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National Electric Power Regulatory Authority

Islamic Republic of Pakistan

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No. NEPRA/TRF-417/WEPL-2017/13233-13235

August 20, 2018

Subject: Determination of National Electric Power Regulatory Authority in the matter of Tariff Petition filed by Western Energy (Pvt.) Limited for Determination of Reference Generation Tariff in respect of 50 MW Wind Power Project [Case # NEPRA/TRF-417/WEPL-2017]

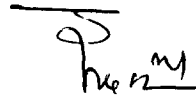
Dear Sir,

Please find enclosed herewith the subject Determination of the Authority along with Annexure-I & II (24 pages) in Case No. NEPRA/TRF-417/WEPL-2017.

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 part along with Annexure-I & II of the Authority's Determination needs to be notified in the official Gazette.

Enclosure: As above


20 08 18
(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.



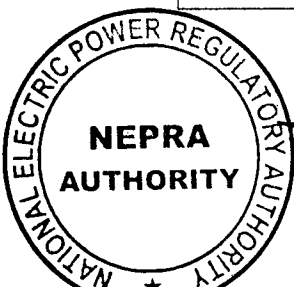
**DETERMINATION OF THE NATIONAL ELECTRIC POWER REGULATORY AUTHORITY IN
THE MATTER OF TARIFF PETITION FILED BY WESTERN ENERGY (PVT.) LIMITED FOR
DETERMINATION OF REFERENCE GENERATION TARIFF IN RESPECT OF 50 MW WIND
POWER PROJECT**

1. Western Energy (Pvt.) Ltd. ("WEPL" or "the petitioner" or "the company/project company") vide its letter dated November 27, 2017 filed a tariff petition before National Electric Power Regulatory Authority ("NEPRA" or the Authority") under Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 ("NEPRA Act, 1997") and NEPRA (Tariff Standards & Procedure) Rules, 1998 ("Tariff Rules, 1998") for determination of reference generation tariff in respect of its 50 MW wind power project ("the project") envisaged to be set up at Jhimpir, District Thatta, Sindh. The petitioner requested for the approval of levelized tariff of US Cents 7.7053/kWh (Rs. 8.0906/kWh) over the tariff control period of 25 years.

SUBMISSIONS OF THE PETITIONER

2. The petitioner submitted that it is a Special Purpose Vehicle ("SPV") registered under the laws of Pakistan. Letter of Intent ("LOI") was issued to WEPL by Alternative Energy Development Board (AEDB) on March 6, 2013 for establishing a wind power generation project. On March 01, 2018, the validity of the said LOI was extended by AEDB till June 24, 2018. WEPL also submitted approval of feasibility study issued by AEDB on Nov 15, 2017. The generation license was issued by NEPRA to WEPL on January 05, 2017 for the capacity of 50 MW.
3. Summary of the key information provided by the petitioner is as follows:

Project company	:	Western Energy (Pvt.) Ltd.
Sponsors	:	Tapal Group & China Shipbuilding Industry Corporation
Capacity	:	50 MW
Project location	:	Jhimpir, District Thatta, Sindh
Land area	:	428 Acres
Concession period	:	25 years from COD
Power purchaser	:	Central Power Purchasing Agency (G) Ltd.
Wind turbine manufacturer	:	Haizhuang Windpower Equipment Co. Ltd.
Model	:	H111-2.0MW
Plant capacity factor	:	37%

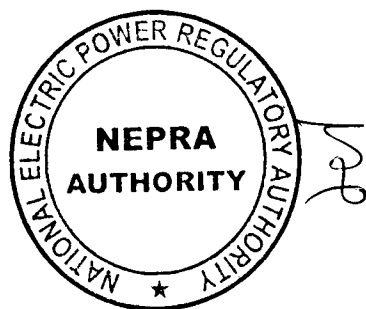


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Annual energy generation	:	162.060 GWh
EPC contractor	:	Shanghai Marine Diesel Engine Research Institute and its affiliate (Offshore) Sino-Qiyao International (Pvt.) Limited (Onshore)
Project cost		USD in millions
EPC cost	:	76.000
Non-EPC & Project Development Cost	:	4.613
Taxes & custom duties	:	2.033
Insurance during construction	:	0.585
Financial Charges	:	2.779
Interest during construction	:	2.445
Total project cost	:	88.455
Financing structure	:	Debt: 75% : Equity: 25%
Debt composition	:	100% foreign loan
Interest rate	:	3 month LIBOR (0.6%) + spread 3% and arranger's fee of 1.2% of loan amount
Debt repayment period	:	13 years
Return on equity	:	17% IRR based
Operations cost (USD million)	:	USD 2.71 million per annum (average)
Insurance cost	:	USD 0.39 million per annum
		PKR/kWh US\$/kWh
Levelized Tariff	:	8.0906 7.7053
Exchange rate	:	1 USD = PKR 105

