National Electric Power Regulatory Authority
Islamic Republic of Pakistan

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No. NEPRA/Director.(Tech.)/LAD-02/ 10694-10700 May 11, 2023

Chief Executive Officer
Islamabad Electric Supply Company (IESCO)
Street No. 40, G-7/4, Islamabad

Subject: **Determination of the Authority in the matter of Investment Plan filed by Islamabad Electric Supply Company Limited (IESCO) under Section 32 of the NEPRA Act for MYT Tariff Control Period from FY 2023-24 TO FY 2027-28.**

The Authority as per provisions of Section 32 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 read with Para 23 of NEPRA Guidelines for Determination of Consumer End Tariff (Methodology and Process), 2015 approves the investment plan and losses assessment of IESCO for five (05) years MYT control period from FY 2023-24 to FY 2027-28.

2. The subject Determination along with **Annex-1 to Annex-V (total 61 pages)** is enclosed herewith for information and further necessary action please

Enclosure: As above

11/05/23

(Engr. Mazhar Iqbal Ranjha)

Copy to:

1. Secretary, Cabinet Division, Cabinet Secretariat, Islamabad.
2. Secretary, Ministry of Energy (Power Division), 'A' Block, Pak Secretariat, Islamabad.
3. Secretary, Ministry of Finance, 'Q' Block, Pak Secretariat, Islamabad.
4. Secretary, Energy Department., Government of the Punjab, 8th Floor, EFU House, Main Gulberg, Jail Road, Lahore,
5. Managing Director, NTDC,414 WAPDA House, Shaharah-e-Qauid-e-Azam, Lahore
6. Chief Executive Officer, Central Power Purchasing Agency Guarantee Limited (CPPA-G),Shaheen Plaza, 73-West, Fazl-e-Haq Road, Islamabad

Determination of the Authority in the matter of Investment Plan filed by Islamabad Electric Supply Company Limited (IESCO) under Section 32 of the NEPRA Act for MYT Tariff Control Period From FY 2023-24 TO FY 2027-28

1. In compliance with the requirements of the Section 32 of the NEPRA Act and NEPRA Guidelines for determination of the Consumer End tariff (Methodology and Process) 2015, IESCO submitted its Distribution Company Integrated Investment Plan (DIIP) for Multi Year Tariff (MYT) control period for FY 2023-24 to FY 2027-28 vide its letter dated 17-10-2022 with approval of CEO IESCO. In this regard, IESCO was directed to submit BOD approved DIIP and in response IESCO vide its letter dated 04-01-2023 submitted BOD approval for DIIP. The DIIP submitted by IESCO has been filed for multiyear tariff i.e. for a period of five (5) years. IESCO's responsibilities reflected in the DIIP include the following:

   i. Strengthening and expansion in system at high voltage (132 and 66 kV) for removing constraints for power transfer from NTDC transmission system to DISCOs system.
   ii. Increasing sales in their service territory and corresponding expansion of their network at the medium and low voltage level.
   iii. Expansion in system for reduction in losses and improving quality parameters
   iv. Administrative measures and Commercial improvement including metering and IT development, Advanced Metering Infrastructure (AMI) project implementation, etc.
   v. Improving Safety and Capacity building & trainings

2. The above functions have been grouped as follows:

S. #	Major Area	Sub-Projects
1	Secondary Transmission and Grid (STG) Expansion and Rehabilitation Projects	Construction of New 132 kV Grid Stations
		Augmentation of 132 kV Grid Stations
		Extension of 132 kV Transformer Bays
		Extension of 132 kV Line Bays
		Erection of New 132 kV Transmission Lines
		Rehabilitation/Reconductoring of 132 kV Transmission Lines
		Installation of Capacitors at 132 kV Grid Stations
2	Distribution of Power (DOP) Expansion and Rehabilitation Projects	Installation of New 11 kV Lines
		Installation of New Distribution Transformers
		Reinforcement of Overloaded Distribution Transformers
		Installation of New LT Lines
		Installation of 11 kV Capacitors
		11 kV feeder load shifting on new grid stations
3	Energy and Loss Reduction (ELR) Projects	Replacement of Defective/Burnt Distribution Transformers
		Rehabilitation of Existing HT and LT Lines
		GIS Mapping/Re-routification of 11 kV Feeders
		GIS Mapping of LT Lines
		ABC Roll out Program
4		Installation of New 11 kV Lines

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	Deposit Works / Consumer Financing	Installation of New LT Lines
		Installation of New Distribution Transformers
		Installation of new Grid Stations
5	**Commercial Improvement Plans**	Installation of Advanced Metering Infrastructure (AMI) / Smart Energy Meters
		Customer Service Improvement
		Anti-Theft Efforts
		Installation of IT Infrastructures
6	**Financial Improvement Plan**	Enterprise Resource Planning (ERP)
		Oracle Plant Maintenance (SAP PM) for all maintenance activities to be performed
7	**Human Resource Improvement Plans**	Hiring of Additional Manpower to undertake the Projects
		Capacity Building of Human Resource as per TNA
		Revamping training centers
8	**Communication Improvement Plans**	Public Communication, outreach and awareness activities
		Mass Media activities
		Corporate Social Responsibility (CSR)
9	**Operational Improvement Plans**	Transformer Repair Workshop (TRW)
		Lineman Training and Tools

3. In order to fulfill the proceedings under section 32 of NEPRA Act and NEPRA Guidelines for determination of the Consumer End tariff (Methodology and Process) 2015, the Authority framed the following issues for the hearing of IESCO which was initially scheduled for 22-11-2022 but later on held on 28-11-2022 on the request of IESCO.

   i. **Whether the claimed cost of Rs. 51,525 Million in the head of STG Expansion and Rehabilitation is justified?** Petitioner must provide the project wise rationale against requested investment and techno commercial benefits to be achieved through proposed investment in terms of constraints removal, additional energy available for sales through MVA additions, reliability & continuity of supply, reduction in transmission losses, etc.

   ii. **Whether the claimed cost of Rs. 19,186 Million in the head of Distribution (Rehabilitation) is justified?** IESCO must provide the basis against requested investment, areas prioritized for loss reduction program and financial impact of T&D losses reduction.

   iii. **Whether the claimed cost of Rs. 7,868 Million in the head of Distribution (Expansion) is justified?** Petitioner to provide the rationale against requested investment in terms of removal of 11 kV Feeder Overloading and benefits of proposed investment in meeting future load growth and timely provision of electricity services to prospective consumers.

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iv. **Whether the claimed cost of Rs. 25,800 Million in the head of AMI is justified?** Petitioner to provide the basis against requested investment in terms of voltage wise areas where AMI/AMR system will be implemented and benefits of proposed investment. Whether any plan of AMR/AMI installation on PMT level is included in the investment plan or otherwise.

v. **Whether the claimed cost of Rs. 4,640 Million in the head of Transformer Monitoring System is justified?** Petitioner to provide the basis against requested investment, breakup of cost and benefits of proposed investment.

vi. **Whether the claimed cost of Rs. 5,310 Million in the head of Other Functional Improvement Plans is justified?** Petitioner to provide the basis against requested investment and benefits of proposed investment.

vii. **Whether the claimed cost of Rs.189,245 Million in the head of Annual Recurring Cost which include O&M and R&M expenses is justified.**

viii. **Petitioner to provide payback period of investments claimed under the head of DOP, ELR and STG.**

4. **Issue # 01: Whether the claimed cost of Rs. 51,525 Million in the head of STG Expansion and Rehabilitation is justified?** Petitioner must provide the project wise rationale against requested investment and techno commercial benefits to be achieved through proposed investment in terms of constraints removal, additional energy available for sales through MVA additions, reliability & continuity of supply, reduction in transmission losses, etc.

PETITIONER'S SUBMISSIONS FOR STG PROJECTS

4.1. The Petitioner in its DIIP submitted STG investment for FY 2023-24 to FY 2027-28 based on the Power Market Survey (PMS), where the bottom up approach is applied considering the best prudent practices for the development of ten years forecast which is called Medium-term Load Forecast with facilitation from National Transmission and Dispatch Company (NTDC). Further, it was informed by IESCO that its Load Forecast Department of MIRAD has conducted the detailed power Market Survey in association with NTDCL. The scope of STG (Expansion & Rehabilitation) as provided by the petitioner is given below:

Sr.	Description	Year 1	Year 2	Year 3	Year 4	Year 5	Total
	A. GRID STATIONS (Nos)						
i	New Grid Stations	4	5	5	4	1	19
ii	Conversion of Grid Stations	0	0	0	0	1	1
iii	Augmentation of Transformers	3	4	4	0	1	12

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iv	Extension of Existing Grid Stations with T/Former bays	1	2	2	0	6	**11**
v	Installation of Capacitor Banks (MVAR)	36	0	0	0	151	**187**
	Additional (MVA)						
i	New Grid Stations	238	290	290	208	80	**1,106**
ii	Conversions	26	0	0	0	0	**26**
iii	Augmentation of Transformers	42	52	54	0	26	**174**
iv	Extension of Grid Stations	26	66	39	0	158	**289**
	Total	**332**	**408**	**383**	**208**	**264**	**1,595**
	B. 132 kV Transmission Lines						
i	New 132kV Transmission Line (km)	66	279	120	35	385	**885**
ii	Re-conductoring of 132kV Transmission Lines (km)	92	110	54	0	42.5	**298.5**

4.2. The petitioner, in its submissions in DIIP and during hearing, has claimed investment requirement of Rs. 43,410 Million (non-escalated) & 51,525 Million (escalated) for STG (Expansion & Rehabilitation) projects. IESCO stated that the project costing was assessed on the basis of the most recent procurement costs, and site specific needs. Further, all major equipment, associated equipment, and civil works are included in the estimates and provision is also made for physical and price contingencies. The year wise details of cost claimed by the petitioner under the head of STG is as under:

Sr. No.	Description	Year 1	Year 2	Year 3	Year 4	Year 5	Total
	A - GRID STATIONS (Rs. Million)						
I	New Grid Stations	2,974	4,742	3,268	2,643	1,554	**15,180**
Ii	Conversion	-	-	-	-	445	**445**
Iii	Augmentatio	293	411	322	-	150	**1,176**
Iv	Extension Transformer Bays	153	346	280	-	950	**1,729**
V	Extension Line Bays	217	263	-	83	442	**1,005**
V	Capacitor Banks	71	-	-	-	96	**166**
	Total	**3,708**	**5,762**	**3,870**	**2,726**	**3,637**	**19,701**
	B - Erection of 132kV Transmission Lines (Rs. Million)						
i	Reconductoring of 132kV T/Lines	1,566	1,824	1,037	-	887	**5,313**
ii	Erection of 132kV Transmission Lines	1,342	2,647	3,489	960	7,950	**16,388**
	Miscellaneous Charges(Rs. Million)						
	Other charges	418	680	472	206	230	2,005
	Grand Total Non-Escalated	**7,034**	**10,913**	**8,868**	**3,892**	**12,704**	**43,410**
	Grand Total Escalated Cost	**7,476**	**12,354**	**10,443**	**4,823**	**16,429**	**51,525**

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4.3. Regarding the rationale for selection of STG projects, IESCO briefed the Authority that STG Program is launched to;

i. Provide relief to the overloaded grid stations and transmission lines
ii. Accommodate future load growth
iii. Evacuate power from future 220kV and 500kV NTDC grid stations
iv. STG Projects were identified by performing system studies in collaboration with NTDC under TSEP project as follows:
    a. Verification & Finalization of PMS Report.
    b. Validation of IESCO Existing Network.
    c. Load flow studies of the system to confirm existing and expected future system constraints.
    d. Identification of sub-projects to eliminate constraints.
    e. Further load flow studies to assess sub project technical viability, and overall compatibility with NTDC system upgrades.
    f. Sub project costs were compiled and then analyzed for financial and economic viability.

4.4. IESCO further added that the STG projects were identified by performing system studies in collaboration with NTDC under TSEP project as follows:

- Verification & Finalization of (Power Market Survey) PMS Report
- Validation of IESCO Existing Network
- Load flow studies of the system to confirm existing and expected future system constraints
- Identification of sub-projects to eliminate constraints
- Further load flow studies to assess sub project technical viability, and overall compatibility with NTDC system upgrades
- Sub project costs were compiled and then analyzed for financial and economic viability

4.5. The petitioner also submitted following forecast as identified in PMS survey for next five years.

CONSUMER GROWTH BY CATEGORY (No. in Million)

Description	Year 1	Year 2	Year 3	Year 4	Year 5
Domestic	3,123,021	3,281,358	3,447,723	3,622,522	3,806,184
Commercial	483,217	502,546	522,648	543,554	565,296
General Services	21,461	22,641	23,886	25,200	26,586
Industrial	18,241	18,836	19,450	20,084	20,738
Bulk	871	889	906	924	943
Agricultural / Tube well	7,428	7,465	7,502	7,540	7,578
Street light	2,330	2,423	2,520	2,620	2,725

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Others	46	46	48	48	50
K-A (AJK)	130	134	138	142	146
Grand Total	**3,656,744**	**3,836,337**	**4,024,821**	**4,222,635**	**4,430,247**
%age Growth	**4.91**	**4.91**	**4.91**	**4.91**	**4.92**

ENERGY FORECAST (GWh)

Description	Year 1	Year 2	Year 3	Year 4	Year 5
Domestic	7127	7702	8303	8837	9,441
Commercial	1417	1617	1821	2002	2098
Public Light	85	87	88	90	92
Small Industries	70	74	78	83	88
M&L Industries	1641	1750	1795	1856	1,931
Tube Well	57	65	73	81	91
Bulk	2688	2784	2883	2987	3,094
TOTAL	13,085	14,079	15,042	15,935	16,828
Growth (%)	**5.9**	**7.6**	**6.8**	**5.9**	**5.6**

DEMAND FORECAST (MW)

Description	Year 1	Year 2	Year 3	Year 4	Year 5
Domestic	1596	1749	1902	2056	2200
Commercial	400	450	501	552	580
Public Light	24	24	25	26	27
Small Industries	14	15	16	17	18
M&L Industries	354	379	391	410	425
Tube Well	9	11	12	14	16
Bulk	532	557	580	610	632
TOTAL	2,688	2,925	3,147	3,382	3,576
Growth (%)	**7.3**	**8.8**	**7.6**	**7.5**	**5.7**

4.6. The petitioner during the course of hearing, claimed to achieve following tangible and non-tangible benefits from STG projects:

- Improvements in the Capacity of Substations
- Reduction in loading of existing 132/11kV transformers
- Sufficient spare capacity to allow connection of additional load resulting from load growth.
- Improvement in the voltage profile of the substations
- Reduction in transmission and transformation losses
- System constraints related to overloading, voltage violation and reactive power compensation will be resolved.
- The quantification of additional energy available for sales and loss reductions is given below:

Description	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Additional Energy Capacity Available for Sales (MkWh)	2,404	3,216	3,019	1,639	1,466	11,744
Expected Energy Savings (MkWh)	82	253	254	257	375	1,221

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% Loss (Without Investment)	1.55%	2.59%	2.60%	2.61%	2.98%	+1.43%
% Loss (With Investment)	**0.988%**	**0.983%**	**0.983%**	**0.983%**	**0.980%**	-0.008
Net Reduction %	**0.56%**	**1.61%**	**1.62%**	**1.63%**	**2.00%**	-1.40

4.7. The petitioner also presented a comprehensive financial analysis for STG projects before the Authority to justify the STG investments. The petitioner in its financial analysis claimed following:

Sr	Description	Value
1	Net present Value (NPV)	Rs. 37,388
2	Benefit to Cost Ratio (B.C.R)	1.43
3	Internal Rate of Return	25.00%
4	Payback Period (Years)	7 Years

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4.8. The existing sub-transmission network of IESCO which include grid stations and transmission lines is given below.

