BD/MZ/NEPRA/15/2024-0808

8th August 2024

REGISTRAR OFFICE
Diary No. 851
8-8-24

The Registrar,
National Power Regulatory Authority ("NEPRA/Authority")
NEPRA Power, Attaturk Avenue (East),
Sector G-5/1
Islamabad.

Subject: Request for Approval of procurement from 15MW Solar Project of Gharo Newgen (Private) Limited ("GNL")

Dear Sir,

This is with reference to the Power Acquisition Plan ("PAP") approved by the Authority on 17th May 2024.

In this regard, we have received the final proposal for 15 MW Solar Project ("Project") from GNL in accordance with Regulation 30 of the NEPRA Electric Power Procurement Regulations, 2022 ("NEPPR") which is enclosed for the Authority's consideration and approval. The Proposal is aligned with regulatory requirements under the NEPPR (as detailed in the Proposal) and expected to decrease KE's average power purchase price.

Therefore, we humbly request the Honourable Authority for its approval on the submitted proposal and procurement of power from the Project. KE will enter into Energy Purchase Agreement (EPA) with GNL subsequent to Authority's and KE's Board Approval.

We remain available in case any further information is required.

Sincerely,

Mudassir Zuberi
Head of Business Development

LETTER OF INTEREST

IN RESPECT OF 15 MW PROJECT OF GHARO NEWGEN (PRIVATE) LIMITED

DATED: 6th August 2024

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ANNEXURE

Letter of Interest

Pertaining to the 15 MWp Solar Power Generation Complex ("Project") of Gharo Newgen (Private) Limited (the "Company")

Summary

Gharo Newgen (Private) Limited (the "**Company**") is hereby submitting its Letter of Interest ("**LOI**") to K-Electric Limited ("**KE**") in respect of the 15 MWp solar power generation complex to be located near Gharo, District Thatta, Sindh, Pakistan ("**Project**").

Concurrence

Pursuant to Section 14B (5) of the NEPRA Act, the Company has applied simultaneously to the National Electric Power Regulatory Authority ("**NEPRA/Authority**") for the issuance of a Concurrence.

Tariff

The Company intends to sell power to KE pursuant to Regulation 30 of the NEPRA (Electric Power Procurement) Regulations, 2022. To this end, KE had included the Project in its Power Acquisition Programme for FY 2024 – 2030 ("**PAP**") which have been approved by the Authority vide its order having reference no. NEPRA/R/Advisor(CTBCM)/LAS-22/PAP(K.E)/7271-75 dated May 17, 2024.

Pursuant to Regulation 30 (5) of the NEPRA (Electric Power Procurement) Regulations 2022, a draft energy purchase agreement (the "**EPA**"), on the basis of which the rates, terms and conditions for such procurement shall be approved by the Authority has been attached as **Annexure 1.**

Grounds

This LOI is based on facts, circumstances and grounds as elaborated in Section A hereunder.

Section A – About the Company, KE, and the Project

1. The Company

1.1 The Project shall be developed, owned, and operated by a special purpose company, Gharo Newgen (Private) Limited (the "**Company**"), which has been registered with the Securities and Exchange Commission of Pakistan, bearing **registration no. 0145593.**

1.2 Mr. Rana Nasim Ahmed is the main sponsor of the Company. Although additional shareholders may be included, Mr. Ahmed will retain a minimum of 51% shareholding in the Company. He is also the main sponsor of (i) Gharo Solar Limited, a 50 MW solar project near Gharo; and (ii) Harappa Solar (Private) Limited, an 18 MW solar project located in Harappa. Importantly, these projects are currently the most advanced and pioneering solar projects in Pakistan. Additionally, Mr. Ahmed also has minority shareholding in a listed sugar sector conglomerate in Pakistan.

Mr. Ahmed has vast industrial experience of more than two decades of managing four sugar mills to the highest international standards. He has spearheaded high-pressure cogeneration in the sugar industry by leading the development, construction, and operations of the first-ever 2 x 26.5 MW (53 MW total) bagasse-based project set up in 2014. These 53 MW biomass projects and two of the four sugar mills were set up as greenfield ventures on expedited timelines in self-EPC mode with multiple contractors, suppliers and consultants managed by Mr. Ahmed. Moreover, he has over fifteen years of experience managing equipment procurement and installation and leading commercial and operation and maintenance ("**O&M**") matters of 70 MW low-pressure, captive biomass power plants. Mr. Ahmed obtained his master's degree (with distinction) from the University of the Punjab and his MBA from Saint Louis University, USA.

1.3 Mr. Rana Uzair Nasim is the CEO of the Company. Mr. Nasim has successfully led and managed solar, biomass and industrial projects with capex of over USD 150 million. He is also serving as the CEO of Gharo Solar Limited and Harappa Solar (Private) Limited since their inception and is the primary point of contact for various stakeholders including local and foreign shareholders / lenders, regulatory and public-sector agencies, power purchasers, suppliers, and contractors. Mr. Nasim has first-hand experience of greenfield project conceptualization and execution and has worked across different areas including design, policy and tariff development, tendering, financing, insurance, negotiation of project concession documents etc. He has also contributed to several important policy and regulatory developments in the broader renewable energy sector in Pakistan. Mr. Nasim previously worked as a management consultant in New York with Oliver Wyman and Dalberg Global Development Advisors. He holds a BA in Economics and an MS in Management Science & Engineering from Stanford University, California, USA.

