MEPCO
ENLIGHTENING LIVES
Office of the, Chief Executive Officer, MEPCO Multan
Ph: 061-9220120 (Ext: 2075) E-mail: dgmiradmepco@gmail.com

No. CEO/MEPCO/DG(MIRAD)/M-09/ 2253-31 Dated: 06-02-2023

The Registrar,
National Electric Power Regulatory Authority (NEPRA),
NEPRA Tower Attaturk (East),
G-5/1, Islamabad

Sub: APPLICATION FOR GRANT OF AN ELECTRIC POWER SUPPLY LICENCE TO MULTAN ELECTRIC POWER COMPANY (MEPCO) LIMITED AS SUPPLIER OF LAST RESORT

It is informed that the MEPCO is Deemed Licensee for Supply of Electric Power as per proviso to Sub-Section (1) of Section 23E of Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997, amended up to date for period of five years which will expire on May 01, 2023. Under the clause (1) of Section 23E of the Act "No person shall, unless licensed by the Authority under this Act, engage in the supply of electric power to a consumer".

Accordingly, in pursuance Regulation (3) of the NEPRA Licensing (Application, Modification, Extension, and Cancellation) Procedure Regulations 2021 issued vide SRO No. 760(1)/2021 dated 17.06.2021 and amendment issued vide SRO No. 442(1)/2022 dated 28.03.2022, please find attached herewith the application for kind consideration of the Authority for grant of Electric Power Supply Licence to MEPCO.

The BOD MEPCO has authorized the undersigned through circular resolution No.02/2023 dated 03.02.2023, communicated vide Company Secretary MEPCO No. 751/ Company Secy: dated 06.02.2023 to sign and file the application for grant of an Electric Power Supply Licence, to provide information / documents required by the Authority and to take necessary steps to complete its process.

Consequently, I Engr. Allahyar Khan, Chief Executive Officer MEPCO hereby request the Honorable Authority for grant of an Electric Power Supply Licence to Multan Electric Power Company (MEPCO) as Supplier of Last Resort for a period of 20 years or more as deemed appropriate.

For any clarification / additional information or any other matter relating to this application Mr. Muhammad Arshad (Director General MIRAD) MEPCO (0302-8266424, email: MEPCO.dgmiradmepco@gmail.com) is designated as focal person.

Chief Executive Officer
MEPCO H/Q Multan

Documents Attached:

1. MEPCO BOD Resolution.
2. Original Cross cheque of Allied Bank, bearing Cheque No.24 69752793 dated 06.02.2023 amounting to Rs.2900311/- (Two Million Nine Hundred thousand three hundred and eleven rupees only) after deduction of withholding tax @ 8%, in favor of NEPRA.
3. Checklist as per Part II Regulation 3 of the NEPRA Licensing (Application, Modification, Extension, and Cancellation) Procedure Regulations 2021 & amendment issued vide SRO No. 442(1)/2022 dated 28.03.2022 and all supporting documents thereto.

CC:

1. DG MIRAD MEPCO for information.
2. Finance Director MEPCO H/Q Multan for information.
3. GM (Technical) MEPCO H/Q Multan for information.
4. GM (OP) MEPCO H/Q Multan for information.
5. GM (CS) / Customer Service Director MEPCO H/Q Multan
6. Manager Legal MEPCO H/Q Multan for information.

PROSPECTUS

(i) BRIEF INTRODUCTION OF MEPCO:

MEPCO is operating as Distribution as well as deemed electric power supplier Licensee as per Section 23E of NEPRA Act 1997 (amended upto date) in 13 Districts; namely, Multan, Khanewal, Vehari, Lodhran, Sahiwal, Pakpattan, Bahawalpur, Bahawalnagar, Rahim Yar Khan, Muzafargarh, Layyah, D.G.Khan and Rajanpur of Province of Punjab, having 09 Operation Circles with 38 Operation Divisions, 01 PD Construction Circle having 09 Construction Divisions, 02 GSO Circle having 06 Divisions, 01 PD GSC Circle having 04 Divisions, and 02 M&T Circle having 09 Divisions, serving approximately 7.863 Million consumers of different categories.

(ii) SALIENT FEATURE OF THE FACILITY OR THE SYSTEM

MEPCO Licensee has total No. 141 Grid Stations having 316 Nos. of Power Transformers with approximate capacity 8965.30MVA and 229,294 Nos. of Distribution Transformers.

(iii) PROPOSED INVESTMENT

MEPCO is investing heavy amount as per allowed NEPRA distribution as well as supply tariff issued vide No.NEPRA/R/ADG/(Trf)/TRF-559/MEPCO-2021/8734-8736 dated 02.06.2022 and No.NEPRA/R/ADG(Trf)/TRF-560/MEPCO-202/8774-8776 dated 02.06.2022 respectively for expansion of electric power network.

(iv) SOCIAL AND ENVIRONMENTAL IMPACT OF THE PROPOSED FACILITY OR SYSTEM

MEPCO is supplying Electric Power to 7.863Million Consumers in 13 Districts of South Punjab at regulated tariff. Therefore, it is in the interest of the consumers and the industry as a whole to ensure the continuous, safe and reliable supply of Electric Power by MEPCO.

Checklist as per Regulation 3 of NEPRA Licensing (Application, Modification, Extension and Cancellation) Procedure Regulations, 2021

Sr. No.	Description	MEPCO Remarks
1	The type or category of license	Electric Power Supply Licence as Supplier of Last Resort (SOLR)
2	The proposed time period of extension	Proposed time period is 20 years starting from May 01, 2023 to April 30, 2043 or more
3	Prospectus	MEPCO is operating as Licensee in 13 Districts; namely, of Province of Punjab, having 09 Operation Circles with 38 Operation Divisions, 01 PD Construction Circle having 09 Construction Divisions, 02 GSO Circle having 06 Divisions, 01 PD GSC Circle having 04 Divisions, and 02 M&T Circle having 09 Divisions, serving approximately 7.821 Million consumers of different categories. Moreover, MEPCO Licensee has total No. 141 Grid Stations having 1739 11kV. Feeders with total No. 228644 of Distribution Transformers. Apart from the above, heavy investment as allowed by Regulator (NEPRA) for expansion of electric network is in the Pipeline. Therefore, it is in the interest of the consumers and the electric power industry as a whole to ensure the continuous, safe and reliable distribution and supply of electric power to licensee / MEPCO for which renewal / extension in the term of Distribution Licence for another term is mandatory.
4	Certified copies of : a) Certificate of Incorporation. b) Memorandum and Article of Association c) Annual Report of Company	Attached as Annexure-A
5	Last annual return of the Company	Attached as Annexure-B
6	Evidence of adequate financial and technical resources available to the applicant for the purposes of undertaking related electric power services for which application for grant of license has been filed, including evidence of cash balances held in reserve by the applicant, along with bank certificates; details of charges or encumbrances attached to the applicant's assets, if any; latest audited financial statements of the applicant; expressions of interest to provide credit or financing along with sources and details thereof, documents describing the net worth and the equity and debt ratios of the applicant, as on the date of the audited balance sheet accompanying the application.	Financial Report for F.Y 2021-22 Attached as Annexure-C
7	Detailed profile of the applicant and the applicant's senior management, technical and professional staff	Summary abstract (Name, Designation, Qualification) of Management Officers Attached as Annexure-D
8	Technical and financial proposal in reasonable detail for the operation, maintenance, planning and development of the facility or system in respect of which the licence is being sought	Attached as Annexure-E

9	Affidavit of any other licence	Attached as Annexure-F
10	Affidavit to the correctness, authenticity and accuracy of application, documents and information submitted	Attached as Annexure-G
11	Applicable documents in support and information set out in Schedule iii for Electric Power Supply	Following attached as Annexure-H i. Relevant feeder maps Number of Consumers and expected load.(emailed) ii. Consumer class/category, sub-category on the basis of sanctioned load and voltage level. iii. Tariff categories of consumer classes to be served. iv. Demand and consumption pattern on different time periods. v. Procurement Plan for meeting expected loads. vi. 12-month projections on expected load, number of consumers and expected sale of units for each consumer category. vii. Training and development procedures and manuals. viii. Information relating to: a) Proposed service territory b) Billing and collection procedures (including provisions for remote metering) c) Ability to access consumer metering system and other services/equipment Emergency provisions and protocols

THE COMPANIES ORDINANCE, 1984

Company Limited by Shares

Memorandum

and

Articles of Association

6/2/23

AM (CM)
MIRAD-MEPCO

MULTAN ELECTRIC POWER COMPANY LIMITED

GOVERNMENT OF PAKISTAN

CERTIFICATE OF INCORPORATION

(Under section 32 of the Companies Ordinance, 1984 (XLVII of 1984)

Company Registration No. L 09522 of 1997-98

I hereby certify that "MULTAN ELECTRIC POWER COMPANY LTD."

// //

// //

is this day incorporated under the Companies Ordinance, 1984 (XLVII of 1984) and that the company is limited by Shares.

Given under my hand at Lehore.

this 14th day of May

one thousand nine hundred and ninety eight.

Fee Rs. =5,000,200/-.

Registrar of the Company Registration Office
رجسٹرار کمپنی رجسٹریشن آفس
LAHORE
Government of Pakistan
حکومت پاکستان

CRO-1

REGISTRAR
OF COMPANIES

No. JRL 8015
Dated 14.5.98

AM (CM)
MIRAD-MEPCO

GOVERNMENT OF PAKISTAN

CERTIFICATE FOR COMMENCEMENT OF BUSINESS

[Under section 146 (2) of the Companies Ordinance, 1984 (XLVII of 1984)]

I hereby certify that the "MULTAN ELECTRIC POWER COMPANY LTD." // which was incorporated under the Companies Ordinance, 1984 (XLVII of 1984), on the 14th day of May 19 98 and which has filed a duly verified declaration in the prescribed form that the conditions of clauses (a) to (e) of sub-section (1) of Section 146 of the said Ordinance have been complied with, is entitled to commence business.

Given under my hand at Lahore this 9th day of June one thousand nine hundred and Ninety eight.

Fee Rs. =200/-

Seal of the Company Registration Office Lahore Government of Pakistan

C.R.O.- 4

AM (C... MIRAD-M...CO

(AKBAR SHAH)
Joint Registrar of Companies

No. JRL/8527 dt. 19/6/98

MULTAN ELECTRIC POWER COMPANY LIMITED

INDEX

MEMORANDUM OF ASSOCIATION

MULTAN ELECTRIC POWER COMPANY LIMITED

INDEX

ARTICLES OF ASSOCIATION

MULTAN ELECTRIC POWER COMPANY LIMITED

INDEX

ARTICLES OF ASSOCIATION

THE COMPANIES ORDINANCE, 1984

PUBLIC COMPANY LIMITED BY SHARES

MEMORANDUM OF ASSOCIATION

OF

MULTAN ELECTRIC POWER COMPANY LIMITED

I. The name of the company is "Multan Electric Power Company Limited".

II. The registered office of the company will be situated in Lahore, Province of Punjab, Pakistan.

III. The objects for which the Company is established are to undertake any or all of the following businesses:

1. To acquire or take over those properties, rights and liabilities of the Pakistan Water and Power Development Authority comprising that administrative division formally known as the Multan Area Electricity Board (AEB) pursuant to the Pakistan Water and Power Development Authority Act of 1958 (as amended) and to carry on, expand and extend the businesses and activities of such Board or any part thereof including, without limitation, the business of a public electricity distributor and supplier.

2. To acquire or take over the properties, rights and liabilities of the grid stations of the Pakistan Water and Power Development Authority and the transmission lines in relation thereto which at the date of adoption of this Memorandum and Articles of Association are directly and exclusively supplying electricity to the areas formerly supplied by the Multan AEB and are located within the said AEB.

3. To carry on all or any of the businesses of purchasing, importing, transforming, converting, distributing, supplying, exporting and dealing in electricity and all other forms of energy and products or services associated therewith and of promoting the conservation and efficient use of electricity and all other forms of energy, and all other powers necessary or incidental to the business of electricity distribution and supply.

4. Electrification. - To do anything which a public electricity supplier is empowered or required to do under or by virtue of or under a license or other authorization granted according to law and its implementing rules and regulations or any statutory instrument made thereunder or any statutory modification or re-enactment thereof and to plan, survey, design, supply equipment, and carry out the electrification of cities, towns, villages, gas and oil refineries, workshops, buildings, highways, bridges, ports, air terminals, and other premises within its area of supply.

5. Dealer in Electrical Equipments. - To carry on all or any of the businesses of wholesalers, retailers, traders, importers, exporters, suppliers, distributors, designers, developers, manufacturers, installers, fitters, testers, repairers, maintainers, contractors, constructors, operators, users, inspectors, reconditioners, servicers, improvers, alterers, protectors, removers, hirers, replacers, importers and exporters of, and dealers in, electrical machinery, systems, products and services used for energy conservation,

agricultural, industrial, household and general equipment, furniture, fixtures, fittings and devices, and all other kinds of goods, equipment, machinery, materials and installations, including but not limited to cables, wires, meters, pylons, tracks, rails, pipelines and any other plant, apparatus, equipment, systems and things incidental to the efficient transformation, supply, and distribution of electricity.

6. Determination of Retail Tariff Rates. - To ascertain the retail tariff rates that will secure recovery of operating costs, interest charges and depreciation of assets, redemption at due time of loans other than those covered by depreciation, payment of taxes, and a reasonable return on investment, and to petition the appropriate government body for the adoption of or increase in its schedule of retail tariff rates.

7. Facilities and Installations. - To locate, establish, construct, equip, operate, use, manage and maintain power grid stations, transforming, switching, conversion, and distribution facilities, grid stations, cables, overhead lines, substations, switching stations, tunnels, cable bridges, link boxes, telecommunications stations, masts, aerials and dishes, fiber optic circuits, satellites and satellite microwave connections, heat pumps, plant and equipment for combined heat and power schemes, offices, computer centers, shops, dispensing machines for pre-payment cards and other devices, showrooms, depots, factories, workshops, plants, printing facilities, warehouses and other storage facilities (including but not limited to facilities for storage and disposal of products and waste), training, education and display centers, stands and show-houses, testing premises, laboratories, research stations, compressor stations, vehicle parks, terminals, transport facilities, roads, and other electrical installations and infrastructure it may deem beneficial.

8. Acquisition and Conveyance of Assets. - To acquire or convey, whether by purchase, lease, concession, grant, hire or otherwise, establish, develop, exploit, operate and maintain real or personal properties including but not limited to land, any estates in land, claims, licenses, concessions, easements, exploration and production rights, and rights or interests of all descriptions in or relating to the same, which may seem to the Company capable or possibly capable of affording or facilitating the purchase, transformation, conversion, supply, distribution, and development of electricity or any other form of energy, and for the accomplishment of all the purposes of the Company herein stated.

9. Site Development. - To build, construct, maintain, alter, enlarge, pull down, and remove or replace structures, factories, offices, works, wharves, roads, railways, tramways, machinery, engines, walls, fences, banks, dams, sluices or water courses and to clear sites for the same and to work, manage and control the same and to carry on any other business which may seem to the Company capable of being conveniently carried on in connection with the above or calculated directly or indirectly to enhance the value of or render more profitable the Company's properties, but not to engage in the business of a real estate developer.

10. Intellectual Property Rights. - To apply for and take out, purchase or otherwise acquire any patents, patent rights, inventions, secret processes, designs, copyrights, trademarks, service marks, commercial names and designations, technological know-how, formulae, licenses, concessions and the like (and any interest in any of them), and exclusive or non-exclusive or limited rights to use any secret or other information as to any invention or secret process of any kind, and to use, exercise, develop, and grant licenses

of, and otherwise turn to account and deal with, the property, rights and ...ion so acquired.

...ring. - For the purposes of electricity supply, distribution and communication, to ...all in, on, above or under any premises or place and to operate, use, inspect, maintain, ...epair, replace and remove cables, lines, ducts, transformers, switchgear (remotely controlled and otherwise, and including time switches), fuses, circuit breakers, electricity service equipment, meters and other devices for measuring or controlling the quantity or quality of electricity supplied, prepayment and debt payment devices, items provided to afford access to, support, encase, insulate, and protect from damage or tampering, the above-mentioned gadgets, or to protect people and property from injury or damage, or to comply with any legal obligation and for other purposes associated with the supply of electricity and to install all such things and apparatus and items for the purposes of supplying, measuring and controlling light, heat, steam, hot water, air-conditioning and refrigeration, and for associated purposes, including payment for these facilities.

12. Demand Forecasting. - To provide or procure the provision of such facilities and services as may be necessary or desirable to forecast electricity/energy demand and to satisfy such demand.

13. Transportation. - To acquire, (whether by purchase, lease, concession, grant, hire or otherwise), charter, lease, take or let on hire, operate, use, employ or turn to account, build, equip, service, repair, maintain, and supply motor vehicles, railway locomotives, wagons, trucks, vessels, and craft of any description, engineering plants and machinery, and parts and accessories of all kinds, and to carry on the businesses of storage contractors, freight contractors, carriers by land, water and air of freight and passengers, forwarding agents, shipping agents and agents of any other kind, in so far as such activities are incidental to or necessary for the transformation, supply and distribution of electricity.

14. Audio-Visual System. - To carry on as principal, agent, contractor or sub-contractor all or any of the businesses of running, operating, managing, supplying and dealing in systems for the conveyance by any means of sounds, visual images, signals, and services, facilities and equipment ancillary to or for use in connection with such systems.

15. Management Information System. - To carry on all or any of the businesses of running, operating, managing, supplying and dealing in data processing and information retrieval systems, computers, computer programmes and software, computer bureau and data bases, meter reading and credit checking and to provide services, facilities and equipment ancillary to or for use in connection with the same.

16. Research and Development. - To carry on business as inventors, researchers and developers, to conduct, promote and commission research and development in connection with the businesses and activities of the Company and its subsidiaries, to establish and maintain research stations, laboratories, workshops, testing and proving grounds and sites, facilities and establishments and installations, and to exploit and turn to account the results of any research and development carried out by or for it.

17. Labour Contracting. - To carry on all or any of the businesses of consultants, advisers and suppliers of management, personnel and training services, whether generally or in respect of one or more of the types of business or activity which the Company has

Partnership. - To enter into partnership, joint venture or cooperation arrangements with any person or company or other legal entity, local or foreign, carrying on or engaged in any business or transaction which the Company is authorized to carry on or engage in, or otherwise seek assistance from or assist any such person, company or legal entity.

26. Related Businesses. - To acquire by any means the whole or any part of the assets, and to undertake the whole or any part of the liabilities, of any person, natural or juridical, carrying on or proposing to carry on any business which the Company is authorized to carry on or which can be carried on in connection therewith, to acquire an interest in, amalgamate or enter into partnership or into any arrangement for sharing profits, cooperation, or mutual assistance, with any such person, to promote, form and sponsor any company [illegible] panies in furtherance of the objects herein stated, and to give or accept, for any of the [illegible]s or things aforesaid or property acquired, such consideration as the Company thinks fit, including without limitation, any shares, debentures, or other securities or rights.

27. Equity Investment. - To invest the surplus moneys of the Company not immediately required in any manner to subscribe for, purchase or otherwise acquire, and to hold, and deal with, any shares, debentures, bonds, notes, and other securities, obligations and investments of any nature whatsoever, including any options or rights in respect of them, and otherwise to invest and deal with the money and assets of the Company, but not to act as an investment company.

