AASAL POWER

JAVED SOLAR PARK (PVT) LTD

For info & n.a. pl.
DRO/DR-I
12/11/18

Ref: [JSPL/NEPRA/002/18]

Date: 08th November, 2018

copy to
i. SA (T-I)
ii. LA (KIP)
iii. SA (Tech)
iv. ADG (Lic)
v. Registrar
vi. MF

cc:
- Chairman
- VC/M (Lic)
- M (T)

THE REGISTRAR,
NATIONAL ELECTRICAL POWER REGULATORY AUTHORITY,
NEPRA Tower, Attaturk Avenue (East)
G-5/1, Islamabad

SUBJECT: <u>SUBMISSION OF THE TARIFF PETITION OF 49.5 MWP SOLAR POWER PROJECT OF JAVED SOLAR PARK (PVT) LTD TO BE LOCATED AT LUNI, KULACHI, DISTRICT DERA ISMAIL KHAN, PROVINCE OF KHYBER PAKHTUNKHWA</u>

Dear Sir,

We herewith submit the Company's Tariff Petition along with the fee as determined by the National Electric Power Regulatory Authority (**"NEPRA"** or the **"Authority"**) for kind consideration and favorable approval by the Authority in accordance, inter alia, with section-31 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 read with Rule 3 of the National Electric Power Regulatory Authority (Tariff Standards and Procedure) Rules, 1998 and other applicable provisions of NEPRA law.

1. The Tariff Petition (including its annexures) are submitted in triplicate, together with:

   (a) A Pay Order No. **11886398** dated 30 October 2018 of Habib Metropolitan Bank Ltd amounting to PKR 636,320/- (Pakistan Rupees Six Lac Thirty-Six Thousand Three Hundred and Twenty only) as requisite for fee for Tariff Petition as communicated by NEPRA;

   (b) Extract of Board Resolution of JAVED SOLAR PARK PRIVATE LIMITED; and

   (c) Statement of Authorized Representative of JAVED SOLAR PARK PRIVATE LIMITED, Mr. Abdul Basit Javed.

2. In light of the submissions set out in the Tariff Petition and the information attached to the same, NEPRA is kindly requested to process the Tariff Petition at the earliest, thereby enabling JAVED SOLAR PARK PRIVATE LIMITED to proceed further with the development of the project.

Respectfully submitted for and on behalf of:
JAVED SOLAR PARK PRIVATE LIMITED

....

MR. ABDUL BASIT JAVED
CHIEF EXECUTIVE OFFICER

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Received along with Two Copies and Chq. Rs 636,320/-

REGISTRAR
Dy. No: 11139
Date: 12-11-18

9390
13-11-18

BEFORE THE NATIONAL ELECTRIC POWER REGULATORY AUTHORITY (NEPRA)

PETITION FOR GENERATION TARIFF

UNDER

NEPRA (TARIFF STANDARDS AND PROCEDURE) RULES 1998

In relation to

49.5 MWP SOLAR PV PROJECT

Petitioner

JAVED SOLAR PARK (PRIVATE) LIMITED

Power Purchaser

CENTRAL POWER PURCHASING AGENCY (GUARANTEE) LIMITED (CPPA-G)

Dated November 08, 2018

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LIST OF SCHEDULES

The following documents are appended with the Tariff Petition:

Annexure A Reference Tariff Table

Annexure B Letter of Intent issued by Pakhtunkhwa Energy Development Organization (PEDO) (along with Addendum in LOI for Enhancement of Project Capacity and LOI extension letter) in favour of project sponsors

Annexure C PEDO panel of experts (POE) approval of the feasibility studies

Annexure D Grid Interconnection Study Approval issued by the Peshawar Electric Supply Company (PESCO)

Annexure E Initial Environmental Examination Approval issued by the Directorate of Environmental Protection Agency, Southern Region, D.I. Khan, Forestry, Environment and Wildlife Department, Government of Khyber Pakhtunkhwa

Annexure F Land Allocation and Lease / Ownership Documents

Annexure G Letter of Intent from the Lenders

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1. Regulatory Framework Leading to Tariff Petition

1.1. **Tariff Petition under NEPRA (Tariff Standards and Procedure) Rules 1998 by Javed Solar Park (Private) Limited in relation to a 49.5 MWp Solar PV Power Plant to be set up near Kulachi, D.I. Khan, Khyber Pakhtunkhwa**

1.1.1. Javed Solar Park (Private) Limited (the "**Company**" or the "**Petitioner**") hereby submits its petition for generation tariff (the "**Tariff**") pursuant to the National Electric Power Regulatory Authority (Tariff Standards and Procedure) Rules 1998 (the "**Tariff Rules 1998**") for consideration and determination by the National Electric Power Regulatory Authority (the "**Authority**" or "**NEPRA**") in relation to a 49.5 MWp Solar PV power plant to be set up in Kulachi, D.I. Khan District, Khyber Pakhtunkhwa.

1.1.2. Javed Solar Park (Private) Limited is a special purpose company incorporated for the purpose of setting up, owning and operating a 49.5 MWp Solar PV power project in Kulachi, D.I. Khan, Khyber Pakhtunkhwa (the "**Project**"). The Company intends to sell the electricity generated by the Project to the Central Power Purchasing Agency (Guarantee) Limited ("**CPPAG**").

1.1.3. The Pakhtunkhwa Energy Development Organisation ("**PEDO**") has issued a Letter of Intent dated July 21 2016 (the "**LOI**") to the sponsors of the Company for 3.5 MWp Solar Power Project initially. However the capacity of the project was enhanced to 49.5 MWp and the validity of LOI was further extended pursuant to letter no 22366-69/PEDO/DREAASAL/Kulachi dated November 11, 2018.

