



Registrar

National Electric Power Regulatory Authority

Islamic Republic of Pakistan

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No. NEPRA/R/TRF-454/JSPL-2018/6057-6059
February 21, 2020

Subject: Determination of National Electric Power Regulatory Authority in the matter of Tariff Petition filed by M/s. Javed Solar Park (Private) Limited for Determination of Generation Tariff in respect of 49.50 MWp Solar Power Project (Case No. NEPRA/TRF-454/JSPL-2018)

Dear Sir,

Please find enclosed herewith the subject Determination of the Authority along with Annex-I, II & III (24 pages) in Case No. NEPRA/TRF-454/JSPL-2018.

2. The Determination is being intimated to the Federal Government for the purpose of notification in the official gazette pursuant to Section 31(7) of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997.

3. Order of the Authority along with Annex-I, II & III of the Determination are to be notified in the official Gazette.

Enclosure: As above

(Syed Safeer Hussain)

Secretary
Ministry of Energy (Power Division)
'A' Block, Pak Secretariat
Islamabad

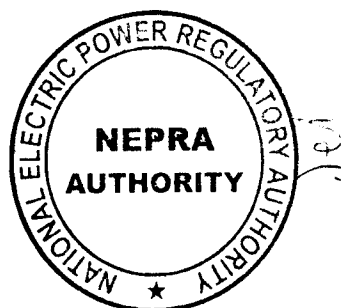
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1. Secretary, Cabinet Division, Cabinet Secretariat, Islamabad.
2. Secretary, Ministry of Finance, 'Q' Block, Pak Secretariat, Islamabad.

DETERMINATION OF NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
IN THE MATTER OF TARIFF PETITION FILED BY M/S JAVED SOLAR PARK (PRIVATE) LIMITED
FOR DETERMINATION OF GENERATION TARIFF IN RESPECT
OF 49.50 MWp SOLAR POWER PROJECT

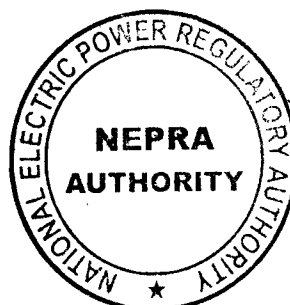
1. M/s Javed Solar Park (Pvt.) Limited (JSPPL or the petitioner/company) filed a tariff petition before National Electric Power Regulatory Authority (NEPRA/the Authority) on November 08, 2018 for determination of generation tariff in respect of its 49.50 MWp solar PV power project (project) to be set up at D.I. Khan, Khyber Pakhtunkhwa. The said petition was filed by JSPPL under Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 (the NEPRA Act), NEPRA (Tariff Standards & Procedure) Rules, 1998 (Tariff Rules) and other applicable provisions of NEPRA laws. The petitioner requested for the approval of leveled tariff of US Cents 7.1454/kWh over the tariff control period of 25 years.
2. The petitioner submitted that it was issued Letter of Interest (LOI) under the Government of Pakistan's Policy for Development of Renewable Energy for Power Generation, 2006 (GOP RE Policy, 2006) on July 21, 2016 by Pakhtunkhwa Energy Development Organization (PEDO), Government of Khyber Pakhtunkhwa (GOKPK) for development of 3.5 MW solar park. Subsequently, PEDO vide addendum to the said LOI on October 24, 2018 enhanced the project capacity from 3.5 MW to 49.5 MW upon recommendation of the Panel of Experts (POE). JSPPL informed that PEDO vide its letter dated November 07, 2018 decided to grant a day-to-day extension in the validity of project's LOI till the time its Grid Interconnection Study (GIS) is approved by National Transmission and Despatch Company Limited (NTDCL) and subsequently the project company obtains Letter of Support (LOS) from Alternative Energy Development Board (AEDB). The certificate of incorporation of the company dated May 16, 2018 issued by Securities and Exchange Commission of Pakistan (SECP) has also been submitted by the petitioner along with the petition. The petitioner has also submitted a letter of PEDO dated November 07, 2018 providing that Panel of Experts (POE) has reviewed and approved the technical feasibility study of the project.
3. Summary of the key information as provided by the petitioner is as follows:

Project company	:	Javed Solar Park (Pvt.) Ltd.
Sponsors	:	AASAL Solar Power (Pvt) Ltd & Abdul Basit Javed
Capacity	:	49.50 MWp
Project location	:	D. I. Khan, Khyber Pakhtunkhwa



Land area	:	250 Acres
Concession period	:	25 years from Commercial Operations Date (COD)
Purchaser	:	Central Power Purchasing Agency (Guarantee) Ltd.
PV modules	:	JA Solar's JAP6 (T) Polycrystalline
Inverter	:	TBEA Xian Electric TC500KH
Construction period	:	10 months
Plant capacity factor	:	19.43%
Annual Energy production	:	84.724 GWh at P90
Project cost		USD million
EPC cost	:	40.590
Pre-COD insurance	:	0.200
Project Development Cost	:	3.660
Land	:	0.930
Financial Charges	:	1.380
Interest during construction	:	1.040
Total project cost	:	47.800
Financing structure	:	Debt: 80% : Equity: 20%
Debt composition	:	50% Foreign loan 50% Local loan
Interest rate	:	Foreign: 3 month LIBOR + 4.25% Local: 6% fixed rate State Bank of Pakistan
Debt tenure	:	SBP : 12 years Foreign: 14 years
Return on equity	:	15%
Annual O&M cost	:	USD 15,000 per MW per annum
Tariff:		Rs./kWh US Cents/kWh
Levelized	:	8.2173 7.1454
Exchange rate	:	1 USD = PKR 115

4. In accordance with Rule 4 of Tariff Rules, the tariff petition was admitted by the Authority on December 10, 2018. Notice of Admission/Hearing was published in the daily national newspapers on January 16, 2019 stating hearing date as January 30, 2019 while also providing salient features of the petition, issues framed for hearing and invitation for filing comments/intervention request from the interested parties. Individual Notices of Admission and Hearing were sent to the stakeholders, considered relevant by NEPRA, and to the



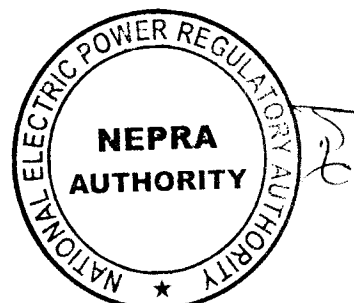
petitioner on January 28, 2019 for participation in the hearing. Tariff petition and Notice of Admission/Hearing were also hosted on NEPRA's website for information of general public.

