National Electric Power Regulatory Authority
Islamic Republic of Pakistan

Registrar

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No. NEPRA/TRF-362/K-Electric-2016/16716-16718
October 9, 2017

Subject: **Decision of the Authority in the matter of Motions for Leave for Review filed by K-Electric Limited, M/s. Whistle Blower Pakistan, M/s. Karachi Chamber of Commerce and Industry, Mr. M. Arif Bilvani and Choudhry Mazhar Ali against Determination of the Authority regarding Multi Year Tariff Petition filed by K-Electric Limited for the period commencing from July 01, 2016 to June 30, 2023 [Case # NEPRA/TRF-362/K-Electric-2016]**

Dear Sir,

Please refer to this office letter No. NEPRA/TRF-362/K-Electric-2016/3760-3762 dated 20.03.2017 whereby Determination of the Authority in the matter of Karachi Electric (K-Electric) Multi Year Tariff (MYT) Petition for Determination of Tariff for the period commencing from July 01, 2016 was communicated to the Federal Government for notification in the official Gazette.

2. Please find enclosed herewith the subject decision of the Authority along with Annex-I, II, III, IV, V, VI, VII and Exhibit-1 (110 pages) in the matter of Motions for Leave for Review filed by K-Electric Limited, M/s. Whistle Blower Pakistan, M/s. Karachi Chamber of Commerce and Industry, Mr. M. Arif Bilvani and Choudhry Mazhar Ali against Determination of the Authority dated 20.03.2017 regarding Multi Year Tariff Petition filed by K-Electric Limited for the period commencing from July 01, 2016 to June 30, 2023.

3. The Decision of the Authority is being intimated to the Federal Government for the purpose of notification in the official Gazette pursuant to Section 31(4) of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997.

4. The Order of the Authority along with all Annexures (Annex-I, II, III, IV, V, VI, VII and Exhibit-1) are to be notified in the Official Gazette.

Enclosure: As above

9/X/17

(Syed Safeer Hussain)

Secretary
Ministry of Energy
'A' Block, Pak Secretariat
Islamabad

CC:
1. Secretary, Cabinet Division, Cabinet Secretariat, Islamabad.
2. Secretary, Ministry of Finance, 'Q' Block, Pak Secretariat, Islamabad.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY

(NEPRA)

PETITION NO: NEPRA/TRF-362/K-Electric-2016

DECISION OF THE AUTHORITY IN THE MATTER OF MOTIONS FOR REVIEW REGARDING MULTI-YEAR TARIFF (MYT) PETITION OF K-ELECTRIC LIMITED FOR THE PERIOD COMMENCING FROM JULY 01, 2016

UNDER

NEPRA TARIFF (STANDARDS AND PROCEDURE) RULES - 1998

ISLAMABAD

OCTOBER 9 , 2017

The Authority, in exercise of the powers conferred on it under Section 7(3) (a) read with Section 31 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997, Tariff Standards and Procedure Rules, 1998 and all other powers enabling it in this behalf, and after taking into consideration all the submissions made by the parties, issues raised, evidence/record produced during hearings, and all other relevant material, hereby issues this decision.

AUTHORITY

9.10.17

Himayat Ullah Khan
Member

6/x/17

Maj (R) Haroon Rashid
Member

Syed Masood-ul-Hassan Naqvi
Member

Saif Ullah Chattha
Vice Chairman
9.10.2017

Brig (R) Tariq Saddozai
Chairman

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9-10-17

Abbreviations

AIA	Amended Implementation Agreement
AMI	Advance Metering Infrastructure
AMR	Automatic Meter Reading
BoD	Board of Director
CAGR	Compound Annual Growth Rate
CAPEX	Capital Expenditure
CCI	Council of Common Interest
CERC	Central Electricity Regulatory Commission
COD	Commercial Operation Date
COSS	Cost of Service Study
CPI	Consumer Price Index
CPPA (G)	Central Power Purchasing Agency Guarantee Limited
CWIP	Closing Work in Progress
DISCO	Distribution Company
DM	Distribution Margin
ERP	Enterprise resource planning
FCA	Fuel Charges Adjustment
FY	Financial Year
GFA	Gross Fixed Assets
GoP	Government of Pakistan
GoS	Government of Sindh
GWh	Giga Watt Hours
HESCO	Hyderabad Electric Supply Company Limited
HHU	Hand Held Unit
HSD	High Speed Diesel
HT/LT	High Tension/Low Tension
IA	Implementation Agreement
IFRS/IAS	International Financial Reporting Standards/International Accounting Standards
IPP	Independent Power Producer
KE	K-Electric
KIBOR	Karachi Inter Bank Offer Rates
KSE	Karachi Stock Exchange
KV	Kilo Volt
Kw	Kilo Watt
kWh	Kilo Watt Hour
LESCO	Lahore Electric Supply Company Limited

LPC	Late Payment Charges
MDI	Maximum Demand Indicator
MEPCO	Multan Electric Power Company Limited
MMBTU	One million British Thermal Units
MoW&P	Ministry of Water and Power
MVA	Mega Volt Amp
MW	Mega Watt
MYT	Multi Year Tariff
NAPLF	Normative Average Plant Load Factor
NEPRA	National Electric Power Regulatory Authority
NPCC	National Power Control Centre
NPV	Net Present Value
NTDCL	National Transmission & Despatch Company Limited
O&M	Operation and Maintenance
OGRA	Oil and Gas Regulatory Authority
PEPCO	Pakistan Electric Power Company
PESCO	Peshawar Electric Supply Company Limited
PPA	Power Purchase Agreement
PPAA	Power Procurement Agency Agreement
PPP	Power Purchase Price
PPRA	Public Procurement Regulatory Authority
R&M	Repair and Maintenance
RAB	Regulatory Asset Base
RE	Rural Electrification
RFO	Residual Fuel Oil
RLNG	Re-gasified Liquefied Natural Gas
RoE	Return on Equity
ROR	Rate of Return
RORB	Return on Rate Base
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SBP	State Bank of Pakistan
SEPCO	Sukkur Electric Power Company Limited
SOT	Schedule of Tariff
T&D	Transmission and Distribution
T&T	Transmission and Transformation
TDS	Tariff Differential Subsidy

TFC	Term Finance Certificate
TOR	Term of Reference
TOU	Time of Use
WACC	Weighted average cost of capital
WAPDA	Water and Power Development Authority
X-Factor	Efficiency Factor
XWDISCO	Ex-WAPDA Distribution Company

DECISION OF THE AUTHORITY IN THE MATTER OF MOTIONS FOR LEAVE FOR REVIEW FILED BY K-ELECTRIC LIMITED, M/S WHISTLE BLOWER PAKISTAN, M/S KARACHI CHAMBER OF COMMERCE AND INDUSTRY, MR. M. ARIF BILVANI AND CHOUDHRY MAZHAR ALI AGAINST DETERMINATION OF THE AUTHORITY REGARDING MULTI YEAR TARIFF PETITION FILED BY K-ELECTRIC LIMITED FOR THE PERIOD COMMENCING FROM JULY 01, 2016 TO JUNE 30, 2023

1. Background

1.1. K-Electric Limited (herein referred to as "the Petitioner or K-Electric or the Company or KE") filed its Integrated Multi Year Tariff ("I-MYT") petition on March 31, 2016, in accordance with the Rule 3 (1) of the NEPRA Tariff (Standards and Procedure) Rules, 1998, requesting for determination of its MYT for a period of ten years commencing from July 01, 2016 to June 30, 2026.

1.2. The said petition was decided by the Authority vide its decision No. NEPRA/TRF-362/K-Electric-2016/3760-3762 dated March 20, 2017 and the same was communicated to the Federal Government for notification in the official gazette.

1.3. K-Electric Limited and five of the interveners i.e. M/s Karachi Chamber of Commerce and Industry (KCCI), Choudhry Mazhar Ali, Mr. M. Arif Bilvani and M/s Whistle Blower Pakistan (WBP), filed Motions for Leave for Review (MLRs) against the aforementioned determination of March 20, 2017.

1.4. Here it is pertinent to mention that K-Electric vide its letters dated March 24, and March 30 2017, considering the significance and material impact of the Authority's MYT determination on its future operations and investment plans, requested for extension in time for filing the MLR till April 21, 2017. However, subsequently, KE vide letter dated March 31, 2017 filed the MLR, wherein K-Electric, citing the paucity of time to analyze the entire determination, stated that it shall file additional grounds or detailed review within the time fame originally requested in its letter dated March 24, 2017. The Authority, considering the filed MLR of K-Electric being incomplete, directed K-Electric to submit the complete MLR latest by April 21, 2017.

1.5. Pursuant to directions of the Authority, K-Electric filed its detailed MLR vide letter dated April 20, 2017, wherein, it also requested for an opportunity of hearing and to raise further grounds/ arguments at the time of hearing.

2. Proceedings

2.1. The Review motions so submitted by the Petitioner and the Interveners were admitted by the Authority as detailed hereunder;

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Sr. #	MLR submitted by	Date of Admission
1	K-Electric Limited	April 27, 2017
2	Karachi Chamber of Commerce & Industry (KCCI)	April 11, 2017
3	Choudhry Mazhar Ali	April 11, 2017
4	Mr. M. Arif Bilvani	April 11, 2017
5	Whistle Blower Pakistan (WBP)	May 10, 2017

2.2. In order to provide fair opportunity to the Petitioner, Interveners and Parties to the proceedings, the Authority decided to conduct a hearing in the matter which was scheduled on May 22 & 23, 2017 at Marriot Hotel Karachi; notices of the hearing / admission along-with copies of the MLRs were sent to parties to the proceedings.

2.3. K-Electric, vide letter dated May 11, 2017, requested the Authority to reschedule the hearing owing to non-availability of its external consultants and advisors. The Authority while acceding to the request of K-Electric, rescheduled the hearing on June 02, 2017 at Karachi.

2.4. The Interveners i.e. Mr. Arif Bilwani, Chaudhry Mazhar Ali, Karachi Chamber of Commerce & Industry and Jamaat-e-Islami Karachi vide letters dated May 15, May 15, May 17 and May 19, 2017 respectively requested the Authority to re-schedule the hearing after Ramazan by stating that it would be difficult for the participant to attend the proceedings during Ramazan. Consequently, the hearing was re-scheduled for July 13 & 14, 2017, at Marriot Hotel Karachi.

3. **Issues**

3.1. The Authority, based on the pleadings of K-Electric and the submissions made by the Interveners, in their MLRs identified the following issues;

i. Heat Rates and Auxiliary Consumption

ii. Rate of Return

iii. Calculation of RAB

iv. Claw Back Mechanism

v. Tariff Structure

vi. Adjustment mechanism

vii. O&M cost

viii. Tariff Control Period

ix. Load Shedding Assumption

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x. T&D Losses and Recovery

xi. Terms & Conditions

xii. Miscellaneous Issues *(Bill Collection charges, Interest on Security deposits, ToU meters, Other Income, Decommissioning of Unit 1 & 2 of BQPS-I and others)*

4. **Hearing**

4.1. Hearing in the matter was held on July 13 & 14, 2017 at Marriot Hotel Karachi, which was attended by the Petitioner, Interveners and Commentators.

4.2. During hearing, K-Electric was represented by its Chief Executive Officer along-with its financial and technical team. Representative from M/s Abraaj Group, majority shareholder of K-Electric, also presented their comments during the hearing. Interveners and various commentators including HBL and UBL also attended the hearing.

4.3. HBL and UBL also submitted their written comments, after the hearing, vide letters dated August 21 & 25, 2017 respectively, wherein, it has been pleaded that based on the financial projections provided by K-Electric, analysis of certain ratios i.e. Debt Service Coverage Ratio and Current ratio, suggest that K-Electric is likely to face serious challenges in meeting these ratios and thus may find it difficult to raise long term financing for future expansion and/or improvements of its existing assets which in turn will adversely impact K-Electric's operational viability. Thus, NEPRA should consider a tariff which would permit K-Electric to service its debt while meeting ratios that would allow further borrowing by K-Electric. It was also opined that while evaluating financing capacity of K-Electric, lenders would have serious doubts about K-Electric's ability to attain the significant improvement i.e. 98.22% in recovery rate considering K-Electric's recovery rate of 87.63% for the FY 2015-16.

4.4. In addition written comments were also received from Pakistan Credit Rating Agency Limited (PACRA), Islamic International Rating Agency (IIRA), Overseas Private Investment Corporation (OPIC) and M/s Shanghai Electric Power Company (SEP), who expressed their concerns on the K-Electric's MYT determination of March 20, 2017, by stating the same being unviable / non-bankable, impacting K-Electric's ability to raise financing, and adversely impacting its operational performance & ability to execute the investment plan.

4.5. The Authority observed that as per the relevant provisions of NEPRA laws, only parties to the proceedings are allowed to participate in the review proceedings and OPIC, SEP, PACRA and IIRA not being parties to the proceedings cannot be made part of the proceedings. However, without prejudice to the above, the Authority has considered the submissions made by these organizations in its review proceedings.

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5. **Issue wise discussion, Analysis and Determination of the Authority**

5.1. On the basis of the pleadings / submissions made by K-Electric, Interveners, & parties to the proceedings, available record, and evidence produced during the course of hearing & afterwards, the issue-wise discussion and findings of the Authority are given hereunder:

6. **Heat Rate and Auxiliary Consumption**

6.1. K-Electric in its MLR has submitted that plant wise heat rates and auxiliary consumption as determined by the Authority is not reflective of ground realities and conditions, resulting in over/under estimation of matrix. Further, unrealistic operational assumptions and ignorance of ambient condition and quality of fuel also results in reduction in base tariff. K-Electric also submitted that the Authority ignored two ground realities for which precedent in the tariff of IPPs exist as mentioned below;

- **Partial Load Operations**
    - Varying daily and seasonal demand due to which the generation fleet is required to be operated on partial load or standby to maintain continuous supply and system reliability.
    - Loading of the plants is required to be adjusted to the varying gas supply on daily and seasonal basis.
    - Staggered planned maintenance activities for the generating complexes.
- **Degradation**
    - Permanent degradation due to the aging of plants.
    - Operational degradation over service period of the generation equipment (due to fouling of the gas turbine components, for instance).

6.2. K-Electric stated that while determining the heat rates and auxiliary consumption, the aforementioned factors have been ignored, resulting in adverse financial impact, wherein the same factors have been accounted for while determining the tariff and approving PPAs for IPPs and GENCOs. K-Electric in this regard mentioned the extracts from Schedule 1 of PPA applicable to all thermal power plants under 2002 policy as under;

FCCh = (FCCRef * FCAFt) * Kh* Dh

Where;

FCCRef = the Reference Fuel Cost Component,
FCAFt = the applicable Fuel Cost Adjustment Factor applicable to hour, h,

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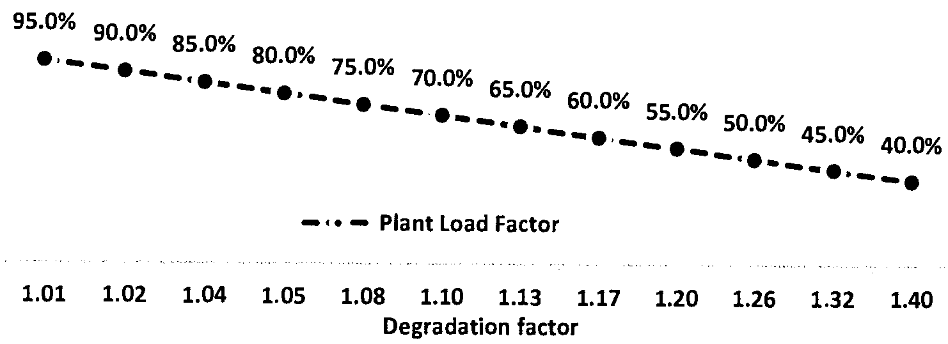
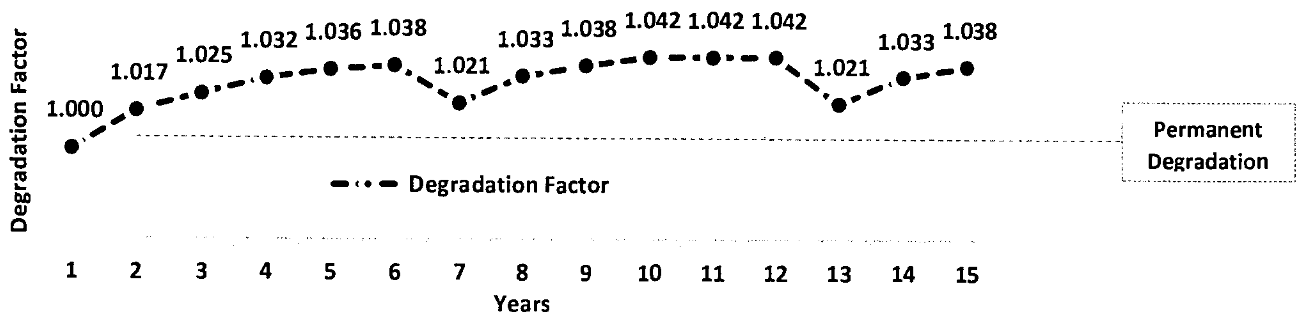
Kh	= the heat rate correction factor due to partial loading of the Complex in hour h,
Dh	= the heat rate degradation factor for the Complex, for the Year in which hour h occurs

6.3. The resultant partial load adjustment and annual heat rate degradation curve for a combined cycle power plant have been illustrated by K-Electric as below;

7. **Heat Rate Partial Load Correction curve for a combined cycle power plant**



Annual Degradation curve for a combined cycle power plant



7.1. K-Electric accordingly requested that such adjustments should also be allowed for its plants.

7.2. Mr. Arif Bilwani on the issue of heat rates and auxiliary consumption submitted that KE's request for maintaining existing generation target heat rate has been accepted for the six units of BQPS-I which in the previous MYT was 10,650 or thermal efficiency of 32.04%. This has been done by breaking / setting these two components amongst 6 unit as a whole in such a way that the final figure for the new MYT has been arrived exactly at the same figures of 32.06% and 10,650 Btu/ kWh.

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7.3. Mr. Bilwani also stated that the Authority accepted the Heat rate Tests conducted by M/s PES in case of SGTPS-II, KGTPS Gas-II and KCCP, whereas in respect of BQPS-II, heat rate test conducted by M/s PES were rejected. It would have been more appropriate to appoint at-least two independent consultants for conducting the heat rate tests of all these plants afresh to be benchmarked against the best available plants at that time or the best plants at that time installed in Pakistan. The Heat rate of KCCP i.e. 7951.85 (42.91%) is lower than BQPS-II i.e. 7990.96 (42.70%), despite the fact that BQPS-II is a more modern and bigger plant. Therefore, the overall recommended heat rates and net capacities needs to be determined afresh. Mr. Bilvani further pointed out that low Plant utilization factor for the new proposed power plants is resulting in high capacity payments.

7.4. KCCI questioned the low efficiencies and high auxiliaries allowed to K-Electric power plants resulting in high monthly FCA and wastage of scarce national resources. KCCI was also of the view that the old inefficient plants should be gradually phased out. KCCI further submitted to set minimum heat rates, auxiliary consumption level and gas or furnace oil consumption levels for the production of power anywhere in the country.

7.5. Whistle Blower International argued that NEPRA has allowed higher Heat Rates i.e. allowed lower efficiency for the BQPS-I's three Power Generating Units that will certainly increase the Power Production cost, for which no justification has been given. It is the primary duty of the Utility to maintain the Heat Rates and if, due to poor workmanship, the efficiency of any Power Plant degrades then its burden should not be passed-on to the electricity consumers. Whistle blower also mentioned that by inducting small engines KE has caused and is causing huge losses to the National Exchequer and the electricity consumers by utilizing the scarce Natural Gas resources to below optimum value.

7.6. Regarding Auxiliaries, Whistle blower stated that the allowed Auxiliary consumption is on the higher side. It has further been highlighted that with the existing Generation mix and Generation Capacity of KE, the operation of Gas based Power Plants on Partial Load is out of question; Partial Load operation of a Gas based Power Plant could only be due to K-Electric's own reasons; hence giving the advantage of Partial Load-Adjustment is not acceptable.

7.7. On the point of Plant factor, Whistle blower has opined that NEPRA has taken the Plant Factor of KE Power Plants at a low value and considered the purchase of Power from NTDC. The purchases from NTDC, while not utilizing KE's own Plants to their standard value (92% for Gas and 88% for RFO Power Plant) is imprudent on financial and economic grounds. KE is since long using the Gas in BOPS-1 Power Plants despite the fact that its other Gas Power Plants were not utilized to their maximum capacity citing the reason of low gas pressure. Low Gas pressure is a manageable issue and not managing the same is the inefficiency of the Power Producer. Further, third-party checks are required so that Gas based electricity should not be sold on RFO based electricity cost/Tariff.

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7.8. Mr. Abu Bakar Usman raised the issue of underutilization of plants despite having available capacity which needed to be addressed in the new MYT.

8. **Plant wise Heat Rates and Auxiliaries**

8.1. **BQPS-II:**

8.1.1. KE stated that BQPS-II is a Combined Cycle Power Plant, consisting of three Gas Turbines, three HRSGs and one Steam Turbine. K-Electric submitted that the Authority has determined heat rate of 7,991 Btu/kWh on Net HHV basis without any compensation of degradation and part load adjustment for life cycle of the plant. KE also highlighted that the comparison of BQPS-II with UCH-II and Foundation power is incomplete and provided a detailed comparison of the various parameters of these generation plants on full load at Reference Site Conditions ("RSC") as tabulated below:

Heat Rates and Auxiliary consumption comparison of BQPS – II with UCH – II & Foundation Power

Particular	KE (BQPS-II)	UCH – II	Foundation Power
Gross Capacity – MW (RSC)	529	392	187
Auxiliary – MW	34	11	7
Net Capacity – MW	**495**	**381**	**180**
Net Heat Rate LHV Basis	7,214	6,921	6,986
Net Efficiency LHV Basis	47.30%	49.30%	48.84%
Auxiliary	6.39%	2.84%	3.74%
Gross Heat rate LHV Basis	6,753	6,725	6,725
Gross Efficiency LHV Basis	**50.53%**	**50.74%**	**50.74%**
Net Heat Rate HHV Basis	**7,991**	**7,675**	**7,738**
Net Efficiency HHV Basis	42.70%	44.46%	44.10%
Auxiliary	6.39%	2.84%	3.74%
Gross Heat rate HHV Basis	7,481	7,457	7,448
Gross Efficiency HHV Basis	**45.61%**	**45.75%**	**45.81%**

8.1.2. KE submitted that in the above comparison, NEPRA's allowed net heat rate of 7,991 Btu/kWh is based on gross efficiency of 45.61% on HHV basis which is exactly comparable with corresponding efficiencies of UCH-II and Foundation Power at full load without any degradation. However, for UCH-II and Foundation Power, correction factor for partial load operations and degradation is applied on these heat rates. Whereas, the approach taken by the Authority in case of BQPS-II does not account for degradation and partial load operations.

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8.1.3. KE also stated that in the given conditions and ground realities, BQPS-II on an average operated at a Plant Load Factor ("PLF") of 85% since its commissioning in 2012. KE in this regard also cited example of Indian regulators that uses a NAPLF of 80-85% for thermal generating stations.

8.1.4. In view thereof, KE requested that in line with partial load correction curves for UCH-II and Foundation Power, a heat rate adjustment factor of 1.0365 at 85% PLF should be applied. Similarly, using the degradation curves of UCH-II and Foundation Power, average applicable degradation factor for a 5-year old plant comes out to be 1.0366 and by applying both these correction factors, the KE's proposed heat rate for BQPS-II is as follows:

NEPRA Determined Heat Rate	Degradation factor	Partial load adjustment factor@85%	Proposed Heat Rate
7,991	1.0366	1.0365	8,586

8.1.5. KE further argued that auxiliary consumption has a direct correlation with loading of the plant. On 85% PLF of BQPS-II, the auxiliary consumption comes out to 6.5%. Accordingly KE has proposed auxiliary consumption for BQPS-II as under;

	NEPRA Determined	KE's Proposed
Auxiliary consumption %	6.11%	6.5%

8.1.6. The Authority observed that under para 23.15 of its MYT determination dated March 20, 2017 it has already directed K-Electric to carry out heat rate test for the BQPS-II Power Plant and submit the test report to the Authority for approval. Therefore, the aforementioned request of KE will be analyzed at the time of heat rate test approval stage. Hence, for the instant review motion, the Authority has decided to maintain its earlier decision in respect of heat rate / thermal efficiency and auxiliary consumption targets of BQPS-II. The adjustment in heat rates will be made based on the results of the performance (Heat Rate).

8.2. **Korangi Combined Cycle Power Plant (KCCP);**

8.2.1. While referring to the specifications of the plant, KE mentioned that the plant was operated in open cycle mode till May 2015 and in June 2015 was converted to combined cycle mode. KE further mentioned that the Authority at the time of commissioning of the plant in 2009, determined a heat rate of 9,110 Btu/kWh and has now calculated the revised overall heat rate, since the plant was upgraded with an addition of a steam turbine. However, while determining the revised overall heat rate a calculation error has been made by the Authority as detailed below;

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Particulars	Legends	As per KE	As per NEPRA
Previously Allowed Heat Rate Net HHV	A	9,110	9,110
Previously Allowed Heat Rate Net LHV	B = A / 1.1076	8,225	8,225
Auxiliary consumption	C	6.92%	
Heat Rate Gross LHV	D = B x (1-C)	7,656	
Previous Capacity without addition of new ST (MW)	E	213.40	
Required MMBTUs	F = D x (E / 1000)	1,633.75	
Capacity Addition of new ST (MW)	G	26.70	
Revised capacity after addition of ST (MW)	H = E + G	**240.10**	
Revised Heat Rate Gross LHV after adding new ST	I = F / (H/1000)	6,804	
Heat Rate Net LHV	J = I / (1-C)	7,310	
Heat Rate Net HHV	**K = J x 1.1076**	**8,097**	**7,952**

8.2.2. KE argued that while determining the auxiliary consumption, NEPRA has not accounted for the load of additional auxiliary equipment installed along with the new steam turbine and used the auxiliary consumption of 6.92% (at full load) based on the independent performance test conducted in October 2011. KE submitted that after addition of the new ST equipment, the revised auxiliary consumption works out to be 19.44 MW, thus, the corrected auxiliary consumption is calculated as 8.10% at full load which will also have an impact on net HHV heat rate, so the revised overall heat rate at full load will be 8,200 btu/kWh at 8.10% auxiliary consumption.

8.2.3. KE also while objecting to the Authority's stance that factor of degradation in efficiency and part load adjustment have already been considered by the Authority earlier, while allowing pervious heat rates, submitted that the Authority's stance is contrary to the facts. The independent performance test report, which is basis of NEPRA's determined heat rate of 9,110 Btu/kWh, specifically states that the test was conducted with the plant operating at full load. Thus, using the concept of NAPLF of 85%, a heat rate adjustment factor of 1.0365 at 85% PLF should be applied. Further, to be consistent with the degradation correction factor allowed to IPPs, an average degradation factor of 1.0366 should also be applied.

8.2.4. In view thereof, KE proposed the following flat heat rate and auxiliary consumption for KCCPP for the next control period.

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NEPRA Determined Heat Rate	Heat Rate after correction of error and auxiliary	Degradation factor	Partial load adjustment Factor@85%	Proposed Heat Rate
7,952	8,200	1.0366	1.0365	**8,810**

	NEPRA Determined	KE's Proposed
Auxiliary consumption %	6.92%	**8.10%**

8.2.5. The Authority on the issue observed that in its original MYT petition, K-Electric mainly requested for continuation of the earlier MYT mechanism and accordingly auxiliary and efficiency numbers were included by K-Electric without detailed analysis and rationale. The Authority accordingly determined the Heat Rates and Auxiliary Consumption numbers, based on the available information and its own evaluation.

8.2.6. K-Electric as part of its Review Motion and afterwards provided new data, workings and evidence in support of its claim, which have been analyzed by the Authority as mentioned here under.