28. Lending. - To advance money or give credit to such persons or companies and on such terms as may seem expedient and, in particular, to customers and others having dealings with the Company, to guarantee the performance of any contract or obligation and the payment of money by the Company, and to accept securities of any person or any property or interest therein of whatever nature in payment or partial payment for any services rendered or for any sale or supply made to, or debt owing from, any such person, but not to act as a finance or banking company.

29. Trusts. - To vest any real or personal property, rights or interests acquired by or belonging to the Company in any person or company on behalf of or for the benefit of the Company, with or without any declared trust in favour of the Company, and to undertake and execute any trust the undertaking whereof may seem desirable, either gratuitously or otherwise.

30. Portfolio Investments. - Subject to such terms and conditions as may be thought advantage[illegible] trade its shares and to undertake markup and currency swaps, options (including [illegible]ed options), swap option contracts, forward exchange contracts, futures contracts or other financial instruments allowed by law, including hedging agreements of any kind, all or any of which may be on a fixed and/or floating rate basis and/or in respect of local or foreign currency or commodities of any kind, but not to engage in the business of a stockbroker.

31. Government Permissions. - To apply for and obtain necessary consents, permissions and licenses from any Government, Provincial, Local, Foreign, Multilateral or other authorities or entities for enabling the Company to carry any of its objects into affect or for extending any of the powers of the Company or for effecting any modification of the constitution of the Company or for any other purpose which may seem expedient, and to enter into arrangements with any Government or authorities, foreign, federal,

Dissolution and Winding Up. - To cease carrying on or wind up any business or activity of the Company and to cancel any registration of and to wind up or procure the dissolution of the Company in any state or territory.

38. Equity Conversion. - To issue, allot and grant options over securities of the Company towards the satisfaction of any liability or obligation undertaken or agreed to be undertaken by or for the benefit of the Company, or in consideration of any obligation or for any other similar purpose.

39. International Operations. - To procure the Company to be registered or recognized in any part of the world and to do all or any of the above things in any part of the world, either as principal, agent, trustee, contractor or otherwise, alone or in collaboration with another, and either by or through agents, trustees, sub-contractors, subsidiaries or otherwise.

40. Disposal of Assets and Declaration of Dividends. - To dispose by any means of the whole or any part of the assets of the Company or of any interest therein and to distribute in specie or otherwise by way of dividends or bonus or reduction of capital all or any of the property or assets of the Company among its members, and particularly, but without prejudice to the generality of the foregoing, securities of any other company formed to take over the whole or any part of the assets or liabilities of the Company or any proceeds of sale or other disposal of any property or assets of the Company.

41. Insurance. - To insure the property, assets, and employees of the Company in any manner deemed fit by the Company, and to create any reserve fund, sinking fund, insurance fund or any other special fund whether for depreciation or for repairing, insuring, improving, extending or maintaining any of the properties of the Company or for any other purpose conducive to the interests of the Company, but not to act as an insurance company.

42. Regulations. - To make rules or regulations not inconsistent with this Memorandum and to provide for all matters for which provision is necessary or expedient for the purpose of giving effect to the provisions of this Memorandum and the efficient conduct of the affairs of the Company.

43. General Power. - To carry on any other businesses or activities which the Directors consider capable of being carried on directly or indirectly for the benefit of the Company and to do all such other things as may be deemed incidental or conducive to the attainment of the above objects or any of them.

Declaration. It is hereby declared that

(a) the word "company" in this Memorandum of Association, except where used in reference to this Company, shall be deemed to include any partnership or other body of persons, whether corporate or unincorporated, and whether domiciled in Pakistan or elsewhere;

(b) the objects specified in each of the paragraphs of this clause shall be regarded as independent objects and, accordingly, shall in no way be limited or restricted (except where otherwise expressed in such paragraphs) by reference to or inference from the terms of any other paragraph or the name of the Company, but may be carried out in as full and ample a manner and construed in as wide a

We, the several persons whose names and addresses are subscribed below, are desirous of being formed into a company in pursuance of this Memorandum of Association and we respectively agree to take the number of shares in the capital of the Company set opposite our respective names.

Name and surname (Present and former) in full (in Block Letters)	Father's/ Husband's Name in Full	Nationality	Occupation	Residential Address in Full	Number of Shares taken by Each Subscriber	Signature
1. Mr.Muhammad Muzaffar-ud-Din Ghauri	Haji Alaf Din Khan	Pakistani	WAPDA Service	Banglow No. A-1, WAPDA Colony Khanewal Road, Multan.	1	
2. Mr. Nasir Ahmad Paracha	Amir Mohammad	Pakistani	WAPDA Service	Flat No. 19 WAPDA Officers Colony Upper Mall, Lahore.	1	
3. Mr. Mehr Dil Khan	Malik Umara Khan	Pakistani	WAPDA Service	132 kV Grid Station WAPDA Qasimpur Bahawalpur Road, Multan.	1	
4. Mr. Muhammad Shabbir Chaudhary	Ch. Muhammad Siddique	Pakistani	WAPDA Service	H. No. 9, Block K, Shah Ruken-e-Alam Housing Scheme, Multan.	1	
5. Mr. Muhammad Azam Khan Shad	Muhammad Khan	Pakistani	WAPDA Service	H. No. 81-B, New Chauburji Park, Lahore.	1	
6. Mr. Tariq Shah	Shaukat Ali Shahab Talib	Pakistani	WAPDA Service	21-Greenwood Homes,Block-C New Muslim Town, Lahore.	1	
7. Mr.Khalid Mahmood	Fazal Din	Pakistani	WAPDA Service	Bunglow No.B-46, WAPDA Colony, Khanewal Road, Multan.	1	

Total number of shares taken 7 (Seven)

Dated the _____ day of _____

Witnesses to above signatures

(Full Name, Father's/Husband's Name)

(in Block Letters) _____

Signature _____

Occupation _____

Full Address _____

THE COMPANIES ORDINANCE, 1984

PUBLIC COMPANY LIMITED BY SHARES

ARTICLES OF ASSOCIATION

OF

MULTAN ELECTRIC POWER COMPANY LIMITED

I. PRELIMINARY

1. TABLE "A" Not to Apply

The regulations in Table 'A' in the First Schedule to the Companies Ordinance, 1984 shall not apply to the Company except as reproduced herein.

2. Definitions

Unless the context otherwise requires, capitalized terms used in these Articles shall have the meanings set out below:-

(a) **"Articles"** mean these Articles as originally framed or as from time to time altered in accordance with law.

(b) **"Board"** means the group of Directors in a meeting duly called and constituted or, as the case may be, the Directors assembled at a board.

(c) **"Company"** means the Multan Electric Power Company Limited.

(d) **"Directors"** means the Directors for the time being of the Company as named in Article 49 and, subsequently, such members duly elected and registered pursuant to Sections 178 and 205, respectively.

(e) **"Month"** means calendar month according to the Gregorian calendar.

(f) **"Office"** means the registered office for the time being of the Company.

(g) **"Ordinance"** means the Companies Ordinance, 1984, or any modification or re-enactment thereof for the time being in force.

(h) **"Ordinary Resolution"** means a resolution passed at a general meeting of the Company when the votes cast (whether *viva voce*, by show of hands or by poll) in favour of a resolution by members who, being entitled to vote in person or by proxy, do so vote, exceed the number of votes, if any, cast against the resolution by members so entitled and voting.

(i) **"Register"** means, unless the context otherwise requires, the register of members to be kept pursuant to Section 147 of the Ordinance.

(j) **"Seal"** means the common or official seal of the Company.

SHARES

5. Shares under Directors' Control

Subject to Section 183 and these Articles, the shares of the Company shall be under the control of the Directors who may allot or otherwise dispose of the same to such persons, on such terms and conditions as the Directors think prudent.

6. Amount Payable on Application

No shares shall be offered to the public for subscription except upon the term that the amount payable on application shall not be less than the full amount of the nominal amount of the share.

7. Allotment of Shares

No share shall be issued at a discount except in accordance with the provisions of the Ordinance. The Directors shall, as regards any allotment of shares, duly comply with such of the provisions of Sections 68 to 73, as may be applicable to the Company. The minimum subscription upon which the Company may proceed to allot the shares shall be Rs 10,000 (Rupees Ten Thousand).

8. Share Certificates

Every person whose name is entered as a member in the Register shall, free of charge, be entitled to receive within ninety (90) days after allotment or within forty-five (45) days of the application for registration of transfer, a certificate under Seal specifying the share or shares held by him and the amount paid-up thereon, including in particular and without limitation, such legends as the Company shall be obliged to affix to certain classes of share certificates as provided by law or as the Company shall have agreed to affix pursuant to any contractual arrangement in this respect; Provided, that, in respect of share or shares held jointly by several persons, the Company shall not be bound to issue more than one certificate, and delivery of a certificate for a share to one of several joint holders shall be sufficient delivery to all.

9. Certificate under Seal

The certificate of title to shares may be issued under the authority of a Director or of a committee of Directors duly authorized thereto by the Board in such manner and form as the Directors may from time to time prescribe. The Seal shall be duly affixed to every share certificate issued by the Company.

10. Issuance of Replacement Certificate

If a share certificate is defaced, lost or destroyed, it may be renewed on payment by the requesting shareholder or his representative of such fee and stamp taxes, if any, and compliance with such terms prescribed by the Directors as to evidence and indemnity and payment of expenses incurred by the Company in investigating title.

I/We, ____________, of ______________, in consideration of the sum of Rupees ______ paid to me by ____________, of ______________, (hereinafter called the "Transferee/s", for brevity), do hereby transfer to the Transferee/s the Ordinary/Preferred books of the Multan Electric Power Company Limited, to hold unto the said Transferee, his/her/their executors, administrators and assigns, subject to the several conditions on which I/We held the same at the time of the execution hereof, and I/We, the Transferee/s, do hereby agree to take the said share (s) subject to the conditions aforesaid.

Witness our hands this __________ day of __________.

Transferor	*Transferee*
________________	________________
Signature	*Signature*

Signed by the above-named Transferor/s and Transferee/s in the presence of:

Witnesses	*Full Name, Father's/ Husband's Name*
(1) ______________ *Signature*	*Nationality* ________
Full Address: ______________ ______________ ______________	*Occupation* ____________
	Full Address of Transferee: ____________ ______________ ______________
(2) ______________ *Signature*	
Full Address: ______________ ______________ ______________	*Occupation* ____________

17. Non- Refusal of Transfer of Shares

The Directors shall not transfer any fully paid shares unless the transfer deed is defective or invalid. The Director may decline to recognize any instrument of transfer, unless-

D. ALTERATION OF CAPITAL

22. Power to Increase Capital

The Company may, from time to time, by ordinary resolution, increase the share capital by such sum to be divided into shares of such amount as the resolution shall prescribe.

23. Further Issue of Capital

All further issue of shares capital shall be subject to the applicable provisions of Section 86. Thereafter, the Directors may dispose of the same in such manner as they think most beneficial to the Company.

24. Provisions Applicable to New Shares

The new shares capital shall be subject to the same provisions with reference to transfer and transmission as the original share capital.

25. Consolidation and Subdivision

The Company may, by ordinary resolution:-

(a) consolidate and divide its share capital into shares of larger amount than its existing shares;

(b) subdivide its existing shares or any of them into shares of smaller amount than that fixed by the Company's Memorandum of Association, subject to the provisos to Section 92, sub-section (1), clause (d); or

(c) cancel any shares which, at the date of the passing of the resolution, have not been taken or agreed to be taken by any person.

26. Reduction of Share Capital

The Company may, by Special Resolution, reduce its share capital in any manner, with and subject to any incident authorized and consent required by law.

IV. MEETINGS AND PROCEEDINGS

A. GENERAL MEETINGS

27. Statutory Meeting

The statutory general meeting of the Company shall be held within the period required by Section 157.

28. Annual General Meeting

The annual general meeting shall be held in accordance with the provisions of Section 158, within eighteen (18) Months from the date of incorporation of the Company and, thereafter, once at least in every year within a period of six Months following the close of its financial year and not later than fifteen Months after the holding of its last preceding annual general meeting, as may be determined by the Directors.

29. Other Meetings

All general meetings of the Company other than the statutory meeting or an annual general meeting shall be called extraordinary general meetings.

35. Chairman of Meeting

The Chairman of the Board of Directors, if any, shall preside as chairman at every general meeting of the Company, but if there is no such Chairman, or if at any meeting he is not present within fifteen minutes after the time appointed for the meeting, or is unwilling to act as chairman, any one of the Directors present may be elected to be the chairman, and if none of the Directors is present, or willing to act as chairman, the members present shall choose one of their number to be the chairman.

36. Adjournment

The Chairman may, with the consent of any meeting at which a quorum is present (and shall if so directed by the majority of members present), adjourn the meeting from time to time but no business shall be transacted at any adjourned meeting other than the business left unfinished at the meeting from which the adjournment took place. When a meeting is adjourned for ten days or more, notice of the adjourned meeting shall be given as in the case of an original meeting. Save as aforesaid, it shall not be necessary to give any notice of an adjournment or of the business to be transacted at an adjourned meeting.

37. Voting

A resolution put to the vote in any general meeting shall be decided on a show of hands unless a poll is (before or on the declaration of the result of the show of hands) demanded. Unless a poll is so demanded, a declaration by the Chairman that a resolution has, on a show of hands, been carried, or carried unanimously, or by a particular majority, or lost, and an entry to that effect in the minutes of the proceedings of the Company shall be conclusive evidence of the fact, without proof of the number or proportion of the votes recorded in favor of, or against, that resolution.

38. Demand for a Poll

A poll may be demanded only in accordance with the provisions of Section 167.

39. Manner of Taking a Poll

If a poll is duly demanded, it shall be taken in accordance with the manner laid down in Section 168 and the result of the poll shall be deemed to be the resolution of the meeting at which the poll was demanded.

40. Time of Taking a Poll

A poll demanded on the election of Chairman or on a question of adjournment shall be taken at once.

41. Casting Vote

In the case of an equality of votes, whether on a show of hands or on a poll, the chairman of the meeting at which the show of hands takes place, or at which the poll is demanded, shall have and exercise a second or casting vote.

Revocation of Authority

A vote given in accordance with the terms of an instrument of proxy shall be valid notwithstanding the previous death or insanity of the principal or revocation of the proxy or of the authority under which the proxy was executed, or the transfer of the share in respect of which the proxy is given; Provided, that, no intimation in writing of such death, insanity, revocation or transfer as aforesaid shall have been received by the Company at its Office before the commencement of the meeting or adjourned meeting at which the proxy is used.

MANAGEMENT AND ADMINISTRATION

A. Board of Directors

49. Number of Directors

The number of Directors shall not be less than seven. The first Directors, to hold office until the first annual general meeting, shall be:-

1. Mr. Muhammad Muzaffar-ud-Din Ghauri
2. Mr. Nasir Ahmad Paracha
3. Mr. Mehr Dil Khan
4. Mr. Muhammad Shabbir Chaudhary
5. Mr. Muhammad Azam Khan Shad
6. Mr. Tariq Shahab
7. Mr. Khalid Mahmood

50. Qualification of Directors

Save as provided in Section 187, no person shall be appointed as a Director unless he is a member of the Company.

51. Chairman of the Board

The Directors may elect one of their number as the Chairman of the Board and vest in him such powers and functions as they may deem fit in relation to the management and administration of the affairs of the Company subject to their general supervision and control.

52. Chief Executive

The Directors may elect one of their number to be the Chief Executive of the Company in accordance with the provisions of Sections 198 and 199 and vest in him such powers and functions as they deem fit in relation to the management and administration of the affairs of the Company subject to their general supervision and control. The Chief Executive of the Company shall be the *ex-officio* Vice-Chairman of the Board. The

an encumbrance on its undertaking or any part thereof and to issue debentures and other securities whether outright or as security for any obligation, liability or debt of the Company or of any third party. In exercising the aforesaid powers of the Company the Directors may, from time to time and on such terms and conditions as they think fit, raise money from banks and financial institutions and from other persons under any permitted system of financing, whether providing for payment of interest or some other form of return, and in particular the Directors may raise money on the basis of mark-up price, musharika, modaraba or any other permitted mode of financing, and without prejudice to the generally of the foregoing the Directors may exercise all or any of the powers of the Company under Section 196(2) of the Ordinance. In particular, the Directors may issue any security as defined in Section 2(1)(34) of the Ordinance or may issue any instrument or certificate representing redeemable capital as defined in 2(1)(30A) of the Ordinance or participatory redeemable capital as defined in Section 2(1)(25) of the Ordinance.

57. Duties of Directors

The Directors shall duly comply with the provisions of the Ordinance.

58. Minute Books

The Directors shall cause minutes to be made in books provided for the purpose of:-

(a) all appointments of officers made by the Directors;

(b) the names of the Directors present at each meeting of the Directors and of any committee of the Directors; and

(c) all resolutions and proceedings at all meetings of the Company and of the Directors and of committees of Directors; and every Director present at any meeting of Directors or committee of Directors shall sign his name in a book to be kept for that purpose.

C. DISQUALIFICATION OF DIRECTORS

59. Disqualification of Directors

No person shall become a Director of the Company if he suffers from any of the disabilities or disqualifications mentioned in Section 187 of the Ordinance and, if already a Director, shall cease to hold such office from the date he so becomes disqualified or disabled or:-

(a) if removed by general or special order of the holding company;

(b) if removed by a resolution of members as hereinafter provided; or

(c) if by notice in writing given to the Company he resigns his office;

Provided, however, that no Director shall vacate his office by reason only of his being a member of any company which has entered into contracts with, or done any work for, the Company but such Director shall not vote in respect of any such contract or work, and if he does so vote, his vote shall not be counted.

64. Proceedings of Committee Meetings

A committee may meet and adjourn as it thinks fit. Questions arising at any meeting shall be determined by a majority of votes of the members present. In case of an equality of votes, the chairman shall have and exercise a second or casting vote.

65. Validity of Directors' Acts

All acts done in any meeting of the Directors or of a committee of Directors shall, notwithstanding that it be afterwards discovered that there was some defect in the appointment of such Directors or that they or any of them were disqualified, be as valid as if every such person had been duly appointed and was qualified to be a Director unless the said act or acts is *ultra vires* in itself.

66. Resolution in Writing

A resolution in writing circulated to all the Directors and signed by a majority of the total number of Directors or affirmed by them through fax, telex or telegram shall be as valid and effectual as if it had been passed at a meeting of the Directors duly convened and held.

E. ELECTION AND REMOVAL OF DIRECTORS

67. Rotation of Directors

At the first annual general meeting of the Company, all the Directors shall retire from office, and Directors shall be elected in their place in accordance with Section 178 for a term of three years.

68. Eligibility for Re-election

A retiring Director shall be eligible for re-election.

69. Election in Accordance with the Ordinance

The Directors shall comply with the provisions of Sections 174 to 178 and Sections 180 and 184 relating to the election of Directors and matters ancillary thereto.

70. Filling of Casual Vacancy

Any casual vacancy occurring in the Board of Directors may be filled by the Directors, but the person so chosen shall be subject to retirement at the same time as if he had become a Director on the day on which the Director in whose place he is chosen was last elected as Director.

71. Removal of Director

The Company may remove a Director but only in accordance with the provisions of the Ordinance.

Profit Carried Forward

The Directors may carry forward any profits which they may think prudent not to distribute, without setting them aside as a reserve.

