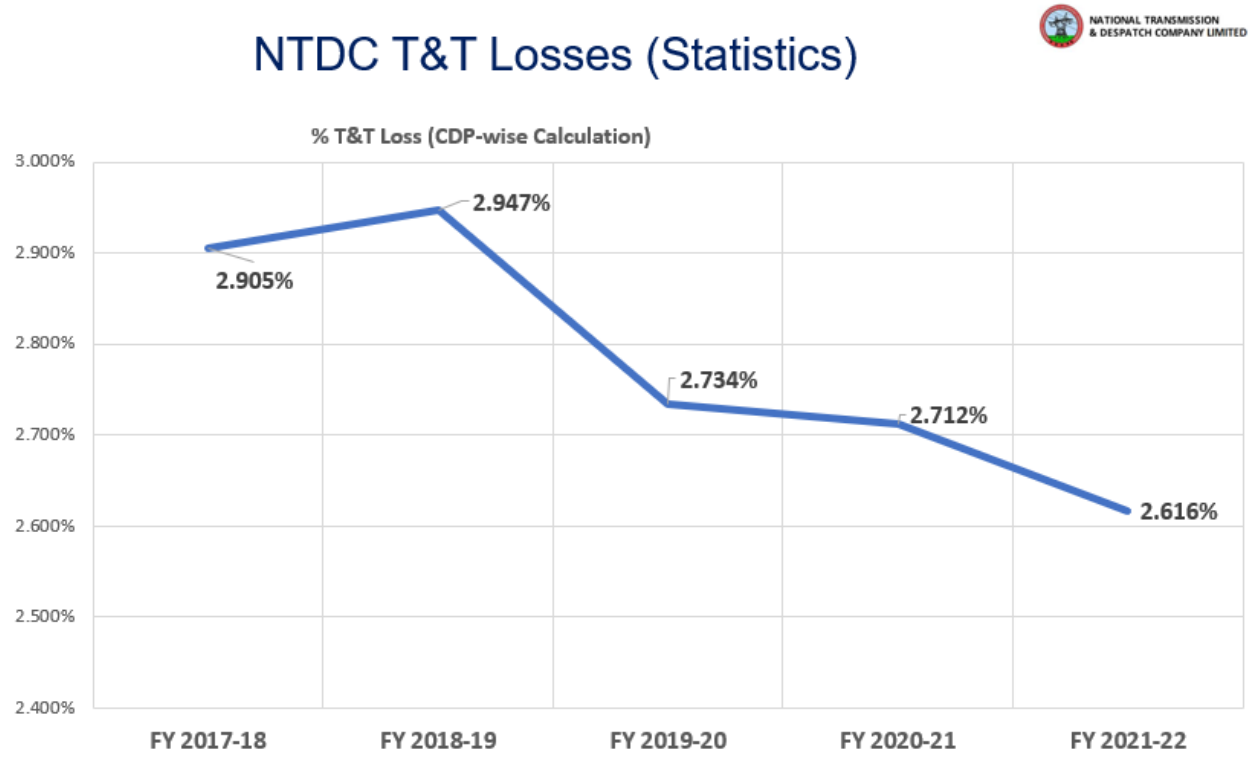
- Network equipment characteristics
- Operational scenarios
  - I^2R Losses Variation due to Underload, Overload
  - Contingency operation
  - Load Centre – Generation Distance
  - Merit Order Dispatch
  - Inadequate Reactive Compensation / Low PF

No manual intervention, administrative loss, or theft/pilferage is involved while calculation of NTDC losses.

4. HISTORICAL STATISTICS FOR NTDC 500 & 220KV SYSTEM T&T LOSSES

With effect from July-2017, NTDC has been reporting its T&T Losses to NEPRA on a monthly basis based on only 500 & 220kV network as per para 34.3 of NTDC Tariff Determination by NEPRA No. TRF-365 dated 11-04-2017.

The year-wise historical trend of NTDC 500 & 220kV System T&T Losses is show as below:



The month-wise historical statistics of NTDC 500 & 220kV System T&T Losses are as follows

2021-22				
Month	Energy Received by NTDC at CDPs (kWh)	Energy Delivered by NTDC at CDPs (kWh)	NTDC T&T Loss (kWh)	% T&T Loss Expressed as % of Energy Received by NTDC at CDPs
Jul-21	14,680,836,871	14,257,786,850	396,165,421	2.721%
Aug-21	15,682,465,431	15,236,955,495	445,509,936	2.862%
Sep-21	13,948,909,598	13,594,701,369	354,208,229	2.560%
Oct-21	10,238,282,143	9,995,247,587	243,034,556	2.395%
Nov-21	8,575,493,651	8,383,878,515	193,321,633	2.254%
Dec-21	9,300,420,657	9,056,848,470	245,435,408	2.638%
Jan-22	10,221,394,068	9,923,576,309	299,785,258	2.932%
Feb-22	8,486,515,010	8,247,026,565	241,142,323	2.841%
Mar-22	10,527,795,928	10,264,397,090	265,449,186	2.521%
Apr-22	12,639,210,824	12,309,493,590	332,522,358	2.630%
May-22	13,341,258,825	13,021,533,473	323,267,416	2.422%
Jun-22	12,688,411,675	12,349,801,859	338,609,816	2.669%
Total (FY 2021-22)	**140,346,583,313**	**136,674,558,597**	**3,672,024,716**	**2.616%**

2020-21				
Month	Energy Received by NTDC at CDPs (kWh)	Energy Delivered by NTDC at CDPs (kWh)	NTDC T&T Loss (kWh)	% T&T Loss Expressed as % of Energy Received by NTDC at CDPs
Jul-20	14,393,961,690	14,016,189,375	377,772,315	2.647%
Aug-20	14,940,010,155	14,541,577,901	398,432,254	2.688%
Sep-20	13,499,100,425	13,159,977,491	339,122,934	2.534%
Oct-20	10,512,822,840	10,264,947,225	247,875,615	2.379%
Nov-20	8,188,020,937	7,977,029,840	210,991,097	2.598%
Dec-20	8,691,860,348	8,412,823,280	279,037,068	3.231%
Jan-21	9,299,598,661	8,972,000,557	327,598,104	3.543%
Feb-21	7,570,895,194	7,320,630,151	250,265,043	3.325%
Mar-21	9,469,537,328	9,160,380,514	309,156,814	3.283%
Apr-21	10,231,061,684	9,966,332,285	264,729,399	2.607%
May-21	12,061,072,793	11,818,934,517	242,138,276	2.030%
Jun-21	13,412,506,522	13,071,915,415	340,591,107	2.562%
Total (FY 2020-21)	**132,270,448,577**	**128,682,738,551**	**3,587,710,026**	**2.712%**

2019-20				
Month	Energy Received by NTDC at CDPs (kWh)	Energy Delivered by NTDC at CDPs (kWh)	NTDC T&T Loss (kWh)	% T&T Loss Expressed as % of Energy Received by NTDC at CDPs
Jul-19	13,301,311,511	12,874,848,858	426,462,653	3.231%
Aug-19	14,524,651,367	14,129,999,134	394,652,233	2.738%
Sep-19	13,705,433,005	13,341,000,018	364,432,987	2.680%
Oct-19	10,151,522,156	9,901,326,978	250,195,178	2.485%
Nov-19	7,967,699,200	7,759,859,946	207,839,254	2.629%
Dec-19	8,217,679,213	7,990,119,046	227,560,167	2.792%

Jan-20	8,928,755,152	8,626,736,754	302,018,398	3.405%
Feb-20	7,491,517,891	7,274,373,484	217,144,407	2.919%
Mar-20	7,708,689,300	7,489,023,706	219,665,594	2.870%
Apr-20	8,918,539,924	8,716,142,863	202,397,061	2.289%
May-20	12,096,454,548	11,786,444,859	310,009,689	2.584%
Jun-20	12,900,844,250	12,581,342,485	319,501,765	2.500%
Total (FY 2019-20)	**125,913,097,517**	**122,471,218,131**	**3,441,879,386**	**2.734%**

2018-19				
Month	Energy Received by NTDC at CDPs (kWh)	Energy Delivered by NTDC at CDPs (kWh)	NTDC T&T Loss (kWh)	% T&T Loss Expressed as % of Energy Received by NTDC at CDPs
Jul-18	11,694,844,238	11,359,584,100	335,260,134	2.892%
Aug-18	12,333,580,708	11,968,728,542	364,852,225	2.983%
Sep-18	11,534,001,844	11,173,862,367	360,139,426	3.145%
Oct-18	8,949,758,305	8,693,440,584	256,317,730	2.887%
Nov-18	7,654,298,276	7,450,513,957	203,784,378	2.684%
Dec-18	7,906,934,197	7,646,229,541	260,704,630	3.320%
Jan-19	8,548,314,810	8,211,600,390	336,714,426	3.961%
Feb-19	6,941,428,306	6,703,026,481	238,401,820	3.457%
Mar-19	7,419,191,006	7,207,368,212	211,822,794	2.876%
Apr-19	8,481,244,466	8,260,919,524	220,324,974	2.622%
May-19	11,200,017,683	10,929,526,489	270,491,194	2.439%
Jun-19	11,716,186,844	11,403,816,139	312,370,705	2.692%
Total (FY 2018-19)	**114,379,800,683**	**111,008,616,326**	**3,371,184,436**	**2.947%**