8.2.7. K-Electric has stated that incremental auxiliary consumption due to addition of steam turbine would result in auxiliary consumption of 8.1%. The Authority observed that benchmark established by CERC of India for auxiliary consumption in respect of CCGT based power plants is 2.5% of the gross capacity, at reference site conditions for different locations across the country. In the matter of K-Electric, since its power plants being operating at sea level (or near to ISO conditions), therefore, a lower value of auxiliary consumption is more justified. The Authority further noted that for RLNG fired combined cycle power projects including Bhikki, Balloki and Haveli Bahadur Shah, the approved auxiliary consumption value is even less than 2% of gross capacity despite the fact that gas booster compressors are also installed at some plants. Moreover, an upcoming CCPP IPP i.e. Kolachi Portgen, also proposed an auxiliary consumption of 2.5% of gross capacity @ RSC. Therefore, by considering gas booster compressor load of 8 MW i.e. 3.33% of gross capacity @ RSC in addition to standard auxiliary load i.e. 2.5% of gross capacity @ RSC for the KCCPP, the reasonable auxiliary consumption value for the KCCPP works out to be 5.83% at RSC, as against 6.92% allowed by the Authority, thus the approved auxiliary consumption value of 6.92% of gross capacity already has a cushion for part load operations. The Authority also understands that in future, due to availability of RLNG, compressors at KCCPP may not be required, thus, further reducing the auxiliary loads.

8.2.8. Regarding heat rates, the Authority has analyzed the OEM data and benchmarks of regulators in India *(Technical Standards for Construction of Electrical Plants and Electrical Lines)* and the overall efficiency allowed to K-Electric in comparison with other references.

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8.2.9. A report prepared by Credit Suisse *(Swiss multinational financial services holding company)* regarding performance of K-Electric issued on 15th July, 2015, puts actual heat rate in respect of KCCPP at 7,866 Btu/kWh net HHV @ RSC (equivalent to 43.38% net HHV thermal efficiency @ RSC). Another report "Value Call" prepared by Taurus Securities Limited (A subsidiary of National Bank of Pakistan) issued on 12th August 2015 reveals that heat rate of KCCPP is 7,582.22 Btu/kWh net HHV @ RSC (equivalent to 45% net HHV thermal efficiency @ RSC) which is lower than the NEPRA's approved heat rates. K-Electric has also contended the calculations of KCCPP heat rates by NEPRA after inclusion of the new steam turbine.

8.2.10. The Authority in view thereof and the detailed working submitted by K-Electric, reviewed its earlier working and noted that impact of addition of new steam turbine has not been fully reflected in the earlier workings of the Authority, thus necessitating a revision in this regard.

8.2.11. K-Electric also challenged NEPRA's contention that degradation and partial load adjustment were considered during the heat rate test conducted on February 16, 2012. KE pointed out that according to records, the tests were conducted with the plant operating at full load. The Authority, in view of K-Electric's arguments, thoroughly reviewed the record of heat rate tests, which substantiates K-Electric's stance of test being conducted on plant operating at full load, consequently the heat rate allowed by NEPRA relates to 100% loading conditions.

8.2.12. Having accepted K-Electric's stance, the Authority feels it appropriate to examine K-Electric's requests regarding degradation and part load adjustment factors. K-Electric has proposed a degradation factor of 1.0366 based on its own analysis of different machines.

8.2.13. The Authority, in order to assess the prudence of proposed degradation factor of 1.0366, based on estimates derived from data of IPPs *(due to unavailability of correction curves)*, analyzed the approved degradation factors as mentioned in the PPAs of Orient, Halmore, Saif and Sapphire Power Plants, being of similar sized GTs based combined cycle power plants, along with regional benchmarks. The Authority noted that there is around 2% (for life cycle of the plant) permanent non-recoverable degradation / deterioration in heat rate due to aging which results in degradation factor of 1.022 (degradation occurs in initial years of operation also). The remaining degradation is of recoverable nature, thus the degradation factor proposed by K-Electric is on the higher side.

8.2.14. The request of K-Electric regarding part load adjustment factor of1.0365 at 85% loading has also been analyzed, in light of the PPAs of Orient, Halmore, Saif and Sapphire Power plants, being of similar sized GTs based combined cycle power plants, wherein a part load adjustment factor of 1.0268 at 85% loading has been allowed. Further, the benchmark and calculation method as specified by CERC namely "Mechanism for compensation for degradation of heat rate, aux consumption, secondary fuel oil consumption, part load operation and multiple start / stop of units" notified on 6th April 2016 was also analyzed. The Authority observed that

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operation on part load may occur due to several reasons including gas fuel constraints, availability issues, dispatch restrictions owing to low demand or transmission / distribution evacuation issues, maintenance issues at the plant, load shedding plan and working capital constraints etc.

8.2.15. In the absence of part load factors, one approach is to direct K-Electric to provide actual operational monthly loading data and then adjustment in heat rate be allowed as per part load factors approved for Orient, Halmore, Saif and Sapphire Power etc. Second approach could be to build the part load factor in the approved heat rates based on historical data of KCCPP.

8.2.16. Various benchmarks recognizing the concept of a normative plant operation have also been reviewed and for combined cycle power plants, a normative loading level of 85% is recommended. K-Electric also has requested for NPL of 85% for KCCPP. The Authority considers that the claimed value of 85% (of rated capacity) due to load variation seems reasonable and thus approved the same. In the absence of part load curves, the Authority considers the adjustments factors allowed to other IPPs, as mentioned above, as reasonable. Accordingly, K-Electric is allowed a part load operation adjustment factor of 1.0268.

8.2.17. In view of the above discussion and in light of comments of Interveners, the following parameters in respect of KCCPP are provisionally approved.

Power Plants	Fuel	Auxiliary Consumption	Net HHV Flat Thermal Efficiency % at RSC	Net HHV Flat Heat Rate at RSC (Btu/kWh) after adjustment of degradation (1.022) and partial load (1.0268) factors
Korangi Combined Cycle Power Plant	Gas/ HSD	6.92%	40.16	8,496.83

8.2.18. The Authority also notes that with the addition of one steam turbine at KCCP, the numbers in respect of efficiency and auxiliary consumption may not be accurately worked out based on the given information and supporting documents. Therefore, the Authority decides that the parameters allowed here are on provisional basis and directs K-Electric to arrange Heat rate test by an Independent Engineer within a period of six months from the date of notification of the instant tariff determination. The selection process and appointment of an independent engineer shall be approved by NEPRA, and the tests shall be conducted in the presence of NEPRA professionals as observers. The adjustment in heat rates will be made based on the results of the performance (Heat Rate) test.

8.3. **KGTPS & SGTPS:**

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8.3.1. KE while mentioning specifications of these plants, stated that these plants were initially operated in open cycle mode and were subsequently converted to combined cycle mode in 2016. KE further stated that at the time of commissioning, the Authority determined net HHV heat rate of 9,500 btu/kWh for both these plants. The plants were upgraded with the addition of new STs and the Authority revised the overall heat rates to 8,588Btu/kWh and 8,596Btu/kWh on net HHV basis for KGTPS and SGTPS respectively. However, while determining the revised overall heat rate a calculation error has been made by the Authority as detailed below;

Particulars	Legends	KGTPS		SGTPS	
		As per KE	As per NEPRA	As per KE	As per NEPRA
Heat Rate Net HHV	A	9,500	9,500	9,500	9,500
Heat Rate Net LHV	B = A / 1.1076	8,577	8,577	8,577	8,577
Auxiliary Consumption *(as per simple cycle test report)*	C	2.24%		2.15%	
Heat Rate Gross LHV	D = B x (1-C)	8,385		8,393	
Previous Capacity without addition of new ST (MW)	E	87.65		87.65	
Required MMBTUs	F = D x E	734.94		735.62	
Capacity Addition of new ST (MW)	G	9.57		9.57	
Revised capacity after addition of ST (MW)	H = E + G	**97.22**		**97.22**	
Revised Heat Rate Gross LHV after adding new ST	I = F / (H/1000)	7,560		7,567	
Determined Auxiliary combined cycle	J	2.50%		2.50%	
Heat Rate Net LHV	K = I / (1-J)	7,753		7,761	
Heat Rate Net HHV	**L = K x 1.1076**	**8,588**	**8,492**	**8,596**	**8,482**

8.3.2. KE further highlighted that the Authority has revised the overall heat rate without taking into account all the technical parameters, resulting in incorrect efficiency and auxiliary consumption benchmarks. KE in this regard submitted that while determining the auxiliary consumption for KGTPS and SGTPS, the Authority has not taken into consideration the load of additional auxiliary equipment installed along with the new steam turbine and benchmarked the auxiliary consumption at 2.50% using Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2014 and Sindh Nooriabad Power Plant as reference. This benchmarking is not valid because of the unique configuration of KGTPS and SGPTS.

8.3.3. KE accordingly submitted that after addition of the new ST equipment, the revised auxiliary consumption for KGTPS and SGTPS works out to be 2.84 MW, thus the corrected auxiliary consumption at full load for KGTPS and SGTPS wroks out as 2.92% and 2.92% respectively. KE submitted that correction in auxiliary numbers will also have an impact on the net HHV heat

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rate of both the plants thus resulting in overall heat rate at full load of 8,625 Btu/kWh and 8,633 Btu/kWh for KGTPS and SGTPS respectively.

8.3.4. KE further, while objecting to the Authority's stance, that impact of degradation has already been considered by the Authority earlier while allowing pervious heat rates, submitted that this stance is contrary to the fact. KE mentioned that the independent performance test report, which is basis of NEPRA's determined heat rate of 9,500 Btu/kWh, specifically states that the test was conducted with the plant operating at RSC. Accordingly no correction factors were applied. KE therefore requested in line with the heat rate degradation curve provided by the EPC Contractor, an average heat rate degradation factor of 1.03 should be applied.

8.3.5. In light of the above discussion, KE proposed the following flat heat rates for KGTPS and SGTPS for the next tariff control period.

Plant	NEPRA Determined Heat Rate	Heat Rate after correction of error and auxiliary	Degradation Factor	KE's Proposed Heat Rate
KGTPS	8,492	8,625	1.03	8,884
SGTPS	8,482	8,633	1.03	8,892

8.3.6. KE further contended that Auxiliary consumption is also impacted by the partial load operations of the complex, therefore, proposed the following auxiliary consumption for KGTPS and SGTPS after taking the impact of new steam turbine.

Plant	NEPRA Determined	KE's Proposed
KGTPS	2.50%	2.92%
SGTPS	2.50%	2.92%

8.3.7. The Authority observed that in its original MYT petition, K-Electric mainly requested for continuation of the earlier MYT mechanism and accordingly auxiliary and efficiency numbers were included without detailed analysis and rationale. The Authority accordingly determined the Heat Rates and Auxiliary Consumption numbers based on the available information and its own evaluation.

8.3.8. K-Electric as part of its Review Motion and afterwards provided new data and evidence in support of its claim, which have been analyzed by the Authority as mentioned here under.

8.3.9. K-Electric has submitted that incremental auxiliary consumption due to addition of a steam turbine would result in auxiliary consumption of 2.92%. The Authority observed that as per National Electricity Plan 2012 of Government of India, prepared by CERC, the standard norm for auxiliary power consumption for open cycle gas based units (including Gas Engine and Gas

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turbine) is 1.00% and in respect of combined cycle gas engine based power plants, the bench mark is 2.5% of gross capacity at reference site conditions for different locations across the country. In the matter of K-Electric, since its power plants are operating at sea level (or near to ISO conditions), therefore, a lower value of auxiliary consumption is more justified. Hence, the Authority considers that the already allowed auxiliary consumption value of 2.5% of gross capacity on various loads is well justified.

8.3.10. Regarding heat rates, the Authority has analyzed the OEM data and benchmarks of regulators in India *(Technical Standards for Construction of Electrical Plants and Electrical Lines)* and the overall efficiency allowed to K-Electric in comparison with other references.

8.3.11. A report prepared by Credit Suisse (Swiss multinational financial services holding company) regarding performance of K-Electric issued on 15th July, 2015 puts actual heat rates in respect of KGTPS and SGTPS at 9,009 Btu/kWh net HHV @ RSC (equivalent to 37.87% net HHV thermal efficiency @ RSC). Another report "Value Call" prepared by Taurus Securities Limited (A subsidiary of National Bank of Pakistan) issued on 12th August 2015 reveals that the heat rate of KGTPS and SGTPS is 9,477.78 Btu/kWh net HHV @ RSC (equivalent to 36% net HHV thermal efficiency @ RSC). Further K-Electric also contended the heat rates calculations of SGTPS and KGTPS by NEPRA, after inclusion of the new steam turbine.

8.3.12. The Authority in view thereof and the detailed working submitted by K-Electric, reviewed its earlier working and noted that impact of addition of new steam turbine has not been fully reflected in the earlier workings of the Authority, thus necessitating a revision in this regard.

8.3.13. The Authority, in order to assess the prudence of proposed degradation factor of 1.03, analyzed the benchmark set by Wartsila for gas based engines and noted that there is 1% (for life cycle of the plant) degradation / deterioration in heat rate due to aging resulting in degradation factor of 1.01. Thus, the degradation factor proposed by K-Electric, based on EPC contractor data, is on the higher side. The Authority further while reviewing the historical operational data, noted that KGTPS and SGTPS may not have been maintained as per the prudent utility practices which may lead to higher heat rates and degradation factors. The Authority accordingly considers 1.75% degradation/ deterioration in heat rates (for life cycle of the plant) as a reasonable estimate due to aging resulting in degradation factor of 1.0175.

8.3.14. In view of the discussions made above, the Authority has decided to maintain its earlier assessment of auxiliary consumption of 2.5% for both KGTPS and SGTPS. Regarding adjustment for degradation, the Authority allows a factor of 1.0175 to be applied to the heat rates of KGTPS and SGTPS separately to work out the revised heat rates. Accordingly, the following the following parameters in respect of KGTPS and SGTPS are provisionally approved.

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Power Plants	Fuel	Auxiliary Consumption	Net HHV Flat Thermal Efficiency % at RSC	Net HHV Flat Heat Rate at RSC (Btu/kWh) after adjustment of degradation factor (1.0175)
KGTPS	Gas	2.50%	39.05	8,737.98
SGTPS	Gas	2.50%	39.01	8,746.02

8.3.15. The Authority also notes that with the addition of steam turbines at KGTPS and SGTPS, the numbers in respect of efficiency and auxiliary consumption may not be accurately worked out based on the given information and supporting documents. Therefore, the Authority decides that the parameters allowed here are on provisional basis and directs K-Electric to arrange Heat rate tests by an Independent Engineer within a period of six months from the date of notification of the instant tariff determination. The selection process and appointment of an independent engineer shall be approved by NEPRA, and, the tests shall be conducted in the presence of NEPRA professionals as observers. The adjustment in heat rates will be made based on the results of the performance (Heat Rate) test.

8.4. BQPS-I:

8.4.1. Regarding BQPS-I plant, KE stated that it consists of 6 units (unit 1 to 6) commissioned during the period from year 1983 to 1997 and as per the commissioning data provided by the EPC contractor, heat rates and auxiliary consumption vary significantly based on the load factor at which the plant operates. KE provided the following results of the commissioning data at full and partial load of BQPS-I;

	Unit 1		Unit 2		Unit 3 & 4		Unit 5		Unit 6	
Load MW – gross	213	132	215	126	217	138	212	127	214	131
Load MW - net after auxiliary	199	121	201	115	204	127	199	117	201	120
Load factor (%)	100%	60.5%	100%	57.1 %	100%	62.1 %	100%	58.6 %	100%	59.6 %
Heat Rate (net) – HHV	9,512	9,981	9,505	9,981	9,454	10,187	9,283	9,798	9,316	9,866
Efficiency (net) %	35.9 %	34.2%	35.9 %	34.2 %	36.1 %	33.5 %	36.8 %	34.8 %	36.6 %	34.6 %
Auxiliary consumption %	6.3%	8.6%	6.3%	8.6%	6.0%	8.2%	6.1%	8.3%	6.2%	8.6%
Difference in efficiency at full and partial load	-1.68%		-1.71%		-2.60%		-1.93%		-2.04%	
Difference in auxiliary at full and partial load	2.34%		2.34%		2.17%		2.20%		2.42%	

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8.4.2. KE submitted that it is evident from the above commissioning data that heat rates and auxiliary consumption vary with different load factors at which the plant operates. The plant is required to be operated on partial load or standby mode to manage the varying demand and system reliability as it comes last on the Economic Merit Order (EMO), therefore, operated at an average load of less than 60% over the last 3-4 years.

8.4.3. KE also contested the degradation of 4% in heat rate for BQPS-I units assumed by the Authority and proposed that the degradation be applied to the relevant commissioning data of BQPS-I, in addition to applying a part load factor adjustment factor and by applying the same assumption to the BQPS-I commissioning data, KE has worked out the revised heat rates and auxiliary consumption at partial load of around 60% as under;

KE's Proposed Benchmarks			
BQPS Units	**Load factors**	**Heat rate after 4% degradation**	**Auxiliary consumption**
Unit 1	60%	11,303	9.64%
Unit 2	57%	11,303	9.64%
Unit 3	62%	11,569	9.20%
Unit 4	62%	11,569	9.20%
Unit 5	59%	11,069	9.30%
Unit 6	60%	11,157	9.30%

8.4.4. KE also provided the record of actual operational heat rates of BQPS-I for the FY 2016-17 which as per KE, are higher than the requested heat rates in the review motion petition. KE further submitted that the heat rates and auxiliary consumption values as shown in above table vary with different load factors at which the plant operates. KE also stated that BQPS 1 is required to be operated on partial load or standby mode to manage the varying demand and system reliability as it comes last on the Economic Merit Order (EMO). Therefore, BQPS 1 is operated at an average load of less than 60% (of rated capacity) over the last 3-4 years.

8.4.5. KE also provided data about auxiliary consumption of BQPS-I, as per EPC contractor, as indicated below;

Commissioning Data	Unit 1		Unit 2		Unit 3		Unit 4		Unit 5		Unit 6	
Plant Load factor (%)	100.00%	60%	100%	57%	100	62%	100	62%	100%	59%	100%	60%
Load MW-Gross	213	132	215	126	217	138	217	138	212	127	214	131
Auxiliary Cons %	6.30%	8.64%	6.30%	8.64%	6%	8.20%	6%	8.20%	6.10%	8.30%	6.20%	8.57%

8.4.6. KE stated that actual operational auxiliary consumption for of BQPS-I the FY 2016-17 is higher than the auxiliary consumption requested in the review motion. KE further submitted that the break-up of auxiliary consumption is prepared from commissioning data record of EPC/OEM

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and 1% auxiliary consumption is added for accommodating transformer losses & common auxiliaries of the station v.i.z. (in line with the proposed auxiliary consumption in the review petition):

i. Water treatment Plants
ii. Water Supply system
iii. Common Start-up Transformers
iv. Common evacuation bus
v. H2 Generation Plants
vi. Plant administration
vii. Workshops
viii. Fuel Storages, Fuel Handling, Fuel supply

8.4.7. In view of the above submissions, KE for the calculation of base tariff and adjustment mechanism for the next control period, has requested the following unit wise heat rates and auxiliary consumption benchmarks;

Plant	Heat Rate Net HHV Basis	Auxiliary Consumption
BQPS – I		
Unit 1	11,303	9.64%
Unit 2	11,303	9.64%
Unit 3	11,569	9.20%
Unit 4	11,569	9.20%
Unit 5	11,069	9.30%
Unit 6	11,157	9.30%

8.4.8. The Authority noted that while approving heat rate / thermal efficiency targets for BQPS-I, it considered design and commissioning data of the plant, useful life of the units, comparison with similar technology regional power plants, historical operational record of the plant and expected decommissioning of older units. Notwithstanding above, the calculation and rationale of allowing unit wise heat rates / thermal efficiency targets have been reviewed while taking in to consideration the data submitted by KE subsequently, during the Review Motion proceeding.

8.4.9. The submissions of K-Electric regarding commissioning data of the power plant have been analyzed and it is observed that heat rates, mentioned by KE while referring to the commissioning data, are not consistent with the heat rates as mentioned in due diligence report prepared by Mott MacDonald (part of KE's license issued by NEPRA in year 2002).

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8.4.10. The following table shows a comparison of KE's provided data with the information submitted as part of license application.

Unit	Heat Rate at Commissioning as per License of KE, Net HHV, (Btu/kWh) at 100% load using KE's assumed aux cons.	Corresponding Efficiency (%)	Heat Rate at Commissioning as per Review Petition of KE, Net HHV, (Btu/kWh) at 100% load	Corresponding Efficiency (%)
Unit 1	9,146.21	37.31	9,512.00	35.87
Unit 2	9,104.59	37.48	9,454.00	36.09
Unit 3	9,124.47	37.39	9,454.00	36.09
Unit 4	9,092.55	37.53	9,454.00	36.09
Unit 5	8,894.57	38.36	9,283.00	36.76
Unit 6	8,955.22	38.10	9,316.00	36.63

8.4.11. It is also observed that KE's data understates efficiency number by 1.5% for every unit, whereas numbers according to license information are more representative of the efficiencies of steam turbine based power plants of comparable size. The information in the preceding paragraphs has been examined for calculating the heat rates as follows:

8.4.12. Although the data provided by KE and Mott MacDonald report about heat rates at commissioning differ, yet the data provided by KE is used for working out the overall number for efficiency. For correction factor to be used for partial loading condition, KE requested that BQPS 1 will be expected to operate at 60% loading and requested to allow correction factors in the range of 1.0493 to 1.0775. KE in support of its claim stated that BQPS-I operates in the Economic Merit Order at the last position therefore it is used to meet the demand and supply gap as and when required. KE'S stance may be true for its historical operation however, logically speaking, steam based power plants like BQPS-I are required to be operated as base load plants and not as peaking plants. Therefore, for future operations KE's operational practices are not accepted. KE is required to upgrade these plants, maintain them and operate these as per prudent utility practices. Accordingly for allowing any adjustment for partial loading operations, the Authority allows 70% loading of BQPS-I. The Authority evaluated correction factors for similar power generation units such as Jamshoro power complex wherein the Authority determined that heat rate of power generation unit deteriorates by 6% if operated at 60% loading. Since BQPS-I is expected to be operated at 70% loading, therefore adjustment factor of 1.0493 is considered for calculating the overall number for heat rate.

8.4.13. KE has also claimed a factor of 4% due to degradation of power generation units by directly subtracting 4% from the efficiency, which in fact translates to 13 to 13.5% increase in heat rate relative to the initial heat rate at the time of commissioning. It is to be noted that in its determination the Authority while referring to General Electric (GE) considered a maximum deterioration of 4% in heat rate for RFO fired steam turbine based power plants as reasonable for a 25 years old plant (that translates to a degradation factor i.e. 1.04) which clearly shows that the degradation factor claimed by K-Electric is significantly on higher side and needs to be rationalized. KE has not correctly applied the degradation factor therefore its arguments are

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not accepted on this parameter. Moreover, for degradation factors, for aging of power generation units, KE's request is not accepted as it is not based on correct interpretation of the concept.

8.4.14. When compared with the Authority's already allowed efficiency levels in the MYT determination dated March 20, 2017, it transpires that KE has already been provided reasonable cushion and operational flexibility in this regard. However, for accurate determination of efficiency levels KE will be required to conduct unit wise performance (Heat Rate) tests by an Independent Engineer.

8.4.15. While approving auxiliary consumption values for BQPS 1 the Authority already considered design and commissioning data of the plant, licensed values of the units, comparison with similar technology regional power plants, historical operational record of the plant and expected decommissioning of older units. Notwithstanding above, the calculation and rationale of allowing unit wise auxiliary consumption targets have been reviewed while taking in to account the data submitted by KE through its Review Motion.

8.4.16. The submissions of K-Electric regarding commissioning data of the power plant have been analyzed and it is noted that the auxiliary consumptions mentioned by KE while referring to commissioning data are not consistent with the auxiliary consumption values as mentioned in the license of KE issued in 2002. The following table shows a comparison of KE provided data with the information submitted as part of license application.

BQPS 1	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Auxiliary Cons % - Existing Plant Characteristics in year 2002 as indicated by KE	6% ~ 8%	6% ~ 8%	6% ~ 8%	6% ~ 8%	6% ~ 8%	6% ~ 8%
Auxiliary Cons % -As per KE while referring commissioning data	6.3% ~ 8.64%	6.3% ~ 8.64%	6% ~ 8.2%	6% ~ 8.2%	6.10% ~ 8.3%	6.20% ~ 8.57%

8.4.17. It may be observed that the auxiliary consumption values for existing facilities in year 2002 are lower than the values as were at the time of commissioning which puts the question mark on the authenticity of data provided by KE. The aforementioned observation is also supported by the annual generation statistics of the company and the data as provided by Generation and Coordination department of KESC to Mott MacDonaldfor due diligence report wherein auxiliary consumption value of unit 5 was even less than 6% and varied in the range of 5.22% to 5.58% from year 1995 till 1998.

8.4.18. KE submitted its data about BQPS 1 based on the historical operational record and requested to allow an impact of part load operations for evaluating auxiliary consumption. The Authority considers that part load operation resulting in output restrictions may be due to several reasons (including gas fuel constraints, availability issues, dispatch restrictions owing to low demand

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or transmission / distribution evacuation issues, maintenance issues at the plant, load shedding plan and working capital constraints etc.). The Authority after reviewing the data did not agree with the contention of K-Electric as already discussed and is of the view that part load operations owing to inefficiency of K-Electric (such as power evacuation constraints and maintenance issues etc. at the plant) may not be passed on to the end consumers and therefore considered 70%loading (of rated capacity) of units of BQPS-1 being prudent /justified numbers for calculating auxiliary consumption targets.

8.4.19. In view of the above discussions, however, the Authority decides that the parameters allowed earlier are provisional and directs K-Electric to arrange performance test (Heat rate test) by an Independent Engineer within a period of six months from the date of notification of the instant tariff determination. The selection process and appointment of an independent engineer shall be approved by NEPRA, whereas, the tests shall be conducted in the presence of NEPRA professionals as observers. The adjustment in heat rates will be made based on the results of the performance (Heat Rate) test.

8.5. Revised Investment Plan - 900 MW BQPS-III

8.5.1. The Authority in its MYT determination of March 20, 2017 allowed K-Electric an overall investment of Rs.237,631 million for its existing as well as future proposed addition in the Generation, Transmission and Distribution Systems. The Investment under Generation part included an amount of Rs.23,124 million for 250 MW Korangi Power Complex (KPC).

8.5.2. K-Electric vide its letter dated March 06, 2017, although, apprised the Authority regarding proposed addition of 900 MW RLNG plant at Bin Qasim, however, no details with respect to its project costs, operational assumptions and plant specifications etc. were provided by K-Electric. The Authority, therefore, restricted itself to the submitted investment plan and did not incorporate the investment of BQPS-III in its MYT determination of March 20, 2017.

8.5.3. K-Electric in its review petition dated April 20, 2017 submitted that it has planned 450 MW x 02 Combined Cycle Power Plants (BQPS–III) operating on RLNG instead of the proposed 250 MW KPC. Moreover, power purchases of 770 MW from external IPPs, including K-Energy (coal conversion of units 3 and 4), are no longer envisaged. KE consequently submitted that units 3 and 4 of BQPS-I will be decommissioned. This change, as per KE, will help optimize the fuel mix, improve generation efficiency, reliability and reduce reliance on IPPs which ultimately will benefit the consumer in the form of lower tariffs due to reductions in capacity payments and lower fuel cost variation.

8.5.4. KE further mentioned that as part of this project, existing Korangi 220 MW CCPP, currently operating on 220 KV would now be shifted to 132 KV which will help in over-coming the transmission constraints in the system and shall facilitate new 900 MW to be dispatched through the EHT network. This change will help in relieving 220 kV circuits in southwest

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region and shall provide redundancy for rehabilitation and up-gradation of EHT network. In addition, three more grids will be rehabilitated to increase the reliability of network.

8.5.5. In order to provide N-1 contingency for 220 kV transmission network, K-Electric proposes to enhance and rehabilitate the outer 220 kV EHT ring from BQPS towards Maripur - Baldia by re-conductoring the constrained transmission network on fast track basis. Further, focus will be on increase in automation, replacement of aged equipment and increase protection to ensure reliable and uninterrupted supply of power.

8.5.6. K-Electric has also filed Licensee Proposed Modification (LPM) dated August 31, 2017 for inclusion of the 900 MW BQPS-III in its Generation License and decommissioning of Unit 3 and 4 of BQPS-I. K-Electric vide its letter dated September 18, 2017 also provided the estimates for Project cost and operational assumptions for the proposed BQPS-III power plant and its allied projects as detailed hereunder;

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Operational Assumptions

Description	Phase-I Simple	Phase-I Combine	Phase-II Simple	Phase-II Combined
Installed Capacity -MW	300	450	300	450
Available Capacity - MW	280	410	280	410
Online Date	Jul-18	Jul-19	Apr-19	Dec-19
Auxiliary %	2.50%		2.50%	
Gross Efficiency % - LHV	38.3%	57.6%	38.3%	57.6%
Net Efficiency % - LHV	37.4%	56.1%	37.4%	56.1%
Gross Efficiency % - HHV	34.7%	52.1%	34.7%	52.1%
Net Efficiency % - HHV	33.9%	50.8%	33.9%	50.8%

*Project Cost Phasing	2018	2019	2020	Total
	USD in Million			
Phase-I	187	187	65	439
Phase-II	130	166	143	439
Allied Projects	47	41	21	109
Total Project Cost	364	394	229	987

* Project cost is inclusive of ECA premium, financing fee, commitment fee and IDC.