80. Payment of Dividends Specie

With the sanction of a resolution in a general meeting, any dividend may be paid wholly or in part by the distribution of specific assets and in particular of paid-up shares or debentures of any other company or in any one or more of such ways. The Directors may fix the value for distribution of such specific assets or any part thereof and may determine that cash payments shall be made to any members upon the footing of the value so fixed, in order to adjust the rights of all members, and may vest any such specific assets in trust for the members entitled to the dividend as may seem expedient to the Directors.

81. Dividends to Joint Holders

If several persons are registered as joint holders of any share, any one of them may give effectual receipt for any dividend payable on the share.

82. Notice of dividend

Notice of any dividend that may have been declared shall be given in the manner hereinafter mentioned to the persons entitled thereto. The Company may give such notice by publication in a newspaper of general circulation in the Province where the Office is situated.

83. Period for Payment of Dividends

Dividends shall be paid within the period specified in Section 251.

VIII. ACCOUNTS

84. Books of Account

The Directors shall cause to be kept proper books of account as required under Section 230.

85. Place Where Accounts Kept

The books of account shall be kept at the Office or at such other place as the Directors shall think fit and shall be open to inspection by the Directors during business hours.

86. Inspection by Members

The Directors, or their representatives, shall from time to time determine whether and to what extent and at what time and place/s and under what conditions or regulations the accounts and books or papers of the Company or any of them shall be open to the inspection of members not being Directors. No member (not being a Director) shall have any right of inspecting of any account and book or papers of the Company, except

eral meeting.

INFIDENTIALITY

o be laid
e sheets

4. Confidentiality Undertaking

Every director, manager, adviser, auditor, trustee, member of a committee, officer, agent, accountant, or other employees of the Company shall, if so required by the Directors, before entering upon his duties, sign a confidentiality undertaking in relation to all transactions of the Company with its customers and the state of accounts with individuals and in matters relating thereto, and shall undertake not to reveal any of the matters which may come to his knowledge in the discharge of his duties, except when required to do so by the Directors or by any general meeting or by any a court of law of competent jurisdiction and except so far as may be necessary in order to comply with any of the provisions in these presents.

95. Members' Access to Company Premises

No member or other person (not being a Director) shall be entitled to enter upon the property of the Company or examine the Company's premises or properties without the permission of a Director, subject to Article 94, to require discovery of or any information respecting any detail of the Company's trading or any matter which is or may be in the nature of a trade secret, mystery of trade, or secret process or of any matter whatsoever which may relate to the conduct of the business of the Company and which in the opinion of the Directors will be inexpedient, in the interest of the Company and its members, to communicate.

XI. RECONSTRUCTION

96. Reconstruction

On any sale of the undertakings of the Company, the Directors or the liquidators on a winding up may, if authorized by a Special Resolution, accept fully paid shares, debentures or securities of any other company, either then existing or to be formed for the purchase in whole or in part of the property of the Company. The Directors (if the profits of the Company permit), or the liquidators (in a winding up), may distribute such shares or securities, or any other properties of the Company amongst the members without realization, or vest the same in trustees for them. A Special Resolution may provide for the distribution or appropriation of the cash, shares or other securities, benefits or property, and for the valuation of any such securities or property at such price and in such manner as the meeting may approve. All shareholders shall be bound by any valuation or distribution so authorized, and waive all rights in relation thereto save only such statutory rights (if any) as are, in case the Company is proposed to be or is in the course of being wound up, incapable of being varied or excluded by these Articles.

XII. WINDING UP

97. Division and distribution of Assets Upon Dissolution

If the Company is wound up, the liquidator may, with the sanction of a Special Resolution of the Company and any other sanction required by law, divide amongst the members in specie or kind the whole or any part of the assets of the Company (whether

We, the several persons whose names and addresses are subscribed below, are desirous of being formed into a company in pursuance of... Association and we respectively agree to take the number of shares in the capital of the Company set opposite our respective names.

Name and surname (Present and former) in full (in Block Letters)	Father's/ Husband's Name in Full	Nationality	Occupation	Residential Address in Full	Number of Shares taken by Each Subscriber	Signature
1. Mr.Muhammad Muzaffar-ud-Din Ghauri	Haji Alaf Din Khan	Pakistani	WAPDA Service	Banglow No. A-1, WAPDA Colony Khanewal Road, Multan.	1	
2. Mr. Nasir Ahmad Paracha	Amir Mohammad	Pakistani	WAPDA Service	Flat No. 19 WAPDA Officers Colony Upper Mall, Lahore.	1	
3. Mr. Mehr Dil Khan	Malik Umara Khan	Pakistani	WAPDA Service	132 kV Grid Station WAPDA Qasimpur Bahawalpur Road, Multan.	1	
4. Mr. Muhammad Shabbir Chaudhary	Ch. Muhammad Siddique	Pakistani	WAPDA Service	H. No. 9, Block K, Shah Ruken-e-Alam Housing Scheme, Multan.	1	
5. Mr. Muhammad Azam Khan Shad	Muhammad Khan	Pakistani	WAPDA Service	H. No. 81-B, New Chauburji Park, Lahore.	1	
6. Mr. Tariq Shahab	Shaukat Ali Shahab Talib	Pakistani	WAPDA Service	21-Greenwood Homes,Block-C New Muslim Town, Lahore.	1	
7. Mr.Khalid Mahmood	Fazal Din	Pakistani	WAPDA Service	Bunglow No.B-46, WAPDA Colony, Khanewal Road, Multan.	1	

Total number of shares taken 7 (Seven)

Dated the _____ day of _____.

Witnesses to above signatures

(Full Name, Father's/Husband's Name)

(in Block Letters)_____

Signature_____

Occupation _____

Full Address _____

Annx-E

MAINTENANCE OF DISTRIBUTION SYSTEM.

Maintenance of any system is the primary requirement for its continuous, smooth and reliable operation. Both maintenance are being carried out i.e preventive maintenance and emergency / break down maintenance. It has been always emphasized on preventive maintenance so that there should be no need of emergency maintenance.

Preventive maintenance / crash maintenance is carried out in October, November and December of every month. In preventive maintenance following activities are emphasized:

- Tree trimming,
- Replacement of damaged/cracked poles/structures,
- Set righting the tilted poles. Stay wires,
- Set righting the loose sag,
- Replacement of defective, loose, undersized jumpers of HT/LT lines and Transformers,
- Replacement of sub-standard/ improper fuses,
- Load balancing of transformers,
- Checking/updating the proper earthing,
- Replacement of defective/ damaged capacitors.

In this regard for keeping the record of maintenance properly 3 formats for HT line. LT line and for maintenance of the transformer have designed. Before the start of the maintenance a proper survey is carried out and according to that survey, demand of the required material is created. Than shutdown required for the safe maintenance are being approved and then maintenance work is started. Theses shut down are also published in print media for public information. Important, sensitive consumers are informed telephonically in person.

Deputy Director (Technical) is the incharge of the circle respective circle maintenance. Strict Safety measures are always ensured for implementing the zero tolerance policy concerning the safety. Monitoring of the quantity and quality of the maintenance work is being carried out on daily basis by the concerned DDT of the circle, XEN of the division office and SDO of the sub division. SE operation also visit the sites frequently.

Progress Of Patrol Book (Trasnformers) In Respect of MEPCO

#	CIRCLE	Progress	Hazards / Discrepancies									
			T-1 Codification	T-2 Bus Bar Required	T-3 Broken & Deterioraed Jumpers	T-4 Un-balancing of TF	T-5 Earthing	T-6 Oil Level & Density	T-7 Over Loading	T-8 Body Condition	T-9 Placement (Proper Platform or Not)	TOTAL

Progress Of Patrol Book (LT Line) In Respect of MEPCO

S#.	Circle	Progress	Hazards / Discrepancies									Remarks
			LOOP in Network LT-1	Under Size or Broken Jumpers LT-2	Loose Span LT-3	Tilted Poles /St. LT-4	Deteriorated/Damaged Poles/St. LT-5	Under Size Conductor/ Over Loading LT-6	Trees & Other Obstacles LT-7	Other Hazardous elements risks to Public or Employee Safety LT-8	Total	

Progress Of Patrol Book (11 KV Line) In Respect of MEPCO

S#	Circle	Progress	Hazards/Discrepancies											TOTAL
			Hazardous Network in Emanating Yard of Grid HT-1	Loop in 11Kv Line HT-2	Long & Loose Span HT-3	Under Size, Loose, Broken Jumpers HT-4	Tilted Poles/St. HT-5	Broken/ Deteriorated Poles/ St. HT-6	Under Size 11KV Spans HT-7	Trees and Other Hazards in Network HT-8	Defective Capacitors/ Voltage Regulators HT-9	Over Loaded 11KV Line (HT-10) (Nos.)	Risk to Public or Employees (Passing over or near residences (HT-11) (Nos.)	

STATEMENT OF BUDGET ALLOCATED / EXPENDITURE FOR MAINTENANCE OF DISTRIBUTION SYSTEM

IN RESPECT OF MEPCO (OPERATION) CIRCLE

Sr. No.	Name of Circle	Total Budget allocated from 07/2022 to 06/2023 (Million)	Expenditure incured from 07/2022 to 12/2022 (Million)
1	Multan	166.48	87.929
2	Muzaffargarh	339.68	242.37
3	Vehari	128.4	50.64
4	Dera Ghazi Khan	97.1	82.587
5	Khanewal	85	49.2
6	Sahiwal	131.764	66.059
7	Bahawal Nagar	88.106	34.84
8	Bahawal Pur	126.5	72.953
9	Rahim Yar Khan	56.5	15.27
MEPCO		**1219.53**	**701.848**

AM (CM)
MIRAD-MEPCO

NEXT 5-YEARS HT/LT EXPANSION PLAN
2022-23 TO 2026-27

Head	Description	2022-23			2023-24			2024-25			2025-26			2026-27			5-YEARS TOTAL EXPANSION		
		No.	Saving (MKWH)	Cost (M)	No.	Saving (MKWH)	Cost (M)	No.	Saving (MKWH)	Cost (M)	No.	Saving (MKWH)	Cost (M)	No.	Saving (MKWH)	Cost (M)	No.	Saving (MKWH)	Cost (M)
ELR	HT Proposals	32	52.47	2069	55	105	5092	50	93	4897	54	95	5574	45	67.5	4947	236	412.97	22579
	LT Proposals	455	13.890	1190	460	14.05	1304	440	13.44	1398	450	13.74	1514	450	13.74	1612	2255	68.86	7018
ELR Total		487	66.36	3259	515	119.05	6396	490	106.44	6295	504	108.74	7088	495	81.24	6559	2491	481.83	29597
DOP	HT Proposals	23	13.89	947	35	63.00	3229	27	29.70	2634	28	48.00	2880	25	45.00	2738	138	199.59	12428
	11 kv Capacitor	60	1.05	14.16	70	1.22	17.57	54	0.94	15.356	56	0.98	16.937	50	0.87	16.08	290	5.06	80.103
	Aug: of T/Fs.	863	7.65	979	904	8.02	1093	949	8.41	1217	996	8.83	1351	990	8.77	1415	4702	41.68	6055
DOP Total		946	22.59	1940.16	1009	72.24	4339.57	1030	39.05	3866.36	1080	57.81	4247.94	1065	54.64	4169.08	5130	246.33	18563
GRAND TOTAL ELR+DOP		1433	88.95	5199.2	1524	191.29	10736	1520	145.49	10161	1584	166.55	11336	1560	135.88	10728	7621	728.16	48160
ABC Cable (km)		44	0.10	19	48	0.11	22	53	0.12	26	59	0.13	31	59	0.13	32	263	0.5739	130

Assistant Manager
O/O Chief Strategic Planner

AM (CM)
MIRAD-MEPCO

NEXT 5-YEARS HT PLAN
2022-23 TO 2026-27

Head	Description	2022-23			2023-24			2024-25			2025-26			2026-27			5-YEARS TOTAL EXPANSION		
		No.	Saving (MKWH)	Cost (M)	No.	Saving (MKWH)	Cost (M)	No.	Saving (MKWH)	Cost (M)	No.	Saving (MKWH)	Cost (M)	No.	Saving (MKWH)	Cost (M)	No.	Saving (MKWH)	Cost (M)
ELR	HT Proposals	32	52.47	2069	55	105.00	5092	50	93.00	4897	54	95.00	5574	45	67.5	4947	236	413.0	22579
DOP	HT Proposals	23	13.89	947	35	63.00	3229	27	29.70	2634	28	48.00	2880	25	45	2738	138	199.59	12428
W.B	HT Proposals	0	0.00	0	35	31.01	0	35	31.01	0	0	0.00	0	0	0	0	70	62.02	0
TOTAL		55	66	3016	125	199.01	8321	112	153.71	7531	82	143	8454	70	112.5	7685	444	674.58	35007
Total Receipt with 5% Growth (MkWh)		23870.61			25064.141			26317.348			27633.215			29014.876					
% Loss Reduction due to HT Works		0.278			0.794			0.584			0.517			0.388					
% HT Loss with Base Line 8.887%		8.609			8.259			8.128			8.046			8.087					
Load Growth 5% impact over base 8.887% 2021-22		0.444			0.453			0.436			0.428			0.424					
Net Loss		9.053			8.712			8.564			8.474			8.510					
TOTAL Decrease (HT Technical Loss 2022-23 (8.887)- loss of 2026-27 (8.510)= -0.377																			

Assistant Manager
O/O Chief Strategic Planner

AM (CM)
MIRAD-MEPCO

NEXT 5-YEARS LT PLAN

Base Technical loss 2021-22= 3.373

2022-23 TO 2026-27

Head	Description	2022-23			2023-24			2024-25			2025-26			2026-27			5-YEARS TOTAL EXPANSION		
		No.	Saving (MKWH)	Cost (M)	No.	Saving (MKWH)	Cost (M)	No.	Saving (MKWH)	Cost (M)	No.	Saving (MKWH)	Cost (M)	No.	Saving (MKWH)	Cost (M)	No.	Saving (MKWH)	Cost (M)
ELR	LT Proposals	455	13.89	1190	460	14.05	1304	440	13.44	1398	450	13.74	1514	450	13.74	1612	2255	68.86	7018
	Sluggish Meters	324003	9.07	892	340203	9.53	998	357213	10.00	1112	375073	10.50	1235	365720	10.24	1277	1762212	49.34	5514
DOP	Aug: of T/Fs.	863	7.65	979	904	8.02	1093	949	8.41	1217	996	8.83	1351	990	8.77	1415	4702	41.68	6055
	ABC Cable (km)	44	0.10	19	48	0.11	22	53	0.12	26	59	0.13	31	59	0.13	32	263	0.58	130
TOTAL		325365	30.71	3080	341615	31.705	3417	358655	31.965	3753	376578	33.198	4131	367219	32.88	4336	1769432	160.46	18717
Receipt Distn: with 5% Growth (MkWh)		23870.61			25064.141			26317.348			27633.215			29014.876					
% Loss Reduction due to LT Works		0.129			0.126			0.121			0.120			0.113					
% LT Loss with Base Line 3.373% (2021-22)		3.244			3.287			3.336			3.388			3.451					
Load Growth 5% impact over base 3.373%		0.169			0.171			0.173			0.175			0.178					
Net Loss		3.413			3.457			3.509			3.564			3.629					

Loss Derease due to investment at LT Proposals /other improvemnets = 3.373-3.451= -0.078

Impact of 5% growth each year upto 2026-27(Increase in loss)= 0.178 Net Increase in loss =0.178-0.078= 0.1

Assistant Manager
O/O Chief Strategic Planner

AM (CM)
MIRAD-MEPCO

Manager (Engineering)
MEPCO HQ Multan

MEPCO Multan Electric Power Company Ltd.

Office of the Chief Executive Officer MEPCO Multan

Memo No. 650 /CE (O&M) T&G

Dated 02-02-2023

(061) 9220186
(061) 9220204
dmdevmepco@gmaill.com

The Manager (CM&RA) MIRAD,
MEPCO Ltd. Multan.

Attention: *AM (RA) MIRAD MEPCO Multan*

Subject: **TOTAL ANNUAL SHUTDOWN W.E.F 07-2022 TO 06-2023 AND EXPENSES.**

The subject cited information received from SS&T Divison MEPCO, Multan, D.G Khan, Muzaffar Garh, Sahiwal and Vehari as desired by your office for further necessary action please:-

Total No. of Shutdowns Financial Year 2022-23 (In Figures)	Total Expense (In Figures)
1876	2305500

Acting (HDM)
O/O CE (O&M) T&G MEPCO
Multan

M (CM&RA)
3.2.23

DIRECTOR GENERAL MIRAD
D.No: 263
Date: 3/2/23
MEPCO H/Q MULTAN

AM (RA)
08/02/23

Annex-F

E-STAMP

ID :	PB-MLT-6B189E92CE790DDD
Type :	Low Denomination
Amount :	Rs 100/-

Scan for online verification

= 2782 =
27-01-2023

Description :	AFFIDAVIT- 4
Applicant :	Allahyar Khan [36502-9721647-1]
S/O :	Jalal
Agent :	Jamshaid Aslam [00000-0000000-0]
Address :	Multan
Issue Date :	27-Jan-2023 1:03:47 PM
Delisted On/Validity :	3-Feb-2023
Amount in Words :	One Hundred Rupees Only
Reason :	NEPRA
Vendor Information :	Muhammad Yaqoob ! PB-MLT-84 ! Chowk Kumharan Wala

MUHAMMAD YAQOOT
Stamp Vendor
Lic. No. 84
Chowk Kumharanwala Multan

نوٹ: یہ ٹرانزیکشن تاریخ اجرا سے سات دنوں تک کے لیے قابل استعمال ہے۔ای استامپ کی تصدیق بذریعہ ویب سائٹ،کیو آر کوڈ یا ایس ایم ایس بھی کی جا سکتی ہے۔

Type "eStamp <16 digit eStamp Number>" send to 8100

AFFIDAVIT

I Engr. Allahyar Khan Chief Executive Officer Multan Electric Power Company Limited duly authorized by the Board of Directors of Multan Electric Power Company Limited, in terms of regulation 3(4)(g) of the NEPRA Licensing (Application, Modification, Extension and Cancellation) Procedure Regulations, 2021 do hereby, solemnly affirm and testify that following licence has been granted by the Honorable Authority to MEPCO:

1. Distribution Licence No.06/DL/2002 dated April 25, 2002 (currently extended provisionally by the Authority till April 30, 2023 through the letter No. NEPRA/R/DG(Lic)/LAD-06/23519 dated 13.12.2022.

Deponent

Engr. Allahyar Khan
Chief Executive Officer MEPCO

Annex G

E-STAMP

ID : PB-MLT-FAFA48EFEF233FE0
Type : Low Denomination
Amount : Rs 100/-

Scan for online verification

=2783=
27-01-2023

Description : AFFIDAVIT- 4
Applicant : Allahyar Khan (36502-9721647-1)
S/O : Jalal
Agent : Jamsahid Aslam (00000-0000000-0)
Address : Multan
Issue Date : 27-Jan-2023 1:01:53 PM
Delisted On/Validity : 3-Feb-2023
Amount in Words : One Hundred Rupees Only
Reason : NEPRA
Vendor Information : Muhammad Yaqoob | PB-MLT-84 | Chowk Kumharan Wala

Chowk Kumharan Wala Multan

نوٹ: یہ ٹرانزیکشن تاریخ اجرا سے سات دنوں تک کے لیے قابل استعمال ہے۔ای استامپ کی تصدیق بذریعہ ویب سائٹ،کیوآر کوڈ یا ایس ایم ایس سے کی جا سکتی ہے

Type "eStamp <16 digit eStamp Number>" send to 8100

AFFIDAVIT

I Engr. Allahyar Khan, Chief Executive Officer Multan Electric Power Company Limited, duly authorized by the Board of Directors of Multan Electric Power Company Limited do hereby, solemnly affirm and testify that the contents of the application for grant of Electric Power Supply Licence as Supplier of Last Resort are in accordance with Regulation 3(1) of NEPRA Licensing Electric Power Supply Regulation, 2022 and Regulation 3 of the NEPRA Licencing (Application, Modification, Extension and Cancellation) Procedure Regulations, 2021 and that the Annexed documents are true and correct to the best of my knowledge, belief on the basis of provided confirmations by the concerned formations put before me; and further declare that:

1. I am the Chief Executive Officer of the Multan Electric Power Company (MEPCO) and fully aware of the affairs of the Company particularly to endorse application for grant of Electric Power Supply Licence.
2. Whatsoever stated in the application and accompanied documents is true and nothing has been concealed.