DESCRIPTION	UNITS	QUANTITIES
132 kV Grid Stations	No.	89
33 kV Grid Stations	No.	2
Consumer Grid	No.	26
NTDC Grid Stations Feeding IESCO	No.	5
Peak Load Demand-Recorded 29.06.2022 (1500-1600 Hrs)	MW	2718
Power Transformers	No.	273
Power Transformers Installed Capacity	MVA	6939
132Kv Transmission Line	KM	3869

4.9. The Authority has noted that the existing sub-transmission network of IESCO has constraints/overloading i.e. 23 power transformers are overloaded at 132 kV Grid Stations. Therefore, it is imperative to remove overloading so that reliability, quality and continuity of the supply is ensured to the DISCO which is operating in federal capital of Pakistan.

4.10. Moreover, the details of proposed new additions as per instant investment plan in IESCO's network for ensuring smooth operations and removal of constraints from transmission networks are given below:

i. MVA Added at 132 kV Grids: 1,595 MVA
ii. New Transmission Lines: 885 km
iii. Rehabilitation of exiting T/Line: 299km
iv. Capacitors Installation at Grids: 187 MVAR
v. Conversion of 66 kV: 1 Nos

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vi. New 132 kV Grid Stations: 19 Nos
vii. Augmentation of 132 kV Transformers: 12 Nos
viii. Extension of 132 kV Transformers: 11 Nos
ix. Extension of 132 kV Line Bays: 39 Nos

4.11. The Authority further observed that IESCO has requested an investment of Rs. 51,525 Million (avg. Rs. 10,305 Million per year) for five year MYT control period. The trend of previous year's investment under STG head reveals that IESCO has fully utilized the investments in STG head noted as under:

FY	Requested	Allowed	Utilized	Utilization (%)
2018-19	8,316	6,748	3,989	**59**
2019-20	3,252	2,545	1,635	**64**
2020-21	1,566	1,566	2,547	**163**
2021-22	1,196	1,196	2,050	**171**
2022-23	5,144	5,129	8,090	**158**
Total	19,474	17,184	18,311	**107**

4.12. Moreover, the comparison of scope of STG works for previous MYT and instant MYT reveals that scope of STG in terms of new grid stations and transmission lines are higher in instant MYT as detailed below:

FY	Previous MYT FY 2018-19 to FY 2022-23 (Allowed)	Instant MYT FY 2023-24 to FY 2027-28 (Requested)
132 kV Grid Station (No)	10	19
Conversion to 132 kV	4	1
Augmentation	43	12
Extension of T/F Bays	21	11
Extension of Line Bays	3	39
Capacitor Banks (MVAR)	214	187
132 kV D/C	218	504
132 kV SDT	270	381
2nd Circuit Stringing	25	113
Re-conductoring	107	185
Total Cost Allowed	**17,184 (allowed)**	**51,525 (Requested)**

4.13. The submitted information of costing for STG Plans has revealed that other escalation factors used by IESCO are quite higher than actual number used by other DISCOs (i.e. 5% for LCC and 3% for FEC cost component), the details of escalation factor is given below. Moreover, as per information provided by IESCO out of Rs. 43,409 Million (non escalated), the foreign equity component is only Rs. 5,244 Million i.e. 12% rest local cost.

FY	Escalation Factors used by IESCO	General Practice of Escalation
2023-24	7.4%	L.C.C 5 % F.E.C 3 % Contingency & others 1-3%
2024-25	12.5%	
2025-26	17.8%	
2026-27	23.9%	
2027-28	29.3%	

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4.14. In view of above, the cost of grid stations has been rationalized at 8% escalation, contingency and other charges. Further, an amount of Rs. 5,828 Million in the head of other material charges are disallowed as the other material charges are repeatedly included by IESCO at various stages while working the cost required for STG Projects:

FY	No/km	Requested Amount (Million Rs)	Rationalized Cost @ 8% escalation & others (Million Rs)
132 kV Grid Station (No)	19	15,180	13,019
Conversion to 132 kV	1	445.21	355
Extension of T/F Bays	11	1,729.49	1,566
Augmentation	12	1,176.12	1,035
New Transmission Line	885	16,389.45	15,401
Remodeling/Reconductoring	299	5,313.18	5,016
Extension of Line Bays	39	1,005	1,005
Capacitor Banks (MVAR)	187	167	167
Other Charges	-	2,005	0
Total	-	43,410	37,564
Escalation & Other	-	8,116	2,540
Grand Total	-	**51,525**	**40,104**

DECISION OF THE AUTHORITY FOR STG INVESTMENT

4.15. In view of foregoing discussion and analysis, the investment of Rs. 40,104 Million is being allowed to IESCO whereas Rs. 5,828 million deducted on account of duplication of other material cost and Rs. 5,593 million deducted against high escalation factors of 40%, by adjusting at 8% the details are given below:

Sr. No.	Description	Year 1	Year 2	Year 3	Year 4	Year 5	Total
A - GRID STATIONS (Rs. Million)							
I	New 132kV Grid Stations	2509.26	4011.12	2935.04	2321.61	1241.55	**13,019**
ii	Conversion of 66 kV grid to 132 kV grid stations	-	-	-	-	355.31	**355**
iii	Extension (Transformer Bays)	137.74	300.84	253.28	-	873.67	**1,566**
iv	Augmentation of Power Transformers at 132 kV G/S	277.13	339.32	282.94	-	135.36	**1,035**
v	Installation of Capacitor Banks	-	71	-	-	96	**167**
vi	Extension (Line Bays)	217	263	-	83	442	**1,005**
Sub Total A		**3141.13**	**4985.28**	**3471.26**	**2404.61**	**3143.89**	**17,147**
B - Erection of 132kV Transmission Lines (Rs. Million)							
I	New 132 kV New Transmission Lines	1193.06	2339.10	3362.49	927.27	7578.73	**15,401**
ii	132 kV Re-conductoring/Rehab/Remodeling	1481.70	1748.74	981.74	-	803.68	**5,016**

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Sub Total B		2674.76	4087.84	4,344.23	927.27	8,382.41	20,417
Grand Total (A+B) Non Escalated		5,815.89	9,073.12	7,815.49	3,331.88	11,526.3	37,564
Escalation & other charges @ 8% C		0	726	625	267	922	2,540
Grand Total Escalated (A+B+C)		5,816	9,799	8,440	3,599	12,448	40,104
Saving Targets							
i	STG Energy Savings (GWh)	82	253	254	257	375	1,221
ii	Requested Transmission Loss	0.988%	0.983%	0.983%	0.983%	0.980%	-
iii	MVA Additions	332	408	383	208	264	1,595
iv	Incremental Sale (GWh)	2,404	3,216	3,019	1,639	1,466	11,744

5. **Issue # 02: Whether the claimed cost of Rs. 19,186 Million in the head of Distribution (Rehabilitation) is justified?** IESCO must provide the basis against requested investment, areas prioritized for loss reduction program and financial impact of T&D losses reduction.

PETITIONER'S SUBMISSIONS FOR DISTRIBUTION (REHABILITATION) / ENERGY LOSS REDUCTION:

5.1. The petitioner in its DIIP and during the course of hearing briefed the Authority that Energy Loss Reduction (ELR) is the part of System Augmentation Program (SAP). Further, ELR cover improvements in Distribution System by installing new feeders, modifying existing feeders, replacing overloaded Transformers, re-conductoring etc.

5.2. The petitioner in its submissions during hearing and DIIP, has claimed investment requirement of Rs. 16,056 Million (non-escalate) for Energy Loss Reduction (ELR) program. Moreover, ELR cost after catering the escalation and other charges as claimed by IESCO is Rs. 19,186 Million. IESCO further stated that the ELR comprises of HT and LT proposals and these proposals are prepared / selected where all or any one of the following improvement is required:

i. Improving Voltage drop (where voltage drop is more than 5%)
ii. Reducing Power Loss (where power loss is more than 3.5%)
iii. Reducing Annual Energy Loss (where annual energy loss is more than 3%)
iv. Decreasing Percentage Loading (where loading is above or equal to 80%)
v. Improving Power Factor;
   - Independent/ Industrial (>0.95)
   - Mix Load urban (>0.95)
   - Mix Load Rural (>0.90)

5.3. The petitioner provided following scope of ELR works.

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Description	2023-24	2024-25	2025-26	2026-27	2027-28	Total
No. of HT Proposals	60	65	72	76	80	353
No. of LT Proposals	858	904	953	1,000	1,048	4,763

5.4. The year wise details of cost (non escalated) claimed by petitioner under the head of ELR for HT and LT proposals is as under:

Million Rupees

Description	Year 1	Year 2	Year 3	Year 4	Year 5	Total
HT Proposals	1,471	1,549	1,621	1,688	1,772	8,100
LT Proposals	1,431	1,512	1,591	1,671	1,750	7,956
Total	2,902	3,061	3,212	3,359	3,522	16,056

5.5. The petitioner during the course hearing, claimed to achieve following tangible and non-tangible benefits from ELR projects:

i. Revenue enhancement through reduction in AT&C losses, pilferage, outages, and reduction in O&M cost.
ii. Provision of more reliable supply of electricity to the consumers
iii. Enhance safety conditions for human life and property
iv. The quantification of energy savings (GWh) and reduction in losses as result of implementation of ELR program is given below:

Description	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Savings (GWh)	77	158	243	332	425	1,235
MVA Additions	72	76	80	84	88	399
Benefit in terms of additional sales (Million Rs.)	568	599	631	662	694	3,146

5.6. The petitioner also presented a comprehensive financial analysis for ELR project before the Authority to justify the investments. The petitioner in its financial analysis claimed following:

Sr	Description	Value
1	Net present Value (NPV)	Rs. 17,940
2	Benefit to Cost Ratio (B.C.R)	2.91
3	Internal Rate of Return	46.9%
4	Payback Period (Years)	6 Years

ANALYSIS

5.7. The existing 11 kV network assets of IESCO are given below.

Description	Value
NO OF 11 KV FEEDERS ENDING JUN-22	1,293
LENGTH OF HT LINE ENDING JUN-22	26,932
LENGTH OF LT LINE ENDING JUN-22	28,160
HT/LT RATIO	0.95
DISTRIBUTION TRANSFORMERS (ENDING 06/2022)	53,616
MVA capacity OF DISTRIBUTION TRANSFORMERS	4,395

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5.8. The Authority observed that IESCO has poor ratio of HT/LT of 0.95. As per international best practices a HT/LT ratio of 1.2 would be very beneficial to power Distribution Company as this measure is a must to improve efficiency and voltage regulation of distribution networks. It is an established fact that increasing HT lines can help in reducing both line losses and voltage drops thereby increasing efficiency of a utility company. Moreover, it is also transpired that IESCO is striving hard to achieve the NEPRA's T&D losses targets. The historic trend of actual losses incurred by IESCO against NEPRA allowed T&D losses targets is given below:

Financial Year	IESCO's Actual Losses (%)	NEPRA Allowed Losses (%)
FY 2018-19	8.86	8.65
FY 2019-20	8.69	8.60
FY 2020-21	8.54	8.50
FY 2021-22	8.18	8.15
FY 2022-23	-	7.80

5.9. Further the Authority noted that as per available record out of 1,293 feeders a total of 49 feeders are overloaded. Further, 1503 distribution transformers are also overloaded. Therefore, HT and LT proposal and investments as proposed by IESCO are pivotal for eliminating overloading of 11 kV feeder and distribution transformers. The ELR investment will improve the reliability, quality and continuity of the supply in IESCO. A total of 190 new 11 kV feeders will be added by IESCO in five years under ELR program. In addition, chain augmentation and addition of distribution transformers will also be undertaken to relieve the system overloading and ensure smooth operations. ELR investment is also important to maintain and achieve NEPRA Determined T&D losses targets.

5.10. The trend of previous years investment utilization under the Distribution (Expansion & Rehabilitation) & ELR transpired that IESCO has fully utilized the investment allowed by NEPRA, details are given below:

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Financial Year	Requested by IESCO	Allowed by NEPRA	Utilized by IESCO	Utilization (%)
2018-19	1,114	1,122	1,676	149
2019-20	1,114	1,126	1,560	139
2020-21	1,114	1,116	1,346	121
2021-22	1,114	1,118	1,834	164
2022-23	1,117	5,716	9,977	175
Total	**5,573**	**10,198**	**16,393**	**161**

5.11. IESCO has requested an investment of Rs. 19,186 Million with escalation for five year MYT control period under ELR head. However, the details provided by IESCO and correction of escalation factors only confirm the investment of Rs. 16,976 Million. The details are given below:

							Million Rupees
Sr	Description	Year 1	Year 2	Year 3	Year 4	Year 5	Total
A	Total Cost of HT Proposals including material cost	1,471	1,548	1,621	1,688	1,772	8,100
B	Total Cost of LT Proposals including material cost	1,431	1,512	1,591	1,671	1,750	7,956
C	Cost of Material A+B (including Store handling, installation & dismantling Charges)	2,902	3,060	3,212	3,359	3,522	16,056
D	Escalation Factor	1.00	1.07	1.07	1.07	1.07	-
E	Cost of Escalation	0.00	214	225	235	247	921
J	**Escalated Cost of ELR (H+I)**	**2,902**	**3,274**	**3,437**	**3,594**	**3,769**	**16,976**

DECISION OF THE AUTHORITY FOR ELR INVESTMENT

5.12. In view of foregoing discussion and analysis, the investment amount of Rs. 16,976 Million is allowed to IESCO whereas Rs. 2,210 million deducted on account of high escalation factors, the year wise details are given below:

(Million Rs.)

Description	Year 1	Year 2	Year 3	Year 4	Year 5	Total
HT Proposals – A	1,471	1,548	1,621	1,688	1,772	8,100
LT Proposals – B	1,431	1,512	1,591	1,671	1,750	7,956
Cost of Material A+B (including Store handling, installation & dismantling Charges)	2,902	3,060	3,212	3,359	3,522	16,056
Escalation Factors allowed	1.00	1.07	1.07	1.07	1.07	-
Cost of Escalation – C	0.00	214	225	235	247	921
Grand Total Escalated Cost (A+B+C)	**2,902**	**3,274**	**3,437**	**3,594**	**3,769**	**16,976**
Saving Targets						
Savings (GWh)	77	158	243	332	425	1,235
MVA Additions	72	76	80	84	88	399
Benefit in terms of additional sales (Million Rs.)	568	599	631	662	694	3,146

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6. **Issue # 3: Whether the claimed cost of Rs. 7,868 Million in the head of Distribution (Expansion) is justified?** Petitioner to provide the rationale against requested investment in terms of removal of 11 kV Feeder Overloading and benefits of proposed investment in meeting future load growth and timely provision of electricity services to prospective consumers.

