National Electric Power Regulatory Authority
Islamic Republic of Pakistan

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No. NEPRA/R/TRF-461/EQSPL-2018/1068-1070
January 14, 2020

Subject: **Determination of National Electric Power Regulatory Authority in the matter of Tariff Petition filed by M/s. Enertech Quetta Solar (Private) Ltd. for Determination of Reference Generation Tariff in respect of 50 MWp Solar Power Project** [Case # NEPRA/TRF-461/EQSPL-2018]

Dear Sir,

Please find enclosed herewith the subject Determination of the Authority along with Annex-I, II & III (31 Pages) in Case No. NEPRA/TRF-461/EQSPL-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. The Order along with Annex-I, II & III of the Authority's Determination shall be notified in the official Gazette.

Enclosure: As above

140120

(Syed Safeer Hussain)

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

CC:

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 ENERTECH QUETTA SOLAR (PRIVATE) LIMITED FOR DETERMINATION OF REFERENCE GENERATION TARIFF IN RESPECT OF 50 MWp SOLAR POWER PROJECT

1. M/s Enertech Quetta Solar (Pvt.) Ltd. (EQSPL or the petitioner/company) filed a tariff petition before National Electric Power Regulatory Authority (NEPRA/the Authority) on December 26, 2018 for determination of generation tariff in respect of its 50 MWp solar power project (project) to be set up at Bostan, District Pishin, Balochistan. The said petition was filed by EQSPL under NEPRA (Tariff Standards & Procedure) Rules, 1998 (Tariff Rules) read with the provisions of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 (the NEPRA Act) and the rules and regulations made thereunder; and in accordance with the Government of Pakistan's Policy for Development of Renewable Energy for Power Generation, 2006 (GOP RE Policy, 2006) and Government of Balochistan's Power Generation Policy, 2007 (GOB Policy, 2007). The petitioner has requested for the approval of levelized tariff of US Cents 6.5241/kWh over the tariff control period of 25 years.

2. The petitioner submitted that it was issued Letter of Interest (LOI) under the GOB Policy on October 26, 2016 by Balochistan Power Development Board (BPDB), GOB for the Sponsor Company namely Enertech Holding Company. EQSPL informed that GOB vide its letter dated September 6, 2018 extended the aforesaid LOI while stating therein the name of the project company as EQSPL. The certificate of incorporation of the company dated September 06, 2016 has also been submitted by the petitioner. The petitioner has also submitted a letter of Energy Department, GOB dated May 17, 2018 stating that BPDB in its meeting held on April 10, 2018 approved the feasibility study of the project as reported by Panel of Experts (POE).

3. Upon initial review of the tariff petition, a number of discrepancies were observed therein and EQSPL vide email communication dated February 28, 2019 was directed to submit clarifications thereon. In response, EQSPL vide emails revised a number of pages of tariff petition. In those communications, EQSPL submitted revised figures of claimed project cost and resultant levelized tariff.

4. Summary of the key information as provided in the tariff petition and subsequent communication is as follows:

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Project company	:	Enertec Quetta Solar (Pvt.) Limited
Sponsor	:	Enertec Holding Company (Kuwait)
Capacity	:	50 MWp
Project location	:	Bostan, District Pishin, Balochistan
Project Basis	:	Build Own Operate Transfer
Land area	:	250 acres
Concession period	:	25 years from Commercial Operations Date
Power purchaser	:	Central Power Purchasing Agency (G) Ltd.
PV Module	:	Poly Crystalline
Mounting structure	:	Fixed Tilt
Inverters	:	Huawei Sun2000 90KTL
Annual energy generation	:	95.081 GWh
Capacity factor	:	21.70%
Construction period	:	10 months
EPC contractor	:	Hydrochina International Engineering Company Limited
Project cost (revised)		**USD in millions**
EPC cost	:	40.135
Non-EPC & Project Development Cost	:	1.513
Security cost during construction	:	0.350
Cost of land	:	0.458
Insurance during construction	:	0.201
Financial Fee and Charges	:	0.916
Interest during construction	:	0.781
Degradation	:	1.453
Total Project Cost	:	**45.807**
Financing structure	:	Debt 80% : Equity 20%
Debt Structure	:	50% Foreign Loan: 50% Local Loan
Interest rates	:	Foreign: Base Rate (2.68%) + spread 4.25% Local: Base Rate (2%) + spread 3.5%
Debt repayment period	:	Foreign: 14 years Local: 11 Years
Return on equity	:	15% IRR based
Annual O&M cost	:	USD 0.900 million
Insurance during operation	:	USD 0.194 million

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		PKR/kWh	US¢/kWh
Levelized Tariff	:	8.7387	6.5214
Exchange rate	:	1 USD = PKR 134	

5. In accordance with Rule 4 of Tariff Rules, the tariff petition was admitted by the Authority on January 24, 2019. Notice of Admission & Hearing was published in the daily national newspapers on March 07, 2019 stating hearing date as March 26, 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 March 11, 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.

6. 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)? and
- Whether the NEPRA (Selection of EPC Contractor by IPPs) Guidelines, 2017 have been fully complied with?
- Whether the 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

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7. The hearing was held on March 26, 2019 (Tuesday) at NEPRA Office located at Room No. 1 & 2, 2nd Floor, Rehman Center, 7-A, Opposite NADRA Office, Model Town, Hali Road, Quetta which was attended a number of participants including the petitioner, representatives of Energy Department-GOB, National Transmission & Despatch Company Ltd. (NTDCL), Embassy of State of Kuwait, Kuwait Consulate, Pak-Kuwait Investment Council, Quetta Electric Supply Co. Ltd. (QESCO), International Financing Corporation (IFC) and other stakeholders.