5. MARGINAL IMPACT OF VARIOUS TECHNICAL FACTORS ON NTDC LOSSES:

5.1. IMPACT OF NTDC PROJECTS

NTDC undertakes Network Expansion projects with approval of GoP and NEPRA focusing on

- Serving Customer Demand
- Network Expansion / Strengthening
- System Constraint Removal

Losses Reduction is a byproduct of NTDC Network Expansion projects, and its qualitative impact is noted but exact quantification of marginal impact can only be established by a detailed study (see Section 7). Furthermore, additional contributing factors detailed below also impact the NTDC T&T Losses:

5.2. INCREASE IN NTDC NETWORK LOADING

- Performance of the NTDC system viz a viz losses is improving but at the same time, the marginal positive impact of NTDC projects on T&T Losses is partially offset due to the increase in (I^2R losses) owing to load growth.
- Avg/month net delivered energy to DISCOs through NTDC network has increased 25% from FY2017-18 to FY2021-22. Hence, this is major contributing factor for increase in % T&T Losses.

$$[\%\ \text{NTDC Losses}] \propto I^2$$

Control Period	Net Energy delivered through NTDC per month (GWh)	Remarks-1	Remarks-2
FY 2017-18	7,218	Base	
FY 2018-19	7,665	6% YoY Increase	29% increase from FY20 to FY22
FY 2019-20	8,136	6% YoY Increase	
FY 2020-21	8,624	6% YoY Increase	
FY 2021-22	9,281	7.6% YoY Increase	

5.3. LONGITUDINAL & SEASONAL POWER FLOWS

- Pakistan is geographically a longitudinal country; the hydel generation is situated in northern part of the country and thermal generation is situated in southern part of the country. While the main load center is situated in the geographical middle of country.
- Predominantly, the power flows over a longer distance from NTDC connected generation in the Southern & Northern Region to the Central Region load centers, resulting in higher losses than the Generation connected near load centers.
- It is appraised that although RLNG based Power Plants are located near load centers, but still Power flows from south to north region (over longer, more lossy path) in both summer and winter seasons due to following reasons:
    - Coal Power Plants (3095MW) situated in southern region get maximum dispatch as these plants are relatively cheaper than RLNG based Power Plants w.r.t. Economic Merit Order.
    - Wind Power Plants (1085MW) are also situated in southern region.
    - The flow of Power from Southern region to mid-country region is further magnified in summer season due to high load demand in mid-country region and maximum generation from Wind Power Plants owing to high wind season.
    - Similarly in winter season, hydel generation is at minimum level due to low hydel indents and canal closure. Resultantly Power Flows from Southern region to mid-country and northern region to meet the System Load Demand.

5.4. INADEQUATE REACTIVE POWER COMPENSATION OF DISCOS [EXTERNAL FACTOR]

- Insufficient reactive power compensation at 132 kV & 11 kV networks results in increase of reactive power flow from NTDC system to DISCOs systems, causing not only lower voltage profile but also increase in current flow & T&T losses in NTDC system
- Due to this excessive withdrawal of reactive power of DISCOs from NTDC network, NTDC losses increase whereas NTDC may not be penalized for DISCO load induced losses.

5.5. OTHER FACTORS

- Long 500 kV lines also have significantly high proportion of corona losses
- Economical merit based thermal generation dispatch

5.6. 660KV HVDC SYSTEM

- The South to North Power Flow of 660kV HVDC T/L of PMLTC System w.e.f. March-2021 alongwith their losses is as follows:

Month	Energy Delivered by NTDC (MWh)	Energy Received by NTDC (MWh)	Gross HVDC Losses * PMLTC Auxiliary included	
			MWh	%
Sep-21	747,247.000	724,088.000	23,159.000	3.099%
Oct-21	680,980.000	660,425.600	20,554.400	3.018%
Nov-21	490,505.000	474,700.500	15,804.500	3.222%
Dec-21	876,109.000	852,894.100	23,214.900	2.650%
Jan-22	1,165,530.000	1,136,314.500	29,215.500	2.507%
Feb-22	813,627.000	790,728.500	22,898.500	2.814%
Mar-22	1,131,431.000	1,101,368.400	30,062.600	2.657%
Apr-22	1,684,806.000	1,638,400.000	46,406.000	2.754%
May-22	1,506,880.000	1,464,440.200	42,439.800	2.816%
Jun-22	999,034.000	970,376.800	28,657.200	2.868%
Jul-22	1,270,094.000	1,236,600.100	33,493.900	2.637%
Aug-22	1,298,135.000	1,263,907.700	34,227.300	2.637%
Total	**12,664,378.000**	**12,314,244.400**	**350,133.600**	**2.765%**

- The regulator approved % Transmission losses limit for HVDC is upto 4.3%.
- After Sep-21 i.e. CoD of PMLTC, the Energy Exchange through HVDC only accounts for 9% of the Net Generation Energy injected into NTDC network. This may vary with the variation in utilization of HVDC system.
- **However, the mechanism of % Transmission losses calculation for HVDC is not CDP-wise but is Station-wise. This difference is described in detail as per Section 6.4.**

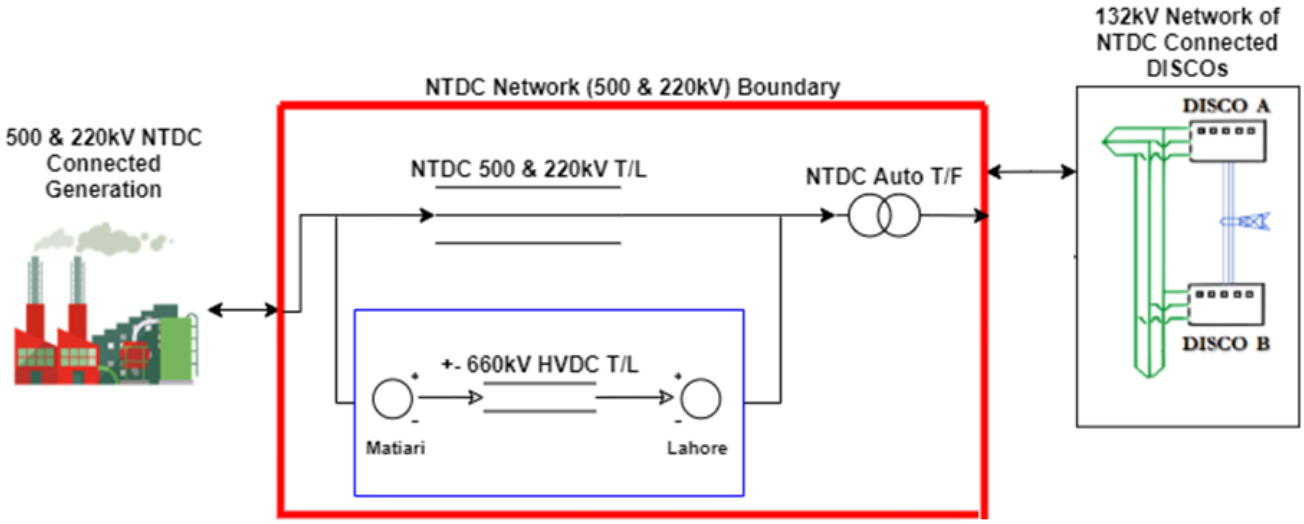
6. METHODOLOGY OF CALCULATION OF NTDC T&T LOSSES

6.1. T&T LOSSES RESTRICTED TO 500 & 220KV NTDC NETWORK ONLY

Pursuant to Para 34 (34.1-34.3) NTDC Tariff Determination by NEPRA No. NEPRA/TRF-365/NTDC-2016 dated 11-04-2017, NTDC is in compliance to report T&T Losses pertaining only to the 500 & 220kV network.