Financing Phasing	2018	2019	2020	Total
	USD in Million			
Forign Debt	142	244	115	501
Local Debt	38	150	113	301
Equity	184	0	0	184
	364	394	228	986

* Includes IDC Financing.

Financing Assumptions

LIBOR Spread	4.50%	Grace Period	3 Years
Hedging Cost-Foreign Borrowing	7.00%	Repayment Period	7 Years
KIBOR Spread	2.50%	Drawdown Starting From	April 2018

Debt/Equity Ratio

	USD in Million	
Debt	802	81%
Equity	184	19%
	986	**100%**

Note: These details are based on best estimates and will be firmed up after EPC finalization and Financial Close.

8.5.7. The Authority has analyzed the aforementioned cost estimates and the operational assumptions of the proposed BQPS-III Power Plant. The Authority believes that the Project cost estimates submitted by K-Electric, when evaluated in comparison with other similar/ comparable plants, is on the higher side while its efficiency is lower. The Authority, in the matter of Haveli Bahadur Shah (HBS) RLNG plant of 1,230.54 MW, has allowed project cost @ US$0.694 million/MW with net LHV efficiency of 62.445%. Accordingly, for BQPS-III, a project cost of US$ 624.6 Million @ US$ 0.694 million/MW has been considered by the Authority in its

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financial projections for the tariff control period. Here it is pertinent to mention that although KE has claimed an amount of Rs. US$109 million for the allied projects in its MLR, however, as per the latest financial model submitted by K-Electric, it incorporated an amount of US$ 106 million for the allied projects instead of US$ 109 million, therefore, while making its future projections, the Authority has considered an amount of US$ 106 million for the allied projects for the tariff control period. Consequently, the total cost for BQPS-III power plant and allied projects has been considered as US$ 730.51 million or Rs.84,408.6 million for the tariff control period.

8.5.8. Since the proposed 900 MW BQPS-III power plant has been benchmarked in terms of cost with HBS Power Plant, therefore, for the purpose of Generation O&M cost for BQPS-III, the cost allowed to HBS Power Plant has been considered as well while making K-Electric's financial projections for the tariff control period. Consequently, the Generation O&M cost of 250 MW KPC, being not envisaged any further, has been excluded from the financial projections.

8.5.9. K-Electric is directed to perform the Capacity and Heat Rate tests for the proposed BQPS-III power plant in a transparent manner by a reputable Independent Engineer in the presence of NEPRA professionals at the time of commissioning for the Authority's approval.

8.5.10. K-Electric is further directed to comply with NEPRA's guidelines namely "Selection of Engineering, Procurement and Construction Contractor by Independent Power Producers Guidelines, 2017" for its subject power plant.

8.5.11. Regarding decommissioning of Unit 3 and 4 of BQPS-I, the Authority has already deliberated this issue in its MYT determination of March 20, 2017 and under point VI of the Order Part decided that;

"In case K-Electric decides to lease out any of its existing power plants or Units including Unit 3 and 4 of BQPS-I, before expiry of their useful life, the indexed tariff components for the said plant or Unit i.e. O&M, Depreciation and RoRB components shall be adjusted from the tariff prevalent at the time of leasing out of such power plant/ unit. The O&M, Depreciation and RoRB components in terms of unit 3 & 4 of BQPS-I included in the tariff to be applicable from July 01, 2016 are Rs.0.0361/kWh, Rs.0.0260/kWh and Rs.0.0220/kWh respectively."

9. **Tariff Structure / Adjustment Mechanism**

9.1. K-Electric on the issue of Tariff Structure and its adjustment mechanism has stated that NEPRA modified the tariff adjustment mechanism from a flexible performance-based regime to a rigid rate-based structure which does not encourage efficiency and has been developed on the basis of a fixed investment plan of Rs.237 billion. This structure may only be suitable for green field transmission and generation projects requiring one-off investments, however, is not feasible

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for a VIU, where continuous reinvestment is required and the investment plan has to remain flexible to allow for any changes due to external factors.

9.2. Citing an example, K-Electric mentioned that its business plan assumes significant off-take from external IPPs which may be impacted due to any number of factors which are not under direct control of KE, therefore, if an IPP off-take contract does not materialize, there is no possibility for K-Electric to invest in own generation fleet to meet its obligation of meeting demand and supply gap. Thus, the business plan needs to be dynamic and flexible.

9.3. K-Electric also submitted that after acquisition by Shanghai Electric Power (SEP), SEP may require changes to K-Electric's business plan which will result in setting-up of 450 MW x 02 Combined Cycle Power Plants ("BQPS-3") operating on RLNG instead of the proposed 250 MW Korangi Plant. Moreover, power purchases of 770 MW from external IPPs, including K-Energy (coal conversion of units 3 and 4 of BQPS-I), will no longer be envisaged under SEP's plan. Consequently, units 3 and 4 of BQPS-I will be decommissioned. However, K-Electric will not be able to recover the additional debt servicing and repayment requirement, alongside incremental O&M cost for the new plant due to the fixed tariff structure.

9.4. K-Electric has requested to modify the adjustment mechanism to allow retention of efficiency improvements through induction of new generation plant based on a mechanism similar to that allowed under the Previous MYT. K-Electric also stated that cost of its TP-2 has been revised upwards by around USD 30 million, however, there is no provision in the tariff mechanism to adjust for changes in estimates.

9.5. K-Electric further stated that under the new tariff mechanism, improvements in T&D losses are no longer retained and the tariff will be adjusted with the set target of T&D losses on an annual basis, whereas significant reduction in T&D losses has been witnessed in the last control period, which was driven by the incentives built in the previous tariff mechanism which allowed retention of efficiency gains due to improvements in T&D losses.

9.6. In view of the foregoing, K-Electric submitted that it is imperative that the tariff structure should cater for such scenarios and provides incentives to the utility to make investments in new capacity and improve the operational efficiency of its existing generation, transmission and distribution businesses. KE argued that the performance-based tariff structure (especially in the context of the adjustment mechanism) provided during the previous control period is the most suitable model considering K-Electric's particular context, which allowed K-Electric to keep the benefit of efficiencies and the claw back mechanism ensured protection for consumers by limiting returns to a reasonable level. Further, to achieve its regulatory objective of monitoring the investment plan, NEPRA may continue with its mid-term investment review as introduced in the Determined MYT 2017.

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9.7. Accordingly, KE has proposed that the base rate adjustment component of PKR 0.53 per kWh in the base tariff be removed; the adjustment mechanism under MYT 2017 be modified on a mechanism similar to that allowed under the Previous MYT to allow retention of efficiency improvements through induction of new generation plant and reduction of AT&C losses.

9.8. KE proposed the following adjustment mechanism;

	Indexation/Adjustment
FUEL COST	
KE Existing Fleet and IPPs	**Monthly** The change in the fuel component of own generation and power purchase from IPPs due to variation in fuel prices and energy mix (excluding new KE plants) be passed on to the consumers. **Quarterly** The variation in the fuel component of own generation and power purchase from IPPs due to variation in fuel prices and energy mix (excluding new KE plants) over reference quarter be adjusted based on respective AT&C benchmarks
KE New Plants	**Monthly** The change in the fuel component due to variation in fuel prices be passed on to the consumers. **Quarterly** The variation in the fuel component due to variation in fuel prices over reference quarter be adjusted based on respective AT&C benchmarks
GENERATION O&M	
KE System	Annual CPI-X Indexation X defined as Lower of 2% or 30% of change in CPI
Power Purchase	**Quarterly** The variation in the Capacity and O&M component of power purchase from IPPs due to variation in capacity, O&M charges and energy mix (excluding new KE plants) over reference quarter be adjusted based on respective AT&C benchmarks.
Depreciation	No Indexation/Adjustment
Return on equity	No Indexation/Adjustment
Cost of debt	No Indexation/Adjustment
TRANSMISSION	
O&M	Annual CPI-X Indexation X defined as Lower of 2% or 30% of change in CPI
Depreciation	No Indexation/Adjustment
Return on equity	No Indexation/Adjustment
Cost of debt	No Indexation/Adjustment
DISTRIBUTION	
O&M	Annual CPI-X Indexation X defined as Lower of 3% or 30% of change in CPI
Depreciation	No Indexation/Adjustment
Other income	No Indexation/Adjustment
Return on equity	No Indexation/Adjustment

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	Indexation/Adjustment
Cost of debt	No Indexation/Adjustment
Retail margin	No Indexation/Adjustment
Other Cost Adjustment	
Unrecovered cost related to monthly fuel adjustments	Quarterly The impact of monthly variations in fuel cost component of own generation and power purchase price to the extent of benchmark AT&C losses, not taken into account in the monthly FCAs, shall be adjusted on quarterly basis.
WPPF, WWF and Other Cost (Bonus etc.) paid to IPPs/CPPA-G	Annual The actual payments in respect of WWF, WPPF and other items (bonus etc.) to the IPPs shall be considered as pass through and shall be adjusted on yearly basis upon production of verifiable documentary evidences. Upon recovery of the same, the impact of these items shall be reversed.
Corporate Tax liability paid by KE	Annual Any corporate tax liability to the extent of current tax paid (without the impact of deferred tax impact) would be treated as pass through and shall be allowed through adjustment in the tariff.
WPPF and WWF paid by KE	Annual Any WPPF and WWF liability to the extent of actual cost paid would be treated as pass through and shall be allowed through adjustment in the tariff.

9.9. KCCI on the issue submitted that allowing fixed rate base return in advance and delinking K-Electric's return with efficiency improvements may not be the prudent approach. Performance based structure is the most suitable structure as it will reduce the base tariff and will force KE to make investments to improve efficiency and increase sales. Minimum investment targets should be set and performance should be monitored every two years instead of four ensuring K-Electric becoming self-sufficient.

9.10. Whistle Blower International mentioned that huge investment of Rs.48.190 billion in Generation, Rs. 115.773 billon in Transmission and Rs.69.468 billion in Distribution segment has been approved and its recovery has been allowed from the consumers from day first of the MYT. There is no provision of this arrangement in Price or Performance based Tariff and in all other cases where Power Plants are being commissioned, these Plants start recovering the Investment amount after commissioning of the plant. Thus, NEPRA has not only allowed K-Electric to make Investment from the money of electricity consumers collected in advance but also allowed K-Electric to retain electricity consumers' money with it for as much time as it wants. The recovery in-advance from the consumers on account of Investment should be withdrawn.

9.11. GoS energy department opined that flexibility in terms of investment plan from its own sources should be allowed. It also stated that the impact of investments for future, which are yet to be materialized, should not be allowed in the advance i.e. utility be allowed a performance base

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mechanism, where investments are not directly recovered in tariff, but are rather funded through efficiency gains. GoS energy department also proposed to remove the base rate adjustment component and allow K-Electric to fund investments through retention of efficiency improvements. It also suggested that reduction in tariff along-with change in structure may result in losses to K-Electric.

9.12. Overseas Investors Chamber of Commerce and Industry (OICCI) mentioned that the new tariff announced by K-Electric is a departure from the previous regime and will cap the company's new investment potential, which could restrict service and efficiency improvements. Therefore, tariff may be reviewed to enable the company to offer reasonable return on equity invested and incentivize additional investments.

9.13. The Federation of Pakistan Chamber of Commerce & Industry (FPCCI) proposed that the concerns shown by K-Electric regarding proposed changes in regulatory policies may be given due consideration and a fair approach be taken so that efficiency and future plans are not affected.

9.14. LRBT stated that a realistic tariff structure shall be allowed that ensures adequate returns and financial stability offering right incentives for K-Electric to continue with its vision of better services. LRBT also stated that the new tariff structure will lead to losses and impede investment plans, resulting in declining service levels.

9.15. The Authority observed that under the earlier MYT 2002 no predetermined return component was built in the tariff, rather utility was allowed to retain the efficiency gains arising out due to cost reduction and/or further investment in the system during the tariff control period. Thus, the consumers were not burdened upfront. At the same time, K-Electric was guaranteed that no downward revision in tariff would be made during the control period and any efficiency gains achieved thereon *(excluding the impact of profit claw back)* were the legitimate right of K-Electric during the control period.

9.16. The Authority considers that the purpose of awarding performance based tariff and corresponding adjustment mechanism, was to incentivize the Utility to bring efficiency in its operations by making investments from its own resources, and therefore, efficiencies in the form of improved generation efficiency, reduced T&D losses, increase in consumer base and other operational improvements were allowed to be retained by K-Electric for the control period, as it was not granted any predetermined fixed return. However, continuation of the aforesaid mechanism after expiry of the MYT 2002 was not committed or allowed by the Authority.

9.17. As of today, the situation has changed; K-Electric is no longer a loss making entity, therefore, after the expiry of the control period, the Authority, considering it right time, decided to share the efficiencies achieved during the previous control period with the consumers. The Authority

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in lieu thereof has allowed a separate component of return to K-Electric on its existing as well as proposed future investments, as per the investment plan submitted by K-Electric. Allowing separate component of return on the existing as well as future proposed investmnets necessitates modification of the adjustment mechanism allowed in the previous MYT, in such a way that impact of efficiencies achieved during the tariff control period are passed on to the consumers in timely manner. Accordingly, the Authority modified the adjustment mechanism wherein the impact of any improved efficiency in generation is captured immediately. Further, a trajectory of T&D losses target has been given to K-Electric, whereby, the entire tariff shall be adjusted annually based on the respective year's T&D losses target.

9.18. In the Authority's opinion, the adjustment mechanism approved by the Authority is more transparent and ensures sharing of efficiency improvements with the consumers through periodic reduction in the tariff and therefore is in the interest of consumers. It also provides for responsibility and accountability of the utility to adhere to the efficiency targets strictly in accordance with the future time lines.

9.19. The previous MYT mechanism allowed-Electric to optimize its returns through reduction in cost, whether that was in Generation, Transmission and Distribution as the consumer end tariff was fixed (subject to certain adjustments). The instant model compels K-Electric to optimize returns through increase in sales and at the same time provides its with the opportunity to retain the benefits of higher efficiencies achieved during the tariff control period by way of reduction in T&D losses over and above the Authority's allowed level, reduction in load shedding and reduction in its O&M cost, thus, addressing the concerns of K-Electric and the Interveners / Commentators for allowing retention of efficiency gains to K-Electric during the previous tariff control period. The Authority noted that during the previous MYT, K-Electric was blamed for not making much investments in the Transmission and Distribution sector as the mechanism of previous MYT of 2002 did not have any penalty tool with regards to investments. However, the allowed adjustment mechanism in the MYT 2017 would penalize K-Electric if it deviates from its own submitted investment plan or even if it fails to achieve the targeted results, with the allowed investments.

9.20. The Authority on the point of allowing return upfront considers that if it has allowed return in advance, it has also taken away all the efficiency gains achieved by KE, which are higher than the return allowed to KE. Regarding return on future investments and allowing it upfront, the Authority considers it as KE's legitimate right as the efficiency gains earned during the last tariff control period through which it was supposed to carry out future investments has already been passed on to the consumers.

9.21. In view of the above discussion and after considering the comments of stakeholders, the Authority does not see any reason to change its earlier decision in this regard. The Authority

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has prescribed the adjustment mechanism for each component of the MYT 2017 in detail under para 31 of its MYT determination dated March 20, 2017.

9.22. On the point of K-Electric that being a VIU, it requires continuous reinvestment and the investment plan has to remain flexible to allow for any changes due to external factors, the Authority observed that the allowed investments is based on the Investment plan submitted by K-Electric itself, which was accepted by the Authority without any changes. Moreover, the additional investment in term of 900MW BQPS-III power plant and allied projects, after rationalization, has also been incorporated in the investment plan while deciding the instant review petition. The Authority is of the firm view that the Investment plan submitted by K-Electric is a well considered plan and K-Electric should adhere to the plan for its future implementation. K-Electric shall also ensure that the allowed distribution sector investments are made on a non-discriminatory basis at IBC level, giving priority to the high loss areas.

10. **Rate of Return and Calculation of RAB**

10.1. K-Electric regarding return component submitted that in the MYT 2017, the Authority has rebased the tariff thereby removing the efficiency gains achieved by K-Electric during the previous control period, and in lieu thereof, fixed return component has been built into the tariff based on written down value of fixed assets. In the earlier MYT, to ensure that returns remain within reasonable limits, returns were capped on the basis of RAB computed as sum of equity and debt (i.e. capital employed) through a claw back mechanism.

10.2. K-Electric further submitted that change in definition of RAB has resulted in a lower RAB and consequently, a lower component of return in the base tariff, which is not appropriate as it penalizes KE for certain investment and financing decisions taken on the basis of the previous MYT structure.

10.3. KE while explaining its stance mentioned that it was required to fund the accumulated loss of Rs.66.4 billion at the start of the previous control period as well as losses incurred during the initial years of the control period through injection of new equity, debt and reinvestment of profits. In addition, profits earned during the previous control period were also reinvested to fund the investments plan and, hence, could not be distributed to shareholders. Resultantly the equity invested in the business is not reflected as an investment in KE's fixed assets to the extent that it relates to funding of losses. KE in this regard provided the following numbers;

	PKR in million
Invested equity at the start of the control period	65,783
Fresh equity injected from FY 2010	37,523
Profits earned from FY 2012 to FY 2016 *(excl. deferred tax and incremental depreciation)* and re-invested in the business	75,901

Other reserve movements	315
Total equity invested	**179,522**
Accumulated loss at the start of the control period	66,350
Losses incurred in FY 2010 and FY 2011	20,983
Capex financed from equity from FY 2010 to FY 2016	92,189
	179,522

10.4. In view thereof, KE requested that it may be allowed return on actual invested equity *(excluding surplus on revaluation of fixed assets and deferred tax)* along with allowance of actual debt which completely reflects the return on capital invested into the company instead of return based on the written down value of the fixed assets and therefore should be calculated as follows;

Invested equity at the start of the period*	**XXX**
Add: Profits earned during the period *(excluding deferred tax & incremental depreciation)*	XXX
Add: Other comprehensive income/(expense)	XXX
Add: Further issue of share capital	XXX
Less: Dividends	(XXX)
Invested equity at the end of the period	**XXX**
Add: Long-term and short-term debt at the end of the period	XXX
Less: Cash at the end of the period	(XXX)
RAB	**XXX**

**Invested equity as at June 30, 2016 is PKR 179,522 million*

10.5. KE further stated that the Authority in the MYT of 2017 has used notional gearing assumption of 70:30 Debt to Equity while assessing the cost of capital based on the rationale that the same is applied for other power projects in the generation, transmission and distribution businesses. KE while objecting to the capital structure used by the Authority, submitted that KE's tariff structure is different as compared to greenfield project such as IPPs and STDC, because for greenfield projects it is possible to implement such capital structure from day one and secondly cost of debt is exactly passed through in the tariff. Whereas, in case of KE, a return on book value of fixed assets has been allowed along with depreciation, thereby, implying that capital recovery for both debt and equity is to be made through depreciation. However, depreciation is allowed in the tariff on the life of the asset (25 to 30 years), whereas, debt has to be repaid in a shorter period (10 years), thus, there is a significant mismatch in cash flows in tariff allowed to KE which is required to be financed by KE from its own resources.

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10.6. KE in this regard provided the following analysis regarding recovery of depreciation component of revenue in comparison with forecasted debt repayment plan over the tariff control period as follows:

PKR in million	2017	2018	2019	2020	2021	2022	2023	Total
Amount recovered through depreciation (A)	5,071	5,277	5,470	6,315	6,535	6,762	6,997	**42,427**
Long term debt repayments to be made								
Existing loans								
Syndicated loans	2,200	2,200	1,695	-	-	-	-	**6,095**
Sukook – PKR 22 billion	1,100	4,400	4,400	4,400	4,400	3,300	-	**22,000**
Others	450	-	-	-	-	-	-	**450**
	3,750	**6,600**	**6,095**	**4,400**	**4,400**	**3,300**	-	**28,545**
New loans								
250 MW Korangi Complex	-	-	3,882	3,882	3,882	3,882	3,882	**19,410**
TP-1000 project	-	-	2,772	5,545	5,545	5,545	5,545	**24,952**
TP-2 project	-	-	-	-	5,080	5,080	5,080	**15,240**
Distribution loan	-	-	385	771	771	771	771	**3,469**
	-	-	**7,039**	**10,198**	**15,278**	**15,278**	**15,278**	**63,071**
Total (B)	**3,750**	**6,600**	**13,134**	**14,598**	**19,678**	**18,578**	**15,278**	**91,616**
Surplus / (Deficit) (c=a-b)	**1,321**	**(1,323)**	**(7,664)**	**(8,283)**	**(13,143)**	**(11,816)**	**(8,281)**	**(49,189)**

10.7. KE stated that as per the above table, it has a debt repayment requirement of Rs.91 billion and will only recover Rs.42 billion through depreciation component in tariff control period, resulting in shortfall of Rs.49 billion, which is expected to be invested by KE while allowing no return for it. KE in this regard also cited examples of Lakhra Power Generation Company Limited ("LPGCL") where return on equity has been calculated based on invested equity, and GENCOs where separate components for actual cost of debt and depreciation are allowed in the base tariff.

10.8. KE, in view of its aforementioned submissions requested that for the purpose of calculation of base tariff, it should be allowed separate component for;

a) Return on invested equity *(excluding surplus on revaluation of fixed assets & deferred tax)*;
b) Actual cost of debt; and
c) Allowance for Depreciation

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11. **Return on Equity - Generation**

11.1. KE submitted that it has been allowed a return on equity of 15% along with a factor to cover foreign exchange fluctuation, for its generation business, in line with the RoE allowed to RFO/gas based IPPs. KE argued that the allowed rate is lower as its risk profile is higher than IPPs owing to capacity payment & sovereign guarantees and 25 to 30 year tariff period allowed to IPPs. Further IPPs operations are relatively straight forward; they are not required to reinvest and are not responsible for end to end planning.

11.2. KE accordingly, requested a return of 19.90% on its generation equity as detailed hereunder;

Return on equity allowed to RFO/gas based IPPs	15.00%
Additional risk premium	2.00%
Return on equity adjusted for additional risk premium	**17.00%**
Adjustment on account of exchange rate variation of 17.05%	2.90%
Return on equity for KE's generation business – PKR based	**19.90%**

12. **Return on Equity – Transmission**

12.1. Similarly for the transmission business segment, KE submitted that the allowed RoE of 15%, based on the return provided to STDC, is lower as STDC is wholly owned by the GoS as compared to KE which is a private entity. KE further stated that its risk profile is higher as compared to private transmission projects, as they benefit from right of way support, capacity and sovereign guarantees along with regulatory tariff for 25 to 30 years and exchange rate variations.

12.2. KE accordingly requested for a ROE of 22.24% on its Transmission equity as detailed hereunder;

Return on equity allowed on the basis of STDC	15.00%
Additional risk premium (2% for private vs public and 2% for lack of right of way support, sovereign guarantee, capacity guarantees and tenure)	4.00%
Return on equity adjusted for additional risk premium	**19.00%**
Adjustment on account of exchange rate variation of 17.05%	3.24%
Return on equity for KE's transmission business – PKR based	**22.24%**

13. **Return on Equity - Distribution**

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13.1. Regarding RoE for the Distribution Segment, KE stated that the allowed RoE of 16.67% on the basis of RoE allowed to XWDISCOS is lower as XWDISCOs are fully owned by the GoP as compared to KE which is a private entity. KE further mentioned that, unlike DISCOs, it does not enjoy any balance sheet support or sovereign guarantees for financing and its risk profile is significantly higher than other private sector investors. KE while justifying exchange risk variation for the distribution segment submitted that private sector investors benchmark their returns to dollarized levels, as is the case in private sector generation and transmission investments, therefore, private investor in distribution business should also be allowed an adjustment on return on equity for exchange rate variation.

13.2. In view thereof, KE requested RoE of 24.19% for its distribution business, as mentioned hereunder;

Return on equity allowed on the basis of XWDISCOS	16.67%
Additional risk premium (2% for private vs public and 2% for lack of right of way support, sovereign guarantees and high operating risks)	4.00%
Return on equity adjusted for additional risk premium	**20.67%**
Adjustment on account of exchange rate variation of 17.05%	3.52%
Return on equity for KE's distribution business – PKR based	**24.19%**

14. <u>Cost of Debt</u>

14.1. K-Electric, on the allowed level of cost of debt of 11.71%, computed by taking into account levelized value of LIBOR and KIBOR over the 7 years period, hedging cost of 5.5% and a spread of 2.5% and 4.5% over KIBOR and LIBOR respectively, requested to be allowed additional Sinosure insurance premium of 1.8% as most of its funding out of Rs.330 billion for next tariff control period is from Chinese lenders. KE while justifying the Sinosure Insurance premium submitted that historically the same has been over 8% of loan principal and its impact on loan spread on an IRR basis is estimated to be 1.8%.

14.2. Regarding hedging cost, KE stated that it is the difference between KIBOR and LIBOR plus a premium. KE further stated that since its forecasted LIBORs and KIBORs floating rates over the ten-year control period have been accepted by NEPRA, therefore, hedging cost of 7.1% assumed by KE in its business model should be used for financial projections.

14.3. Based on the above analysis, KE requested the following cost of debt:

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	Rate*	Spread	Insurance premium	Hedging	Total	Weight*	Requested
LIBOR	2.3%	4.5%	1.8%	7.1%	**15.7%**	78%	12.2%
KIBOR	9.4%	2.5%	-	-	**11.9%**	22%	2.6%
							14.8%

14.4. KE further requested that it has requested a performance based adjustment mechanism where future investments are funded through retention of efficiency gains therefore only actual cost of existing debt should be allowed in the base tariff. However, average interest rate movement over the next control period should be allowed in accordance with the methodology adopted by NEPRA in the Determined MYT 2017.

14.5. Whistle Blower international on the issue stated that WACC of 13+% is a high rate, keeping in view the current interest rates and the rate of return in this business around the globe, as well as the large quantum of the business. Whistle Blower proposed that this rate should not be more than 9-10%.

14.6. GoS Energy Department in this regard stated that reasonable returns may be allowed to K-Electric in line with its risk profile as well as returns offered to other private investors in the power sector.

14.7. CPPA –G on the point of return, submitted that the determined Rate of Return for all segments is reasonable by comparing market risk of comparable business and may be maintained.

14.8. KCCI on the point of changing calculation of RAB, submitted that the actual equity invested by K-Electric is not reflected in the RAB, and should be consistent with the previous strategy, yielding positive results all round. Considering K-Electric's unique structure and business, comparing it with other entities in the power sector is not rationale.

14.9. On the point of calculation of RAB from equity side, the Authority is of the view that KE in the past has been financing towards accumulated losses, however, keeping in view the present state of affairs of the company, and the fact that a component of return has been added *(in lieu of efficiency gains)* in the tariff for the existing as well as future assets, it became necessary to modify the mechanism for calculation of RAB, to be calculated from the asset side of the financial statements, in order to encourage more investments for system expansion and rehabilitation to ensure safe and reliable supply of electricity to the consumers. Here it is also pertinent to mention that after the aforementioned changes, if RAB is allowed to be calculated from the equity side as requested by KE, it would tantamount to allowing return on past accumulated losses; for which any risks of such gain or loss were to be borne by K-Electric. Further at the time of purchase, the investor had already discounted the bid price in view of the existing and the prospective future losses at the time of its privatization. Therefore, in view of the above discussion, and keeping in view the submissions of Interveners/ Commentators,

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the Authority does not see any reason to change its earlier decision regarding calculation of RAB from the asset side of Balance sheet. The Authority deliberated this issue in detail under para 25.16 of its MYT determination dated March 20, 2017.

14.10. On the arguments of K-Electric regarding claimed mismatch of the depreciation component and loan repayment, the Authority considers that depreciation and principle repayment gap arises only for the initial years. The depreciation component would continue to exist even after the repayment of the principle and would continue for 10-15 years after the repayment of principle. It is a standard accepted practice that any such gap, is funded initially from the allowed RoRB. Once the asset becomes free of charge it improves the worth of balance sheet which can be used as a collateral for further financing. In addition, KE being a going concern is required to make continuous investments in the system, therefore, such timing gaps are always expected. However such gaps are bridged through effective cash management by the utility, the impact of which has already been considered in our cash flow projections for the instant decision.