8. Energy Department, GOB submitted comments during the hearing as well as in writing on March 25, 2019. Post hearing, comments were submitted by Central Power Purchasing Agency (G) Ltd. (CPPA-G) dated April 5, 2019. Ministry of Energy-Power Division, Government of Pakistan (MOE) also submitted its comments dated May 6, 2019. The comments of these parties are discussed in the relevant paragraphs of this determination. The issue wise submissions of the petitioner and the Authority's findings and decision thereon are as under.

9. **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?

9.1 The petitioner in the tariff petition claimed USD 40.135 million on account of Engineering Procurement and Construction (EPC) cost. Subsequently, the petitioner revised the EPC cost claim to USD 39.865 million while stating that there was a typo error while recording the offshore price in the tariff petition. This claim consists of USD 30.361 million for Offshore Contract and USD 9.504 million for Onshore Contract.

9.2 EQSPL submitted copies of EPC Contracts signed in November, 2018. The Offshore Contract was signed with Power Construction Corporation of China Limited (Power China) and Onshore Contract was signed with Hydro China International Engineering Company Limited (Hydro China).

9.3 In its petition and during the hearing, the petitioner apprised the Authority that the EPC cost has been finalized after a competitive bidding process. It stated that the selection of EPC contractor was managed through the internal guidelines of EnerTech Holding Company (sponsor) and Kuwait Investment Authority (under the laws of Government of Kuwait). It also

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submitted that NEPRA Guidelines for selection of Engineering, Procurement and Construction Contractor by independent Power Producer, 2017 (NEPRA EPC Guidelines) were adopted where possible while keeping in view the sensitive nature of the region.

9.4 The petitioner submitted the details of the process it followed for the selection of the EPC contractor. Based on that process, the sponsor company of the project selected Power China as a preferred bidder and its subsidiary Hydro China for the construction part due to the strength of their proposal as well as the experience of Chinese companies of working in Balochistan.

9.5 EQSPL submitted that it signed term sheet with Power China in December, 2017 and thereafter detailed site survey, meeting with local/federal authorities for a workable security plan were carried out. Various meetings were held between March, 2018 to October, 2018 to finalize technical and commercial aspects of the EPC contracts. Then, the EPC contracts were finalized and executed in November, 2018.

9.6 The petitioner submitted that it shall install 147,060 Nos. Polycrystalline PV modules of Canadian Solar CS3U-34P for the project. EQSPL further submitted that it has selected string inverter Sun2000 90 KTL (464 Nos.) manufactured by Huawei.

9.7 The petitioner during the hearing submitted that the claimed EPC cost for the project is comparatively higher because it is required to build concrete boundary wall and security towers, embankments and water ways, higher labour cost in that area, higher transport costs and due to NTDCL's relatively higher stringent grid requirements for the project.

9.8 During hearing, the petitioner apprised the Authority that under the approval of the environmental studies and land lease agreement, GOB has required EQSPL to undertake a number of activities under Corporate Social Responsibility (CSR) for which USD 3 million has been taken into account under the claimed EPC cost.

9.9 Energy Department, GOB commented that the EPC cost being claimed by the petitioner is significantly higher and it requires rationalization because it would ultimately be passed on to the consumers. GOB also stated in its comments that the project company shall reimburse/pay 5% of the project cost during EPC phase bi annually OR ensure/undertake a number of activities as mandatory part of the project, subject to NEPRA's approval as pass

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through cost under the tariff determination. It has been noted that almost all the activities of CSR as communicated by the petitioner in its petition were listed by the GOB in its comments.

9.10 To start with, the Authority understands that the cost of CSR of USD 3 million as required by GOB and accordingly claimed by the petitioner may not be considered to be included and allowed in the EPC cost. CSR is something which is required to be done out of the profits by the companies. It is not appropriate and legitimate under the law to make it the part of EPC/project cost and then allow return on that cost to the petitioner. Accordingly, the claimed EPC cost (net of CSR) works out to be around USD 36.865 million, i.e. around USD 0.74 million per MW.

9.11 The Authority has observed that one of the comparable solar project has claimed EPC cost of around USD 0.65 million per MW and that too for relatively costlier tracking technology and smaller size of the 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, NEPRA is of the view that EPC cost being claimed by EQSPL may not be considered prudent and reflective of prevailing prices and therefore requires assessment.

9.12 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.

9.13 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

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tracking mounting structure has been achieved by a solar power project which has recently been commissioned. Earlier, the Authority has kept the difference of USD 0.04-0.05 million per MW between the cost of tracking and fixed structures due to both electrical and mechanical factors and the same principle has been adopted for this case. 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 as well as project specific cost of concrete boundary wall and security towers, embankments and water ways, higher labour cost etc. have also been taken into account. The cost of electrical balance of plant equipment has been allowed in line with the comparable projects while taking into account the requirement of additional equipment as per the requirement of NTDCL. It has also been ensured to provide a reasonable amount of profits to the EPC Contractors. Keeping in view all these factors, the Authority has assessed the EPC cost of EQSPL as USD 0.5355 million per MW (USD 26.775 million) which is hereby approved.