Deponent

Engr. Allahyar Khan
Chief Executive Officer MEPCO

Annex - XV(11)

Consumer Class / Category on the basis of Sanctioned Load

MEPCO MULTAN.

Tariff	No. of Consu-mers	San. Load KW	Units Billed (Mil. KWH)	Billing Consumer end (Mil. Rs.)	Avg. Rate Per Unit (Rs.)	Avg. KWH / connection	% Age share	
							Units Billed	Amount Billed
A - 1 (0 - 50)	441,587	10,789,247	29.93	227.69	7.61	11	0.33	0.08
51-100 Units(Life line)	18,065		38.74	384.31	9.92	357	0.43	0.13
0-100 Units (Pro.)	2,999,340		566.16	8,586.10	15.17	31	6.29	2.99
101-200 Units (Pro.)	116,131		809.58	13,312.05	16.44	1,162	8.99	4.63
A - 1 (0 - 100)	2,557,593		265.88	5,946.56	22.37	17	2.95	2.07
A - 1 (101 - 200)	666,718		938.82	24,565.79	26.17	235	10.42	8.55
A - 1 (201 - 300)	110,799		1,199.05	34,042.81	28.39	1,804	13.31	11.85
A - 1 (301 - 400)	25,948		524.76	18,463.18	35.18	3,371	5.83	6.43
A - 1 (401 - 500)	9,656		254.80	9,646.48	37.86	4,398	2.83	3.36
A - 1 (501 - 600)	4,363		139.46	5,451.51	39.09	5,327	1.55	1.90
A - 1 (601 - 700)	2,320		82.69	3,316.00	40.10	5,940	0.92	1.15
A - 1 Above 700	3,885		164.87	7,663.93	46.48	7,073	1.83	2.67
TEMPORARY	1,068	10,995	0.27	13.88	50.66	43	0.00	0.00
A - 1 TOD	24,389	164,905	80.52	2,909.75	36.14	550	0.89	1.01
DOMESTIC	6,981,862	10,965,147	5,095.53	134,530.03	26.40	122	56.57	46.83
A - 2	603,028	897,364	263.86	13,885.17	52.62	73	2.93	4.83
A - 2 Above 5 KW	25	942	0.11	5.96	56.23	707	0.00	0.00
A - 2 TOD	23,523	587,889	292.13	16,417.06	56.20	2,070	3.24	5.71
TEMPORARY	2,393	29,983	8.17	481.84	58.95	569	0.09	0.17
COMMERCIAL	628,969	1,516,178	564.27	30,790.02	54.57	150	6.26	10.72
B - 1	14,757	127,313	13.48	678.66	50.36	152	0.15	0.24
B - 1 TOD	34,968	451,335	164.84	7,205.88	43.71	786	1.83	2.51
B - 2	1,632	228,374	0.01	2.08	208.00	1	0.00	0.00
B - 2 TOD	8,825	1,202,950	514.69	23,254.24	45.18	9,720	5.71	8.09
B - 3 TOD	372	637,381	632.53	25,594.23	40.46	283,391	7.02	8.91
B - 4 TOD	10	194,242	264.03	10,251.83	38.83	4,400,500	2.93	3.57
INDUSTRIAL	60,564	2,841,595	1,589.58	66,986.92	42.14	4,374	17.65	23.32
C - 1 (a)	32	405	0.02	0.86	44.79	100	0.00	0.00
C - 1 (b)	125	10,270	0.76	35.58	46.88	1,012	0.01	0.01
C - 1 TOD	39	28,600	19.43	905.59	46.60	83,043	0.22	0.32
C - 2	9	2,496	0.41	19.13	46.55	7,611	0.00	0.01
C - 2 TOD	61	98,234	99.10	4,447.89	44.88	270,765	1.10	1.55
C - 3 (a)	0	0	0.00	0.00	0.00	#DIV/0!	0.00	0.00
C - 3 TOD	3	29,000	20.80	930.43	44.73	1,155,500	0.23	0.32
BULK SUPPLY	269	169,005	140.52	6,339.48	45.11	87,063	1.56	2.21
D-1 SCARP (46)	2,684	39,472	0.01	0.56	43.08	1	0.00	0.00
D-1 a, D-2 Agri. (41, 42, 49, 52)	9,141	106,344	0.20	5.63	28.86	4	0.00	0.00
D-1 a, D-2 Agri. (43, 44, 47, 48) TOD	60	529	0.02	0.57	31.67	50	0.00	0.00
D-1 b Agri. TOD (45)	917	13,891	4.38	181.27	41.41	796	0.05	0.06
D-1 b Agri.TOD (50, 51) TOD	92,201	1,621,822	1,425.89	40,187.16	28.18	2,578	15.83	13.99
D-1 b Agri. TOD (53, 54) TOD	159	2,197	0.06	1.74	30.00	61	0.00	0.00
AGRICULTURE (T/W)	105,162	1,784,255	1,430.55	40,376.92	28.22	2,267	15.88	14.05
GENERAL SERVICE (66)	43,201	376,494	172.84	7,646.57	44.24	667	1.92	2.66
G P LIGHTING	1,758	16,829	10.87	485.96	44.72	1,030	0.12	0.17
H RESIDENTIAL CLY.	122	12,851	3.15	143.83	45.63	4,306	0.03	0.05
I RAILWAY TR	4	8,016	0.00	0.00	0.00	0	0.00	0.00
J COGENERATION	2	4,225	0.00	2.28	0.00	0	0.00	0.00
TOTAL OTHERS	45,087	418,415	186.86	8,278.65	44.30	691	2.07	2.88
MEPCO	7,821,913	17,694,595	9,007.31	287,302.01	31.90	192	100	100

AM (CM) MIRAD-MEPCO

Annex H(iii)

Tariff Category of Consumer Classes to be Served

07/2022 - 12/2022

MEPCO MULTAN.

Tariff	No. of Consu-mers	Units Billed (Mil. KWH)	Billing Consumer end (Mil. Rs.)	Avg: Rate Per Unit	Avg. KWH / connection/ Month
DOMESTIC	6,981,862	5,095.53	134,530.03	26.40	122
COMMERCIAL	628,969	564.27	30,790.02	54.57	150
INDUSTRIAL	60,564	1,589.58	66,986.92	42.14	4,374
BULK SUPPLY	269	140.52	6,339.48	45.11	87,063
AGRICULTURE (T/W)	105,162	1,430.55	40,376.92	28.22	2,267
GENERAL SERVICE	43,201	172.84	7,646.57	44.24	667
P LIGHTING	1,758	10.87	485.96	44.72	1,030
RESIDENTIAL CLY.	122	3.15	143.83	45.63	4,306
RAILWAY TRACTION	4	0.00	0.00	0.00	0
MEPCO	7,821,911	9,007.31	287,299.73	31.90	192

AM (CM)
MIRAD-MEPCO

Annex (D)

(Point No. 03)

Pattern of Demand (Average) and Consumption (Drawl) on different time periods for the year 2022 in Respect of MEPCO.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Demand (MW)	1427	1585	2094	3031	3609	3662	3578	3410	3474	2351	1592	1442
Consumption (Drawl MW)	1562	1542	2008	2286	3311	2966	3122	3041	2937	2242	1553	1368

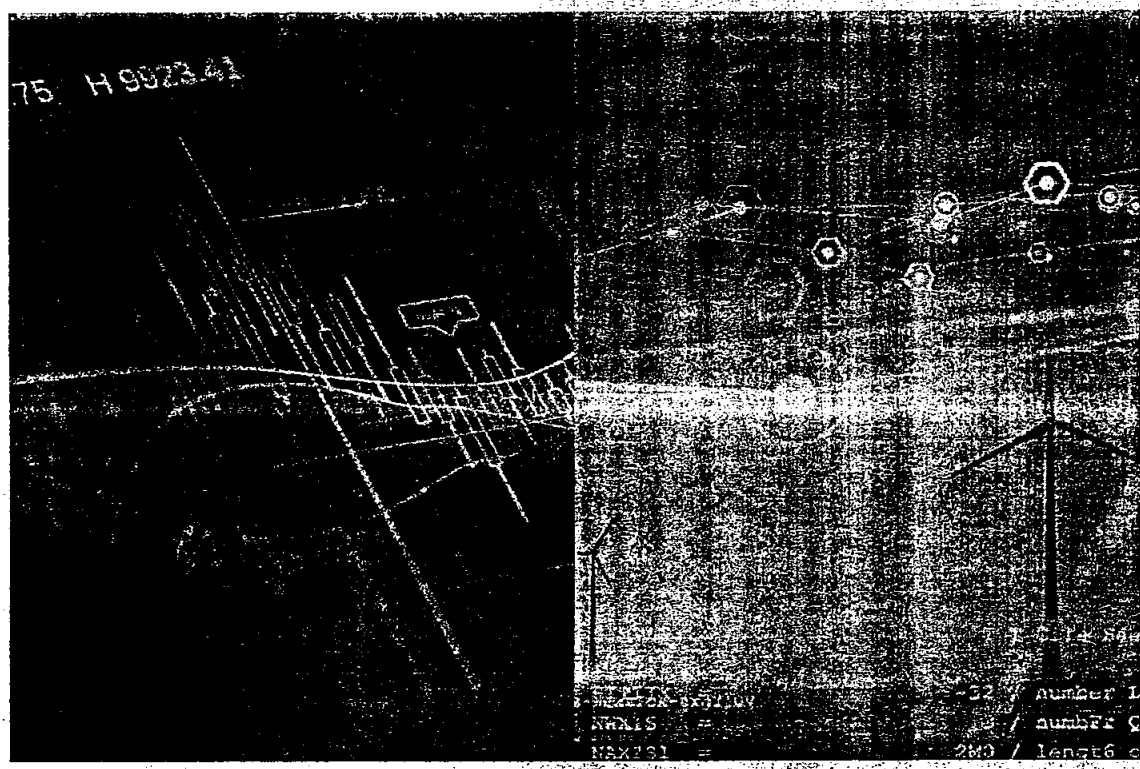
AM (CM)
MIRAD-MEPCO

MULTAN ELECTRIC POWER COMPANY LTD.

Power acquisition program is under process, as per clause-(6)2 of Power Procurement Regulation 2022. However, Market Operator calculation of capacity obligation & credit capacity to MEPCO is attached.

Annex-H(V)

MARKET OPERATOR (MO)



FINAL YEARLY SETTLEMENT STATEMENT (FYSS)

2022

Market Management System

AM (CM)
MIRAD-MEPCO

Final Yearly Settlement Statement (FYSS)

2022

PREAMBLE

The Market Commercial Code requires CPPA, the Market Operator of Pakistan's Electricity Market, to issue an aggregated settlement statement comprising the results of the Balancing Mechanism of Capacity and Compensation for Excess Losses.

This Final Yearly Settlement Statement (FYSS) for the year 2022 is being issued in accordance with the provisions of Chapter 11 of the Market Commercial Code. This statement comprises the results of the Balancing Mechanism for Capacity (BMC) and Compensation for Excess Losses. These results have been obtained as per the formulas given in Chapter 9 and 11 of the Market Commercial Code.

This report is circulated for the review and feedback of the stakeholders before the issuance of the Extraordinary Yearly Settlement Statement.

Final Yearly Settlement Statement

Settlement Period: 2022

SN	Party ID	Party Name	Balancing Mechanism For Capacity (BMC) Charges		Compensation for Excess Losses	Interest Accrued	Interest Payable	Adjustment from ESS	Net Amount
			Amounts Payable	Amounts Receivable					
			PKR	PKR	PKR	PKR	PKR	PKR	PKR
1	2	LESCO	0	0	0	0	0	0	0
2	3	IESCO	0	0	0	0	0	0	0
3	4	FESCO	0	0	0	0	0	0	0
4	5	GEPCO	0	0	0	0	0	0	0
5	6	HESCO	0	0	0	0	0	0	0
6	7	SEPCO	0	0	0	0	0	0	0
7	8	MEPCO	0	0	0	0	0	0	0
8	9	PESCO & TESCO	0	0	0	0	0	0	0
9	10	QESCO	0	0	0	0	0	0	0
10	12	K Electric	0	0	0	0	0	0	0
11	25	NTDC	-	-	0	0	0	0	0
12	26	PMLTC	-	-	0	0	0	0	0

Enclosed:

Appendix A: Detailed report on Balancing Mechanism For Capacity

Appendix B: Detailed report on Compensation for Excess Losses

Annexure-A

Central Power Purchasing Agency

Market Operator

Report on Balancing Mechanism of Capacity

2022

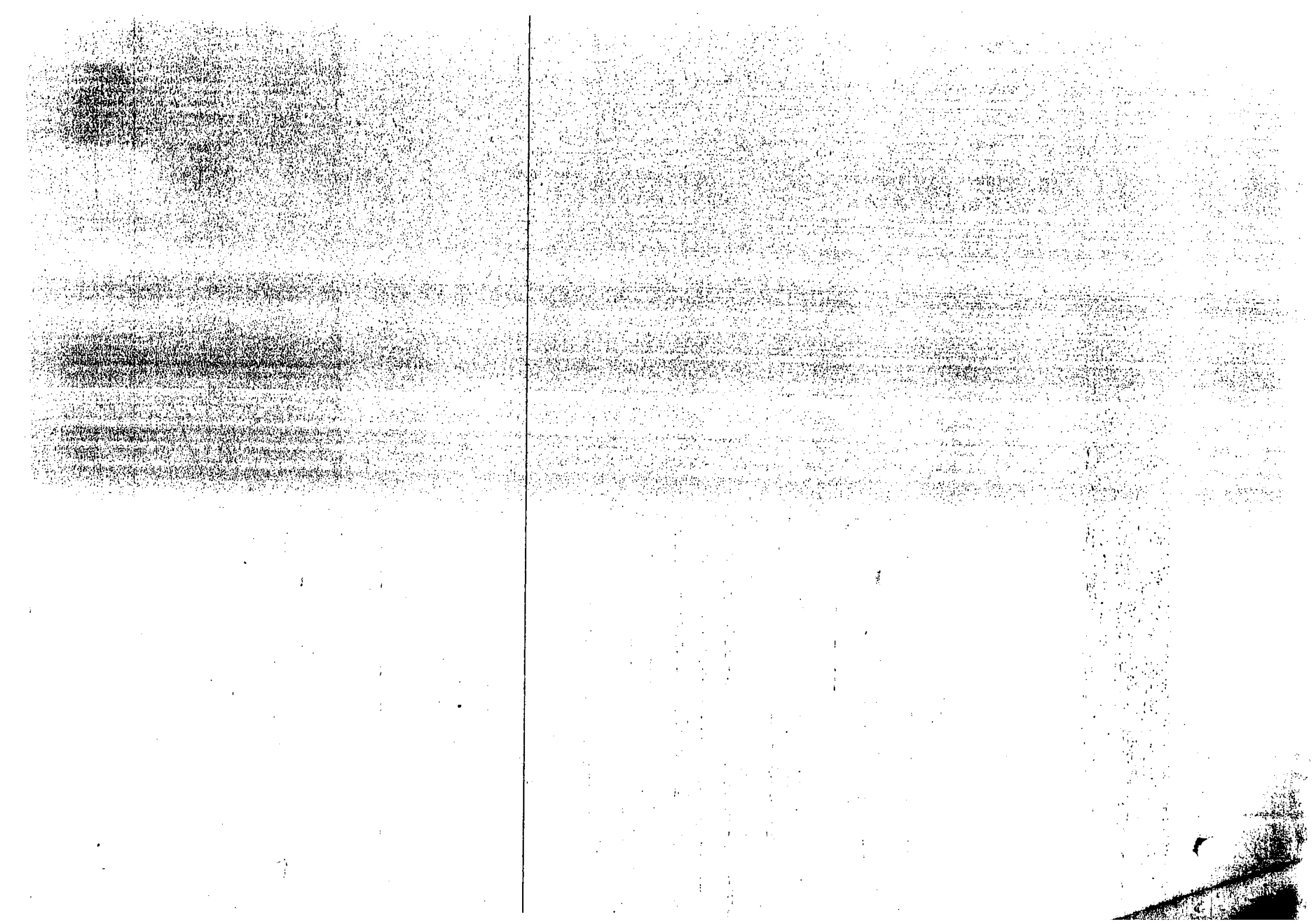


TABLE OF CONTENTS

List of Tables

List of Figure

Executive Summary

The market commercial code requires CPPA to prepare the preliminary results of the Balancing Mechanism for Capacity (BMC) and publish the results to all Market Participants for their feedback before final execution of the BMC and issuance of the Preliminary Yearly Settlement Statement (PYSS).

In compliance to the provision of the Commercial Code and the Dry Run Plan, CPPA-G has prepared the Preliminary Results of the BMC for the year 2022 in accordance with the provisions of Chapter 9 of the Commercial Code. Currently, the market participants are only the EX-WAPDA DISCOs and KE, so the results only pertains to these entities.

Inputs

For the preparation of these results, the following inputs were considered:

1. **Critical Hours:** In order to determine the Critical Hours, the metering data for the months of June, July, August, and September was considered because hourly profile of only these months was available.
2. **Energy not served data:** The hourly profile of energy not served during the months mentioned above was obtained from NTDC.
3. **Capacity Provided by Generators:** In order to determine the Capacity provided by the Generators during the Critical Hours, the availability data from NPCC and the metering data from MSP was utilized.
4. **Capacity Contracted by Market Participants:** As currently, there are only Legacy Contracts through which Capacity is being purchased by the Market Participants, therefore, the Capacity Provided by generators was allocated among all Market Participants using the Allocation Factors given in **Table 4** of the Commercial Code.
5. **Capacity Demanded by Market Participants:** Since we only have SOLRs as Market Participants, so their Capacity Demanded will be taken as the average Energy supplied by the SOLR during the Critical Hours. The relevant metering data from MSP was utilized for this calculation.