1.1.4. The Authority is exclusively responsible for regulating the provision of electric power services and to determine tariffs pursuant to the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 (the "**NEPRA Act**"). Section 7(3) of the NEPRA Act specifically mandates the Authority to determine tariffs and the Tariff Rules 1998 lay down the broad procedural framework for tariff applications and determinations. This petition is being submitted before the Authority pursuant to Section [illegible] and Section 31

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of the NEPRA Act read with Rule 3 of the Tariff Rules 1998 and other enabling provisions of the applicable law and policy.

1.1.5. Pursuant to the Authority's determination No. NEPRA/SPVPGT-2017/2915-2917 dated 3 March 2017 (the "**Solar Determination**"), the upfront tariff regime for solar power projects is no longer available in the foreseeable future. This tariff petition is therefore submitted on a cost-plus basis under the Policy for Development of Renewable Energy for Power Generation of 2006.

1.1.6. The Project is an initiative of AASAL Solar Power (Private) Limited whose major shareholder (95%) is Mr. Abdul Basit Javed. Abdul Basit Javed has played major role in bringing FAS Power Trading Company of Saudi Arabia into Pakistan which is establishing a 50 MWp Solar Power Plant in KPK. Similarly in the past he advised Target Group in developing 50 MWp Kulachi Solar Power Project (Private) Limited.

1.1.7. The sponsors plan to implement the Project under self-EPC mode through direct supervision and management of multiple contractors and consultants for design, supply of equipment and construction, installation and commissioning services. Accordingly this tariff petition is submitted under the Self-EPC mode for implementation of the project.

1.1.8. The Project Company request to allow a levelized tariff of US Cent 7.1454 for the one of the initial Solar PV Projects in the province of KPK and in this regard further submits following facts for the consideration of NEPRA:

i. The Project is based on a Debt mix of 50:50 local and foreign and no indexations are required with regard to change in KIBOR and US Dollar parity with regard to local debt component, as same is based on the SBP RE Financing Facility with fixed mark-up rate of 6%. Accordingly in long run the tariff offered by the Project will be cheaper compare to other solar projects with 100% foreign debt financing.

ii. The Project tariff and underlying IDC calculations are based on the recent LIBOR of 236 basis points compared to recent solar tariff determinations of NEPRA that used LIBOR of 1.694 %.

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iii. The Project is located in north region of Pakistan (as per the upfront tariff determinations issued by NEPRA) that has a lower energy and relatively higher tariff compared to south region projects.

iv. The Project is located in Kulachi KPK and distance from port is comparatively longer than other solar projects in Sindh.

v. Security costs at Project site in D I Khan region will be higher compare to projects in QASPL, Karachi or Sindh.

vi. The Project will contribute in the betterment and development of a less privileged area of Pakistan and will also help in development of skilled labour and infrastructure around the Project site.

vii. Solar energy is environmental friendly that will help addressing current energy shortfall in a shorter construction period compared to other technologies.

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2. The Project & Key Considerations

2.1. The Project

2.1.1. The sponsors of Javed Solar Park (Private) Limited conceived a 49.5 MWp solar power project in order to provide clean energy to the country. The conceived project is one of the first utility scale solar power project in the province of Khyber Pakhtunkhwa and will pave way in the development and mobilization of solar industry in the province.

2.2. Project Sponsors

2.2.1. The Project is an initiative of AASAL Solar Power (Private) Limited whose major shareholder (95%) is Mr. Abdul Basit Javed, a qualified Chartered Accountant, with net worth of 40 million USD. Mr. Abdul Basit owns and manages family properties of agricultural and commercial nature; measuring about 4,000 acres (directly owned by Mr. Abdul Basit) in the province of KPK.

2.2.2. Abdul Basit Javed has played major role in bringing FAS Power Trading Company of Saudi Arabia into Pakistan which is establishing a 50 MWp Solar Power Plant in KPK. Similarly in the past he advised Target Group in developing 50 MWp Kulachi Solar Power Project (Private) Limited.

2.2.3. He has also made his footprints in the energy sector of the country through substantial investment in hydropower sector. His company AASAL owns two hydropower Projects of 6.6 MW and 20.6 MW with approved feasibilities by PEDO where as other four projects of 45 MW, 65 MW, 100 MW and 100 MW respectively are in the LOI stage. The company is therefore successfully managing and developing more than 400 MW with different partners. In solar power industry AASAL has successfully completed bidding in numerous projects of United Nations for Solarization of different units in entire KPK. AASAL has also successfully won the project of Solarization of Quaid E Azam University Islamabad having capacity of 12 MWp.

2.3. Rationale for Solar Power

2.3.1. To ensure a sustainable energy future for Pakistan, it is necessary that the energy sector be accorded a high priority. It is considered that solar power

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generation could become a significant contributor to Pakistan's electricity supply in the near future. The development of solar generation projects supports the environmental objectives of the Government of Pakistan by:

- reducing dependence on fossil fuels for thermal power generation;
- increasing diversity in Pakistan's electricity generation mix;
- reducing greenhouse gas emissions through the avoidance of thermal power generation; and
- helping in the reduction of the exorbitant trade deficit.

2.3.2. National Renewable Energy Laboratory of USA, estimates the solar energy potential of 2.9 million MW in the country. Pakistan being in the sunny belt is ideally located to take advantage of the solar energy technologies. This energy source is widely distributed and abundantly available in the country with about 2500-3000 sunshine hours and 1.9 - 2.3 MWh per m^2 per year. It has an average daily global insulation of 19 - 20 MJ/m2 per day with annual mean sunshine duration of 8 to 8.5 hours a day. These values are among the highest in the world. For daily global radiation up to 23MJ/m2, 24 (80%) consecutive days are available in this area. If harnessed adequately, solar energy would eradicate energy shortages in the country.