9.14 The allowed EPC cost is the maximum limit on overall basis. Applicable foreign portion of this cost shall be allowed variations at Commercial Operations Date (COD) due to change in PKR/USD parity during the allowed construction period, on production of authentic documentary evidence to the satisfaction of the Authority.

10. **Whether the claimed Non-EPC cost is justified? Also provide justification for land requirement as claimed by the petitioner?**

10.1 The petitioner has claimed USD 4.219 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	0.201
Non-EPC and Project Development Cost	1.513
Security cost during construction	0.350
Cost of land	0.458
Financial Charges	0.916
Interest during construction	0.781
Total non-EPC cost	**4.219**

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Insurance during Construction:

10.2 The petitioner has claimed USD 0.201 million on account of pre-COD insurance cost. The petitioner submitted that as per the typical requirements set out by lenders/energy purchaser, it intends to procure the following insurances during the construction phase of the project:

a) Fire & Hazards
b) Terrorism
c) Marine Cover
d) Equipment Associated Risk
e) Construction Associated Risks.

10.3 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 at the rate of 0.4% of the approved EPC cost to EQSPL. On this basis, the amount being approved under this head works out to be around USD 0.107 million.

Project Development Cost

10.4 During hearing, the petitioner submitted the brief summary of PDC excluding land cost; details thereof are given hereunder:

Project Development Cost	USD million
Administrative cost	0.330
Consultancies and technical studies	0.450
Regulatory/legal fees	0.073
Site development	0.450
Travelling cost	0.210
Total	**1.513**

10.5 Besides the tabulated above costs of PDC, the petitioner has also claimed security cost of USD 0.40 million in the tariff petition, however, later revised the said claim to the tune of USD 0.35 million vide its email February 28, 2019. EQSPL vide email dated November 13, 2019

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submitted a letter of Home & Tribal Affairs Department-GOB dated November 7, 2018 enclosing therewith letter of Directorate General, Balochistan Levies Force (BLF), Quetta dated October 30, 2018 regarding establishment of security cost of 100 MW solar projects (Enertech Quetta and Enertech Bostan). BLF in its letter has estimated annual security cost of Rs.105,743,840 for 100MW for two Enertech solar projects.

10.6 The Authority has examined the cost of PDC inclusive of security cost 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 basis, the Authority has decided to approve the PDC of USD 1.2 million for EQSPL inclusive of security cost. 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.

Financing Fee and Charges

10.7 EQSPL has claimed financing fees and charges of USD 0.916 million. The petitioner submitted that this cost head includes lenders' up-front fee, arrangement and commitment fee, charges related to various letters of credit to be established in favour of various contracting parties, fee and stamp duty applicable on financing documents, agency fee, security trustee fee, monitoring fee and the fees for the lenders' various advisors.

10.8 It has been noted that Benchmark Guidelines states the provision of financing fee & charges not exceeding 2.00% 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 0.449 million.

Interest during construction (IDC)

10.9 The petitioner has submitted that interest during construction (IDC) has been calculated as USD 0.781 million. The petitioner submitted that IDC is based on interest rate of 3 months LIBOR (2.68%) plus spread of 4.25% for foreign loan and base rate of 2% and spread of 3.5% under State Bank of Pakistan ("SBP") Renewable Energy refinancing facility and 10 months construction period. The petitioner submitted that IDC be adjusted as per actual based on

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actual disbursement of loans and prevailing LIBOR rates during the project construction period.

10.10 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 0.492 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, for the allowed construction period starting from the date of financial close, on the basis of actual drawdowns (within the overall debt allowed by the Authority at COD) by applying rates of LIBOR applicable at the day of the respective drawdowns.

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

Project Cost	**USD million**
EPC Cost	26.775
Non-EPC and Project Development Cost	1.200
Insurance during construction	0.107
Financing Fee and Charges	0.449
Interest During Construction	0.492
Total	**29.023**

Cost of Land

10.12 The petitioner has claimed cost of land as USD 0.4586 million in the tariff petition which was later revised to USD 0.4581 million vide email dated February 28, 2019. Later the petitioner vide its email dated November 18, 2019 revised the cost of land to the tune of USD 0.72 million. EQSPL submitted that 250 acres of land has been allocated by GOB for the project.

10.13 The petitioner submitted that in exercise of powers conferred by Section 10(2) of the Colonization of Government Lands Act, 1912, as applicable to the province of Balochistan, the Senior Member (Land Utilization Department), Board of Revenue (Balochistan) issued the Statement of Conditions (SOC) No. 53/LU/2018/6278-83 dated April 23, 2018. The SOC states that the same has been issued for grant of state land measuring 500 acres situated near

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Mouza Neeli Tappa, Bostan, Tehsil Karezat, District Pishin on lease for producing alternative energy through the development of solar photovoltaic generation facilities. Clause 3 of SOC provides that GOB will grant land to Balochistan Energy Company Limited (BECL) by way of Master Lease. That land shall then be sub-leased, in accordance with the SOC and provision of Act, to a company, a person or group of person, organization or a co-operative society. Clause 7 of SOC states that the GOB shall hold 5% equity in the company developing the project.

10.14 EQSPL submitted that pursuant to the SOC, the Board of Revenue (Balochistan) through the Deputy Commissioner / Collector, District Pishin has executed a Master Lease dated May 07, 2018 with BECL. Through the said document, GOB has leased out 500 acres land situated near Mouza Neeli Tappa, Bostan, Tehsil Karezat, District Pishin to BECL. Para 8 of the Master Lease provides that pursuant to GOB Policy, 2007, the lessee shall hold 5 percent equity in the company developing the project, on behalf of the lessor.