Results

Based on the analysis, the following results were obtained

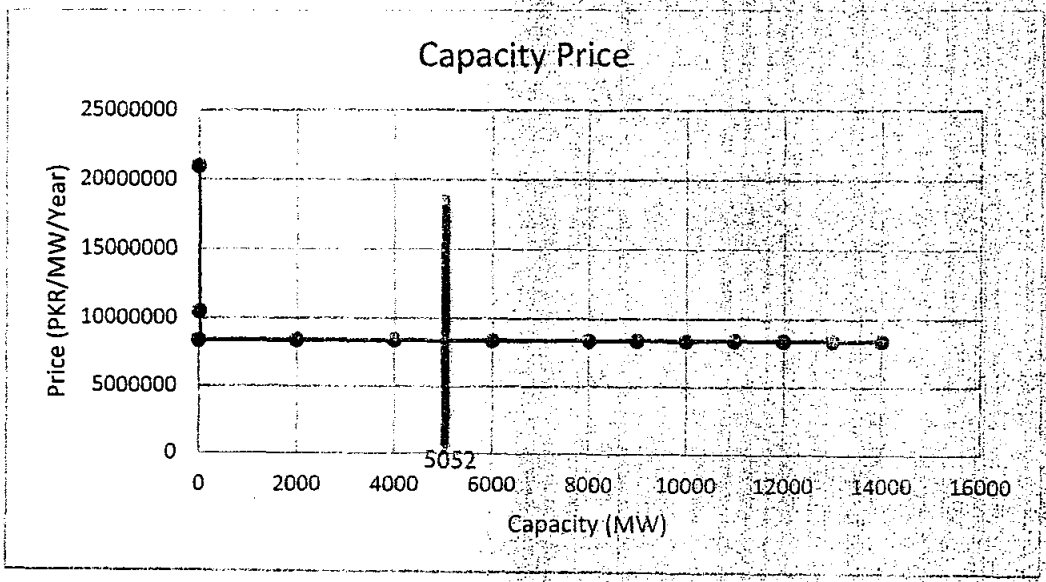
1. All Critical Hours belonged to the Months of June and July.
2. All Market Participants had positive capacity imbalances as shown in **Table 1** below.

Table 1: Capacity Balance

#.	Market Participant ID	Market Participant Name	Capacity Requirement (ACR)(MW)	Credited Capacity (ACC)(MW)	Capacity Balance (CB)
			MW	MW	MW
1	2	LESCO	5,210	5,362	152
2	3	IESCO	2,256	2,579	323
3	4	FESCO	2,969	3,326	358
4	5	GEPCO	2,198	2,496	297
5	6	HESCO	848	1,217	370
6	7	SEPCO	690	948	258
7	8	MEPCO	3,510	4,335	826
8	9,11	PESCO & TESCO	2,736	3,718	982
9	10	QESCO	835	1,428	593
10	12	K Electric	1,157	2,050	893

Based on the methodology as given in the commercial code and utilizing the inputs as described above, the following graph was constructed to depict the demand and supply curves and to determine the capacity balance price. The calculations are explained in detailed in the following sections. It can be observed from the graph that the capacity price is equal to 0.8 times the reference technology price (8400000 PKR/MW-Year).

Figure 1: Demand and Supply Curve and the Capacity Price



This report is being published as the final results as we received no feedback from any stakeholder on the preliminary results published with the Preliminary Yearly settlement Statement.

Part1: Introduction

Capacity Obligations is one of the most important aspects of the CTBCM and the Balancing Mechanism for Capacity has been designed to facilitate the Market Participants to comply with such obligations. Through the Balancing Mechanism for Capacity, Market Participants can buy the amount of Capacity that they need in order to comply with their obligations from the Market Participants that have provided Capacity in surplus of their obligations. As such, this mechanism facilitates the trading of Capacity and help participants buy if they are short and sell if they are in surplus.

The Balancing Mechanism for Capacity is based on the concept of system security where Market Participants are evaluated at the time when the system security is more critical. Capacity is a product which is more critical at certain time than others and therefore shall be evaluated in those times where it is more critical. In such critical time, the Capacity provided and demanded by all Market Participants is evaluated and penalties and rewards are being calculated as per the actual performance.

As per provisions of the Commercia Code, the critical time is represented by the Critical Hours in the system and the Capacity demanded and Capacity provided by Market Participants shall be evaluated during these critical hours. If the Capacity Provided (Self-owned or through purchase in Contracts) by a Market Participant is greater than the Capacity Demanded (Self consumption or through selling Capacity in Contracts) by such Market Participant, then such Market Participants will have a positive imbalance and will be rewarded if there is any need of such Capacity. If the Capacity Provided by a Market Participant is less than the Capacity Demanded by such Market Participant, then such Market Participants will have a negative imbalance and will pay for the shortage as per the mechanism described in the Commercial Code.

It is important to highlight that both the Capacity Obligations and the Balancing Mechanism for Capacity are complementary instruments with similar objectives: To guarantee that there is enough capacity installed in the system to supply current and forecasted load with an adequate level of reliability. Therefore, both instruments need to be assessed jointly: i.e., Capacity Obligations can be "relaxed" if there is a relatively liquid balancing mechanism, with several Market Participants having enough capacity surplus; or the opposite if the capacity surpluses are reduced.

Part 2: Inputs

The following inputs were utilized for preparing the preliminary results of the Balancing Mechanism for Capacity.

1. Hourly Metering and Load Shedding Data of DISCOs

For the calculation of Critical Hours, hourly metering data of DISCOs was conveyed by MSP. Based on the metering data, hourly demand of DISCOs and transmission losses were calculated. The hourly profile of energy not served (Load Shedding) was also obtained from the System Operator. Accumulative hourly demand, hourly transmission losses and hourly load shed data is used for the calculation of critical hours.

2. Generator's Availability and Energy Data

For the calculation of capacity provided by the generators in critical hours, hourly availability data and load curtailment data of AREs was obtained from the System Operator. Apart from this, metering data of generator's CDPs was obtained from MSP. For thermal power plants and hydro with storage, availability data was used while for REs and SPPs hourly injected energy and load curtailment data is utilized for the calculation of capacity provided by generators

3. Contract Data and Allocation Factors

For crediting the capacity provided by generators during the critical hours to the respective Market Participants, the Capacity Contracts data is required. As there are only Legacy Generators which are in contract with all DISCOs and KE, so the Capacity provided by these Generators was credited to the DISCOs and KE by using the allocation factors given in **Table 4** of the commercial code.

4. Metering and Trading points data of DISCOs and KE

For the calculation of capacity requirements, demand of each market participant is required in each critical hour. For this calculation, hourly metering data of critical hours at metering and trading points as conveyed by MSP was utilized.

5. Efficient Reserve

The efficient level of reserves is the Capacity that is required to be installed in the system above the peak load, on long term basis, in order to minimize the total system costs. System operator will determine the efficient level of reserves while developing IGCEP. Till system operator determines the efficient level of reserve, 35% value of efficient level of reserve is used in accordance with the provisions of the commercial code.

6. Unitary Cost

The unitary cost of the Capacity is the investment cost of the most economic Generation Unit, capable to provide 1 MW of Firm Capacity during the Critical Hours. The reference technology will be the technology which minimizes the levelized fixed costs. The unitary cost of capacity will

be equal to the levelized investment cost of the reference technology. This value will be calculated by the System Operator. Till such time this methodology is developed by the System Operator, the unitary cost of the Capacity is taken as 10,500,000 PKR/MW/Year in accordance with the provisions of the commercial code.

Part 3: Execution of BMC

Step 1: Critical Hours:

The critical hours are those hours in which the power system is at maximum stress. In principle, these hours are those in which the amount of reserves of the system are minimal.

According to the provisions of the commercial code, System Operator will determine the critical hours keeping in view the characteristics of demand, maintenance plans, fuel constraints, operational constraints, transmission reliability considerations and minimum reserve requirements of the power system. Since, CCOP is not yet developed for the determination of critical hours, so as an interim measure (according to the provisions of the commercial code) top 50 hours are considered as critical hours in which the sum of total demand, hourly transmission losses and estimation of demand which has been disconnected upon instructions by SO is higher than all other hours. While determining top 50 hours, not more than 5 hours of the same day are included in the critical hours.

Determination of Critical hours:

For this study, only June, July, August, and September data was available so this data was assessed to find the critical hours in accordance with the provisions of the commercial code. It is the responsibility of the System Operator to determine the critical hours in future, for now analysis is run by the Market Operator based on the data obtained from System Operator and MSP. Following **Table 2** contains the top 50 critical hours determined as the result of calculations.

Table 2: Critical Hours

Critical Hours			
Sr No.	Month	Day	Hours
1	6	9	15
2	6	9	16
3	6	9	17
4	6	11	15
5	6	11	16
6	6	11	17
7	6	13	17
8	6	14	14
9	6	14	15
10	6	14	16
11	6	14	17
12	6	14	18

Critical Hours			
Sr No.	Month	Day	Hours
26	6	29	17
27	6	29	18
28	6	30	13
29	6	30	14
30	6	30	15
31	6	30	16
32	6	30	17
33	7	2	16
34	7	2	17
35	7	2	18
36	7	3	15
37	7	3	16

Critical Hours			
Sr No.	Month	Day	Hours
13	6	15	14
14	6	15	15
15	6	15	16
16	6	15	17
17	6	15	18
18	6	28	14
19	6	28	15
20	6	28	16
21	6	28	17
22	6	28	18
23	6	29	13
24	6	29	15
25	6	29	16

Critical Hours			
Sr No.	Month	Day	Hours
38	7	3	17
39	7	4	13
40	7	4	14
41	7	4	15
42	7	4	16
43	7	4	17
44	7	5	13
45	7	5	14
46	7	5	16
47	7	5	17
48	7	5	18
49	7	19	16
50	7	19	17

Step 2: Capacity Provided by Generators:

According to the provisions of the commercial code, the Capacity provided by each Generation Unit (expressed in MW-year) shall be equal to the average Capacity provided by such Generator to the Grid System during the Critical Hours.

As per provisions of the Commercial Code, the Capacity provided by different type of Generation Units have been calculated as following:

i. For AREs without storage generation units, the energy injected, and energy curtailed upon the instructions of System Operator or the distribution network operator in each critical hour is calculated, and it's averaged over the 50 critical hours.

ii. For Small Power Producers (SPPS), metering data is utilized to calculate the Capacity provided as the average of energy injected during the critical hours. As the SPPS don't report the actual availability to the System Operator, therefore, the only information available is their actual metering data.

iii. For Thermal power plants, hourly availability data of generators is used to calculate the Capacity provided as the average availability provided by such generators in the critical hours.

iv. Similar process is adopted for the Hydro with storage but due to unavailability of availability data on hourly basis, average of their ADC (Annual Dependable Capacity) is taken in the critical hours.

v. For Imports, Energy injected into the Transmission or Distribution Network during the critical hours has been considered.

Determination of Capacity Provided by Generators:

It is the responsibility of the System Operator to perform the calculations and provide each generator's provided capacity in the critical hours, however for this analysis, calculations are performed by Market Operator on the basis of the data provided by the System Operator and MSP. Following **Table 3** represents the cumulative capacity provided by each generator during the critical hours which will be used for executing BMC.

Table 3: Capacity Provided

#.	Generator Name	Cumulative Capacity
1	ACT Wind (Pvt) Limited	16,394
2	ACT2 DIN Wind (Pvt) Ltd.	33,525
3	Agar Textile	-
4	AJ Power (Private) Ltd.	4,222
5	Almoiz Industries Limited	22,468
6	Altern Energy Ltd.	-
7	Appolo Solar Development Pakistan	38,329
8	Artistic Energy (Pvt.) Limited	32,069
9	Artistic Wind Power (Pvt) Ltd.	32,495
10	Atlas Power Limited	67,626
11	Attock Gen Limited	51,840
12	Balloki Project (NPPMCP)	1,010,530
13	Best Green Energy Pakistan Limited	38,256
14	CCPP Nandipur (Genco-3)	510,000

#.	Generator Name	Cumulative Capacity
71	JDW-II (Sadiqabad) Sugar Mills Ltd	23,040
72	JDW-III (Ghotki) Sugar Mills Ltd	24,000
73	Jhimpir Power (Private) Limited	33,068
74	K2 Nuclear Power Plant (KANNUP-2)	412,200
75	K3 Nuclear Power Plant (KANNUP-3)	366,300
76	Karot Hydro Power 720MW	540,096
77	Kohinoor Energy Ltd.	41,384
78	Kot Addu Power Company Ltd.	401,559
79	Lakeside Energy Limited	31,137
80	Lalpir Power (Private) Limited	336,000
81	Laraib Energy Limited	39,677
82	Liberty Power Tech Limited	61,980
83	Liberty Wind Power-I Ltd.	30,689
84	Liberty Wind Power-II (Pvt.) Ltd.	31,500

#.	Generator Name	Cumulative Capacity
15	Chanar Energy Limited	-
16	Chashma Nuclear Power Plant-I	309,000
17	Chashma Nuclear Power Plant-II	306,000
18	Chashma Nuclear Power Plant-III	329,560
19	Chashma Nuclear Power Plant-IV	306,000
20	China Power Hub Gen Company	1,214,243
21	China Power Hub Generation company	-
22	Chiniot Power Limited	38,440
23	Crest Energy Pakistan Limited	38,477
24	Daral Khwar HPP	24,058
25	DIN Energy Ltd.	30,730
26	Engro Power Gen Thar Limited	602,600
27	Engro Powergen Qadirpur Limited	217,474
28	Engro Powergen Thar (Pvt) Limited	-
29	Fatima Energy Limited	120,000
30	Fauji Kabirwala Power Company Ltd.	82,189
31	FFC Energy Limited	25,324
32	Foundation Power Company Daharki Ltd.	60,300
33	Foundation Wind Energy-I Limited	19,388
34	Foundation Wind Energy-II (Pvt.) Limited	20,904
35	GENCO I - Jamshoro Power Company	51,840

#.	Generator Name	Cumulative Capacity
85	Lucky Cement Limited	10,703
86	Lucky Coal	228,000
87	Master Green Energy Limited	30,257
88	Master Wind Energy Limited	29,495
89	Metro Power Company Ltd	26,217
90	Metro Wind Power Limited	39,396
91	Mira Power Limited	25,475
92	Narowal Energy Limited	58,063
93	NASDA Green Energy Limited	31,647
94	Neelum Jhelum Hydropower	806,784
95	NGPS Multan	-
96	Nishat Chunian Power Limited	62,608
97	Nishat Power Limited	63,708
98	Orient Power Company (Private)	190,146
99	Pak Gen Power Limited	329,000
100	Pakhtunkhwa Energy Development	61,319
101	Port Qasim Electric Power Company	667,299
102	Punjab Thermal Power Pvt. Limited	-
103	Quaid E Azam Solar Power Pvt Ltd	37,204
104	Quaid-e-Azam Thermal Power (Pvt)	1,142,960
105	Rousch Pak Power Ltd.	371,299

#.	Generator Name	Cumulative Capacity
36	GTPS Faisalabad	8,640
37	Gul Ahmed Electric Limited	31,472
38	Gul Ahmed Wind Power Ltd	26,878
39	Habibullah Coastal Power Co. (Pvt.) Ltd.	-
40	Halmore Power Generation Company	176,230
41	Hamza Sugar Mills Limited	9,600
42	Harappa Solar (Pvt) Limited	8,944
43	Haveli Bahadur Shah (NPPMCP)	1,109,303
44	Hawa Energy (Private) Limited	32,472
45	Head Marala, Hydro Power Station	3,007
46	Head Trimu Punjab Thermal Power	186,220
47	HPS (Allai+Dubair+Khan	180,151
48	HPS Jagraan Hydropower AJK	18,784
49	HPS Kumhariwala , PAKPATTAN	550
50	HPS WAPDA Chashma	107,160
51	HPS WAPDA Chicho ki Malian	2,919
52	HPS WAPDA Chitral	281
53	HPS WAPDA Dargai	1,945
54	HPS WAPDA Ghazi Barotha	1,146,300
55	HPS WAPDA Golen Gol	24,230
56	HPS WAPDA Gomal Zam	6,374

#.	Generator Name	Cumulative Capacity
106	RYK Mills Limited	28,000
107	Saba Power Company (Pvt.) Ltd.	123,058
108	Sachal Energy Development	24,124
109	Saif Power Limited	203,227
110	Sapphire Electric Company Limited	192,440
111	Sapphire Wind Power Company Limited	28,408
112	Star Hydro Power Limited	126,436
113	Tavanir	61,567
114	Tenaga Generasi Limited	21,820
115	Thal Industries Corporation Ltd	-
116	Thar Energy Limited	-
117	Thatta Power (Pvt.) Limited	15,120
118	The Hub Power Company Limited	1,200,000
119	Three Gorges First Wind Farm Pakistan	25,604
120	Three Gorges Second Wind Farm Pakistan	28,391
121	Three Gorges Third Wind Farm Pakistan	27,825
122	TNB Liberty Power Ltd.	211,739
123	TPS Guddu (Genco-2)	623,200
124	TPS Guddu-747 (Genco-2)	542,016
125	TPS Jamshoro (Genco-1)	264,003
126	TPS Kotri	140

#.	Generator Name	Cumulative Capacity
57	HPS WAPDA Jabban	20,237
58	HPS WAPDA Jinnah	34,487
59	HPS WAPDA Kurram Garhi	164
60	HPS WAPDA Mangla	1,000,000
61	HPS WAPDA Nandipur	4,219
62	HPS WAPDA Rasul	8,445
63	HPS WAPDA Renala	353
64	HPS WAPDA Shadiwal	4,017
65	HPS WAPDA Tarbela	4,888,000
66	HPS WAPDA Warsak	163,340
67	Huaneng Shandong Ruyi Energy (Pvt) Ltd	1,032,120
68	Hydrochina Dawood Power (Private) Limited	23,409
69	Indus Wind Energy Ltd.	33,251
70	JDW Mills Limited (Unit-II) Rahim Yar	23,900

#.	Generator Name	Cumulative Capacity
127	TPS Muzaffargarh (Genco-3)	266,400
128	TPS Quetta	-
129	Tricom Wind Power (Private) Limited	34,128
130	Tricon Boston Consulting	33,204
131	Tricon Boston Consulting	33,087
132	Tricon Boston Consulting	32,378
133	Uch Power Ltd.	457,053
134	Uch-II Power (Pvt.) Limited	115,380
135	UEP Wind Power (Pvt)Ltd	51,264
136	Yunus Energy Limited	26,856
137	Zephyr Power (Pvt.) Limited	25,525
138	Zhenfa Pakistan New Energy Company	57,106
139	Zorlu Energy Pakistan Limited	27,122

Step 3: Capacity Credited to Market Participants

According to the provisions of the commercial code, Market Participants information regarding the contracts in the contract register will be used to determine the credited capacity of market participants. If we analyse the current situation, all generators are in contract with the DISCOs through the Legacy Contract mechanism and no competitive supplier or BPC is present. To get the DISCOs and KE contracted capacity amount, allocation factors given in the **Table 8** of the commercial code are utilized. The following **Table 4** shows the allocation factors of each DISCO and KE.

Table 4: Allocation Factors

Supplier	Allocation Factor
LESCO	21.10%
GEPCO	9.82%
FESCO	13.09%
IESCO	10.15%
MEPCO	17.06%
PESCO	12.89%
HESCO	4.79%
QESCO	5.62%
TESCO	1.74%
SEPCO	3.73%
K-Electric	As per Bilateral Contract

It can be seen from the **Table 4** above that the DISCOs are given a percentage allocation and the KE is given a fixed quantum. This means that KE will get the share as per this quantum and the remaining capacity will be shared among the EX-WAPDA DISCOs as per the percentages given in the above **Table 4**. For this report, a value of 2050, as agreed in the draft power purchase agency agreement between CPPA (SPA) and KE has been considered. This 2050 MW has been allocated to each generation unit on pro-rata basis, based on the Capacity provided values of all generators.