14.11. The Authority is also of the view that actual debt equity ratio of entities keep on changing with the payment of debts and changing gearing profiles, hence, may or may not be of optimal mix at any specific point in time. That is the reason why the Authority allows a mix of capital structure which it considers to be the optimum. Accordingly, the Authority decided to adopt debt equity structure of 70:30, in the instant case for the purpose of calculating WACC, which is in line with the same as approved for other DISCOs. In view thereof, the Authority maintains its earlier decision in this regard. The Authority has deliberated this issue in detail under para 25.21 of its MYT determination dated March 20, 2017.

14.12. On the point of RoE on Generation assets, the Authority observed that K-Electric was allowed a total RoE of 17.56% for generation plants, comprising of 15% RoE and 2.56% on account of exchange rate variation, in line with the return allowed by the Authority to other thermal IPPs, in accordance with Rule 17(3) (ii) of NEPRA (Tariff Standards & Procedure) Rules 1998. Therefore, the Authority maintains its earlier assessment in this regard.

14.13. For RoE on Distribution assets, the Authority allowed RoE of 16.67% in line with the RoE allowed to XWDISCOs, as K-Electric bears the same risks of distribution business. The Authority, therefore maintains its earlier decision in this regard.

14.14. Regarding RoE on transmission assets, K-Electric has been allowed an RoE of 15% in line with the RoE allowed to STDC and NTDC, which bears the same risks of transmission business. The Authority therefore maintains its earlier assessment in this regard.

14.15. The argument of Sovereign Guarantee raised by K-Electric, has already been addressed by the Authority in the MYT determination of March 20, 2017 at para 21.22 as reproduced hereunder;

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"The Petitioner has to understand that an IPP has to enter into Power Purchase Agreement (PPA) with an agent i.e. CPPA-G which is dependent upon the performance of distribution companies, having risk of recovery from different areas of the utilities with different risk profile. DISCOs being owned by the GoP have been protected through sovereign guarantee for non-performance of its utilities. In contrast the Petitioner being a vertically integrated utility has a direct control over its customer base, hence is not dependent on the government for recoveries. Further, the argument of Sovereign Guarantee is not relevant as it defeats the main purpose of Petitioner's privatization."

14.16. Regarding additional margin of 2% requested by K-Electric, on account of being a private entity, the Authority considers that the transmission and distribution license granted to K-Electric provides exclusivity for its operations, whereby, laying down any distribution or transmission lines is the sole responsibility as well as opportunity for K-Electric to increase its consumer base irrespective of its ownership with respect to being private or public.

14.17. The Authority on the issue of cost of debt observed that K-Electric has been allowed cost of debt of 11.71% including hedging cost @ 5.5% in the MYT determination dated March 20, 2017.

14.18. Regarding cost of Debt KE has requested for allowing additional Sinosure fee of 1.8% by claiming that most of its funding out of Rs.330 billion will be through Chinese financing and also requested for an increase in hedging cost from allowed 5.5% to 7.1%.

14.19. Regarding Sinosure fee, the Authority noted that KE has not provided any evidence of its major portion of future financing through Chinese lenders neither the same could be substantiated from the updated financial model submitted by K-Electric to the Authority, therefore, not included by the Authority. However, in case Sinosure fee is incurred, the Authority may consider it at the time of midterm review, based on the Authority's decisions on Sinosure fee in other cases. The same may be allowed as a separate period cost item in the subsequent quarterly tariff adjustments if K-Electric's actual weighted average cost of debt due to inclusion of Sinosure fee is found higher than the Authority's assessed weighted average cost of debt.

14.20. Regarding hedging cost, the Authority has allowed a hedging cost of 5.50% to K-Electric as against KE's request of 7.10% in the MLR. However, K-Electric in its latest financial model, submitted to the Authority, has incorporated hedging cost @ 7%.

14.21. While calculating K-Electric's cost of debt, the Authority carried out its own projection for future KIBOR and LIBOR values, however, accepted KE's projections in this regard being reasonable. The Authority having considered K-Electric's assumptions of LIBOR & KIBOR, is of the view that K-Electric's contention regarding hedging cost carries weight and the future assessment in this regard needs to be reviewed.

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14.22. Accordingly, the Authority by taking the levelized value of difference between LIBOR and KIBOR over seven years period has reassessed hedging cost as 6.58%, which has accordingly been incorporated while working out the KE's cost of debt. Here it is pertinent to mention that since FY 2016-17 has already lapsed, therefore, the Authority while working out the hedging cost as well as cost of debt has taken the actual values of LIBOR and KIBOR as on Dec. 2016 and June 2017. In view of the foregoing discussion, the cost of Debt of K-Electric for the tariff control period works out as 12.51%. Consequently, the overall WACC allowed to K-Electric during the tariff control period has been revised to 13.83%.

14.23. The issue of K-Electric to allow only the actual cost of existing debt in the base tariff with a performance based adjustment mechanism, whereby future investments are funded through retention of efficiency gains, has already been discussed in detail under the issue of tariff structure / adjustment mechanism.

15. **Retail Margin**

15.1. KE submitted that it has been allowed a return on RAB approach for the distribution business, which only caters for the network business and does not compensate for the exposure to challenges inherent in its retail business. As per KE, the traditional return on capital approaches is not suited to assess appropriate returns for this business which limits the potential revenues that can be derived directly from the regulated asset base. KE also quoted examples of international regulators in this regard whereby this aspect has been covered by provision of retail margin to the utilities particularly where the business under consideration is 'asset-light'.

15.2. In view thereof, K-Electric requested a retail margin of 3% on turnover to be included in the tariff for next control period keeping in view the international precedents, its large consumer base, higher risk profile and to have an incentive to both earn a return and to continue to invest to improve future performance, which is not sufficiently compensated by the return on RAB approach.

15.3. The Authority on the point of retail margin on turnover, is of the considered view that retail margin is generally given in those cases where the wire and retail businesses are separate functions and there is competition in retail segment. In case of K-Electric, both these functions are combined, and the Authority has allowed an overall RoE of 16.67% for the distribution function, in which risk associated with retail business has been taken into account, thus allowing separate retail margin of 3% is not justified. Here it is pertinent to mention that while rebasing K-Electric's tariff, the Authority used K-Electric's actual O&M costs which includes costs pertaining to its retail business as well.

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16. **Growth in O&M Expenses and Other Income**

16.1. K-Electric submitted that the NEPRA's projected Net O&M Expenses and Other Income (Net O&M Expenses) in the MYT 2017 is unrealistic as O&M Expenses are expected to grow at a higher pace due to increase in KE's generation capacity, T&D network and operations. Further, growth in Other Income assumed by NEPRA is not in line with historic trends, resulting in lower projection of Net O&M Expenses by Rs.29 billion over seven year periods as detailed hereunder;

	As per NEPRA forecast	As per KE's forecast	Difference
	FY 2017 - 2023 (PKR in billion)		
O&M expenses	225	250	(25)
Other income *(excluding Late Payment Surcharge)*	(41)	(37)	(4)
Total	**184**	**213**	**(29)**

16.2. KE further stated that the total forecasted revenue in respect of Net O&M Expense component of tariff is PKR 198 billion in the next 7 years as against the projected expenses assumed by NEPRA of PKR 184 billion. As a result, NEPRA has assumed an unrealistic gain in respect of Net O&M expenses of around PKR 14 billion in its projection. K-Electric also argued that under the performance based CPI-X mechanism, gains earned in O&M expenses through efficiency are to be retained by the company as performance incentive. However, by assuming efficiency gains in its financial projections for calculation of base rate adjustment component, gains, which should have been allowed to KE, have been rather disallowed through adjustment in tariff on year to year basis by adjusting the base rate adjustment component. Accordingly, KE has requested the Authority to consider the financial projection of O&M Expenses and Other Income as per business plan submitted by KE instead of assuming any unrealistic gain in its financial projection.

16.3. Mr. Arif Bilwani on the issue of assessing generation cost, submitted that no comparison has been made with the generation expenses incurred by other power producers or GENCOs to authenticate the reasonableness of the KE's claim. KE's request for increase of Rs.0.66/kWh in the O & M component has been substantially accepted on the lame excuse of being still lower than the request and for justifying the increase. The comparison of T&D cost has been made between K-Electric, LESCO, IESCO & FESCO along-with units received, conveniently ignoring the facts about size of network, number of consumers served, density of consumers per KM etc.

16.4. Whistle Blower submitted that reduction of Rs. 3.50/kWh in the MYT is just to create an optical illusion as NEPPA has actually increased the base number of all Tariff components i.e. O&M component for Generation, Transmission and Distribution systems and also a new Investment component has been introduced. The Tariff components given in the MYT of 2002 and 2009

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were subject to indexation and this practice needs to be continued with indexation. Increase in these Tariff components is not at all justified rather with increase in sale of electricity units, O&M expense is required to be decreased. Whistle blower also mentioned that NEPRA, while allowing the higher O&M cost, compared the same with some of the IPPs and not with the cost of GENCOs; BQPS-1 is of similar type to those of GENCOs. Whistle Blower also highlighted overcharging of KE's Generation O&M cost on the units purchased from external sources.

16.5. Mr. Mazhar Ali argued that against KE's requested increase of Rs.0.66 /kWh in O&M, NEPRA allowed an increase of Rs.0.35-37/kWh, but in fact KE's O&M is reducing day by day due to slashing employee's strength by 7,000. Further KE is purchasing electricity from IPPs which narrows the space of allowing any increase in O&M.

16.6. Jamat e Islami regarding increase in O&M cost by 37 paisa stated that the same is not justified and no increase be allowed owing to reduction in head count from 17,567 to 10,000.

16.7. On the point of Mr. Bilwani that the Authority did not make any comparison of the generation expense with other Power producers or GENCOs, the Authority noted that in para 25.11.6 of the determination dated March 20, 2017, a comparison of the Generation O&M cost of K-Electric has been made with comparable IPPs. Further, on the concern of Mr. Bilwani to make comparison of Transmission and Distribution cost of K-Electric with other XWDISCOs, without accounting for the size of network, number of consumer served, density of consumers per KM etc. the Authority, observed that it has discussed this issue in para 25.12.13 of the determination, wherein it has been discussed that as every company has its own dynamics, so making a comparison in terms of area, sales, network, customer base etc. is not prudent, therefore, the more appropriate approach would be to analyze the aforementioned costs on per unit basis.

16.8. Regarding concern of M/s Whistle Blower that the O&M component should have been maintained after allowance of indexation, the Authority has already discussed this issue in para 25.7 of the MYT determination dated March 20, 2017, wherein it is mentioned that the allowed indexed O&M cost components were not sufficient for the recovery of actual O&M cost of K-Electric, rather the same was being managed through cross subsidization within the allowed overall average tariff. Further, the Authority, considering the fact that the efficiencies achieved during the previous MYT period are no longer retained by K-Electric and have now been passed on to the consumers, re-assessed the O&M cost of K-Electric, on the basis of available record to ensure recovery of the prudently incurred cost that going forward would enable the utility to remain financially viable to meet its operational expenses as well as would enable it to pursue its future investment plans, which is also in the interest of consumers. The matter has been discussed in para 25.8 of the MYT determination.

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16.9. On the point of Mr. Mazhar Ali and Jamat-e-Islami that the O&M cost is reducing day by day due to slashing employee's strength by 7,000, here it is pertinent to mention that the Authority allowed O&M cost to K-Electric based on its results for the FY 2015-16, whereby impact of any reduction in head count has already been accounted for.

16.10. The Authority while doing the projection of O&M cost has considered the actual O&M cost of K-Electric for the FY 2015-16 for the base case for future increases. The increase in the cost has been projected in line with the increase in sales growth, target of T&D losses and load shedding assumptions. In addition the Authority also considered the historic actual increases in KE's O&M.

16.11. Here it is pertinent to mention that due to change in assumptions of load shedding, assessment of T&D losses for the control period and inclusion of Generation of BQPS-III the pleadings of K-Electric in respect of not allowing gains earned in O&M expenses through efficiency are no longer valid.

16.12. The Authority observed that its assumptions of projections of O&M cost have already been discussed in detail under para 28.30 of the MYT determination dated March 20, 2017. The Authority based on the submissions of K-Electric and the Interveners/ Commentators does not see any rationale to change its earlier assumptions regarding projections of O&M costs.

17. <u>Fixed Charges Growth Assumption</u>

17.1. K-Electric in this regard stated that in the MYT 2017, for development of Schedule of Tariff (SoT), NEPRA has assumed that Maximum Demand Indicator (MDI) used for billing of fixed charges will grow with the same growth rate as assumed for units billed. However, historic trend suggests that this assumption does not hold true as KE's units billed grew by CAGR of 5% during the last six years, whereas MDI billed grew by CAGR of 1.9% during the same period. K-Electric provided the following growth in Units Sold viz-a-viz load over the last 6 year period from FY 2011 till FY 2016;

Year	Units Billed (GwH)	MDI (MW)
FY - 11	10,059	13,434
FY - 12	10,277	13,616
FY - 13	10,942	14,199
FY - 14	11,453	14,266
FY - 15	12,294	14,532
FY - 16	12,865	14,781
CAGR	5.04%	1.93%

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17.2. KE accordingly requested that a revised SOT should be formulated, based on realistic assumptions of growth in load (MDI) and units billed.

17.3. The Authority observed that while projecting future revenues of K-Electric during the tariff control period, the average sale rate worked out for the respective year, after allowing for the allowed adjustments in the base / reference tariff, was multiplied by the projected units to be sold in that year, to calculate the total revenues. However, the sale rate so worked out did not include any bifurcation in terms of fixed rate and the variable rate, meaning thereby that both fixed as well as variable revenues were assumed to increase at same rate.

17.4. However, after considering the submissions made by K-Electric and keeping in view the the historical trend in load growth vis a vis growth in units billed, the Authority considers K-Electric request legitimate and accordingly, has revised its assumptions in terms of load growth for projecting future revenues during the tariff control period, the impact of which has been incorporated in the tariff through base rate adjustment component.

18. **Profit Claw Back Mechanism**

18.1. KE has argued that the revision in definition of RAB and EBIT in the MYT 2017 along-with the clawback thresholds is not appropriate and it penalizes KE for certain investment and financing decisions taken on the basis of previous MYT structure.

18.2. KE further submitted that only profits appearing in audited financial statements, which are determined under approved financial reporting framework applicable in Pakistan, accrue to a company and can be distributed to shareholders. Therefore, inputs used for the purpose of clawback should be based on audited financial statements and cannot be based on any working prepared for regulatory purposes as NEPRA has done, by adding back provision for doubtful debts in the calculation of EBIT.

18.3. KE proposed that for the purpose of calculation of clawback, EBIT should be computed in a manner consistent with the calculation of RAB and accordingly requested that EBIT should be based on KE's audited financial statements with the adjustment of incremental depreciation due to revaluation of fixed assets and tax allowed as pass through item in the MYT 2017 as follows;

EBIT as per financial statements	XXX
Add: Impact of incremental depreciation due to revaluation	XXX
Less: Tax allowed as pass through	(XXX)
EBIT	XXX

18.4. Regarding clawback thresholds, KE mentioned that it should be allowed a market rate of return in line with other private power sector investors to ensure its returns commensurate with the risks relating to its generation, transmission and distribution businesses. Accordingly, KE

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requested the following sharing mechanism if the return based on EBIT and RAB exceeds the following thresholds;

Returns	Proposed Clawback Thresholds
Where the return exceeds 15% but remains within 18%	25% of the return in excess of 15%
Where the return exceeds 18% but remains within 20%	In addition to above, 50% of the return in excess of 18%
Where the return exceeds 20%	In addition to above, 75% of the return in excess of 20%

18.5. The Authority understands that its decision of calculation of EBIT, for the purpose of Profit Claw Back, by adding therein the provision for bad debts was necessitated due to the Authority's decision of not-allowing K-Electric the provision for bad debts. If the same is not added back in the EBIT, it would mean that K-Electric has indirectly been allowed such cost which has otherwise been disallowed, meaning thereby that burden of K-Electric's inefficiencies has been passed on to the consumers.

18.6. The Authority already in its MYT determination dated March 20, 2017 under para 30.9.7 has decided as under;

"Previously the Petitioner's EBIT as per its Audited Financial Statements was considered for calculating the percentage of return, and only the impact of incremental depreciation due to assets revaluation was added back, thus any expenses charged to P&L were allowed including provision for bad debts.

In the light of the Authority's instant decision to disallow provision for bad debts and allow only write offs coupled with the changes / adjustments made in the Other Income has necessitated revision in calculation of EBIT for the purpose of claw back mechanism….."

18.7. The Authority, however, considers that the point of K-Electric to adjust the amount of Tax or any other cost allowed as pass through is valid and shall be deducted while calculating the EBIT for the purpose of claw back. Further, in view of the instant decision of the Authority to consider the amount of actual write offs of K-Electric for each year of the Tariff control period (discussed in detail the ensuing paragraphs), also warrants changes in the calculation of EBIT. Accordingly, for the purpose of Claw Back, EBIT shall be calculated as per the following methodology;

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Earning Before Interest and Tax as per the financial Statement

Add Provision for Doubtful debt

Add Any other provision / expense charged by the Petitioner that the Authority considers unjustified

Add Depreciation charged to P&L with revaluation

Less *Write-offs amount allowed by Authority for respective year

Less Depreciation for the Year on Cost basis

Less Late Payment Surcharge (LPS)

Less Any Cost Allowed as Pass-through by the Authority (e.g. Corporate Tax Paid, WWF, WPPF, etc.)

EBIT for the purpose of application of Clawback

* Write-offs amount allowed means the amount projected in tariff plus any amount allowed as per the Write off adjustment mechanism.

19. <u>Load Shedding Assumption</u>

19.1. KE has submitted that the Authority in its MYT 2017 observed that KE's policy of Segmented Load Shed is not consistent with the NEPRA's approved performance standards and directed KE to immediately start taking necessary measures to eliminate load shedding in Karachi within the next three years.

19.2. KE in this regard argued that Ministry of Water and Power has formally approved the segmented load shed in its National Power Policy 2013 and accordingly all XWDISCOs carry out load shed in areas based on their recoveries and line losses. The load shed carried out by XWDISCOs is significantly higher than load shed carried out by KE as XWDISCOs, for areas above 70 percent losses, carry out 18 hours of load shed, and whereas, similar areas in KE face 7.5 hours of load shed.

19.3. KE further submitted that in addition to reduced hours of load shed as compared to XWDISCOs, as per its vision of a load shed free Karachi, KE is working aggressively on its Project Ujala *(ABC with low cost meter and community engagement)* which is targeted to convert very high loss areas into low loss areas. In this respect, NEPRA needs to consider that Segmented Load Shed policy is pivotal for KE in getting support from local communities, especially in areas having law and order and access issues, as it provides an incentive for communities to support KE which ultimately benefits them through exemption from load shed and provision of reliable supply.

19.4. Accordingly, KE requested the Authority that the matter of Segmented Load Shed be adjusted after deliberation with all stakeholders including GoP and till such time, K-Electric's assumptions regarding load shed be used for future growth projections.

19.5. Whistle Blower objected the K-Electric's Segmented Load -Shedding Policy i.e. more Load-shedding in high loss areas and vice versa by stating that the same is against the applicable laws of NEPRA and the Constitution of Pakistan.

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19.6. On the issue of segmented load shedding, the Authority at para 53.4 of the MYT determination dated March 20, 2017 has already adjudicated that since this practice is being followed throughout the country, hence it would adjudicate on the issue in separate proceedings. The Authority, however, while making projections of sales and sent out units of K-Electric for the tariff control period, assumed a zero load shed after the FY 2019, owing to the fact that K-Electric's TP-I would be completed by the FY 2019. The Authority considering the fact that TP-I is already delayed, as stated by K-Electric, therefore, it has decided to revise its assumption with respect to load shedding in the tariff control period.

19.7. Although, the Authority in its MYT determination dated March 20, 2017 directed K-Electric to eliminate load shedding within next three years, however, considering the judgment of Supreme Court of Pakistan whereby the Honorable Court in Human right cases No.14392/2013 & 790-G/2009 in the matter of unprecedented load shedding and increase in electricity prices dated 26-11-2013 under para 36 (ii) decided that a policy has to be announced by the NTDC / DISCOs under which supply of electricity to the consumers who believe in law and make payments in time, is encouraged & supply of unauthorized consumers is discouraged and also keeping in view the fact that the same practice is being followed by other XWDISCOs throughout the country, the Authority is of the view that it would be unfair with K-Electric to set a target of zero load shedding for those areas where its recoveries are low. Here it is pertinent to mention that in the matter of XWDISCOs, they are not penalized for any sort of load shedding.

19.8. K-Electric has not been allowed provision for doubtful debts in MYT 2017, meaning thereby that any recovery loss in excess of write offs shall be borne by K-Electric and will not be passed on to the consumers, thus, consumers have been protected from any adverse impact upfront. Therefore considering high recovery in high loss areas, would mean penalizing the utility twice, which would be against the principles of equity and justice.

19.9. The instant MTY 2017 allows the Utility to maximize its profits by higher sales growth, therefore, an incentive should be provided to K-Electric to minimize load shedding in order to increase its sales and earn higher profits, which would also be benefiting the consumer in the shape of exemption from load shed and provision of reliable supply.

19.10. Accordingly, for the purpose of making future financial projections of K-Electric, the sales as projected by K-Electric have been accounted for by the Authority, for the seven years tariff control period.

19.11. Consequent to the above, the O&M cost of K-Electric, during the tariff control period, has been adjusted in line with the revised sales growth, keeping the assumptions for financial projections same as discussed in the MYT determination of March 20, 2017. Similarly the projections of

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"Other income" for the tariff control period has also been rationalized with the revised sales growth.

20. **T&D Losses and Recovery**

20.1. K-Electric while pleading the issue of T&D losses and Recovery submitted that previous MYT adjustment mechanism allowed retention of efficiency improvements, including efficiencies on account of T&D losses, however, in the new MYT 2017, all efficiency benchmarks set under previous determination has been rebased, thus removing the efficiency gains achieved by K-Electric during the previous control period, despite the fact that K-Electric did not generate adequate returns and now in lieu of efficiency gains a fixed margin has been built into the tariff.

20.2. K-Electric further submitted that the Authority itself in the MYT 2017, acknowledged that more appropriate approach to assess the performance of the utility would be on the basis of AT&C losses, which in addition to T&D losses also takes into account the loss sustained by the utility due to non-recovery of amount billed to consumers. However, instead of adopting an AT&C based approach, in setting the base tariff, the Authority has only accounted for the actual T&D losses and a write-off allowance of 1.78%, which is substantially below the actual collection loss incurred by K-Electric.

20.3. K-Electric also argued that Recovery losses are genuine and realistic cost of distribution businesses and are taken into account while setting tariffs for privately-owned utilities in developing countries (e.g. Nigeria and India), with collection-related challenges similar to K-Electric. The only viable regulatory measure is an AT&C loss curve-based approach, encouraging improvement over time and in the absence of this approach, tariff is not cost-reflective and may result in solvency issues for the distribution business. K-Electric further pointed out that unlike XWDISCOs, K-Electric is not financially supported by the government, therefore, non-provision of AT&C loss allowance would significantly impact its ability to achieve future targets set by NEPRA as well as execute its investment plan. K-Electric also highlighted that AT&C losses can only be brought down to a reasonable level over a period of time after incurring significant capital expenditure and improving processes. K-Electric accordingly requested that considering the ground realities (propensity to pay, law and order etc.), the socio-economic environment in which K-Electric operates, the tariff should be based on the actual AT&C loss of FY 2015-16 to be truly cost reflective and at the same time provide benchmarks for improvement over the control period to incentivize the utility to further improve.

20.4. K-Electric argued that recoveries could not be made under the land revenue act owing to;

- ✓ Illegal possession of property,
- ✓ Kachi abadis,

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- ✓ China-cutting plots with disputed ownership etc.
- ✓ Areas such as Orangi, Korangi, Baldia, Layari and Malir with high losses and low recoveries due to restricted access and illegal possession of property.
- ✓ Sindh Building Control Authority ("SBCA") does not allow for a legal meter to be provided to the illegal premises therefore, these connections are billed on estimated load on Hook connections.
- ✓ Disconnection is not effective due to law and order situation associated with restrictive access e.g. Baba and Bhit Island, Afghan Basti areas.
- ✓ Reconnection to the system through illegal means (such as "kundas") due to overhead distribution network utilizing bare conductors. On average, over 200,000 defaulters are disconnected monthly, however, around 80% of these disconnections reconnect to the system through illegal means.
- ✓ Lodging of FIRs is not practical due to the number of cases involved, capacity constraints of law enforcement agencies and lack of identification documents.

20.5. K-Electric highlighted the following initiatives in this regard;

- ✓ Organizational restructuring of the distribution business,
- ✓ Training & Development of distribution workforce,
- ✓ Implementation of Automated SAP ISU billing system
- ✓ Mapping of consumers to PMTs and Feeders for identification of high loss area
- ✓ Installation of Automated Meter Readers ("AMRs") on grids and feeders with check meters,
- ✓ Recovery campaigns in coordination with law enforcement agencies and introduction of easy payment schemes etc.

20.6. KE also claimed that in view of the experience gained from implementation of initiatives during the previous control period, it has developed a comprehensive plan which addresses reduction in network losses and increase in collection efficiency through investments in technology and improvement of processes. This includes;

- ✓ **Aerial Bundled Cabling ("ABC") – Investment of PKR 18 billion planned for conversion of 12,450 PMTs**

    - This will lead to a reduction of commercial losses caused by "kundas" and will provide Petitioner the ability to effectively disconnect the consumer. However, as this initiative is capital and resource-intensive, it can only be rolled-out over a period of time with the support of residents of the relevant area.

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✓ **Automated Metering Infrastructure ("AMI") – Investment of PKR 14.7 billion planned**

- To introduce smart-metering in Petitioner's network, there is a requirement to establish a back-end IT infrastructure which has to be implemented in a phased-manner after introduction of SAP ISU and optimisation of business processes. This will facilitate installation of AMRs at all distribution nodes (sub-stations/ PMTs).

✓ **Technical Loss Reduction ("TLR") program – Investment of PKR 9.6 billion planned for optimization of 1,080 feeders**

- Involves modelling for optimisation of network parameters and minimisation of losses. This will improve LT and HT network ratio.

✓ **Aggressive roll-out of previously successful recovery strategies: Rebate schemes, recovery drives and media campaigns**

- To take initiatives based on community engagement and development to convert illegal connections to metered but subsidized connections and install ABC to reduce losses. Community engagement and development is an effective tool to convince the residents to convert to metered connections. AT&C losses can only be brought down to a reasonable level over a period of time after incurring significant capital expenditure and improving processes.

- AT&C based approach is the only viable regulatory measure and is also followed internationally in developing countries by Regulators like India and Nigeria to cater for the recovery problems in privately own entities. Further, this approach has also been included as a tariff benchmark in the GoP's National Tariff Policy and Guideline of 2014.

- K-Electric is not financially supported by the GoP, unlike XWDISCOs, and non-provision of AT&C loss allowance will significantly impact its ability to achieve future targets set by the Authority as well as execute its investment plan.

20.7. K-Electric also provided historical improvement of its AT&C ratio with XWDISCOs as follows;

AT&C Losses	2009	2010	2011	2012	2013	2014	2015	Cumulative Improvement
KE	43.2%	41.5%	42.0%	37.6%	38.7%	35.0%	31.0%	**-12.20%**
HESCO / SEPCO	55.8%	61.0%	60.9%	59.0%	54.9%	52.2%	53.0%	**-2.8%**
XWDISCOs	27.8%	28.0%	28.7%	30.1%	27.1%	27.4%	27.4%	**-0.4%**

20.8. As per K-Electric, it has made substantial improvement in T&D losses and AT&C losses as compared to XWDISCOs and as the losses go down every incremental percent reduction becomes significantly more capital intensive and difficult to achieve. K-Electric, accordingly,

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requested the Authority to consider T&D loss reduction and recovery improvement as forecasted by K-Electric, being based on investment plan already approved by the Authority, for setting benchmarks based on AT&C loss.

20.9. In view thereof, K-Electric, for the purpose of calculation of base tariff, has requested that its actual AT&C loss of 31.9% for FY-2015-16 should be considered; and it may be allowed the following AT&C benchmarks for the next control period;

Projected	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Recovery Ratio	90.1%	90.9%	91.6%	92.2%	92.9%	93.4%	93.9%	94.3%	94.7%	95.1%
T&D Loss	20.9%	19.8%	18.8%	17.8%	16.8%	16.0%	15.4%	14.8%	14.3%	13.8%
AT&C Loss	**28.7%**	**27.1%**	**25.6%**	**24.2%**	**22.7%**	**21.5%**	**20.5%**	**19.6%**	**18.8%**	**18.0%**

20.10. On the issue of recovery, KCCI vide letter dated July 12, 2017 and also during hearing, argued that by not accounting for the under recoveries, the tariff falls short of the actual costs. The allowed write offs @ 1.78% is an extremely difficult target in the working conditions of the city, therefore, recovery loss needs to be recognized, and K-Electric be given a realistic path for improvement.