PETITIONER'S SUBMISSIONS FOR DISTRIBUTION (EXPANSION) / DOP PROJECTS:

6.1. Regarding the claim of Rs. 7,868 Million under the head of Distribution of Power (DOP) program, IESCO briefed that the DOP head deals with projects to meet future load growth and timely provision of electricity services to prospective consumers. Moreover, the petitioner submitted that funds are required for evacuation of power from planned grid stations using 55' /45' structures or duct lines as per site position. Similarly, Underground material is expensive and cost cannot be justified under other heads. Therefore, funds are necessarily required under DOP head in order to meet future load growth and ensure Continuity of Supply.

6.2. Moreover, the petitioner submitted that there are programs where rehabilitation work is undertaken without involving satisfactory benefit to cost (B/C) ratios but are still essential in a DISCO's liability. Such rehabilitation / expansion works are done under the Distribution of Power (DOP) program. The petitioner further claimed that DOP deals with projects where the Distribution of Power or continuity of services is the main objective instead of feasibility. Major activities performed under this program are:

i. Construction of feeders due to addition of a 132 KV new transformer, new 132 KV grid station.
ii. Shifting of the load from overloaded grid station / feeder to lightly loaded grid station / feeder.
iii. Rehabilitation of feeder by replacement of conductor, pole, structure or the introduction of new ones by mid spanning (to reduce span length).
iv. Deteriorated conductor (with broken strands) or a conductor with more / unacceptable number of joints is replaced on top priority basis.
v. Augmentation of distribution transformer (with higher capacity) due to the addition of new general connections / increase of load by individual customers.
vi. Installation of 11KV capacitors for improvement of power factor/voltage profile

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6.3. The scope of DOP self-financing work as submitted by IESCO is given below:

Description	Year 1	Year 2	Year 3	Year 4	Year 5	Total
No. of HT Proposals	22	23	24	25	26	120
No. of LT Proposals	162	171	180	189	198	900

6.4. The cost details of DOP self-financing work is given below:

Million Rupees

Description	Year 1	Year 2	Year 3	Year 4	Year 5	Total
HT Proposals	501	528	558	586	613	2,786
LT Proposals	681	729	759	795	833	3,797
Total	**1,182**	**1,257**	**1,316**	**1,381**	**1,446**	**6,583**
Other Charges and Escalation	**90**	**164**	**246**	**340**	**445**	**1,285**
Grand Total	**1,272**	**1,420**	**1,563**	**1,721**	**1,892**	**7,868**

6.5. Regarding DOP Consumer Financed Projects, the petitioner stated that requirement of new HT/LT Lines and grid stations under deposit works are estimated based on the previous year's trends, the details are provided below:

Cost of Work for 11 kV and Below Village Electrification		Rs. In Million					
		Year 1	Year 2	Year 3	Year 4	Year 5	Total
A.	HT Network	251	278	307	339	372	1,547
B.	LT Network	981	1,086	1,202	1,325	1,458	6,052
Total Village Electrification		1,231	1,364	1,509	1,664	1,830	7,599
Deposit Works		4120	4521	4958	5439	5964	25001
Grand Total Consumer Financed		5351	5885	6467	7103	7794	32,600

6.6. The petitioner during the course hearing, claimed to achieve following tangible and non-tangible benefits from ELR projects:

i. Provision of electricity service to new consumers.
ii. Increase in asset base of IESCO
iii. The quantification of energy savings (GWh) and reduction in losses as result of implementation of DOP self-financing program is given below:

Description	Year 1	Year 2	Year 3	Year 4	Year 5
Expected Savings (MkWh)	33	67	103	141	181
Total MVA Additions	23	24	26	27	28
Additional Capacity Available for Sales (MkWh)	182	192	202	212	222

6.7. The petitioner also presented a comprehensive financial analysis for DOP projects before the Authority to justify the investments. The petitioner in its financial analysis claimed following:

Sr	Description	Value
1	Net present Value (NPV)	Million Rs. 3,137
2	Benefit to Cost Ratio (B.C.R)	1.48
3	Internal Rate of Return	19.6%
4	Payback Period (Years)	8 Years

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ANALYSIS

6.8. The Authority is of the opinion that DOP program is very important because its purpose is to meet the future load growth and provision of electricity services to new consumers. The consumer growth rate forecasted by IESCO is around 6 to 7% which is very attractive in current economy situation of the country. Moreover, the submitted BC ratio and payback period of 1.48 and 8 years respectively is quite good for execution of DOP works.

6.9. Moreover, the Authority noted that IESCO has requested an investment of Rs. 6,583 Million for DOP Self Financing (without escalation) and 7,868 Million with escalation. The scrutiny of data revealed that IESCO has used escalation factors up to 30% which has been rationalized at 7% according to PC-I pattern as adopted by other DISCOs also. Moreover, IESCO has included miscellaneous material cost of Rs. 1,175 Million, upon inquiry it was informed that this cost is included to cover unforeseen circumstance that may require additional material cost. It is to highlight that such costs are covered in escalation and are not claimed separately. Therefore, such cost has been deducted from total claim and the verified amount of DOP (own resources) including escalation is 5,720 Million. The details of DOP (own resource) amount is given below:

Cost of Work for 11 kV and Below Expansion		Rs. In Million					
		Year 1	Year 2	Year 3	Year 4	Year 5	Total
A.	**Rehabilitation of HT Lines**	**681**	**729**	**759**	**795**	**833**	**3,797**
1	New Line	449	479	501	525	555	2,509
	Re-conductoring	46	54	54	57	57	268
	Re-routing	0	0	0	0	0	0
2	**11kV Capacitors**	5	5	5	5	5	25
3	**Installation of 11 kV Panels**	30	32	33	34	36	165
4	**11kV 500 MCM Cable**	20	20	20	20	20	99
5	**Misc HT Cost**	131	139	146	154	160	731
B.	**Rehabilitation of LT Lines**	**501**	**528**	**558**	**586**	**613**	**2,786**
1	**New Transformers**						
	a. 25 KVA	0	0	0	0	0	0
	b. 50 KVA	6	6	6	6	7	32
	c. 100 KVA	23	24	25	27	28	127
	d. 200 KVA	24	26	27	28	30	137
	e. 100 KVA (Pad mounted)	63	66	70	74	76	349
	f. 200 KVA (Pad mounted)	88	91	97	102	106	483
	Sub Total	**204**	**214**	**226**	**237**	**248**	**1,128**

2	**Augmentation of Transformers**						
	a. 50 KVA	3	3	3	3	4	15
	b. 100 KVA	15	16	17	17	18	84
	c. 200 KVA	16	17	18	19	20	91
	e. 100 KVA (Pad mounted)	41	44	47	49	52	233
	f. 200 KVA (Pad mounted)	57	61	64	68	72	322
	Sub Total	**133**	**141**	**149**	**157**	**165**	**745**
3	**Rehabilitation of LT Lines**						
	New LT Line	69	72	77	80	84	382
	Re-conductoring of LT Line	9	9	10	11	11	50
	Cables	6	7	7	7	8	36
4	**LT Capacitors**	0.2	0.3	0.3	0.3	0.3	1.3
5	**Other Equipments and Material**						
	a. Single Phase Meters	0	0	0	0	0	0
	b. Three Phase Meters	0	0	0	0	0	0
	Sub Total	**0**	**0**	**0**	**0**	**0**	**0**
6	**Misc LT Cost**	**81**	**86**	**90**	**95**	**97**	**444**
7	**Total Cost**	**1,182**	**1,257**	**1,316**	**1,381**	**1,446**	**6,583**
	Misc Material Cost (HT+LT)	**212**	**225**	**236**	**249**	**257**	**1175**
	Total Cost Less Misc Material Cost (HT+LT)	**970**	**1,032**	**1,080**	**1,132**	**1,189**	**5,408**
	Escalation Factors	**1.00**	**1.07**	**1.07**	**1.07**	**1.07**	**-**
	Escalation Cost	**0**	**72.331**	**75.761**	**79.331**	**83.251**	**310.674**
	Grand Total DOP Expansion	**971**	**1,106**	**1,158**	**1,213**	**1,273**	**5,720**

6.10. In addition to above, the petitioner has claimed an amount of Rs. 32,600 Million for Deposit Works / Consumer Financing in DOP projects including village electrification.

6.11. The trend of previous years investment utilization by IESCO under the Distribution (Expansion) is given below:

Financial Year	allowed by NEPRA	utilized by IESCO	Utilization (%)
2018-19	1831	1372	75
2019-20	1688	1499	89
2020-21	1673	1102	66
2021-22	1676	2751	164
2022-23	17149	1109	6
Total	**24017**	**7833**	33

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DECISION OF THE AUTHOIRTY ON DOP INVESTMENT

6.12. In view of foregoing discussion and analysis, the investment of Rs. 5,720 Million for DOP (own resources) is allowed whereas Rs. 1,175 million deducted on account of duplication of other material cost and Rs. 973 million deducted against high escalation factors. Moreover, Rs. 32,600 Million for DOP Consumer Financing / Deposit Works is being allowed to IESCO as detailed below:

Million Rupees

Sr	Description	Year 1	Year 2	Year 3	Year 4	Year 5	Total
A.	**Rehabilitation of HT Lines**	**681**	**729**	**759**	**795**	**833**	**3,797**
1	New Line	449	479	501	525	555	2,509
	Re-conductoring	46	54	54	57	57	268
	Re-routing	0	0	0	0	0	0
2	11kV Capacitors	5	5	5	5	5	25
3	Installation of 11 kV Panels	30	32	33	34	36	165
4	11kV 500 MCM Cable	20	20	20	20	20	99
5	Misc HT Cost	131	139	146	154	160	731
B.	**Rehabilitation of LT Lines**	**501**	**528**	**558**	**586**	**613**	**2,786**
1	New Transformers						
	a. 25 KVA	0	0	0	0	0	0
	b. 50 KVA	6	6	6	6	7	32
	c. 100 KVA	23	24	25	27	28	127
	d. 200 KVA	24	26	27	28	30	137
	e. 100 KVA (Pad mounted)	63	66	70	74	76	349
	f. 200 KVA (Pad mounted)	88	91	97	102	106	483
	Sub Total	**204**	**214**	**226**	**237**	**248**	**1,128**
2	Augmentation of Transformers						
	a. 50 KVA	3	3	3	3	4	15
	b. 100 KVA	15	16	17	17	18	84
	c. 200 KVA	16	17	18	19	20	91
	e. 100 KVA (Pad mounted)	41	44	47	49	52	233
	f. 200 KVA (Pad mounted)	57	61	64	68	72	322
	Sub Total	**133**	**141**	**149**	**157**	**165**	**745**
3	Rehabilitation of LT Lines						
	New LT Line	69	72	77	80	84	382
	Re-conductoring of LT Line	9	9	10	11	11	50
	Cables	6	7	7	7	8	36
4	LT Capacitors	0.2	0.3	0.3	0.3	0.3	1.3
5	Other Equipments and Material						
	a. Single Phase Meters	0	0	0	0		0

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	b. Three Phase Meters	0	0	0	0	0	0
	Sub Total	**0**	**0**	**0**	**0**	**0**	**0**
6	**Misc LT Cost**	**81**	**86**	**90**	**95**	**97**	**444**
7	**Total Cost**	**1,182**	**1,257**	**1,316**	**1,381**	**1,446**	**6,583**
8	**Misc Material Cost (HT+LT)**	**212**	**225**	**236**	**249**	**257**	**1175**
9	**Total Cost Less Misc Material Cost (HT+LT)**	**970**	**1,032**	**1,080**	**1,132**	**1,189**	**5,408**
10	**Escalation Factors**	**1.00**	**1.07**	**1.07**	**1.07**	**1.07**	-
11	**Escalation Cost**	**0**	**72.331**	**75.761**	**79.331**	**83.251**	**310.674**
12	**Grand Total DOP Expansion**	**971**	**1,106**	**1,158**	**1,213**	**1,273**	**5,720**
	Consumer Financed DOP						
13	Village Electrification	1,231	1,364	1,509	1,664	1,830	7,599
14	Deposit Works	4,120	4,521	4,958	5,439	5,964	25,001
15	Grand Total Consumer Financed	5,351	5,885	6,467	7,103	7,794	32,600
	Saving Targets DOP Self Financing						
16	Expected Saving MkWh	33	67	103	141	181	525
17	MVA Additions	23	24	26	27	28	128
18	Additional Sales MkWh	182	192	202	212	222	1,010

7. **Issue # 04: Whether the claimed cost of Rs. 25,800 Million in the head of AMI is justified?** The petitioner to provide the basis against requested investment in terms of voltage wise areas where AMI/AMR system will be implemented and benefits of proposed investment. Whether any plan of AMR/AMI installation on PMT level is included in the investment plan or otherwise.

PETITIONER'S SUBMISSIONS FOR AMI/AMR/SMART ENERGY METERS

7.1. Regarding AMI project, the petitioner during the course of hearing stated that, IESCO shall carry out meter replacement program across its territory with AMI (PLC/GSM/GPRS) meters in Rawalpindi City Circle, Cantt Circle, Taxila Division and all Industrial Connections of IESCO under ADB funded AMI Project. Further, IESCO will Procure 1,890,690 AMI/ Smart Energy Meters in 5 Years and 30,000 AMI meters shall be installed on PMT's of City Circle, Cantt Circle, and Industrial Consumers of entire IESCO region. The year wise details of AMI meter installation and cost as provided by the petitioner is as under:

Million Rs.

Description	Year 1	Year 2	Year 3	Year 4	Year 5	Total
AMI Cost	2,529	4,571	4,571	4,945	9,184	25,800

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System	HES, MDMS, Billing system and CIS for entire 3.5 million Consumers scalable up to 5 Million Consumers					
Consumer Meters (No)	0	530,345	530,345	200,000	600,000	1,860,690
PMT Meters (Nos)	0	7,000	8,000	8,000	7,000	30,000

7.2. In addition, IESCO explained that through AMI project it will be able to achieve the objective of automated meter reading without human intervention and consumer satisfaction, loss reduction and recovery improvement in high loss areas, assessment of load profile of each consumer on real time, availability of real time data for planning purpose etc., remotely disconnection and re-connection and better asset management.