PROCEEDINGS:

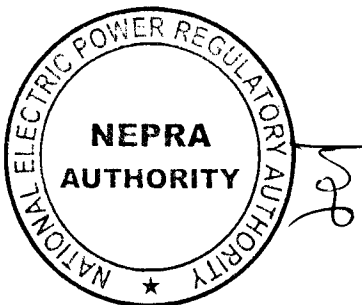
- The Authority considered the tariff petition and admitted the same for further processing. Notice of Admission/Hearing containing salient features of the petition, hearing schedule and issues framed for hearing was published in two national daily newspapers on March 17, 2018. Through the said notices, NEPRA invited comments and intervention requests from the interested parties within fourteen (14) days of publication of notice. Tariff petition and Notice of Admission/Hearing were also published on NEPRA's website for information of general public. Individual Notices of hearing were also sent to the stakeholders, considered to be relevant, and the petitioner on March 20, 2018 for participation in the proceedings.




5. The hearing on the subject matter was held on April 3, 2018 (Tuesday) at 11:30 A.M. at NEPRA Tower, Islamabad, which was attended by a large number of participants including the petitioner, representatives of National Transmission & Despatch Co. Ltd. ("NTDCL"), Private Power & Infrastructure Board ("PPIB"), Government of Sindh (GOS), etc.
6. In response to Notice of Admission/Hearing, comments were received from Central Power Purchasing Agency (Guarantee) Limited ("CPPA-G") dated March 26, 2018 whereas no intervention request was received from any party. The comments of CPPA-G are discussed in the relevant paragraphs of this determination.

ISSUES FRAMED

7. Following is the list of issues that were framed by the Authority for the hearing:
 - i. Whether the details provided for EPC cost are sufficient and whether the claimed EPC cost is competitive and comparative and based on the firm and final agreement(s)? and
 - ii. Whether the NEPRA (Selection of EPC Contractor by IPPs) Guidelines, 2017 have been fully complied with?
 - iii. 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.
 - iv. Whether the claimed annual energy generation and corresponding plant capacity factor are reasonable and justified? And
 - v. Whether the petitioner's proposed wind turbine technology satisfies the international standards of quality and operation?
 - vi. Whether the claimed O&M costs are justified? Provide rationale of claiming foreign & local O&M cost.
 - vii. Whether the claimed insurance during operation cost is justified?
 - viii. Whether the claimed return on equity is justified?
 - ix. Whether the claimed financing/debt terms are justified?
 - x. Whether the claimed construction period is justified?
 - xi. Any other issue with the approval of the Authority.
8. The issue wise submissions of the petitioner and the Authority's findings and decision thereon are as under:



Whether the details provided for EPC cost are sufficient and whether the claimed EPC cost is competitive and 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?

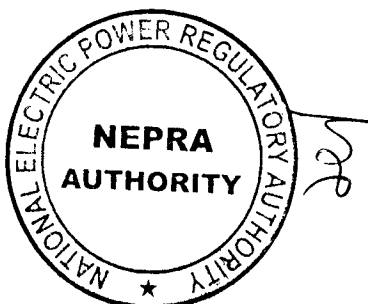
9. The petitioner has claimed USD 76 million on account of Engineering, Procurement and Construction ("EPC") cost in its tariff petition. In this regard, the petitioner has submitted copies of Offshore Agreement signed on December 15, 2014 with Shanghai Marine Diesel Engine Research Institute and Onshore Agreement signed on January 30, 2015 with M/s Sino-Qiyao International (Pvt.) Limited. The breakup of the EPC cost as provided by the petitioner is given hereunder:

EPC cost	(USD in million)
Offshore contract	64.6
Onshore contract	11.4
Total	76.0