20.11. Regarding provision for doubtful debts, CPPA-G stated that the same has been increased from 0.7% to 1.78% for the base year and on top, a political instability allowance has been added, providing additional benefit to the petitioner and burdening the consumers. CPPA-G submitted that K-Electric was required to improve its performance which in the instant case has deteriorated. The consumers' paid higher tariff in anticipation of benefiting from the efficiencies however consequent passing of inefficiencies of the petitioner to consumer, after 7 years will be unfair.

20.12. Government of Sindh, Energy Department mentioned that consideration be given to "cost of recovery" which is not being captured in the tariff. A target in this regard be included in the tariff rather than ignoring the issue.

20.13. HBL vide its written comments dated August 21, 2017 submitted, that based on the financial projections provided by K-Electric, analysis of certain ratios i.e. Debt Service Coverage Ratio and Current ratio suggest that K-Electric is likely to face serious challenges in meeting these ratios and thus may find it difficult to raise long term financing for future expansion and/or improvements of its existing assets which in turn will adversely impact K-Electric's operational viability. Thus, NEPRA should consider a tariff which would permit K-Electric to service its debt while meeting ratios that would allow further borrowing by K-Electric. HBL opined that while evaluating financing capacity of K-Electric, lenders would have serious doubts about K-

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Electric's ability to attain the significant improvement i.e. 98.22% in recovery rate considering K-Electric's recovery rate of 87.63% for the FY 2015-16.

20.14. Similar concerns were also raised by UBL vide its letter dated August 25, 2017.

20.15. Other organizations i.e. M/s Shanghai Electric Power Company (SEP), Overseas Private Investment Corporation (OPIC), Pakistan Credit Rating Agency Limited (PACRA) and Islamic International Rating Agency (IIRA) also expressed their concerns on the K-Electric's MYT determination dated March 20, 2017, being unviable / non-bankable, impacting K-Electric's ability to raise financing, thus, adversely impacting its operational performance and ability to execute the investment plan.

20.16. The Authority observed that decision of setting 98.22% recovery target in the MYT determination of March 20, 2017 was based on the reason that while determining the base tariff in 2002, the Authority considered Provision for Doubtful debts of around 2% of the projected sales revenue, which was gradually reduced to less than 1%, as per the projections made for the period from 2003 to 2005, attached with the MYT determination of 2002. However, actual recovery position of K-Electric did not show much improvement rather it has deteriorated as mentioned in the following table;

Year	**FY09**	**FY10**	**FY11**	**FY12**	**FY13**	**FY14**	**FY15**	**FY16**
Recovery ratios	88.6%	89.8%	85.6%	88.7%	84.9%	87.1%	90.4%	87.6%

20.17. K-Electric in its defense has cited example of other XWDISCOs i.e. HESCO/ SEPCO, who's AT&C losses, as per K-Electric are far more as highlighted in the preceding paragraphs. The Authority believes that making comparison of K-Electric with HESCO/ SEPCO is not relevant. K-Electric being the only vertically integrated Utility was privatized with the intention of bringing in efficiencies in its system which *inter alia* included improvement is recoveries and reduction in T&D losses. If the inefficiencies are still to be borne by the Government/ consumers, then the whole privatization process becomes ineffective. In the MYT determination of 2002, the base tariff remained fixed throughout the control period (except certain variations), hence, the impact of under recoveries till June 2016 has already been borne by the GoP or consumers, therefore, passing on cost of inefficiencies on the part of K-Electric, again either to the GoP or the consumers, would not only be unjust to the paying consumers or the GoP, whichever is the case, such an approach itself is against the spirit of privatization. Here it is also pertinent to mention that AT&C losses of most of the XWDISCOs are substantially lower than K-Electric.

20.18. The Authority considers that if K-Electric's contention with respect to either burdening the GoP by way of subsidy for maintaining uniform tariff in the country or the law abiding

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consumers who pay their bills, for the unrecovered amount and pilferage is accepted, it will be against the principle of equity, fairness and justice. This has to be seen in the context of responsibility and accountability. In the instant case, whether it is the responsibility of paying consumers to ensure recovery from non-paying consumers or it is the responsibility of K-Electric. Even if the K-Electric's contention is accepted, it would be counterproductive and will encourage the culture of non-payment and pilferage; and will further aggravate the inefficiencies, thus, defeating the objective of privatization for bringing in efficiency in the system.

20.19. The Authority also observed that K-Electric has been allowed a margin of 5.2% in its T&D losses which accounts for the ground realities i.e. law and order situation and the socio-economic environment in which K-Electric operates, that K-Electric has referred to in its MLR. It is also to be noted that in case of XWDISCOs, the Authority has also fixed recovery targets at 100%, and only actual bad debts written off to the extent of private receivables are allowed, given that due process of law has been followed in this regard.

20.20. The Authority is also cognizant of the fact that the Petitioner is the exclusive distributor of electricity in its licensed area and in case of default, the connection of the premises, if disconnected, cannot be restored until the outstanding dues are paid in full by the defaulter. Further the distribution company always has the option to recover the outstanding amount after following the due process of law. In addition to this, at the time of connection, K-Electric collects security deposits from the consumers, which also serves as a deterrence and mitigates the risk of default by the premises. On the argument of K-Electric regarding China Cutting, illegal possession of property and Kachi Abadis, the Authority has not only allowed impact of law & order in the T&D losses of K-Electric, but in order to improve performance in future, the Authority in its MYT determination dated March 20, 2017 proposed the concept of prepaid meters.

20.21. On the point of K-Electric that recovery losses are taken into account while setting tariffs for privately-owned utilities in developing countries e.g. Nigeria and India, the Authority observed that while setting K-Electric's base tariff in the MYT in 2002, Provision for Doubtful debts at around 2% was considered. K-Electric was required to improve its performance which in the instant case has deteriorated, therefore, incorporating any such inefficiencies again in the tariff at an increased percentage of around 8% will be against the principle of fairness, justice and equity. Here it is pertinent to mention that as of June 2016, the private receivables of K-Electric are over Rs.92 billion, including running defaulters of around Rs.13 billion for more than one year, meaning thereby that despite non-payment of their dues, such consumers have neither been disconnected nor any amount has been recovered from them.

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20.22. The Honorable Supreme Court in other Human right cases No.14392/2013 & 790-G/2009 in the matter of unprecedented load shedding and increase in electricity prices dated 26-11-2013 under para 36 (ii) decided as under;

36 (ii). "The competent authority shall take steps to control all kind of losses after supply of the generation like line losses, theft, etc, by using modern devices like introducing smart meters and supplying electricity only to the consumers, if need be, in advance or without any default after submission of the bills. As far as all kind of unauthorized consumers are concerned, efforts should be made to persuade them to make payments of the bills, failing which action as envisaged under the electricity act, 1910, the Electricity Rules, 1937 and NEPRA act, 1997 as well as other enabling laws / rules, should be taken. A policy has to be announced by the NTDC / DISCOs under which this supply of electricity to the consumers to believe in law and make payments in time, is encouraged and supply of unauthorized consumers is discouraged."

20.23. It is evident from the aforementioned decision, that supply of electricity to the paying consumers has been encouraged, meaning thereby that burden of non- paying consumers may not be passed on to the paying consumers rather the unauthorized consumers be discouraged.

20.24. Here it is pertinent to mention that the Authority in its MYT determination of March, 20 2017, allowed actual write offs of Rs.2,782 million to K-Electric. This amount includes around 15% of the billed amount as escalation component, which caters for future price increases, during the control period, as the Authority while working out the projections for the control period has kept the fuel prices constant.

20.25. The Authority's allowed amount of write offs of Rs.2,782 million, worked out to be 1.78% of K-Electric's assessed sales revenue for the base year as per the MYT determination of March 20, 2017. However, after incorporating the aforementioned decisions and its consequent effects on base rate adjustment component, resulting in higher assessed sales revenues for the base year, the percentage of actual write offs allowed to K-Electric vis a vis sales revenues for the base year works out as 1.69%. The amounts of write offs projected in tariff accordingly works out as under for the seven years tariff control period;

FY	2017	2018	2019	2020	2021	2022	2023
Write Offs Projected (Rs. in Million)	2,982	3,176	3,228	3,285	3,597	4,026	4,195

20.26. The Authority has allowed write offs @ 1.69% of the assessed sales revenue for the each respective year during the tariff control period. In addition, an amount of Rs.48,594 million as provision for debts considered doubtful is also available with K-Electric as per its Audited

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Financial statements for the FY 2015-16. The following criteria with respect to write offs shall be observed.

i. The connection has to be permanently disconnected for more than 3 years and due process of law to recover the outstanding dues as arrears of Land Revenue has been followed. In case where ownership of a premises is disputed, K-Electric shall certify that it has made best efforts to recover the outstanding amount but the amount is not recoverable, than it will be considered for write offs.

ii. The amount to be written off shall be duly approved by the Board of Directors (BOD) of K-Electric.

iii. The amount of write off shall be duly supported with the details pertaining to the name & address of the premises/consumers, CNIC etc.

iv. The write offs will be considered by the Authority by ensuring the amount recommended for write offs has not been taken by K-Electric in any other way.

20.27. Here it is clarified that the aforementioned criteria would be observed in all cases of write offs;

20.28. On the issue of criteria for write offs, K-Electric has argued that the criteria of 3 years Permanently Disconnected consumers is onerous. K-Electric also stated that the conditions imposed for claiming write-offs included onerous requirement that the connection has to be permanently disconnected for more than 3 years and due process of law as per the Land Revenue Act has been followed *(based on the rationale that being exclusive territory of K-Electric, it has the right to disconnect and sell the property after following the due process of law).*

20.29. K-Electric further stated that practically achieving compliance with the above conditions mentioned by the Authority needs to be understood in the context of the operating environment and socio-economic conditions of Karachi as well as the results of efforts made by K-Electric during the previous control period.

20.30. The Authority considers that section 54A of the Electricity Act 1910 also elaborates that the charges for supply of energy or any other sum outstanding against a consumer under this Act shall be recoverable as an arrear of land revenue. Logically and keeping in view the relevant documents, a prerequisite for this has to be that the premises is permanently disconnected for a reasonable period so that the utility has exhausted its all efforts to recover the amount. The Authority keeping in view the relevant provisions of NEPRA Rules and Regulations, considers 3 years as a reasonable period.

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20.31. Although KCCI, Government of Sindh, UBL and HBL have supported the plea of K-Electric for allowing recovery loss, however, the Authority considering it the responsibility of K-Electric for recovery of the billed amount has decided to allow cost to the extent of actual write offs, as per the adjustment mechanism. The Authority does not find any justification to further burden consumers on account of recovery loss.

20.32. On the issue of T&D losses, K-Electric has requested to allow AT&C by taking into account the projections made by K-Electric in terms of T&D losses for the tariff control period.

20.33. Mr. Bilwani on the issue submitted that T&D losses target has been enhanced despite K-Electric agreeing to maintain the T&D loss targets given under the previous MYT. The enhancement of target by 5.2% has been made on flimsy ground of "Law & Order" situation and accordingly target for the FY 2016 has been set at 22.10%, which is the actual T&D losses for the FY 2016, thus allowing a massive benefit of 7.10% to the Licensee in one go against the already allowed target of 15% for the FY 2016 under the previous MYT. Further, there is discrepancy in the numbers of T&D losses target reported by the Petitioner. Mr. Bilwani also stated that honest consumers have been burdened with extra tariff by allowing actual write-off of bad debts in the tariff.

20.34. Karachi Chamber of Commerce and Industry (KCCI) submitted that allowing 5.2% margin in T&D losses on account of "law and order" is not justified and questioned the criteria adopted for allowing such margin. KCCI was of the view that T&D losses target should be started from 15% and be reduced from thereon.

20.35. Whistle Blower Pakistan submitted that T&D losses for FY 2016-17 should have been fixed at 15%, considering the geographical location, smaller area of the Utility and concentrated load position of K-Electric, which requires minimum T&D losses. Any allowance on account of Law and Order situation, though beyond comprehension, may be only in 5% area of the Petitioner's jurisdiction, whereas NEPRA has applied the margin of 5.2% T&D losses, in all areas of K-Electric. This allowance is not justified at all and must be reviewed. The T&D losses of K-Electric, if not better than should at least be comparable with IESCO, FESCO and GEPCO.

20.36. Mr. Mazhar Ali submitted that losses were required to be fixed on 15%, but the Authority fixed it at higher level, giving undue advantage to K-Electric at the cost of Govt. exchequer.

20.37. Jamat e Islami Karachi stated that target of T&D losses should be set at 15%.

20.38. Mr. Abu Bakar Usman stated to reduce the T&D losses level to 3%.

20.39. CPPA-G mentioned that target of losses may be fixed at 15% by eliminating allowance of political instability of 5.2%, to pass on the benefit to the consumers since K-Electric retained

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the efficiency gain for 7 years, which was financed by the consumers through payment of higher tariff during the period of 7 years.

20.40. The Authority observed that while determining K-Electric's MYT 2017, for the purpose of base case, K-Electric is allowed a T&D loss target of 22.10%, comprising of 16.90% as Technical losses and 5.2% on account of Margin for law & order. For future years losses target, the Authority, allowed the following T&D losses target to K-Electric during the tariff control period;

	Tariff Control Period						
FY	1st Year	2nd Year	3rd Year	4th Year	5thYear	6th Year	7th Year
Allowed T&D Losses (%)	20.40	19.20	17.71	16.23	14.56	13.54	12.53

20.41. The Authority's aforementioned targets of T&D losses were primarily assessed based on the significant amount of investments being made by K-Electric in its Transmission and Distribution networks in terms of overhauling and rehabilitation activities in the existing transmission networks and sustainable loss reductions projects at distribution level which included Aerial Bundled Cabling (ABC), technical loss reduction and meter replacement projects.

20.42. The Authority also understands that brining down T&D losses not only involve significant capital expenditure but a reasonable period of time is also required after incurring the CPAEX and making improvement in the processes to achieve desired results. Further, as the losses go down, every incremental percent reduction becomes significantly more capital intensive and difficult to achieve. This is also evident from the fact that although K-Electric was allowed the investment under the Transmission and Distribution systems, as requested by K-Electric, however, as per the available information, K-Electric has not been able to achieve the target of 20.90% set for the FY 2016-17, as its actual losses stand at around 21.50%, as reported by K-Electric, (falling short by 0.60%).

20.43. Here it is pertinent to mention that in the previous MYT 2002, K-Electric maximized its profits through higher investment in the Generation Segment as compared to Transmission and Distribution systems. However, in the instant MYT 2017, the Authority has incentivized K-Electric to maximize its profits through increase in sales, improvements in recoveries and reduction in T&D losses, thus, encouraging K-Electric to make more investments in the Transmission and Distribution sector. In view thereof, the Authority considers that the future targets during the tariff control period should provide an inbuilt incentive to the Utility to make more investments in these segments in order to earn profits. Here it is also clarified that in case of abnormal profits, the same shall be shared with the consumers through the claw back mechanism.

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20.44. The Authority has considered KE's request for setting T&D loss targets as requested by it in the initial tariff petition as well as reiterated in the MLR. The Authority believes that giving stringent future T&D loss target to K-Electric would leave the utility with risk of not achieving those targets, which would also constrain its liquidity and financial resources, in addition to the shortfall in actual recovery, to make available the funds for the desired investment in its system. This would further impact its efficiency improvement plans, which is not desirable.

20.45. In view of the aforementioned discussion, the submissions made by K-Electric and reconsidering the points raised by Interveners/ commentators, the Authority has decided to revise the future targets of T&D losses during the tariff control period as suggested by KE in MLR and mentioned hereunder;

	Tariff Control Period						
FY	1st Year	2nd Year	3rd Year	4th Year	5thYear	6th Year	7th Year
Allowed T&D Losses (%)	20.90	19.80	18.75	17.76	16.80	15.95	15.36

20.46. Based on the aforementioned allowed T&D losses and projected recovery targets, the AT&C of K-Electric works out to be as under;

FY	2017	2018	2019	2020	2021	2022	2023
Recovery Ratio	98.31%	98.31%	98.31%	98.31%	98.31%	98.31%	98.31%
T&D Loss	20.90%	19.80%	18.75%	17.76%	16.80%	15.95%	15.36%
AT&C Loss	**22.24%**	**21.16%**	**20.12%**	**19.15%**	**18.21%**	**17.37%**	**16.79%**

20.47. The aforementioned AT&C losses may change to the extent of recoveries if the write off figures approved by the Authority in future, as per the adjustment mechanism, are changed.

20.48. On the concerns raised by HBL, UBL and other organizations, the Authority is of the view that these concerns may have arisen due to difference in assumptions considered by the Authority while working out the MYT vis a vis assumptions taken by K-Electric for making future financial projections. The Authority considers that in case of K-Electric's inability to achieve future desired efficiency levels set by the Authority, its sustainability and its ability to carry out the allowed investments would be seriously constrained and eventually consumers of K-Electric would suffer.

20.49. In view hereof, the Authority has reviewed its earlier assumptions allowed in the MYT 2017 and has modified its financial projections for the seven years tariff control period of K-Electric wherever deemed appropriate as discussed in the preceding paragraphs. Accordingly, the tariff has been modified to that extent. In view thereof, the Authority considers that the issues raised by HBL, UBL and others have been duly addressed.

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21. **Tariff Control Period**

21.1. On the issue of tariff control period, KE has requested a 10 years period, against Authority's allowed period of 7 years, by arguing that it needs to provide comfort to lenders in terms of consistent and predictable future cash flows of the utility. KE also submitted that the international precedent referred to by NEPRA in the MYT 2017, is only relevant for DISCOs and is not suitable for KE which is a VIU. KE further mentioned that the assertion by NEPRA that DISCOs are able to finance their capital program despite having annual tariff is not valid as DISCOs are financed through GoP's improvement and funding programs.

21.2. KE has also stated that a longer tariff control period will provide lenders with the necessary comfort that debt will be repaid and the ten-year time period is the most efficient (lowest cost) means of debt financing. A shorter regulatory period would require existing project financing to be renegotiated and debt providers would require higher credit spreads to compensate them for the additional risk of default. KE also delineated that the assets in which investments are made are long-term assets and their cost of financing is lower over a longer time horizon, therefore, if the I-MYT is set below 10 years, the cost of finance will increase and these loans will need to be renegotiated and would put the investment program at risk with consequent detriments to customers. In view thereof, KE has requested for a tariff control period of ten years to enable it to execute its business plan and earn a reasonable return.

21.3. Mr. Arif Bilwani argued that despite strong opposition from most of the interveners for continuation of expired tariff as well as MYT, the MYT has further been extended for 7 years and that too without any annual review. Only a limited review and that too for "allowed investments" will be conducted after 4 years i.e. only once during the whole tariff control period, which also is ambiguous as the mechanism for adjustment of base rate in case of underperformance has not been prescribed. The review should be carried out every year and timelines for completion of transmission and distribution projects be developed.

21.4. Whistle blower international suggested that the allowed MYT period of seven years is on the higher side, which should have been 5 years. By giving a longer period, NEPPA extended the monopoly of K-Electric in Karachi for the next seven years.

21.5. Mr. Mazhar Ali was of the view that a shorter period is to the disadvantage of consumers, therefore MYT period will be extended for at-least 10 years as requested by K-E.

21.6. Abu Bakar opposed the MYT regime by suggested that the same should be abolished and instead single year tariff be allowed.

21.7. HBL vide its written comments has proposed that a longer tariff period will provide more comfort to lenders and as such may allow KE to raise its requisite financing for long term replacement and expansion plans and projects.

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21.8. UBL vide its letter dated August 25, 2017 also raised the same concerns as shown by HBL.

21.9. The Authority, regarding a longer tariff control period i.e. ten years against the allowed period of seven years, noted that the previous MYT of 2002 was also initially determined for period of seven years, although the same remained applicable for around twelve years period after KE's privatization, and K-Electric had been able to raise financing during the previous MYT, even though it was incurring losses. The Authority believes that given the present situation, whereby K-Electric has become a profitable entity, K-Electric is in a better position to arrange financing for its future investment at more favorable terms, thus enabling it to fund its proposed investments at lower costs. The Authority understands the MYT itself ensures consistent and predictable cash flows thus providing comfort to the lenders. The Authority is also of the view that an unreasonable longer tariff control period exposes the utility to greater risks in terms of changes in external factors. Further, most of the Interveners in their review petitions have also opposed a longer tariff control period.

21.10. Foregoing in view, the Authority has decided to maintain its earlier decision of allowing a tariff control period of seven years to K-Electric. The Authority has discussed the issue of tariff control period in detail with reasonable clarity under para 21 of its MYT determination dated March 20, 2017.

22. **Terms & Conditions**

22.1. Although K-Electric has not disputed the terms & conditions of the Tariff attached with the MYT determination of March 20, 2017, however, various Interveners / Commentators showed their concerns regarding changes in the terms & conditions of Tariff by the Authority in MYT 2017.

22.2. Mr. Bilwani submitted that Change in terms & conditions of the Life line consumers and introduction of A-3 General Category has been made without consultation with the consumers of K-Electric. Further, the amendments made in the terms & conditions of the B-1 & B-2 consumer categories, was neither demanded by KE nor the consumers.

22.3. Mr. Mazhar Ali suggested that domestic consumer slabs be revised either from 1-100 or from 51-100 instead of 1-50 and 1 -100. Further, two slab system as per past should be-restored.

22.4. Jamat e Islami argued that tariff for consumer categories from 0-50, 1-100, 101-200 and 201-300 have been increased in the new tariff. Moreover, 1-50 slab should be removed from the Tariff and it should be 1-100, after deducting illegal increase through SRO-677.

22.5. The Authority observed that point of Interveners regarding change in Terms & Conditions of life line consumers and introduction of A-3 General Category without consultation with the consumers of K-Electric is not correct, as these points were made separate issues for discussion

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during the hearing of K-Electric's I-MYT Petition held on September 27 & 28, 2016 at Karachi, as mentioned hereunder;

- *Whether the existing terms & conditions of consumer categories (including life line) are needed to be revised?*
- *What are the concerns of the Petitioner on the application of domestic tariff for Government office, educational institutions and religious institutes?*

22.6. Regarding revision of domestic consumer category either from 1-100 or from 51-100 instead of 1-50, the Authority considers that the domestic category of 1-50 units has specifically been designed for low income consumers, which are protected from any adverse financial impact. Resultantly consumers having consumption in excess of 50 units are not included in this category and are not entitled for the benefits of life line consumers. Accordingly such consumers having monthly consumption of 51 units above units are charged the tariff applicable for 1-100 units slabs for their entire consumption.

23. <u>**Decommissioning of BQPS I (Units 3 & 4) and Generation Long Term Investment Plan**</u>

23.1. KE on the issue of decommission of Unit 3&4 of BQPS-I stated that the Authority in MYT 2017 assumed decommissioning of Units 1 & 2 of BQPS-I in August 2018 and August 2019, respectively, while its Units 3 & 4 are assumed to be operational throughout the control period. Further, the Authority has also not considered investment for GLTIP.

23.2. KE submitted that ideally the oldest units should be replaced first, however, due to technical issues in the boilers of Units 3 & 4, the outage duration for both units is comparatively higher than Units 1 & 2, therefore, recommended that units 3 & 4 which are in much poor condition with respect to reliability and performance, should be decommissioned.

23.3. KE further submitted that with the rehabilitation of units 1 & 2 through GLTIP, the useful lives of these units will be enhanced, therefore, any such proposal of not investing and hence de-commissioning of Units 1 & 2 will result in an imbalance of demand and supply in the city of Karachi. Thus, the proposed investment in Units 1 & 2 is in the best interest of the consumers of Karachi.

23.4. KE accordingly requested the Authority to review the assumption of decommissioning of Unit 1 & 2 of BQPS I and the GLTIP.

23.5. The Authority noted that in its MYT determination of March 20, 2017, it did not allow the proposed investment for Unit 1 and 2 of the BQPS-I and directed KE to carry out its own cost benefit analysis for this cost and take its own commercial decision because these units were to outlive their life by August 2018 and August 2019 respectively. Although KE, in its business plan projected generation from these two units even after expiry of their useful life, but the

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Authority in its projection did not continue these units for operation after expiry of their useful life being quite old and inefficient (Steam turbines).

23.6. The Authority, however, in order to provide an incentive to K-Electric neither considered the proposed investment of GLTIP for the BQPS-I in its workings nor any corresponding gains thereof; thus, if K-Electric intends to carry out such investments, it would be purely its commercial decision and would be done through its own resources, hence is allowed to retain the benefits of the improved efficiencies of BQPS-I if any, for the control period, occurring due to the proposed GLTIP. Moreover, the investments on this account has not been considered in RAB for RORB calculations.

23.7. The Authority after considering the aforementioned submissions of K-Electric does not see any rationale to amend its earlier decision in this regard.

24. **Interest on Security Deposit**

24.1. On the issue of payment of Interest on Security Deposits to the consumers, KE while referring to section 226 of the Companies Ordinance 1984 which states that *"No company, and no officer or agent of a company, shall receive or utilize any money received as security or deposit, except in accordance with a contract in writing........"* mentioned that the terms and conditions of new connections specify that the security deposit will be utilized for the purpose of business.

24.2. KE also argued that other utility companies such as DISCOs, Sui Southern Gas Company also collect security deposits on new connections and under their respective terms and conditions use these deposits for business purposes, but no interest is paid on these security deposits.

24.3. In view thereof, KE stated that the security deposit has no relationship with the interest earned on bank deposit by KE; neither there is any legal requirement to pay interest on security deposit nor is there any such practice being carried out across the industry. Accordingly, KE requested the Authority to review its order of enforcing the payment of interest on security deposit.

24.4. CPPA – G on the issue opined that interest on security deposits shall be paid to consumers' equivalent to the RoE of distribution business as the consumer money is being invested in business as part of equity.

24.5. The Authority in its MYT 2017 directed KE to pay interest on security deposits to the consumers henceforth through their bills due to the fact that;

- In the matter of XWDISCOs, the amount of interest on bank deposits appearing in their financial statements is adjusted/ deducted while determining the consumer end tariff, thus effectively consumers are being passed on the benefit of interest on security

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deposits in the shape of lower determined tariff. Therefore, stance of KE that no other utility is paying interest on security deposits is not correct.

- Amount of interest earned by KE on Bank Deposits is reflected under the head of Other Income, which was not adjusted while adjusting/ deducting the Other Income for base rate calculations of KE, unlike XWDISCOs where such amount is deducted. Therefore, to pass on the benefit of interest earned by KE on Consumers' Security Deposit, is imperative that KE pays the same through individual bills to the consumers.

24.6. Regarding the submission of CPPA-G, the Authority is of the view that the amount deposited by the consumers as Security does not bear the same risk as borne by the Utility, therefore, the point of CPPA-G to pay interest on security deposits equivalent to RoE of distribution business is not justified. As per K-Electric, if the same amount is invested in business, then the consumer have the right of interest rate being the opportunity cost for K-Electric, but if the amount of security deposit is not invested by K-Electric, then the same amount would have been borrowed by K-Electric on which it was supposed to pay interest cost.

24.7. Considering the aforementioned discussion and the submission of K-Electric, the Authority reiterates its earlier decision in the matter of Security deposits as per its MYT determination of March 20, 2017.

25. <u>Net Metering</u>

25.1. On the point of providing net metering arrangements in accordance with applicable provisions of NEPRA (Alternative and Renewable Energy) Distributed Generation and Net Metering Regulations, 2015, KE submitted that it has already shared its observation and concerns with NEPRA vide letter No. KE/BPR/NEPRA/2017/045 dated March 2, 2017, consideration of which are essential for successful roll out of net metering. KE accordingly requested the Authority to take up the above issues and provide it the opportunity of hearing.

25.2. The Authority in its MYT determination, 2017, as per NEPRA (Alternative and Renewable Energy) Distributed Generation and Net Metering Regulations, 2015, also applicable to K-Electric, has directed K-Electric to provide net metering arrangement to the consumers in accordance with the applicable provisions of the afore said Regulations. The Authority after considering the submissions of K-Electric does not see any rationale to amend its earlier decision in this regard

26. <u>New Connections</u>

26.1. On the issue of charging new connection charges from the prospective consumers on rate comparable with the XWDISCOs, preferably LESCO, till separate proceedings are initiated, KE, while appreciating Authority's initiative to start proceedings in this regard, submitted that connection charges collected from consumers form part of KE's 'other income' which has been

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deducted from the allowed costs while determining tariff for KE. Accordingly, KE requested the Authority to consider the impact of change in new connection rates while determining the 'other income' deducted in base tariff for the control period.