2. K-Electric Limited ("KE/Power Purchaser")

2.1 KE is a privately-owned power utility which is solely responsible for provision of electricity to Karachi and its adjoining areas. Since privatization, KE has made continued investments in

generation capacity, improving its fleet efficiency, and launching transmission and distribution enhancement programs.

2.2 KE produces electricity from its own generation units with an installed capacity of 2,817 MW, and in addition, has arrangements with external power producers for around 1,668 MW which includes 1,100 MW from the National Grid.

2.3 As of June 2023, KE has an installed capacity of 4,485 MW which is primarily dependent on imported RLNG, RFO and coal. Approximately, 98% of KE's energy requirements are met by thermal plants whereas its renewable energy share only stands at 2%. As a result, KE and its customers are facing the challenge of rising fuel prices due to the global increase in fuel prices and significant rupee devaluation.

2.4 Due to the significant growth in Karachi's population and setting up of special economic zones and industrial parks, it is anticipated that KE's power demand has reached around 4,168 MW. To meet the increasing demand and rationalize its generation cost, KE plans to induct approximately 673 MW renewable plants by FY 2026 as per KE PAP. The planned projects will help KE to diversify its fuel mix benefiting consumers and the economy at large.

3. The Project

3.1 The anticipated capacity of the Project is 15 MWp solar power plant with 12 MWac on-grid string inverters and it shall be connected with Gharo Grid Station in Gharo, District Thatta at 11kV voltage.

3.2 Pursuant to the NEPRA (Electric Power Procurement) Regulations, 2022, the Company has negotiated procurement rates with KE such that proposed procurement shall result in a decrease in the basket price of KE. This decrease is based on the following grounds:

a. The land for the Project is already available to the Company, which means that the Company can ensure speedy execution and timely delivery of electricity through its Project.

b. The Project is strategically located in a developing industrial / commercial area where significant demand rise in upcoming years is forecasted. The co-location of the proposed Project with KE's 132/11 kV Gharo Grid station is an ideal combination for KE particularly since the interconnection shall be at 11 kV and it would enable most of the power to be dispersed locally. This approach would also help in reducing transmission line losses.

c. The Project is aligned with KE PAP and it will contribute 12 MW of renewable energy in KE system.

d. As submitted by KE in its PAP, the non-indexed basket price is expected to be ~8.7 cents/kWh in year FY-2024. In comparison, the proposed first year tariff of the Project is 4.7984 cents. As the Project's tariff is substantially lower than KE's basket price, the

proposed procurement will clearly result in a decrease in the average power purchase price of KE.

3.3 As per the draft EPA attached as **Annexure 1**, the Company will be signing a 25-year off-take arrangement with KE, and the Project is anticipated to have a construction period of 8 months from financial close. Financial Close is targeted for January 2025 with the anticipated Project commercial operations date ("COD") of August 2025. A schedule of activities and key milestones is provided in the table below.

Period	***Tasks***
July 2022 to June 2023	✓ Incorporation of Project Company
	✓ Identification of Project land and initial yield study
	✓ Land acquisition
July 2023 to June 2024	✓ Inclusion in KE Power Acquisition Program (PAP)
	✓ Approval of Project in PAP by the Authority (NEPRA)
July 2024 to November 2024	... Contractor/supplier negotiation and selection
	... Tariff submission and approval
	... Concurrence application and approval
	... EPA finalization with KE and NEPRA approval
	☐ Lenders' due diligence
December 2024	☐ Financial Close
January 2025	☐ Commencement of works and supply
August 2025	☐ Project Commissioning

✓ Completed ... In Progress ☐ To be initiated

3.4 Key features of the Project

Company Name	Gharo Newgen (Private) Limited
Location	Deh Ghairabad No. 3, Taluka Mirpur Sakro, District Thatta, Sindh, Pakistan
Key Terms	
Project Size	15 MWp
Agreement Term	25 Years
Power Purchaser	K-Electric Limited
Land Area	54.44 Acres
Annual Energy Production (kwh)	30,024,900
Capacity Factor	22.85%
Construction Period	8 Months
Project Capital Cost (USD)	
EPC Cost	8,449,680
Non-EPC Cost	1,002,934
Project Development Cost	318,522
Insurance During Construction	32,700
Financial Fees & Charges	206,950
Interest During Construction	444,857
Total Project Cost[1]	9,452,614
Financing Terms	
Debt Equity Structure	80:20
Equity ($)	1,890,523
Long-Term Debt ($)	7,562,091
Debt	Foreign
Terms of Long-Term Debt	15 Years including 1 Year Grace Period
O&M Costs	
Project O&M Costs ($)	12,500/MW
Levelized Tariff	
Levelized Tariff – US cents	4.1988/kWh

[1] The total project cost does not include pass-through items such as duties & taxes and land costs as specified later in this submission

Section B – Details of EPC and Suppliers

1. Engineering, Procurement, and Construction (EPC) Details

1.1 Company Proposed EPC Cost

The estimated capital cost of the project is provided below. Individual cost components are discussed in the following sections.