10. The petitioner submitted that EPC Cost includes the cost of 25 wind turbine generators, generator step up transformers, MV Substation, HV Substation, protection system, SCADA system, communication system, metering system and anemometry system, electrical equipment together with ancillary equipment and other goods, systems and machinery and includes the cost of, inter alia, the erection, testing, completion and commissioning of the equipment and construction of the facility that is capable of fulfilling the intended purpose. The EPC Cost also includes costs for staff accommodation (construction of the camp buildings), supply of drinking water and electricity (to camp buildings), catering services for the staff, certain project vehicles, standby generator (including fuel), site security during construction period and construction of internal access roads.
11. NEPRA vide letter dated May 11, 2018 directed the petitioner to submit the complete documents related to bidding process followed by the project company for the selection of the EPC contractor. The petitioner in its response dated May 29, 2018 submitted that the project company started development work after receipt of the LOI in March, 2013. At that time, NEPRA's upfront tariff regime was in vogue and the selection of EPC Contractor for the project was the prerogative of the sponsors while the NEPRA (Selection of EPC Contractor by IPPs) Guidelines, 2017 was issued on 19th May 2017. Accordingly, the criterion for the selection of EPC Contractor was based on best market terms for technically

superior wind turbine technology which is best suited for the selected site and supported by the Chinese Authorities.

12. To evaluate the EPC cost claim of WEPL, the Authority has referred the latest available EPC cost data in different parts of the world. The information given in the reports published by International Renewable Energy Agency ("IRENA"), Bloomberg and other sources has been relied upon for this purpose. Furthermore, the tariff determinations approved by the regulators of countries in different regions have also been studied. The costs allowed by the Authority in previously determined wind power projects were also examined. After analysing all this information, the Authority is of the view that EPC cost of USD 76 million as claimed by WEPL is on the higher side. The process of selection of contractors followed by the petitioner may have been transparent; however, the same has not yielded prices which can be considered competitive and comparative. The considerations of the Authority for the assessment of the EPC costs to be allowed to the petitioner are given in the following paragraph.
13. It was noted that the average wind turbine prices across most of the countries were below USD 1 million per MW in 2017. The most updated reports provide that average global cost of wind turbines for the contracts signed in 1st half of 2018 have fallen to around USD 0.85 million per MW. Besides turbine cost, the absolute amount and proportion of other components that constitute the total EPC cost as given in the referred reports was also analysed. EPC costs in China and India were also checked and found lowest in the world due to their local manufacturing, low cost of land and labour etc. For instance, there are states in India where the total EPC cost of even less than USD 0.80 million per MW has been allowed by their respective regulators. However, the Authority is of the view that the cases of any particular country cannot be made exact reference for Pakistan owing to differences in market conditions, local manufacturing bases, tariff regimes, performance targets and other technological and economic factors. The trend of decrease in EPC prices over last couple of years and reasons thereof were also examined. The competition among WTG suppliers has been reported as the primary factor for the decline in turbine prices and corresponding EPC cost of wind power projects. The variations in the cost of turbines having different hub heights, rotor diameters, nameplate capacity were also analysed. The differences in the civil cost part of the project due to variations in the number and size of the turbines were also considered. The Authority further noted that margins for EPC contractor, transportation costs, level of performance being approved in this determination etc. should also be taken into account to set the EPC cost. After detailed



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analysis of the available information and factoring in the all the aforesaid factors, the Authority has decided to approve the EPC cost of WEL as USD 57.251 million.

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.

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.

15. The petitioner has claimed USD 12.455 million on account of non-EPC cost. Detail of non-EPC costs provided by the petitioner is hereunder:

Non-EPC Cost	(USD million)
Taxes & custom duties	2.033
Project Development cost	4.613
Insurance during construction	0.585
Financial charges	2.779
Interest during construction	2.445
Total Non-EPC Cost	12.455

Taxes and custom duties

16. The petitioner has claimed following taxes:

Taxes & custom duties	% of value service
Sindh Sales Tax on Services (onshore EPC contract)	8%
Tax on Contract for Construction Services	7%

17. The petitioner further submitted that custom duty, additional custom duty, sales tax on imports, advance income tax on import, SIDC, FED has not been assumed in the petition and requested to allow/adjust at actual at COD.
18. The Authority has noted that in the earlier tariff determinations, only those duties and taxes which are directly imposed on the petitioner, being non-transferable and non-reimbursable nature, up to commencement of operation at COD stage have been allowed by the

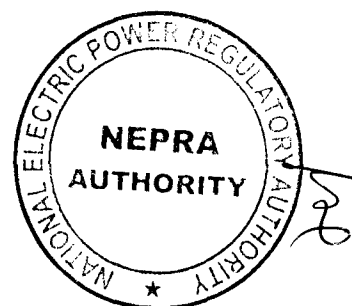
Authority. The same treatment is hereby allowed for WEPL. Doing so, the impact of claimed duties/taxes have not been taken into account while determining reference tariff. Duties fulfilling the aforesaid criteria shall be adjusted at the time of COD on production of documentary evidence to the satisfaction of the Authority.