6.2. NTDC T&T LOSSES (KWH)

NTDC T&T Losses in kWh are essentially the arithmetic difference between energy exchange recorded at NTDC-Generation, NTDC-Distribution, and NTDC-HVDC/PMLTC **CDPs**.



$$kWh\ Received\ (NTDC)_{per\ CDP} - kWh\ Delivered\ (NTDC)_{per\ CDP} = Loss_{NTDC} + Loss_{HVDC}$$

$$\boldsymbol{Loss_{NTDC}} = kWh\ Received\ (NTDC)_{per\ CDP} - [kWh\ Delivered\ (NTDC)_{per\ CDP} + Loss_{HVDC}]$$

The enumeration of NTDC 500 & 220kV Network CDPs is as follows:

Active Commercial Metering Points / CDPs of NTDC		
Metering Point Type		**Count**
NTDC Connected Metering CDPs	NTDC-Generation CDPs	**124**
	NTDC-DISCOs Metering CDPs	**180**
	NTDC - HVDC CDPs	**12**
Total		**316**

Detailed list of NTDC CDPs is annexed with this document.

6.3. NTDC % T&T LOSSES (PRESENT METHODOLOGY = CDP WISE)

For essentially the same amount of kWh losses, there are multiple options for expression of these kWh losses in percentage (%) terms by using different reference as denominator.

Due to configuration of NTDC CDPs with regards to location of Metering Points, the present reporting mechanism and the NEPRA allowed limit of NTDC losses utilize "Energy Received by NTDC at CDPs" (totalized on per CDP basis) as denominator for calculation of % losses.

Hence, NTDC % T&T losses are calculated by dividing NTDC T&T kWh losses by Gross NTDC Import recorded at all CDPs. Mathematically:

$$\%\boldsymbol{Loss_{NTDC}} = \frac{kWh\ Received\ (NTDC)_{per\ CDP} - [kWh\ Delivered\ (NTDC)_{per\ CDP} + Net\ Loss_{HVDC}]}{kWh\ Received\ (NTDC)_{per\ CDP}}$$

NTDC reporting methodology for % T&T Losses is consistent with the principles and equations laid down in Para 11.2.4.1 & 11.2.3.3 of recently approved Market Commercial Code.

6.4. % T&T LOSSES (ALTERNATE METHODOLGY)

- In order to be able to compare NTDC % T&T losses with other international transmission utilities, it is important to note that the % T&T losses calculation mechanism be similar. But in instant case:

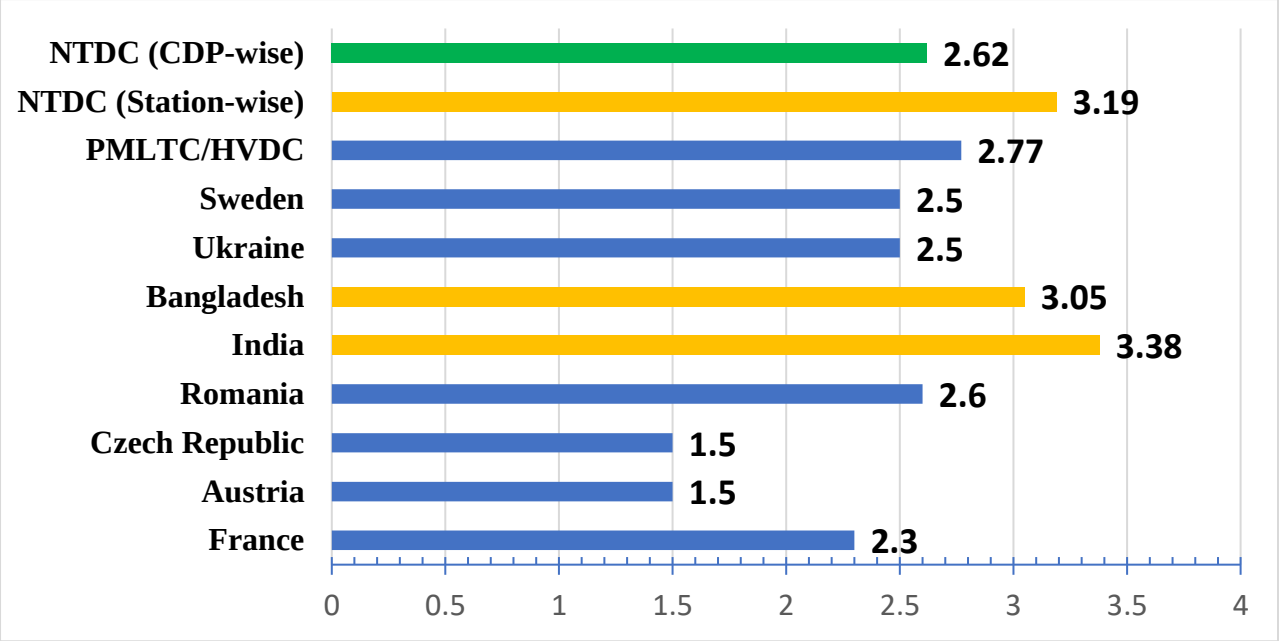
A: % T&T Loss Calculation Mechanism (NTDC Existing)	B: % T&T Loss Calculation Mechanism (International Utilities)
$\%Loss_{Mechanism\ A} = \frac{kWh\ Losses}{kWh\ Received_{per\ CDP}}$	$\%Loss_{BMechanism\ B} = \frac{kWh\ Losses}{Net\ kWh\ Received_{per\ station\ basis}}$
Due to configuration of NTDC CDPs with regards to location of Metering Points: $\%Loss_{Mechanism\ B} > \%Loss_{Mechanism\ A}$	

- Statistical Comparison of both mechanisms is detailed as below:

				CDP-wise Calculation			**Station-wise Calculation**
Period	**Energy Received by NTDC at CDPs (GWh)**	**Energy Delivered by NTDC at CDPs (GWh)**	**NTDC T&T Loss (GWh)**	**% T&T Loss Expressed as % of Energy Received by NTDC at CDPs**	**Net Energy Received by NTDC at Generation Points (GWh)**	**Net Energy Delivered by NTDC at Distribution Points (GWh)**	**% T&T Loss Method 2 Expressed as % of Net Energy Received by NTDC at Generation Points**
2017-18	106,002	102,922	**3,080**	**2.905%**	89,696	86,616	**3.433%**
2018-19	114,380	111,009	**3,371**	**2.947%**	95,346	91,975	**3.536%**
2019-20	125,913	122,471	**3,442**	**2.734%**	101,072	97,630	**3.405%**
2020-21	132,270	128,683	**3,588**	**2.712%**	107,082	103,494	**3.350%**
2021-22	140,347	136,675	**3,672**	**2.616%**	115,051	111,379	**3.192%**

6.5. COMPARISON WITH PMLTC AND INTERNATIONAL UTILITIES

- Comparison of NTDC % T&T Losses with international transmission utilities amid the varying %T&T Loss calculation mechanism is as follows:



- **Station-wise Losses Calculation Methodology has to be adopted for reporting and regulatory limit to compare any two different transmission utility statistics, because the CDP-wise statistics vary with the relative location of Metering CDPs.**

- **It is submitted that the present reporting mechanism for NTDC % T&T losses NTDC and the regulatory limit for NTDC may both be simultaneously rationalized in light of Independent Consultant Study.**

7. INDEPENDENT STUDY OF NTDC T&T LOSSES

- NTDC system has seen vast expansion dynamics in the recent years w.r.t. length of transmission network, quantum of energy served, utilization of technologies, overloading and underloading of regions etc.
- NTDC submits that any change in NTDC benchmark target needs to be based on qualitatively and quantitatively impact of contributing technical factors and on basis of actual study/data.

- To arrive at a factual and equitable level of T&T losses benchmark, an internationally reputed consultant is in the process of being hired by NTDC for **qualitative** and **quantitative** assessment of all factors contributing towards of Primary Transmission System losses of NTDC 500 & 220kV Network.
- The Terms of Reference for "Study for Evaluation of T&T Losses of NTDC Network" by Independent Consultant are as follows:

8. TERM OF REFERENCE (TOR) FOR STUDY FOR EVALUATION OF T&T LOSSES OF NTDC NETWORK BY AN INDEPENDENT CONSULTANT

Terms of Reference for study of evaluation and estimation of NTDC Transmission & Transformation (T&T) are as follows but not limited to following:

1. Review and verification of all data provided by NTDC for envisaged study.
2. Evaluation of NTDC network losses (MW) through simulation of the two-loading condition/scenarios (peak and off-peak) for all the months of existing FY 2021-22 and for future years 2022-23, 2023-24 &2024-25.
3. Preparation of load flow models of the existing system of NTDC after matching with real time loading conditions corresponding to two loading scenarios (peak and off-peak) of all months for FY 2021-22. The matching of the network must consider but not limited to network actual/recorded values of voltages, current, MW/ MVAR flow in NTDC network (HVDC & AC system), scheduled/forced outages of transmission line& transformers, and actual generator dispatch (MW/MVAR) connected at 500 kV, 220 kV &132 kV voltage (NTDC grids only).
4. Actual/Recorded network parameter like power flows (i.e., active (MW) and reactive power (MVAR), voltages, and current on all transmission and transformation network & generator along with scheduled/forced outage of transmission lines (to be supplied by National Power Control Center NPCC) for the FY 2021-22 will be used for the study with verification of data from NTDC grids/Asset Management where needed.
5. Preparation of load flow models for the two-loading condition (peak and off-peak) for all the months of future years 2022-23, 2023-24 &2024-25. The transmission and generation plan upto FY 2024-25 will be supplied by Power System Planning (PSP) and scheduled outage of transmission line (if any) will be provided by NPCC. In the said model, the system parameters (i.e., T/Line & transformer loading and network voltage limits etc.) should be as per grid code and generation dispatch should be according to merit order/optimal dispatch and scheduled/forced outages.
6. For future years 2022-23, 2023-24 &2024-25, the impact of cheap generation resources (indigenous coal-based pants and wind plants) should also be considered during calculation of transmission losses.
7. All the data of power system components like generators, transmission lines, transformers, switch shunts, fixed shunts, static var compensator, shunt reactors etc. would be modeled properly in the matched/future selected models. No load and Full load losses of transformer would be entered correctly. Appropriate techniques would be adopted for taking into account transformation/transmission line losses due to ageing.
8. Lumped load modeling at 132 kV bus bars of NTDC Grid Stations would be performed.
9. Modeling of split bus bars would be performed as per operating scenarios of Asset Management/NPCC.
10. Achieve best fit curve for 24 points for each year brought out from above analysis by performing polynomial regression analysis for the respective year.
11. Compute overall annual average power and energy loss each for the existing FY 2021-22 and future years 2022-23, 2023,24& 2024-25. It should take into account I^2R loss, corona loss, dielectric and any other losses associated with the network.
12. The computed %age energy losses of NTDC network for the existing FY2021-22 and future years 2022-23, 2023-24 & 2024-25 would be evaluated by either developing loss curve

through curve fitting technique and estimation of energy loss using area under the curve method or by any other appropriate technique.

13. Comparison of losses evaluated from the simulated cases with recorded losses by NTDC for the same period i.e. FY 2021-22.
14. Review the existing technique/methodology for measuring the losses of NTDC system and recommend if any change is required for improvement.
15. Recommendation must also be given for reduction in transmission network losses of NTDC in future.
16. Presentation of work done to NTDC and NEPRA.

Note:

Simulation & analysis of power flow cases/models for existing FY 2021-22; and future years 2022-23, 2023-24 & 2024-25 should be conducted by using PSS/E software (preferably version 33 or advanced).

9. TENTATIVE TIMELINE FOR INDEPENDENT STUDY ON EVALUATION OF T&T LOSSES OF NTDC NETWORK

Sr No.	Action Item	Tentative Completion Date / Status
1	Development of Comprehensive ToRs for Independent Consultant Study on NTDC T&T Losses.	Completed.
2	Development of RFP & Tender Documents.	15-10-2022
3	Pre-Bid Meetings	25-10-2022
4	Tendering Process	15-11-2022
5	Bid Evaluation Process	15-12-2022
6	Project Award	31-01-2023
7	Completion of Study	31-07-2023

10. NTDC 11kV AUXILIARY CONSUMPTION FROM XWDISCOs

NTDC operates and maintains 500kV & 220kV Grids & Transmission Lines throughout Pakistan. All of the NTDC Grid Stations consume auxiliary supply, essential for Grid Station equipment Operation, Instrumentation, & Protection.

Exact quantification of Energy (kWh) consumed by NTDC Grid Station's 11kV Auxiliary Supply is being done through NTDC-DISCO Auxiliary CDPs to accurately assess & monitor the overall losses of NTDC Transmission System and this data is also important for billing, engineering studies, and planning purposes.

Technical Department of NEPRA in its monthly FCA hearings for XWDISCOs, disallows the 11kV Auxiliary Consumption of NTDC Grid Stations, which are then charged to NTDC by

CPPAG at complete EPP rate on monthly basis. NTDC is being charged the amount of 11kV Auxiliary Consumption even if NTDC remains with in the regulatory limit of T&T Losses.

10.1. STATISTICS OF NTDC 11KV AUXILIARY CONSUMPTION

The Prior year statistics for 11kV Auxiliary Consumption at NTDC Grid Stations is as follows:

Financial Year	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
NTDC 11kV Aux Consumption (kWh)	27,676,843	27,945,955	28,655,831	31,114,712
Financial Impact charged to NTDC Rs.	161,758,825	146,521,578	150,063,171	266,514,021* (only available for 11 months)

10.2. TREATMENT OF NTDC 11KV AUXILIARY CONSUMPTION

Since the 11kV Auxiliary consumption at NTDC Grid Stations is being utilized primarily for the purpose of running the mandated 500 & 220kV transmission network, NEPRA is requested to:

"Allow NTDC, up to a certain determined limit, the use of 11kV Auxiliary at its 500/220kV Grid Stations from XWAPDA DISCOs in Tariff. NTDC may account the 11kV Auxiliary Consumed as its T&T Loss, and if within the NEPRA approved limits, this corresponding amount may not be charged to NTDC."

11. CONCLUSION

The performance of NTDC viz a viz % T&T Losses is improving consistently over the last 3 years. In light of all above, NTDC submits that the T&T Losses assessment for the upcoming Tariff Control Period may be provisionally accepted as following based upon present reporting methodology:

Financial Year	T&T Losses Assessment
FY 2022-2023	**T&T Losses *provisionally* requested to be allowed on "as per actual" basis in line with NEPRA's Tariff Review Determination for FY 2020, FY 2021, FY 2022 dated 16-09-2022.** **Further, it is submitted that the above assessment shall be firmed up based upon the out-come of Independent Consultant Study on NTDC T&T Losses.**
FY 2023-2024	
FY 2024-2025	

NATIONAL TRANSMISSION & DESPATCH COMPANY LIMITED

Metering Information System

Active Commercial Metering Points / NTDC CDPs Summary

Metering Point Type		Location / Voltage	Count	Totals
NTDC Connected Metering CDPs	NTDC-Generation CDPs	500 / 220 kV GSU T/Fs and/or T/Ls	**124**	**316**
	NTDC-DISCOs Metering CDPs	LV Side of 220/132 kV Auto T/Fs	**180**	
	NTDC - HVDC CDPs	500kV AC T/Ls	**12**	
	NTDC Grid Auxiliary Metering Points	11kV	**58**	
Grand Total			**374**	

NATIONAL TRANSMISSION & DESPATCH COMPANY LIMITED

Metering Information System

NTDC - Generation CDPS (500 & 220kV Stations)