2.3.3. The Government of Pakistan has clearly articulated its support for the development of renewable energies. Due to the fact that solar energy is one of the most economical and efficient of renewable energy production techniques, the focus is on supporting the development of solar farms through Independent Power Producers (the Solar IPPs).

2.3.4. The 49.5 MWp Javed Solar Park Project is proposed to fulfil the country's twin imperatives of continuously augmenting generation given increasing electricity demand and to harness indigenous and environmentally friendly energy resources.

2.3.5. It is also important to highlight that utility scale solar projects offers the most efficient solution in bridging the ongoing demand supply gap in the electricity.

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2.4. Project Status

2.4.1. Since the issuance of the LOI by PEDO, Sponsors of the Project have carried out the following development activities:

- Initial energy yield studies
- Execution of agreements for purchase of land
- Preliminary site surveys
- Grid interconnection study
- Environmental impact assessment studies
- Project feasibility
- Preliminary plant design

2.4.2. The Grid Interconnection assessment for the proposed PV plant was undertaken by ARCO energy and completed in January 2018. Pursuant to the letter no. CE (Dev)/933-34 dated 21 February 2018 issued by PESCO (the "**Grid Study Approval**"), the Project has been accorded approval for grid connectivity.

2.4.3. The land for the Project has been selected by the sponsors with intent to minimize additional infrastructural expenditure by PESCO/NTDC. The identified site is adjacent to the 50MWp Kulachi Solar Power Project by Target Group and 50 MWp FAS Energy Pakistan Power Project that shall also be supplying electricity to CPPA-G.

2.4.4. A detailed Initial Environmental Examination ("**IEE**") Report has been prepared Nasir Absar Consulting (Pvt.) Limited, on behalf of the Sponsors, which has been approved by the Directorate of Environmental Protection Agency, Southern Region, D.I. Khan, Forestry, Environment and Wildlife Department, Government of Khyber Pakhtunkhwa ("**KP-EPA**").

2.4.5. As per the IEE Report, the Project has no significant adverse impacts and shall contribute positively to the environment and socioeconomic development of the area. Further, the Project land is marginal in nature with no endangered flora or fauna species in the area. Appropriate measures for environmental monitoring and mitigation have been proposed in the approval issued by the KP-EPA.

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2.4.6. The following table provides a summary of the completed tasks and future Project milestones.

Period	*Tasks*
Completed	✓ Issuance of LOI and incorporation of Project Company
	✓ Identification of Project land and initial yield study
	✓ Grid study approval by PESCO
Completed	✓ Preliminary technical design
	✓ Feasibility Study
	✓ Project land acquisition
	✓ Environmental studies and approval
Submitted	... Tariff submission and approval
	... Generation licence application and approval
After Tariff Determination	☒ Signing of EPA
	☒ Contractor/Supplier negotiation and selection
	☒ Lenders' Due Diligence
	☒ Financial Close
	☒ Commencement of works and supply
	☒ Commissioning of the Project

✓ *Completed* ... *Submitted* ☒ *To be initiated*

2.4.7. The electricity generated through the Project will be sold to Central Power Purchasing Agency Guarantee Limited on behalf of ex-WAPDA distribution companies (the Purchaser) pursuant to the energy purchase agreement (the EPA), which in turn will distribute and modulate the electricity generated by the Project Company.

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2.4.8. The EPA will be finalized and executed by and between the Project Company and the Purchaser and the IA will be finalized and executed by and between the Project Company and the President of the Islamic Republic Pakistan (through AEDB), in each case, following NEPRA's approval of the Project Company's twenty-five (25) years Reference Generation Tariff, the grant of a generation license to the Project Company and after execution of the tripartite LOS with AEDB and PEDO.

2.5. **Project Site**

2.5.1. The location of the Project is accessible through Rawalpindi-Jand-Kohat Road (N-55) at the distance of approximately 430 km from Islamabad and Mianwali-Talagang-Dera Ismail Khan Road at the distance of approximately 440 km from Islamabad. The Project site is located about 24 km south-east from Garwaki and 17 km North-West from Kulachi.

2.5.2. The Project site is approximately a square of around 250 acres in area and is expected to accommodate a total PV capacity of approximately 49.5 MW_P.

2.5.3. The Project site map is shown below.

Location Coordinates of the Proposed Project Location

Latitude (N)	Longitude (E)
31°56'49.48"N	70°16'47.45"E
31°56'50.81"N	70°17'30.54"E
31°56'20.85"N	70°17'30.42"E
31°56'18. 97"N	70°16'51.61"E

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2.6. Estimated Output

2.6.1. The Project's technical consultant carried out evaluation with regard to energy production estimate for the Project, based on:

(a) Resource assessment at the project site
(b) Plant technical specifications;
(c) Project/Site layout.

2.6.2. Solar resource assessment is based on Solargis high-resolution database. The Soalrgis database used for assessment (GHI, DIF, DNI and GTI) is calculated by a suit of solar models, and the data inputs are derived from geostationary meteorological satellites and global meteorological models. (Data calculated from Meteosat MSG IODC and Meteosat MFG IODC satellite data (© 2017 EUMETSAT) and from atmospheric data (Solar Resource: © 2017 ECMWF and NOAA) by Solargis method)

2.6.3. The resource assessment also utilizes meteorological data (TEMP, RH, WS, WD, AP and PWAT) that is processed from the outputs of global meteorological models. All Solargis parameters are validated by quality-controlled ground measurements acquired by high-accuracy meteorological equipment worldwide. The spatial and time resolution of the original input data are harmonized during the model processing to achieve the best possible result. (Metrological Data: Spatially disaggregated from CFSR, CFSv2 and GFS (© 2017 NOAA) by Solargis method)

2.6.4. Satellite-derived monthly GHI and diffuse horizontal irradiation ("DHI") for the Project location, for the period from January 1999 to June 2017, calculated from Meteosat and GOES (Geostationary Operational Environmental Satellite) which has a resolution of approximately 250 m (SolarGIS). This data set is considered to be the most representative for the site location and is used for energy assessment.