Project Development Cost

19. The petitioner has claimed Project Development Cost ("PDC") of USD 4.613 million. In its petition and during the hearing, the petitioner submitted that this claim includes the cost of feasibility and other studies, administrative costs, fixed assets and office setup cost, various regulatory fees, security cost, travelling expenses, cost of land and fees in relation to advisors of the project. During the hearing, the petitioner submitted that the development work on the project has been prolonged since 2013 due to a number of impediments, therefore the administrative and other development costs has increased on account of these delays.
20. The Authority has noted that PDC of around USD 3.5 million had been allowed in the earlier tariff cases of wind power projects. The Authority has also examined the cost of PDC being claimed by other wind power projects and found that the claim of as low as USD 2.03 million has been made. The Authority also referred the recent tariff cases of solar power projects of comparable size where the maximum PDC to the tune of USD 1.782 million has been allowed. Considering these details while accounting for the difference in construction period between solar and wind power projects, the Authority has decided to allow USD 2.5 million on account of PDC to the petitioner. This cost shall be adjusted at actual, up to the maximum allowed cost, based on production of verifiable documents at the time of COD.

Insurance During Construction

21. The petitioner has claimed USD 0.585 million on account of insurance during construction cost. Further, the petitioner has requested that in the event it cannot arrange the insurance at 0.5% per annum due to any reasons then insurance during construction up to 1.35% of EPC cost may be allowed at COD. Following insurance coverage has been indicated by the petitioner during the construction period:
- a) Construction all risk insurances (CAR)
 - b) CAR delay in start-up insurance
 - c) Terrorism insurance
 - d) Marine and inland transit insurance
 - e) Marine – delay-in start-up insurance



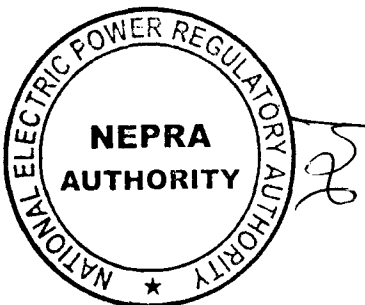
f) Comprehensive general liability

22. The Authority has analysed the available data with respect to during construction insurance incurred by a number of wind power projects that have achieved COD. It has also been noted that in the recent tariff cases of solar power projects, the Authority has allowed pre-COD insurance at the maximum rate of 0.50% of the approved EPC cost. Based on these considerations, the Authority has decided to allow insurance during construction to the maximum of 0.5% of the approved EPC cost for the project as well which works out to be around USD 0.286 million. Insurance during construction shall be adjusted at actual, subject to allowed amount as maximum limit, at the time of COD on production of authentic documentary evidence to the satisfaction of the Authority.

Financial Fee & Charges

23. The petitioner has claimed USD 2.779 million on account of financial charges and submitted that the claimed amount includes the advisory and arrangement fee to secure sinosure cover, the lenders' up-front fee and commitment fee, mandate and processing fee and stamp duty applicable on the financing documents, agency fee, security trustee fee, lenders' project monitoring fee and the fees for the lenders' legal and other advisors customary for a foreign lender to engage in order to carry out the due diligence, drafting of financing documents and monitoring of the project during the construction period. The petitioner submitted that the requested financial charges are in line with the prevailing market conditions and practices applicable for project financing transactions as allowed by NEPRA in its other tariff determinations.
24. It was noted that in earlier tariff determinations for wind power projects, the Authority had allowed financial fee & charges at the rate of 3% of the debt portion of capital expenditures (EPC, PDC, pre-COD insurance). In recent cost plus tariff determinations of solar power projects, financial fee & charges at the rate of 2.5% of the debt portion of capital expenditures has been allowed. Considering the recent standards, the Authority has decided to approve financing fee and charges with the cap of 2.5% of the allowed debt portion of the approved capital cost to WEPL. Accordingly, the allowed amount under this head works out to be around USD 1.201 million. Financing charges shall be adjusted at actual, subject to allowed amount as maximum limit, at the time of COD on production of authentic documentary evidences to the satisfaction of the Authority.