Sr. No.	Metering Station (Grid/PH)	Metering Point Description (Line/TF)	From	To
1	Atlas Power Sheikhupura	220kV L2	IPP	NTDC
2	Atlas Power Sheikhupura	220kV L1	IPP	NTDC
3	Coal : China Power Hub (1320MW)	M1, T1 - HV Side	IPP	NTDC
4	Coal : China Power Hub (1320MW)	M2, T2 - HV Side	IPP	NTDC
5	Coal : China Power Hub (1320MW)	M3, S/S T/F	IPP	NTDC
6	Coal : Engro Thar (660MW)	M1 - Generator 1	IPP	NTDC
7	Coal : Engro Thar (660MW)	M2 - Generator 2	IPP	NTDC
8	Coal : Engro Thar (660MW)	M3 - SST T/F	IPP	NTDC
9	Coal : Lucky Electric	GT	IPP	NTDC
10	Coal : Lucky Electric	SST	IPP	NTDC
11	Coal : Port Qasim (1320MW)	G-1	IPP	NTDC
12	Coal : Port Qasim (1320MW)	G-2	IPP	NTDC
13	Coal : Port Qasim (1320MW)	SS T/F	IPP	NTDC
14	Coal : Sahiwal (1320MW)	500 KV TL-1	IPP	NTDC
15	Coal : Sahiwal (1320MW)	500 KV TL-2	IPP	NTDC
16	Coal : Thal Nova Thar	GT	IPP	NTDC
17	Coal : Thal Nova Thar	SST	IPP	NTDC
18	Coal : Thar Energy Limited (TEL)	GT M-1	IPP	NTDC
19	Coal : Thar Energy Limited (TEL)	SST M-2	IPP	NTDC
20	Engro PowerGen Qadirpur	ST	IPP	NTDC
21	Engro PowerGen Qadirpur	GT	IPP	NTDC
22	Foundation Power Daharki	220kV Line 2	IPP	NTDC
23	Foundation Power Daharki	220kV Line 1	IPP	NTDC
24	HPS (Allai+Dubair+Khan Khawar) + Ranolia	220kV Allai Mansehra Line II	WAPDA	NTDC
25	HPS (Allai+Dubair+Khan Khawar) + Ranolia	220kV Allai Mansehra Line I	WAPDA	NTDC
26	HPS Karot 720MW	225MVA 15.75/525kV T-1	IPP	NTDC
27	HPS Karot 720MW	225MVA 15.75/525kV T-2	IPP	NTDC
28	HPS Karot 720MW	225MVA 15.75/525kV T-3	IPP	NTDC
29	HPS Karot 720MW	225MVA 15.75/525kV T-4	IPP	NTDC
30	HPS Neelum Jhelum	Unit-1	WAPDA	NTDC
31	HPS Neelum Jhelum	Unit-2	WAPDA	NTDC
32	HPS Neelum Jhelum	Unit-3	WAPDA	NTDC
33	HPS Neelum Jhelum	Unit-4	WAPDA	NTDC
34	HPS WAPDA Ghazi Barotha	500 kV Tarbela-2 Line	WAPDA	NTDC
35	HPS WAPDA Ghazi Barotha	500 kV Gatti-1 Line	WAPDA	NTDC
36	HPS WAPDA Ghazi Barotha	500 kV Rawat-2 Line	WAPDA	NTDC
37	HPS WAPDA Ghazi Barotha	550 kV Tarbela-1 Line	WAPDA	NTDC
38	HPS WAPDA Ghazi Barotha	500 kV Rawat-1 Line	WAPDA	NTDC
39	HPS WAPDA Ghazi Barotha	500 kV Gatti-2 Line	WAPDA	NTDC
40	HPS WAPDA Ghazi Barotha	220kV Nowshehra I	WAPDA	NTDC
41	HPS WAPDA Ghazi Barotha	220kV Nowshehra II	WAPDA	NTDC
42	HPS WAPDA Mangla	220kV Mangla - New Ghakhar (Nokhar)	WAPDA	NTDC
43	HPS WAPDA Mangla	220kV Mangla - New Rawat - II	WAPDA	NTDC
44	HPS WAPDA Mangla	220kV Mangla - Kala Shah Kakoo - III	WAPDA	NTDC
45	HPS WAPDA Mangla	220kV Mangla - New Rawat - I	WAPDA	NTDC
46	HPS WAPDA Mangla	220kV Mangla - Kala Shah Kakoo - I	WAPDA	NTDC
47	HPS WAPDA Mangla	220kV Mangla - Ghakhar - I	WAPDA	NTDC
48	HPS WAPDA Mangla	220kV Mangla - Ghakhar - II	WAPDA	NTDC
49	HPS WAPDA Mangla	220kV Mangla - Kala Shah Kakoo - II	WAPDA	NTDC
50	HPS WAPDA Tarbela	500 kV Peshawar Line	WAPDA	NTDC
51	HPS WAPDA Tarbela	500 kV Barotha 1 Line	WAPDA	NTDC
52	HPS WAPDA Tarbela	220kV Burhan 3 Line	WAPDA	NTDC
53	HPS WAPDA Tarbela	220kV ISPR (Sangjani) Line	WAPDA	NTDC
54	HPS WAPDA Tarbela	220kV Burhan 1 Line	WAPDA	NTDC
55	HPS WAPDA Tarbela	220kV Mardan 2 Line	WAPDA	NTDC
56	HPS WAPDA Tarbela	220kV Burhan 2 Line	WAPDA	NTDC

NATIONAL TRANSMISSION & DESPATCH COMPANY LIMITED

Metering Information System

NTDC - Generation CDPS (500 & 220kV Stations)

Sr. No.	Metering Station (Grid/PH)	Metering Point Description (Line/TF)	From	To
57	HPS WAPDA Tarbela	220kV Mardan 1 Line	WAPDA	NTDC
58	HPS WAPDA Tarbela	500 kV Rawat Line	WAPDA	NTDC
59	HPS WAPDA Tarbela	500 kV Barotha 2 Line	WAPDA	NTDC
60	HUBCO Karachi	500 kV Jamshoro Line	IPP - 94	NTDC
61	HUBCO Karachi	500 kV NKI Line	IPP - 94	NTDC
62	KAPCO Kot Addu	220kV T/L KAPCO - New Multan - 6	IPP - 94	NTDC
63	KAPCO Kot Addu	220kV T/L KAPCO - New Multan - 3	IPP - 94	NTDC
64	KAPCO Kot Addu	220kV T/L KAPCO - New Multan - 4	IPP - 94	NTDC
65	KAPCO Kot Addu	220kV T/L KAPCO - Pak Gen	IPP - 94	NTDC
66	KAPCO Kot Addu	220kV T/L KAPCO - New Multan - 1	IPP - 94	NTDC
67	KAPCO Kot Addu	220kV T/L KAPCO - New Multan - 5	IPP - 94	NTDC
68	Lalpir Power	220kV Muzaffar Garh L2	IPP - 94	NTDC
69	Lalpir Power	220kV Muzaffar Garh L1	IPP - 94	NTDC
70	Nuclear : CHASHNUPP - C1	T1 (C1)	NUCLEAR	NTDC
71	Nuclear : CHASHNUPP - C2	T1 (C2)	NUCLEAR	NTDC
72	Nuclear : CHASHNUPP - C3	T1 (C3)	NUCLEAR	NTDC
73	Nuclear : CHASHNUPP - C4	T1 (C4)	NUCLEAR	NTDC
74	Nuclear : KANUPP - K2	M-1	NUCLEAR	NTDC
75	Nuclear : KANUPP - K3	M1	NUCLEAR	NTDC
76	PakGen Power	220kV Line 2	IPP - 94	NTDC
77	PakGen Power	220kV Line 1	IPP - 94	NTDC
78	RLNG CCPP Balloki	T1	IPP	NTDC
79	RLNG CCPP Balloki	T2	IPP	NTDC
80	RLNG CCPP Balloki	T3	IPP	NTDC
81	RLNG CCPP Bhikki	T1	IPP	NTDC
82	RLNG CCPP Bhikki	T2	IPP	NTDC
83	RLNG CCPP Bhikki	T3	IPP	NTDC
84	RLNG CCPP HBS Jhang	GT-1	IPP	NTDC
85	RLNG CCPP HBS Jhang	GT-2	IPP	NTDC
86	RLNG CCPP HBS Jhang	ST	IPP	NTDC
87	RLNG CCPP Head Trimu	ST	IPP	NTDC
88	RLNG CCPP Head Trimu	GT2	IPP	NTDC
89	RLNG CCPP Head Trimu	GT1	IPP	NTDC
90	Rousch Power Abdul Hakeem	500kV Multan Line	IPP - 94	NTDC
91	Rousch Power Abdul Hakeem	500kV Gatti Line	IPP - 94	NTDC
92	TPS Guddu	220kV Shikarpur II Line	GENCO	NTDC
93	TPS Guddu	220/500 kV T3	GENCO	NTDC
94	TPS Guddu	220kV Shikarpur I Line	GENCO	NTDC
95	TPS Guddu	220kV Sibbi Line	GENCO	NTDC
96	TPS Guddu	220/500 kV T1	GENCO	NTDC
97	TPS Guddu	220/500 kV T2	GENCO	NTDC
98	TPS Guddu 747MW	500 kV T2	GENCO	NTDC
99	TPS Guddu 747MW	500 kV T1	GENCO	NTDC
100	TPS Guddu 747MW	500 kV T3	GENCO	NTDC
101	TPS Jamshoro	220kV Circuit 4 to 500 kV G/S	GENCO	NTDC
102	TPS Jamshoro	Starting T/F (220/66kV) T-4 for TPS JAMSHORO	GENCO	NTDC
103	TPS Jamshoro	Starting T/F (220/66kV) T-5 for TPS JAMSHORO	GENCO	NTDC
104	TPS Jamshoro	220kV Circuit 1 to 500 kV G/S	GENCO	NTDC
105	TPS Jamshoro	220kV Circuit 2 to 500 kV G/S	GENCO	NTDC
106	TPS Jamshoro	220kV Circuit 3 to 500 kV G/S	GENCO	NTDC
107	TPS Muzaffargarh	220kV BAHAWALPUR-2	GENCO	NTDC
108	TPS Muzaffargarh	220/500kV G/S CCT No. 1	GENCO	NTDC
109	TPS Muzaffargarh	220kV NEW MULTAN-4	GENCO	NTDC
110	TPS Muzaffargarh	220kV KAPCO	GENCO	NTDC
111	TPS Muzaffargarh	220kV BAHAWALPUR-1	GENCO	NTDC
112	TPS Muzaffargarh	220kV NEW MULTAN-1	GENCO	NTDC