7.3. The petitioner, during the course of hearing, quantified following benefits/saving to be achieved through implementation of AMI project.

i. Reduction in meter reading cost i.e. Rs. 445 Million / Annum
ii. Reduction in Disconnection/Reconnection Cost i.e. Rs. 101Million/Annum
iii. Reduction in Defective/Burnt Meter cost i.e. Rs.118 Million/Annum
iv. Reduction in Burnt Transformers cost i.e. Rs 190 Million / Annum
v. Reduction in losses to the tune of 0.84%
vi. Savings due to loss reduction i.e. 1,565 Million / Annum
vii. Total benefits per annum is Rs. 2,419 Million

Description	Year 1	Year 2	Year 3	Year 4	Year 5	Total
AMI Savings (MkWh)	16	90	160	163	163	592
Reduction in losses	0.10%	0.14%	0.20%	0.20%	0.20%	0.84%

7.4. IESCO further stated that implementation of AMI in two circles on PMT as well as consumer level including industrial connections will help in achieving significant improvement in commercial performance as electro-mechanical metering has often subject to inaccurate manual readings and field tampering, resulting in a significant loss of revenue and increased opportunities for theft. Petitioner further said that the AMI project will help reduce distribution losses, enhance load control and load management, provide automated consumption (billing) data, improve revenue / collection and customer services, reduce billing complaints, increase operational efficiency, reduce operating costs and modernize the electricity metering and billing operations. Further, the Transformer Monitoring System (TMS) will be installed on 17,274 PMTS (100 kVA & 200 kV PMTs) of other circles to monitor the health of transformers.

7.5. The petitioner also presented a comprehensive financial analysis for AMI project before the Authority to justify the investments. The petitioner in its financial analysis claimed following:

Sr	Description	Value
1	Net present Value (NPV)	Rs. 8,041 Million
2	Benefit to Cost Ratio (B.C.R)	1.39

3	Internal Rate of Return	19.2%
4	Payback Period (Years)	10 th year

ANALYSIS

7.6. The Authority observed that AMI project is based on the loan from ADB. The Authority observed that AMI project with remote disconnection features at consumer level is essential to modernize the distribution network of IESCO.

7.7. Moreover, IESCO has also included Transformer Monitoring System (TMS) to be installed on 17,274 PMTS (100 kVA & 200 kV PMTs) of other circles to monitor the health of transformers where AMI is not being implemented.

DECISION OF THE AUTHORITY FOR AMI INVESTMENT

7.8. Keeping in view the importance of AMI project in modernization of IESCO's infrastructure thereby bringing commercial improvements in company, the investment of Rs. 25,800 Million is being allowed by the Authority in the head of AMI.

Million Rupees

Sr	Description	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	AMI Metering for two circles as per original scope including MDMS and CIS/billing for whole company	2,529	4,571	4,571	4,945	9,184	25,800
	Recommended Saving Targets						
2	AMI Savings (MkWh)	16	90	160	163	163	592
3	Reduction in losses	0.10%	0.14%	0.20%	0.20%	0.20%	0.84%

8. **Issue # 05: Whether the claimed cost of Rs. 4,640 Million in the head of Transformer Monitoring System is justified?** Petitioner to provide the basis against requested investment, breakup of cost and benefits of proposed investment.

PETITIONER'S SUBMISSIONS FOR TRANSFORMER MONITORING SYSTEM (TMS) PROJECT

8.1. Regarding the claim of Transformer Monitoring System (TMS), IESCO stated that it will be installed on 17,274 PMTS (100 kVA & 200 kV PMTs) of circles other than Rawalpindi City, Rawalpindi Cantt and Taxila Division (as AMI is being implemented on these 2 circles and 1 division) to monitor the health of transformers.

8.2. IESCO further stated that the project shall ensure protection of Distribution Transformers and avoid damage of costly equipment besides ensuring continuity of supply. Moreover, the scope and cost of the project as provided by the petitioner is given below:

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Description	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Transformer Monitoring Systems (No.)	3,056	0.00	2,614	1,593	2,043	17,274 No.
MCCB Breaker required for AMI (No.)	0.00	6,458	0.00	0.00	0.00	
Monitoring Meter for Pad Mounted Transf. (No.)	1,320	0.00	0.00	0.00	0.00	
Non Escalated Project Cost Million Rs.	**1,109**	**646**	**915**	**558**	**715**	**3,943**
Project Cost with Escalation Million Rs.	1,194	730	1,086	695	935	4,640

8.3. Furthermore, the following main benefits are expected :

i. Cost of replacement of burnt transformers will reduce.
ii. Cost of fuel and similarly cost of un-served electricity due to damage of transformers will reduce.
iii. Rehabilitation budget shall be efficiently directed to replace over loaded distribution transformers.
iv. Proper audit of energy sale from each transformer will be ensured.
v. Saving in repair and maintenance cost of transformers i.e. Rs. 3,628 Million and additional energy sales of 537 MkWh.

8.4. The petitioner also presented a comprehensive financial analysis for TMS before the Authority to justify the investments. The petitioner in its financial analysis claimed following:

Sr	Description	Value
1	Net present Value (NPV)	Million Rs. 2,625
2	Benefit to Cost Ratio (B.C.R)	1.75
3	Internal Rate of Return	34.1%
4	Payback Period (Years)	6 Years

DECISION OF THE AUTHORITY FOR TMS Project

8.5. Keeping in view the importance of TMS project in modernization of IESCO's infrastructure thereby bringing commercial improvements in company, the investment of Rs. 4,141 Million are being allowed by the Authority as per following details.

Description	Year 1	Year 2	Year 3	Year 4	Year 5	Total
TMS CAPEX Million Rs	1,109	646	915	558	715	3,943
Escalation factor	1.0	1.07	1.07	1.07	1.07	-
Grand Total Million Rs.	**1,109**	**691**	**979**	**597**	**765**	**4,141**

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Recommended Saving Targets	Saving in repair and maintenance cost of transformers i.e. Rs. 3,628 Million and additional energy sales of 537 MkWh.

9. **Issue # 06: Whether the claimed cost of Rs. 5,310 Million in the head of Other Functional Improvement Plans is justified?** The petitioner to provide the basis against requested investment and benefits of proposed investment.

PETITIONER'S SUBMISSIONS FOR OTHER FUNCTIONAL IMPROVEMENT PLAN

9.1. The petitioner has provided following details of year wise cost breakup for other functional improvement plans.

Million Rs.

Description	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Commercial Improvement Plan	265	459	171	174	229	1,298
Financial Improvement Plan	103	73	83	72	72	403
HR Improvement Plan	1,706	490	491	407	424	3,516
Communication Improvement Plan	20	20	-	-	-	40
Contingencies: @1%	21	10	7	7	7	53
Grand Total	2,115	1,051	752	659	732	5,310

9.2. **Commercial Improvement Plan:** The petitioner submitted that this plan covers the commercial improvement activities such as metering (including AMRs), Hand Held Units based meter reading, improvement in billing systems, anti-theft initiatives, consumer census, customer services improvement initiatives etc.

i. **Advance Metering Infrastructure (AMI):** The petitioner submitted that the Government of Pakistan has initiated power sector reforms in order to eliminate significant and long-term problems within the sector. In this context, the Government is starting a major-scale program to introduce the use of Advanced Metering Infrastructure (AMI) in Pakistani DISCOs funded by ADB (US$ 139.8 Million). The investment plan will be implemented in different phases, with the goal of achieving significant AMI coverage across major Pakistan's cities and hubs of industrial activity. In that sense, the first stage (Tranche-I) of the project aims to cover 0.9 million consumers in IESCO, Islamabad. The scope is given below:

A1 - 1Ø meters (Domestic)	=	697,160 Nos	COMMUNICATION TECHNOLOGY		
A2 - 1 Ø meters (Commercial)	=	77,463 Nos	Power line communication (PLC)	=	90%
A2 - 3 Ø meters (Domestic & Commercial)	=	85,185 Nos	General Packet Radio Service (GPRS)	=	10%
Meters, Substation	=	238 Nos	PROJECT TIME LINE	=	3 Years
Meters, Dist. Transformers	=	14,955 Nos	Preparatory activities	=	1 Years
Meters, large customers	=	4,617 Nos	Deployment activities	=	2 Years
Modern Billing System	=	02 Million Consumers			

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ii. Anti-Theft: IESCO is regularly taking measures to reduce theft of electricity and reduce administrative losses. In addition to installation of AMI in Rawalpindi City and Cantt circles, IESCO will take following steps in order to curtail theft:

- ABC Installation : ABC is used in areas where frequent theft is observed and administrative losses are high. 150 KM of cable will be procured and installed in 2023-24 as per priority decided by Operation Directorate.

- Set Right PVCs : On point of emanation, dressing of PVCs ensures that theft is easy to spot. In narrow alleys and market places, this practice will reduce the chances of theft.

- Theft Detection and Security Equipment: GIS data will be used to identify high loss areas and surveillance teams of IESCO equipped with all necessary facilities will accordingly be deputed in those areas. Surveillance teams are provided with meter securing equipment and theft detecting meters annually to ensure efficient working.

- Removal of Sluggish/Old Meters: Line loss comprises of two components i.e. technical and administrative losses. The contribution from administrative losses depends upon defective/ sluggish meters. In order to reduce administrative losses, removal of sluggish meter with efficient and advanced technology meters plays a vital role.

- Benefits: The benefits of the project include Reduce theft, Reading accuracy, Increase in sold units, Monitoring is easy

iii. Accurate Meter Reading (HHU): In order to achieve accurate meter reading from field formation and subsequent transfer of data to HES and MDMS, high-quality Hand-Held Units will be provided to meter readers. It will also reduce consumer complaints regarding billing.

iv. Customer Complaint Redressal: IESCO is a service provider utility company and customer satisfaction are very important. For this purpose, IESCO has an automated complaint portal CCMS (covered in CIS) maintained by PITC and several customer services centers but current facilities are not nearly enough for existing and growing customers' satisfaction. Therefore, IESCO will expand its customer service platform with creation of 06 new customer services centers over next five years.

v. Customer Information System (CIS) : IESCO currently has a two tier Integrated Billion System. Level-1 data is collected and maintained in field formations i.e.,

new connection, meter reading and various billing adjustments. Computer section in every subdivision and customer service center is connected to Level-2 computer center through servers where billing data is compiled and collection, tax, subsidy and other tariff related adjustments are made. Bills are printed through heavy duty printers. System maintenance and upgradation in next five years will include:

- Shifting of IBS connectivity and replacement of misc IBS Equipment in all Field Formations of IESCO.
- Replacement of existing old printers at IESCO Computer Centre, Islamabad.
- IESCO is also introducing advance metering infrastructure (AMI) which includes state of the art billing and CIS solution in which consumer can promptly access its data through mobile applications and in-house display devices. Scope and benefits of the project have been discussed above.

- **Safety Improvement Plan:** IESCO is currently procuring PPE items on specifications developed by the then D&S Department, which have several loopholes. Therefore, international standards i.e., ASTM, IEC and NFPA 70E etc. will be adopted for future PPE items (e.g., arc rated PPEs). The cost of PPE items would increase probably twice what we have spent in current year but the safety of valuable staff would be ensured by using these international standard PPEs. Moreover, in compliance of Safety Committee of the BoD the capacity building program of all the HSE personnel would be done in coming years. Different international safety certification programs will be launched like NEBOSH etc. Which will help to enhance skills of HSE personnel to save the precious lives of our line staff.

9.3. **Financial Improvement Plan:** This plan covers the financial improvement activities including back-office automation through ERP systems, internal audit and controls improvement initiatives etc. The scope of the five-year financial improvement plan is presented under this business plan.

i. **ERP: (CIS, INVENTORY, HR, FINANCIAL):** The new IT infrastructure will be used to enable operations at a transaction level thus providing advantages like inbuilt process controls, workflow enabled transactions, single point of data capture and support for timely strategic decision making. Development of electrical consumer and network database is necessary for power sector applications like asset management, revenue management, and energy audit and load flow studies. The benefits of the projects will be:

- Strategic Decision Making: Real-time availability of information / Easy access to all stakeholders and specially for decision making
- Operational Excellence: Technology Enablement to ensure efficiency by minimizing human interaction

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- Single view of power related information
- Information availability on demand
- Cost effectiveness of resource usage resulting into optimization of financial resources
- Improved Customer Services Transparency & Improve Customer Satisfaction
- Explore opportunities & Ready to Implement New Business requirements
- Establish an infrastructure to strengthen information transparency and regulatory reporting
- Implement tough rules on governance, risk and compliance
- Achieve good governance

vi. **Revamping Internal Audit and Control:** Internal Audit department will be reorganized as per recommendation of Audit and Risk committee and approved by IESCO BOD.

vii. **E – Tendering:** PPRA is currently developing an E – Tendering infrastructure for transparent and efficient tendering process at national level. IESCO will adopt the same once it is launched. Expected COD is 2023-24 for this project.

9.4. **HR Improvement Plan:** It includes revamping of the Regional Training Centers (R.T.C), Human Resource Information System, Training of employees through external training institutions, conducting the yardstick study, I.T Infrastructure to support new initiative, improving the working environment and promoting the safety culture etc. The cost of staffing plan is included O&M Cost. The detail of HR Plan is presented below:

Description		Year 1	Year 2	Year 3	Year 4	Year 5
A	Revamping of Training Centers	RTC building & Hostel, Vehicles	Curriculum Development	Construction of practical labs	Revision of Curriculum	Renovation of RTC & CTC
		Class rooms in CTC Islamabad, CTC City Rwp & CTC Cantt Rwp	Provision of IT equipment for enhancing the training activities.			
B	Provision of Safety T&P and	Safety Courses & Safety Workshops	Training of Trainers from external	Provision of latest safety equipment	Enhancement of safety trainings &	OJT of line Staff for enhancing

	promoting safety culture	Rehabilitation of Practical Yard at RTC and new yards at CTCs. T&P material samples at RTC & all CTCs	training institutions.		safety workshops	their working skills by using modern safety equipment
C	Training of employees through external training institutions	150	165	182	201	225
D	Human Resource Information System Implementation	Part of ERP – Detailed in Financial Improvement Plan 5 iii-b				
E	Conducting the yard stick study & creation of new posts	Compliance of NEPRA letter No. NEPRA/R/TRF-100/12654-63			Hiring of Consultant	Study and Reporting
F	Improving the working environment	- Revamping of IESCO H/Q - Revamping of IESCO 06 Circle offices. - Revamping of IESCO Divisions. - Revamping of subdivisions.				

9.5. **Communication Improvement Plan:** It includes following:

Description		Year 1	Year 2	Year 3	Year 4	Year 5
A	Improving Internal Communications with Employees	IESCO email active directory Server	E-Desk	Execution of work flows in ERP- AP System at Circle level	Execution of work flows in ERP- SAP System at Divn. Level	Execution of work flows in ERP- SAP System at S/Divn. level
B	Improving External Communications with Customers	Covered in Commercial Improvement Plan (CCMS, CIS and complaint redressal plan)				
C	Communication material	Detailed in IT infrastructure				

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DECISION OF THE AUTHORITY FOR OTHER FUNCTIONAL IMPROVEMENT PLAN

9.6. Rs. 5.310 Million for functional improvement plans which is necessary to support the MYT initiatives and bring positive change in working/environment of company is being allowed as per following details:

Million Rs.