Interest during construction (IDC)



25. The petitioner has claimed interest during construction of USD 2.445 million for 18 month construction period which has been calculated on the basis of 3 month LIBOR of 0.6% plus spread of 4.2% (including 1.2% of the arranger fee). The petitioner submitted that actual IDC, however, shall be subject to change depending on the fluctuations in base rate, funding requirement (drawdowns) of the project during the construction period, changes in project cost including changes due to taxes and duties, and variations in PKR / USD exchange rate. The petitioner has claimed loan tenor of 13 years for the project. The terms of financing as well as period for construction being approved in this determination are discussed in the ensuing relevant sections. Based on the approved financing terms, construction period, capital cost including financing fee and charges while considering notional drawdowns of 20% in each quarter, the IDC works out to be USD 1.939 million which is hereby approved.

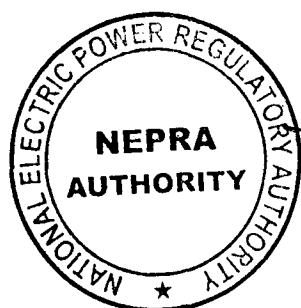
26. Recapitulating the above, the approved project cost under various heads is given hereunder:

Project Cost	(USD million)
EPC Cost	57.251
Project Development Cost	2.500
Insurance during construction	0.286
Financing Fee & Charges	1.201
Interest During Construction	1.939
Total	63.177

Whether the claimed annual energy generation and corresponding plant capacity factor are reasonable and justified? And Whether the petitioner's proposed wind turbine technology satisfies the international standards of quality and operation?

27. The petitioner submitted the following technical parameters in this regard:

Project capacity	50 MW
Annual power generation	162,060 MWh
Net capacity factor	37%
Hub Height	80m
Rotor Diameter	111m
Name plate capacity (Each Turbine)	2MW



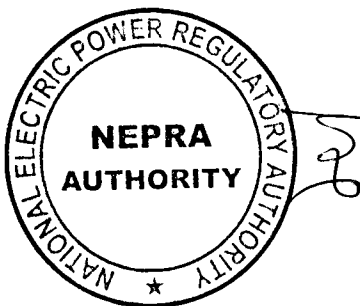

28. The petitioner submitted that annual energy production of 162.060 GWh and corresponding net plant capacity factor of 37% has been estimated for the project. The petitioner submitted Wind Resource and Energy Yield Assessment Report ("Energy Report") conducted by the technical consultant hired by WEPL.
29. During the hearing the petitioner submitted that its was asked by the Government entities to relocate the project site due to the plan of Pakistan Air Force ("PAF") for construction of Bholari Air Base in close proximity of its earlier project site. Keeping in view the larger national interest, WEPL agreed to relocate the wind project site and with the help of AEDB and Energy Department, Government of Sindh, a new piece of land measuring 428 acres was allocated to WEPL in January 2016. Soon after the reallocation of land, WEPL once again carried out all the requisite studies. However, lately, the area of newly allocated site was further reduced due to the restrictions imposed by the PAF. Due to the said restrictions, WEPL once again revised all the relevant studies. Now the capacity factor of the project on newly allocated sites has been reduced to 35% from 38.33% due to aforesaid restrictions imposed by the PAF. However, WEPL submitted that it is taking the risk and claiming capacity factor of 37% with the request to allow 100% tariff on energy generated beyond 37%.
30. During the hearing the petitioner submitted that H111- 2.0 MW wind turbine manufactured by CSIC (Chongqing) Haizhuang Windpower Equipment Co., Ltd. has been selected for WEPL. Haizhuang Windpower Equipment Co., Ltd. has successfully installed 8800+ MW around the world. The selected wind turbine complies with International Electro-technical Commission (IEC) Class III and type certified by the China Classification Society and has statement of compliance from DNV.GL. The petitioner also submitted that the selected wind turbine technology has also been approved by the Committee of Experts formed by AEDB under the terms of the LOI.
31. To assess this parameter of tariff, the Authority has analysed the data of energy yields of currently operational wind power plants in the country. The data of energy yields in different regions of the world and their trend in last couple of years has also been reviewed. It has been noted that worldwide, the capacity factors have improved as new machines are yielding better energy output within a given wind resource regime. These improvements have also been noted while comparing the energy production of old and newly commissioned wind power projects in Jhimpir region. It is found that the primary reason of these better results has been the change in turbine design through improvement in hub height, nameplate capacity and especially the enhancement in rotor diameters. For WEPL also, it has been found that the mentioned three parameters are better than the

turbines installed by the earlier wind power projects which are under operation in the country. Keeping in view these considerations while comprehensively analysing the information with respect to wind resource, location, technology etc. using a number of standard tools, the Authority understands that the net annual plant capacity factor as claimed by the petitioner is on the lower side. The Authority has decided to set the tariff of WEPL at net annual plant capacity factor of 41.4%. For energy beyond the set plant factor, the Authority has decided to approve the following mechanism:

<u>Net annual plant capacity factor</u>	<u>% of prevalent tariff</u>
Above 41.4% to 42.4%	80%
Above 42.4% to 43.4%	90%
Above 43.4%	100%

Whether the claimed O&M costs are justified? Provide rationale of claiming foreign & local O&M cost.

32. The petitioner has claimed weighted average O&M cost of USD 2.71 million per annum i.e. around USD 54,000 per MW per annum. The petitioner submitted that O&M agreement has been signed with the Sino-Qiyao International (Pvt.) Ltd. for the initial period of 10 years after COD. Under the arrangement, the O&M Contractor shall be responsible for provision or procurement and performance of all the works, services, supplies and other activities including management services necessary to operate and maintain the project to ensure energy production is maximized and that the project is operated and maintained in accordance with the applicable performance standards. The petitioner requested to allow the claimed O&M cost being significantly low compared to previous upfront tariffs. The petitioner claimed O&M cost of 54% in local currency and 46% in foreign component.
33. To evaluate the O&M cost claim of WEPL, the Authority has referred the latest available O&M cost data in different parts of the world. The information given in the reports published by International Renewable Energy Agency ("IRENA"), Bloomberg and other sources have been relied upon. Furthermore, the tariff determinations approved by the regulators of countries in different regions have also been studied. The costs allowed by the Authority in previously determined wind power projects were also examined. Analysing all this data and particularly the trend of decrease in this cost component, the Authority is of the view that O&M cost of USD 2.71 million as claimed by WEPL is not reasonable. The

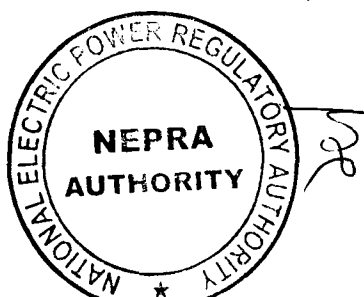


considerations made by the Authority for the assessment of the EPC costs to be allowed to the petitioner are given in the following paragraph.

34. The referred reports provide that the O&M cost has decreased sharply over the last couple of years and forecast further decrease in the upcoming years. The O&M cost of as low as USD 15,000 per MW per annum has been found reported in the referred sources for the initial term contracts. However, these sources qualify that O&M cost increases reasonably with turbines age as component failure becomes more common and manufacturer warranties expire. It has also been found reported that wind power projects being setup with larger turbines and more sophisticated design will have relatively lower overall O&M cost. The reported impact of size of project and turbines on the annual cost of O&M and differentials with their varying sizes was also analysed. O&M cost in India and China have also been checked and found to be lowest across different countries. Particularly in India, the O&M cost has been found in the range of USD 10,000 per MW to USD 14,000 per MW in different states. Nevertheless, the Authority is cognizant of the fact that the costs of India and China cannot be replicated in Pakistan due to advanced development stage of wind industry in those countries and consequent available expertise in terms of manpower and required equipment as well as due to difference in tariff regimes. In addition, the Authority also noted that the level of performance being approved in this determination is relatively higher as compared to what is allowed in India and China which shall require more robust warranties from the O&M contractor that shall also result in comparatively higher O&M cost. Considering all these factors, the Authority has decided to approve O&M cost of USD 23,000 per MW per annum for WEPL. In view of the current local market conditions, the Authority has decided to share the approved O&M cost into local and foreign components in the ratio of 25:75.
35. The petitioner is hereby directed to conduct a transparent and competitive bidding process for the selection of the O&M contractor while following the procedure given in the EPC Guidelines, 2017. The O&M cost approved in this determination shall be considered as ceiling for that purpose. Approved O&M cost shall be adjusted on the basis of bidding results at the time of COD considering the approved amount as the maximum limit.

Whether the claimed insurance during operation cost is justified?