26.2. The Authority, in its MYT determination of March 20, 2017 under para 57, on the issue decided to carryout separate proceedings through consultation of relevant stakeholders so as to ensure equitable basis for charging of other connection charges from consumers all across the country and till such time K-Electric shall ensure that other connection charges pertaining to new connections to the prospective consumers are comparable with the XWDISCOs preferably LESCO. The Authority maintains its earlier decision in the matter.

27. **<u>Bill Collection Charges</u>**

27.1. On the issue of Bill Collection charges, Mr. Mazhar Ali requested that it should be restricted, and earlier paid figure shall also be returned.

27.2. KCCI stated that bill collection charges have been allowed without any circular from state bank of Pakistan in this regard and shall be deducted from the base rate calculations, if it is proven that there is no such circular. Mr. Bilwani also raised the same point of allowing bill collection charges without any circular from state bank of Pakistan in this regard.

27.3. The Authority observed that it has discussed the issue of Bill collection charges in detail in its MYT determination under para 43 of the determination, and therefore maintains its earlier decision in this regard.

28. **<u>Base Rate Adjustment Component</u>**

28.1. In view of the decisions made in the preceding paragraphs, the Authority observed that in order to ensure the allowed overall allowed WACC of 13.83% to K-Electric during the tariff control period, on its existing as well as future investments, the base rate adjustment component needs to be revised which accordingly been revised to Rs.1.0590/kWh.

29. **<u>Claw Back Threshold</u>**

29.1. Since K-Electric has been allowed a base rate adjustment component of Rs.1.0590/kWh, to ensure overall WACC of 13.83%, during the tariff control period, on its existing and future investments, resultantly in initial years of the tariff control period, K-Electric will be earning a return higher than the allowed WACC of 13.83%. By including the Base rate adjustment component, K-Electric will be earning the following EBITs as percentage of respective year's average RAB, during the tariff control period;

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Tariff Control Period						
1st Year	2nd Year	3rd Year	4th Year	5th Year	6th Year	7th Year
23.00%	18.62%	13.07%	10.97%	10.84%	10.82%	11.30%

29.2. Consequent thereupon, the limits for sharing of returns over and above the allowed returns, have been revised as under;

Year	1st Year	2nd Year	3rd Year	4th Year	5th Year	6th Year	7th Year
Sharing 25%	23.00%-26.00%	18.62%-21.62%	13.07%-16.07%	10.97%-13.97%	10.84%-13.84%	10.82%-13.82%	11.30%-14.30%
Sharing 50%	Over 26.00%-29.00%	Over 21.62%-24.62%	Over 16.07%-19.07%	Over 13.97%-16.97%	Over 13.84%-16.84%	Over 13.82%-16.82%	Over 14.30%-17.30%
Sharing 75%	Over 29.00%	Over 24.62%	Over 19.07%	Over 16.97%	Over 16.84%	Over 16.82%	Over 17.30%

29.3. The Order part along with all Annexures attached with this determination is intimated to the Federal Government for notification in the official gazette under Section 31(4) of the NEPRA Act.

30. <u>ORDER</u>

30.1. The Authority having heard the petitioner, Interveners, Commentators etc. and perusal of the information/ record has determined K-Electric's Multi Year Tariff (MYT) comprising of three separate segments i.e. Generation, Transmission and Distribution in line with the articles of Licenses issued for the respective functions read with the Rule 17(3) (xiii) of the Tariff (Standards and Procedure) Rules, 1998. The segment-wise tariff so determined is indicated hereunder;

K-Electric Tariff w.e.f. July 01, 2016

Tariff Components	Remarks	Rs./kWh	Remarks	Rs./kWh
Generation	At Bus Bar	7.6974	At Units Sold Basis	9.7312
Transmission	At Transmission Sent Outs	0.4827	At Units Sold Basis	0.6023
Distribution	At Units Sold	1.3780	At Units Sold Basis	1.3780
Base Rate Adjustment Component			At Units Sold Basis	1.0590
Tariff applicable w.e.f. July 01, 2016			At Units Sold Basis	**12.7706**

I. K-Electric is allowed to charge tariff from its consumers as indicated in the schedule of tariff attached as Annex -V to this determination.

II. The period for the Multi Year Tariff shall be of seven years applicable from July 01, 2016 till June 30, 2023.

III. The consumer end tariff shall be subject to the following adjustments;

- The fuel cost component of KE's own generation power plants shall be adjusted in accordance with the mechanism attached herewith as Annex-II.

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- The Power Purchase Cost component shall be adjusted in accordance with the mechanism attached herewith as Annex-III.

- The actual payments in respect of WWF and WPPF to the IPPs shall be considered as pass through and shall be adjusted on yearly basis upon production of verifiable documentary evidence.

- The O&M, Depreciation, RORB, Other Income and base rate adjustment components shall be adjusted in accordance with the mechanism attached herewith as Annex-IV.

IV. The following flat thermal efficiencies and heat rates (Net HHV) for K-Electric's own existing generation fleet have been determined, for the Tariff Control Period;

Plant	Heat Rate (Btu/kWh) Net HHV FLAT	Corresponding Efficiency (%)
BQPS-I		
Unit 1	10,802	31.59
Unit 2	10,650	32.04
Unit 3	10,996	31.03
Unit 4	10,899	31.31
Unit 5	10,304	33.11
Unit 6	10,249	33.29
BQPS 2	7,991	42.70
KCCPP	8,497	40.16
KGTPS	8,738	39.05
SGTPS	8,746	39.01

V. The following auxiliary consumption of gross capacity at mean site conditions have been allowed, for the Tariff Control Period;

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Plant Description	Installed Capacity at ISO	Gross Capacity at mean site	Approved Net Capacity at mean site	Auxilary Consumption of gross Capacity
	MW	MW	MW	%
Bin Qasim Power Station (BQPS 1):				
Unit 1	210.00	200.00	183.78	8.11
Unit 2	210.00	200.00	184.00	8.00
Unit 3	210.00	200.00	183.50	8.25
Unit 4	210.00	200.00	183.64	8.18
Unit 5	210.00	200.00	184.50	7.75
Unit 6	210.00	200.00	184.58	7.71
Sub-Total	**1,260.00**	**1,200.00**	**1,104.00**	**8.00**
Korangi 220 MW CCPP:				
Unit-1-4 Gas Turbine of 48.38 MW each	193.50	187.70		
Unit-5 Steam Turbine	26.50	25.70		
Unit-6 Steam Turbine (New addition)	27.50	26.70		
Sub-Total	**247.50**	**240.10**	**223.49**	**6.92**
Gas Engines at Korangi Town:				
32 Gas engines of 3.041 MW each	97.31	87.65		
Unit 33 Steam Turbine (New addition)	10.00	9.57		
Sub-Total	**107.31**	**97.21**	**94.78**	**2.50**
Gas Engines at SITE:				
32 Gas engines of 3.041 MW each	97.31	87.65		
Unit 33 Steam Turbine (New addition)	10.00	9.57		
Sub-Total	**107.31**	**97.21**	**94.78**	**2.50**
Bin Qasim New CCPP (BQPS 2):				
Unit-1-3 Gas Turbine each of 127.8 MW	383.40	347.10		
Unit-4 Steam Turbine	189.27	181.30		
Sub-Total	**572.67**	**528.40**	**496.11**	**6.11**
Total	**2,294.79**	**2,162.92**	**2,013.16**	

VI. In case K-Electric decides to lease out any of its existing power plants or Units including Unit 3 and 4 of BQPS-I, before expiry of their useful life, the indexed tariff components for the said plant or Unit i.e. O&M, Depreciation and RoRB components shall be adjusted from the tariff prevalent at the time of leasing out of such power plant/ unit. The O&M, Depreciation and RoRB components in terms of unit 3 & 4 of BQPS-I included in the tariff to be applicable from July 01, 2016 are Rs.0.0361/kWh, Rs.0.0260/kWh and Rs. 0.0220/kWh respectively.

VII. The heat rates of BQPS-II have been determined on the basis of heat rates guaranteed by the EPC contractor. K-Electric has already been directed to conduct heat rate test of BQPS-II and submit the same to the Authority for approval. The adjustment in heat rates will be made based on the results of the performance (Heat Rate) test.

VIII. In view of the addition of steam turbines at KCCP, SGTPS and KGTPS, the numbers in respect of efficiency and auxiliary consumption are worked on provisional basis, based on the given information and supporting documents. K-Electric is directed to conduct heat rate test of KCCP, SGTPS and KGTPS and submit the report to the Authority for approval. The adjustment in heat rates will be made based on the results of the performance (Heat Rate) test.

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IX. Regarding BQPS-I, the parameters allowed by the Authority are provisional and the Authority directs K-Electric to arrange performance test (Heat rate test) by an Independent Engineer within a period of six months from the date of notification of the instant tariff determination. The selection process and appointment of an independent engineer shall be approved by NEPRA, whereas, the tests shall be conducted in the presence of NEPRA professionals as observers. The adjustment in heat rates will be made based on the results of the performance (Heat Rate) test.

X. K-Electric shall arrange heat rate tests by an Independent Engineer within a period of six months from the date of notification of the instant tariff determination. The selection process and appointment of an independent engineer shall be approved by NEPRA, whereas, the tests shall be conducted in the presence of NEPRA professionals as observers. The adjustment in heat rates will be made based on the results of the performance (Heat Rate) test.

XI. For the upcoming power plants or replacement of existing power plants/units, K-Electric shall perform Capacity and Heat Rate tests in a transparent manner by a reputable Independent Engineer in the presence of NEPRA professionals at the time of commissioning for the Authority's approval. Till approval of performance test results by the Authority, adjustment in the fuel cost component for the upcoming and replaced power plants shall be allowed based on the heat rates as guaranteed by the EPC contractor subject to adjustment. The adjustment in heat rate will be made only if the heat rate in the test is found lower than the heat rates guaranteed by the EPC contractor. Similarly adjustment in capacity will be made only if the actual capacity pursuant to the performance test is found to be higher than the capacity guaranteed by the EPC contractor. The replacement would mean installation of new power plant/ unit (which as per existing fleet includes but not limited to, turbines, engines etc.) in place of existing power plant/ unit with over all higher net thermal efficiencies.

XII. For the upcoming power plants or replacement of existing power plants/units, no adjustment in tariff except to the extent of Heat rates and Auxiliaries shall be made.

XIII. K-Electric is directed to obtain approval of the Authority for future power acquisition along-with the rates and other terms and conditions for purchase of power from external sources. K-Electric shall not be allowed any adjustment in tariff on account of power purchase cost variation in respect of those power sources for which prior approval of the Authority has not been obtained. For this purpose K-Electric shall submit its request for power acquisition along-with the rationale and relevant documents.

XIV. The cost of WWF/WWPF related to K-Electric shall be allowed as pass through cost on actual basis subject to provision of verifiable documentary evidence for adjustment on yearly basis to be recovered in the next year.

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XV. K-Electric has not been allowed any provision on account of the Doubtful debts in the tariff, however, Bad Debts written off @ 1.69% of K-Electric's assessed sales revenue has been allowed in the base case. For the purpose of actual write offs in future, K-Electric shall complete the following procedures;

i. The connection has to be permanently disconnected for more than 3 years and due process of law to recover the outstanding dues as arrears of Land Revenue has been followed. In case where ownership of a premises is disputed, K-Electric shall certify that it has made best efforts to recover the outstanding amount but the amount is not recoverable, than it will be considered for write offs.

ii. The amount to be written off shall be duly approved by the Board of Directors (BOD) of K-Electric.

iii. The amount of write off shall be duly supported with the details pertaining to the name & address of the premises/consumers, CNIC etc.

iv. The write offs will be considered by the Authority by ensuring the amount recommended for write offs has not been taken by K-Electric in any other way.

XVI. K-Electric has not been allowed the impact of Revaluation on its Regulatory Assets Base while working out the Depreciation charges and Return on Rate Base.

XVII. Other Income, excluding the impact of Late Payment charges (LPC), Interest on Bank Deposits and Meter Rent, has been deducted from the base case assessment.

XVIII. K-Electric shall pay interest earned on security deposits to the consumers through electricity bills.

XIX. K-Electric shall not charge bank collection charges from the consumers separately in their bills.

XX. K-Electric is directed to stop charging of meter rent in future from those consumers who pay their cost of meter. In case of any meter replacement, owing to fault of consumers, the matter shall be dealt with as per the relevant provisions of the CSM.

XXI. K-Electric is hereby allowed a total investment of Rs.298,915 million for the seven years tariff control period for its Generation, Transmission and Distribution Systems as given hereunder;

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Investment Allowed

Functions	Rs. In Million
Generation	97,305
Transmission	127,942
Distribution	73,668
Total	**298,915**

XXII. K-Electric shall place relevant documentary record of its additional investment decisions on its official website for information of the consumers.

XXIII. Neither the Investments proposed by K-Electric in associate companies nor any return thereof has been considered in the tariff.

XXIV. A midterm review to the extent of allowed Investments only shall be carried out, after completion of four years of the tariff control period, and in case of under investment /performance by K-Electric, the base rate adjustment component may be adjusted, keeping in view the amount of Investment allowed vis a vis actual investment made by K-Electric during the period, after thorough analysis and review by the Authority. Similarly, for the last three years of the tariff control period, adjustment of base rate adjustment component, may be made in the next tariff determination, keeping in view the amount of Investment allowed vis a vis actual investment made by K-Electric during the period, after thorough analysis and review by the Authority. For clarity purpose, a self-explanatory adjustment mechanism has been attached as Exhibit-I.

XXV. K-Electric has been allowed the following target of T&D losses during the tariff control period;

	Tariff Control Period						
FY	1st Year	2nd Year	3rd Year	4th Year	5th Year	6th Year	7th Year
Allowed T&D Losses (%)	20.90%	19.80%	18.75%	17.76%	16.80%	15.95%	15.36%

XXVI. Profit Claw Back Mechanism shall become applicable, if the regulated EBIT of K-Electric exceeds the following thresholds in the respective year and shall be determined as prescribed in the Annex-VII.

Tariff Control Period						
1st Year	2nd Year	3rd Year	4th Year	5th Year	6th Year	7th Year
23.00%	18.62%	13.07%	10.97%	10.84%	10.82%	11.30%

XXVII. The limits for sharing of returns over and above the allowed returns, have been revised as under;

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Year	1st Year	2nd Year	3rd Year	4th Year	5th Year	6th Year	7th Year
Sharing 25%	23.00%-26.00%	18.62%-21.62%	13.07%-16.07%	10.97%-13.97%	10.84%-13.84%	10.82%-13.82%	11.30%-14.30%
Sharing 50%	Over 26.00%-29.00%	Over 21.62%-24.62%	Over 16.07%-19.07%	Over 13.97%-16.97%	Over 13.84%-16.84%	Over 13.82%-16.82%	Over 14.30%-17.30%
Sharing 75%	Over 29.00%	Over 24.62%	Over 19.07%	Over 16.97%	Over 16.84%	Over 16.82%	Over 17.30%

XXVIII. The X-Factor shall be applicable as lower of 2% or 30% of change in CPI for the Generation and Transmission functions and lower of 3% or 30% of change in CPI for the Distribution function.

XXIX. Terms and Conditions of supply of K-Electric have been modified in line with the terms and conditions of supply for XWDISCOs as prescribed in Annex-VI.

XXX. The issue of new connection charges shall be decided through separate proceedings with consultation of all the relevant stakeholders. Till such time K-Electric shall ensure that other connection charges pertaining to new connections to the prospective consumers are comparable with the XWDISCOs preferably LESCO.

XXXI. The Authority may review the tariff applicable to each class of consumers for rationalization or modification from time to time as deemed appropriate, in such a manner that the overall rate would remain the same.

XXXII. K-Electric shall ensure that;

a. All existing consumers having sanctioned load of more than 5kW and above shall be provided ToU metering arrangement not later than December 31, 2017 and shall be billed on ToU rates.

b. All new consumers having sanctioned load of 5kW and above shall be provided ToU metering arrangement with immediate effect and shall be billed on ToU rates.

c. To start billing immediately on ToU rates to the consumer who have already been provided with ToU meters.

XXXIII. Reference CPI for allowing future CPI-X indexations is 205.99 as on May 31, 2016.

XXXIV. Furnace oil price of Rs.27,744/Metric Ton has been assumed to work out the Fuel cost component of K-Electric's own power plants.

XXXV. Gas price has been assumed as Rs.613/mmbtu.

XXXVI. For the power purchase cost (Fuel, O&M and Capacity charges), the actual cost for the month of June, 2016 has been taken as reference.

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XXXVII. Any corporate tax liability to the extent of current tax paid (without the impact of deferred tax impact) would be treated as pass through and shall be allowed through adjustment in the tariff.

XXXVIII. All components of the tariff shall be adjusted with yearly allowed target of T&D losses.

XXXIX. K-Electric is allowed to charge the users of its system a "Use of system charge" (UOSC) equal to:

i) Where 220kV, 132 kV and 66kV system is involved;

$$UOSC = TM(Gross) \times \frac{(1-L)}{(1-0.013)} \quad Paisa/kWh$$

ii) Where only 11 kV distribution systems is involved;

$$UOSC = DM(Gross) \times \frac{(1-L)}{(1-0.062)} \times \text{AFA(D)} \quad Paisa/kWh$$

iii) Where Transmission Network along with 11 kV distribution systems are involved;

$$UOSC = TM + DM(Gross) \times \frac{(1-L)}{(1-0.075)} \times \text{AFA(TD)} \quad Paisa/kWh$$

Where;

Gross Transmission Margin for FY 2016-17 is set at Rs. 0.6023/kWh to be adjusted on respective year regulatory assessments.

Gross Distribution Margin for FY 2016-17 is set at Rs. 1.6860/kWh (without taking the impact of other income) to be adjusted on respective year regulatory assessments.

Gross Transmission & Distribution Margin for FY 2016-17 is set at Rs.2.2883/kWh (without excluding impact of other income) to be adjusted on respective year regulatory assessments

'L' is the overall percentage loss assessment for the respective year.

AFA (D) = Adjustment factor for assets at 11 kV level i.e. 42%.

AFA (TD) =Adjustment factor for assets at Transmission Network along with 11 kV level i.e. 67%.

XL. K-Electric shall be obligated for adjustment/ recovery of any /all amounts in respect of matters currently pending in the courts or with the Authority or arising out in future pertaining to previous MYT determination /decisions of the Authority. The Authority in

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such cases shall prescribe the method of recovery/adjustment of such costs /claims based on its decision in the matter.

XLI. K-Electric is directed to provide net metering arrangement to the consumers in accordance with the applicable provisions of *NEPRA (Alternative and Renewable Energy) Distributed Generation and Net Metering Regulations, 2015.*

XLII. No adjustment on account of variation in KIBOR and LIBOR shall be allowed to K-Electric during the tariff control period.

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The Summary of Directions;

1. To stop charging bill collection charges separately from the consumers in future.

2. To pay interest on security deposits to the consumers through their bills in future.

3. To stop charging of meter rent in future from those consumers who pay their cost of meter

4. To provide following information regarding 900 MW BQPS-III RLNG Power plant within 30 days of the issuance of instant MYT determination:

    i. Make, Model & Type of Technology.

    ii. OEM and EPC guaranteed figures for net LHV flat thermal efficiency (at mean site conditions) on RLNG and HSD (if applicable) based on simple and combined cycle mode of operation.

    iii. OEM and EPC guaranteed figures for net capacity along with auxiliary consumption (at mean site conditions) on RLNG and HSD (if applicable) based on simple and combined cycle mode of operation.

    iv. Degradation and part-load adjustment factors provided by OEM for the major individual components and overall plant.

    v. Clear time lines regarding COD on open cycle and on combined cycle mode.

5. To apply the weighted average method for calculation of monthly F.O in its future adjustments to the Authority.

6. To develop and share its plans/ recommendations regarding competitive market regime in consultation with CPPA-G within a period of two years.

7. To follow grid code strictly and to build a state of the art real time online dispatch, control and monitoring center having a dedicated software with the objective of determining the most efficient, low-cost and reliable operation of a power system by dispatching the available electricity generation resources to supply the load on the system so as to achieve the objective to minimize the total cost of generation.

8. K-Electric is directed to take up the matter regarding payments from Strategic consumers with the GoP and a mechanism with respect to recoveries of arrears along-with future payments must be covered and clearly elaborated in the Implementation Agreement.

9. To comply following directions regarding ToU;

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a. All existing consumers having sanctioned load of more than 5kW and above shall be provided ToU metering arrangement not later than December 31, 2017 and shall be billed on ToU rates.

b. All new consumers having sanctioned load of 5kW and above shall be provided ToU metering arrangement with immediate effect and shall be billed on ToU rates.

c. To start billing immediately on ToU rates to the consumer who have already been provided with ToU meters.

10. In case of doubts about the accuracy of any metering equipment, K-Electric, in addition to its existing testing lab should also provide the facility of mobile testing laboratory having exactly calibrated equipment at the door step of the affected consumer to check the accuracy of the meter, in presence of the consumer (or its representative). The calibrated equipment should indicate the last calibration date of the testing equipment.

11. Till the finalization of the review filed by K-Electric against decision of the Authority dated October 03, 2016, regarding under-utilization of sanctioned load, K-Electric is directed to refrain from disconnecting supply of consumers due to under-utilization of their sanctioned load.

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Annex-I

Detial of Tariff FY 2016-17

Description	Unit	FY 17		
		Mln. Rs.	Rs. /kWh (Unit Sent Out)	Rs. /kWh (Unit Sold)
GENERATION				
K.E System	[GWh]	9,114		
Power Purchase	[GWh]	2,934		
NTDC	[GWh]	5,409		
	[GWh]	**17,458**		
Fuel Cost				
K.E System		51,090	2.9265	3.6998
Power Purchase (IPPs, etc.)		17,703	1.0140	1.2820
CPPA-G		21,790	1.2482	1.5780
		90,583	**5.1888**	**6.5598**
Generation O&M				
K.E System		5,763	0.3301	0.4173
Power Purchase (IPPs, etc.)		7,538	0.4318	0.5459
CPPA-G		13,478	0.7720	0.9760
		26,779	**1.5339**	**1.9392**
Depreciation		3,864	0.2213	0.2798
RORB		13,152	0.7534	0.9524
Generation Total		**134,378**	**7.6974**	**9.7312**
TRANSMISSION				
Units Purchased	[GWh]	17,458		
Transmission Loss (%)		1.3%		
Units Lost	[GWh]	227		
Units Sent Out	[GWh]	17,231		
O&M		2,941	0.1707	0.2130
Depreciation		1,369	0.0795	0.0991
RORB		4,007	0.2326	0.2902
Transmission Total		**8,318**	**0.4827**	**0.6023**
DISTRIBUTION				
Units Purchased	[GWh]	17,231		
Distribution Loss (%)		19.86%		
Units Lost	[GWh]	3,422		
Units Sent/Sold	[GWh]	13,809		
O&M		15,699	1.1369	1.1369
Bad Debts		2,941	0.2130	0.2130
Depreciation		2,189	0.1585	0.1585
Other Income		(4,253)	(0.3080)	(0.3080)
RORB		2,453	0.1776	0.1776
Distribution Total		**19,028**	**1.3780**	**1.3780**
Base Rate Adjustment Component		*14,624*		*1.0590*
Avg. Sale Rate		**176,348**		**12.7706**

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Annex-II

MECHANISM FOR ADJUSTMENT IN TARIFF DUE TO VARIATION IN FUEL PRICE

1. The fuel cost component of tariff of KE's own generation power plants shall be adjusted due to change in fuel prices, generation mix and volume. KE shall be allowed adjustment in this tariff component on monthly and quarterly basis.

Adjustments on Monthly Basis

2. The change in fuel cost component of KE's own generation fleet including any new/replaced power plants due to variation in fuel prices, generation mix and volume shall be passed on to the consumers of KE directly in their monthly bills in the form of Fuel Charges Adjustment ("FCA"). Following steps shall be followed to calculate these variations;

   i. The monthly fuel cost of each power plant/unit (inclusive of new /upcoming power plants) (on each fuel in case of dual fuel power stations) in KE's own generation system will be calculated based on actual units generated based on the target of heat rates and auxiliary consumption, approved by the Authority, as per the following formula;

$$CoF = (GBB \times HR \times FP_{(CM)})$$

CoF	=	Cost of Fuel of each power station/unit in Million Rupees
GBB	=	Generation at Bus Bar of power station after its approved auxiliary consumption expressed in GWh
HR	=	The approved heat rate for each power station/unit in BTUs/kWh at Bus Bar.
$FP_{(CM)}$	=	Price of fuels for the current month converted into Rs./BTUs. The price of gas as notified by the relevant Authority shall be used. In case of deregulated fuels, the prices shall be verified from the documentary evidences to be submitted by KE. The conversion in BTUs shall be made based on calorific value approved by the Authority. For the determined fuel component in this tariff determination, the furnace oil and gas prices of Rs, 27,744/Metric ton and Rs. 613/MMBTu respectively have been used as reference. Calorific value of 40,351 BTUs/kg for furnace oil has been used.

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Note: For dual fuel power plants/units, total fuel cost shall be calculated totaling the cost of energy generated on each fuel.

ii. The fuel cost of each power station shall be totaled to arrive at monthly fuel cost of KE's whole generation fleet.

$$TCoF_{(WG)} = CoF1 + CoF2 + CoF3 \ldots\ldots CoF_N$$

TCoF (WG)	=	Total Cost of Fuel in Million Rupees of whole generation fleet of KE
COF1	=	Cost of Fuel in Million Rupees of 1st power plant/unit
COF2	=	Cost of Fuel in Million Rupees of 2nd power plant/unit
COF3	=	Cost of Fuel in Million Rupees of 3rd power plant/unit
CoFN	=	Cost of Fuel in Million Rupees of Nth power plant/unit

iii. The weighted average fuel cost shall be worked out by dividing the total fuel cost of whole generation fleet of KE with the total units sent out (both own generation and power purchases) by KE in that month.

$$WAFC_{(WG)} = TCoF_{(WG)} / TUSO$$

WAFC (WG)	=	Weighted Average Fuel cost of KE's whole generation fleet in Rs./kWh
TCoF (WG)	=	Total Cost of Fuel in Million Rupees of whole generation fleet of KE
TUSO	=	Total Units Sent Out based on targeted auxiliaries (KE's own generation + Power Purchases) in GWh

iv. The computed monthly weighted average cost shall be compared with the reference weighted average cost to compute monthly FCA portion of change in KE own generation's fuel component. The formula is produced below;

$$FCA(OG) = \{WAFC_{(WG)(CM)} - WAFC_{(WG)(RM)}\}$$

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FCA(OG)	=	The required Increase/ (Decrease) in Rs./kWh in fuel cost component of KE's own generation for the current month over the last month of the previous quarter to be reflected in the monthly bills of consumers as part of Fuel Charges Adjustment.
WAFC (WG) (CM)	=	Weighted Average Fuel cost of KE's whole generation fleet of the Current Month in Rs./kWh
WAFC (WG) (RM)	=	Weighted Average Fuel cost of KE's whole generation fleet of the Reference Month in Rs./kWh

v. For the purpose of above adjustment the Current Month would mean the month for which adjustment is required and the Reference Month would mean the last month of the preceding quarter.

vi. For the purpose of adjustment for the months from July 01, 2016 to September, 2016, the determined fuel cost component of Rs.2.9265/kWh, calculated on total units sent out basis, shall be used as reference.

vii. The generation at Bus bar for each power station/unit shall be worked out after subtracting the auxiliary consumption, set by the Authority, from the gross generation for each generating unit/power station.

viii. The price of furnace oil shall be worked out on the basis of monthly weighted average method taking into account the opening stock, monthly purchases and closing stock. The price of gas as notified by the relevant Authority shall be used to calculate the cost and corresponding variations. In case of other fuels, the costs and variations shall be computed using prices that are either notified by the relevant Authority or based on the documentary evidences submitted by KE.

ix. In case it is not possible to calculate energy on each fuel for the dual fuel power stations then the energy generated shall be worked out based on proportionate BTUs consumed (based on Authority's benchmark calorific value) of each fuel.

x. The calorific value of furnace oil has been set as 40,351 BTUs/Kg. No variations in the calorific value shall be allowed on actual basis during the tariff control period. The calorific value of other fuels shall be approved by the Authority before allowing variation thereon.