5. Following issues were framed by the Authority for the hearing:

- Whether the claimed EPC cost is competitive, comparative and based on the firm and final agreement(s)?
- Whether the NEPRA (Selection of EPC Contractor by IPPs) Guidelines, 2017 have been fully complied with?
- Whether the details provided for Non-EPC cost are sufficient and claimed Non-EPC cost is justified? Also provide justification for land requirement as claimed by the petitioner?
- Whether the claimed O&M costs are justified?
- Whether the claimed insurance during operation cost is justified?
- Whether the claimed return on equity is justified?
- Whether the claimed financing/debt terms are justified?
- Whether the claimed annual energy generation and corresponding plant capacity factor are reasonable and justified?
- Whether the petitioner's proposed solar modules technology satisfies the international standards of quality and operation?
- Whether the claimed construction period is justified?
- Whether the project grid interconnection study is approved by the relevant organization(s) and whether NTDCL has issued power evacuation certificate?
- Any other issue with the approval of the Authority

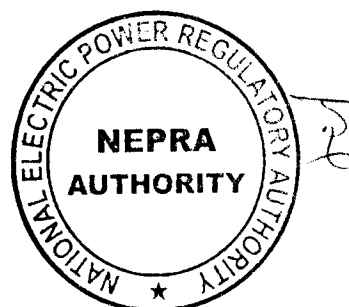
6. The hearing was held on January 30, 2019 (Wednesday) at NEPRA Tower, Ataturk Avenue, G-5/1, Islamabad which was attended by a number of participants including the petitioner, representatives of Punjab Power Development Board (PPDB), PEDO, GOKPK and other stakeholders. No comments or intervention request were received from any stakeholder on subject matter.

7. The issue wise submissions of the petitioner and the Authority's findings and decision thereon are as under.



8. **Whether the claimed EPC cost is competitive, comparative and based on the firm and final agreement(s) and
Whether the NEPRA (Selection of EPC Contractor by IPPs) Guidelines, 2017 have been fully complied with?**

- 8.1 The petitioner has claimed USD 40.59 million on account of Engineering Procurement and Construction (EPC) cost. On a per MW basis, the claimed EPC cost comes out to be around USD 0.820 million.
- 8.2 The petitioner submitted that this claim includes the cost of supply of equipment i.e. cost of PV modules, inverters, electrical equipment, together with ancillary equipment and other goods, systems and machinery. It also includes 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. The petitioner further submitted that claimed EPC includes cost related to 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. Moreover, it includes 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.
- 8.3 The petitioner submitted that this project is the first solar project being developed in province of KPK. JSPPL submitted that when compared to solar projects in Sindh, its project site is substantially distant from the port resulting in higher transportation cost, availability of skilled labour in the project's region is limited and security cost is higher due to unstable law and order situation in the area.
- 8.4 During hearing, the petitioner apprised the Authority that since the project company is having a self EPC arrangement so NEPRA (Selection of EPC Contractor by IPPs) Guidelines, 2017 does not apply on it.
- 8.5 The Authority has noted that one of the comparable solar project has claimed EPC cost of around USD 0.65 million per MW for tracking technology and for smaller size compared to JSPPL's project. It has also been noted that the referred petitioner filed application back in November, 2018, i.e. the claimed prices do not account for the impact of decrease in



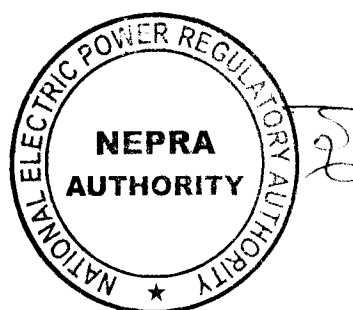
equipment prices since that time. In light thereof, the Authority is of the view that EPC cost being claimed by JSPPL may not be considered prudent and reflective of prevailing prices and therefore requires assessment.

8.6 For this purpose, the Authority has relied upon the EPC cost and project cost data in different countries. The prices of different types of modules, inverters and mounting structures in different parts of the world were researched through a number of reports published by credible organizations. Moreover, a number of online sources providing spot prices data of equipment of solar power system were also surfed. Furthermore, the costs being claimed recently by other comparable projects were also checked.

8.7 It has been noted that the average prices of solar modules of different types and brands have gone as low as USD 0.19 million per MW. Those average prices were at the level of USD 0.32-0.34 million per MW back in January, 2018. This shows that there has been a decline of more than 40% in the cost of modules in mere two years' time. The same trend of decreasing module prices is also being forecasted by different credible agencies; however, these sources state that the trend would not be that sharp. The cost of inverters, inclusive of combiner boxes, has been found reported in different sources and has been claimed in other tariff petitions at or below the level of USD 0.04 million per MW. For mounting structures, the price of as low as USD 0.10 million per MW for single axis tracking has been stated by one of the solar projects. It has also been noted that the cost of around USD 0.11 million per MW for tracking mounting structure has been achieved by a solar power project which has recently been commissioned. On these base figures, the factors such as transportation cost, existing local market conditions, local manufacturing base, length of time allowed for achieving financial close etc. were given due consideration. The cost of civil works as allowed by the Authority in the comparable tariff cases has been rationalized for the impact of PKR devaluation and local inflation. The cost of electrical balance of plant equipment has been allowed in line with the comparable projects. It has also been ensured to provide a reasonable amount of profits to the Contractor(s). Keeping in view all these factors, the Authority has assessed the EPC cost for JSPPL as USD 0.5356 million per MW (USD 26.512 million) which is hereby approved. The allowed EPC cost shall be adjusted at COD in accordance with the mechanism given in the Order part of this determination.

9. **Whether the details provided for Non-EPC cost are sufficient and claimed Non-EPC cost is justified? Also provide justification for land requirement as claimed by the petitioner?**

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- 9.1 The petitioner has claimed USD 7.21 million on account of non-EPC cost. The break-up of the cost components as provided by the petitioner is as follows:

Non-EPC cost	USD Million
Insurance during construction	0.20
Project Development Cost	3.66
Land	0.93
Financial Fee and Charges	1.38
Interest during construction	1.04
Total non-EPC cost	7.21

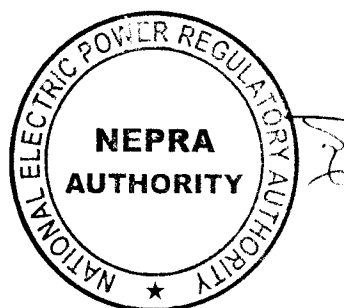
Insurance during Construction

- 9.2 The petitioner has claimed USD 0.20 million on account of pre-COD insurance cost. JSPPL submitted pre-COD insurance cost covers the insurance cost of solar power complex during construction phase prior to COD. The petitioner submitted that as per the norms of Pakistan power market and in accordance with the requirements set out by the lenders funding the project, it intends to procure following insurances during the construction phase of the project;

- Erection all risk insurance (EAR)
- EAR delay in start-up insurance
- Marine and inland transit insurance
- Marine – Delay-in startup insurances
- Terrorism insurance

- 9.3 The petitioner submitted that the claimed amount does not include Federal Excise Duty which is requested to be trued up at actual at the time of COD.