36. The petitioner has claimed USD 0.39 million per annum on account of insurance during operation. The petitioner submitted that insurance during operations is based on 0.5% of claimed EPC cost. The petitioner submitted that the insurance cost consists of all-risk' insurance/reinsurance, business interruption insurance & machinery break-down, natural



calamities, sabotage and terrorism. Following insurance coverage proposes to procure by the petitioner during the operation phase:

- a) Property Damage and Comprehensive Machinery Insurance (including Business Interruption insurance);
- b) Third Party Liability;
- c) Terrorism insurance;
- d) Group Personal Accident Insurance; and
- e) Motor Comprehensive Insurance

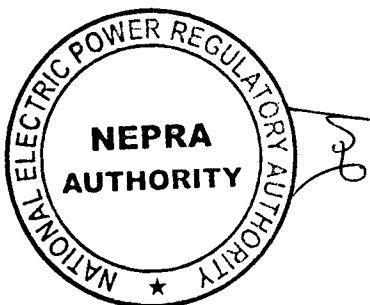
37. The Authority has allowed insurance during operation at the rate of 0.4% of the EPC cost in the most recent determination of solar energy projects. The data of actual insurance of operational wind power projects has also been analysed for this purpose which shows that insurance during operation has been secured at the rate of even less than 0.4%. In view thereof, the Authority has decided to allow insurance during operation at maximum limit of 0.4% of the approved EPC cost to WEPL. This cost shall be allowed adjustment on annual basis as per the mechanism given in the order part of this determination.

Whether the claimed return on equity is justified?

38. The petitioner claimed Return on Equity (ROE) of 17% (IRR basis) on invested equity. It was noted that over the passage of time, the Authority has revised the equity returns downward for a number of generation technologies keeping in view the developments in those sectors. The Authority has noted that more than 1000 MWs of wind power projects are operational. Further, it has been learnt that wind power projects having capacity of more than 2,000 MWs to be setup in Sindh have obtained LOIs from different facilitating agencies. This makes it quite clear that risk profile for developing wind projects especially in Sindh has reduced considerably. Moreover, the Authority noted that a number of under process wind power companies have claimed ROE of even less than 14%. In view thereof, the Authority has decided to approve the ROE for the petitioner at the rate of 14%.

Whether the claimed financing/debt terms are justified?

39. The petitioner has submitted that 100% foreign loan shall be secured for the project based on debt to equity ratio of 75:25. The interest rate of 3 month LIBOR (0.6%) + spread of 4.2% (including arranger fee) has been claimed in the petition for the debt servicing period of thirteen years. During the hearing, the petitioner also requested to approve the provision of Sinasure fee in the tariff of the project. In support of its claim, the petitioner submitted



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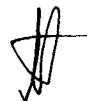
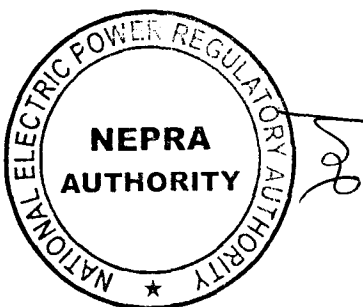


indicative term sheet signed with lenders namely Industrial and Commercial Bank of China with the petition.

40. The Authority has considered the terms of financing being claimed by the petitioner. The Authority has noted that the State Bank of Pakistan ("SBP") has issued concessionary financing scheme in June, 2016. Under the said scheme, renewable energy projects having capacity up to 50 MW can secure loan up to the limit of 6 billion at the rate of 6% for the debt servicing tenor of ten years. The Authority noted that the capacity of the project is 50 MW which makes it eligible to avail financing under SBP scheme. The Authority has therefore decided to approve the reference tariff of WEPL on the terms of financing scheme issued by SBP and hereby direct the petitioner to approach SBP for this purpose.
41. In case the petitioner is not able to secure financing under SBP scheme then the tariff of WEPL shall be adjusted on conventional local/foreign financing, or a mix of both, at the time of its COD. However, the petitioner shall have to prove through documentary evidence that it exhausted the option of availing financing under SBP scheme before availing part/full of conventional local/foreign loan. For conventional full/part of local loan, if any, the tariff of the petitioner shall be approved on applicable KIBOR plus spread of 1.75% and foreign loan on applicable LIBOR plus spread of 4.25%. For conventional loans, the term of debt servicing shall not be lesser than thirteen years.
42. The petitioner claimed tariff on debt : equity ratio of 75:25. The Authority has considered that a number of under process wind power projects have claimed their tariffs on debt : equity ratio of 80 : 20. Further, the Authority has considered that a number of benchmark/upfront tariff determinations of renewable power projects have been approved at the debt : equity ratio of 80:20. In view thereof, the Authority has decided to approve WEPL's tariff on debt to equity proportion of 80:20. The approved debt : equity ratio shall remain same regardless of any form of financing secured by the petitioner. .