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xi. K-Electric shall submit its monthly adjustment request within seven days following the current month. The request shall be submitted on a prescribed format as provided in this Mechanism. KE shall submit the following information/data for verification.

- Complete monthly data showing plant/unit wise gross generation, actual auxiliary consumption, fuel consumption, installed capacity, de-rated capacity, plant availability, power dispatched and system demand data.
- Fuel stock position (opening and closing), Furnace Oil/Gas/Other Fuels purchased during a month along with duly verified copies of purchase orders.
- KE shall be obligated to provide any additional information, if required, during the processing of the relevant adjustment request.

xii. The approved monthly FCA shall be notified by the Authority and shall be charged in the month intimated by the Authority in the respective monthly FCA decision. The determined FCA shall be charged on the basis of units consumed by each consumer in the month for which it is calculated.

xiii. K-Electric in its FCA request shall certify that data provided is accurate and plants have been operated following economic despatch.

Adjustment on quarterly basis.

xiv. The impact of monthly variations in Million Rupees in KE own generation's fuel cost component to the extent of targeted T&D losses, not taken into account in the monthly FCAs, shall be adjusted on quarterly basis, i.e. approved respective monthly FCA times the total units sent out multiplied by the allowed level of T&D losses. The impact of these variations shall be worked out based on targeted units to be sold in the next quarter and shall be adjusted in the Schedule of Tariff of KE. Upon recovery of the allowed variations, this impact shall be reversed in the next quarterly adjustment.

xv. Furthermore, in order to bring KE's tariff on current level of fuel prices, the KE own generation's fuel cost component shall be adjusted at the price level of last month of each quarter. The weighted average fuel cost of last month of quarter under consideration shall be

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compared with the weighted average fuel cost of reference month of last quarter to work out this impact. The resultant variations in terms of Rs./kWh shall be adjusted in the SOT of KE. For the purpose of adjustment for the quarter July 01, 2016 to September, 2016, the fuel cost component of Rs.3.6998/kWh, calculated on units sold basis, shall be used as reference.

xvi. The determined fuel cost component shall also be adjusted with the target of yearly T&D losses while making the adjustment for the quarter April-June every year.

xvii. The aforesaid quarterly adjustments shall be made in the consumer end tariff using following yearly target of T&D losses;

FY	2016	2017	2018	2019	2020	2021	2022	2023
Loss Reduction (%)	22.10	20.90	19.80	18.75	17.76	16.80	15.95	15.36

xviii. K-Electric shall submit the quarterly adjustment request within fifteen days (15), following the last month of each quarter.

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MECHANISM FOR ADJUSTMENT OF FUEL PRICE VARIATIONS

Generation on Gas, F.O and Others at Bus Bar	Unit	Reference month	Current Month
Bin Qasim Power Station Unit-I Bin Qasim Power Station Unit-II Bin Qasim Power Station Unit-III Bin Qasim Power Station Unit-IV Bin Qasim Power Station Unit-V Bin Qasim Power Station Unit-VI Korangi Gas Turbine Power Station SITE Gas Turbine Power Station Bin Qasim Power Station-II CCPP Korangi Combined Cycle Power Station New Power Station(s)	GWh		
Total			
Price of Fuel			
Gas	(Rs/MMBTu)		
Furnace	(Rs/M.Ton)		
Others			
Approved Heat Rates at Bus Bar-Gas, F.O, Others			
Bin Qasim Power Station-I Bin Qasim Power Station Unit-II Bin Qasim Power Station Unit-III Bin Qasim Power Station Unit-IV Bin Qasim Power Station Unit-V Bin Qasim Power Station Unit-VI Korangi Gas Turbine Power Station SITE Gas Turbine Power Station Bin Qasim Power Station-II CCPP Korangi Combined Cycle Power Station New Power Station(s)	BTU/kWh		
Cost of Fuels (Gas, F.O, Total , Others)			
Bin Qasim Power Station-I Bin Qasim Power Station Unit-II Bin Qasim Power Station Unit-III Bin Qasim Power Station Unit-IV Bin Qasim Power Station Unit-V Bin Qasim Power Station Unit-VI Korangi Gas Turbine Power Station SITE Gas Turbine Power Station Bin Qasim Power Station-II CCPP Korangi Combined Cycle Power Station New Power Station(s)	Mln Rs.		
Total Cost of Fuel	Mln Rs.		
Weighted Average Cost- Current Month	Rs./kWh		
Less Weighted Average Cost- Reference Month	Rs./kWh		
Required Increase/Decrease- KE's Own Generation	Rs./kWh		

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Annex-III

MECHANISM FOR ADJUSTMENT IN TARIFF DUE TO VARIATION IN POWER PURCHASE PRICE ("PPP")

1. This mechanism shall be applicable to make adjustments in the PPP component of KE's tariff due to variation in fuel prices, energy mix, inflation, exchange rate etc. on monthly and quarterly basis.

Adjustment on Monthly Basis

2. The change in the fuel component of PPP due to variation in fuel prices and energy mix shall be passed on to the consumers of KE directly in their monthly bills in the form of FCA. Following steps shall be followed to calculate these variations;

   i. The actual fuel cost of each power station/source, determined/approved by the Authority, shall be totaled to arrive at monthly total fuel cost of all the power stations.

$$TCoF_{(WPPP)} = CoF1 + CoF2 \ldots\ldots\ldots CFN$$

TCoF (WPPP)	=	Total Cost of Fuel in Million Rupees of all external generation sources
COF1	=	Cost of Fuel in Million Rupees of 1st power plant/unit
COF2	=	Cost of Fuel in Million Rupees of 2nd power plant/unit
COFN	=	Cost of Fuel in Million Rupees of Nth power plant/unit

   ii. The weighted average fuel cost of the PPP shall be worked out by dividing the total fuel cost with the total units sent out (both own generation and power purchases) by KE in that month.

$$WAFC\ (WG) = TCoF\ (WG) / TUSO$$

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WAFC $_{(WPPP)}$	=	Weighted Average Fuel cost of all external generation sources in Rs./kWh
TCoF $_{(WPPP)}$	=	Total Cost of Fuel in Million Rupees of all external generation sources
TUSO	=	Total targeted Units Sent Out (KE's own generation+ Power Purchases) in GWh

iii. The computed monthly weighted average fuel cost shall be compared with the reference weighted average fuel cost to compute the PPP fuel component part of FCA. The formula is produced below;

$$\text{FCA-PPP} = \{\text{WAFC}_{(WPPP)(CM)} - \text{WAFC}_{(WPPP)(RM)}\}$$

FCA-PPP	=	The required Increase/ (Decrease) in PPP's fuel cost component for the current month over the reference month to be reflected in the monthly bills of consumers as part of Fuel Charges Adjustment.
WAFC $_{(WPPP)(CM)}$	=	Weighted Average Fuel cost component of PPP of the Current Month
WAFC $_{(WPPP)(RM)}$	=	Weighted Average Fuel cost component of PPP of the Reference Month

iv. For the purpose of above adjustment, the Current Month would mean the month for which adjustment is required and the Reference Month would mean the last month of the preceding quarter. For the purpose of adjustment for the months from July 01, 2016 to September, 2016, the fuel cost component of PPP of Rs. 2.2622/kWh, calculated on units sent out basis, shall be used as reference.

v. The monthly adjustment shall be restricted to the fuel component of PPP and shall be passed on to the consumers as part of FCA in accordance with the above formula.

vi. K-Electric shall, within seven days following the Current Month, request for FCA to compensate for variations in fuel component of PPP. The request shall be submitted on a prescribed format as provided in this Mechanism.

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vii. KE shall submit the following information/data for verification.

- Complete monthly data showing power purchased in GWh, installed capacity, de-rated capacity, plant availability, power dispatched and system demand data.
- Duly verified copies of invoices raised by each external source of power along with duly verified copies of their purchase orders/bill stickers.
- K-Electric shall also provide separate workings/indexations for all the tariff components along with the applicable currency exchange rate, US CPI etc. in accordance with approved determination/power purchase agreement.
- KE shall be directed for the provision of any additional information, if required, during the processing of relevant adjustment request

viii. The approved monthly FCA shall be notified by the Authority and shall be charged in the month intimated by the Authority in the respective monthly decision. The determined FCA shall be charged on the basis of units consumed by each consumer in the month for which FCA is calculated.

Adjustment on quarterly basis.

ix. The impact of monthly variations in Million Rupees in fuel cost component of PPP to the extent of targeted T&D losses, not taken into account in the monthly FCAs, shall be adjusted on quarterly basis. The impact of these variations shall be worked out based on targeted units to be sold in the next quarter and shall be adjusted in the SoT of KE. Upon recovery of the allowed variations, this impact shall be reversed.

x. In addition, the monthly variations in Million Rupees in the variable O&M and fixed costs, as allowed by the Authority, shall be adjusted on quarterly basis using weighted average method on targeted units sold basis. The impact of these variations shall be worked out based on targeted units to be sold in the next quarter and shall be adjusted in the SoT of KE. Upon recovery of the allowed variations, this impact shall be reversed. For the purpose of these adjustments for the quarter July 01, 2016 to September, 2016, the O&M and capacity charges components of Rs. 1.5219/kWh, calculated on units sold basis, shall be used as reference.

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xi. Furthermore, in order to bring KE's tariff on current level of prices, each cost component of PPP shall be adjusted at the price level of last month of each quarter. The total weighted average PPP of last month of quarter under consideration shall be compared with the total weighted average PPP of reference month of the last quarter to work out this impact. For the purpose of these adjustments for the quarter July 01, 2016 to September, 2016, the PPP of Rs. 4.3819/kWh, calculated on units sold basis, shall be used as reference.

xii. The determined PPP component shall also be adjusted with the target of yearly T&D losses while making the adjustments for the quarter April-June every year.

xiii. The net quarterly variation in the power purchase cost (Fuel + Fixed part) shall be adjusted in the consumer end tariff based on the following yearly target of T&D losses.

FY	2016	2017	2018	2019	2020	2021	2022	2023
Loss Reduction (%)	22.10	20.90	19.80	18.75	17.76	16.80	15.95	15.36

xiv. K-Electric shall submit the quarterly adjustment request within fifteen days (15), following the last month of each quarter. K-Electric shall be entitled to monthly/quarterly adjustment of PPP only from such sources whose tariffs are determined/approved by the Authority. The approved tariff of wind/solar power projects shall only be allowed variations on quarterly basis.

xv. The actual payments in respect of WWF and WPPF to the IPPs shall be considered as pass through and shall be adjusted on yearly basis upon production of verifiable documentary evidences. Upon recovery of the same, the impact of these items shall be reversed.

xvi. For the purpose of above adjustment the Current Quarter would mean the quarter for which adjustment is required and the Reference Quarter would mean the quarter preceding the Current Quarter.

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xvii. The approved quarterly adjustment in tariff along with the revised schedule of tariff shall be sent to GoP for notification.

MECHANISM FOR CALCULATIONS OF POWER PURCHASE COST VARIATIONS

Generation at Bus Bar	**Unit**	**Reference month**	**Current Month**
Tapal Gul Ahmed NTDC KANUPP PASMIC Others	GWh		
Total			
Rate of Power Purchase	**Unit**	**Last month**	**Current Month**
Tapal Gul Ahmed NTDC KANUPP PASMIC Others	Rs./ kWh		
Total			
Total Cost of Power Purchase			
Tapal Gul Ahmed NTDC KANUPP PASMIC Others	Mln. Rs.		
Weighted Average Cost- Current Month	Rs./kWh		
Weighted Average Cost- Reference Month	Rs./kWh		
Required Increase/Decrease in the consumer end tariff	Rs./kWh		

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MECHANISM FOR ADJUSTMENT OF O&M, BAD DEBTS, BASE RATE ADJUSTMENT COMPONENT, OTHER INCOME, DEPRECIATION AND RETURN COMPONENTS

1. This mechanism shall be applicable to make adjustments in the O&M cost components of KE's tariff. The breakup of approved O&M cost components for the generation, transmission and distribution segments adjusted for FY 2016-17 of KE is indicated in the following table;

TABLE - I

O&M Component	Symbol	Component (Rs/kWh)
(1)	(2)	(3)
Generation owned by K-Electric	Go	0.4173
Transmission	To	0.2130
Distribution	Do	1.1369
Total Rate		**1.7672**

2. The productivity/efficiency factor (X factor) for future years as applicable to O&M component relating to each segment of generation, transmission and distribution will be;

X factor = lower of 2% or 30% of change in CPI for Generation & Transmission functions and lower of 3% or 30% of change in CPI for Distribution function

3. The O&M component of each segment (Generation, Transmission and Distribution) of Tariff shall be varied to the extent of the change in CPI as per the following formula;

$$OM_I = OMo * \{1 + ((C_{PN}-C_{PO})/C_{PO}) - X\ factor)\}$$

OMI	=	Revised O&M Component of each segment
OMo	=	Reference O&M Component of each segment
CPN	=	New CPI (CPI General as notified by the Pakistan Bureau of Statistics for the month of May each year)
CPO	=	Reference CPI (CPI General as notified by the Pakistan Bureau of Statistics for the month of May of the previous year)
X	=	Respective efficiency factor, for the concerned component as per Para 2

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4. For the purpose of initial indexation falling due on July 01, 2017 the new CPI will be that of May 2017, the previous O&M components of the tariff shall be as indicated in Table-1 above and the previous CPI shall be that of May, 2016 i.e. 205.99 as notified by the Federal Bureau of Statistics (FBS).

5. The above tabulated O&M components have been adjusted with T&D losses of 20.90% applicable for the financial year 2017. These components, after making aforesaid indexation, shall also be adjusted with yearly losses, as targeted in this determination. The formula for adjustment on new losses shall be as follows;

$$OM_{ADJ} = OM_{I} * (1-TL_{(PY)})/ (1-TL_{(NY)})$$

OM_{ADJ}	=	Adjusted O&M Component to be applicable in the next year of each segment
OM_{I}	=	Revised O&M Component of each segment
$TL_{(PY)}$	=	Target of Losses in the Previous Year
$TL_{(NY)}$	=	Target of Losses in the Next Year

6. The adjusted O&M components of tariff resulting from application of CPI indexation and loss adjustment applicable from July 01, 2017 shall become the reference O&M component for application of indexation on July 01, 2018. The CPI as of May, 2017 shall become the previous CPI and the new CPI shall be that of May, 2018 for applying indexation on July 01, 2017. The same procedure will be repeated for the subsequent yearly indexation.

7. The aforesaid variation in the O&M components of tariff i.e. Generation, Transmission & distribution shall be aggregated to form the resulting variation in average sale rate that shall be applied to all categories of consumers.

8. The determined Return, Base Rate Adjustment, Other Income, Bad Debt and Depreciation components of the tariff of KE shall remain fixed throughout the control period, except for adjustment with the yearly target of T&D losses.

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Annex-V

SCHEDULE OF ELECTRICITY TARIFF
FOR K-ELECTRIC LIMITED
DETERMINED FOR THE FY 2016-17

A-1 GENERAL SUPPLY TARIFF - RESIDENTIAL

Sr. No.	TARIFF CATEGORY / PARTICULARS	FIXED CHARGES Rs/kW/M	VARIABLE CHARGES Rs/kWh	
a)	For Sanctioned load less than 5 kW			
i	Up to 50 Units	-	4.00	
	For Consumption exceeding 50 Units			
ii	1- 100 Units	-	9.10	
iii	101- 200 Units	-	10.70	
iv	201- 300 Units	-	12.25	
v	301- 700 Units	-	13.95	
vi	Above 700 Units	-	16.30	
b)	For Sanctioned load 5 kW & above			
			Peak	Off-Peak
	Time Of Use	-	16.50	12.87

As per decision of the Authority, residential consumers will be given benefit of only one previous slab.
Consumption exceeding 50 units but not exceeding 100 units will be charged under the 1-100 slab.
Under tariff A-1, there shall be minimum monthly customer charge at the following rates even if no energy is consumed.

a) Single Phase Connections: Rs. 75/- per consumer per month
b) Three Phase Connections: Rs. 150/- per consumer per month

A-2 GENERAL SUPPLY TARIFF - COMMERCIAL

Sr. No.	TARIFF CATEGORY / PARTICULARS	FIXED CHARGES Rs/kW/M	VARIABLE CHARGES Rs/kWh	
a)	For Sanctioned load less than 5 kW		12.90	
b)	For Sanctioned load 5 kW & above	400.00	12.50	
			Peak	Off-Peak
c)	Time Of Use	400.00	16.50	11.80

Under tariff A-2, there shall be minimum monthly charges at the following rates even if no energy is consumed.

a) Single Phase Connections; Rs. 175/- per consumer per month
b) Three Phase Connections: Rs. 350/- per consumer per month

A-3 GENERAL SERVICES

Sr. No.	TARIFF CATEGORY / PARTICULARS	FIXED CHARGES Rs/kW/M	VARIABLE CHARGES Rs/kWh
a)	General Services	-	13.23

Under tariff A-3, there shall be minimum monthly charges at the following rates even if no energy is consumed.

a) Single Phase Connections; Rs. 175/- per consumer per month
b) Three Phase Connections: Rs. 350/- per consumer per month

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B INDUSTRIAL SUPPLY TARIFFS

Sr. No.	TARIFF CATEGORY / PARTICULARS	FIXED CHARGES Rs/kW/M	VARIABLE CHARGES Rs/kWh	
B1	Upto 25 kW (at 400/230 Volts)	-	13.44	
B2(a)	25-500 kW (at 400 Volts)	400.00	12.59	
B3(a)	For all loads upto 5000 KW (at 11,33 kV)	380.00	10.92	
B4(a)	For all loads upto 5000 KW (at 66,132 kV)	360.00	10.06	
	Time Of Use		Peak	Off-Peak
B1(b)	Upto 25 kW (at 400/230 Volts)	-	16.50	12.87
B2(b)	25-500 kW (at 400 Volts)	400.00	16.50	11.75
B3(b)	For All Loads up to 5000 kW (at 11,33 kV)	380.00	16.50	10.80
B4(b)	For All Loads (at 66,132 kV & above)	360.00	16.50	10.10
B5	For All Loads (at 220 kV & above)	340.00	16.50	9.45

For B1 consumers there shall be a fixed minimum charge of Rs. 350 per month.
For B2 consumers there shall be a fixed minimum charge of Rs. 2,000 per month.
For B3 consumers there shall be a fixed minimum charge of Rs. 50,000 per month.
For B4 consumers there shall be a fixed minimum charge of Rs. 500,000 per month.
For B5 consumers there shall be a fixed minimum charge of Rs. 1000,000 per month.

C - SINGLE-POINT SUPPLY FOR PURCHASE IN BULK BY A DISTRIBUTION LICENSEE AND MIXED LOAD

Sr. No.	TARIFF CATEGORY / PARTICULARS	FIXED CHARGES Rs/kW/M	VARIABLE CHARGES Rs/kWh	
C -1	For supply at 400/230 Volts			
a)	Sanctioned load less than 5 kW	-	13.47	
b)	Sanctioned load 5 kW & up to 500 kW	400.00	12.59	
C -2(a)	For supply at 11,33 kV up to and including 5000 kW	380.00	11.27	
C -3(a)	For supply at 132 and above, up to and including 5000 kW	360.00	10.96	
	Time Of Use		Peak	Off-Peak
C -1(c)	For supply at 400/230 Volts 5 kW & up to 500 kW	400.00	16.50	11.75
C -2(b)	For supply at 11,33 kV up to and including 5000 kW	380.00	16.50	10.80
C -3(b)	For supply at 132 kV up to and including 5000 kW	360.00	16.50	10.10

D - AGRICULTURE TARIFF

Sr. No.	TARIFF CATEGORY / PARTICULARS	FIXED CHARGES Rs/kW/M	VARIABLE CHARGES Rs/kWh	
D-1	For all Loads	200.00	11.22	
	Time of Use		Peak	Off-Peak
D-2	For all Loads	200.00	16.50	10.80

Note:- The consumers having sanctioned load less than 5 kW can opt for TOU metering.

E - TEMPORARY SUPPLY TARIFFS

Sr. No.	TARIFF CATEGORY / PARTICULARS	FIXED CHARGES Rs/kW/M	VARIABLE CHARGES Rs/kWh
E-1(i)	Residential Supply	-	14.00
E-1(ii)	Commercial Supply	-	15.00
E-2 (i)	Industrial Supply	-	15.00
E-2 (ii)	Bulk Supply		
	(a) at 400 Volts	-	15.00
	(b) at 11 kV		15.00

For the categories of E-1(i&ii) and E-2 (I&ii) above, the minimum bill of the consumers shall be Rs. 50/- per day subject to a minimum of Rs.500/- for the entire period of supply, even if no energy is consumed.

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F - SEASONAL INDUSTRIAL SUPPLY TARIFF

125% of relevant industrial tariff

Note:

Tariff-F consumers will have the option to convert to Regular Tariff and vice versa. This option can be exercised at the time of a new connection or at the beginning of the season. Once exercised , the option remains in force for at least one year.

G- PUBLIC LIGHTING

Sr. No.	TARIFF CATEGORY / PARTICULARS	FIXED CHARGES Rs/kW/M	VARIABLE CHARGES Rs/kWh
	Street Lighting	-	13.95

Under Tariff G, there shall be a minimum monthly charge of Rs.500/- per month per kW of lamp capacity installed.

H - RESIDENTIAL COLONIES ATTACHED TO INDUSTRIAL PREMISES

Sr. No.	TARIFF CATEGORY / PARTICULARS	FIXED CHARGES Rs/kW/M	VARIABLE CHARGES Rs/kWh
	Residential Colonies attached to industrial premises	-	13.95

J - SPECIAL CONTRACTS UNDER NEPRA (SUPPLY OF POWER) REGULATIONS 2015

Sr. No.	TARIFF CATEGORY / PARTICULARS	FIXED CHARGES Rs/kW/M	VARIABLE CHARGES Rs/kWh	
J -1	For supply at 66 kV & above and having sanctioned load of 20MW & above	360.00	10.96	
J-2				
(a)	For supply at 11,33 kV	380.00	11.27	
(b)	For supply at 66 kV & above	360.00	10.96	
J-3				
(a)	For supply at 11,33 kV	380.00	11.27	
(b)	For supply at 66 kV & above	360.00	10.96	
	Time Of Use		Peak	Off-Peak
J -1(b)	For supply at 66 kV & above and having sanctioned load of 20MW & above	360.00	16.50	10.10
J-2 (c)	For supply at 11,33 kV	380.00	16.50	10.80
J-2 (d)	For supply at 66 kV & above	360.00	16.50	10.10
J-3 (c)	For supply at 11,33 kV	380.00	16.50	10.80
J-3 (d)	For supply at 66 kV & above	360.00	16.50	10.10

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Annex-VI

TERMS AND CONDITIONS OF TARIFF
(FOR SUPPLY OF POWER SPECIFIC TO EACH CONSUMER CATEGORY)

PART-I

GENERAL DEFINITIONS

The Company, for the purposes of these terms and conditions means K-Electric engaged in the business of distribution of electricity within the territory mentioned in the licence granted to it for this purpose.

1. "Month or Billing Period", unless otherwise defined for any particular tariff category, means a billing month of 30 days or less reckoned from the date of last meter reading.
2. "Minimum Charge", means a charge to recover the costs for providing customer service to consumers even if no energy is consumed during the month.
3. "Fixed Charge" means the part of sale rate in a two-part tariff to be recovered on the basis of "Billing Demand" in kilowatt on monthly basis.
4. "Billing Demand" means the highest of maximum demand recorded in a month except in the case of agriculture tariff D2 where "Billing Demand" shall mean the sanctioned load.
5. "Variable Charge" means the sale rate per kilowatt-hour (kWh) as a single rate or part of a two-part tariff applicable to the actual kWh consumed by the consumer during a billing period.
6. "Maximum Demand" where applicable, means the maximum of the demand obtained in any month measured over successive periods each of 30 minutes' duration except in the case of consumption related to Arc Furnaces, where "Maximum Demand" shall mean the maximum of the demand obtained in any month measured over successive periods each of 15 minutes' duration.
7. "Sanctioned Load" where applicable means the load in kilowatt as applied for by the consumer and allowed/authorized by the Company for usage by the consumer.
8. "Power Factor" means the ratio of kWh to KVAh recorded during the month or the ratio of kWh to the square root of sum of square of kWh and kVARh,.
9. Point of supply means metering point where electricity is delivered to the consumer.
10. Peak and Off Peak hours for the application of Time Of Use (TOU) Tariff shall be the following time periods in a day:

	* PEAK TIMING	OFF-PEAK TIMING
April to October (inclusive)	6.30 PM to 10.30 PM	Remaining 20 hours of the day
November to March (inclusive)	6.00 PM to 10.00 PM	-do-

* To be duly adjusted in case of day light time saving

11. "Supply", means the supply for single-phase/three-phase appliances inclusive of both general and motive loads subject to the conditions that in case of connected or sanctioned load exceeding 4 kW supply shall be given at three-phase.
12. "Consumer" means a person of his successor-in-interest as defined under Section 2(iv) of the Regulation of Generation, Transmission and Distribution of Electric Power Act (XL of 1997).
13. "Charitable Institution" means an institution, which works for the general welfare of the public on no profit basis and is registered with the Federal or Provincial Government as such and has been issued tax exemption certificate by Federal Board of Revenue (FBR).

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14. NTDCL means the National Transmission and Dispatch Company Limited.
15. CPPA(G) means Central Power Purchasing Agency Guarantee Limited (CPPA)(G).
16. The "Authority" means "The National Electric Power Regulatory Authority (NEPRA)" constituted under the Regulation of Generation, Transmission and Distribution of Electric Power Act (XL of 1997).

GENERAL CONDITIONS

1. "The Company shall render bills to the consumers on a monthly basis or less on the specific request of a consumer for payment by the due date.
2. The Company shall ensure that bills are delivered to consumers at least seven days before the due date. If any bill is not paid by the consumer in full within the due date, a Late Payment Charge of 10% (ten percent) shall be levied on the amount billed excluding Govt. tax and duties etc. In case bill is not served at least seven days before the due date then late payment surcharge will be levied after 7^{th} day from the date of delivery of bill.
3. The supply provided to the consumers shall not be available for resale.
4. In the case of two-part tariff average Power Factor of a consumer at the point of supply shall not be less than 90%. In the event of the said Power factor falling below 90%, the consumer shall pay a penalty of two percent increase in the fixed charges determined with reference to maximum demand during the month corresponding to one percent decrease in the power factor below 90%.

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PART-II

(Definitions and Conditions for supply of power specific to each consumer category)

A-1 RESIDENTIAL

Definition

"Life Line Consumer" means those residential consumers having single phase electric connection with a sanctioned load up to 1 kW.

At any point of time, if the floating average of last six months' consumption exceed 50 units, then the said consumer would not be classified as life line for the billing month even if its consumption is less than 50 units. For the purpose of calculating floating average, the consumption charged as detection billing would also be included.

1. This Tariff is applicable for supply to;

   i) Residences,
   ii) Places of worship,

2. Consumers having sanctioned load less than 5 kW shall be billed on single-part kWh rate i.e. A-1(a) tariff.
3. All new consumers having sanctioned load 5 kW and above shall be provided T.O.U metering arrangement and shall be billed on the basis of tariff A-l(b) as set out in the Schedule of Tariff.
4. All existing consumers having sanctioned load 5 kW and above shall be provided T.O.U metering arrangement and converted to A- 1(b) Tariff by the Company.

A-2 COMMERCIAL

1. This tariff is applicable for supply to commercial offices and commercial establishments such as:

   i) Shops,
   ii) Hotels and Restaurants,
   iii) Petrol Pumps and Service Stations,
   iv) Compressed Natural Gas filling stations,
   v) Private Hospitals/Clinics/Dispensaries,
   vi) Places of Entertainment, Cinemas, Theaters, Clubs;
   vii) Guest Houses/Rest Houses,
   viii) Office of Lawyers, Solicitors, Law Associates and Consultants, All Private Offices etc.

2. Consumers under tariff A-2 having sanctioned load of less than 5 kW shall be billed under a Single-Part kWh rate A-2(a).
3. All existing consumers under tariff A-2 having sanctioned load 5 kW and above shall be billed on A-2(b) tariff till such time that they are provided T.O.U metering arrangement; thereafter such consumers shall be billed on T.O.U tariff A-2(c).
4. All new connections having load requirement 5 kW and above shall be provided T.O.U meters and shall be billed under tariff A-2(c).