- 9.4 The Authority has noted that NEPRA (Benchmarks for Tariff Determination) Guidelines, 2018 (Benchmarking Guidelines) issued vide S.R.O. 763(I)/2018 notification dated June 19, 2018 states the provision of insurance during construction at the rate of 0.40% of EPC cost for solar projects. In accordance therewith, the Authority has decided to allow insurance during construction, inclusive of taxes, charges and/or duties, at the rate of 0.4% of the approved EPC



cost to JSPPL. On this basis, the amount being approved under this head works out to be around USD 0.106 million.

Project Development Cost

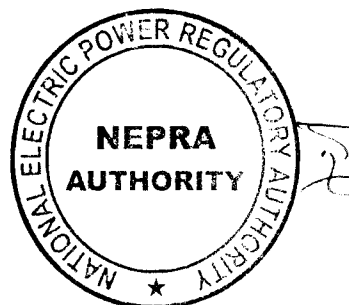
- 9.5 The petitioner has claimed around USD 3.67 million on account of Project Development Cost (PDC). During the hearing, following details were presented by JSPPL:

Project Development Cost	USD Million
Consultancy costs	0.500
Owner's engineer costs	0.250
Independent engineer for NTDC	0.100
PD studies (survey, geotech, topo, grid etc.)	0.500
Permits, permissions & related costs	0.080
Site, security & infrastructure	2.000
Administration cost and HR cost	0.140
Travelling costs	0.100
Total	3.670

- 9.6 The Authority has examined the cost of PDC that has been allowed in tariff of comparable solar projects. The impact of PKR devaluation against USD and local inflation that have occurred since the time of approval of tariff determinations of those projects has been accounted for. The requirement of comparatively higher security and its corresponding costs has also been given due consideration. On these bases, the Authority has decided to approve the PDC of USD 1.0 million for JSPPL. This amount is being approved on lump sum basis, i.e. the cost incurred on individual heads of PDC may change but should not exceed the overall amount.

Cost of Land

- 9.7 The petitioner has claimed USD 0.930 million on account of land cost for the proposed land area of 250 acres. During the proceedings, JSPPL submitted copy of "Agreement to Sell" with executed on October 30, 2018 between three (03) Nos. landowners and the project company. As per Agreement to Sell, the landowners have agreed to sell the project land at the rate of USD 3,600 per acre with total sale consideration of USD 900,000. On query, the petitioner



informed that the difference in the cost of land as decided in the Agreement to Sell (USD 900,000) and as claimed in the petition (USD 930,000) is that USD 30,000 was claimed for transfer fee, stamp duty and other charges in the petition.

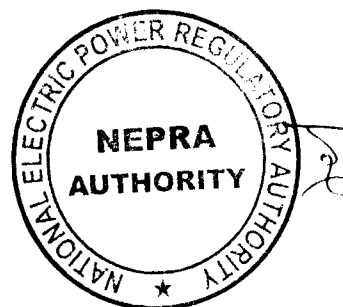
- 9.8 The Authority is of the view that denominating the cost of land in USD in the Agreement to Sell may not be considered justified. To assess the cost of land, an analysis with respect to the cost that has been allowed to comparable solar projects (both on lease basis and on procurement from private party) has been carried out. Considering the claimed cost at exchange rate (PKR/USD) prevailing on the date of Agreement, the amount of USD 0.500 million is found comparative and justified and is hereby approved.

Financing Fee and Charges

- 9.9 JSPPL has claimed financing fees and charges of USD 1.38 million. The petitioner submitted that this cost head includes lenders' arrangement fee, upfront fee, commitment fee and other related costs.
- 9.10 It has been noted that Benchmark Guidelines states the provision of financing fee & charges not exceeding 2% of the approved debt amount of the capital expenses. In accordance with the said benchmark, the Authority has decided to allow the captioned cost at the rate of 2% of approved debt portion of allowed capital expenses, as maximum limit, to the petitioner. Accordingly, this amount works out to be around USD 0.450 million.

Interest during construction (IDC)

- 9.11 The petitioner has claimed Interest during Construction (IDC) of USD 1.04 million. The petitioner submitted that IDC has been calculated based on mix of foreign and local debt. 3 month LIBOR plus margin of 4.25% has been used for foreign financing and fixed rate of 6% under SBP refinancing facility for local loan. The construction period of 10 months has been taken into account for this claim. The petitioner submitted that IDC is to be adjusted at actual at the time of true-up based on actual debt drawdown, revised quarterly LIBOR rates and PKR/USD exchange rate wherever applicable.
- 9.12 Based on the abovementioned approved costs while considering the drawdown schedule as given in the Order part of this determination; the IDC works out to be around USD 0.514 million and is hereby approved. The details of financing terms and construction period that



have been used to work out the aforesaid amount of IDC is discussed in the ensuing relevant sections. The allowed IDC shall be re-computed at COD as per the mechanism given in the Order part of this determination.

9.13 Recapitulating above, the approved project cost is given hereunder:

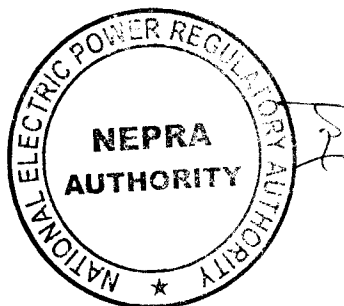
Project Cost	USD Million
EPC Cost	26.512
Project Development Cost	1.000
Land Cost	0.500
Insurance during construction	0.106
Financing Fee and Charges	0.450
Interest During Construction	0.514
Total	29.082

10. **Whether the claimed O&M costs are justified?**

10.1 The petitioner has claimed O&M cost of USD USD 15,000 per MW per year. JSPPL submitted that the claimed O&M cost is in line with NEPRA's determination where similar O&M cost was allowed based on similar technology. It also submitted that its project size is relatively small and does not benefit from the very substantial economies of scale in O&M costs available to large solar plants. It also highlighted that the project requires high security (due to location) and cleaning costs during operations.

10.2 To evaluate this claim of JSPPL, the O&M cost being allowed in other parts of the world has been referred. Local market and security conditions of the area where project is being setup, required skilled manpower, spare parts etc. have also been deliberated upon. The cost recently being claimed by other solar power projects based on different technologies has also been compared. The O&M cost as allowed earlier to comparable projects has also been examined while taking into account the PKR devaluation and local inflation. In view thereof, the Authority has decided to approve the O&M cost of USD 0.470 million per year to JSPPL, i.e. USD 9,500 per MW per year.

10.3 To decide about the proportion of approved O&M cost, the Authority has examined the change in local CPI (allowed on local portion) viz a viz the collective change in both US CPI and exchange rate (allowed for foreign portion) for last nineteen years. It has been noted that



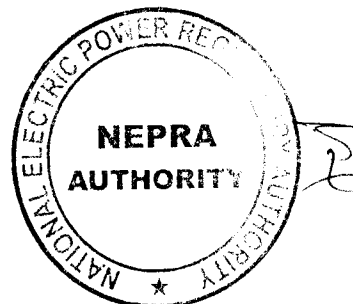
the average annual change in indices allowed on foreign component during the last couple of years has been higher relative to local inflation. However, the change in indices applied on local and foreign component has roughly been same when analysis is carried out for the longer term. Further, it has been studied that the majority of O&M cost for solar project consists of administrative expenses (either site or at office) and may be obtained in local currency. The cost of spare parts and replacement of equipment and some services would require procurement from abroad; however, their proportions are not very significant and also vary from year to year. In view of these considerations, the Authority has decided to allow whole of approved O&M cost in local currency.