10.15 EQSPL also submitted Sub-lease Deed/Agreement executed between BECL and EQSPL on July 4, 2019 for development of project. As per the sub lease agreement, the land has been given to EQSPL on sub-lease for a period of 25 years from COD and 27 years from the date of sub-lease, whichever comes first. Pursuant to section 5 of sub lease, the project shall be transferred to GOB after completion of twenty five years from COD. Pursuant to section 8, in consideration of sub-lease of the land, the lessor shall hold/own 8% equity/shareholding in the company on behalf of GOB.

10.16 The Authority has considered the above details. The analysis with respect to the cost of land that has been allowed to comparable solar projects (both on lease basis and on procurement from private party) has also been carried out. It has also been noted that the project shall be transferred to the provincial government post completion of twenty five years of operation. In view thereof, the Authority is of the view that approved level of return (as discussed in the following section) on 5% equity representation (as given in SOC and Master Lease) is an appropriate amount to be allowed for yearly lease cost of land. On this basis, an amount of Rs. 6.312 million per year has been allowed which comes out to be around Rs. 25,250 per acre per year. As the payment of cost of land is to be made on annual basis after the COD of the power plant, hence, the Authority is of the view that making it a part of the project cost upfront may not be justified. In view thereof, the Authority has decided to allow cost of land as a separate component of tariff which shall remain fixed throughout the control period.

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

11.1 The petitioner in the petition claimed O&M cost of USD 0.9 million/year. Through its letter dated April 01, 2019, the petitioner requested to allow O&M cost of USD 0.75 million per year. EQSPL clarified that the O&M cost as claimed in the petition was inclusive of CSR expenses of USD 0.150 million per year as required by GOB. The petitioner has submitted signed copy of warranty period O&M agreement executed on November 16, 2018 with Hydro China. It was submitted by the petitioner that warranty period consists of 24 months from COD.

11.2 GOB submitted that the O&M cost stated by the company is quite higher. It submitted that O&M costs recently determined by NEPRA are in the range of USD 11,000-12,000 per MW per year.

11.3 To evaluate this claim of EQSPL, 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. 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 0.50 million per year to EQSPL, i.e. USD 10,000 per MW per year.

11.4 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 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.

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12. **Whether the claimed insurance during operation is justified?**

12.1 In its tariff petition, EQSPL claimed insurance during operation of USD 0.194 million per annum. The petitioner submitted that in case of increase of actual annual insurance, adjustment up to maximum cap of 0.75% of the EPC cost be allowed on the production of actual insurance premium.

12.2 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, to the petitioner, subject to adjustment on actual basis as per the mechanism given in the order part.

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

13.1 The petitioner submitted that Return on Equity during Construction (ROEDC) and Return on Equity (ROE) components have been calculated based on a rate of return of 15% in line with the previous tariff determinations of the Authority of similar projects. The petitioner submitted that it has not assumed Withholding Tax (WHT) on dividends and stated in the petition that 14% ROE net of WHT be allowed. The petitioner further requested that ROE to be adjusted to 16% or higher if NEPRA determines to reduce projects cost to ensure appropriate returns to the project sponsors. The petitioner has stated to compute its ROE component while treating the project on Build, Own, Operate and Transfer (BOOT) basis.

13.2 The Authority has noted that in the most recent comparable tariff cases of renewable technologies, 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%, as the maximum limit, for EQSPL. It has been noted that the Authority has decided principally not to allow WHT on dividends and maintains its said stance for EQSPL.

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

14.1 The petitioner submitted indicative term sheets from IFC, CDC and United Bank Limited (UBL) for debt arrangement along with the tariff petition. During hearing and in its latest submission, the petitioner has claimed following financing/debt parameters regarding the debt arrangement:

Debt	80% (50% foreign and 50% local)
Interest	Local: (5.5%) 2%+3.5% SBP fixed rate Foreign: 3 month LIBOR (2.68%) + 4.25%
Debt term	Local: 12 years Foreign: 15 years

14.2 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 EQSPL at debt to equity ratio of 80: 20 as claimed by the petitioner.

14.3 Benchmarking Guidelines provide that in case the renewable energy projects eligible for securing debt under the revised SBP refinancing scheme for renewable energy, 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 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 scheme. In view thereof, the Authority has decided to compute and approve tariff of EQSPL at 50% local and 50% foreign financing as claimed by the petitioner. For local loan, the cost of 5.5% as claimed by the petitioner has been taken into account. For the foreign loan, the cost of 6.156% (LIBOR of 1.9055% + spread of 4.25%) has been taken into account. The savings in approved cost/spread of aforesaid financings shall be shared in the ratio of 60 : 40 between power purchaser and producer. To

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compute the savings on the cost of financing under SBP scheme, the cost of 6% as given in the said scheme shall be taken into account.

14.4 The petitioner has claimed debt servicing period of ten years for financing under SBP scheme and fourteen years for foreign financing. In view of approvals given in the recent tariff determinations, the Authority has decided to approve the tenors as claimed by the petitioner.

15. **Whether the claimed annual energy production and corresponding plant capacity factor are justified?**

Whether the petitioner's proposed solar modules and inverter technology satisfies the international standards of quality and operation?