NATIONAL TRANSMISSION & DESPATCH COMPANY LIMITED

Metering Information System

NTDC - Generation CDPS (500 & 220kV Stations)

Sr. No.	Metering Station (Grid/PH)	Metering Point Description (Line/TF)	From	To
113	TPS Muzaffargarh	220kV NEW MULTAN-3	GENCO	NTDC
114	TPS Muzaffargarh	220kV Muzaffargarh	GENCO	NTDC
115	TPS Muzaffargarh	220/500kV G/S CCT No. 2	GENCO	NTDC
116	TPS Muzaffargarh	220kV PAKGEN-1	GENCO	NTDC
117	TPS Muzaffargarh	220kV LALPIR-2	GENCO	NTDC
118	TPS Muzaffargarh	220kV LALPIR-1	GENCO	NTDC
119	TPS Muzaffargarh	500kV NTDC Grid Feeder	NTDC	GENCO
120	UCH Power - I	220kV M1	IPP - 94	NTDC
121	UCH Power - I	220kV M2	IPP - 94	NTDC
122	UCH Power - II	220kV GT 2	IPP	NTDC
123	UCH Power - II	220kV GT 1	IPP	NTDC
124	UCH Power - II	220kV GT 3	IPP	NTDC

NATIONAL TRANSMISSION & DESPATCH COMPANY LIMITED

Metering Information System

NTDC - DISCO CDPS

Sr. No.	Metering Station (Grid/PH)	Metering Point Description (Line/TF)	From	To
1	220kV Bahria G/S Rawalpindi	220kV Bahria	NTDC	IESCO
2	220kV KE G/S KDA	Jamshoro - 1	K-Electric	NTDC
3	220kV KE G/S KDA	Jamshoro - 2	K-Electric	NTDC
4	220kV NTDC G/S Bahawalpur	220/132kV T1	NTDC	MEPCO
5	220kV NTDC G/S Bahawalpur	220/132kV T2	NTDC	MEPCO
6	220kV NTDC G/S Bahawalpur	220/132kV T3	NTDC	MEPCO
7	220kV NTDC G/S Bandala	220/132kV T1	NTDC	FESCO
8	220kV NTDC G/S Bandala	220/132kV T2	NTDC	FESCO
9	220kV NTDC G/S Bandala	220/132kV T3	NTDC	FESCO
10	220kV NTDC G/S Bannu	220/132kV T/F T1	NTDC	PESCO
11	220kV NTDC G/S Bannu	220/132kV T/F T2	NTDC	PESCO
12	220kV NTDC G/S Bannu	220/132kV T/F T5	NTDC	PESCO
13	220kV NTDC G/S Bund Road	220/132kV T1	NTDC	LESCO
14	220kV NTDC G/S Bund Road	220/132kV T2	NTDC	LESCO
15	220kV NTDC G/S Bund Road	220/132kV T3	NTDC	LESCO
16	220kV NTDC G/S Bund Road	220/132kV T4	NTDC	LESCO
17	220kV NTDC G/S Burhan	220/132kV T1	NTDC	IESCO
18	220kV NTDC G/S Burhan	220/132kV T2	NTDC	IESCO
19	220kV NTDC G/S Burhan	220/132kV T3	NTDC	IESCO
20	220kV NTDC G/S Burhan	220/132kV T4	NTDC	IESCO
21	220kV NTDC G/S Chakdara	T-1	NTDC	PESCO
22	220kV NTDC G/S Chakdara	T-2	NTDC	PESCO
23	220kV NTDC G/S Chishtian	M1	NTDC	MEPCO
24	220kV NTDC G/S Chishtian	M2	NTDC	MEPCO
25	220kV NTDC G/S Chishtian	M3	NTDC	MEPCO
26	220kV NTDC G/S Daharki	T-1	NTDC	MEPCO
27	220kV NTDC G/S Daharki	T-2	NTDC	MEPCO
28	220kV NTDC G/S Daudkhel	220/132kV T1	NTDC	FESCO
29	220kV NTDC G/S Daudkhel	220/132kV T2	NTDC	FESCO
30	220kV NTDC G/S DI Khan	T-1	NTDC	PESCO
31	220kV NTDC G/S DI Khan	T-2	NTDC	PESCO
32	220kV NTDC G/S DM Jamali	T1	NTDC	QESCO
33	220kV NTDC G/S DM Jamali	T2	NTDC	QESCO
34	220kV NTDC G/S Ghakkhar	220/132kV - T1	NTDC	GEPCO
35	220kV NTDC G/S Ghakkhar	220/132kV - T2	NTDC	GEPCO
36	220kV NTDC G/S Ghakkhar	220/132kV - T3	NTDC	GEPCO
37	220kV NTDC G/S Ghakkhar	220/132kV - T4	NTDC	GEPCO
38	220kV NTDC G/S Ghazi Road	250 MVA T-1 (GIS)	NTDC	LESCO
39	220kV NTDC G/S Ghazi Road	250 MVA T-2 (GIS)	NTDC	LESCO
40	220kV NTDC G/S Ghazi Road	250 MVA T-3 (GIS)	NTDC	LESCO
41	220kV NTDC G/S Gujrat	220/132kV ATR-1	NTDC	GEPCO
42	220kV NTDC G/S Gujrat	220/132kV ATR-2	NTDC	GEPCO
43	220kV NTDC G/S Gujrat	220/132kV ATR-3	NTDC	GEPCO
44	220kV NTDC G/S Hala Road	220/132kV T1	NTDC	HESCO
45	220kV NTDC G/S Hala Road	220/132kV T2	NTDC	HESCO
46	220kV NTDC G/S Hala Road	220/132kV T3	NTDC	HESCO
47	220kV NTDC G/S ISPR Islamabad	220/132kV T1	NTDC	IESCO
48	220kV NTDC G/S ISPR Islamabad	220/132kV T2	NTDC	IESCO
49	220kV NTDC G/S ISPR Islamabad	220/132kV T3	NTDC	IESCO
50	220kV NTDC G/S ISPR Islamabad	220/132kV T4	NTDC	IESCO
51	220kV NTDC G/S ISPR Islamabad	T-7	NTDC	IESCO
52	220kV NTDC G/S Jaranwala Road	220/132kV T1	NTDC	FESCO
53	220kV NTDC G/S Jaranwala Road	220/132kV T2	NTDC	FESCO
54	220kV NTDC G/S Jaranwala Road	220/132kV T3	NTDC	FESCO
55	220kV NTDC G/S Jaranwala Road	220/132kV T4	NTDC	FESCO
56	220kV NTDC G/S Jhampir	M1	NTDC	HESCO