11. Whether the claimed insurance during operation is justified?

11.1 In its tariff petition, JSPPL claimed insurance during operation at the rate of 0.5% of claimed EPC Cost. The petitioner also requested to allow annual insurance during operation subject to the maximum cap of 0.75% of EPC cost. JSPPL submitted that in view of the practices set by the other power generation projects in Pakistan and in accordance with the requirements set by the lenders, it shall procure the following insurance during the operational phase of the project:

- Property Damage and Comprehensive Machinery Insurance;
- Third Party Liability;
- Terrorism insurance;
- Group Personal Accident Insurance; and
- Motor Comprehensive Insurance.

11.2 The Authority noted that in the recently approved solar tariff determinations, insurance during operation at the rate of 0.4% of the approved EPC cost has been allowed. Benchmark Guidelines also provide insurance during operation at the rate of 0.4% of EPC cost for solar projects. In view thereof, the Authority has decided to allow insurance during operation at the maximum limit of 0.4% of the approved EPC cost, including all taxes/charges and/or taxes, to the petitioner, subject to adjustment on actual basis as per the mechanism given in the Order part of this determination.



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12. **Whether the claimed return on equity is justified?**

12.1 The petitioner has claimed Return on Equity (ROE) of 15% while stating that the risk associated with the project site is high as compared to other solar projects due to its proximity to FATA. JSPPL further argued that no solar project has to date been commissioned in KPK. The Authority has noted that in the most recent comparable tariff cases of renewable technologies being setup in all the regions of the country, it has allowed ROE (both during construction and operation) to the limit of 14%. Accordingly, the Authority has decided to approve the ROE of 14% for JSPPL also.

13. **Whether the claimed financing/debt terms are justified?**

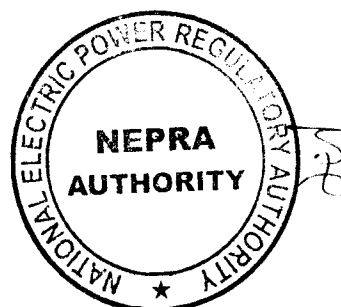
13.1 The petitioner claimed following parameters regarding the debt:

Debt	80% (50% foreign and 50% local)
Interest	Foreign: 3 month LIBOR + 4.25% Local: SBP fixed rate of 6%
Repayment period	Foreign loan: 13 years Local loan: 11 years

13.2 During the proceedings, the petitioner submitted indicative term sheet dated July 18, 2018 signed with the lender i.e. Dubai Islamic Bank Pakistan Limited.

13.3 The Authority has noted that Benchmarking Guidelines provides that the debt : equity ratio for all renewable power projects will be 80:20 and in case of change in ratio, the return approved on equity shall be adjusted to maintain cost of capital at the same level as under a 80:20 debt-equity ratio capital structure. The debt-equity ratio of 80:20 has also been approved by the Authority in the recent wind and solar tariff determinations. Therefore, the Authority has decided to compute and approve tariff of JSPPL on debt to equity ratio of 80:20.

13.4 Benchmarking Guidelines provide that in case of renewable energy projects eligible for securing debt under the revised State Bank of Pakistan Refinancing Scheme (SBP Scheme), a flat rate of 6% shall be approved with debt repayment period not exceeding 12 years. For foreign financing, Benchmarking Guidelines say that spread not exceeding 4.25% over LIBOR shall be approved. The size of the project being setup by the petitioner is 49.50 MW which makes it eligible to avail financing under SBP scheme. However, it has been noted that SBP vide its circular dated July 26, 2019 has decided that eligible renewable energy projects of



more than 20MW shall be given financing of up to 50% under the SBP Scheme. In view thereof, the Authority has decided to compute and approve tariff of JSPPL at 50% local and 50% foreign financing. For local loan, the cost of 6% as stated in the SBP Scheme has been taken into account. For the foreign loan, the cost of 6.156% (LIBOR of 1.9055% + spread of 4.25%) has been used.

- 13.5 The petitioner has claimed debt servicing period of thirteen years for foreign financing. The Authority in recently approved wind and solar tariff determinations has allowed foreign debt repayment period of not less than thirteen years. In view of approvals given in the recent tariff determinations, the Authority has decided to approve foreign debt repayment period of 13 years as claimed by the petitioner. For local loan under SBP scheme, the debt repayment period has been spread over 10 years.

14. **Whether the claimed annual energy production and corresponding plant capacity factor are justified? and**
Whether the petitioner's proposed solar modules and inverter technology satisfies the international standards of quality and operation?

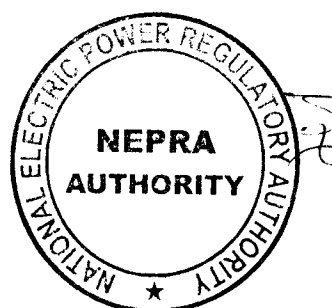
- 14.1 The petitioner has submitted the following in this regard:

Project capacity	49.50 MWp
Annual power generation	84.724 GWh
Net capacity factor	19.54%

- 14.2 The petitioner during the hearing and in tariff petition submitted that it has selected polycrystalline PV Module "JAP6(T)" manufactured by JA Solar for the project. It stated that JA Solar established in 2005 and is one of the leading manufacturers and suppliers in the solar power industry based out of China. For inverters, the petitioner submitted that it has selected TBEA Xian Electric inverters 20TC500KH for the project which is a global leading PV inverter system solution supplier. The petitioner further submitted that it intends to install cutting-edge tracking technology for the project which shall provide higher plant factor and higher energy output to the energy purchaser.

- 14.3 It has been noted that the generation license for the proposed technology has already been approved for JSPPL. For plant capacity factor, the Authority has considered the modules,

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inverters and other equipment as proposed by JSPPL with respect to their quality and energy yield. The plant capacity factor that has been allowed for polycrystalline modules in the recent tariff cases of different regions of the country were also checked. Considering these factors, the Authority is of the view that the claimed net plant capacity factor is on lower side as per the assessment of Technical Team of NEPRA and decided to compute the tariff of JSPPL on the capacity factor of 21.03%. The solar resource risk shall be borne by the power producer and a sharing mechanism given in the order part of this determination shall be applied on the energy produced beyond the approved capacity utilization factor.

15. Whether the claimed construction period is justified?

15.1 During the hearing and in its tariff petition, the petitioner proposed 10 month construction period for the project. The Authority has noted that in other similar scale solar PV projects, the construction period of 10 months has been allowed. Therefore, the same construction time limit is hereby allowed to JSPPL as well.