15.1 The petitioner has submitted the following in this regard:

Project capacity	50 MWp
Annual power generation	95.081 GWh
Net capacity factor	21.70%

15.2 The petitioner submitted that it has selected polycrystalline PV Module "Canadian Solar CS3U-340P" for the project. Further, it submitted that inverters of Huawei Sun 2000 90KTL shall be installed for the project. Additionally, following details have been stated in the petition:

Module output warranty	25 years warranty for depreciation not more than 0.5 %
Efficiency of module	17.14%
No. of modules	147,060
Inverter capacity	100 KW each
Inverter model	Sun2000 90KTL
Inverter Manufacturer	Huawei
No. of inverters	464 units
Inverter efficiency	99% (Euro: 98.4%; CEC: 98.5%)
Warranty period	10 years

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Mounting structure	HDG steel
Mounting method	Fixed-tilt

15.3 EQSPL vide email dated November 8, 2019 submitted "Solar resource and yield assessment for a PV installation of 50 MW in Bostan (Pakistan)" dated August 24, 2017. The report is compiled by INGENIA Solar Energy S.L.U. of Spain.

15.4 During hearing, the Authority directed the petitioner to submit justification of using fixed-tilt over tracking technology. In response, the petitioner vide letter dated April 1, 2019 submitted the following:

> "We contacted various Vendors for a comprehensive solution on trackers. The main issue faced with international companies is their inability to perform services for maintenance in Balochistan. While the companies are willing to provide warranty claims, they require that the trackers are dismantled and transported to Karachi for any maintenance as their employees will not travel to the site at Balochistan due to security concerns. Whereas, for Fixed Tilt System, the fault ratio is much lower than the tracking system. In case there is any problem with a fixed tilt system, our EPC can train local resources on site to manage it. Tracking systems are very technical and require expertise which are not currently available locally.
>
> EnerTech has already installed two tracking systems as pilot projects in Quetta. Those systems were made by Morgan Solar, a Canadian company specializing in dual Axis technology. The engineers from the company came to Islamabad to train resources only for deployment of the system, however for any repairs or maintenance these systems are dismantled and shipped to Islamabad, where the specialists come from Canada to evaluate and repair, thus increasing the costs of operating these systems significantly. It is important to note that these systems are under 25 years warranty, but the management of the warranty is very costly for us due to the security situation in the region. For our 100 MW project, we approached several companies producing trackers such as, Morgan Solar Canada, Arctech, China and Kingsun, China for the proposals. The obstacle is the same as these

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companies have security concerns for sending their engineers to the site for repairs, maintenance and warranty claims.

The project site is on the base of mountain chain and has periodic gusts of high speed. Even for our fixed tilt systems, the system is designed to withstand 200 km/hr of wind speed, however due to lack of information pertaining to the wind conditions of the site, we have been very conservative in the design of trackers for the wind speed. This leads to very high cost of EPC. It is based on our analysis that the higher EPC and O&M costs and risks of failure in the tracking plant is significant and without adequate support from the manufacturers, it is too risky for the first project in Balochistan to follow tracking systems."

15.5 It has been noted that the generation license for the proposed technology has already been approved for EQSPL. For plant capacity factor, the Authority has considered the modules, inverters and other equipment as proposed by EQSPL with respect to their quality and energy yield. The resource and yield assessment report as submitted by the petitioner has also been examined. The plant capacity factor that has been allowed for polycrystalline modules in the recent tariff cases of south region were also checked and found to be in the range of 20.5% (fixed tilt) to 22.21% (single axis). Considering these factors, the Authority is of the view that the claimed net plant capacity factor is on slightly lower side as per the assessment of Technical team of NEPRA and therefore decided to compute the tariff of EQSPL on the capacity factor of 22.40%. 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.

16. **Whether the claimed construction period is justified?**

16.1 The petitioner has claimed construction period of 10 months. 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 EQSPL as well.

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

17.1 The petitioner submitted that it engaged Power Planners International on May 10, 2017 for conducting the Grid Interconnection Study (GIS) of the project. During the hearing, EQSPL submitted that its GIS has been approved by both QESCO and NTDCL and there is not requirement of obtaining consents from NTDCL/CPPA-G under Tariff Rules. The Authority has noted that it has approved generation license of EQSPL. The Authority also agrees with the submission of the petitioner that the requirement of obtaining power evacuation certificate is not given in the Tariff Rules, 1998. In view thereof, the Authority considered it appropriate to proceed further in the matter as per the stipulations given in the Tariff Rules.

18. **Degradation factor**

18.1 EQSPL claimed degradation factor 0.7% per annum in its tariff petition and requested to allow its impact through adjustment in reference tariff. Then, the petitioner vide email dated February 28, 2019 claimed degradation impact of USD 1.453 million while including the same in the project cost. During the hearing, the petitioner asked to allow degradation at the rate of 0.5% per annum. The Authority has noted that degradation factor of 0.5% has been taken into account in the recently approved tariff cases of solar power projects and decided to approve the same in EQSPL's tariff. As claimed by the petitioner, the Authority has decided to capitalize the impact of degradation in the approved project cost. The amount of USD 0.969 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.