No.	Equipment	Price (USD)
1	Solar PV Modules	1,650,000
2	Inverters, String Combiner Boxes & AC/DC Cables	1,097,882
3	Single Axis Sun Tracking System	1,526,425
4	Civil & General Works	1,188,000
5	Electrical Balance of Plant	788,000
6	Electrical Works	1,064,999
7	EPC, Design, Engineering & Supervision	539,144
8	Marine and local inland transportation	320,550
	Total EPC Cost (USD)	8,175,000
	Total EPC Cost (USD/MW)	545,000

The module prices have been determined using transparent and publicly accessible datasets. For example, pvxchange[2]. For other equipment and works, the Company has obtained multiple quotations based on project specifications from reputable suppliers.

PV Modules

The Company has selected 630W[3] N-type bifacial double glass monocrystalline modules for the project. The module type has been based on the high-corrosion (C5) environment at the project site which necessitates selection of more robust double glass modules. The modules are compliant with IEC 61215, IEC 61730, UL 61215, UL61730, and IEC 62941:2019. Current price range for these modules is between USD 0.11/watt to USD 0.15/watt with average value of USD 0.135/watt. Against this, the Company has assumed a price of USD 0.11/watt excluding delivery to Karachi Seaport and transportation to the project site. Currently, the market price for these modules is at an all-time low due to favorable market conditions. However, module prices can start exhibiting opposite trend based on changes in upstream module costs such silicon wafer and glass etc., according to the top 5 market leading manufacturers

[2] https://www.pvxchange.com/Price-Index

[3] Since the exact wattage depends on the time of order placement, the final module wattage may vary slightly.

Central Inverters, String Combiner Boxes & AC/DC Cables

The DC electric power generated by the PV modules flows through string combiner boxes at 1500V DC and is converted into 630V AC by the inverter station. The company has selected central inverter stations with forced air-cooling technology and a maximum efficiency of 99.0%. However, the actual efficiency will be lower based on parameters such as DC line losses, PV module generation and ambient temperature.

The Company has chosen central inverter stations with capacities of 2x4.4MVA and 1x3.3MVA with three-level technology. This includes inverter transformers, switchgear, and LV auxiliary power supply. The new inverter series complies with IEC 61727, IEC 62116, IEC 62271-202, IEC 62271-200, and IEC 60076 standards. The latest supplier quotation is USD 0.0732 million per MWp, encompassing advanced inverters, string combiner boxes, and high-quality AC/DC cables essential for efficient energy conversion and transmission.

Tracking System

The PV modules will be installed on a 1P/2P horizontal single-axis tracking system with a built-in algorithm to track the sun. The tracking system will be ground-mounted on pile-type foundations which are necessitated by the high-water table at the project site being in a coastal area. The company has chosen a supplier capable of providing Magnelis or ZM coating to withstand C5 corrosion standards. The total cost, competitive at USD 0.1018 million per MWp, takes into account the C5 specifications for the structure.

Civil and General Works

Civil and general works entail the construction of foundations for central inverter stations, control rooms, offices and storage facilities necessary for the project's functionality. These works include site preparation, boundary walls, roads and other civil infrastructure essential to support the project's operation and maintenance. The civil and general cost is linked with local inflation, steel and cement index. These indexes have increased 63.37%, 73.86% and 55.68%[4] over the period of last 2 years respectively. The competitive cost of Civil & General work is USD 0.0792 million per MWp as per multiple quotations from reputable vendors.

Electrical Balance of Plant (EBOP)

The EBOP includes 11kV switchgear with four (04) outgoing feeders with load distribution, metering panels, auxiliary transformers, battery backup, SCADA systems, and equipment necessary to support the main power generation and distribution infrastructure. This also covers cooling systems, fire protection, lighting, and other ancillary electrical systems vital for safe and efficient power plant operation. The SCADA system, crucial for monitoring, control, and data acquisition, facilitates real-time monitoring and remote operation. Quotations amounting to USD 0.0525 million per MWp were obtained for this head. It is to be noted that this head includes the cost of both the main and the back-up metering systems.

[4] https://www.pbs.gov.pk/index.php/content/price-statistics

Electrical Works:

The cumulative cost of electrical works, including the installation of solar panels, inverter stations, switchgear, AC/DC and earthing cables, and other electrical components and services, is USD 0.0710 million per MWp.

Freight and Logistics:

The Company has assumed 94 containers for sea freight from China Port to Karachi Port based on information provided by various suppliers. An average cost of USD 1,950 per container has been considered in this tariff petition. It is important to highlight that these freight charges for the transportation of equipment, materials, and other components are considered under routine conditions, not accounting for the recent significant increase in sea freight costs. Currently, logistics prices have surged to USD 5,500 per container due to supply chain disruptions, increased global demand, rising fuel costs, and limited shipping capacity.

Degradation

The solar PV modules would degrade at a levelized annual degradation factor of 0.45% of EPC cost. The impact of degradation factor has been capitalized in the estimated Project cost. The amount of USD 0.275 million has been made part of the estimated Project cost based on the levellzed rate of 3.36% of the EPC cost. It is clarified that the approved degradation would become part of the project cost and no further compensation would be provided for degradation under the EPA.