16. Whether the project grid interconnection study is approved by the relevant organization(s) and whether NTDCL has issued power evacuation certificate?

16.1 The petitioner submitted that Grid Interconnection Assessment of the project was undertaken by M/s Arco Energy. The petitioner submitted approval letter of Grid Interconnection Study (GIS) issued by Peshawar Electric Supply Company (PESCO) on February 21, 2018. In the said approval, PESCO has stated that the revised GIS of the project has been vetted for load flow, contingency, short circuit and stability analysis. The proposed interconnection scheme through 2.5 km In/Out arrangement from 132 KV FAS Solar Power-132 kV Grid Station Kulachi S/Circuit Transmission Line using rail conductor for connecting the said power project is found technically feasible and approved. During the proceedings, the petitioner informed that it has submitted GIS to NTDCL on March 07, 2019 through CPPA-G with all the revisions as proposed by NTDCL; however, the approval of GIS by NTDCL is still awaited. The Authority has noted that approval of project's GIS/power evacuation certificate by NTDCL is not a requirement for the award of tariff as given in the Tariff Rules. This issue was framed to confirm that the integration of the subject project does not affect the overall grid system. The Authority has further noted that during the proceedings of the Generation License as awarded to petitioner on January 10, 2020, the matter of interconnection of the project has already been discussed and addressed. In view thereof, the Authority considered it appropriate to proceed further in the subject matter as per the stipulations given in the Tariff Rules.

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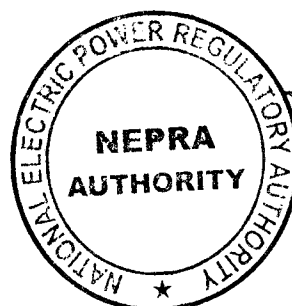
17. **Degradation factor**

- 17.1 The petitioner has claimed USD 1.47 million as the impact of degradation as part of the project cost at the rate of 3.62% of the EPC cost. The Authority has noted that degradation factor of 0.5% per year has been taken into account in the recently approved tariff cases of solar power projects and decided to approve the same in JSPPL's tariff. The Authority has decided to capitalize the impact of allowed degradation in the approved project cost. The amount of USD 0.960 million has been made part of the approved project cost while calculating the same at the levelized rate of 3.62% of the approved EPC cost.

18. **ORDER**

In pursuance of section 7(3)(a) of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 and NEPRA (Tariff Standards & Procedure) Rules, 1998, the Authority hereby determines and approves the generation tariff along with terms and conditions for Javed Solar Park (Pvt.) Limited for its 49.50 MWp solar power project for delivery of electricity to the power purchaser as follows:

- Levelized tariff works out to be Rs. 6.1484/kWh (US Cents 3.9578/kWh).
- The tariff has been worked out on Build, Own and Operate basis.
- EPC cost of USD 26,512 million has been approved.
- Project Development Cost of USD 1.00 million has been approved.
- Cost of land of USD 0.500 million has been approved.
- Insurance during construction at the rate of 0.4% of the approved EPC cost has been approved.
- Financing fee at the rate of 2% of the debt portion of the capital cost has been approved.
- Debt to Equity ratio of 80:20 has been approved.
- Financing mix of 50% local and 50% foreign has been used.
- ROE and ROEDC of 14% has been allowed.
- The cost of debt of 6% (SBP scheme) has been used for local financing.
- The cost of debt of 3 month LIBOR (1.9055%) + spread (4.25%) has been used for foreign financing.



- Debt servicing period of 10 years from COD has been used for local financing under SBP scheme.
- Debt servicing period of 13 years from COD has been used for foreign financing.
- O&M Cost of USD 9,500 per MW per year has been allowed.
- Insurance during Operation has been calculated as 0.40% of the allowed EPC Cost.
- Construction period of 10 months has been allowed.
- Net Annual Plant Capacity Factor of 21.03% has been approved.
- Reference Exchange Rates of 155.35 PKR/USD has been used.
- IDC and ROEDC have been worked out using following drawdown schedule:

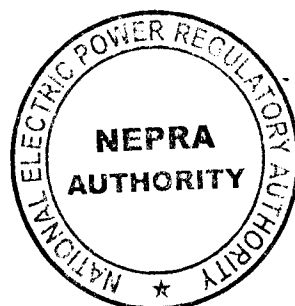
Month 1	5.00%
Month 2	5.00%
Month 3	5.00%
Month 4	15.00%
Month 5	15.00%
Month 6	15.00%
Month 7	6.67%
Month 8	6.67%
Month 9	13.33%
Month 10	13.33%

- Detailed component wise tariff is attached as Annex-I of this decision.
- Debt Servicing Schedule for local loan is attached as Annex-II of this decision.
- Debt Servicing Schedule for foreign loan is attached as Annex-III of this decision.

A. One Time Adjustments at COD

- The EPC cost shall be verified and adjusted at actual considering the approved amount as the maximum limit. Applicable foreign portion of the EPC cost will be adjusted at COD on account of variation in PKR/USD parity during the construction period, on production of authentic documentary evidence by the petitioner to the satisfaction of the Authority. The adjustment in

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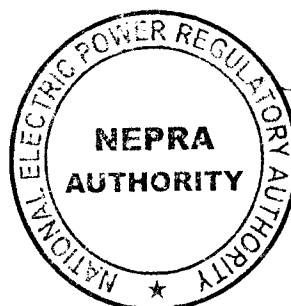
approved EPC cost shall be made for the currency fluctuation against the reference parity values.

- PDC, Insurance during construction, Land cost and Financing Fee and Charges shall be adjusted at actual at the time of COD considering the approved amount as the maximum limit. The amounts allowed on these accounts in USD will be converted in PKR using the reference PKR/USD rate of 155.35 to calculate the maximum limit of the amount to be allowed at COD.
- Duties and/or taxes, not being of refundable nature, relating to the construction period directly imposed on the company up to COD will be allowed at actual upon production of verifiable documentary evidence to the satisfaction of the Authority.
- The tariff has been determined on debt : equity ratio of 80 : 20. The tariff shall be adjusted on actual debt : equity mix at the time of COD, subject to equity share of not more than 20%. For equity share of more than 20%, allowed IRR shall be neutralized for the additional cost of debt : equity ratio.
- IDC will be recomputed at COD on the basis of actual timing of debt draw downs (for the overall debt allowed by the Authority at COD) for the project construction period of 10 months starting from the date of financial close. For foreign loan, the IDC shall also be allowed adjustment for change in applicable LIBOR.
- ROEDC will 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 of 10 months from the date of financial close.
- For foreign and local loans, the savings in the approved spreads shall be shared between the power purchaser and power producer in the ratio of 60:40.