2.6.5. The resource assessment was than modelled for 49.5 MWp installed with single axis tracker system and crystalline modules at project site (Kulachi).

2.6.6. The summary of the results is as follows:

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Gross DC Capacity	49.5 MWp
Net Capacity Factor	19.54 %
Annual Energy Generation	84,724 MWh

2.7. Equipment Details

2.7.1 After a consummate search and elaborated analysis, the following equipment has been selected for the Project:

A- PV Modules

Manufacturer	JA Solar
Type	Poly-crystalline
Model	JAP6(T)
Number Of Modules	215,220 pcs
Total Installed Capacity	49.5 MWp

Certifications & tests: JAP6 (T) modules have passed following performance and quality tests;

- ISO 9001:2008, ISO 14001:2004, BS OHSAS18001 certified factory
- IEC 61215, IEC 61730 certified product

B- PV Inverter

Manufacturer	TBEA Xian Electric
Model	TC500KH
Number Of Inverters	95 Central Inverters
Maximum DC Input Power	567 KW
Rated Output Power	550 KW

The selected PV Inverter provides maximum system efficiency up to 99%.

2.7.2. The Company intends to install cutting-edge tracking technology at the Project. Besides being one of the few solar plants in Pakistan to showcase single-axis trackers, the Project shall also provide a higher plant factor and higher energy output to the purchaser. Importantly, the yield curve from the tracking plant will be flatter and more attuned to grid requirements compared to a fixed system.

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3. Project Cost

3.1. Details of Project Cost

3.1.1 The total Project Cost, expressed in United States Dollars, has been calculated after thorough analysis, evaluation and understanding of the dynamics that affect the development and operation of a solar PV project. The reference exchange rates used to convert the relevant costs into United States Dollars are USD 1 = PKR 115 which shall be adjusted at actuals, at the time of COD wherever applicable.

3.1.2 The breakup of the Project Cost is summarized as follows:

	US$ million	Rs. million
EPC cost	40.59	4,668
Project development cost	3.66	421
Financing Cost	1.38	158
Insurance During Construction	0.20	23
Interest during Construction	1.04	119
Land Cost	0.93	107
Capitalized Degradation @3.62%	1.47	169
Total Project Cost	**49.27**	**5,666**

3.2. Details of Proposed Project Cost

3.2.1. Engineering, Procurement and Construction (EPC) cost

3.2.1.1 The proposed EPC cost for the project is USD 49.27 Million (USD 0.995 Million/MW), for the first IPP solar project in KPK and keeping in view its location, access and security concerns as discussed in preceding paragraphs. In this regard we refer NEPRA's determination # NEPRA/TRF-403/GSPL-2017/1190-1192 dated 25 January 2018 under which an EPC cost of 0.750 (US$ Million/MW) has been allowed to Gharo Solar (Pvt.) Limited (GSPL) that is a 50 MWp utility scale project located in K-Electric territory Gharo Sindh.

3.2.1.2 It is submitted that GSPL is located near Karachi where all the facilities, access roads, skilled labour are available, while Javed Solar Park Project is located in Dera Ismail Khan, KPK. The major factors that have impact on the Project's EPC cost compared to Solar projects in Sindh are discussed hereunder:

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- The project site is substantially distant from the port resulting in higher transportation cost;
- Availability of skilled labour in the Project's region is limited
- Security cost due to law and order situation in the area is comparatively high.

EPC Cost is based on the Self-EPC mode, similar to GSPL EPC structure, and include the cost of supply of equipment i.e. cost of PV Modules, PV inverters, electrical equipment, together with ancillary equipment and other goods, systems and machinery. It will also include the cost of construction, installation and commissioning including the cost of erection, testing, completion and commissioning of the equipment and construction of the facility that is capable of fulfilling the intended purpose. Staff accommodation (construction of container type houses), supply of drinking water and electricity (to container houses), catering services for the staff, certain project vehicles, standby generator (including fuel), site security during construction period and internal access roads etc.

3.2.1.3 Cost of project design services including all the cost associated with conceptual design of the plant including design of mechanical, electrical and civil works for the project will also form part of EPC cost.

3.2.1.4 Breakup of EPC cost is given hereunder;

Item	Cost/MWp (USD million)	Total Cost (USD Million)
PV Modules	0.340	16.83
PV Inverters	0.060	2.97
Civil Works & Mounting Structures	0.300	14.85
Others	0.120	5.94
Total	**0.820**	**40.59**

3.2.1.5 In order to justify above costs, the petitioner submits the following for the consideration of the Authority;

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PV Module Cost

The Project Company strongly believes that it would be able to procure PV modules at USD 0.34 million per MWp and the same cost is proposed for approval of the authority. It is also submitted that the above proposed cost does not include transportation cost from sea port to the Project Site that is claimed under the head "Others" described in the forthcoming sections.

PV Inverter and Other Cost

In respect of proposed PV inverter cost we would like to highlight the Bloomberg New Energy Finance (BNEF) forecast in Q4 2017 report provided following breakdown of the EPC costs:

TABLE-1

Year (US$ M/ MW) Utility Scale Projects	2016	2017
Module	0.48	0.35
Inverter	0.07	0.06
Balance of plant	0.20	0.20
Engineering, procurement & construction	0.26	0.25
Other	0.12	0.12
System cost	**1.14**	**0.98**

**Source: 4Q 2017 global PV market outlook – Bloomberg New Energy Finance*

According the Petitioner claims a cost of USD 0.06 million per MWp for PV inverters in line with the prevailing market conditions and recent determinations by NEPRA (dated 25th January 2018) for similar solar power projects. The transportation cost for these items is included under the head "Others".