Determination of Capacity Credited

After subtracting the KE's share from each generator as explained above, the remaining capacity provided by generators is the actual capacity which is contracted with EX-WAPDA DISCOs. This capacity is then allocated among the EX-WAPDA DISCOs according to the allocation factors as given in **Table 4** above. PESCO and TESCO have been considered jointly because their demand is not separately available at the CDP points.

The following **Table 5** depicts the capacity credited to each market participant which is the average of credited capacity during critical hours

Table 5: Capacity Credited

#	Generator Name	PESCO & TESCO	IESCO	LESCO	FESCO	GEPCO	MEPCO	SEPCO	HESCO	QESCO	K-Electric
1	ACT Wind (Pvt) Limited	2,219	1,540	3,201	1,986	1,490	2,588	566	727	853	1,224
2	ACT2 DIN Wind (Pvt) Ltd.	4,539	3,149	6,546	4,061	3,046	5,292	1,157	1,486	1,743	2,503
3	Agar Textile	0	0	0	0	0	0	0	0	0	0
4	AJ Power (Private) Ltd.	572	397	824	511	384	666	146	187	220	315
5	Almoiz Industries Limited	3,042	2,110	4,387	2,722	2,042	3,547	775	996	1,168	1,677
6	Altern Energy Ltd.	0	0	0	0	0	0	0	0	0	0
7	Appolo Solar Development Pakistan Limited	5,189	3,600	7,484	4,643	3,483	6,051	1,323	1,699	1,993	2,861

#	Generator Name	PESCO & TESCO	IESCO	LESCO	FESCO	GEPCO	MEPCO	SEPCO	HESCO	QESCO	K-Electric
8	Artistic Energy (Pvt.) Limited	4,341	3,012	6,261	3,884	2,914	5,063	1,107	1,421	1,668	2,394
9	Artistic Wind Power (Pvt) Ltd.	4,399	3,052	6,345	3,936	2,953	5,130	1,122	1,440	1,690	2,426
10	Atlas Power Limited	9,155	6,352	13,204	8,191	6,145	10,676	2,334	2,997	3,517	5,048
11	Attock Gen Limited	7,018	4,869	10,122	6,279	4,711	8,184	1,789	2,298	2,696	3,870
12	Balloki Project (NPPMCP)	136,805	94,912	197,305	122,404	91,827	159,528	34,879	44,791	52,552	75,433
13	Best Green Energy Pakistan Limited	5,179	3,593	7,469	4,634	3,476	6,039	1,320	1,696	1,989	2,856
14	CCPP Nandipur (Genco-3)	69,043	47,901	99,577	61,776	46,344	80,511	17,603	22,605	26,522	38,070
15	Chanar Energy Limited	0	0	0	0	0	0	0	0	0	0

#	Generator Name	PESCO & TESCO	IESCO	LESCO	FESCO	GEPCO	MEPCO	SEPCO	HESCO	QESCO	K-Elect
16	Chashma Nuclear Power Plant-I	41,832	29,022	60,332	37,429	28,079	48,780	10,665	13,696	16,069	23,066
17	Chashma Nuclear Power Plant-II	41,426	28,741	59,746	37,065	27,806	48,307	10,562	13,563	15,913	22,842
18	Chashma Nuclear Power Plant-III	44,616	30,953	64,346	39,919	29,947	52,026	11,375	14,608	17,139	24,601
19	Chashma Nuclear Power Plant-IV	41,426	28,741	59,746	37,065	27,806	48,307	10,562	13,563	15,913	22,842
20	China Power Hub Gen Company	164,383	114,046	237,080	147,080	110,338	191,687	41,910	53,821	63,147	90,640
21	China Power Hub Generation company (Pvt.) Ltd	0	0	0	0	0	0	0	0	0	0
22	Chiniot Power Limited	5,204	3,610	7,505	4,656	3,493	6,068	1,327	1,704	1,999	2,869
23	Crest Energy Pakistan Limited	5,209	3,614	7,513	4,661	3,496	6,074	1,328	1,705	2,001	2,872

#	Generator Name	PESCO & TESCO	IESCO	LESCO	FESCO	GEPCO	MEPCO	SEPCO	HESCO	QESCO	K-Electric
24	Daral Khwan HPP	3,257	2,260	4,697	2,914	2,186	3,798	830	1,066	1,251	1,796
25	DIN Energy Ltd.	4,160	2,886	6,000	3,722	2,792	4,851	1,061	1,362	1,598	2,294
26	Engro Power Gen Thar Limited	81,579	56,598	117,657	72,992	54,758	95,130	20,799	26,710	31,338	44,982
27	Engro Powergen Qadirpur Limited	29,441	20,426	42,462	26,342	19,762	34,332	7,506	9,639	11,310	16,234
28	Engro Powergen Thar (Pvt) Limited	0	0	0	0	0	0	0	0	0	0
29	Fatima Energy Limited	16,245	11,271	23,430	14,535	10,904	18,944	4,142	5,319	6,241	8,958
30	Fauji Kabirwala Power Company Ltd.	11,127	7,719	16,047	9,955	7,469	12,975	2,837	3,643	4,274	6,135
31	FFC Energy Limited	3,428	2,379	4,944	3,067	2,301	3,998	874	1,122	1,317	1,890

#	Generator Name	PESCO & TESCO	IESCO	LESCO	FESCO	GEPCO	MEPCO	SEPCO	HESCO	QESCO	K-Electric
32	Foundation Power Company Daharki Ltd.	8,163	5,664	11,774	7,304	5,479	9,519	2,081	2,673	3,136	4,501
33	Foundation Wind Energy-I Limited	2,625	1,821	3,785	2,348	1,762	3,061	669	859	1,008	1,447
34	Foundation Wind Energy-II (Pvt.) Limited	2,830	1,963	4,082	2,532	1,900	3,300	722	927	1,087	1,560
35	GENCO I - Jamshoro Power Company Limited (JPCL)	7,018	4,869	10,122	6,279	4,711	8,184	1,789	2,298	2,696	3,870
36	GTPS Faisalabad	1,170	811	1,687	1,047	785	1,364	298	383	449	645
37	Gul Ahmed Electric Limited	4,261	2,956	6,145	3,812	2,860	4,968	1,086	1,395	1,637	2,349
38	Gul Ahmed Wind Power Ltd	3,639	2,524	5,248	3,256	2,442	4,243	928	1,191	1,398	2,006
39	Habibullah Coastal Power Co. (Pvt.) Ltd.	0	0	0	0	0	0	0	0	0	0

#	Generator Name	PESCO & TESCO	IESCO	LESCO	FESCO	GEPCO	MEPCO	SEPCO	HESCO	QESCO	K-Electric
40	Halmore Power Generation Company Limited	23,858	16,552	34,409	21,347	16,014	27,821	6,083	7,811	9,165	13,155
41	Hamza Sugar Mills Limited	1,300	902	1,874	1,163	872	1,516	331	426	499	717
42	Harappa Solar (Pvt) Limited	1,211	840	1,746	1,083	813	1,412	309	396	465	668
43	Haveli Bahadur Shah (NPPMCP)	150,176	104,189	216,591	134,368	100,802	175,120	38,288	49,169	57,689	82,806
44	Hawa Energy (Private) Limited	4,396	3,050	6,340	3,933	2,951	5,126	1,121	1,439	1,689	2,424
45	Head Marala, Hydro Power Station	407	282	587	364	273	475	104	133	156	224
46	Head Trimu Punjab Thermal Power	25,210	17,490	36,359	22,557	16,922	29,398	6,428	8,254	9,684	13,901
47	HPS (Allai+Dubair+Khan Khawar) + Ranolia	24,389	16,920	35,174	21,822	16,370	28,440	6,218	7,985	9,369	13,448

#	Generator Name	PESCO & TESCO	IESCO	LESCO	FESCO	GEPCO	MEPCO	SEPCO	HESCO	QESCO	K-Electric
48	HPS Jagraan Hydropower AJK	2,543	1,764	3,668	2,275	1,707	2,965	648	833	977	1,402
49	HPS Kumhariwala , PAKPATTAN	74	52	107	67	50	87	19	24	29	41
50	HPS WAPDA Chashma	14,507	10,065	20,923	12,980	9,738	16,917	3,699	4,750	5,573	7,999
51	HPS WAPDA Chicho ki Malian	395	274	570	354	265	461	101	129	152	218
52	HPS WAPDA Chitral	38	26	55	34	26	44	10	12	15	21
53	HPS WAPDA Dargai	263	183	380	236	177	307	67	86	101	145
54	HPS WAPDA Ghazi Barotha	155,185	107,664	223,814	138,850	104,164	180,961	39,565	50,809	59,613	85,568
55	HPS WAPDA Golen Gol	3,280	2,276	4,731	2,935	2,202	3,825	836	1,074	1,260	1,809

#	Generator Name	PESCO & TESCO	IESCO	LESCO	FESCO	GEPCO	MEPCO	SEPCO	HESCO	QESCO	K-Electric
56	HPS WAPDA Gomal Zam	863	599	1,245	772	579	1,006	220	283	331	476
57	HPS WAPDA Jabban	2,740	1,901	3,951	2,451	1,839	3,195	699	897	1,052	1,511
58	HPS WAPDA Jinnah	4,669	3,239	6,734	4,177	3,134	5,444	1,190	1,529	1,793	2,574
59	HPS WAPDA Kurram Garhi	22	15	32	20	15	26	6	7	9	12
60	HPS WAPDA Mangla	135,379	93,923	195,249	121,129	90,870	157,865	34,516	44,324	52,005	74,647
61	HPS WAPDA Nandipur	571	396	824	511	383	666	146	187	219	315
62	HPS WAPDA Rasul	1,143	793	1,649	1,023	767	1,333	291	374	439	630
63	HPS WAPDA Renala	48	33	69	43	32	56	12	16	18	26

#	Generator Name	PESCO & TESCO	IESCO	LESCO	FESCO	GEPCO	MEPCO	SEPCO	HESCO	QESCO	K-Electric
64	HPS WAPDA Shadiwal	544	377	784	487	365	634	139	178	209	300
65	HPS WAPDA Tarbela	661,733	459,097	954,379	592,077	444,171	771,645	168,713	216,658	254,200	364,876
66	HPS WAPDA Warsak	22,113	15,341	31,892	19,785	14,843	25,786	5,638	7,240	8,494	12,193
67	Huaneng Shandong Ruyi Energy (Pvt) Ltd	139,728	96,940	201,521	125,019	93,788	162,936	35,624	45,748	53,675	77,045
68	Hydrochina Dawood Power (Private) Limited	3,169	2,199	4,571	2,835	2,127	3,695	808	1,038	1,217	1,747
69	Indus Wind Energy Ltd.	4,501	3,123	6,492	4,028	3,022	5,249	1,148	1,474	1,729	2,482
70	JDW Mills Limited (Unit-II) Rahim Yar Khan	3,236	2,245	4,666	2,895	2,172	3,773	825	1,059	1,243	1,784
71	JDW-II (Sadiqabad) Sugar Mills Ltd	3,119	2,164	4,499	2,791	2,094	3,637	795	1,021	1,198	1,720

#	Generator Name	PESCO & TESCO	IESCO	LESCO	FESCO	GEPCO	MEPCO	SEPCO	HESCO	QESCO	K-Electric
72	JDW-III (Ghotki) Sugar Mills Ltd	3,249	2,254	4,686	2,907	2,181	3,789	828	1,064	1,248	1,792
73	Jhimpir Power (Private) Limited	4,477	3,106	6,456	4,005	3,005	5,220	1,141	1,466	1,720	2,468
74	K2 Nuclear Power Plant (KANNUP-2)	55,803	38,715	80,482	49,929	37,456	65,072	14,227	18,271	21,436	30,770
75	K3 Nuclear Power Plant (KANNUP-3)	49,589	34,404	71,520	44,369	33,286	57,826	12,643	16,236	19,049	27,343
76	Karot Hydro Power 720MW	73,118	50,728	105,453	65,421	49,078	85,262	18,642	23,939	28,088	40,317
77	Kohinoor Energy Ltd.	5,603	3,887	8,080	5,013	3,761	6,533	1,428	1,834	2,152	3,089
78	Kot Addu Power Company Ltd.	54,363	37,716	78,404	48,640	36,489	63,392	13,860	17,799	20,883	29,975
79	Lakeside Energy Limited	4,215	2,925	6,080	3,772	2,829	4,915	1,075	1,380	1,619	2,324

#	Generator Name	PESCO & TESCO	IESCO	LESCO	FESCO	GEPCO	MEPCO	SEPCO	HESCO	QESCO	K-Electr
80	Lalpir Power (Private) Limited	45,487	31,558	65,604	40,699	30,532	53,043	11,597	14,893	17,474	25,081
81	Laraib Energy Limited	5,371	3,727	7,747	4,806	3,605	6,264	1,369	1,759	2,063	2,962
82	Liberty Power Tech Limited	8,391	5,821	12,102	7,508	5,632	9,784	2,139	2,747	3,223	4,627
83	Liberty Wind Power-I Ltd.	4,155	2,882	5,992	3,717	2,789	4,845	1,059	1,360	1,596	2,291
84	Liberty Wind Power-II (Pvt.) Ltd.	4,264	2,959	6,150	3,816	2,862	4,973	1,087	1,396	1,638	2,351
85	Lucky Cement Limited	1,449	1,005	2,090	1,296	973	1,690	369	474	557	799
86	Lucky Coal	30,866	21,415	44,517	27,617	20,718	35,993	7,870	10,106	11,857	17,020
87	Master Green Energy Limited	4,096	2,842	5,908	3,665	2,749	4,776	1,044	1,341	1,573	2,259

#	Generator Name	PESCO & TESCO	IESCO	LESCO	FESCO	GEPCO	MEPCO	SEPCO	HESCO	QESCO	K-Electric
88	Master Wind Energy Limited	3,993	2,770	5,759	3,573	2,680	4,656	1,018	1,307	1,534	2,202
89	Metro Power Company Ltd	3,549	2,462	5,119	3,176	2,382	4,139	905	1,162	1,363	1,957
90	Metro Wind Power Limited	5,333	3,700	7,692	4,772	3,580	6,219	1,360	1,746	2,049	2,941
91	Mira Power Limited	3,449	2,393	4,974	3,086	2,315	4,022	879	1,129	1,325	1,902
92	Narowal Energy Limited	7,861	5,453	11,337	7,033	5,276	9,166	2,004	2,574	3,020	4,334
93	NASDA Green Energy Limited	4,284	2,972	6,179	3,833	2,876	4,996	1,092	1,403	1,646	2,362
94	Neelum Jhelum Hydropower Company (Pvt.) Ltd.	109,222	75,776	157,524	97,725	73,312	127,363	27,847	35,760	41,957	60,224
95	NGPS Multan	0	0	0	0	0	0	0	0	0	0

#	Generator Name	PESCO & TESCO	IESCO	LESCO	FESCO	GEPCO	MEPCO	SEPCO	HESCO	QESCO	K-Elect
96	Nishat Chunian Power Limited	8,476	5,880	12,224	7,584	5,689	9,884	2,161	2,775	3,256	4,674
97	Nishat Power Limited	8,625	5,984	12,439	7,717	5,789	10,057	2,199	2,824	3,313	4,756
98	Orient Power Company (Private) Limited	25,742	17,859	37,126	23,032	17,278	30,017	6,563	8,428	9,889	14,194
99	Pak Gen Power Limited	44,540	30,901	64,237	39,851	29,896	51,938	11,356	14,583	17,110	24,559
100	Pakhtunkhwa Energy Development Organization (Malakand-III)	8,301	5,759	11,973	7,428	5,572	9,680	2,116	2,718	3,189	4,577
101	Port Qasim Electric Power Company (Pvt.) Limited	90,338	62,675	130,290	80,829	60,637	105,343	23,032	29,578	34,703	49,812
102	Punjab Thermal Power Pvt. Limited	0	0	0	0	0	0	0	0	0	0
103	Quaid E Azam Solar Power Pvt Ltd	5,037	3,494	7,264	4,506	3,381	5,873	1,284	1,649	1,935	2,777

#	Generator Name	PESCO & TESCO	IESCO	LESCO	FESCO	GEPCO	MEPCO	SEPCO	HESCO	QESCO	K-Electric
104	Quaid-e-Azam Thermal Power (Pvt) Limited	154,733	107,351	223,162	138,445	103,860	180,434	39,450	50,661	59,439	85,319
105	Rousch Pak Power Ltd.	50,266	34,874	72,496	44,975	33,740	58,615	12,816	16,458	19,309	27,716
106	RYK Mills Limited	3,791	2,630	5,467	3,392	2,544	4,420	966	1,241	1,456	2,090
107	Saba Power Company (Pvt.) Ltd.	16,659	11,558	24,027	14,906	11,182	19,427	4,247	5,454	6,400	9,186
108	Sachal Energy Development (Private) Limited	3,266	2,266	4,710	2,922	2,192	3,808	833	1,069	1,255	1,801
109	Saif Power Limited	27,513	19,088	39,680	24,617	18,467	32,082	7,015	9,008	10,569	15,170
110	Sapphire Electric Company Limited	26,052	18,075	37,574	23,310	17,487	30,380	6,642	8,530	10,008	14,365
111	Sapphire Wind Power Company Limited	3,846	2,668	5,547	3,441	2,581	4,485	981	1,259	1,477	2,121

#	Generator Name	PESCO & TESCO	IESCO	LESCO	FESCO	GEPCO	MEPCO	SEPCO	HESCO	QESCO	K-Electric
112	Star Hydro Power Limited	17,117	11,875	24,687	15,315	11,489	19,960	4,364	5,604	6,575	9,438
113	Tavanir	8,335	5,783	12,021	7,458	5,595	9,719	2,125	2,729	3,202	4,596
114	Tenaga Generasi Limited	2,954	2,049	4,260	2,643	1,983	3,445	753	967	1,135	1,629
115	Thal Industries Corporation Ltd	0	0	0	0	0	0	0	0	0	0
116	Thar Energy Limited	0	0	0	0	0	0	0	0	0	0
117	Thatta Power (Pvt.) Limited	2,047	1,420	2,952	1,831	1,374	2,387	522	670	786	1,129
118	The Hub Power Company Limited	162,455	112,708	234,299	145,354	109,044	189,438	41,419	53,189	62,406	89,577
119	Three Gorges First Wind Farm Pakistan (Private) Limited	3,466	2,405	4,999	3,101	2,327	4,042	884	1,135	1,332	1,911

#	Generator Name	PESCO & TESCO	IESCO	LESCO	FESCO	GEPCO	MEPCO	SEPCO	HESCO	QESCO	K-Electric
120	Three Gorges Second Wind Farm Pakistan Limited	3,844	2,667	5,543	3,439	2,580	4,482	980	1,258	1,476	2,119
121	Three Gorges Third Wind Farm Pakistan (Private) Limited	3,767	2,613	5,433	3,370	2,528	4,393	960	1,233	1,447	2,077
122	TNB Liberty Power Ltd.	28,665	19,887	41,342	25,648	19,241	33,426	7,308	9,385	11,011	15,806
123	TPS Guddu (Genco-2)	84,368	58,533	121,679	75,487	56,630	98,382	21,510	27,623	32,409	46,520
124	TPS Guddu-747 (Genco-2)	73,378	50,908	105,828	65,654	49,253	85,565	18,708	24,025	28,187	40,460
125	TPS Jamshoro (Genco-1)	35,740	24,796	51,546	31,978	23,990	41,677	9,112	11,702	13,729	19,707
126	TPS Kotri	19	13	27	17	13	22	5	6	7	10
127	TPS Muzaffargarh (Genco-3)	36,065	25,021	52,014	32,269	24,208	42,055	9,195	11,808	13,854	19,886