B. Indexations

Adjustment of O&M, ROE, ROEDC, applicable Debt Servicing Components shall be made on quarterly basis to be applicable from 1st July, 1st October, 1st January and 1st April. Adjustment of Debt Servicing Component, where applicable, may also be allowed on bi-annual basis depending upon the final terms approved by the Authority at the time of COD. For bi-annual adjustments, the periods shall start from 1st July and 1st January. Insurance component shall be

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adjusted on annual basis starting from either 1st January or 1st July. The indexation mechanisms are given hereunder:

i) **Operation and Maintenance Costs**

O&M component of tariff shall be adjusted on account of change in local Inflation (CPI) as notified by the Pakistan Bureau of Statistics according to the following mechanism:

L. O&M (REV)	=	L. O&M (REF) * CPI (REV) / CPI (REF)
Where;		
L. O&M (REV)	=	The revised O&M Local Component of Tariff
L. O&M (REF)	=	The reference O&M Local Component of Tariff
CPI (REV)	=	The revised CPI (General)
CPI (REF)	=	The reference CPI (General) of 263.59 for the month of November, 2019

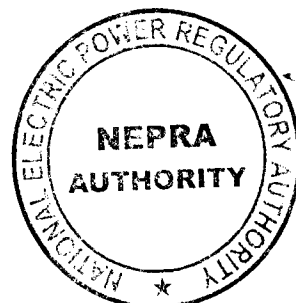
Note: The reference index of CPI shall be revised for making the required adjustments in O&M component at the time of COD. For the adjustment of O&M component at COD, the revised CPI value for the middle month of preceding quarter prior to the date of COD shall be considered. Thereafter, the CPI value taken at COD shall become reference for subsequent adjustments in the O&M component.

ii) **Insurance during Operation**

The actual insurance cost for the minimum cover required under contractual obligations with the power purchaser, not exceeding 0.4% of the approved EPC cost, will be treated as pass through. Insurance component of reference tariff shall be adjusted annually as per actual upon production of authentic documentary evidence according to the following formula:

AIC	=	Ins (Ref) / P (Ref) * P (Act)
Where;		
AIC	=	Adjusted insurance component of tariff
Ins (Ref)	=	Reference insurance component of tariff
P (Ref)	=	Reference premium @ 0.4% of approved EPC Cost at Rs. 155.35/USD

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P (Act)	=	Actual premium or 0.4% of the approved EPC Cost converted into Pak Rupees on exchange rate prevailing on 1 st day of the insurance coverage period whichever is lower
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iii) **Return on Equity**

The ROE (ROE + ROEDC) component of the tariff will be adjusted on account of change in USD/PKR parity. The variation relating to these components shall be worked out according to the following formula:

ROE (Rev)	=	ROE (Ref) * ER (Rev) / ER (Ref)
Where;		
ROE (Rev)	=	Revised ROE Component of Tariff
ROE (Ref)	=	Reference ROE Component of Tariff
ER (Rev)	=	The revised TT & OD selling rate of US dollar as notified by the National Bank of Pakistan
ER (Ref)	=	The reference TT & OD selling rate of Rs. 155.35/USD

Note: The reference tariff component shall be revised after making the required adjustments at the time of COD.

iv) **Indexations applicable to debt**

For foreign debt, respective principal and interest components will be adjusted on quarterly/bi-annual basis, on account of revised TT & OD selling rate of US Dollar, as notified by the National Bank of Pakistan as at the last day of the preceding period, over the applicable reference exchange rate as approved at COD.

v) **Variations in LIBOR**

The interest part of tariff component for the foreign loan shall remain unchanged throughout the term except for the adjustment due to variation in interest rate as a result of variation in LIBOR according to the following formula:

ΔI	=	$P (REV) * (LIBOR (REV) - 1.9055\%) / 4$
Where;		



ΔI	=	The variation in interest charges applicable corresponding to variation in 3 month LIBOR. ΔI can be positive or negative depending upon whether 3 month LIBOR (REV) per annum > or < 1.9055%. The interest payment obligation will be enhanced or reduced to the extent of ΔI for each quarter under adjustment.
P (REV)	=	The outstanding principal (as indicated in the attached debt service schedule to this order), at the relevant quarterly calculations date. Quarter 1 shall commence on the commercial operations date (i.e. the first figure will be used for the purposes of calculation of interest for the first quarter after commercial operations date)
LIBOR (REV)	=	Revised 3 month LIBOR as at the last day of the preceding quarter.

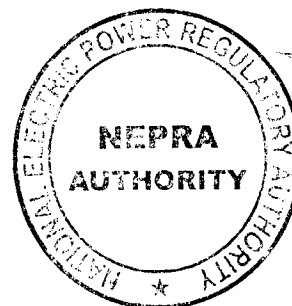
Note: The reference tariff component shall be revised after making the required adjustments at the time of COD.

C. Terms and Conditions

The following terms and conditions shall apply to the determined tariff:

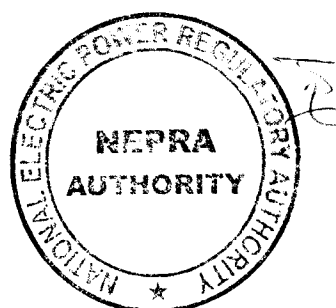
- All plant and equipment shall be new and of acceptable standards. The verification of the plant and equipment will be done by the Independent Engineer at the time of the commissioning of the plant duly appointed by the power purchaser.
- This tariff will be limited to the extent of net annual energy generation supplied to the power purchaser up to 21.03% net annual plant capacity factor. Net annual energy generation supplied to the power purchaser in a year, in excess of 21.03% net annual plant capacity factor, will be charged at the following tariffs:

<u>Net annual plant capacity factor</u>	<u>% of prevalent tariff allowed to power producer</u>
Above 21.03% to 21.06%	-
Above 21.06% to 21.81%	20%
Above 21.81% to 22.56%	40%
Above 22.56% to 23.31%	80%
Above 23.31%	90%



- The risk of solar resource shall be borne by the power producer.
- The maximum plant PV capacity shall not exceed 49.50 MWp.
- In the above tariff no adjustment for certified emission reductions has been accounted for. However, upon actual realization of carbon credits, the same shall be distributed between the power purchaser and the power producer in accordance with the applicable GOP Policy, amended from time to time.
- The petitioner is required to ensure that all the equipment is installed as per the details/specifications in the generation license as awarded by NEPRA.
- The petitioner is hereby directed to secure the maximum available loan under the SBP Scheme. The savings in the cost of financing under SBP Scheme shall be shared between power purchaser and power producer in the ratio of 60:40 at the time of COD or during any time of the loan repayment period, as applicable. The savings in the approved limit of spread over foreign loan shall also be shared between power purchaser and power producer in the ratio of 60:40 at the time of COD or during any time of loan tenor, as applicable.
- Allowed limit of degradation has been made part of the approved project cost. No extra financial compensation shall be provided in the EPA.
- The company will have to achieve financial close within one year from the date of issuance of tariff determination. The tariff granted to the company will no longer remain applicable/valid, if financial close is not achieved by the company, for whatever reason, in the abovementioned timeline or its generation license is declined/revoked by NEPRA.
- The targeted maximum construction period from prescribed date/time of financial close is 10 months. No adjustment will be allowed in this tariff to account for financial impact of any delay in project construction. However, the failure of the company to complete construction within 10 months will not invalidate the tariff granted to it.
- Pre COD sale of electricity is allowed to the power producer, subject to the terms and conditions of EPA, at the applicable tariff excluding debt servicing and return components. However, pre COD sale will not alter the required COD stipulated in the EPA in any manner.
- In case the company is obligated to pay any tax on its income from generation of electricity, or any duties and/or taxes, not being of refundable nature, are imposed on the company, the exact amount paid by the company on these accounts shall be reimbursed on


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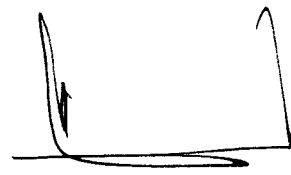
production of original receipts. This payment shall be considered as a pass-through payment. However, withholding tax on dividend shall not be passed through.