Civil Works & Mounting Structure

In order to justify proposed cost for civil works & mounting structures we would like to draw the Authority's attention towards recent determination for GSPL whereby cost of USD 0.25 Million per MWp is allowed for Civil Works & Mounting Structures. Since the project site has different characteristics as

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compared to GSPL demanding higher cost under this head, particularly pertaining to the security of the staff as the site is located in a high security zone. Project Company assumes that foolproof security will be provide to the Project staff, particularly the foreign staff; involved in the construction and operations of the Project which will result in high level security arrangements costs. Project Company believes that it is appropriate to demand cost of USD 0.30 Million per MWp to complete the civil works and mounting structures.

Others

All other costs ancillary to the EPC costs have been clubbed under this head. NEPRA, in its recent determinations dated 25th January 2018 for similar solar power projects in the Province of Sindh, has allowed a cost of USD 0.10 million per MWp. However, keeping in view the distance from sea port and security concerns in the project area, the Project company requests the Authority to allow a reasonable cost of USD 0.12 million per MWp for the Project.

EPC Margin

Based on the experience of the Project Sponsors, the Petitioner intends to carry out the Project under self-EPC mode hence EPC margin is not included in the Project Cost. For projects under outsourced EPC contracting approach, NEPRA has allowed EPC Contractors' margin of 10% in its determination of Upfront Tariff for Solar projects numbered NEPRA/UTS-2015/17871-17874 dated December 16, 2015. Similarly in recent determinations of NEPRA dated January 25, 2018 it has ensured to provide a reasonable amount of profits to the EPC Contractors. However, since the Project Company is carrying out the project in self-EPC mode, it has not proposed any EPC margin in its cost and expect the benefit of saving from this shall be pass on to the end consumers.

3.2.2. **Project Development Cost**

3.2.2.1. The Company has budgeted the Project Development Cost (Non-EPC cost) of USD 3.67 Million.

3.2.2.2. Project Development Cost comprise of cost of project sponsor / owner's engineers and supervision, including technical and financial feasibility study, grid interconnection study, IEE report, geotechnical investigation, fees of

technical, legal and financial consultants for the sponsor, independent engineers under EPA and government agencies applicable fees. It also covers security cost of the team, related travelling expenses and administrative cost incurred to date and to be incurred by the sponsor prior to COD.

3.2.2.3. The Petitioner proposes the total project development cost of US$ 3.67 million (US$ 0.074 million/MWp). The Petitioner submits that proposed project development cost may be allowed keeping in view distant location, security concerns and being a Project to be located in an underdeveloped region of KPK.

3.2.2.4. Any governmental fees, levies and charges in excess of what is prescribed at the time of this petition shall be treated as "pass-through" to the power purchaser.

3.2.3. **Cost of Land**

3.2.3.1. The Project site consists of approximately 250 acres of land area. The Project Company has acquired the project land.

3.2.4. **Custom Duties, Local Withholding Taxes & Others**

3.2.4.1. In accordance with Section 18 (1A) of the Custom Act, 1969 read with Serial 11 to the Part I of' Fifth Schedule of the Customs Act, 1969 (the Schedule), custom duties have been assumed to be zero percent (0%). However, in case duties and taxes of such nature are imposed, they will accordingly be treated as pass through and claimed at the time of COD true-up.

3.2.5. **Lenders' Fees & Charges**

3.2.5.1. Financing Fee and Charges include the costs related to the debt financing of the Project. Such costs include, inter alia, the lenders' up-front fee and commitment fee; mandate and processing fee, fees payable, and stamp duty applicable on the financing documents; agency fee; security trustee fee; lenders' Project monitoring fee and the fees for the lenders' various advisors.

3.2.5.2. In the recent determinations by NEPRA (dated 25th January 2018), the authority has allowed financing fee and charges at 2.5% however the petitioner requests the authority to allow 3.1% financing fee and charges keeping in view the fact

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that it will be first solar project in KPK and related cost of travelling & security of lender's advisors will be comparatively higher compare to other projects.

3.2.5.3. The Petitioner requests NEPRA that as it has not considered any duties and taxes on account of Financial Fees and Charges, any duties and taxes if applicable on account of these costs may kindly be allowed as adjustment for actual cost at the time of COD.

3.2.6. **Pre-COD Insurance**

3.2.6.1. This will cover the cost of insurances of the solar power complex during the construction phase (prior to COD). The Petitioner, as per the norm of Pakistan power market while also complying with lender's requirements, will procure the following insurances during the construction phase of the project:

- Erection All Risk Insurances (EAR);
- EAR Delay in Start-up Insurance
- Marine and Inland Transit Insurance;
- Marine - Delay-In Startup Insurances; and
- Terrorism Insurance

3.2.6.2. Under this head, a total of USD 0.203 million is included in the project cost at benchmark insurance rate of 0.5% of EPC cost as allowed by the authority in its recent tariff determination for solar power projects (dated 25th January 2018). The proposed amount does not include Federal Excise Duty (FED), which is requested to be trued up at actuals, at the time of COD. The petitioner requests the Authority to permit insurance during construction at the benchmark rate of 0.5 % of EPC, to be adjusted at the time of COD

3.2.7. **Interest During Construction (IDC)**

3.2.7.1. The Interest During Construction (the IDC) of USD 1.04 million has been calculated, based on mix of foreign and local debt; on the basis of 3 months Base LIBOR plus a margin of 4.25% basis points and fixed rate of 6% under SBP RE refinancing facility for foreign and local debt components respectively while assuming a construction time of ten (10) months.

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3.2.7.2. This item is proposed to be adjusted at actual at the time of IDC true-up on the basis of actual debt drawdown, revised quarterly LIBOR rates and actual Rs to US$ exchange rate wherever applicable.