19. **Comments submitted by CPPA-G and MOE**

19.1 Following submissions were advanced by CPPA-G and MOE:

- As per decision of the Cabinet Committee on Energy (CCOE) taken on February 27, 2019, the name of EQSPL is appearing in the list of category III. The CCOE decision pertaining to EQSPL is that "...may be allowed to proceed ahead subject to becoming successful in the competitive bidding process to be undertaken by AEDB specifically designed for each technology under this category based on the quantum ascertained for each technology by Indicative Generation Capacity Expansion Plan (IGCEP) by NTDCL." Therefore, the process of tariff determination need to review. MOE in its comments on May 06, 2019

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NATIONAL ELECTRIC POWER REGULATORY AUTHORITY while reproducing the decision of CCOE dated February 27, 2019 requested NEPRA to hold up admission/hearing of the new tariff petitions including EQSPL till the issuance of new policy guidelines under the RE Policy 2019.

- Power generation in Pakistan is being procured according to NTDC IGCEP as per PC-4 of Grid Code in line with the demand vs supply position.

- NEPRA State of Industry Report, 2017 (SIR 2017) has indicated surplus capacity of 908 MW in the year 2018 and projected to increase to 13,934 MW by the year 2025. The surplus generation will result in huge financial burden on the end consumers in the form of capacity payment.

- NEPRA must review the proposal of the demand vs. supply situation coupled with quantum of renewable energy to be inducted in the national grid according to the recommendations of the Grid Code Review Panel duly approved by NEPRA from time to time.

- New solar power plants are being set up globally at a tariff under 3 cents per kWh. Pakistan needs to induct cheap electricity into its existing mix to lower its basket price, in line with the IGCEP. Using concentrated photovoltaic and double axis technology through competitive bidding process can result in the acquisition of comparatively lower cost solar generation.

19.2 The Authority has noted that the aforesaid submissions of CPPA G with respect to SIR 2017, IGCEP and quantum of induction of renewable energy have already been addressed in the generation license decisions of EQSPL and other renewable cases. With respect to submission regarding decision of CCOE, the Authority has noted that it has time and again clarified that it decided to induct solar energy through competitive bidding and directed the relevant agencies to develop Request for Proposal (RFP) for that purpose. Due to non-finalization of RFP by any agency after the lapse of considerable time period, the process of competitive bidding has not taken place. Therefore, it may not be considered appropriate to stop accepting complete applications under Tariff Rules and delay the induction of cheap electricity merely on the basis that relevant entities have caused delay in carrying out competitive bidding. With respect to the argument of lower tariff, the Authority is of the view that solar tariffs are dependent on multiple factors which include solar irradiance in the area of installation, cost of capital of the country and sizing of the project. Comparison of solar tariffs across countries has to be made while considering all these factors and other

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considerations including state of maturity of the sector in the form of installed capacity base and local manufacturing. Notwithstanding above, the tariff being approved in this determination is the lowest in the current mix of the country.

20. **ORDER**

In pursuance of section 7(3)(a) read with 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 Enertech Quetta Solar (Pvt.) Limited (EQSPL) for its 50 MWp solar power project for delivery of electricity to the power purchaser as follows:

- Levelized tariff works out to be Rs. 5.8418/kWh (US Cents 3.7604/kWh).
- The tariff has been worked out on Build, Own, Operate and Transfer basis.
- EPC cost of USD 26.775 million has been approved.
- Project Development Cost of USD 1.200 million has been approved.
- Insurance during constriction 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.
- Equity redemption has been made from 16th till 25th year.
- The cost of debt of 5.5% (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 14 years from COD has been used for foreign financing.
- O&M Cost of USD 10,000 per MW per year has been allowed.
- Insurance during Operation has been calculated as 0.40% of the allowed EPC Cost.

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- Construction period of 10 months has been allowed.
- Net Annual Plant Capacity Factor of 22.4% 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 approved EPC cost shall be made for the currency fluctuation against the reference parity values.
- PDC, Insurance during construction 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

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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 loan, the savings in the approved spreads shall be shared between the power purchaser and power producer in the ratio of 60:40. To compute the saving in cost of local financing under SBP scheme, the rate of 6% as given in the said scheme shall be taken into account and then the computed savings shall be shared between 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 adjusted on annual basis starting from either 1st January or 1st July. Land cost component shall remain fixed during the tariff control period and no adjustment shall be applicable thereon. The indexation mechanisms are given hereunder:

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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 1st day of the insurance coverage period whichever is lower

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 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:

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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 22.40% net annual plant capacity factor. Net annual energy generation supplied to the power purchaser in a year, in excess of 22.40% net annual plant capacity factor, will be charged at the following tariffs:

Net annual plant capacity factor	% of prevalent tariff allowed to power producer
Above 22.40% up to 23%	
Above 23% to 23.75%	20%

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Above 23.75% to 24.5%	40%
Above 24.5% to 25.25%	80%
Above 25.25%	90%

- The risk of solar resource shall be borne by the power producer.

- The maximum plant PV capacity shall not exceed 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 tenor, as applicable. To compute that saving, the cost of 6% as given in the SBP scheme shall be taken into account. 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

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delay in project construction. However, the failure of the company to complete construction within 10 months will not invalidate the tariff granted to it.

- The tariff has been calculated and approved on Build, Own, Operate and Transfer basis. Relevant agencies, prior to signing the security/concession and other documents, may consider the arrangement as decided between GOB and project company for the transfer of the project after completion of tariff control period of 25 years.

- 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 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.

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21. 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.