Capacity Factor

Due to advancements in technology, the capacity factor of the Project is estimated at 22.85%. Accordingly, the annual energy generation would be 30,024,900 kWh at P50 under the Solargis standard based on the PVsyst report. Alternatively, under the Meteonorm 8.1 Standard, the estimated capacity factor is 21.35%, with an annual energy generation of around 28,053,900 kWh at P50. Our analysis considers a higher capacity factor 22.85% at P50, while lenders typically adopt a more conservative approach like P75.

1.2 Equipment Suppliers

The likely key suppliers for the Project based on the development team's experience are indicated below. However, these are subject to change following the completion of Project design.

No.	Equipment	Brands
1	Solar PV Modules	JA Solar / Longi or other tier-I[5] manufacturer
2	Tracking System	Optimum Trackers, Arctech or equivalent
3	Grid Connected Inverters	Sungrow / Huawei / TBEA or equivalent
4	Transformers	TBEA, QRE or equivalent
5	Switchgear	Bilal Switchgear Engineering (Pvt) LTD, Tariq Electric Pvt Ltd, Siemens or equivalent
6	Cables	Any reputable local or foreign supplier

1.3 Final Proposed Tariff:

It is important to highlight that the Company has engaged in multiple rounds of discussions with KE regarding the levelized tariff proposal.

After several discussions and negotiations, the Company took into account the anticipated decrease in module prices and adjustments in the prices of other major components of EPC, the Company adjusted its proposed tariff, resulting in a final offer of USc 4.1988/kWh exclusive of land price.

1.4 EPC Quotations:

To substantiate the EPC cost, the Company obtained quotations from the market. The Company issued a Request for Proposal (RFP) for the construction, complete plant design, supply, installation, testing, and commissioning of the 15MWp Project. Five quotations were received, with two disqualified for not meeting technical and contractual requirements. The bid evaluation report prepared by the Company shows the following bids from the three qualified companies:

Companies	Bid US$ (Millions)	Ranking
Orient Energy Systems (Pvt.) Ltd.	8.87	1st
Reon Energy Limited	9.10	2nd
Feroze Power (Pvt.) Ltd.	9.33	3rd

Based on the evaluation, Orient Energy provided the most competitive bid and was ranked first. After reviewing the EPC quotations for the project, The Company determined that USD 8.87 million will be required for construction, complete plant design, supply, installation, testing, and commissioning, with the lowest bid considered. Given the Company's technical and commercial expertise, and since the EPC costs substantiated by the Company through its own analysis in Section 1.1 are lower than the EPC quotes obtained from turnkey contractors, the Company has

[5] As per Bloomberg New Energy Finance (BNEF) Report

decided to use an EPC cost of USD 8.175 million, based on the Company's analysis, as the reference.

1.5 Comparison with other Solar Projects:

To further substantiate the EPC cost, the Company has compared the EPC cost with other recently approved solar plants such as Zorlu Solar Pakistan (Pvt.) Limited, Access Electric (Pvt.) Limited, and Access Solar (Pvt.) Limited. The allowed EPC costs for these plants are provided in the table below for the Authority's reference:

Description	Zorlu Solar Pakistan (Pvt.) Limited	Access Electric (Pvt.) Limited	Access Solar (Pvt.) Limited
Determination Date	July 26, 2023	July 26, 2023	July 26, 2023
Project Size	100 MW	10 MW	11.52 MW
EPC Cost (Total)	USD 65 Mn	USD 6.8 Mn	USD 7.834 Mn
EPC Cost ($/MW)	USD 650,000	USD 680,000	USD 680,035

As evident from above determinations, the EPC requested by the Company is lower than other recently approved projects' EPC costs. Subsequent to above NEPRA determinations, the price of PV modules has decreased significantly. However, there have been increase in the prices of other components, particularly substation equipment, civil works and rising transportation cost have offset some of the savings from cheaper modules.

1.6 Site Specific Challenges:

Furthermore, project site presents unique challenges due to its geological and environmental conditions, impacting the overall cost structure. These challenges include:

High Corrosion: The plant is located in a coastal area and is classified in the highest corrosion category (C5), which poses significant challenge to the plant, equipment, and mounting structures. To mitigate this issue, the use of anticorrosive materials and C5 protection is required, leading to increased EPC and maintenance costs.

Higher Civil Cost due to high water table: The water table at the site is just a few feet below ground level and is highly saline, which necessitates dewatering, special additives for piling, strong pile foundations and overall increases the cost of foundations. Additionally, since the site is at nearly 0 elevation above the sea level, it is prone to flooding during rainy season, which requires higher minimum elevation of all buildings.

Considering the above factors, the onshore part of the EPC cost for the Company would increase significantly as compared to other projects situated in more favorable environments.

Based on the detailed analysis, market conditions, and site-specific challenges, the proposed EPC cost is justified and competitive.

1.7 Opportunity to avail all time low Module Prices:

It is important to highlight that currently the module prices are at all-time low level, allowing the Company to offer a competitive tariff. Resultantly, the Company requests KE and the Honorable Authority to expedite its process and approvals in order to avail the benefit from the low prices.