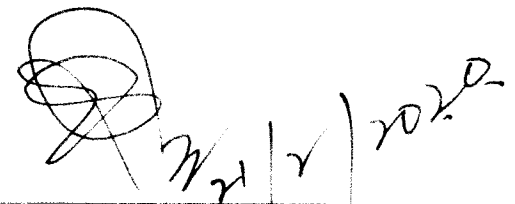
- No provision for the payment of Workers Welfare Fund and Workers Profit Participation has been made in the tariff. In case, the company has to pay any such fund, that will be treated as pass through item in the EPA.
 - The approved tariff along with terms & conditions shall be made part of the EPA. General assumptions, which are not covered in this determination, may be dealt with as per the standard terms of the EPA.
19. The Order part along with 3 Annexures is recommended for notification by the Federal Government in the official gazette in accordance with Section 31(7) of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997.

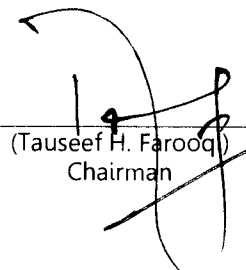
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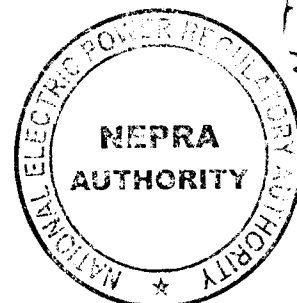

(Saif Ullah Chattha)
Member
21.2.2020


(Rafique Ahmed Shaikh)
Member


(Eng. Bahadur Khan)
Member

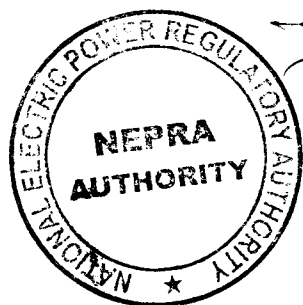

(Rehmatullah Baloch)
Vice Chairman


(Tauseef H. Farooqi)
Chairman



**JAVED SOLAR PARK (PVT.) LIMITED
REFERENCE TARIFF TABLE**

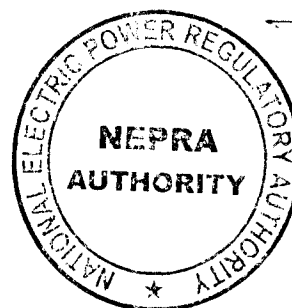
Year	O&M Local	Insurance	Return on Equity	Return on Equity during Construction	Principal Repayment	Interest Charges	Tariff
	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh
1	0.8011	0.1807	1.4330	0.0812	2.6067	2.4299	7.5327
2	0.8011	0.1807	1.4330	0.0812	2.7684	2.2682	7.5327
3	0.8011	0.1807	1.4330	0.0812	2.9402	2.0965	7.5327
4	0.8011	0.1807	1.4330	0.0812	3.1225	1.9141	7.5327
5	0.8011	0.1807	1.4330	0.0812	3.3162	1.7204	7.5327
6	0.8011	0.1807	1.4330	0.0812	3.5219	1.5147	7.5327
7	0.8011	0.1807	1.4330	0.0812	3.7404	1.2963	7.5327
8	0.8011	0.1807	1.4330	0.0812	3.9724	1.0642	7.5327
9	0.8011	0.1807	1.4330	0.0812	4.2188	0.8178	7.5327
10	0.8011	0.1807	1.4330	0.0812	4.4805	0.5561	7.5327
11	0.8011	0.1807	1.4330	0.0812	1.9590	0.3404	4.7954
12	0.8011	0.1807	1.4330	0.0812	2.0824	0.2170	4.7954
13	0.8011	0.1807	1.4330	0.0812	2.2136	0.0858	4.7954
14	0.8011	0.1807	1.4330	0.0812	-	-	2.4960
15	0.8011	0.1807	1.4330	0.0812	-	-	2.4960
16	0.8011	0.1807	1.4330	0.0812	-	-	2.4960
17	0.8011	0.1807	1.4330	0.0812	-	-	2.4960
18	0.8011	0.1807	1.4330	0.0812	-	-	2.4960
19	0.8011	0.1807	1.4330	0.0812	-	-	2.4960
20	0.8011	0.1807	1.4330	0.0812	-	-	2.4960
21	0.8011	0.1807	1.4330	0.0812	-	-	2.4960
22	0.8011	0.1807	1.4330	0.0812	-	-	2.4960
23	0.8011	0.1807	1.4330	0.0812	-	-	2.4960
24	0.8011	0.1807	1.4330	0.0812	-	-	2.4960
25	0.8011	0.1807	1.4330	0.0812	-	-	2.4960
Levelized Tariff	0.8011	0.1807	1.4330	0.0812	2.4597	1.1926	6.1484