AUTHORITY

(Saif Ullah Chattha)
Member
9.1.2020

(Rafique Ahmed Shaikh)
Member
8/1/2020

(Eng. Bahadur Khan)
Member

(Rehmatullah Baloch)
Vice Chairman
8/1/2020

(Tauseef H. Farooqi)
Chairman

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Annex-I

ENERTECH QUETTA SOLAR (PVT.) LIMITED
REFERENCE TARIFF TABLE

Year	Land Cost	O&M	Insurance	Return on Equity	Return on Equity during Contruction	Loan Repayment	Interest Charges	Tariff
	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh
1	0.0643	0.7917	0.1696	1.3297	0.0754	2.3527	2.1640	6.9474
2	0.0643	0.7917	0.1696	1.3297	0.0754	2.4908	2.0259	6.9474
3	0.0643	0.7917	0.1696	1.3297	0.0754	2.6371	1.8796	6.9474
4	0.0643	0.7917	0.1696	1.3297	0.0754	2.7920	1.7247	6.9474
5	0.0643	0.7917	0.1696	1.3297	0.0754	2.9560	1.5606	6.9474
6	0.0643	0.7917	0.1696	1.3297	0.0754	3.1297	1.3869	6.9474
7	0.0643	0.7917	0.1696	1.3297	0.0754	3.3137	1.2030	6.9474
8	0.0643	0.7917	0.1696	1.3297	0.0754	3.5085	1.0082	6.9474
9	0.0643	0.7917	0.1696	1.3297	0.0754	3.7147	0.8019	6.9474
10	0.0643	0.7917	0.1696	1.3297	0.0754	3.9332	0.5835	6.9474
11	0.0643	0.7917	0.1696	1.3297	0.0754	1.6304	0.4038	4.4651
12	0.0643	0.7917	0.1696	1.3297	0.0754	1.7331	0.3011	4.4651
13	0.0643	0.7917	0.1696	1.3297	0.0754	1.8423	0.1920	4.4651
14	0.0643	0.7917	0.1696	1.3297	0.0754	1.9584	0.0759	4.4651
15	0.0643	0.7917	0.1696	1.3297	0.0754	-	-	2.4308
16	0.0643	0.7917	0.1696	1.8209	0.0754	-	-	2.9220
17	0.0643	0.7917	0.1696	1.8209	0.0754	-	-	2.9220
18	0.0643	0.7917	0.1696	1.8209	0.0754	-	-	2.9220
19	0.0643	0.7917	0.1696	1.8209	0.0754	-	-	2.9220
20	0.0643	0.7917	0.1696	1.8209	0.0754	-	-	2.9220
21	0.0643	0.7917	0.1696	1.8209	0.0754	-	-	2.9220
22	0.0643	0.7917	0.1696	1.8209	0.0754	-	-	2.9220
23	0.0643	0.7917	0.1696	1.8209	0.0754	-	-	2.9220
24	0.0643	0.7917	0.1696	1.8209	0.0754	-	-	2.9220
25	0.0643	0.7917	0.1696	1.8209	0.0754	-	-	2.9220
Levelized Tariff	**0.0643**	**0.7917**	**0.1696**	**1.4093**	**0.0754**	**2.2353**	**1.0961**	**5.8418**

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Annex-II

ENERTECH QUETTA SOLAR (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	1,863,766,526	35,261,173	25,626,790	1,828,505,353	60,887,963	1.4675	1.0149
2	1,828,505,353	35,746,014	25,141,949	1,792,759,339	60,887,963		
3	1,792,759,339	36,237,522	24,650,441	1,756,521,817	60,887,963		
4	1,756,521,817	36,735,788	24,152,175	1,719,786,030	60,887,963		
5	1,719,786,030	37,240,905	23,647,058	1,682,545,125	60,887,963	1.5499	0.9325
6	1,682,545,125	37,752,967	23,134,995	1,644,792,158	60,887,963		
7	1,644,792,158	38,272,070	22,615,892	1,606,520,088	60,887,963		
8	1,606,520,088	38,798,311	22,089,651	1,567,721,776	60,887,963		
9	1,567,721,776	39,331,788	21,556,174	1,528,389,988	60,887,963	1.6369	0.8455
10	1,528,389,988	39,872,600	21,015,362	1,488,517,388	60,887,963		
11	1,488,517,388	40,420,848	20,467,114	1,448,096,540	60,887,963		
12	1,448,096,540	40,976,635	19,911,327	1,407,119,905	60,887,963		
13	1,407,119,905	41,540,064	19,347,899	1,365,579,841	60,887,963	1.7288	0.7536
14	1,365,579,841	42,111,240	18,776,723	1,323,468,601	60,887,963		
15	1,323,468,601	42,690,269	18,197,693	1,280,778,332	60,887,963		
16	1,280,778,332	43,277,260	17,610,702	1,237,501,072	60,887,963		
17	1,237,501,072	43,872,323	17,015,640	1,193,628,749	60,887,963	1.8259	0.6565
18	1,193,628,749	44,475,567	16,412,395	1,149,153,182	60,887,963		
19	1,149,153,182	45,087,106	15,800,856	1,104,066,075	60,887,963		
20	1,104,066,075	45,707,054	15,180,909	1,058,359,021	60,887,963		
21	1,058,359,021	46,335,526	14,552,437	1,012,023,495	60,887,963	1.9284	0.5540
22	1,012,023,495	46,972,639	13,915,323	965,050,856	60,887,963		
23	965,050,856	47,618,513	13,269,449	917,432,343	60,887,963		
24	917,432,343	48,273,268	12,614,695	869,159,075	60,887,963		
25	869,159,075	48,937,025	11,950,937	820,222,050	60,887,963	2.0367	0.4457
26	820,222,050	49,609,909	11,278,053	770,612,140	60,887,963		
27	770,612,140	50,292,046	10,595,917	720,320,095	60,887,963		
28	720,320,095	50,983,561	9,904,401	669,336,534	60,887,963		
29	669,336,534	51,684,585	9,203,377	617,651,949	60,887,963	2.1510	0.3314
30	617,651,949	52,395,248	8,492,714	565,256,700	60,887,963		
31	565,256,700	53,115,683	7,772,280	512,141,017	60,887,963		
32	512,141,017	53,846,024	7,041,939	458,294,994	60,887,963		
33	458,294,994	54,586,406	6,301,556	403,708,588	60,887,963	2.2718	0.2106
34	403,708,588	55,336,969	5,550,993	348,371,618	60,887,963		
35	348,371,618	56,097,853	4,790,110	292,273,765	60,887,963		
36	292,273,765	56,869,198	4,018,764	235,404,567	60,887,963		
37	235,404,567	57,651,150	3,236,813	177,753,418	60,887,963	2.3993	0.0830
38	177,753,418	58,443,853	2,444,109	119,309,564	60,887,963		
39	119,309,564	59,247,456	1,640,507	60,062,109	60,887,963		
40	60,062,109	60,062,109	825,854	0	60,887,963		