Section C – Key Assumptions

The following table provides the key Project assumptions:

Tariff Period	25 years
Exchange Rates	Rs.280/US$
US CPI	301
Pakistan CPI	211
Debt Equity Ratio	80:20
Discount Rate for Tariff	10%
Foreign Debt	100%
SOFR	4.50%
Spread/Margin	4.50%
Debt tenor	15 Years (with one year grace period)

Section D – Project Costs

1. Project Cost Summary

Project cost has been calculated after detailed analysis, evaluation and understanding of parameters that affect the development and operation of solar projects. The following table provides a breakdown of Project costs:

EPC Cost (including degradation)	**8,449,680**
Non-EPC Cost	**1,002,934**
Insurance During Construction	32,700
Development Cost	318,522
Financing Fees & Charges	206,950
Interest During Construction	444,762
Total Project Cost (USD)[6]	**9,452,614**

2. Project Cost Explanation

[6] The total project cost does not include pass-through items such as duties & taxes and land costs as specified later in this submission

2.1 EPC Costs

The EPC cost per MW of the project is established at $545,000. This figure is supported by the detailed rationale provided in section B (1.1) above, which outlines the specific factors and considerations that contribute to this cost estimation. The EPC cost covers all expenses associated with designing, procurement, and construction of the project.

In addition to the base EPC cost, a levelized degradation rate of 3.36% has been applied. This degradation allowance is in line with guidelines set by NEPRA. The purpose of this degradation allowance is to account for anticipated wear and tear, efficiency losses, and other factors that may affect the project's performance over its operational lifetime.

As a result of applying the 3.36% levelized degradation rate to the EPC cost, the total cost per MW is calculated to be USD 563,312. This EPC cost will be used to calculate the reference tariff of the project.

2.2 Non-EPC Cost

Non-EPC Costs of the Project includes project development cost, financing fee and charges, insurance cost and interest during construction. The Non-EPC cost per MW is established at $66,862.

There is a prevailing practice within the Authority that some of the non-EPC project cost components are benchmarked in USD terms that would be converted into PKR at fixed exchange rate. However, considering current economic situation of Pakistan, which is characterized by high local inflation and significant devaluation of PKR against the USD, this fixed exchange rate fails to accurately reflect the actual rise in costs. Specifically, certain Project costs, such as those associated with local technical, legal, and other consultants, may experience an increase when measured in PKR due to the devaluation of the local currency and inflation. Therefore, the Company understands that to effectively reflect any actual variations in the exchange rate and local inflation, the foreign portion of Non-EPC cost should be adjusted at the commercial operation date ("COD") based on average exchange rate over the construction period, and the local portion should be adjusted for change in local inflation based on average N-CPI over the same period.

2.2.1 Insurance During Construction

The insurance costs cover the insurance of the Project Company's assets during the construction phase. These costs are estimated to be 0.4% of the total EPC cost, in line with NEPRA's benchmark. The insurance coverage includes Construction All Risk Insurance, Delay in Start-up Insurance, Marine and Inland Transit Insurance, and Marine Delay in Start-up Insurance

2.2.2 Project Development Cost

Project development cost ("PDC") is estimated at USD 318,522/MW. This cost mainly includes:

- Project feasibility study cost by leading international engineering consultant;
- Cost related to other engineering studies and environmental approvals;
- Cost related to establishment of the Company and maintaining it in good standing;
- Legal advisory charges associated with advice on all legal aspects of the Project and stamp duty and registration fee in respect of project documents;
- Project advisors including tax and corporate advisors;
- Cost related to KE's letter of credit to be furnished to KE pursuant to the provisions of the draft EPA;
- Cost relating to various permits necessary for the Project; and
- Management cost as well as Company salaries and wages, utilities, travelling and conveyance, security, office supplies cost, rent rates and taxes, medical and travel insurance, fees and subscription, vehicles running and maintenance, repair and maintenance, printing stationary and periodical, miscellaneous and other expenses.

The scale of the Project is at par with Access Electric (Private) Limited and Access Solar (Private) Limited. Access Electric (Private) Limited's total permissible PDC is USD 49,600 per MW, whereas Access Solar (Private) Limited's PDC stands at USD 56,510. In comparison, the Company's proposed PDC is USD 21,235 per MW, which is significantly lower. It is important to note that Access Electric (Private) Limited and Access Solar (Private) Limited benefit from synergies arising from their proximal locations and their development by the same team. Furthermore, as discussed earlier, there has been a significant surge in local inflation, coupled with a substantial devaluation of the local currency. Consequently, the Company proposes that an adjustment of this component at COD is allowed to accurately reflect any actual variations in the exchange rate and local inflation from the reference rate. The foreign portion of development cost should be adjusted at the COD based on average exchange rate over the construction period, and the local portion should be adjusted for change in local inflation based on average N-CPI over the same period.

2.2.3 Financing Fee and Charges

Financial fees and charges encompass the costs associated with the debt financing of the Project. These costs include fees for debt arrangement, legal services, advisory charges, lenders' mandate fees, commitment fees, and charges associated with establishing various letters of credit for different contracting parties; fees and stamp duties applicable to the financing documents; agency fees; security trustee fees; and the lenders' project monitoring fees, as well as any other charges required by the lenders.

The calculation of these financial charges is contingent upon the estimated Project cost and debt requirements. Any alterations to the Project cost will correspondingly impact the financial charges. Consequently, these costs are subject to revisions at later stages to align with executed financing documents and actual drawdowns during the construction phase.

The Company based on correspondence with lenders understand that lenders will charge higher percentage of finance fees and charges because the debt size is smaller and the lender needs to meet its minimum threshold. Consequently, the financial charges are calculated at 2.75% of the total loan amount, whereas the Authority's benchmark is 2% of the approved debt.