ITEMS	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Commercial Improvement Plan						
AMI	Cost is allowed in AMI head already					
Removal of Sluggish/Old Meters	149	152	154	156	158	769
Anti-Theft	110	10	10	10	10	150
Accurate meter reading	0	56	0	0	60	116
Customer Information System	1	241	1	1	1	245
Safety Improvement Plan	5	0	7	7	0	18
Sub Total	**265**	**459**	**171**	**174**	**229**	**1,298**
Financial Improvement Plan						
Enterprise Resource Planning (ERP)	23	13	13	2	2	53
Revamping the Internal Audit	Included in Staffing Plan					
E – Tendering	20	0	0	0	0	20
IT infrastructure to support new initiatives	60	60	70	70	70	330
Sub Total	**103**	**73**	**83**	**72**	**72**	**403**
HR Improvement Plan						
Revamping of Training Centers	490	90	90	0	20	690
Promoting safety culture/ External Safety Trainings	242	242	242	242	242	1,210
Training of employees through external training institutions	Covered in O&M					
Human Resource Information System Implementation	Included in Financial Improvement Plan					
Improving the Working Environment	974	158	159	165	162	1,616
Sub Total	**1,706**	**490**	**491**	**407**	**424**	**3,516**
Communication Improvement Plan						
Improving Internal Communications with Employees	20	20	0	0	0	40
Improving External Communications with Customers	Included in Commercial Improvement Plan					
Communication material	Included in IT infrastructure					
Sub Total	**20**	**20**	**0**	**0**	**0**	**40**
Total Functional Improvement Plan	**2,094**	**1,041**	**744**	**653**	**725**	**5,257**
Contingencies: @1%	**15**	**10**	**7**	**7**	**7**	**53**
Grad Total	**2,115**	**1,051**	**751**	**660**	**732**	**5,310**

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10. **Issue #07: Whether the claimed cost of Rs.189,245 Million in the head of Annual Recurring Cost which include O&M and R&M expenses is justified.**

PETITIONER'S SUBMISSIONS FOR O&M AND R&M EXPENSES

10.1. Regarding the claim of Rs. 189,245 Million under the head of Annual Recurring cost, the petitioner clarified that this is the estimated existing Operation & Maintenance Cost and Depreciation Expenditure of the proposed new investments. The OPEX is only mentioned here for information. It will separately claimed in the MYT Petition with justification after approval of DIIP investment plans.

DECISION OF THE AUTHORITY FOR O&M AND R&M EXPENSES

10.2. The Authority agrees with petitioner that Annual Recurring Cost is part of OPEX and shall be filed along with next MYT petition.

11. **Issue # 05: The petitioner to provide payback period of investments claimed under the head of DOP, ELR and STG**

11.1. The petitioner has provided following details of payback period of the investment claimed under DOP , ELR and STG investments

Description	FIRR (%)	BC Ratio	Payback period (Years)
Secondary Transmission & Grids, (STG)	25%	1.43	7th year
Energy Loss Reduction, (ELR)	46.9%	2.91	6th year
Distribution of Power, (DoP)	19.6%	1.48	8th year
Automatic Metering Infrastructure, (AMI)	19.2%	1.39	9th year
ABC project	15.5%	1.41	7th year
TMS / APMS project	34.1%	1.75	6th year
Overall – DIIP	**20.7%**	**1.64**	**8th year**

12. In addition to above, IESCO claimed the cost for removal of safety hazards, GIS Mapping and T&P and Vehicles as per following details:

12.1. **Safety Hazard:** Petitioner has claimed a cost of Rs. 4,403 Million for removal of safety hazards at HT and LT level as per following details

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Description		Unit	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Scope of Work for 11 kV and Below Safety Hazards								
	Length of new HT line	Km	430	308	339	373	410	1859
	Length of new LT line	Km	160	176	194	213	234	977
	HT Hazard Removal	Mil	639	519	571	629	691	3050
	LT Hazard Removal	Mil	222	244	268	295	324	1353
	Total Cost	**Mil Rs.**	**861**	**763**	**839**	**924**	**1015**	**4,403**

12.2. **GIS Mapping:** The petitioner has claimed cost of Rs. 358.5 Million for GIS mapping of new HT feeders and LT lines. The details are given below:

Sr. No.	Description	Unit	Rs. In Million					
			Year 1	Year 2	Year 3	Year 4	Year 5	Total
GIS Mapping								
1	HT Mapping							
	Number of 11 kV Feeders / Length of HT Lines mapped	Mil	1.0	1.25	1.50	1.75	2.0	7.50
2	LT Mapping							
	Number of Transformers / Length of LT Lines mapped	Mil	40	100	100	40	40	320
3	Tools Required							
	GIS Mapping Software Licenses	Mil	6.0	0.00	0.00	0.00	0.00	6.0
	Hardware including plotters, computers, GPS Devices.	Mil	5.0	5.0	5.0	5.0	5.0	25.0
	Grand Total	Mil	52	106.25	106.5	46.75	47	358

12.3. **T&P, Vehicles and Civil Works:** The petitioner has claimed cost of Rs. 9,156.65 Million for T&P, Vehicles and civil works as shown below:

Description	Unit	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Vehicles	MRs.	850.35	554.2	522.3	892.8	731	3550.65
T&P	MRs.	613	705	810	932	1,072	4,131
Civil Works	MRs.	660	180	185	180	270	1,475
Grand Total		2123.35	1439.2	1517.3	2004.8	2073	9156.65

12.4. Moreover, IESCO stated that the Vehicle Policy will also reduce expenditure in maintenance head / POL.

- It will also reduce cost of operation on account of driver's salary and their perks.

- It will eliminate discrimination amongst Officers.
- Induction of new vehicles and elimination of old vehicles will improve working efficiency besides reducing carbon emissions.

12.5. The petitioner has provided following breakup of vehicles cost. Further, petitioner has requested for adoption of Officers Transport Policy. Further, it is pleaded by the petitioner that transport policy will reduce burden on consumers since purchase cost shall be shared on 60:40 ratio i.e.

i. Employee Contribution - 60%
ii. Employer Contribution - 40%

2	**Vehicles**								
	a. Officers Transport Policy*		MRs.	If Transport Policy adopts, cost of vehicle 3-f will reduce the cost of officer vehicle as transport policy will be adopted on 60% & 40%. Draft of TPT policy is attached.					
	b. Heavy Trucks	STG	MRs.	Cost is included in STG					
		Others	MRs.	51	25.5	34	34	25.5	170
	c. Light Vehicles	STG	MRs.	Cost is included in STG					
		Others	MRs.	46	55.2	69	69	64.4	303.6
3	d. Bucket Mounted Trucks		MRs.	310	110	110	10	20	560
	e. Motor cycles		MRs.	4.35	3	4.5	4.8	4.5	21.15
	f. Jeeps (4x4) (Double Cabin 2x4)		MRs.	104.5	57	38	104.5	85.5	389.5
	i. Light Vehicle(Pickup/Shehzore)		MRs.	88	80	100	280	144	692
	j. Cranes		MRs.	40	40	40	280	280	680
	j. Winch		MRs.	36	36	36	0	0	108
	j. Coaster		MRs.	28	42	0	42	28	140
	j. Water Tanker		MRs.	36	12	0	0	12	60
	j. Forklifter		MRs.	9	9	18	18	18	72
	j. Suzuki Vans		MRs.	0	7	2.8	28	26.6	64.4
	j. Hiace / SUVs		MRs.	37.5	37.5	30	22.5	22.5	150
	Busses		MRs.	60	40	40	0	0	140
	Sub Total		**MRs.**	850.35	554.2	522.3	892.8	731	3550.65

DECISION OF THE AUTHORITY FOR SAFETY HAZARDS, GIS MAPPING, T&P AND VEHICLES

12.6. The claimed cost of Rs. 4,403 Million for removal of safety hazards is allowed to IESCO in line with power with safety initiative of NEPRA.

12.7. The claimed cost of Rs. 358 Million for GIS Mapping and procurement of tools/softwares for GIS is also allowed to IESCO whereas Rs. 66 million deducted on account of duplication of cost.

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12.8. Authority allows Rs. 4,131 Million and Rs. 1,475 Million for T&P and Civil Works respectively.

12.9. Regarding vehicles and transport policy, an investment of Rs. 2,333.15 Million is being allowed to IESCO whereas the Authority disallows Rs. 647.3 million on account of duplication of STG vehicles & Rs. 743.5 million against Officers' Transport Policy. The details of allowed operational vehicles cost is given below:

Million Rs.

Description		Unit	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Bucket Mounted Trucks		MRs.	310	110	110	10	20	560
Motor cycles		MRs.	4.35	3	4.5	4.8	4.5	21.15
Light Vehicle(Pickup/Shehzore)		MRs.	88	80	100	280	144	692
Cranes		MRs.	40	40	40	280	280	680
Winch		MRs.	36	36	36	0	0	108
Water Tanker		MRs.	36	12	0	0	12	60
Fork lifter		MRs.	9	9	18	18	18	72
Busses		MRs.	60	40	40	0	0	140
Heavy Trucks	STG	MRs.	Cost is included in STG					
Light Vehicles	STG	MRs.	Cost is included in STG					

Overall Investments allowed to IESCO

13. In view of above discussions and analysis, the investment allowed to IESCO under various heads is as follows:

Million Rs.

Head	Year 1	Year 2	Year 3	Year 4	Year 5	Total
STG	5,816	9,799	8,440	3,599	12,448	40,104
ELR	2,902	3,274	3,437	3,594	3,769	16,976
DOP	971	1,106	1,158	1,213	1,273	5,720
AMI	2,529	4,571	4,571	4,945	9,184	25,800
TMS	1,109	691	979	597	765	4,141
Functional Improvement Plans	2,115	1,051	751	660	732	5,310
Safety Hazard	861	763	839	924	1015	4,403
GIS	52	106.25	106.5	46.75	47	358
T&P	613	705	810	932	1,072	4,131
Civil Works	660	180	185	180	270	1,475
Operational Vehicles	583.35	330	348.5	592.8	478.5	2333.15
Own Resources	**18,211**	**22,576**	**21,625**	**17,284**	**31,054**	**110,752**
Village Electrification	1,231	1,364	1,509	1,664	1,830	7,599
Deposit Works	4,120	4,521	4,958	5,439	5,964	25,001
Consumer Financing	**5,351**	**5,885**	**6,467**	**7,103**	**7,794**	**32,600**
Grand Total	**23,562**	**28,461**	**28,092**	**24,387**	**38,848**	**143,351**

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LOSSES ASSESSMENT OF IESCO

14. NEPRA has allowed 7.80% losses to IESCO for FY 2022-23 which comprised 1.5% transmission loss and 6.3% distribution losses. IESCO in its instant DIIP has projected following T&D losses for MYT control period from FY 2023-24 to FY 2027-28.

Fiscal Year	Transmission Loss	Distribution Loss	Technical Loss	Non- Technical Losses	Overall Losses
2023-24	0.99%	6.32%	7.31%	0.47%	7.78%
2024-25	0.98%	6.32%	7.31%	0.45%	7.76%
2025-26	0.98%	6.32%	7.30%	0.44%	7.74%
2026-27	0.98%	6.30%	7.28%	0.44%	7.72%
2027-28	0.98%	6.28%	7.26%	0.44%	7.70%

15. The Authority has never allowed non-technical losses to IESCO in past MYT/SYT. Further, IESCO is implementing AMI program and other loss mitigation / anti-theft measures in instant MYT to curb non-technical loss. Moreover, there is no worse law and order situation in the service area of IESCO.

16. In view of above, the requested losses are being allowed to IESCO except the quantum of non-technical loss. T&D loss targets for MYT tariff control period set for IESCO are given below:

Description	Year 1	Year 2	Year 3	Year 4	Year 5
Transmission Loss	0.99%	0.98%	0.98%	0.98%	0.98%
Distribution Loss	6.32%	6.32%	6.32%	6.30%	6.28%
T&D Loss Targets	7.31%	7.31%	7.30%	7.28%	7.26%

17. The performance targets which are to be achieved by IESCO though above referred investment are given below.

Description	(Baseline)	Year 1	Year 2	Year 3	Year 4	Year 5
SAIDI (hours)	NEPRA is revising mechanism for SAIFI & SAIDI. IESCO endeavor to achieve target as set forth by NEPRA & IESCO mutually.					
SAIFI (Nos)						
Voltage (Volts)	132/66/33 /11/0.4	132/66/33/11 /0.4	132/33 /11/0.4	132/33/ 11/0.4	132/33/ 11/0.4	132/33/ 11/0.4
Supply Restoration (no. of violations)	31	26	21	16	11	6
Fatal accidents	10	0	0	0	0	0
Non-fatal accidents	9	0	0	0	0	0
No of meters read manually	0 (MOBILE & HHU)	0 (MOBILE & HHU)	0 (HHU)	0 (HHU)	0 (HHU)	0 (HHU)
New connections installation (days)	35 days	35 days	35 days	35 days	35 days	35 days

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Reduction in billing related complaints	0.028 %	0.027	0.025	0.022	0.018	0.015
Transmission Loss	0.990%	0.988%	0.983 %	0.983%	0.983%	0.98%
Distribution Loss	6.878%	6.321%	6.323 %	6.320%	6.301%	6.28%
T&D Losses	7.80%	7.309%	7.307 %	7.304%	7.284%	7.26%
Supply related complaints (hours)	3	3	3	3	3	3
Meters Replacement	As per consumer service manual					

18. DIRECTION OF THE AUTHORITY

i. IESCO shall submit a quarterly progress report showing utilization of allowed investment, physical progress and the benefits accrued against amount incurred for each project highlighted under different heads. The submitted quarterly progress report shall be reviewed/verified by a third-party consultant/firm selected by the Authority on ToRs approved by the Authority for effective monitoring on quarterly basis. The charges/fees for hiring of the services of third party consultant/firm for this purpose shall be borne by IESCO.

ii. IESCO shall submit progress report showing achievement of the allowed targets (T&D losses, SAIFI, SAIDI, Reliability, Continuity, Quality of Power Supply and other performance standards) linked with the investment plan approved by the Authority.

iii. No re-appropriation shall be allowed to IESCO against the approved investments under different heads.

iv. In case of any deviation under each head of investment for more than 5% of the approved investment plan due to any regulatory decisions/interventions, IESCO shall be required to submit the additional investment requirements for prior approval of the Authority.

v. IESCO shall submit its Power Acquisition Program as provided under Section 32 of the Act read with the provisions as laid down in NEPRA (Electric Power Procurement) Regulations, 2022.

vi. IESCO shall ensure implementation of consumer facilitation / services programs through usage of IT tools and advanced softwares and applications.

vii. IESCO shall ensure zero fatal accidents goal and shall ensure safe working environment for its employees and general public by utilizing approved budget by the Authority against safety plans.

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19. ORDER OF THE AUTHORITY

The Authority as per provisions of Section 32 of the NEPRA Act, 1997 read with para 23 of NEPRA Guidelines for Determination of Consumer end Tariff (Methodology and Process) 2015 approves the following investment plan and losses assessment of IESCO for next five (5) years MYT control period from FY 2023-24 to FY 2027-28.