NATIONAL TRANSMISSION & DESPATCH COMPANY LIMITED

Metering Information System

NTDC - DISCO CDPS

Sr. No.	Metering Station (Grid/PH)	Metering Point Description (Line/TF)	From	To
57	220kV NTDC G/S Jhampir	M2	NTDC	HESCO
58	220kV NTDC G/S Jhampir	T3	NTDC	HESCO
59	220kV NTDC G/S Jhampir	T-4	NTDC	HESCO
60	220kV NTDC G/S Jhampir-II	T1	NTDC	HESCO
61	220kV NTDC G/S Jhampir-II	T2	NTDC	HESCO
62	220kV NTDC G/S Jhampir-II	T3	NTDC	HESCO
63	220kV NTDC G/S Kala Shah Kaku	220/132kV T1	NTDC	LESCO
64	220kV NTDC G/S Kala Shah Kaku	220/132kV T2	NTDC	LESCO
65	220kV NTDC G/S Kala Shah Kaku	220/132kV T3	NTDC	LESCO
66	220kV NTDC G/S Kala Shah Kaku	220/132kV T4	NTDC	LESCO
67	220kV NTDC G/S Kassowal	220/132kV T2	NTDC	MEPCO
68	220kV NTDC G/S Kassowal	220/132kV T1	NTDC	MEPCO
69	220kV NTDC G/S Kassowal	T-4	NTDC	MEPCO
70	220kV NTDC G/S Khuzdar	220/132kV T1	NTDC	QESCO
71	220kV NTDC G/S Khuzdar	220/132kV T2	NTDC	QESCO
72	220kV NTDC G/S Lal Suhanra	T1	NTDC	MEPCO
73	220kV NTDC G/S Lalian	ATR-02	NTDC	FESCO
74	220kV NTDC G/S Loralai	220/132kV T1	NTDC	QESCO
75	220kV NTDC G/S Loralai	220/132kV T2	NTDC	QESCO
76	220kV NTDC G/S Luddewala	220/132kV T1	NTDC	FESCO
77	220kV NTDC G/S Luddewala	220/132kV T2	NTDC	FESCO
78	220kV NTDC G/S Luddewala	220/132kV T3	NTDC	FESCO
79	220kV NTDC G/S Mansehra	250 MVA T/F - 1	NTDC	PESCO
80	220kV NTDC G/S Mansehra	250 MVA T/F - 2	NTDC	PESCO
81	220kV NTDC G/S Mardan	220/132kV T1	NTDC	PESCO
82	220kV NTDC G/S Mardan	220/132kV T2	NTDC	PESCO
83	220kV NTDC G/S Mardan	220/132kV T3	NTDC	PESCO
84	220kV NTDC G/S Muzaffargarh	220/132kV T1	NTDC	MEPCO
85	220kV NTDC G/S Muzaffargarh	220/132kV T2	NTDC	MEPCO
86	220kV NTDC G/S Muzaffargarh	220/132kV T3	NTDC	MEPCO
87	220kV NTDC G/S New Shalamar	T1	NTDC	LESCO
88	220kV NTDC G/S New Shalamar	T2	NTDC	LESCO
89	220kV NTDC G/S New Shalamar	T3	NTDC	LESCO
90	220kV NTDC G/S Nishatabad	220/132kV T2	NTDC	FESCO
91	220kV NTDC G/S Nishatabad	220/132kV T3	NTDC	FESCO
92	220kV NTDC G/S Nishatabad	220/132kV T4	NTDC	FESCO
93	220kV NTDC G/S Nishatabad	220/132kV T5	NTDC	FESCO
94	220kV NTDC G/S Nishatabad	220/132kV T1	NTDC	FESCO
95	220kV NTDC G/S NKLP	220/132kV T2	NTDC	LESCO
96	220kV NTDC G/S NKLP	220/132kV T1	NTDC	LESCO
97	220kV NTDC G/S NKLP	220/132kV T3	NTDC	LESCO
98	220kV NTDC G/S Nowshehra	T-1	NTDC	PESCO
99	220kV NTDC G/S Nowshehra	T-2	NTDC	PESCO
100	220kV NTDC G/S Okara	220/132kV T1	NTDC	LESCO
101	220kV NTDC G/S Okara	220/132kV T2	NTDC	LESCO
102	220kV NTDC G/S Quetta Industrial	220/132kV T1	NTDC	QESCO
103	220kV NTDC G/S Quetta Industrial	220/132kV T2	NTDC	QESCO
104	220kV NTDC G/S Quetta Industrial	220/132kV T3	NTDC	QESCO
105	220kV NTDC G/S Ravi	220/132kV T1	NTDC	LESCO
106	220kV NTDC G/S Ravi	220/132kV T2	NTDC	LESCO
107	220kV NTDC G/S Ravi	220/132kV T3	NTDC	LESCO
108	220kV NTDC G/S Rohri	T1	NTDC	SEPCO
109	220kV NTDC G/S Rohri	T2	NTDC	SEPCO
110	220kV NTDC G/S Sarfaraz Nagar	220/132kV T1	NTDC	LESCO
111	220kV NTDC G/S Sarfaraz Nagar	220/132kV T2	NTDC	LESCO
112	220kV NTDC G/S Sarfaraz Nagar	220/132kV T3	NTDC	LESCO

NATIONAL TRANSMISSION & DESPATCH COMPANY LIMITED

Metering Information System

NTDC - DISCO CDPS

Sr. No.	Metering Station (Grid/PH)	Metering Point Description (Line/TF)	From	To
113	220kV NTDC G/S Sarfaraz Nagar	220/132kV T6	NTDC	LESCO
114	220kV NTDC G/S Shahi Bagh	220/132kV T1	NTDC	PESCO
115	220kV NTDC G/S Shahi Bagh	220/132kV T2	NTDC	PESCO
116	220kV NTDC G/S Shahi Bagh	220/132kV T3	NTDC	PESCO
117	220kV NTDC G/S Shahi Bagh	220/132kV T4	NTDC	PESCO
118	220kV NTDC G/S Sialkot	220/132kV T1	NTDC	GEPCO
119	220kV NTDC G/S Sialkot	220/132kV T2	NTDC	GEPCO
120	220kV NTDC G/S Sialkot	220/132kV T3	NTDC	GEPCO
121	220kV NTDC G/S Sibbi	220/132kV T2	NTDC	QESCO
122	220kV NTDC G/S Sibbi	220/132kV T1	NTDC	QESCO
123	220kV NTDC G/S Summandari Road	220/132kV T1	NTDC	FESCO
124	220kV NTDC G/S Summandari Road	220/132kV T2	NTDC	FESCO
125	220kV NTDC G/S Summandari Road	220/132kV T3	NTDC	FESCO
126	220kV NTDC G/S TM Khan Road	220/132kV T2	NTDC	HESCO
127	220kV NTDC G/S TM Khan Road	220/132kV T1	NTDC	HESCO
128	220kV NTDC G/S Toba Tek Singh	T1	NTDC	FESCO
129	220kV NTDC G/S Toba Tek Singh	T3	NTDC	FESCO
130	220kV NTDC G/S Toba Tek Singh	T2	NTDC	FESCO
131	220kV NTDC G/S Toba Tek Singh	T4	NTDC	FESCO
132	220kV NTDC G/S University Barakahu	220/132kV T1	NTDC	IESCO
133	220kV NTDC G/S University Barakahu	220/132kV T2	NTDC	IESCO
134	220kV NTDC G/S Vehari	220/132kV T1	NTDC	MEPCO
135	220kV NTDC G/S Vehari	220/132kV T2	NTDC	MEPCO
136	220kV NTDC G/S Vehari	220/132kV T3	NTDC	MEPCO
137	220kV NTDC G/S Wapda Town	220/132kV T1	NTDC	LESCO
138	220kV NTDC G/S Wapda Town	220/132kV T2	NTDC	LESCO
139	220kV NTDC G/S Wapda Town	220/132kV T3	NTDC	LESCO
140	500kV NTDC G/S Dadu	220/132kV T5	NTDC	SEPCO
141	500kV NTDC G/S Dadu	220/132kV T1	NTDC	SEPCO
142	500kV NTDC G/S Dadu	220/132kV T3	NTDC	SEPCO
143	500kV NTDC G/S DG Khan	T3	NTDC	MEPCO
144	500kV NTDC G/S DG Khan	T4	NTDC	MEPCO
145	500kV NTDC G/S Faisalabad West	220/132kV Auto Transformer T-8	NTDC	FESCO
146	500kV NTDC G/S Faisalabad West	220/132kV Auto Transformer T-9	NTDC	FESCO
147	500kV NTDC G/S Jamshoro	220/132KV 160 MVA T/F T-3	NTDC	HESCO
148	500kV NTDC G/S Jamshoro	220/132KV 160 MVA T/F T-7	NTDC	HESCO
149	500kV NTDC G/S New Multan	220/132kV T3	NTDC	MEPCO
150	500kV NTDC G/S New Multan	220/132kV T4	NTDC	MEPCO
151	500kV NTDC G/S New Multan	220/132kV T5	NTDC	MEPCO
152	500kV NTDC G/S NKI Karachi	500/220kV T1	NTDC	K-Electric
153	500kV NTDC G/S NKI Karachi	500/220kV T2	NTDC	K-Electric
154	500kV NTDC G/S Nokhar	220/132kV T4	NTDC	GEPCO
155	500kV NTDC G/S Nokhar	220/132kV T5	NTDC	GEPCO
156	500kV NTDC G/S Nokhar	220/132kV T6	NTDC	GEPCO
157	500kV NTDC G/S Nokhar	220/132kV T-7	NTDC	GEPCO
158	500kV NTDC G/S Rahim Yar Khan	T-6	NTDC	MEPCO
159	500kV NTDC G/S Rahim Yar Khan	T-5	NTDC	MEPCO
160	500kV NTDC G/S Rawat	220/132kV T5	NTDC	IESCO
161	500kV NTDC G/S Rawat	220/132kV T6	NTDC	IESCO
162	500kV NTDC G/S Rawat	220/132kV T7	NTDC	IESCO
163	500kV NTDC G/S Rawat	220/132kV T8	NTDC	IESCO
164	500kV NTDC G/S Sheikh Muhammadi	220/132kV T6	NTDC	PESCO
165	500kV NTDC G/S Sheikh Muhammadi	220/132kV T7	NTDC	PESCO
166	500kV NTDC G/S Sheikh Muhammadi	220/132kV T8	NTDC	PESCO
167	500kV NTDC G/S Sheikh Muhammadi	220/132KV T5	NTDC	PESCO
168	500kV NTDC G/S Sheikhupura	220/132kV T5	NTDC	LESCO