It is important to highlight that certain major components, such as arrangement fee, commitment fee, agency fee, trustee fee, etc., do not decrease proportionally with project size, contributing to the modest percentage difference from the benchmark.

Moreover, due to the prevailing significant inflation and devaluation of the local currency, an adjustment to the relevant financial component at COD will accurately reflect exchange rate fluctuations and local inflation. The foreign portion of finance fee and charges should be adjusted at the commercial operation date (COD) based on the average exchange rate over the construction period whereas the local portion should be adjusted for changes in local inflation based on the average N-CPI over the same period.

2.2.4 Interest During Construction

Interest during Construction (IDC) is estimated at USD 29,651 per MW based on 100% foreign financing and assuming eight months construction period. The IDC cost is to be actualized at COD based on the actual debt drawdown profile, SOFR rate, KIBOR rate and local & foreign debt mix.

Section E – Tariff Break-Up

1. O&M

The O&M cost includes personnel cost, administrative and management expenses, maintenance cost, component replacements due to standard use or maintenance, and other miscellaneous costs. After COD, the plant's O&M activities will be carried out either by the Company itself or by an experienced and proficient O&M operator. In either case, the O&M team will maintain and operate the plant efficiently in accordance with international standards and practices, including accepted norms of health, safety, and environmental practices.

The Authority has allocated an O&M budget of USD 9,000 per MW to Zorlu Solar Pakistan Limited. It's important to note that comparisons between Zorlu Solar Pakistan Limited and the Company are not straightforward as Zorlu Solar Pakistan Limited's project has 100MW capacity, with an O&M cost of USD 9,000 per MW per year (totaling USD 900,000 annually), which is deemed reasonable for large-scale projects due to cost efficiencies achieved through scale. However, it is emphasized that O&M expenses for smaller solar projects remain comparable to those of larger ones, as they still require a project manager, plant manager, shift engineers, support staff, security guards and similar administrative expenses. Hence, covering all costs within a budget of USD 9,000 per MW per year (USD 135,000 annually for smaller projects) is challenging, especially under current economic conditions marked by high inflation.

The Project's scale is also comparable to that of Access Electric (Private) Limited and Access Solar (Private) Limited, which have been allocated an O&M cost of USD 10,000 per MW per year. According to our information, both were developed by the same team and are located in close proximity, thereby benefiting from synergies. The Company understands that it is likely that the maintenance costs for the Project would be higher due to significant corrosion, high-water table, more cleaning requirements and security & surveillance challenges due to coastal area in the Gharo region. Furthermore, extensive O&M activities at the plant site, such as draining and dewatering during the summer monsoon season, painting steel structures due to routine rusting and high corrosion, and the shorter lifetime of electrical equipment such as fans in inverters, are involved.

Given these considerations, the primary concern is that smaller projects might face higher per-unit costs due to the distribution of fixed expenses (such as personal cost, administrative costs, and overheads) over a reduced output. In view of unique challenges of plant site, higher maintenance cost and other expenses faced by smaller-scale projects, the O&M cost for the Project is estimated USD 12,500 per MW in order to ensure the smooth, efficient and effective operation of the plant.

1.1 Local And Foreign Portion Of O&M Cost

The total O&M expense is split into local and foreign portion in a ratio of 50:50 with no distinction made between variable or fixed and the following table explains the same:

O&M Cost share (Foreign & Local) – USD	
Foreign O&M %	50%
Local O&M %	50%
Foreign O&M	6,250
Local O&M	6,250
Total O&M	**12,500**

2. Insurance

Insurance consists of operational all-risk and political violence insurance for the Project, along with business-interruption insurance; these are standard insurances required by all lenders and are also incorporated under the draft EPA. Insurances are required to be maintained throughout the life of the project. Since the Pakistan insurance/reinsurance industry does not have sufficient capacity and expertise to manage such huge risks entirely, therefore the risk is required to reinsured internationally. International insurance premiums for solar projects are increasing due to heightened risks from climate change and supply chain disruptions. Insurance premiums are higher for smaller solar projects due to the lack of economies of scale, making each unit of coverage more expensive. Moreover, the Company understands that owing to the small scale of the Project and significantly increased international premiums, the provision of the Authority's benchmark 0.4% of EPC cost does not cover the entire risk exposure. Consequently, the Company

requests that the insurance cost component for the operational period be calculated at 0.5% of the EPC cost.

3. Return on Equity

The Company requests that an internal return ("IRR") on equity and return on equity during construction (ROEDC) of 13% for the project, with any taxes payable on revenues and income as pass-through items. This return is in line with NEPRA benchmark. Moreover, as allowed in previous solar tariffs, the Return on Equity During Construction (ROEDC) will be adjusted at COD on the basis of actual equity injections (within the overall equity allowed by NEPRA) during the project construction period.

4. Pass-Through Items

4.1 Land Cost

The land purchase cost is a crucial element of the overall project budget, covering payments to the owner, stamp duty, registration fees, legal fees. Due to high inflation, land costs have increased significantly, making previous tariff determination benchmarks irrelevant.