A. Investment Plan (Million Rs)

Head	Year 1	Year 2	Year 3	Year 4	Year 5	Total
STG (Annex-I)	5,816	9,799	8,440	3,599	12,448	40,104
ELR (Annex-II)	2,902	3,274	3,437	3,594	3,769	16,976
DOP	971	1,106	1,158	1,213	1,273	5,720
AMI	2,529	4,571	4,571	4,945	9,184	25,800
Transformer Monitoring System	1,109	691	979	597	765	4,141
Functional Improvement Plans	2,115	1,051	751	660	732	5,310
Safety Hazard	861	763	839	924	1015	4,403
GIS Mapping	52	106.25	106.5	46.75	47	358
T&P (Annex-III)	613	705	810	932	1,072	4,131
Civil Works (Annex-IV)	660	180	185	180	270	1,475
Operational Vehicles	583.35	330	348.5	592.8	478.5	2333.15
Own Resources	**18,211**	**22,576**	**21,625**	**17,284**	**31,054**	**110,752**
Village Electrification	1,231	1,364	1,509	1,664	1,830	7,599
Deposit Works	4,120	4,521	4,958	5,439	5,964	25,001
Consumer Contribution Annex-V	**5,351**	**5,885**	**6,467**	**7,103**	**7,794**	**32,600**
Grand Total	**23,562**	**28,461**	**28,092**	**24,387**	**38,848**	**143,351**

B. Losses Targets

Voltage Level	Year 1	Year 2	Year 3	Year 4	Year 5
Transmission Loss	0.99%	0.98%	0.98%	0.98%	0.98%
Distribution Loss	6.32%	6.32%	6.32%	6.30%	6.28%
T&D Loss Targets	7.31%	7.31%	7.30%	7.28%	7.26%

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Amina Ahmad
Member

Tauseef H. Farooqi
Chairman

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11/05/23

STG Projects

Annexure I

Sr.	Name of Grid Station	Proposal	Voltage (KV)	Claimed by HESCO Un-escalated (Million PKR)	NEPRA Allowed					
					Material Cost	Civil Work	Land	Transmission Line	Total	Escalated Cost for FY 2024-25 to FY 2027-28 (Quarterly) @8%
1	Shakrial	N	132	1,331.387	278.95	213.447	500.000	102.990	1,095.39	1,095.39
2	Khanpur	N	132	598.425	205.95	159.744	64.000	62.447	492.14	492.14
3	Kallar Kahar	N	132	471.155	205.94	159.744	-	51.902	417.59	417.59
4	Rewat RCCI-II	N	132	572.579	275.60	159.744	-	68.806	504.15	504.15
FY 2023-24				**2,973.545**					**2,509.26**	**2,509.26**
5	Ghourghushti	N	132	528.75	186.99	159.744	64.000	50.835	461.57	498.50
6	I-10/II	N	132	1,444.19	320.57	213.447	500.000	121.790	1,155.80	1,248.27
7	Cabinet Islamabad	N	132	892.58	275.60	159.744	320.000	68.806	824.15	890.08
8	Liagat Bagh	N	132	1,331.39	275.60	213.447	500.000	102.990	1,092.03	1,179.40
9	Lilla			544.75	186.99	159.744	80.000	50.835	477.57	515.78
FY 2024-25				**4,741.660**					**4,011.12**	**4,332.01**
10	Burhan-II	N	132	534.81	205.94	159.744	70.000	50.845	486.53	525.45
11	Sawan-II	N	132	852.72	275.60	159.744	280.000	68.829	784.17	846.90
12	Simly Dam	N	132	722.72	275.60	159.744	150.000	68.829	654.17	706.50
13	Gaggan	N	132	558.42	238.40	159.744	24.000	62.447	484.59	523.35
14	Chakwal-II	N	132	599.42	238.40	159.744	65.000	62.447	525.59	567.63

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			FY 2025-26	**3,268.098**	**2,935.04**					**3,169.85**
15	Rajjar-II	N	132	599.42	238.40	159.744	65.000	62.447	525.59	567.63
16	Attock-II	N	132	654.42	212.66	159.744	120.000	62.447	554.85	599.24
17	Fatehjang-II	N	132	654.42	238.40	159.744	120.000	62.447	580.59	627.03
18	Jhelum Cantt-II	N	132	734.42	238.40	159.740	200.000	62.447	660.58	713.43
			FY 2026-27	**2,642.695**	**2,321.61**					**2,507.34**
19	Golra Road	N	132	1553.609	320.37	394.700	400.000	126.485	1,241.55	1,340.87
			FY 2027-28	**1,553.609**	**1,241.55**					1,340.87
	Total New Grid Stations			**15180**					**13019**	**13,859**

FY 2027-28

20	Fathepur	Con	132.00	445.21	206.44	89.60	0.00	59.27	355	383.73
	Total Conversions			**445.21**					**355**	**383.73**
21	Pinanwal	Ext	132.00	152.91	106.56	6.84		24.34	138	137.74
	FY 2023-24					Total			138	137.74
22	Murree	Ext	132.00	152.91	106.56	6.85		24.34	138	148.77
23	KTM	Ext	132.00	193.33	125.16	6.85		31.08	163	176.13
	FY 2024-25					Total			301	324.91
24	Bahtar More	Ext	132.00	152.77	106.56	6.84		24.32	138	148.74
25	Baragowa	Ext	132.00	127.22	88.66	6.84		20.06	116	124.81
	FY 2025-26					Total			253	273.54
26	Adyala	Ext	132.00	194.29	125.16	6.84		31.24	163	176.30
27	G-9	Ext	132.00	194.29	125.16	6.84		31.24	163	176.30

28	Kahuta City	Ext	132.00	152.77	106.56	6.84		24.32	138	148.74
29	Islamgarh	Ext	132.00	123.76	88.66	16.50		23.36	129	138.80
30	Nilore	Ext	132.00	161.41	106.56	16.20		29.68	152	164.63
31	Trarkhel	Ext	132.00	123.84	88.66	16.50		23.36	129	138.80
	FY 2027-28					Total			874	943.56
	Total Extensions			[illegible]					1566	1679.76
32	Mirpur	Aug	132.00	132.08	107.97	2.25		22.47	133	132.69
33	NPF	Aug	132.00	28.76	5.00	1.75		5.00	12	11.75
34	E-8	Aug	132.00	132.08	107.97	2.25		22.47	133	132.69
	FY 2023-24					Total			277	277.13
35	Basal	Aug	132.00	28.75	5.00	1.74		5.00	12	12.68
36	Plandri	Aug	132.00	127.46	86.00	1.74		21.45	109	117.93
37	Dandot	Aug	132.00	127.46	86.00	1.74		21.45	109	117.93
38	Chakri	Aug	132.00	127.46	86.00	1.74		21.45	109	117.93
	FY 2024-25					Total			339	366.47
39	Kallar Syedan	Aug	132.00	132.08	105.00	2.25		22.47	130	140.10
40	Danda Shah Bilawal	Aug	132.00	28.75	5.00	1.74		5.00	12	12.68
41	Khuiratta	Aug	132.00	28.75	5.00	1.74		5.00	12	12.68
42	F-6	Aug	132.00	132.09	105.00	2.26		22.47	130	140.11
	FY 2025-26					Total			283	305.58
43	Kallar Syedan	Aug	132.00	150.38	107.97	0.00		27.40	135	146.19
	FY 2027-28					Total			135	146.19
	Total Augmentations			[illegible]					[illegible]	[illegible]

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Sr. No.	Name of Grid Station	Proposal	Voltage (KV)	Total Claimed by IESCO Unescalated (Million PKR)	Material Cost	Civil Works	Installation	Crop/RoW	Total	Escalation 5%, Cont.and other 3% Total 8%
1	Feed for Rawat-II/ RCCI from In-Out from Old Rawat to KRL Kahuta	132	D/C	207.08	115.598	30.14	25.324	25	196	196.062
2	Feed for Khanpur Chakwal District from Chakwal to CS Shah	132	D/C	34.20	18.415	5.133	4.095	4.5	32	32.143
3	Feed for Shakrial Rawalpindi from Tramari Grid Station	132	D/C	316.37	90.552	51.575	39.133	30	211	211.26
4	Feed for Kallar Kahar from CS Shah to NP Sethi	132	D/C	18.56	11.07	2.666	2.3992	1.5	18	17.6352
5	Double Circuit from 220/132kV Bahria Town Phase-VIII to Adyala Circuit	132	D/C	443.27	255.847	66.396	55.063	46.5	424	423.806
6	Conversion from 66kV to 132KV SDT T/Line Lakarmar to Pindigheb	132	SDT	322.78	186.017	23.81	39.3276	63	312	312.1546
FY 2023-24						Total			1193	1193.0608
7	132kV Sambli Bheramal (BMP) to Murree (for 2nd source to Murree)	132	SDT	411.601	216.262	72.924	46.4462	60	396	427.282776
8	Second Circuit Stringing from Hattian to Bagh to Rawla Kot using SDT Towers	132	SDT	90.050	48.39	0.01	11.74	19.6	80	86.1192
9	Feed for Ghourghushti In- Out From Faqirabad to Gondal Circuit	132	D/C	290.761	169.608	35.137	36.7706	35	277	298.636848
10	Feed for 132kV I-10-II GS, near Islamic University (In-Out from 132kV Pirwadhai - H-11 Line)	132	D/C	170.436	95.656	29.46	20.6626	17	163	175.800888

11	Cabinet Islamabad/ Sarai Kharbuza In Out from Sangjani to D-12 Circuit	132	D/C	319.757	178.453	58.011	38.4576	31	306	330.395328
12	Feed for Liaqat Bagh 132kV Cantt-II GS, Nr. Liaqat Bagh to Existing 132kV Cantt GS for Ring Circuit	132	D/C	344.126	156.839	27.06	33.3944	30.5	248	267.616872
13	Feed for Lilla In - Out from Dandot to Pinanwal Circuit.	132	D/C	361.339	211.438	40.733	46.101	44	342	369.65376
14	2nd Circuit Stringing of Fateh Jang to Basal	132	S/C	171.235	72.306	0.01	18.5708	59.8	151	162.741744
15	Stringing of 2nd Circuit from Taman to DS Bilwal	132	S/C	175.226	126.535	3.715	28.0852	3	161	174.242016
16	Feed for 132kV Cantt-II GS, Nr. Liaqat Bagh (from In-Out 132kV Satellite Town - MES Line)	132	D/C	312.759	156.839	27.06	2.0266	30.5	216	233.739648
FY 2024-25						Total			2339	2526.22908
17	Feed for Burhan-II In-Out From New Wah to Burhan Circuit	132	D/C	152.068	92.195	19.371	19.6162	15	146	157.876776
18	Feed for Sowan – II In-Out from Giga to Chaklala Circuit	132	D/C	313.880	181.673	51.576	38.7174	30	302	326.123712
19	Feed for Simly Dam from University to Bahria Enclave	132	D/C	313.880	181.673	51.576	38.7174	30	302	326.123712
20	Feed for Gaggan In-Out from Adyala to Chakri Road Circuit	132	D/C	313.880	181.673	51.576	38.7174	30	302	326.123712
21	Chakwal – II In-Out From Chakri to Chakwal Circuit	132	D/C	791.603	478.325	96.059	101.5906	86	762	822.932568
22	Dispersal of Power from 220/132 kV Zeropoint	132	D/C	436.910	250.874	76.473	53.1562	41.5	422	455.763456

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	In-Out G-13 to Zeropoint Circuit									
23	Dispersal of Power from 220/132 kV Zeropoint In-Out NUST to H-11	132	D/C	436.910	250.874	76.473	53.1562	41.5	422	455.763456
24	Dispersal of Power from 220/132 kV Zeropoint In-Out Zeropoint to Express Sangjani Circuit	132	D/C	152.307	86.394	27.087	18.37	15	147	158.59908
25	Dispersal of Power from 220/132 kV Zeropoint In-Out Zeropoint to Satelite- MES Circuit	132	D/C	577.393	333.733	98.088	70.7508	55	558	602.177544
FY 2025-26						**Total**			3362	3631.484016
26	Feed for Rajjar – II (In-Out from Mangla to Rajjar Circuit)	132	D/C	149.419	87.159	21.277	18.607	16.5	144	155.02644
27	Feed for Attock-II(In-Out from Attock - Gondal Circuit)	132	D/C	257.926	156.839	27.06	33.3944	30.5	248	267.616872
28	Feed for Fateh Jang-II (In-Out From Basal to Jand Circuit)	132	D/C	180.936	121.536	12.982	25.3256	16	176	189.911088
29	Feed for Jehlum Cantt-II (In -Out from Rawat to Sanghoi Circuit)	132	D/C	179.736	121.536	12.982	25.1256	16	176	189.695088
30	In-Out from Rawala Kot to Minhasa Circuit	132	D/C	193.268	106.734	25.103	23.1108	29.5	184	199.203624
FY 2026-27						**Total**			927	1001.453112
31	Dispersal of Power from 500/220/132 kV Chakwal (In-Out from Existing 132kV Chakwal to DG Khan Cement Line)	132	D/C	686.577	311.474	118.64	77.1562	105	612	661.251816
32	Dispersal of Power from 500/220/132 kV Chakwal (In-Out from Existing 132kV Chakwal	132	D/C	672.317	311.474	119.38	77.1562	90	598	645.851016

	to Pakistan Cement Line)									
33	Dispersal of Power from 500/220/132 kV Chakwal (In Out from Existing 132kV Chakwal-II - Chakri Line)	132	D/C	396.412	262.19	25.018	54.399	45	387	417.53556
34	Dispersal of Power from 500/220/132 kV Chakwal Construction of Double Circuit using existing 66kV Right way of 132kV Chakwal to CS Shah	132	D/C	1040.149	630.264	118.644	133.5008	120.5	1003	1083.141504
35	Dispersal of Power from 500/220/132 kV Chakwal Construction of Double Circuit using existing 66kV Right of way NPS for Talagang	132	D/C	1026.814	625.583	112.16	132.609	119	989	1068.50016
36	Dispersal of Power from 500/220/132kV Islamabad-West (In-Out from 132kV D-12 to E-8 line)	132	D/C	436.910	251.474	76.473	53.1562	41.5	423	456.411456
37	Dispersal of Power from 500/220/132kV Islamabad-West (In-Out from 132kV Tarnol & F-11 line)	132	D/C	714.004	392.014	134.866	83.9396	75.5	686	741.225168
38	Dispersal of Power from 500/220/132kV Islamabad-West to 132kV Bahter More to New Wah GS	132	SDT	179.736	121.576	12.982	25.1256	16	176	189.738288

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39	Dispersal of Power from 220/132kV New Kamra (In-out on 132kV Kamra -Sanjwal line)	132	D/C	257.926	156.839	27.06	33.3944	30.5	248	267.616872
40	Dispersal of Power from 220/132kV New Kamra (In-Out on 132kV Faqirabad - Gondal line)	132	D/C	149.418	87.439	19.401	18.7528	17.5	143	154.540224
41	Dispersal of Power from 220/132kV New Kamra (In-Out on 132kV Gondal -Jhangeria Circuit	132	D/C	149.418	87.439	19.401	18.7528	17.5	143	154.540224
42	Dispersal of Power from 220/132kV New Kamra to 132kV Burhan-II	132	D/C	179.736	121.536	12.982	25.1256	16	176	189.695088
43	I-11 to KTM Feed for Golra Road Rawalpindi	132	D/C	221.873	70.959	122.195	15.763	5.1	214	231.13836
44	132kV SDT Line feed for 132kV Fateh Pur GS from Khui Ratta	132	D/C	251.875	78.496	138.092	17.1138	11.1	245	264.385944
45	Baragowa from 132kV Khan Pur Grid Station to remove the Island Position during (N-1)	132	SDT	694.992	283.796	296.166	60.421	36.3	677	730.81764
46	Baragowa from 132kV Khan Pur Grid Station to remove the Island Position during (N-1)	132	SDT	694.992	283.796	296.166	60.421	36.3	677	730.81764
47	N.P. Sethi from 132kV Pakistan Cement Grid Station to remove the Island Position during (N-1)	132	SDT	196.423	103.926	53.2	23.4372	2.6	183	197.816256
FY 2027-28						Total			7579	8185.023216
Total New Transmission Line				**16389.45**					**15401**	**16537.250**