3.2.8. **Construction Time**

3.2.8.1. The construction time is proposed to be ten (10) months and IDC has been computed accordingly.

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4. Assumptions on Capital Structure And Financing Costs

4.1. Capital Structure of the Project

4.1.1. The total cost of the project will be US$ 49. 27 million with the proposed capital structure comprising of 80% debt and 20 % equity, with a total debt component of US$ 39.42 million and a total equity component of US$ 9.85 million. This is tabulated below:

Description	US$ million
Equity	**9.85**
Debt – Local	**19.71**
Debt – Foreign	**19.71**
Project Cost	**49.27**
Debt: Equity Ratio	80:20

4.2. Assumptions on Financing Costs

4.2.1. Debt funding mix is 50:50 foreign and local debt.

4.2.2. The repayment period of the loan is set at 12 years (including 1-year grace period) based on the requirements of SBP RE Refinancing Facility while the tenor of 14 years (including 1-year grace period) has been assumed for the foreign component of the debt.

4.2.3. The principal amount of the loan/facility will be repaid quarterly in equal instalments.

4.2.4. The interest payable on the loan is has been calculated, based on mix of foreign and local debt; on the basis of 3 months Base LIBOR plus a margin of 425 basis points for foreign loan and fixed rate of 6% (under SBP RE Refinancing Facility) on the local loan. The Company shall be entitled to receive the benefit of any cost savings in this regard in the ratio of 40:60 between the Company and the CPPAG/consumers, in case the final agreed spread is further reduced from proposed 4.25% for foreign debt component or in case the Company is able to negotiate a lower fixed rate (i.e. below 6%) on the local component of the loan under the SBP RE Refinance Facility.

4.3. Return on Equity

4.3.1. The Company is aware that the Authority has reduced an IRR from 17% to 15% in recent cases, however the Company would like to highlight that the risk

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associated with this project site is high as compared to other solar project, chiefly due to its proximity to FATA and considering the fact that no solar project has to date been commissioned in the Khyber Pakhtunkhwa province. Given the risks of being the first solar power project in Khyber Pakhtunkhwa province, it may be justified that a higher IRR should be awarded than that awarded to projects in other parts of the country.

4.3.2. However in view of the recent determinations by NEPRA, the Project Company is claiming an IRR of 15% based on which RoE component has been computed.

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5. Operations and Maintenance Costs & Post COD Insurance

5.1. The Tariff is based on annual O&M cost of USD 15,000 per MW per year. Project Company has proposed a conservative amount, since a tracking system is typically expected to have higher operating costs due to motors and other rotating parts. Furthermore the proposed O&M cost is in line with NEPRA's determination # NEPRA/TRF-403/GSPL-2017/1190-1192 dated 25 January 2018; where similar O&M cost was allowed based on similar technology.

5.2. Further, since insurance post COD is not included within the O&M cost, there will need to be separate true-ups or adjustment on this account subject to the maximum of 0.5% of EPC cost.

5.3. It is also highlighted that the Project size is relatively small and Project Company does not benefit from the very substantial economies of scale in O&M costs available to large solar plants. For example, if the Project is compared to a solar plant of 100 MWp, the operational manpower requirements for both plants will be almost same and so the larger plant will effectively have close to half the O&M cost per MW to that of the Project Company.

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6. INDEXATIONS, ESCALATIONS AND COST ADJUSTMENT

6.1. NEPRA is requested to allow indexation for the various Reference Generation Tariff components in the following manner.

6.2. **Fixed O&M (Local) Cost Component**

6.2.1. The Reference Fixed O&M (Local) Cost Component shall be quarterly indexed to the WPI of manufacturing in Pakistan, as notified by the Federal Bureau of Statistics based on the following formula:

$$\text{Fixed O\&M}_{(LRev)} = \text{Relevant Reference Generation Tariff Component} * (WPI_{(Rev)} / WPI_{(Ref)})$$

Where:

$FO\&M_{(LRev)}$ = the revised Fixed O&M (Local) Cost Component applicable for the relevant quarter.

$WPI_{(Rev)}$ = the revised WPI of manufacturing in Pakistan for the month prior to the month in which indexation is applicable, as notified by the Federal Bureau of Statistics.

$WPI_{(Ref)}$ = the WPI of manufacturing in Pakistan for the month in which tariff is determined, as notified by the Federal Bureau of Statistics.

6.3. **Fixed O&M (Foreign - USD) Cost Component**

6.3.1. The Reference Foreign Fixed O&M (Foreign - USD) Cost Component shall be quarterly indexed to both:

(a) the USD/PKR exchange rate, based on the revised TT & OD selling rate of USD notified by the National Bank of Pakistan; and

(b) the US CPI (for all Urban-consumers), issued by the US Bureau of Labor Statistics.

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6.3.2. The applicable formula shall be as follows:

$$FO\&M_{(FUSD-Rev)} = \text{Relevant Reference Generation Tariff Component} * (US\ CPI_{(Rev)} / US\ CPI_{(Ref)}) * (FX\ USD_{(Rev)}/115)$$

Where:

$FO\&M_{(FUSD-Rev)}$	=	the revised Foreign O&M (Foreign – USD) Cost Component, applicable for the relevant quarter
$US\ CPI_{(Rev)}$	=	the revised US CPI (for all Urban-consumers) for the month prior to the month in which indexation is applicable, issued by US Bureau of Labor Statistics.
$US\ CPI_{(Ref)}$	=	the US CPI (for all Urban-consumers) for the month in which tariff is determined, as issued by US Bureau of Labor Statistics.
$FX\ USD_{(Rev)}$	=	the revised TT & OD selling rate of PKR/USD as on the date on which indexation is applicable, as notified by the National Bank of Pakistan.

6.4. **Insurance Cost**

6.4.1. The Reference Insurance Cost Component shall be quarterly indexed to USD/PKR exchange rate, based on the revised TT & OD selling rate of USD notified by the National Bank of Pakistan.