Given the rapid inflation and significant development near the Dhabeji Special Economic Zone, land prices have changed substantially over the past three years. To ensure transparency, the Company will conduct an appraisal by a valuer recognized by the Pakistan Banks Association and the State Bank of Pakistan and the appraised value will be used as the actual land cost which will be submitted to KE and the Authority for consideration in Tariff determination.

4.2 Other Pass-Through Items

The Company submits that the following cost components should be allowed as passed-through items on the actual basis incurred by the Company or those obligated to pay in relation to the Project, in accordance with the laws of Pakistan:

- The payments to workers welfare fund and workers profit participation fund have been assumed to be reimbursed as pass-through at actual by KE;
- Zakat deduction on dividends, as required under the Zakat and Ushr Ordinance, 1980 is considered a pass-through item;
- No tax on income of the Company (including proceeds against sale of electricity to KE) has been assumed. Income tax including advance income tax, corporate tax, turnover tax, general sales tax/provincial sales tax, and all other taxes, excise duties, levies, fees, etc., imposed by any federal/provincial entity, including local bodies and not of a refundable nature, will be treated as pass-through items;
- Taxes and custom duties on the import of plant and equipment under including Sindh cess, will be treated as a pass-through item.

- Any other taxes and charges, whether during the construction or operation period, including but not limited to sales tax on the EPC contract and withholding tax on the EPC offshore contract incurred by the Company, will be treated as pass-through;
- If the Company is required to make payment of withholding tax on debt servicing the same shall be treated as pass-through item. KE will reimburse to the Company the actual amount paid on account of withholding tax.
- The withholding tax on dividends, up to a maximum of 7.5%, shall be paid by the shareholders of the Company. However, if the Government of Pakistan alters the withholding tax rate on dividends from the current 7.5% (either increasing or decreasing it), such changes will be directly passed through to KE. The ROE of 13% has been assumed in accordance with NEPRA determinations, which were based on a 7.5% withholding tax rate. If the withholding tax increases to, say, 15%, then the effective ROE for shareholders will be reduced to 11.05%.

5. Interconnection Scheme for the Project

In general, the interconnection works from the generation plant's gantry to the purchaser's grid station is constructed by the power purchaser. However, as the Project falls under the negotiated procurement regime at 11kv level, it is to be determined by the Authority if the required interconnection investment falls under the domain of the Company or Power Purchaser. Further, the Interconnection Works for the Project were not included in KE Investment Plan as the Project was envisaged and submitted for NEPRA approval after the Investment Plan.

Considering the above, the Company is willing to undertake financing of the purchaser interconnection works provided that the costs will be treated as pass-through in its tariff, at the time of the COD stage adjustment. Alternatively, NEPRA may allow Project cost for the interconnection works to KE as part of its Investment Plan.

6. One Time Adjustments at COD

The Company has assumed the following one-time adjustments:

- Applicable foreign portion of the allowed EPC cost is to be adjusted on actual basis at COD on account of variation in PKR/USD parity and local portion of the EPC cost to be adjusted on actual basis with local inflation, on production of authentic documentary evidences to the satisfaction of the Authority.
- Due to high inflation and significant PKR devaluation in recent years, foreign portion of non-EPC cost is to be adjusted at COD based on average exchange rate over the construction period, and the local portion should be adjusted for change in local inflation based on average N-CPI over the same period
- Debt to equity ratio has been assumed at 80:20, which is to be adjusted as per actual at COD, subject to maximum equity of 25%
- Debt servicing is based on 100% foreign financing with a tenor of 15 years (additional one year grace period). However, the actual debt is to be adjusted based on actual mix of foreign and local financing.
- In case of local financing the spread over KIBOR would be 2.25%

- The principal repayment and cost of debt is to be adjusted at COD as per actual borrowing composition.
- Interest during construction is to be adjusted as per actual based on actual disbursement of loans and prevailing SOFR and KIBOR rates during the Project construction period;
- Duties and/or taxes, not being of refundable nature, relating to the construction period directly imposed on the Company up to COD, are to be allowed at actual upon production of verifiable documentary evidence to the satisfaction of the Authority.
- Any negative financial implementations resulting from changes in tax rates, duties etc. and currently applicable sales tax structure are to be adjusted in the Project cost.
- Pre-COD insurance cost is to be adjusted at actual subject to a cap of 0.5% of the EPC cost.
- ROE is to be adjusted at COD in order to ensure an IRR based return of 13% on equity.
- Return on equity during construction ("**ROEDC**") is to be adjusted at COD on the basis of actual equity injections (within the overall equity allowed by the Authority at COD) during the Project construction period allowed by the Authority.

7. Summary of Tariff Indexation

The adjustment in the tariff components will be made on a quarterly basis on July 1st, October 1st, January 1st, and April 1st, as per the mechanism explained below:

7.1 Operation and Maintenance (O&M) Costs

O&M components of the tariff will be adjusted on account of change in local inflation (N-CPI), foreign inflation (US CPI) and exchange rate on a quarterly basis on the latest available information. It is important to note that NEPRA recently shifted O&M indexation for Zorlu Solar Pakistan Limited to an annual basis. Given the substantial devaluation of local currency and inflation trends, this annual indexation is not viable in the current context. Therefore, the Company request the Authority to revert to the standard quarterly indexation mechanism. The reference N-CPI and US CPI values considered in the proposed tariff are 219.14 and 301.84 respectively. The reference TT and OD selling rate is of Rs. 280/USD.