	Reconducting of Kahuta City- Mang-Plandari-Tararkhal	132	Rehab	138.432	104.497	7.061	21.1452	4.5	137	137.2032
	Remodeling of New Wah to Bahter More to Fateh Jang	132	Rehab	1002.247	587.908	124.228	126.2532	120.5	959	958.8892
	Reconducting of Zero Point to I-8	132	Rehab	294.349	187.886	23.381	42.4946	16	270	269.7616
	Reconducting of Nilore-KRL Kahuta	132	Rehab	130.565	80.183	7.18	18.9808	9.5	116	115.8438
FY 2023-24						**Total**			**1482**	**1481.6978**
	Reconductoring of Talagang to Chakwal	132	Rehab	250.452	180.649	18.099	36.1422	15.5	250	270.421416
	Burhan to AWC to CDA Pump to Sangjani Circuit and one circuit In-Out at Taxila Grid Station	132	Rehab	1002.247	587.908	124.228	126.2532	120.5	959	1035.600336
	Gondal to Faqirababd (Gondal - Ghurgushti & Ghurgushti to Faqirabad)	132	Rehab	571.179	301.566	80.243	66.656	91	539	582.6222
FY 2024-25						**Total**			**1749**	**1888.643952**
	Burhan to Kamra	132	Rehab	560.914	296.627	79.158	65.4594	89	530	572.663952
	Faqirabad-Sanjwal-Kamra	132	Rehab	476.029	258.655	61.197	56.6386	75	451	487.609848
FY 2025-26						**Total**			**981.74**	**1060.2738**
	Choa Saiden Shah (CSS) to Dandot	132	Rehab	88.574	39.446	0.1	9.7456	30	79	85.634928
	Single Circuit 132 KV Nilore to 132 KV Bharakahu on Rail Conductor	132	Rehab	74.449	54	0	12.4082	0	66	71.720856
	Single Circuit 132 KV Nilore to 132 KV B. Enclave on Rail Conductor	132	Rehab	240.304	180	0	40.0506	0	220	237.654648
	Single Circuit 132 KV University to 132KV	132	Rehab	283.584	210	0	47.264	0	257	277.84512

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	Simly Dam on Rail Conductor								
	Single Circuit 132 KV University to 132 KV Barakahu on Rail Conductor	132	Rehab	8.212	3.75	0	1.3686	0	5	5.528088
	In-Out arrangement of 132kV Islamgarh to Mirpur	132	Rehab	33.532	19.305	3.864	4.578	2.2	30	32.34276
	Stringing of Second Circuit 132 KV Lakar Mar – 132 KV Tammas	132	Rehab	158.112	71.817	1.2	16.8654	55.72	146	157.250592
FY 2027-28					**Total**				804	867.976992
Total Rehabilitation			-		-				**5,016**	**5,298.59**
Line Bay			-		-				**1,005**	**1,068.04**
Capacitor Banks			-		-				**167**	**180.36**
Grand Total			-		-				**37,563**	**40,104**

Description	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Line Bays	217	263	-	83	442	**1,005**
Capacitor Banks	-	71	-	-	96	**167**

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Sr.	DESCRIPTION	UNIT	Quantities						Cost (Thousand Rs.)					
			FY 24	FY 25	FY 26	FY 27	FY 28	TOTAL	FY 24	FY 25	FY 26	FY 27	FY 28	TOTAL
A.	**MATERIAL FOR 11 KV FEEDER WORKS**		34	36	38	40	42	190						
1.	NEW 11 kV LINES													
	a. Osprey	KM	115	122	128	134	141	640	548,320	581,696	610,304	638,912	672,288	3,051,520
	b. Dog	KM	69	73	77	81	84	384	105,313	111,418	117,523	123,628	128,207	586,089
	c. Rabbit	KM	35	36	38	40	42	191	43,166	44,399	46,866	49,333	51,799	235,563
	d. 11KV 500MCM S/C CABLE	KM	12	12	13	13	14	64	66,231	66,231	71,750	71,750	77,269	353,231
	Sub-total	KM	231	243	256	268	281	1279	763,030	803,744	846,443	883,623	929,563	4,226,403
2.	11 kV LINE RECONDUCTORING													
	a. Osprey	KM	70	74	78	82	86	390	197,399	208,679	219,959	231,239	242,519	1,099,795
	b. Dog	KM	32	34	35	37	39	177	24,182	25,694	26,450	27,961	29,472	133,759
	c. Rabbit	KM	17	17	18	19	20	91	7,867	7,867	8,330	8,792	9,255	42,111
	d. 11KV 500MCM CABLE S/C	KM	6	7	7	7	8	35	33,115	38,635	38,635	38,635	44,154	193,174
	e. Cable 4AWG 3/C	KM	3	3	3	3	3	15	7,898	7,898	7,898	7,898	7,898	39,490

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	Sub-total	KM	128	135	141	148	156	708	270,461	288,773	301,272	314,525	333,298	1,508,329
3.	11 kV CAPACITORS													
	a. Fixed 11 kV 450 kVAR	No.	10	10	10	10	10	48	1,435	1,435	1,435	1,435	1,435	7,175
	b. Switched 11kV 450 kVAR	No.	29	29	29	29	29	143	8,551	8,551	8,551	8,551	8,551	42,755
	Sub-total	No.	38	38	38	38	38	191	9,986	9,986	9,986	9,986	9,986	49,930
		MVAR	10	10	10	10	10	50						
4.	11 kV PANELS	No.	34	36	38	40	42	190.0	46,750	49,500	52,250	55,000	57,750	261,250
5.	REPLACEMENT OF EARTHING (DURING RECONDUCTORING OF HT LINE)	No.	200	200	200	200	200	1000	410	410	410	410	410	2,050
6.	SECTIONALIZERS ALONG WITH D-FITTINGS & FAULT LOCATING DEVICES	SET	156	156	156	156	156	780	4,671	4,671	4,671	4,671	4,671	23,355
7.	11KV 500MCM CABLE S/C (For use with 11kV Panels)	KM	15	15	15	15	15	75	82,789	82,789	82,789	82,789	82,789	413,945
B.	**TOTAL (Item 1 to 7) COST OF H.T FDRS**								**1,178,097**	**1,239,873**	**1,297,821**	**1,351,004**	**1,418,467**	**6,485,262**

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Sr. No.	DESCRIPTION	UNIT	Quantities						Cost (Thousand Rs.)					
			2022-23	2023-24	2024-25	2025-26	2026-27	TOTAL	2022-23	2023-24	2024-25	2025-26	2026-27	TOTAL
C	LESS VALUE OF DISMANTLED MATERIAL													
	11 kV Lines													
	- Dog (New Osprey)	KM	23	25	26	27	29	130	350	370	390	410	430	1,950
	- Rabbit (New Dog, Osprey)	KM	11	11	12	12	13	59	85	91	93	99	104	472
	- Gopher (New Rabbit,Dog)	KM	6	6	6	6	7	30	28	28	30	32	33	151
	Sub-total	**KM**	**40**	**42**	**44**	**46**	**48**	**219**	**463**	**489**	**513**	**541**	**567**	**2,573**
	- Store Charges (12%)								141,372	148,785	155,739	162,120	170,216	778,231
	- Installation Charges (8%)								94,248	99,190	103,826	108,080	113,477	518,821
	- Dismantling Charges (5%)								23	24	26	27	28	129
	- Less value of dismantled material								-463	-489	-513	-541	-567	-2,573
	- Civil / Contract Works (Foundations for Line with Osprey)								36,041	38,235	40,115	41,996	44,189	200,576
	- Civil / Contract Works (Foundations for Line with DOG & Rabbit)								9,001	9,434	9,953	10,473	10,905	49,766

	- Civil / Contract Works (Foundations for Reconductoring with Osprey)								7,062	7,465	7,869	8,272	8,676	39,343
	- Civil / Contract Works (Foundations for Reconductoring with Dog & Rabbit)								1,045	1,087	1,130	1,194	1,258	5,714
	- Total Cost of Civil / Contract Works (Foundations)								53,148	56,221	59,067	61,934	65,028	295,399
	- Civil / Contract Works FOR 2 X 2 Duct line	Mtr	3	3	3	3	4	16	264	264	264	264	352	1,408
	- Civil / Contract Works FOR 2 X 3 Duct line	Mtr	4	5	5	5	5	24	1,040	1,300	1,300	1,300	1,300	6,240
	- Civil / Contract Works FOR 4 x 4 Duct line	Mtr	7	8	8	8	9	40	2,930	3,348	3,348	3,348	3,767	16,741
	- Total Cost of Civil / Contract Works (Duct line)	Mtr	14	16	16	16	18	80	4,234	4,912	4,912	4,912	5,419	24,389
	Total Cost (Including material cost)								**1,470,872**	**1,548,214**	**1,620,848**	**1,687,744**	**1,772,044**	**8,099,722**

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Sr.	DESCRIPTION	UNIT	Quantities						Cost (Thousand Rs.)					
			FY 24	FY 25	FY 26	FY 27	FY 28	TOTAL	FY 24	FY 25	FY 26	FY 27	FY 28	TOTAL
K	MATERIAL FOR LT PROPOSALS													
8.	REPLACEMENT OF D-FITTINGS	No.	151	151	151	151	151	755	822	822	822	822	822	4,110
9.	NEW TRANSFORMER SUBSTATIONS (ADDITIONAL/EXTENSION)													
	a. 25 kVA	No.	17	18	19	20	21	95	8,657	9,167	9,676	10,185	10,694	48,379
	b. 50 kVA	No.	252	266	280	294	308	1400	177,580	187,446	197,311	207,177	217,042	986,556
	b. 100 kVA	No.	348	367	387	406	425	1933	245,230	258,619	272,712	286,101	299,490	1,362,152
	c. 200 kVA	No.	223	235	247	260	272	1237	226,274	238,450	250,627	263,818	275,994	1,255,163
	d. 100 kVA (Pad Mounted)	No.	9	9	10	10	11	49	11,640	11,640	12,933	12,933	14,227	63,373
	e. 200 kVA (Pad Mounted)	No.	9	9	10	10	11	49	16,097	16,097	17,885	17,885	19,674	87,638
	Sub-total	No.	858	904	953	1000	1048	4763	685,478	721,419	761,144	798,099	837,121	3,803,261
10	NEW TRANSFORMER SUBSTATIONS (AUGMENTATIONS)													
	a. 50 kVA	No.	15	16	17	18	18	84	7,639	8,148	8,657	9,167	9,167	42,778
	b. 100 kVA	No.	47	50	52	55	58	262	32,871	34,969	36,368	38,466	40,564	183,238
	c. 200 kVA	No.	89	94	99	104	108	494	89,835	94,882	99,929	104,976	109,013	498,635

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	Sub-total	No.	151	160	168	177	184	840	130,345	137,999	144,954	152,609	158,744	724,651
L	MATERIAL FOR LT PROPOSALS INVOLVING VARIOUS TYPES OF MATERIAL.													
11	NEW 11 kV LINES													
	Rabbit (Required with Additional D/TF) for Extension of Line	KM	90	95	100	105	110	500	110,999	117,165	123,332	129,498	135,665	616,659
	Sub-total	KM	90	95	100	105	110	500	110,999	117,165	123,332	129,498	135,665	616,659
12.	NEW LT LINES													
	a. 3-Phase WASP Line	KM	78	83	87	92	96	436	115,010	122,382	128,280	135,652	141,550	642,874
	b. 3-Phase ANT Line	KM	157	166	175	183	192	873	159,619	168,769	177,920	186,053	195,203	887,564
	c. 1-Phase ANT Line	KM	26	28	29	30	32	145	24,267	26,134	27,067	28,001	29,868	135,337
	Sub-total	KM	261	277	291	305	320	1454	298,896	317,285	333,267	349,706	366,621	1,665,775
13.	LT CAPACITORS													
	a. 5 kVAR capacitor	No.	32	34	36	38	40	180	44	47	50	53	56	250
	b. 10 kVAR capacitor	No.	54	57	60	63	66	300	93	99	104	109	114	519
	c. 20 kVAR capacitor	No.	22	23	24	25	26	120	69	72	75	78	81	375
	Sub-total	No.	108	114	120	126	132	600	206	218	229	240	251	1,144
14.	LT LINE RECONDUCTORING													

X

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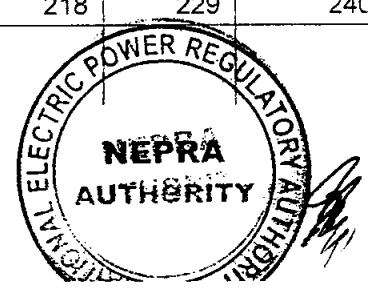

	a. 3-Phase -WASP	KM	177	187	197	207	217	985	133,812	141,372	148,932	156,492	164,0	744,660
	b. 3-Phase -ANT	KM	44	47	49	52	54	246	13,121	14,015	14,612	15,506	16,103	73,357
	Sub-total	KM	221	234	246	259	271	1231	146,933	155,387	163,544	171,998	180,155	818,017

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Sr.	DESCRIPTION	UNIT	Quantities						Cost (Thousand Rs.)					
			FY 24	FY 25	FY 26	FY 27	FY 28	TOTAL	FY 24	FY 25	FY 26	FY 27	FY 28	TOTAL
15	PVC CABLES													
	A. For Coustomers													
	a. Twin core 7/0.052	KM	135	143	150	158	165	751	11,880	12,584	13,200	13,904	14,520	66,088
	b. Four core 19/0.052	KM	27	29	30	32	33	151	9,192	9,873	10,213	10,894	11,235	51,407
	B. For Sub- mains													
	a. 4- core 19/0.083	KM	9	10	10	11	11	51	4,113	4,570	4,570	5,027	5,027	23,307
	b. 4- core 37/0.083	KM	9	10	10	11	11	51	6,723	7,470	7,470	8,217	8,217	38,097
	Sub-total	KM	180	192	200	212	220	1004	31,908	34,497	35,453	38,042	38,999	178,899
16	CONNECTORS													
	a. 1-Phase (S-117)	No.	21600	22800	24000	25200	26400	120000	1,944	2,052	2,160	2,268	2,376	10,800
	b. 3-Phase (S-157)	No.	14400	15200	16000	16800	17600	80000	1,368	1,444	1,520	1,596	1,672	7,600
	Sub-total	No.	36000	38000	40000	42000	44000	200000	3,312	3,496	3,680	3,864	4,048	18,400
M	**TOTAL (Item 8 to 16) COST OF L.T PROPOSALS**								**1,408,899**	**1,488,288**	**1,566,425**	**1,644,878**	**1,722,426**	**7,830,916**