NATIONAL TRANSMISSION & DESPATCH COMPANY LIMITED

Metering Information System

NTDC - DISCO CDPS

Sr. No.	Metering Station (Grid/PH)	Metering Point Description (Line/TF)	From	To
169	500kV NTDC G/S Sheikhupura	220/132kV T6	NTDC	LESCO
170	500kV NTDC G/S Sheikhupura	220/132kV T7	NTDC	LESCO
171	500kV NTDC G/S Sheikhupura	220/132kV T8	NTDC	LESCO
172	500kV NTDC G/S Shikarpur	220/132kV T1	NTDC	SEPCO
173	500kV NTDC G/S Shikarpur	220/132kV T2	NTDC	SEPCO
174	500kV NTDC G/S Shikarpur	220/132kV T3	NTDC	SEPCO
175	500kV NTDC G/S Yousafwala	220/132kV T3	NTDC	MEPCO
176	500kV NTDC G/S Yousafwala	220/132kV T4	NTDC	MEPCO
177	500kV NTDC G/S Yousafwala	220/132kV T5	NTDC	MEPCO
178	500kV NTDC G/S Yousafwala	220/132kV T6	NTDC	MEPCO
179	NGPS Multan	220kV New Multan - 1	MEPCO	NTDC
180	NGPS Multan	220kV New Multan - 2	MEPCO	NTDC

NATIONAL TRANSMISSION & DESPATCH COMPANY LIMITED

Metering Information System

NTDC - HVDC CDPS

Sr. No.	Metering Station (Grid/PH)	Metering Point Description (Line/TF)	From	To
1	660kV HVDC Converter Station Matiari	Matiari - Engro Thar - I	HVDC	NTDC
2	660kV HVDC Converter Station Matiari	Matiari - Engro Thar - II	HVDC	NTDC
3	660kV HVDC Converter Station Matiari	Matiari - Moro	HVDC	NTDC
4	660kV HVDC Converter Station Matiari	Matiari - Jamshoro	HVDC	NTDC
5	660kV HVDC Converter Station Matiari	Matiari - Port Qasim - I	HVDC	NTDC
6	660kV HVDC Converter Station Matiari	Matiari - Port Qasim - II	HVDC	NTDC
7	660kV HVDC Converter Station Matiari	Matiari - Jamshoro - II	HVDC	NTDC
8	660kV HVDC Converter Station Matiari	Matiari - Dadu	HVDC	NTDC
9	660kV HVDC Converter Station Lahore	Lahore - SKP - I	HVDC	NTDC
10	660kV HVDC Converter Station Lahore	Lahore - SKP - II	HVDC	NTDC
11	660kV HVDC Converter Station Lahore	Lahore - South - I	HVDC	NTDC
12	660kV HVDC Converter Station Lahore	Lahore - South - II	HVDC	NTDC

NATIONAL TRANSMISSION & DESPATCH COMPANY LIMITED

Metering Information System

NTDC - DISCO's Auxiliary CDPs

Sr. No.	Metering Station (Grid/PH)	Metering Point Description (Line/TF)	From	To
1	132kV FESCO G/S Chiniot Road	11kV Gatti Feeder (Grid Auxiliary)	FESCO	NTDC
2	132kV FESCO G/S Nishatabad New	11kV Feeder (Grid Auxiliary)	FESCO	NTDC
3	220kV NTDC G/S Bahawalpur	Grid Auxiliary	NTDC	MEPCO
4	220kV NTDC G/S Bandala	132/11kV T-4 (Grid Auxiliary)	NTDC	FESCO
5	220kV NTDC G/S Bannu	Grid Auxiliary	NTDC	PESCO
6	220kV NTDC G/S Bund Road	Grid Auxiliary	NTDC	LESCO
7	220kV NTDC G/S Burhan	Grid Auxiliary	NTDC	IESCO
8	220kV NTDC G/S Chakdara	Grid Auxiliary	NTDC	PESCO
9	220kV NTDC G/S Chishtian	Grid Auxiliary	NTDC	MEPCO
10	220kV NTDC G/S Daudkhel	Grid Auxiliary	NTDC	FESCO
11	220kV NTDC G/S Daudkhel	Grid Auxiliary # 2	NTDC	FESCO
12	220kV NTDC G/S DI Khan	Grid Auxiliary	NTDC	PESCO
13	220kV NTDC G/S DM Jamali	Grid Auxiliary	NTDC	QESCO
14	220kV NTDC G/S Ghakkhar	Grid Auxiliary	NTDC	GEPCO
15	220kV NTDC G/S Ghazi Road	Grid Auxiliary	NTDC	LESCO
16	220kV NTDC G/S Gujrat	T-4 (Grid Auxiliary)	NTDC	GEPCO
17	220kV NTDC G/S Hala Road	Grid Auxiliary	HESCO	NTDC
18	220kV NTDC G/S ISPR Islamabad	Grid Auxiliary	NTDC	IESCO
19	220kV NTDC G/S Jaranwala Road	Grid Auxiliary	NTDC	FESCO
20	220kV NTDC G/S Jhampir	Grid Auxiliary	HESCO	NTDC
21	220kV NTDC G/S Kala Shah Kaku	Grid Auxiliary	NTDC	LESCO
22	220kV NTDC G/S Kassowal	Grid Auxiliary	NTDC	MEPCO
23	220kV NTDC G/S Khuzdar	11kV Grid Auxiliary - II	NTDC	QESCO
24	220kV NTDC G/S Khuzdar	11kV Grid Auxiliary - I	NTDC	QESCO
25	220kV NTDC G/S Lal Suhanra	T4 (Grid Auxiliary)	NTDC	MEPCO
26	220kV NTDC G/S Lalian	T-04 Auxiliary	NTDC	FESCO
27	220kV NTDC G/S Loralai	Grid Auxiliary	NTDC	QESCO
28	220kV NTDC G/S Luddewala	Grid Auxiliary	NTDC	FESCO
29	220kV NTDC G/S Mansehra	Grid Auxiliary	NTDC	PESCO
30	220kV NTDC G/S Mardan	Grid Auxiliary	NTDC	PESCO
31	220kV NTDC G/S Muzaffargarh	Grid Auxiliary	NTDC	MEPCO
32	220kV NTDC G/S New Shalamar	Grid Auxiliary	NTDC	LESCO
33	220kV NTDC G/S NKLP	Grid Auxiliary	LESCO	NTDC
34	220kV NTDC G/S Nowshehra	Grid Auxiliary	NTDC	PESCO
35	220kV NTDC G/S Okara	Grid Auxiliary	NTDC	LESCO
36	220kV NTDC G/S Quetta Industrial	Grid Auxiliary	NTDC	QESCO
37	220kV NTDC G/S Ravi	Grid Auxiliary	NTDC	LESCO
38	220kV NTDC G/S Rohri	T-3 Grid Auxiliary	NTDC	SEPCO
39	220kV NTDC G/S Sarfaraz Nagar	Grid Auxiliary	NTDC	LESCO
40	220kV NTDC G/S Shahi Bagh	Grid Auxiliary	NTDC	PESCO
41	220kV NTDC G/S Sialkot	Grid Auxiliary	NTDC	GEPCO
42	220kV NTDC G/S Sibbi	Grid Auxiliary	NTDC	QESCO
43	220kV NTDC G/S Summandari Road	Grid Auxiliary	NTDC	FESCO
44	220kV NTDC G/S TM Khan Road	Grid Auxiliary	NTDC	HESCO
45	220kV NTDC G/S Toba Tek Singh	Grid Auxiliary	NTDC	FESCO
46	220kV NTDC G/S University Barakahu	Grid Auxiliary	NTDC	IESCO
47	220kV NTDC G/S Vehari	11kV Grid Auxiliary	NTDC	MEPCO
48	220kV NTDC G/S Wapda Town	Grid Auxiliary	NTDC	LESCO
49	500kV NTDC G/S DG Khan	T5 - Grid Auxiliary	NTDC	MEPCO
50	500kV NTDC G/S Faisalabad West	132/11kV Transformer T-1 (Grid Auxiliary)	NTDC	FESCO
51	500kV NTDC G/S New Multan	132/11kV T6 (Grid Auxiliary)	NTDC	MEPCO
52	500kV NTDC G/S Nokhar	Grid Auxiliary	NTDC	GEPCO
53	500kV NTDC G/S Rahim Yar Khan	T-7 Grid Auxiliary	NTDC	MEPCO
54	500kV NTDC G/S Rawat	Grid Auxiliary	NTDC	IESCO
55	500kV NTDC G/S Sheikh Muhammadi	Grid Auxiliary	NTDC	PESCO
56	500kV NTDC G/S Shikarpur	Grid Auxiliary	NTDC	SEPCO
57	500kV NTDC G/S Yousafwala	Grid Auxiliary - 6	NTDC	MEPCO
58	500kV NTDC G/S Yousafwala	Grid Auxiliary - 5	MEPCO	NTDC