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A-3 GENERAL SERVICES

1. This tariff is applicable to;

    i. Approved religious and charitable institutions
    ii. Government and Semi-Government offices and Institutions
    iii. Government Hospitals and dispensaries
    iv. Educational institutions
    v. Water Supply schemes including water pumps and tube wells operating on three phase 400 volts other than those meant for the irrigation or reclamation of Agriculture land.

1. Consumers under General Services (A-3) shall be billed on single-part kWh rate i.e. A-3(a) tariff.

B INDUSTRIAL SUPPLY

Definitions

1. "Industrial Supply" means the supply for bona fide industrial purposes in factories including the supply required for the offices and for normal working of the industry.
2. For the purposes of application of this tariff an "Industry" means a bona fide undertaking or establishment engaged in manufacturing, value addition and/or processing of goods.
3. This Tariff shall also be available for consumers having single-metering arrangement such as;

    i) Poultry Farms
    ii) Fish Hatcheries and Breeding Farms and
    iii) Software houses

Conditions

An industrial consumer shall have the option, to switch over to seasonal Tariff-F, provided his connection is seasonal in nature as defined under Tariff-F, and he undertakes to abide by the terms and conditions of Tariff-F and pays the difference of security deposit rates previously deposited and those applicable to Tariff-F at the time of acceptance of option for seasonal tariff. Seasonal tariff will be applicable from the date of commencement of the season, as specified by the customers at the time of submitting the option for Tariff-F. Tariff-F consumers will have the option to convert to corresponding Regular Industrial Tariff category and vice versa. This option can be exercised at the time of obtaining a new connection or at the beginning of the season. Once exercised, the option will remain in force for at least one year.

B -1 SUPPLY AT 400 VOLTS THREEPHASE AND/OR 230 VOLTS SINGLE PHASE

1. This tariff is applicable for supply to Industries having sanctioned load up-to 25 kW.
2. Consumers having sanctioned load up-to 25 kW shall be billed on single-part kWh rate.
3. All existing consumers under tariff B-1 shall be provided T.O.U metering arrangement by the Company and convert it to-B1 (b) Tariff.
4. All new applicants i.e. prospective consumers applying for service to the Company shall be provided T.O.U metering arrangement and charged according to the applicable T.O.U tariff.

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B-2 SUPPLY AT 400 VOLTS

1. This tariff is applicable for supply to Industries having sanctioned load of more than 25 kW up to and including 500 kW.
2. All existing consumers under tariff B-2 shall be provided T.O.U metering arrangement by the Company and converted to B-2(b) Tariff.
3. All existing consumers under tariff B-2 shall be billed on B-2(a) tariff till such time that they are provided T.O.U metering arrangement; thereafter such consumers shall be billed on T.O.U tariff B-2(b).
4. All new applicants i.e. prospective consumers applying for service to the Company shall be provided T.O.U metering arrangement and charged according to the applicable T.O.U tariff.

B-3 SUPPLY AT 11 kV AND 33 kV

1. This tariff is applicable for supply to Industries having sanctioned load of more than 500 kW up to and including 5000 kW and also for Industries having sanctioned load of 500 kW or below who opt for receiving supply at 11 kV or 33 kV.
2. If, for any reason, the meter reading date of a consumer is altered and the acceleration/retardation in the date is up to 4 days, no notice shall be taken of this acceleration or retardation. But if the date is accelerated or retarded by more than 4 days, the fixed charges shall be assessed on proportionate basis for the actual number of days between the date of the old reading and the new reading.
3. The supply under this Tariff shall not be available to a prospective consumer unless he provides, to the satisfaction and approval of the Company, his own Transformer, Circuit Breakers and other necessary equipment as part of the dedicated distribution system for receiving and controlling the supply, or, alternatively pays to the Company for all apparatus and equipment if so provided and installed by the Company. The recovery of the cost of service connection shall be regulated by the NEPRA eligibility criteria.
4. All existing consumers under tariff B-3 shall be provided T.O.U metering arrangement by the Company and converted to B-3(b) Tariff.
5. All existing consumers under tariff B-3 shall be billed on B-3(a) tariff till such time that they are provided T.O.U metering arrangement; thereafter such consumers shall be billed on T.O.U tariff B-3(b).
6. All new applicants i.e. prospective consumers applying for service to the Company shall be provided T.O.U metering arrangement and charged according to the applicable T.O.U tariff.

B-4 SUPPLY AT 66 kV and 132 kV

1. This tariff is applicable for supply to Industries for all loads of more than 5000 kW receiving supply at 66 kV and 132 kV and also for Industries having load of 5000 kW or below who opt to receive supply at 66 kV or 132 kV.
2. If, for any reason, the meter reading date of a consumer is altered and the acceleration/retardation in the date is up to 4 days, no notice shall be taken of this acceleration or retardation. But if the date is accelerated or retarded by more than 4 days, the fixed charges shall be assessed on proportionate basis for the actual number of days between the date of the old reading and the new reading.
3. If the Grid Station required for provision of supply falls within the purview of the dedicated system under the NEPRA Eligibility Criteria, the supply under this Tariff shall not be available to such a prospective consumer unless he provides, to the satisfaction and approval of the Company, an independent grid station of his own including Land, Building, Transformers, Circuit Breakers and other necessary equipment and apparatus as part of the dedicated distribution system for receiving and controlling the supply, or, alternatively, pays to the Company for all such Land, Building, Transformers, Circuit Breakers and other necessary equipment and apparatus if so provided and installed by the

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Company. The recovery of cost of service connection shall be regulated by NEPRA Eligibility Criteria.

4. All existing consumers under tariff B-4 shall be provided T.O.U metering arrangement by the Company and converted to B-4(b) Tariff.
5. All existing consumers under tariff B-4 shall be billed on B-4(a) tariff till such time that they are provided T.O.U metering arrangement; thereafter such consumers shall be billed on T.O.U tariff B-4(b).
6. All new applicants i.e. prospective consumers applying for service to the Company shall be provided T.O.U metering arrangement and charged according to the applicable T.O.U tariff.

B-5 SUPPLY AT 220 kV AND ABOVE

1. This tariff is applicable for supply to Industries for all loads of more than 5000 kW receiving supply at 220 kV and above and also for Industries having load of 5000 kW or below who opt to receive supply at 220 kV.
2. If, for any reason, the meter reading date of a consumer is altered and the acceleration/retardation in the date is up to 4 days, no notice shall be taken of this acceleration or retardation. But if the date is accelerated or retarded by more than 4 days, the fixed charges shall be assessed on proportionate basis for the actual number of days between the date of the old reading and the new reading.
3. If the Grid Station required for provision of supply falls within the purview of the dedicated system under the NEPRA Eligibility Criteria, the supply under this Tariff shall not be available to such a prospective consumer unless he provides, to the satisfaction and approval of the Company, an independent grid station of his own including Land, Building, Transformers, Circuit Breakers and other necessary equipment and apparatus as part of the dedicated distribution system for receiving and controlling the supply, or, alternatively, pays to the Company for all such Land, Building, Transformers, Circuit Breakers and other necessary equipment and apparatus if so provided and installed by the Company. The recovery of cost of service connection shall be regulated by NEPRA Eligibility Criteria.
4. All the new industrial consumers shall be billed on the basis of ToU tariff B-5 given in the Schedule of Tariff.

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C BULK SUPPLY

"Bulk Supply" for the purpose of this Tariff, means the supply given at one point for self-consumption not selling to any other consumer such as residential, commercial, tube-well and others.

General Conditions

If, for any reason, the meter reading date of a consumer is altered and the acceleration/retardation in the date is up to 4 days no notice will be taken of this acceleration or retardation. But if the date is accelerated or retarded by more than 4 days the fixed charges shall be assessed on proportionate basis for actual number of days between the date of old reading and the new reading.

C-I SUPPLY AT 400/230 VOLTS

1. This Tariff is applicable to a consumer having a metering arrangement at 400/230 volts, having sanctioned load of up to and including 500 kW.
2. Consumers having sanctioned load less than 5 kW shall be billed on single-part kWh rate i.e. C-I(a) tariff'.
3. All new consumers having sanctioned load 5 kW and above shall be provided T.O.U metering arrangement and shall be billed on the basis of Time-of-Use (T.O.U) tariff C-1(c) given in the Schedule of Tariff.
4. All the existing consumers governed by this tariff having sanctioned load 5 kW and above shall be provided T.O.U metering arrangements.
5. All existing consumers under tariff C-1 having sanctioned load 5 kW and above shall be billed on C-1(b) tariff till such time that they are provided T.O.U metering arrangement; thereafter such consumers shall be billed on T.O.U tariff C-1(c).

C-2 SUPPLY AT 11 kV AND 33 kV

1. This tariff is applicable to consumers receiving supply at 11 kV or 33 kV at one-point metering arrangement and having sanctioned load of up to and including 5000 kW.
2. The supply under this Tariff shall not be available to a prospective consumer unless he provides, to the satisfaction and approval of the Company, his own Transformer, Circuit Breakers and other necessary equipment as part of the dedicated distribution system for receiving and controlling the supply, or, alternatively pays to the Company for all apparatus and equipment if so provided and installed by the Company. The recovery of the cost of service connection shall be regulated by the NEPRA eligibility criteria.
3. All new consumers shall be provided TOU metering arrangement and shall be billed on the basis of tariff C-2(b) as set out in the Schedule of Tariff.
4. Existing consumers governed by this tariff shall be provided with T.O.U metering arrangement and converted to C-2(b)
5. All existing consumers under tariff C-2 shall be billed on C-2(a) tariff till such time that they are provided T.O.U metering arrangement; thereafter such consumers shall be billed on T.O.U tariff C-2(b).

C-3 SUPPLY AT 66 kV, 132 kV AND ABOVE

1. This tariff is applicable to consumers having sanctioned load of more than 5000 kW receiving supply at 66 kV, 132kV and above.
2. If the Grid Station required for provision of supply falls within the purview of the dedicated system under the NEPRA Eligibility Criteria, the supply under this Tariff shall not be available to such a prospective consumer unless he provides, to the satisfaction and approval of the Company, an independent grid station of his own including Land, Building, Transformers, Circuit Breakers and other necessary equipment and apparatus as part of the dedicated distribution system for receiving and controlling the supply, or, alternatively, pays to the Company for all such Land, Building, Transformers, Circuit Breakers and other necessary equipment and apparatus if so provided and installed by the

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Company. The recovery of cost of service connection shall be regulated by NEPRA Eligibility Criteria.

3. Existing consumers governed by this tariff shall be provided with T.O.U metering arrangement and converted to C-3(b).
4. All existing consumers under tariff C-3 shall be billed on C-3(a) tariff till such time that they are provided T.O.U metering arrangement; thereafter such consumers shall be billed on T.O.U tariff C-3(b).
5. All new consumers shall be provided TOU metering arrangement and shall be billed on the basis of tariff C-3(b) as set out in the Schedule of Tariff.

D AGRICULTURAL SUPPLY

"Agricultural Supply" means the supply for Lift Irrigation Pumps and/or pumps installed on Tube-wells intended solely for irrigation or reclamation of agricultural land or forests, and include supply for lighting of the tube-well chamber.

Special Conditions of Supply

1. This tariff shall apply to:
   - i) Bona fide forests, agriculture tube-well and lift irrigation pumps for irrigation of agricultural land.
   - ii) Tube-Wells meant for aqua-culture, viz. fish farms, fish hatcheries and fish nurseries.
   - iii) Tube-wells installed in a dairy farm meant for cultivating crops as fodder and for upkeep of cattle.
2. If, for any reason, the meter reading date of a consumer is altered and the acceleration/retardation in the date is up to 4 days, no notice shall be taken of this acceleration or retardation. But if the date is accelerated or retarded by more than 4 days, the fixed charges shall be assessed on proportionate basis for the actual number of days between the date of the old reading and the new reading.
3. The lamps and fans consumption in the residential quarters, if any, attached to the tube-wells shall be charged entirely under Tariff A-1 for which separate metering arrangements should be installed.
4. The supply under this Tariff shall not be available to consumer using pumps for the irrigation of parks, meadows, gardens, orchards, attached to and forming part of the residential, commercial or industrial premises in which case the corresponding Tariff A-1, A-2 or Industrial Tariff B-1, B-2 shall be respectively applicable.

D-1 For all loads

D-2 Time of Use for all loads

1. Consumers having sanctioned load less than 5 kW shall be billed on single-part kWh rate i.e. D-1 tariff given in the Schedule of Tariff.
2. All new consumers having sanctioned load 5 kW and above shall be provided TOU metering arrangement and shall be charged on the basis of Time-of- Use (T.O.U) tariff D- 2 given in the Schedule of Tariff.
3. All the existing consumers having sanctioned load 5 kW and above shall be provided T.O.U metering arrangements and shall be governed by D-1 till that time.

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E -1 TEMPORARY RESIDENTIAL/COMMERCIAL SUPPLY

Temporary Residential/Commercial Supply means a supply given to persons temporarily on special occasions such as ceremonial, religious gatherings, festivals, fairs, marriages and other civil or military functions. This also includes supply to touring cinemas and persons engaged in construction works for all kinds of single phase loads. For connected load exceeding 4 kW, supply may be given at 400 volts (3 phase) to allow a balanced distribution of load on the 3 phases. Normally, temporary connections shall be allowed for a period of 3 months which can be extended on three months basis subject to clearance of outstanding dues.

Special Conditions of Supply

1. This tariff shall apply to Residential and Commercial consumers for temporary supply.
2. Ordinarily the supply under this Tariff shall not be given by the Company without first obtaining security equal to the anticipated supply charges and other miscellaneous charges for the period of temporary supply.

E -2 TEMPORARY INDUSTRIAL SUPPLY

"Temporary Industrial Supply" means the supply given to an Industry for the bonafide purposes mentioned under the respective definitions of "Industrial Supply", during the construction phase prior to the commercial operation of the Industrial concern.

SPECIAL CONDITIONS OF SUPPLY

1. Ordinarily the supply under this Tariff shall not be given by the Company without first obtaining security equal to the anticipated supply charges and other miscellaneous charges for the period of temporary supply.
2. Normally, temporary connections shall be allowed for a period of 3 months, which may be extended on three months' basis subject to clearance of outstanding dues.

F SEASONAL INDUSTRIAL SUPPLY

"Seasonal Industry" for the purpose of application of this Tariff, means an industry which works only for part of the year to meet demand for goods or services arising during a particular season of the year. However, any seasonal industry running in combination with one or more seasonal industries, against one connection, in a manner that the former works in one season while the latter works in the other season (thus running throughout the year) will not be classified as a seasonal industry for the purpose of the application of this Tariff.

Definitions

1. "Year" means any period comprising twelve consecutive months.
2. All "Definitions" and "Special Conditions of Supply" as laid down under the corresponding Industrial Tariffs shall also form part of this Tariff so far as they may be relevant.

Special Conditions of Supply

1. This tariff is applicable to seasonal industry.
2. Fixed Charges per kilowatt per month under this tariff shall be levied at the rate of 125% of the corresponding regular Industrial Supply Tariff Rates and shall be recovered only for the period that the seasonal industry actually runs subject to minimum period of six consecutive months during any twelve consecutive months. The condition for recovery of Fixed Charges for a minimum period of six months shall not, however, apply to the seasonal industries, which are connected to the Company's Supply System for the first time during the course of a season.

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3. The consumers falling within the purview of this Tariff shall have the option to change over to the corresponding industrial Supply Tariff, provided they undertake to abide by all the conditions and restrictions, which may, from time to time, be prescribed as an integral part of those Tariffs. The consumers under this Tariff will have the option to convert to Regular Tariff and vice versa. This option can be exercised at the time of obtaining a new connection or at the beginning of the season. Once exercised, the option will remain in force for at least one year.

4. All seasonal loads shall be disconnected from the Company's Supply System at the end of the season, specified by the consumer at the time of getting connection, for which the supply is given. In case, however, a consumer requires running the non-seasonal part of his load (e.g., lights, fans, tube-wells, etc.) throughout the year, he shall have to bring out separate circuits for such load so as to enable installation of separate meters for each type of load and charging the same at the relevant Tariff.

5. Where a "Seasonal Supply" consumer does not come forward to have his seasonal industry re-connected with the Company's Supply System in any ensuing season, the service line and equipment belonging to the Company and installed at his premises shall be removed after expiry of 60 days of the date of commencement of season previously specified by the consumer at the time of his obtaining new connection/re-connection. However, at least ten clear days notice in writing under registered post shall be necessary to be given to the consumer before removal of service line and equipment from his premises as aforesaid, to enable him to decide about the retention of connection or otherwise. No Supply Charges shall be recovered from a disconnected seasonal consumer for any season during which he does not come forward to have his seasonal industry re-connected with the Company's Supply System.

G PUBLIC LIGHTING SUPPLY

"Public Lighting Supply" means the supply for the purpose of illuminating public lamps.

Definitions

"Month" means a calendar month or a part thereof in excess of 15 days.

Special Conditions of Supply

The supply under this Tariff shall be used exclusively for public lighting installed on roads or premises used by General Public.

H RESIDENTIAL COLONIES ATTACHED TO INDUSTRIES

This tariff is applicable for one-point supply to residential colonies attached to the industrial supply consumers having their own distribution facilities.

Definitions

"One Point Supply" for the purpose of this Tariff, means the supply given by one point to Industrial Supply Consumers for general and domestic consumption in the residential colonies attached to their factory premises for a load of 5 Kilowatts and above. The purpose is further distribution to various persons residing in the attached residential colonies and also for perimeter lighting in the attached residential colonies.

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"General and Domestic Consumption", for the purpose of this Tariff, means consumption for lamps, fans, domestic applications, including heated, cookers, radiators, air-conditioners, refrigerators and domestic tube-wells.

"Residential Colony" attached to the Industrial Supply Consumer, means a group of houses annexed with the factory premises constructed solely for residential purpose of the bonafide employees of the factory, the establishment or the factory owners or partners, etc.

Special Conditions of Supply

The supply under this Tariff shall not be available to persons who meet a part of their requirements from a separate source of supply at their premises.

J. SPECIAL CONTRACTS UNDER NEPRA (SUPPLY OF POWER) REGULATIONS 2015

Supply for the purpose of this tariff means the supply given at one or more common delivery points;

i. To a licensee procuring power from K-Electric for the purpose of further supply within its respective service territory and jurisdiction.

ii. To an O&M operator under the O&M Agreement within the meaning of NEPRA (Supply of Power) Regulations 2015 duly approved by the Authority for the purpose of further supply within the service territory and jurisdiction of the K-Electric

iii. To an Authorized agent within the meaning of NEPRA (Supply of Power) Regulations 2015, procuring power from the K-Electric for further supply within the service territory and jurisdiction of the K-Electric

J-1 SUPPLY TO LICENSEE

1. This tariff is applicable to a Licensee having sanctioned load of 20 MW and above receiving supply at 66 kV and above.
2. Existing consumers governed by this tariff shall be provided with T.O.U metering arrangement and converted to J-1(b).
3. All new consumers shall be provided TOU metering arrangement and shall be billed on the basis of tariff J-1(b) as set out in the Schedule of Tariff.

SUPPLY UNDER O&M AGREEMENT

J-2 (a) SUPPLY AT 11 KV AND 33 KV

1. This tariff is applicable to an O&M operator receiving supply at 11 kV or 33 kV under the O&M Agreement duly approved by the Authority.
2. Existing consumers governed by this tariff shall be provided with T.O.U metering arrangement and converted to J-2(c).

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3. All new consumers shall be provided TOU metering arrangement and shall be billed on the basis of tariff J-2(c) as set out in the Schedule of Tariff.

J-2 (b) SUPPLY AT 66 KV AND ABOVE

1. This tariff is applicable to an O&M operator receiving supply at 66 kV & above under the O&M Agreement duly approved by the Authority.
2. Existing consumers governed by this tariff shall be provided with T.O.U metering arrangement and converted to J-2(d).
3. All new consumers shall be provided TOU metering arrangement and shall be billed on the basis of tariff J-2(d) as set out in the Schedule of Tariff.

SUPPLY TO AUTHORIZED AGENT

J-3 (a) SUPPLY AT 11 KV AND 33 KV

1. This tariff is applicable to an authorized agent receiving supply at 11 kV or 33 kV.
2. Existing consumers governed by this tariff shall be provided with T.O.U metering arrangement and converted to J-3(c).
3. All new consumers shall be provided TOU metering arrangement and shall be billed on the basis of tariff J-3(c) as set out in the Schedule of Tariff.

J-3 (b) SUPPLY AT 66 KV AND ABOVE

1. This tariff is applicable to an authorized agent receiving supply at 66 kV & above.
2. Existing consumers governed by this tariff shall be provided with T.O.U metering arrangement and converted to J-3(d).
3. All new consumers shall be provided TOU metering arrangement and shall be billed on the basis of tariff J-3(d) as set out in the Schedule of Tariff.

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Annex – VII

CLAWBACK MECHANISM FOR PROFIT SHARING WITH THE CONSUMERS

1- K-Electric Limited shall, on yearly basis and within the first week of January, submit the proposed adjustment of tariff arising out of the transfer of a portion of the profits of the preceding financial year to consumers according to the Claw-Back formula as provided hereunder along with the basis of the calculations supported with the relevant audited financial statements:

CLAWBACK FORMULA

2- To the extent that the Annual Return on the Average Regulatory Asset Base (hereinafter referred to as "Average RAB") exceeds the limits prescribed hereunder the surplus return shall be shared with consumers through a reduction in tariff, in annual sharing proportions as set out below:

Year	1st Year	2nd Year	3rd Year	4th Year	5th Year	6th Year	7th Year
Sharing 25%	23.00%-26.00%	18.62%-21.62%	13.07%-16.07%	10.97%-13.97%	10.84%-13.84%	10.82%-13.82%	11.30%-14.30%
Sharing 50%	26.00%-29.00%	21.62%-24.62%	16.07%-19.07%	13.97%-16.97%	13.84%-16.84%	13.82%-16.82%	14.30%-17.30%
Sharing 75%	Over 29.00%	Over 24.62%	Over 19.07%	Over 16.97%	Over 16.84%	Over 16.82%	Over 17.30%

3- The Annual Return on the RAB shall be respective year's Earnings Before Interest and Tax (hereinafter referred to as "EBIT") divided by the Average RAB. Method for calculation of both EBIT and Average RAB are mentioned is hereunder;

4- EBIT shall be worked out according to formula mentioned hereunder;

Earning Before Interest and Tax as per the financial Statement
Add Provision for Doubtful debt
Add Any other provision / expense charged by the Petitioner that the Authority considers unjustified
Add Depreciation charged to P&L with revaluation
Less *Write-offs amount allowed by Authority for respective year
Less Depreciation for the Year on Cost basis
Less Late Payment Surcharge (LPS)
Less Any Cost Allowed as Pass-through by the Authority (e.g. Corporate Tax Paid, WWF, WPPF, etc.)
EBIT for the purpose of application of Clawback

* Write-offs amount allowed means the amount projected in tariff plus any amount allowed as per the Write off adjustment mechanism.

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5- <u>Average RAB</u>

Average RAB shall be worked out according to the following formula;

	Fixed Assets Without Revaluation(O/B)
Add	Additions during the Year
Less	Accumulated Depreciation on cost
=	**Net Fixed Assets**
Add	WIP on Cost (C/B)
Less	Deffered Revenue (Consumer financed Asset)
=	**Regulatory Asset Base (RAB)**
Average RAB =	((Current RAB + Last Year RAB) / 2)

The decrease in average sale rate (S_{ICB}) will be calculated as under.-

$$(S_{ICB}) = \frac{Ps}{U_{ST}}$$

Where Ps = The aggregate profit to be transferred to the consumers calculated in according with the methodology as discussed earlier.
U_{ST} = Estimated units expected to be sold during the twelve months following the date of decision of the Authority.

6- The above reduction shall be applied uniformly to all classes of consumer categories (excluding Life Line Consumers) directly in their monthly bills vide Authority's separate decision in this regard.

7- The Authority shall make its determination, after the completion of the procedural requirements, as soon as possible but not later than Forty five (45) days of the receipt of the request for reduction in rates and shall notify the same in the official gazette.

8- In case, K-Electric does not submit a request for tariff adjustment in a certain year, the Authority shall review the audited financial statements on its own and approve a tariff reduction, based on the aforementioned formulae, required to be passed on to the consumers, based on the respective proportion of profits.

9- The decrease in consumer class-wise tariff shall be allowed in terms of paisas per kWh rounded to two decimal places.

10- K-Electric shall not carry out any adjustment in the consumer end tariff unless allowed, approved or directed by the Authority.

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Mid Term Review Adjustment Mechanism Example

Description	Unit	FY 17	FY18	FY19	FY 20	FY 21	FY 22	FY 23	Total
Investment Allowed									
Generation	[Mln. Rs.]	4,605	29,726	30,812	21,885	2,880	3,694	3,703	97,305
Transmission Network	[Mln. Rs.]	25,029	28,118	33,786	18,826	15,350	3,145	3,690	127,942
Distribution Network	[Mln. Rs.]	8,307	8,387	8,744	9,694	11,966	13,477	13,094	73,668
Total Investments	[Mln. Rs.]	***37,940***	***66,230***	***73,341***	***50,404***	***30,196***	***20,316***	***20,487***	***298,915***
Opening Fixed Assets	[Mln. Rs.]	210,931	221,624	238,826	368,918	405,061	424,213	491,813	
Addition in Fixed Assets During the Year	[Mln. Rs.]	10,693	17,203	130,092	36,143	19,152	67,599	21,099	
Closing Fixed Assets	[Mln. Rs.]	221,624	238,826	368,918	405,061	424,213	491,813	512,912	
Projected Average RAB	[Mln. Rs.]	***148,419***	***190,640***	***248,149***	***294,649***	***317,466***	***323,343***	***323,772***	-
Allowed Return on Rate Base	[Mln. Rs.]	20,520	26,358	34,309	40,738	43,892	44,705	44,764	255,284
Net Present Value based on the allowed WACC	[Mln. Rs.]	***147,510***							
NPV of Projected Return (FY 2016-17 to FY 2022-23)	[Mln. Rs.]	**77,316**							
Short-fall in RORB (FY 2016-17 to FY 2022-23)	[Mln. Rs.]	**70,194**							
Rate Base Component Allowed In FY 2017 Tariff	[Rs. /kWh]	**1.0590**							

Investment Carried Out (Actual (assumed))		FY 17	FY18	FY19	FY 20
Generation	[Mln. Rs.]	3,454	22,294	23,109	16,413
Transmission	[Mln. Rs.]	15,017	16,871	20,271	11,295
Distribution	[Mln. Rs.]	7,061	7,129	7,432	8,240
Total Investment	[Mln. Rs.]	***25,532***	***46,294***	***50,812***	***35,949***

Revised Projected RAB (Based on Revised Actual Investment)	[Mln. Rs.]	142,250	168,446	205,512	235,060	252,437	260,319	262,935
Allowed Return on Rate Base	[Mln. Rs.]	19,667	23,289	28,414	32,499	34,901	35,991	36,353
Net Present Value based on the allowed WACC	[Mln. Rs.]	***123,378***						
Revised NPV of Projected Return (FY 2016-17 to FY 2022-23)	[Mln. Rs.]	**82,354**						
Short-fall in RORB (FY 2016-17 to FY 2022-23) (revised)	[Mln. Rs.]	**41,024**						
Revised Rate Base Component For FY 2017 tariff	[Rs. /kWh]	**0.6285**						
Un-Adjusted (Component * (1-FY 2017 Target Losses)	[Rs. /kWh]	0.4971						
Adjustment To Be Include In Tariff of FY 2021 (Adjusted)	[Rs. /kWh]	*0.5975*						
Adjustment To Be Excluded From Tariff of FY 2021	[Rs. /kWh]	*1.0186*						

Calculation of Amount to Be Return to Consumers

Rate base component allowed (Un-Adjusted)	[Rs. /kWh]	0.8377
Rate base component should be allowed (Un-Adjusted)	[Rs. /kWh]	0.4971
Excess Component	[Rs. /kWh]	(0.3406)
Units Procured From FY 2017-2020 (actual Units)	[MkWh]	74,359
Adjustment To be made In Tariff	[Mln. Rs.]	(25,325)
Projected Units Sold For FY 2021	[Mln. Rs.]	17,150
Adjustment to be made in Tariff **(A)** for **FY 2020-21**	[MkWh]	**(1.4766)**

Revised Rate Base Component in tariff (from FY 2020-21 to FY 2022-23)

Rate base adjustment factor to be exclude from the tariff **(B)**	1.0186
Rate base adjustment factor to be include in tariff from the tariff **(C)**	0.5975

Note:

Adjustment **A shall** remain applicable for one year period only and adjustments **B** and **C** shall continue for remaining tariff control period.

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