#	Generator Name	PESCO & TESCO	IESCO	LESCO	FESCO	GEPCO	MEPCO	SEPCO	HESCO	QESCO	K-Electric
128	TPS Quetta	0	0	0	0	0	0	0	0	0	0
129	Tricom Wind Power (Private) Limited	4,620	3,205	6,664	4,134	3,101	5,388	1,178	1,513	1,775	2,548
130	Tricon Boston Consulting Corporation (Pvt.) Limited, Project-A	4,495	3,119	6,483	4,022	3,017	5,242	1,146	1,472	1,727	2,479
131	Tricon Boston Consulting Corporation (Pvt.) Limited, Project-B	4,479	3,108	6,460	4,008	3,007	5,223	1,142	1,467	1,721	2,470
132	Tricon Boston Consulting Corporation (Pvt.) Limited, Project-C	4,383	3,041	6,322	3,922	2,942	5,111	1,118	1,435	1,684	2,417
133	Uch Power Ltd.	61,875	42,928	89,239	55,362	41,532	72,153	15,775	20,259	23,769	34,118
134	Uch-II Power (Pvt.) Limited	15,620	10,837	22,528	13,976	10,485	18,214	3,982	5,114	6,000	8,613
135	UEP Wind Power (Pvt)Ltd	6,940	4,815	10,009	6,210	4,658	8,093	1,769	2,272	2,666	3,827

#	Generator Name	PESCO & TESCO	IESCO	LESCO	FESCO	GEPCO	MEPCO	SEPCO	HESCO	QESCO	K-Electric
136	Yunus Energy Limited	3,636	2,522	5,244	3,253	2,440	4,240	927	1,190	1,397	2,005
137	Zephyr Power (Pvt.) Limited	3,456	2,397	4,984	3,092	2,319	4,030	881	1,131	1,327	1,905
138	Zhenfa Pakistan New Energy Company (Pvt.) Ltd	7,731	5,364	11,150	6,917	5,189	9,015	1,971	2,531	2,970	4,263
139	Zorlu Enerji Pakistan Limited	3,672	2,547	5,296	3,285	2,465	4,282	936	1,202	1,410	2,025
	Total (kW)	3,717,851	2,579,370	5,362,041	3,326,498	2,495,509	4,335,375	947,887	1,217,259	1,428,183	2,050,000
	Total (MW)	3,718	2,579	5,362	3,326	2,496	4,335	948	1,217	1,428	2,050

Step 4: Capacity Requirements of Market Participants:

According to the provisions of the commercial code, the capacity requirement of SOLR is equal to the average energy supplied by SOLR during the critical hours multiplied by a reserve margin. The energy supplied is calculated through the following formula:

$$ACR_{k,y}[MW] = \frac{\sum_{h \in CH}\left(\sum_{\forall i \in TP} Act\_E_{TP_{i,h}} + \sum_{\forall j \in MP} E_{MP_{j,h}}\right)}{50\ hours} x\,(1 + RM)$$

where,

$ACR_{k,y}$ is the Capacity Requirement of the Supplier of Last Resort "*k*", for the Fiscal Year "*y*", in MW;

$Act\_E_{TP_{i,h}}$ *is* the total Energy injected/withdrawn at the Trading Point "*i*", belonging to the Supplier of Last Resort "*k*", in hour "*h*"

$E_{MP_{j,h}}$ is the Energy injected/withdrawn at the Metering Point "*j*", which is not a Trading Point, belonging to the Supplier of Last Resort "*k*", in hour "*h*"

$\sum_{\forall i \in TP}$ means the sum over all Trading Points belonging to the Supplier of Last Resort "k";

$\sum_{\forall j \in MP}$ means the sum over all Metering Points which are not Trading Points, belonging to the Supplier of Last Resort "*k*";

$S_{h \in CH}$ means the 50 hours which have been defined as Critical Hours, for the Fiscal Year "*y*";

RM Reserve Margin as per commercial code

Determination of Capacity Requirements of market participants:

For the implementation of the above formula, the following values were utilized:

i. For $Act\_E_{TP_{i,h}}$, the average energy withdrawal during the critical hours at the trading points of DISCOs and KE as conveyed by MSP was considered. This value was g f grossed up with the Distribution losses as provided in the commercial code.

ii. For $E_{MP_{j,h}}$, a value of zero was considered as curretly, no such metering points in the boundaries of the Suppliers or Last Resort exists which are not the trading points.

iii. For Reserve Margin, a value of RM 10% was taken in accordance with the provisions of the commercial code.

Based on the data as explained above, the Capacity Requirement of each Market Participant were calculated, and the results are given in **Table 6** below.

Table 6: Capacity Requirement

Month	Day	Hours	LESCO	IESCO	FESCO	GEPCO	HESCO	SEPCO	MEPCO	QESCO	K-Electric	PESCO & TESCO
6	9	15	4,782,167	2,247,787	2,920,977	2,097,190	720,688	648,157	3,517,184	785,038	941,000	2,409,197
6	9	16	4,877,591	2,175,320	2,852,558	2,096,129	731,203	658,787	3,437,422	784,776	940,000	2,408,043
6	9	17	4,933,928	2,067,680	2,711,699	2,070,323	744,019	637,366	3,276,388	739,140	1,001,000	2,052,933
6	11	15	4,724,733	2,043,824	2,725,539	1,987,553	734,108	710,526	3,395,961	884,903	938,000	2,254,960
6	11	16	4,881,813	1,975,017	2,663,362	2,004,712	725,543	759,666	3,349,953	817,713	988,000	2,317,378
6	11	17	4,939,430	2,001,950	2,649,042	2,069,969	734,241	783,438	3,312,591	754,340	977,000	2,246,315
6	13	17	4,930,845	2,027,855	2,720,810	1,864,185	735,438	775,777	3,021,184	724,081	1,004,000	2,296,197
6	14	14	4,465,076	2,065,564	2,600,913	1,844,214	784,794	731,432	3,056,088	824,871	1,059,000	2,152,478
6	14	15	4,598,428	2,050,634	2,554,078	1,852,771	856,085	711,691	3,024,972	847,319	1,043,000	2,171,617
6	14	16	4,764,978	2,123,932	2,300,215	2,085,033	779,573	686,858	3,028,616	781,772	1,085,000	2,215,101
6	14	17	4,819,508	2,067,863	2,627,227	1,933,411	792,079	652,280	3,040,292	751,398	1,099,000	2,283,434
6	14	18	4,678,110	2,060,171	2,660,795	1,892,840	756,306	631,672	3,143,769	679,989	1,039,000	2,347,676
6	15	14	4,656,505	2,107,826	2,625,244	1,978,618	686,085	677,492	3,126,554	887,656	1,025,000	2,288,552
6	15	15	4,721,146	2,187,539	2,754,071	2,059,160	752,532	706,687	2,769,754	855,491	1,011,000	2,323,114
6	15	16	4,782,146	2,227,294	2,498,544	2,061,116	767,967	666,590	2,976,049	735,802	1,031,000	2,453,240
6	15	17	4,969,785	2,105,168	2,425,452	1,956,149	778,033	660,588	2,927,458	759,200	1,049,000	2,334,834
6	15	18	4,792,140	2,166,482	2,557,521	2,026,305	669,026	634,737	2,935,880	680,946	1,066,000	2,502,091
6	28	14	4,668,303	2,133,363	2,610,316	1,910,434	673,344	524,551	2,972,810	875,316	1,090,000	2,379,698
6	28	15	4,804,011	2,095,553	2,485,835	2,051,136	706,326	573,880	2,795,139	746,692	1,138,000	2,579,910
6	28	16	4,791,662	2,049,603	2,439,820	2,040,958	665,981	557,725	3,063,672	779,233	1,117,000	2,577,092
6	28	17	4,771,714	2,024,323	2,492,211	1,897,521	774,689	523,022	3,005,053	741,469	1,169,000	2,516,107

Month	Day	Hours	LESCO	IESCO	FESCO	GEPCO	HESCO	SEPCO	MEPCO	QESCO	K-Electric	PESCO & TESCO
6	28	18	4,641,519	1,868,780	2,537,421	1,941,456	767,887	531,807	3,065,747	699,306	1,165,000	2,612,117
6	29	13	4,793,231	2,134,382	2,628,041	2,140,769	890,721	625,952	3,091,997	849,953	1,081,000	2,698,432
6	29	15	4,760,831	2,215,137	2,929,796	2,068,306	808,456	620,128	3,031,999	836,938	1,048,000	2,779,612
6	29	16	4,955,123	2,222,409	2,723,575	2,047,591	756,007	609,489	3,026,012	826,171	1,057,000	2,693,250
6	29	17	4,949,602	2,184,124	2,840,226	1,986,786	774,021	606,079	2,885,211	852,624	1,058,000	2,434,485
6	29	18	4,850,213	2,275,042	2,498,121	1,997,470	761,354	628,411	2,910,459	722,813	1,104,000	2,682,004
6	30	13	4,621,560	2,111,978	2,848,525	2,035,231	787,057	584,705	3,112,764	908,243	1,111,000	2,765,027
6	30	14	4,609,741	2,234,409	2,843,554	2,074,618	756,138	555,408	3,125,605	830,524	1,088,000	2,755,052
6	30	15	4,597,658	2,202,743	2,889,982	1,975,293	773,190	612,451	3,207,800	829,725	1,137,000	2,814,456
6	30	16	4,687,923	2,317,638	2,955,200	1,910,132	755,381	587,074	3,239,328	831,586	1,141,000	2,670,778
6	30	17	4,562,954	2,166,356	2,816,711	1,880,935	788,421	583,597	3,146,067	802,901	1,073,000	2,666,752
7	2	16	4,462,374	1,896,421	2,794,239	1,775,417	858,399	675,001	2,987,069	882,937	1,119,000	2,481,106
7	2	17	4,553,508	1,870,948	2,803,614	1,824,173	871,815	686,118	3,069,719	839,458	1,067,000	2,397,598
7	2	18	4,506,242	1,859,724	2,661,148	1,857,126	796,117	682,606	3,087,619	704,723	1,066,000	2,423,794
7	3	15	4,172,106	1,931,278	2,967,952	1,808,472	806,181	718,538	3,406,579	938,286	1,030,000	2,681,109
7	3	16	4,233,739	1,988,741	2,857,861	1,835,584	782,131	710,376	3,545,214	830,480	934,000	2,629,567
7	3	17	4,255,798	1,936,649	2,763,210	1,907,847	833,088	708,681	3,518,837	784,542	932,000	2,689,883
7	4	13	4,841,740	1,964,309	2,669,438	2,144,075	794,009	550,474	3,352,007	775,017	1,064,000	2,677,047
7	4	14	4,805,199	1,999,451	2,821,593	2,136,548	779,738	566,346	3,434,884	757,772	1,073,000	2,585,534
7	4	15	4,947,685	2,100,129	2,865,248	2,128,446	863,555	506,172	3,394,953	586,600	1,114,000	2,581,572
7	4	16	4,938,667	2,119,384	2,892,973	2,106,653	881,739	453,903	3,559,588	477,254	934,000	2,767,739
7	4	17	4,915,627	2,025,540	2,920,952	2,122,826	837,590	433,579	3,406,739	370,158	919,000	2,797,307
7	5	13	4,817,388	1,683,214	2,813,083	1,944,040	744,442	598,757	3,428,319	799,723	1,115,000	2,247,008

Month	Day	Hours	LESCO	IESCO	FESCO	GEPCO	HESCO	SEPCO	MEPCO	QESCO	K-Electric	PESCO & TESCO
7	5	14	4,915,117	1,725,618	2,633,260	2,080,038	678,795	609,521	3,429,595	788,355	1,053,000	2,130,740
7	5	16	4,935,463	1,796,267	2,608,588	2,009,326	807,727	612,576	3,425,378	617,190	961,000	2,296,754
7	5	17	4,925,496	1,666,232	2,438,702	2,099,401	804,132	643,100	3,436,092	570,051	1,077,000	2,359,876
7	5	18	4,956,251	1,688,496	2,436,230	2,008,112	746,484	598,273	3,410,604	500,714	1,134,000	2,352,868
7	19	16	4,637,551	2,212,953	2,845,833	2,171,593	683,470	575,324	3,343,792	719,352	1,031,000	2,779,074
7	19	17	4,603,835	2,156,253	2,756,565	2,124,522	776,428	574,279	3,273,625	601,576	1,073,000	2,787,401
Sum (MW)			236808	102559	134938	99923	38533	31362	159530	37972	52569	124350
Capacity Requirement (MW)			**4,736**	**2,051**	**2,699**	**1,998**	**771**	**627**	**3,191**	**759**	**1,051**	**2,487**
Capacity Requirement with Reserve Margin (MW)			**5,210**	**2,256**	**2,969**	**2,198**	**848**	**690**	**3,510**	**835**	**1,157**	**2,736**

Step 5: Capacity Balance

According to the provision of the commercial code, the Capacity Balance of each Market Participant will be determined as the difference between the credited capacity and the capacity requirements taking into account the capacity purchased or sold through bilateral contracts with other market participants.

$$CB_{i,y} = ACC_{i,y} - ACR_{i,y}$$

Where:

CBi_y is the Capacity Balance of Market Participant "i", for the year "y", which will be used for determining its participation in the Balancing Mechanism for Capacity, in MW;

$ACC_{i,y}$ is the Credited Capacity to Market Participant "i", for the year "y", calculated pursuant to Commercial Code Clause 9.2.3.3, in MW;

ACR_{iy} is the Capacity Requirement of the Market Participant "i", for the year "y", calculated pursuant to Commercial Code Clause 9.2.4.2, in MW.

The following **Table 7** depicts the result of each market participant.

Table 7: Capacity Balance

#.	Market Participant ID	Market Participant Name	Capacity Requirement (ACR)	Credited Capacity (ACC)	Capacity Balance (CB)
			MW	MW	MW
1	2	LESCO	5,210	5,362	152
2	3	IESCO	2,256	2,579	323
3	4	FESCO	2,969	3,326	358
4	5	GEPCO	2,198	2,496	297
5	6	HESCO	848	1,217	370
6	7	SEPCO	690	948	258
7	8	MEPCO	3,510	4,335	826
8	9,11	PESCO & TESCO	2,736	3,718	982
9	10	QESCO	835	1,428	593
10	12	K Electric	1,157	2,050	893

Step 6: Unitary Cost of Reference Technology:

For executing BMC for the current year, the methodology developed in the commercial code dictates that the unitary cost of the Capacity shall be taken as 10,500,000 PKR/MW/Year as an interim measure.

Step 7: Capacity Price:

The capacity price will be determined by the intersect of the two curves: A supply curve and a demand curve

The supply curve represents the Capacity "offered" by the Market Participants. It is calculated as the sum of the Capacity Balances of all Market Participants which have a positive Capacity Balance (Capacity surplus).

The demand curve is made using the points A,B,C and D. Point A and B represents the sum of the negative imbalances of the market participants which corresponds to 200% of levelized investment cost of reference technology on y-axis. For point C, the capacity on x-axis is found by using the following formula as per commercial code:

$$EDL_y = \sum_{\forall i \in neg} CB_{i,y} * \frac{1+RE}{1+RM}$$

Where the CB represents total amount of Capacity required by the Market Participants which has a negative value of the Capacity Balance. As no market participant have a negative capacity balance value so the capacity at point C becomes zero. This value corresponds to 100% of levelized investment cost of reference technology on y-axis. Point D is plotted by extending the demand curve with the same slope as that of point C which then corresponds to 80% of levelized cost of reference technology on y-axis. This is represented in the following **Table 8.**

Table 8: Demand Curve

Points	Capacity (MW)	Price (PKR/MW-Year)
A	0	21000000[1]
B	0[2]	21000000
C	0[3]	10500000[4]

[1] 2*LIC

[2] There are no negative capacity imbalances i.e $CB_{i,y} = 0$

[3] As $CB_{i,y} = 0$, therefore, anything multiplied by 0 is zero

[4] LIC

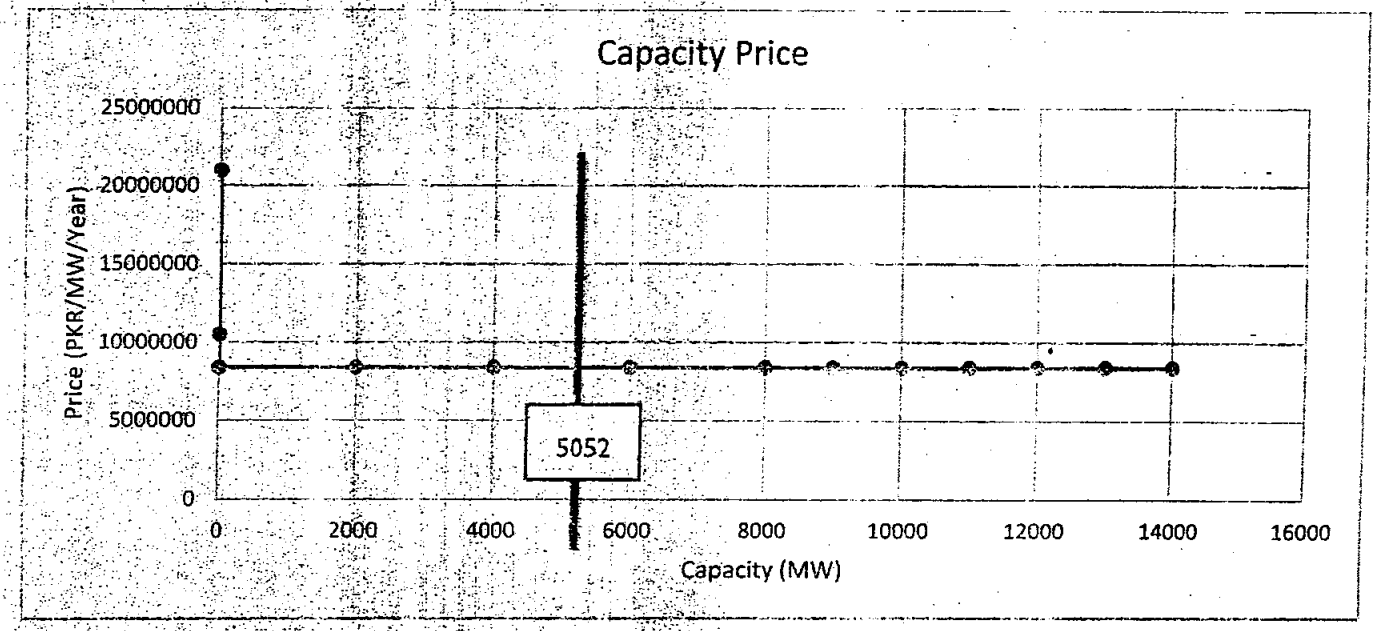
Points	Capacity (MW)	Price (PKR/MW-Year)
D	0[5]	8400000[6]
E	2000	8400000
F	4000	8400000
G	6000	8400000
H	8000	8400000
I	9000	8400000
J	10000	8400000
K	11000	8400000
L	12000	8400000
M	13000	8400000
N	14000	8400000

The above figures are represented in a graphical form as given in **Figure 2** below. The blue line represents the demand curve taking the values as given in **Table 8** above. The brown line represents the supply curve which is a vertical line meaning that this supply is totally in-elastic (as you can't increase supply in the past). The value of 5052 is the sum of positive capacity balances of all market participants as given in **Table 7** above.