(a) Indexation Formula

6.4.2. The indexation of the Insurance Cost Component shall be based on the following formula:

$$Insurance_{(Rev)} = \text{Relevant Reference Generation Tariff Component} * (FX\ USD_{(Rev)} / 115)$$

Where:

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$Insurance_{(Rev)}$ = the revised Insurance Cost Component applicable for the relevant quarter.

$FX\ USD_{(Rev)}$ = the revised TT & OD selling rate of PKR/USD as on the date on which indexation is applicable, as notified by the National Bank of Pakistan.

Adjustment Formula

6.4.3. The adjustment of the Insurance Cost Component for increase in insurance premium shall be based on the following formula:

$$Insurance_{(Adj)} = \text{Relevant Reference Generation Tariff Component} * (P_{(Act)} / P_{(Ref)})$$

Where:

$Insurance_{(Adj)}$ = the revised Insurance Cost Component applicable for the relevant year.

$P_{(Act)}$ = Actual Insurance Premium or [ ]% of the EPC Price whichever is lower.

$P_{(Ref)}$ = Reference Insurance Premium of [ ] ([ ] % of the EPC Price).

6.5. Return on Equity

6.5.1. In line with NEPRA's previous determinations for thermal IPPs and the RE IPPs, the ROE Component of the Reference Generation Tariff shall be quarterly indexed to the USD/PKR exchange rate, based on the revised TT & OD selling rate of USD notified by the National Bank of Pakistan.

6.5.2. The applicable formula shall be as follows:

$$ROE_{(Rev)} = \text{Relevant Reference Generation Tariff Component}* (FX\ USD_{(Rev)}/115)$$

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Where:

$ROE_{(Rev)}$	=	the revised ROE component applicable for the relevant quarter.
$FX\ USD_{(Rev)}$	=	the revised TT & OD selling rate of PKR/USD as on the date on which indexation is applicable, as notified by the National Bank of Pakistan.

6.6. Principal Component (Foreign)

6.6.1. The Reference Principal Component (Foreign) shall be quarterly indexed to USD/PKR exchange rate, based on the revised TT & OD selling rate of USD notified by the National Bank of Pakistan.

6.6.2. The applicable formula shall be as follows:

$PRIN_{(FRev)}$ = Relevant Reference Generation Tariff Component * (FX $USD_{(Rev)}$ / 115)

Where:

$PRIN_{(FRev)}$ =		the revised Principal Component (Foreign) applicable for the relevant quarter.
$FX\ USD_{(Rev)}$=		the revised TT & OD selling rate of PKR/USD as on the date on which indexation is applicable, as notified by the National Bank of Pakistan.

6.7. Interest Charges (Foreign)

6.7.1. The Interest Charges (Foreign) part of the Reference Debt Service Component shall be quarterly adjusted for variations in interest rate as a result of variation in 3 months LIBOR & foreign exchange fluctuations in the PKR / USD exchange rate.

6.7.2. The Interest Charges (Foreign) of the Debt Service Component shall be indexed based on the following formula:

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$I_{(Rev)}$ = Relevant Generation Tariff Component * (LIBOR$_{(Rev)}$ + 4.25%) / (LIBOR $_{(Ref)}$ + 4.25%)* (FX USD$_{(Rev)}$ /115)

Where:

$I_{(Rev)}$	=	the revised Interest Charge component applicable for the relevant quarterly period.
Libor$_{(Rev)}$	=	the revised 3 month LIBOR rate at the end of each 3 months period.
Libor$_{(Ref)}$	=	3 month LIBOR rate prevailing on the date of tariff determination.
FX USD$_{(Rev)}$	=	the revised TT & OD selling rate of PKR/USD as on the date on which indexation is applicable, as notified by the National Bank of Pakistan.

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7. TARIFF SUMMARY

7.1. Based on the submission highlighted above a tariff of Rs 8.2125 per kWh or US Cents 7.1454 per kWh has been proposed. The proposed tariff figures as indicated below are the results of a detailed financial analysis:

Year	O&M (Local)	O&M (Foreign)	Insurance	ROE	Debt Repayment	Total Tariff	Total Tariff
	PKR/kWh	PKR/kWh	PKR/kWh	PKR/kWh	PKR/kWh	PKR/kWh	US¢/kWh
1-11	0.5039	0.5039	0.2755	2.1317	6.4225	9.8376	8.5495
12-13	0.5039	0.5039	0.2755	2.1317	3.0829	6.4979	5.6471
14-25	0.5039	0.5039	0.2755	2.1317	-	3.4150	2.9679
LEVELIZED TARIFF						8.2173	7.1454

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8. General Assumption

The following have been assumed while calculating the Reference Generation Tariff and changes in any of these assumptions will result in changes in the Reference Generation Tariff:

8.1. Debt to Equity ratio is assumed to be 80 to 20;

8.2. indexation against PKR / USD variations will be permitted for debt servicing payments to be made for settlement of foreign source debt;

8.3. exchange rate have been assumed to be: PKR 115 /USD;

8.4. any taxes federal, provincial, local or district, stamp duties and levies etc. which are not factored in the tariff calculation shall be treated as pass through items, in terms of the EPA;

8.5. no customs duties and income tax have been considered for imports. Any changes in the customs duties or any other duty or tax on import of equipment and material will be treated as "pass through" to the Purchaser. Similarly, customs duties on spare parts after COD will be "passed through" to the Purchaser;

8.6. any change in the existing structure of sales tax that results in negative impact on project is assumed to be adjusted in tariff at COD;

8.7. deduction of withholding tax is assumed only in the On-Shore Contract. No withholding tax has been considered in the Off- Shore Contract. Any additional tax, if levied, will be "pass through" to the Purchaser;