7.2 Insurance During Operation

Insurance component of the reference tariff will be adjusted annually on actual basis at exchange rate prevailing at the time of insurance premium payment.

7.3 Return on Equity and Return on Equity During Construction

The ROE and ROEDC component of the tariff will be adjusted on a quarterly basis on account of change in USD/PKR parity. As mentioned earlier, NEPRA recently shifted ROE and ROEDC indexation for Zorlu Solar Pakistan Limited to an annual basis. Given the substantial devaluation of local currency, this annual indexation is not viable in the current context. Therefore, the Company requests the Authority to revert to the standard quarterly indexation mechanism. The reference TT and OD selling rate is of Rs. 280/USD.

7.4 Indexation Applicable to Debt

Foreign debt and its interest will be adjusted on a quarterly basis, on account of changes in USD/PKR parity. The reference TT and OD selling rate is of Rs. 280/USD.

7.5 Variation in SOFR

The interest part of the foreign loan will be adjusted quarterly as a result of variation in SOFR spread. The reference SOFR rate spread considered in the proposed tariff is 4.50%. The following table provides a breakdown of tariff indexations:

Component	Indexation	Frequency
O&M (Local)	Pakistan N-CPI (General)	Quarterly
O&M (Foreign)	US$ to Pak Rupee Rate and US CPI	Quarterly
Return on Equity	US$ to Pak Rupee Rate	Quarterly
Return on Equity During Construction	US$ to Pak Rupee Rate	Quarterly
Principal Repayment	US$ to Pak Rupee Rate for Foreign Loans	Quarterly
Interest Repayment	3-Month SOFR, 3-Month KIBOR US$ to Pak Rupee Rate for Foreign Loans	Quarterly
Insurance During Operation	US$ to Pak Rupee Rate	Annual

Section F – Tariff Table

	1	2	3	4	5	6	7	8	9	
Year	Foreign O&M	Local O&M	Total O&M	Insurance	ROE + ROEDC	Interest Payment	Principal Payment	Total Debt Servicing	Total Tariff	Total Tariff (US cents)
1	0.6245	0.6245	1.2490	0.2723	1.7115	4.4708	1.8933	6.3641	9.5969	4.7984
2	0.6245	0.6245	1.2490	0.2723	1.7115	4.2945	2.0695	6.3641	9.5969	4.7984
3	0.6245	0.6245	1.2490	0.2723	1.7115	4.1019	2.2622	6.3641	9.5969	4.7984
4	0.6245	0.6245	1.2490	0.2723	1.7115	3.8913	2.4727	6.3641	9.5969	4.7984
5	0.6245	0.6245	1.2490	0.2723	1.7115	3.6612	2.7029	6.3641	9.5969	4.7984
6	0.6245	0.6245	1.2490	0.2723	1.7115	3.4096	2.9545	6.3641	9.5969	4.7984
7	0.6245	0.6245	1.2490	0.2723	1.7115	3.1346	3.2295	6.3641	9.5969	4.7984
8	0.6245	0.6245	1.2490	0.2723	1.7115	2.8339	3.5301	6.3641	9.5969	4.7984
9	0.6245	0.6245	1.2490	0.2723	1.7115	2.5053	3.8587	6.3641	9.5969	4.7984
10	0.6245	0.6245	1.2490	0.2723	1.7115	2.1462	4.2179	6.3641	9.5969	4.7984
11	0.6245	0.6245	1.2490	0.2723	1.7115	1.7535	4.6105	6.3641	9.5969	4.7984
12	0.6245	0.6245	1.2490	0.2723	1.7115	1.3244	5.0397	6.3641	9.5969	4.7984
13	0.6245	0.6245	1.2490	0.2723	1.7115	0.8553	5.5088	6.3641	9.5969	4.7984
14	0.6245	0.6245	1.2490	0.2723	1.7115	0.3425	6.0216	6.3641	9.5969	4.7984
15	0.6245	0.6245	1.2490	0.2723	1.7115	-	-	-	3.2328	1.6164
16	0.6245	0.6245	1.2490	0.2723	1.7115	-	-	-	3.2328	1.6164
17	0.6245	0.6245	1.2490	0.2723	1.7115	-	-	-	3.2328	1.6164
18	0.6245	0.6245	1.2490	0.2723	1.7115	-	-	-	3.2328	1.6164
19	0.6245	0.6245	1.2490	0.2723	1.7115	-	-	-	3.2328	1.6164
20	0.6245	0.6245	1.2490	0.2723	1.7115	-	-	-	3.2328	1.6164
21	0.6245	0.6245	1.2490	0.2723	1.7115	-	-	-	3.2328	1.6164
22	0.6245	0.6245	1.2490	0.2723	1.7115	-	-	-	3.2328	1.6164
23	0.6245	0.6245	1.2490	0.2723	1.7115	-	-	-	3.2328	1.6164
24	0.6245	0.6245	1.2490	0.2723	1.7115	-	-	-	3.2328	1.6164
25	0.6245	0.6245	1.2490	0.2723	1.7115	-	-	-	3.2328	1.6164
Levelized	0.6245	0.6245	1.2490	0.2723	1.7115	2.6161	2.5488	5.1649	8.3977	4.1988