[5] As the slope of the line is negative infinity, therefore, this value will remain zero.

[6] 0.8 * LIC

Figure 2: Demand Supply Curve and the Capacity Price



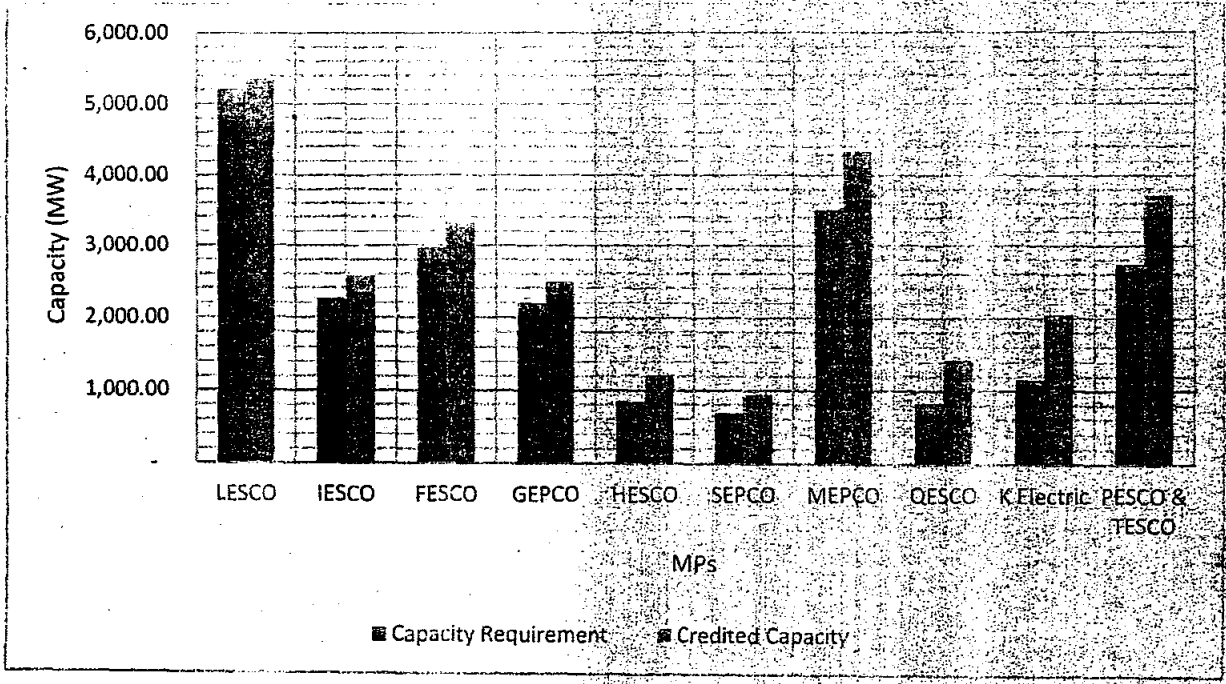
Step 8: Determination of Amount sold and purchased:

Since all the market participants have positive capacity balances and no market participant have any capacity deficit, hence no capacity is traded among the market participants.

Part 4: Results

No market participant was found with a negative capacity balance in the Year 2022 as shown in **Table 7** above and represented graphically in **Figure 3** below. Each market participant has sufficient capacity to comply with its ex-post capacity obligations. Hence no capacity will be traded in the BMC for this year.

Figure 3: Capacity Balances of each Market Participant



Annexure-B

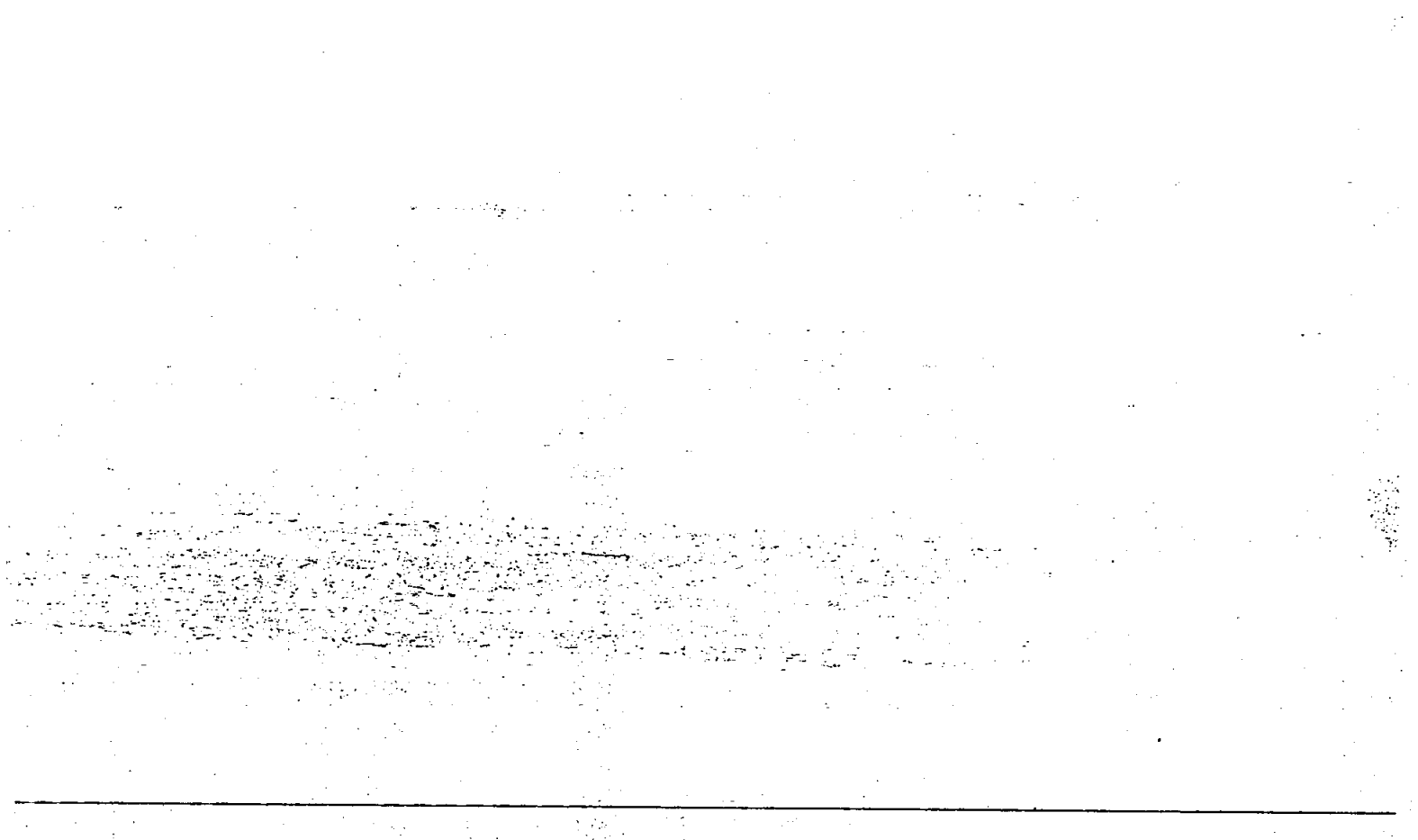
Central Power Purchasing Agency

Market Operator

Report on
CHARGES AND COMPENSATIONS FOR EXCESS LOSSES OF A TSP

2022

TABLE OF CONTENTS



List of Tables

Executive Summary

As per provision of the Commercial Code, the Market Operator is required to determine the charges to be imposed on a Transmission Service Provider which had incurred, during the previous fiscal year, transmission losses above the cap which was determined by the Authority in the latest tariff determination for the relevant Transmission Service Provider.

Currently, there are two transmission licensees operating in Pakistan as part of the National Grid except in the area served by K-Electric:

i. National Transmission and Despatch Company (NTDC)
ii. Pak Matiari-Lahore Transmission Company (Pvt) Ltd (PMLTC)

In this report, Excess losses have been calculated for National Transmission & Despatch Company (NTDC) and Pak Matiari-Lahore Transmission Company (Pvt) Ltd for the fiscal year 2021-22. The results are summarized in **Table 1** below.

Table 1: Summary of the transmission losses

Annual Losses (2021-22)						
#.	Service Provider ID	Service Provider Name	Transmission Loss MWh	Transmitted Energy MWh	Annual Losses %	Allowed Cap %
1	2	NTDC	3,672,025	140,346,583	2.62%	2.712%
2	3	PMLTC	341,426	11,902,143	2.87%	4.3%

Since the Transmission Service Provider's Annual Loss percentage is lower than the allowed cap on the losses, as determined by the Authority in the latest Tariff Determination for relevant each Transmission Service Provider. So, the Excess Losses are zero for National Transmission & Despatch Company (NTDC) and Pak Matiari-Lahore Transmission Company (Pvt) Ltd. Hence, there will be no charges imposed on any of them.

This report is being published as the final results as we have received no feedback from any stakeholder on the preliminary results published with the Preliminary Yearly Settlement Statement.

Executive Summary

As per provision of the Commercial Code, the Market Operator is required to determine the charges to be imposed on a Transmission Service Provider which had incurred, during the previous fiscal year, transmission losses above the cap which was determined by the Authority in the latest tariff determination for the relevant Transmission Service Provider.

Currently, there are two transmission licensees operating in Pakistan as part of the National Grid except in the area served by K-Electric:

i. National Transmission and Despatch Company (NTDC)
ii. Pak Matiari-Lahore Transmission Company (Pvt) Ltd (PMLTC)

In this report, Excess losses have been calculated for National Transmission & Despatch Company (NTDC) and Pak Matiari-Lahore Transmission Company (Pvt) Ltd for the fiscal year 2021-22. The results are summarized in **Table 1** below.

Table 1: Summary of the transmission losses

Annual Losses (2021-22)						
#.	Service Provider ID	Service Provider Name	Transmission Loss MWh	Transmitted Energy MWh	Annual Losses %	Allowed Cap
1	2	NTDC	3,672,025	140,346,583	2.62%	2.712%
2	3	PMLTC	341,426	11,902,143	2.87%	4.3%

Since the Transmission Service Provider's Annual Loss percentage is lower than the allowed cap on the losses, as determined by the Authority in the latest Tariff Determination for relevant each Transmission Service Provider. So, the Excess Losses are zero for National Transmission & Despatch Company (NTDC) and Pak Matiari-Lahore Transmission Company (Pvt) Ltd. Hence, there will be no charges imposed on any of them.

This report is beirg published as the final results as we have received no feedback from any stakeholder on the preliminary results published with the Preliminary Yearly Settlement Statement.

Part 1: Introduction

Transmission network plays a very important role in the operation of the power system. It brings electricity from the points where it is generated to the points where it is consumed. During the transmission of electricity, there are losses in the network which is an inherent characteristic of electricity transmission. These losses must be monitored in order to gauge the performance of the transmission licensee. NEPRA has fixed the caps i.e., the maximum allowed amount of losses a transmission licensee can incur without any penalty for each transmission licensee. The market participants shall bear the cost of such losses up to this cap and the cost of losses beyond such cap shall be borne by the respective transmission licensee.

It is also important here to clarify that the cap set by NEPRA is on annual basis, therefore, the hourly actual losses will be borne by the market participants in the monthly settlements and the evaluation of the cap will be done after the end of the fiscal year. If the transmission licensee has incurred losses above the cap, the market participants will receive compensation for the excess amount of losses incurred by the transmission licensee as per the process described below.

Before issuance of the Preliminary Yearly Settlement Statement (PYSS), the Market Operator is required to determine the actual amount of losses of each Transmission Service Provider, simply by adding the total transmission losses for every hour of the period. This value will be transformed into a percentage of the total energy transmitted by the transmission network of the respective transmission licensee, by dividing the total amount of losses by the total energy injected into such network. If this value is below the allowed cap in the tariff determination by the Authority, nothing additional will be done. If this value is above the cap set by the Authority, Transmission Service Provider shall purchase the additional energy as per the mechanism given in the Commercial Code.

The Commercial Code states that if any transmission licensee has incurred excess losses, the Market Operator shall invoice the respective transmission licensee for such energy, utilizing for such purpose the average marginal price of the energy over the considered period. This average would be an energy-weighted average, using for such calculation the total energy injected into the transmission network every hour.

The amount charged to be the Transmission Service Provider for the excess losses will be distributed among all market participants representing demand on a pro-rata basis considering the total energy consumption of such market participants during the whole year.

The procedure to undertake the calculations for the excess losses is described in the below sections.

Part 3: Calculation Methodology

As provided in the commercial code, the calculations are performed in the following steps:

Step 1: Assessment of the Annual Losses of a Transmission Service Provider

As per clause no of 11.2.2.1 of commercial code, the total Transmission losses of a Transmission Service Provider shall be assessed by the Market Operator as:

$$TransLoss_k[MWh] = \sum_{h=1}^{h=n} \left(\sum_{\forall\, i \in MP_k} E_{MP\,i,k,h} \right)$$

Where:

- $TransLoss_k$ are the total Transmission losses of the Transmission Service Provider k in the previous fiscal year, expressed in MWh;
- $E_{MPi,k,h}$ is the Energy registered by the Commercial Metering System as per provisions of Chapter 4 at the Trading Point i, corresponding to the Transmission Service Provider k in the hour h;
- $\forall\ i \in MP_k$ means all those Trading Points located at the boundary of the Transmission Service Provider k;
- $\sum_{h=1}^{h=n}(\ )$ means the sum over the total number of hours of the previous fiscal year (8,760 or 8,784 hours, as the case may be).

As described above, the transmission loss for each transmission licensee has to be calculated by the Market Operator from the hourly data provided by the Metering Service Provider. However, due to the unavailability of the hourly data from the Metering Service Provider for the year 2021-22, the monthly aggregated data of the losses was obtained from the Metering Service Provider (NTDC). The data is provided in **Table 2** below.

Table 2: Transmission losses of Transmission Licensees

Month	Year (2021-22) Transmission Loss NTDC (kWh)	Transmission Loss PMLTC (kWh)
Jul-21	396,165,422	26,884,600
Aug-21	442,244,861	32,129,300
Sep-21	351,048,479	23,159,000
Oct-21	243,034,556	20,554,400
Nov-21	193,321,633	15,804,500
Dec-21	245,435,408	23,214,900
Jan-22	299,785,258	29,215,500
Feb-22	241,142,323	22,898,500

Month	Year (2021-22) Transmission Loss NTDC (kWh)	Transmission Loss PMLTC (kWh)
Mar-22	265,449,186	30,062,600
Apr-22	332,520,358	46,406,000
May-22	323,267,416	42,439,800
Jun-22	338,609,816	28,657,200
Total	**3,672,024,716**	**341,426,300**

Step 2: Calculation of Transmitted Energy of a Transmission Service Provider

The Market Operator determined the total Transmitted Energy of a Transmission Service Provider as per clause no of 11.2.3.3 of the commercial code, for the previous fiscal year, by adding the total Energy injected into the Transmission Network of the relevant Transmission Service Provider.

$$TransEnergy_k[MWh] = \sum_{h=1}^{h=n} \left(\sum_{\forall\, i \in MP_{G \to T}} E_{MP_{i,k,h}} \right)$$

Where:

- $TransEnergy_k$ is the total Transmitted Energy by the Transmission Service Provider k;
- $E_{MP_{i,k,h}}$ is the Energy registered by the Commercial Metering System at the Metering Point i, corresponding to the Transmission Service Provider k in the hour h;
- $\forall\ i \in MP_{G \to T}$ *means* all those boundary points between a Transmission Network and
  - a Generator; or
  - a Distribution Network; or
  - a BPC; or
  - an Import point; or
  - a Transmission Network of another Transmission Service Provider

  in which the Energy is injected into the Transmission Network of the Transmission Service Provider k (positive value according to the sign convention provided in Clause 11.2.2.2), during hour h;
- $\sum_{h=1}^{h=n}(\ )$ means the sum over the total number of hours of the previous fiscal year (8,760 or 8,784 hours, as the case may be).

As described above, the transmitted energy by each transmission licensee has to be calculated by the Market Operator from the hourly data provided by the Metering Service Provider. However,

due to the unavailability of the hourly data from the Metering Service Provider for the year 2021-22, the monthly aggregated data of the losses was obtained from the Metering Service Provider (NTDC). The data is provided in **Table 3** below.

Table 3: Energy Transmitted by the Transmission Licensees

Month	NTDC Energy Transmitted (kWh)	PMLTC Energy Transmitted (kWh)
Jul-21	14,680,836,872	861,118,000
Aug-21	15,682,465,431	944,876,100
Sep-21	13,948,909,598	747,247,000
Oct-21	10,238,282,143	680,980,000
Nov-21	8,577,200,148	490,505,000
Dec-21	9,302,283,878	876,109,000
Jan-22	10,223,361,567	1,165,530,000
Feb-22	8,488,168,888	813,627,000
Mar-22	10,529,846,276	1,131,431,000
Apr-22	12,642,015,948	1,684,806,000
May-22	13,344,800,889	1,506,880,000
Jun-22	12,688,411,675	999,034,000
Total	**140,346,583,313**	**11,902,143,100**

Step 3: Calculation of Annual Losses Percentage of a Transmission Service Provider

The Market Operator has determined the Annual Loss expressed in percentage of a Transmission Service Provider as per clause no of 11.2.4.1 of commercial code for the fiscal year 2021-2022, by dividing the total Transmission losses by the Transmitted Energy of the relevant Transmission Service Provider.

$$AnnualLoss_k[\%] = \frac{TransLoss_k}{TransEnergy_k[MWh]} * 100$$

The results obtained through the above formula are given in **Table 4** below.

Table 4: Annual Loss Percentage of Transmission Licensees

#.	Service Provider ID	Service Provider Name	Annual losses (%) Transmission Loss (MWh)	Transmitted Energy (MWh)	Annual Losses (%)
1	2	NTDC	3,672,025	140,346,583	2.62%
2	3	PMLTC	341,426	11,902,143	2.87%

Part 4: Results

The comparison of the actual losses with the allowed caps has been presented in **Table 5** below:

Table 5: Comparison of Actual Losses with the Cap

#.	Service Provider ID	Service Provider Name	Annual Losses		
			Actual (%)	Allowed Cap (%)	Violation
1	2	NTDC	2.62%	2.712%	No
2	3	PMLTC	2.87%	4.3%	No

Since the Transmission Service Provider's Annual Loss Percentage is lower than the allowed losses, as determined by the Authority in the latest Tariff Determinations for both Transmission Service Providers. So, the Excess Losses are zero for National Transmission & Despatch Company (NTDC) and Pak Matiari-Lahore Transmission Company (Pvt) Ltd. Hence, there will be no charges imposed on it.

12 Months Projection of Consumers, expected Sale of Units (FY 2022-23)

MEPCO MULTAN.

Tariff	No. of Consumers	Units Billed (Mil. KWH)
DOMESTIC	7,172,821	9,662.44
COMMERCIAL	639,540	963.27
INDUSTRIAL	60,413	3,510.77
BULK SUPPLY	77	288.23
AGRICULTURE (T/W)	107,586	4,328.02
GENERAL SERVICE	44,083	352.27
P LIGHTING	1,774	23.43
RESIDENTIAL CLY.	122	6.58
RAILWAY TRACTION	4	0.00
MEPCO	8,026,421	19,135.00

AM (CM)
MTRAD-MEPCO

MAP OF CIRCLES UNDER MEPCO