8.8. 7.5% withholding tax on dividend is assumed. Any changes in the aforesaid withholding tax regime will be "pass through" to the Purchaser;

8.9. the Zakat deduction on dividends (currently @ 2.5%), as required to be deducted under Zakat Ordinance, is to be considered as "pass through";

8.10. Sindh Infrastructure Development Surcharge on the imports for the Project has not been assumed and shall be treated as "pass through" to the Purchaser;

8.11. Federal Excise Duty has not been assumed as part of the Project Cost; in case the same is required to be paid by the Project, the same should be treated as pass-through under the tariff;

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8.12. the Purchaser shall be exclusively responsible for the financing of construction, operation and maintenance of the interconnection and transmission lines as per the prevailing policy at the time of tariff determination;

8.13. Main Energy meter will be provided by the Purchaser at its own cost;

8.14. financing terms are based on the initial discussion with the financial institutions and hence are subject to final negotiations once tariff has been determined by NEPRA and the EPA / IA are signed. This will include mainly the debt-equity ratio, grace period and loan repayment term, benchmark index (LIBOR/KIBOR) and the spread margin of the financial institution;

8.15. pre-COD insurance costs are considered based on the estimates in line with market rates and Group's strengths. Premium rate for the insurance arrangements will be finalized at the time of financial close;

8.16. no hedging cost is assumed for exchange rate fluctuations during construction and all cost overruns resulting from variations in the exchange rate during construction shall be included in the Project Cost.;

8.17. project contingency and maintenance reserves are not included in Reference Generation Tariff calculations. If required by lenders, these will be adjusted accordingly in the Reference Generation Tariff;

8.18. any other assumptions that are not expressly stated herein but are based on the EPA draft negotiated by the Project Company with the Purchaser. Consequently, any change in any such assumptions may lead to change in the Reference Generation Tariff;

8.19. the payments to Workers Welfare Fund and Workers Profit Participation Fund have not been accounted for in the Project budget and have been assumed to be reimbursed at actual by the Purchaser;

8.20. insurance during operations will be allowed annually by NEPRA subject to the maximum cap of 0.75% of EPC cost; and

8.21. any incentives given to any other solar IPP shall also be given to Javed Solar Park (Private) Limited.

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9. Relief Sought

9.1. In light of the foregoing submissions, The Company requests and submits to the learned Authority to kindly approve the proposed generation tariff together with the pertinent indexations to remain effective for a period of 25 years from the date of COD.

9.2. The Company would be pleased to provide any further information, clarification or explanation that may be required by the Authority during its evaluation process.

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For and on behalf of

JAVED SOLAR PARK (PRIVATE) LIMITED

Abdul Basit Javed

Director and CEO

JAVED SOLAR PARK (PVT) LTD. JSP

Annexure A Reference Tariff Table

Year	O&M (Local)	O&M (Foreign)	Insurance	ROE	Loan Repayment	Interest Payment	Total Tariff	Total Tariff
	PKR/kWh	PKR/kWh	PKR/kWh	PKR/kWh	PKR/kWh	PKR/kWh	PKR/kWh	US¢/kWh
1	0.5039	0.5039	0.2755	2.1317	3.1216	3.3009	9.8376	8.5544
2	0.5039	0.5039	0.2755	2.1317	3.3218	3.1007	9.8376	8.5544
3	0.5039	0.5039	0.2755	2.1317	3.5348	2.8877	9.8376	8.5544
4	0.5039	0.5039	0.2755	2.1317	3.7616	2.6610	9.8376	8.5544
5	0.5039	0.5039	0.2755	2.1317	4.0029	2.4197	9.8376	8.5544
6	0.5039	0.5039	0.2755	2.1317	4.2597	2.1628	9.8376	8.5544
7	0.5039	0.5039	0.2755	2.1317	4.5331	1.8895	9.8376	8.5544
8	0.5039	0.5039	0.2755	2.1317	4.8240	1.5986	9.8376	8.5544
9	0.5039	0.5039	0.2755	2.1317	5.1336	1.2889	9.8376	8.5544
10	0.5039	0.5039	0.2755	2.1317	5.4632	0.9593	9.8376	8.5544
11	0.5039	0.5039	0.2755	2.1317	5.8140	0.6086	9.8376	8.5544
12	0.5039	0.5039	0.2755	2.1317	2.7718	0.3111	6.4979	5.6504
13	0.5039	0.5039	0.2755	2.1317	2.9597	0.1233	6.4979	5.6504
14	0.5039	0.5039	0.2755	2.1317	0.0000	0.0000	3.4150	2.9696
15	0.5039	0.5039	0.2755	2.1317	0.0000	0.0000	3.4150	2.9696
16	0.5039	0.5039	0.2755	2.1317	0.0000	0.0000	3.4150	2.9696
17	0.5039	0.5039	0.2755	2.1317	0.0000	0.0000	3.4150	2.9696
18	0.5039	0.5039	0.2755	2.1317	0.0000	0.0000	3.4150	2.9696
19	0.5039	0.5039	0.2755	2.1317	0.0000	0.0000	3.4150	2.9696
20	0.5039	0.5039	0.2755	2.1317	0.0000	0.0000	3.4150	2.9696
21	0.5039	0.5039	0.2755	2.1317	0.0000	0.0000	3.4150	2.9696
22	0.5039	0.5039	0.2755	2.1317	0.0000	0.0000	3.4150	2.9696
23	0.5039	0.5039	0.2755	2.1317	0.0000	0.0000	3.4150	2.9696
24	0.5039	0.5039	0.2755	2.1317	0.0000	0.0000	3.4150	2.9696
25	0.5039	0.5039	0.2755	2.1317	0.0000	0.0000	3.4150	2.9696
						AVERAGE TARIFF	**6.4876**	**5.6414**
						LEVELIZED TARIFF	**8.2173**	**7.1454**