N	LESS VALUE OF DISMANTLED MATERIAL												
	a. LT Lines												
	- Ant (New Wasp)	KM	42.1	44.5	46.9	49.3	51.7	234.5	337	356	375	394	413	1,875
	- Gnat (New Ant)	KM	10.5	11.2	11.7	12.4	12.9	58.6	52	56	58	62	64	292
	Sub-total	KM	53	56	59	62	65	293	389	412	433	456	477	2,167
	b. Transformers													
	- 25 kVA (New 50 kVA) Retirement	No.	15	16	17	18	18	84	750	800	850	900	900	4,200
	- 50 kVA (New 100 kVA) Replacement	No.	47	50	52	55	58	262	3,290	3,500	3,640	3,850	4,060	18,340
	- 100 kVA (New 200 kVA) Replacement	No.	89	94	99	104	108	494	8,900	9,400	9,900	10,400	10,800	49,400
	Sub-total	No.	151	160	168	177	184	840	12,940	13,700	14,390	15,150	15,760	71,940
	- Store Charges (12%)								169	179	188	197	207	940
	- Installation Charges (8%)								113	119	125	132	138	626
	- Dismantling Charges (5%)								666	706	741	780	812	3,705
	- Less value of dismantled material								-13,329	-14,112	-14,823	-15,606	-16,237	-74,107
	- Total Cost of Civil / Contract Works (Foundations)								34,827	36,843	38,782	40,628	42,650	193,730
O	**Total Cost (Including material cost)**								1,431,345	1,512,023	1,591,439	1,671,009	1,749,995	7,955,811

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Sr. No.	DESCRIPTION	UNIT	Quanties						Cost (Thousand Rs.)					
			2022-23	2023-24	2024-25	2025-26	2026-27	TOTAL	2022-23	2023-24	2024-25	2025-26	2026-27	TOTAL
17	ENERGY METERS													
	- *Taken in Maintenance Head*	No.	0	0	0	0	0	0	0	0	0	0	0	0
18.	VEHICLES													
	- *Taken in DOP Project*	No.	0	0	0	0	0	0	0	0	0	0	0	0
19	TOOLS & PLANTS													
	- *Taken in DOP Project*	No.	0	0	0	0	0	0	0	0	0	0	0	0
20	- PERSONAL COMPUTERS / LAPTOP													
	- *Taken in IT Equipment*	No.	0	0	0	0	0	0	0	0	0	0	0	0
R	**Total (item 17 to 20)**								**0**	**0**	**0**	**0**	**0**	**0**
S	GRAND TOTAL								2,902,217	3,060,237	3,212,287	3,358,753	3,522,039	16,055,533
	Escalation Factors								1.00	1.07	1.07	1.07	1.07	-
	GRAND TOTAL Escalated Cost								**2,902,217**	**3,274,453**	**3,437,147**	**3,593,866**	**3,768,582**	**16,976,265**

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Annexure III

Sr	Description		Unit	2023-24	2024-25	2025-26	2026-27	2027-28	Total
	Tools & Plants (T&P) Scope								
	a. Instrument and Test Equipment	STG	Nos	10	10	8	-	-	28
		Others		15,936	16,290	16,404	18,861	18,591	86,082
	b. PPE		Nos	26,121	32,770	40,826	46,950	58,146	204,813
	c. Mechanical Plants (generators, welding plants etc.)		Nos	1	1	2	0	0	4
	Sub Total			**42,068**	**49,071**	**57,240**	**65,811**	**76,737**	**290,927**
	Cost Million Rs.								
	Instrument and Test Equipment		MRs.	275.70	281.82	283.58	326.12	321.46	1,488.68
	PPE		MRs.	336.96	422.73	526.66	605.65	750.08	2,642.08
	Mechanical Plants (generators, welding plants etc.)		MRs.	Cost is included in STG project 6-i(a)					
	Grand Total		**MRs.**	**613**	**705**	**810**	**932**	**1,072**	**4,131**

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List of New Offices Civil Works							ANNEX-IV
Description	Unit	2023-24	2024-25	2025-26	2026-27	2027-28	Total
New Grid Stations**	No.	4	5	5	4	1	19
New GSO Circle	No.	1	0	0	0	0	2
P&I Divisions	No.	1	0	0	0	0	1
P&I Sub Divisions	No.	1	0	0	0	0	1
SS&T Divisions	No.	1	0	0	0	0	1
Operation Sub Divisions	No.	2	0	0	0	0	2
Operation Divisions	No.	1	1	1	1	2	6
Revenue Offices	No.	1	1	1	1	2	6
Operation Circles	No.	0	0	1	0	1	2
Director (Planning) D&S	No.	0	1	0	0	0	1
Director (GIS)	No.	1	0	0	0	0	1
Construction Circles	No.	0	0	0	0	0	0
Construction Divisions	No.	0	0	0	0	0	0
Assistant Director (T&I)	No.	1	0	0	0	0	1
AE Transmission SS&TL	No.	1	0	0	0	0	1
AE Maintenance Grids	No.	1	0	0	0	0	1
Customer Service Center	No.	1	1	1	1	2	6
Total	No.	**17**	**9**	**9**	**7**	**8**	**51**
Cost Million Rs.							
New Grid Stations	MRs.	0.00	0.00	0.00	0.00	0.00	0.00
New GSO Circle	MRs.	60	0.00	0.00	0.00	0.00	60
P&I Divisions	MRs.	60	0.00	0.00	0.00	0.00	60
P&I Sub Divisions	MRs.	60	0	0	0	0	60
SS&T Divisions	MRs.	60	0	0	0	0	60
Operation Sub Divisions	MRs.	120	0	0	0	0	120
Operation Divisions	MRs.	60	60	65	60	90	335
Revenue Offices	MRs.	60	60	65	60	90	335
Operation Circles	MRs.	0	0	0	0	0	0
Construction Circles	MRs.	0	0	0	0	0	0
Construction Divisions	MRs.	0	0	0	0	0	0
AE Transmission SS&TL	MRs.	60	0	0	0	0	60
AE Maintenance Grids	MRs.	60	0	0	0	0	60
Customer Service Center	MRs.	60	60	55	60	90	325
Other Offices	MRs.						0
Total	**MRs.**	**660**	**180**	**185**	**180**	**270**	**1475**

**Grid Stations cost has been included in STG.

ANNEX-V

DEPOSIT - SCOPE & COST

i. SCOPE

Scope of Work for 11 kV and Below Deposit Case		Unit	Year 1	Year 2	Year 3	Year 4	Year 5	Total
A.	**HT Network**							
1	New Line	KM	613	674	742	816	897	3742
	Re-conductoring	KM	135	142	150	157	164	748
	Re-routing	KM	0	0	0	0	0	0
2	**11kV Capacitors**	No.	0	0	0	0	0	0
3	**Installation of 11 kV Panels**	No.	20	21	22	23	24	110
4	**11kV 500 MCM Cable**	KM	0	0	0	0	0	0
B.	**LT Network**							
1	**New Transformers**							
	a. 25 KVA	No.	1178	1296	1425	1568	1725	7192
	b. 50 KVA	No.	788	867	953	1049	1154	4811
	c. 100 KVA	No.	372	409	450	495	545	2271
	d. 200 KVA	No.	392	431	474	522	574	2393
	e. 100 KVA (Pad mounted)	No.	18	20	22	24	26	110
	f. 200 KVA (Pad mounted)	No.	63	69	76	84	92	385
	Sub Total	No.	2811	3092	3401	3741	4116	17161
2	**Augmentation of Transformers**							
	a. 50 KVA	No.	0	0	0	0	0	0
	b. 100 KVA	No.	0	0	0	0	0	0
	c. 200 KVA	No.	0	0	0	0	0	0
	d. others KVA	No.	0	0	0	0	0	0
	Sub Total	No.	0	0	0	0	0	0
3	**LT Lines**							
	New LT Line	KM	593	652	718	789	868	3620
	Re-conductoring of LT Line	KM	130	138	145	152	159	724
	Cables	KM	0	0	0	0	0	0
4	**LT Capacitors**	No.	0	0	0	0	0	0
5	**Other Equipments and Material**							
	a. Single Phase Meters	No.	0	0	0	0	0	0
	b. Three Phase Meters	No.	0	0	0	0	0	0
	Sub Total	No.	0	0	0	0	0	0

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ii. COST

Cost of Work for 11 kV and Below Expansion		Rs. In Million					
		Year 1	Year 2	Year 3	Year 4	Year 5	Total
A.	**HT Network**	**1401**	**1533**	**1676**	**1834**	**2004**	**8448**
1	New Line	964	1060	1166	1282	1411	5882
	Re-conductoring	95	101	105	111	115	527
	Re-routing	0	0	0	0	0	0
2	**11kV Capacitors**	0	0	0	0	0	0
3	**Installation of 11 kV Panels**	28	29	30	32	33	151
4	**11kV 500 MCM Cable**	0	0	0	0	0	0
5	**Misc HT Cost**	314	343	375	409	445	1,888
B.	**LT Network**	**2659**	**2921**	**3209**	**3525**	**3872**	**16187**
1	**New Transformers**						
	a. 25 KVA	600	660	726	798	878	3663
	b. 50 KVA	555	611	672	739	813	3390
	c. 100 KVA	262	288	317	349	384	1600
	d. 200 KVA	398	438	481	529	582	2428
	e. 100 KVA (Pad mounted)	23	26	28	31	34	142
	f. 200 KVA (Pad mounted)	113	124	136	150	165	688
	Sub Total	**1951**	**2146**	**2361**	**2597**	**2857**	**11911**
2	**Augmentation of Transformers**						
	a. 50 KVA	0	0	0	0	0	0
	b. 100 KVA	0	0	0	0	0	0
	c. 200 KVA	0	0	0	0	0	0
	d. others KVA	0	0	0	0	0	0
	Sub Total	**0**	**0**	**0**	**0**	**0**	**0**
3	**LT Lines**						
	New LT Line	622	684	752	827	910	3795
	Re-conductoring of LT Line	86	92	96	101	106	481
	Cables	0	0	0	0	0	0
4	**LT Capacitors**	0	0	0	0	0	0
5	**Other Equipments and Material**						
	a. Single Phase Meters	0	0	0	0	0	0
	b. Three Phase Meters	0	0	0	0	0	0
	Sub Total	**0**	**0**	**0**	**0**	**0**	**0**
6	**Misc LT Cost**	**0**	**0**	**0**	**0**	**0**	**0**
7	**Total Cost**	**4120**	**4521**	**4958**	**5439**	**5964**	**25001**

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VILLAGE ELECTRIFICATION - SCOPE & COST

i. SCOPE

Scope of Work for 11 kV and Below Village Electrification		Unit	Year 1	Year 2	Year 3	Year 4	Year 5	Total
A.	**HT Network**							
1	Number of Villages	No.	400	422	444	466	488	2220
	New Line	KM	144	152	160	168	176	800
	Re-conductoring	KM	0	0	0	0	0	0
	Re-routing	KM	0	0	0	0	0	0
2	**11kV Capacitors**	No.	0	0	0	0	0	0
3	**Installation of 11 kV Panels**	No.	0	0	0	0	0	0
4	**11kV 500 MCM Cable**	KM	0	0	0	0	0	0
B.	**LT Network**							
1	**New Transformers**							
	a. 25 KVA	No.	328	346	364	382	400	1820
	b. 50 KVA	No.	40	42	44	47	49	222
	c. 100 KVA	No.	32	34	36	37	39	178
	d. 200 KVA	No.	0	0	0	0	0	0
	e. 100 KVA (Pad mounted)	No.	0	0	0	0	0	0
	f. 200 KVA (Pad mounted)	No.	0	0	0	0	0	0
	Sub Total	No.	400	422	444	466	488	2220
2	**Augmentation of Transformers**							
	a. 50 KVA	No.	0	0	0	0	0	0
	b. 100 KVA	No.	0	0	0	0	0	0
	c. 200 KVA	No.	0	0	0	0	0	0
	d. others KVA	No.	0	0	0	0	0	0
	Sub Total	No.	0	0	0	0	0	0
3	**LT Lines**							
	New LT Line	KM	503	531	560	588	616	2798
	Re-conductoring of LT Line	KM	0	0	0	0	0	0
	Cables	KM	0	0	0	0	0	0
4	**LT Capacitors**	No.	400	422	444	466	488	2220
5	**Other Equipments and Material**							
	a. Single Phase Meters	No.	0	0	0	0	0	0
	b. Three Phase Meters	No.	0	0	0	0	0	0
	Sub Total	No.	0	0	0	0	0	0

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ii. COST

Cost of Work for 11 kV and Below Village Electrification		Rs. In Million					
		Year 1	Year 2	Year 3	Year 4	Year 5	Total
A.	**HT Network**	**251**	**278**	**307**	**339**	**372**	**1,547**
1	New Line	195	205	216	227	238	1,080
	Re-conductoring	0	0	0	0	0	0
	Re-routing	0	0	0	0	0	0
2	**11kV Capacitors**	0	0	0	0	0	0
3	**Installation of 11 kV Panels**	0	0	0	0	0	0
4	**11kV 500 MCM Cable**	0	0	0	0	0	0
5	**Misc HT Cost**	56	73	91	112	134	467
B.	**LT Network**	**981**	**1,086**	**1,202**	**1,325**	**1,458**	**6,052**
1	**New Transformers**						
	a. 25 KVA	167	176	185	195	204	927
	b. 50 KVA	28	30	31	33	35	156
	c. 100 KVA	23	24	25	26	27	125
	d. 200 KVA	0	0	0	0	0	0
	e. 100 KVA (Pad mounted)	0	0	0	0	0	0
	f. 200 KVA (Pad mounted)	0	0	0	0	0	0
	Sub Total	**218**	**230**	**242**	**254**	**266**	**1,209**
2	**Augmentation of Transformers**						
	a. 50 KVA	0	0	0	0	0	0
	b. 100 KVA	0	0	0	0	0	0
	c. 200 KVA	0	0	0	0	0	0
	d. others KVA	0	0	0	0	0	0
	Sub Total	**0**	**0**	**0**	**0**	**0**	**0**
3	**LT Lines**						
	New LT Line	576	608	642	673	706	3,205
	Re-conductoring of LT Line	0	0	0	0	0	0
	Cables	0	0	0	0	0	0
4	**LT Capacitors**	0.6	0.7	0.7	0.7	0.8	3.5
5	**Other Equipments and Material**						
	a. Single Phase Meters	0	0	0	0	0	0
	b. Three Phase Meters	0	0	0	0	0	0
	Sub Total	**0**	**0**	**0**	**0**	**0**	**0**
6	**Misc. LT Cost**	**186**	**247**	**318**	**397**	**485**	**1,636**
7	**Total Cost**	**1,231**	**1,364**	**1,509**	**1,664**	**1,830**	**7,599**