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ENERTECH QUETTA SOLAR (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	11,997,210	136,569	184,622	11,860,641	321,191	0.8851	1.1491
2	11,860,641	138,671	182,520	11,721,970	321,191		
3	11,721,970	140,805	180,386	11,581,166	321,191		
4	11,581,166	142,971	178,220	11,438,194	321,191		
5	11,438,194	145,171	176,020	11,293,023	321,191	0.9409	1.0934
6	11,293,023	147,405	173,786	11,145,617	321,191		
7	11,145,617	149,674	171,517	10,995,944	321,191		
8	10,995,944	151,977	169,214	10,843,966	321,191		
9	10,843,966	154,316	166,875	10,689,650	321,191	1.0002	1.0341
10	10,689,650	156,691	164,500	10,532,960	321,191		
11	10,532,960	159,102	162,089	10,373,858	321,191		
12	10,373,858	161,550	159,641	10,212,308	321,191		
13	10,212,308	164,036	157,155	10,048,271	321,191	1.0632	0.9711
14	10,048,271	166,561	154,630	9,881,711	321,191		
15	9,881,711	169,124	152,067	9,712,587	321,191		
16	9,712,587	171,726	149,465	9,540,860	321,191		
17	9,540,860	174,369	146,822	9,366,491	321,191	1.1301	0.9042
18	9,366,491	177,052	144,139	9,189,439	321,191		
19	9,189,439	179,777	141,414	9,009,662	321,191		
20	9,009,662	182,544	138,647	8,827,118	321,191		
21	8,827,118	185,353	135,838	8,641,766	321,191	1.2013	0.8330
22	8,641,766	188,205	132,986	8,453,561	321,191		
23	8,453,561	191,101	130,090	8,262,459	321,191		
24	8,262,459	194,042	127,149	8,068,417	321,191		
25	8,068,417	197,028	124,163	7,871,389	321,191	1.2770	0.7573
26	7,871,389	200,060	121,131	7,671,329	321,191		
27	7,671,329	203,139	118,052	7,468,190	321,191		
28	7,468,190	206,265	114,926	7,261,925	321,191		
29	7,261,925	209,439	111,752	7,052,486	321,191	1.3574	0.6769
30	7,052,486	212,662	108,529	6,839,824	321,191		
31	6,839,824	215,935	105,256	6,623,890	321,191		
32	6,623,890	219,258	101,933	6,404,632	321,191		
33	6,404,632	222,632	98,559	6,182,000	321,191	1.4429	0.5913
34	6,182,000	226,058	95,133	5,955,943	321,191		
35	5,955,943	229,536	91,655	5,726,406	321,191		
36	5,726,406	233,069	88,122	5,493,337	321,191		
37	5,493,337	236,655	84,536	5,256,682	321,191	1.5338	0.5005
38	5,256,682	240,297	80,894	5,016,385	321,191		
39	5,016,385	243,995	77,196	4,772,390	321,191		
40	4,772,390	247,750	73,441	4,524,640	321,191		
41	4,524,640	251,562	69,629	4,273,077	321,191	1.6304	0.4038
42	4,273,077	255,434	65,757	4,017,644	321,191		
43	4,017,644	259,364	61,827	3,758,279	321,191		
44	3,758,279	263,356	57,835	3,494,923	321,191		
45	3,494,923	267,408	53,783	3,227,515	321,191	1.7331	0.3011
46	3,227,515	271,524	49,667	2,955,991	321,191		
47	2,955,991	275,702	45,489	2,680,289	321,191		
48	2,680,289	279,945	41,246	2,400,345	321,191		
49	2,400,345	284,253	36,938	2,116,092	321,191	1.8423	0.1920
50	2,116,092	288,627	32,564	1,827,465	321,191		
51	1,827,465	293,069	28,122	1,534,396	321,191		
52	1,534,396	297,579	23,612	1,236,818	321,191		
53	1,236,818	302,158	19,033	934,660	321,191	1.9584	0.0759
54	934,660	306,808	14,383	627,852	321,191		
55	627,852	311,529	9,662	316,323	321,191		
56	316,323	316,323	4,868	0	321,191		

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