JAVED SOLAR PARK (PVT.) LIMITED
Debt Servicing Schedule - Local

Relevant Quarters	Base amount (Rs.)	Principal Repayment (Rs.)	Interest (Rs.)	Balance Principal (Rs.)	Total Debt Service (Rs.)	Annual Principal Repayment (Rs./kWh)	Annual Interest (Rs./kWh)
1	1,866,811,135	34,399,919	28,002,167	1,832,411,216	62,402,086	1.5432	1.1940
2	1,832,411,216	34,915,917	27,486,168	1,797,495,299	62,402,086		
3	1,797,495,299	35,439,656	26,962,429	1,762,055,643	62,402,086		
4	1,762,055,643	35,971,251	26,430,835	1,726,084,392	62,402,086		
5	1,726,084,392	36,510,820	25,891,266	1,689,573,572	62,402,086	1.6379	1.0993
6	1,689,573,572	37,058,482	25,343,604	1,652,515,090	62,402,086		
7	1,652,515,090	37,614,359	24,787,726	1,614,900,731	62,402,086		
8	1,614,900,731	38,178,575	24,223,511	1,576,722,156	62,402,086		
9	1,576,722,156	38,751,253	23,650,832	1,537,970,903	62,402,086	1.7384	0.9988
10	1,537,970,903	39,332,522	23,069,564	1,498,638,380	62,402,086		
11	1,498,638,380	39,922,510	22,479,576	1,458,715,870	62,402,086		
12	1,458,715,870	40,521,348	21,880,738	1,418,194,523	62,402,086		
13	1,418,194,523	41,129,168	21,272,918	1,377,065,355	62,402,086	1.8451	0.8921
14	1,377,065,355	41,746,105	20,655,980	1,335,319,250	62,402,086		
15	1,335,319,250	42,372,297	20,029,789	1,292,946,953	62,402,086		
16	1,292,946,953	43,007,881	19,394,204	1,249,939,071	62,402,086		
17	1,249,939,071	43,653,000	18,749,086	1,206,286,072	62,402,086	1.9583	0.7789
18	1,206,286,072	44,307,795	18,094,291	1,161,978,277	62,402,086		
19	1,161,978,277	44,972,411	17,429,674	1,117,005,866	62,402,086		
20	1,117,005,866	45,646,998	16,755,088	1,071,358,868	62,402,086		
21	1,071,358,868	46,331,703	16,070,383	1,025,027,165	62,402,086	2.0785	0.6587
22	1,025,027,165	47,026,678	15,375,407	978,000,487	62,402,086		
23	978,000,487	47,732,078	14,670,007	930,268,409	62,402,086		
24	930,268,409	48,448,060	13,954,026	881,820,349	62,402,086		
25	881,820,349	49,174,780	13,227,305	832,645,569	62,402,086	2.2060	0.5312
26	832,645,569	49,912,402	12,489,684	782,733,167	62,402,086		
27	782,733,167	50,661,088	11,740,998	732,072,079	62,402,086		
28	732,072,079	51,421,004	10,981,081	680,651,074	62,402,086		
29	680,651,074	52,192,320	10,209,766	628,458,755	62,402,086	2.3414	0.3958
30	628,458,755	52,975,204	9,426,881	575,483,550	62,402,086		
31	575,483,550	53,769,832	8,632,253	521,713,718	62,402,086		
32	521,713,718	54,576,380	7,825,706	467,137,338	62,402,086		
33	467,137,338	55,395,026	7,007,060	411,742,312	62,402,086	2.4851	0.2521
34	411,742,312	56,225,951	6,176,135	355,516,362	62,402,086		
35	355,516,362	57,069,340	5,332,745	298,447,021	62,402,086		
36	298,447,021	57,925,380	4,476,705	240,521,641	62,402,086		
37	240,521,641	58,794,261	3,607,825	181,727,380	62,402,086	2.6376	0.0996
38	181,727,380	59,676,175	2,725,911	122,051,205	62,402,086		
39	122,051,205	60,571,318	1,830,768	61,479,887	62,402,086		
40	61,479,887	61,479,887	922,198	-	62,402,086		

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JAVED SOLAR PARK (PVT.) LIMITED

Debt Servicing Schedule - Foreign

Relevant Quarters	Base amount (USD)	Principal Repayment (USD)	Interest (USD)	Balance Principal (USD)	Total Debt Service (USD)	Annual Principal Repayment Rs./kWh	Annual Interest Rs./kWh
1	12,016,808	152,515	184,924	11,864,293	337,439	1.0635	1.2359
2	11,864,293	154,862	182,577	11,709,431	337,439		
3	11,709,431	157,245	180,194	11,552,186	337,439		
4	11,552,186	159,665	177,774	11,392,520	337,439		
5	11,392,520	162,122	175,317	11,230,398	337,439	1.1305	1.1689
6	11,230,398	164,617	172,822	11,065,781	337,439		
7	11,065,781	167,150	170,289	10,898,631	337,439		
8	10,898,631	169,722	167,716	10,728,909	337,439		
9	10,728,909	172,334	165,104	10,556,574	337,439	1.2017	1.0977
10	10,556,574	174,986	162,452	10,381,588	337,439		
11	10,381,588	177,679	159,760	10,203,909	337,439		
12	10,203,909	180,413	157,025	10,023,495	337,439		
13	10,023,495	183,190	154,249	9,840,306	337,439	1.2774	1.0220
14	9,840,306	186,009	151,430	9,654,297	337,439		
15	9,654,297	188,871	148,568	9,465,426	337,439		
16	9,465,426	191,778	145,661	9,273,648	337,439		
17	9,273,648	194,729	142,710	9,078,919	337,439	1.3579	0.9415
18	9,078,919	197,726	139,713	8,881,193	337,439		
19	8,881,193	200,768	136,670	8,680,425	337,439		
20	8,680,425	203,858	133,581	8,476,567	337,439		
21	8,476,567	206,995	130,444	8,269,572	337,439	1.4434	0.8560
22	8,269,572	210,180	127,258	8,059,392	337,439		
23	8,059,392	213,415	124,024	7,845,977	337,439		
24	7,845,977	216,699	120,740	7,629,278	337,439		
25	7,629,278	220,034	117,405	7,409,244	337,439	1.5343	0.7651
26	7,409,244	223,420	114,019	7,185,824	337,439		
27	7,185,824	226,858	110,581	6,958,966	337,439		
28	6,958,966	230,349	107,090	6,728,617	337,439		
29	6,728,617	233,894	103,545	6,494,724	337,439	1.6310	0.6684
30	6,494,724	237,493	99,946	6,257,231	337,439		
31	6,257,231	241,148	96,291	6,016,083	337,439		
32	6,016,083	244,859	92,580	5,771,224	337,439		
33	5,771,224	248,627	88,812	5,522,597	337,439	1.7337	0.5657
34	5,522,597	252,453	84,986	5,270,144	337,439		
35	5,270,144	256,338	81,101	5,013,806	337,439		
36	5,013,806	260,283	77,156	4,753,524	337,439		
37	4,753,524	264,288	73,151	4,489,236	337,439	1.8429	0.4565
38	4,489,236	268,355	69,084	4,220,881	337,439		
39	4,220,881	272,485	64,954	3,948,396	337,439		
40	3,948,396	276,678	60,761	3,671,718	337,439		
41	3,671,718	280,936	56,503	3,390,782	337,439	1.9590	0.3404
42	3,390,782	285,259	52,180	3,105,523	337,439		
43	3,105,523	289,649	47,790	2,815,875	337,439		
44	2,815,875	294,106	43,333	2,521,769	337,439		
45	2,521,769	298,632	38,807	2,223,137	337,439	2.0824	0.2170
46	2,223,137	303,227	34,211	1,919,909	337,439		
47	1,919,909	307,894	29,545	1,612,016	337,439		
48	1,612,016	312,632	24,807	1,299,384	337,439		
49	1,299,384	317,443	19,996	981,941	337,439	2.2136	0.0858
50	981,941	322,328	15,111	659,613	337,439		
51	659,613	327,288	10,151	332,325	337,439		
52	332,325	332,325	5,114	0	337,439		