Whether the claimed construction period is justified?

43. The petitioner has claimed 18 month time for the construction of the project. The Authority has noted that there are a number of under process wind power projects which are claiming construction period of fifteen month. In addition, it has also been seen that there are a number of operational wind projects that have been able to complete construction in fifteen months. In view thereof, the Authority has decided to approve the construction period of fifteen months for WEPL as well.



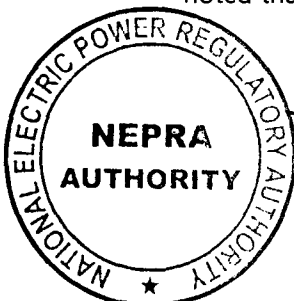
Any other issue with the approval of the Authority.

Time of Financial Close

44. It was noted that the Authority in earlier wind tariffs had been allowing the time of one year to achieve financial close. In the most recent cases of solar energy, the Authority has allowed the time of six months to achieve financial close. This time was shortened in view of rapid cost and technological improvements happening in that industry. For wind power projects also, the Authority has noted the changes with respect to prices and technology are very rapid and therefore decided to allow time of six months to the petitioner to achieve the financial close.

Comments of CPPA-G

45. CPPA-G submitted that NEPRA should review the proposal in the context of demand vs supply situation coupled with the quantum of renewable energy to be inducted in Grid according to the recommendations of Grid Code Review Panel ("GCRP") duly approved by NEPRA from time to time. CPPA-G also submitted that all the projects based on wind, solar, small hydel and bagasse energy will be awarded through competitive bidding as per Cabinet Committee on Energy ("CCE") decision.
46. Regarding the submission of CPPA-G with respect to demand and supply position, it has been noted that NTDCL vide its letter dated June 23, 2017 submitted tentative demand supply analysis with the report namely Power Balance up to 2025. In that document, NTDCL submitted that it plans to evacuate 600 MW additional power from wind power projects in 2019-20.
47. Regarding quantum of renewable energy induction in the Grid, the Authority considered minutes of GCRP's meeting held on March 26, 2016, circulated on March 31, 2016, whereby GCRP decided to inform NEPRA and other stakeholders that the share of wind comes out to be 1,756 MW for the year 2016-17. The Authority also noted that NTDCL has issued certificate of approval of the system studies of the project company on November 11, 2016. NTDCL in its approval letter also certified that the power to be generated by the project company will be evacuated by December, 2019 and will not have any adverse effect on the national grid as required under the Grid Code. On the basis of that approval, the Authority has issued generation license to WEPL on January 05, 2017.
48. Regarding award of tariff of renewable energy projects through competitive bidding, it was noted that vide its decision dated January 27, 2017 in the matter of Wind Power Generation



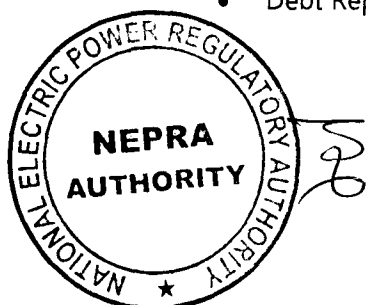
Tariff, the Authority decided to allow induction of wind energy through competitive bidding and directed the relevant agencies to develop Request For Proposal (RFP) for that purpose. Due to non-finalization of RFP by any agency after the lapse of considerable time period, the process of competitive bidding has not taken place. Further, the Authority through decision dated May 30, 2017 passed in the Review Motions of GOS clarified that submission of tariff petitions under the Tariff Rules, 1998 is permissible. Therefore, it may not be considered appropriate to stop entertaining applications under Tariff Rules, 1998 merely on the basis of the decision of CCE.

49. ORDER

In pursuance of section 7(3)(a) read with Rule 3 of the Tariff Standards & Procedure Rules, 1998, the Authority hereby determines and approves the following generation tariff along with terms and conditions for Western Energy (Pvt) Limited for its 50 MW wind power project for delivery of electricity to the power purchaser:

Tariff Component	Rs./kWh	
	Year 1-10	Year 11-25
Operations and Maintenance Cost	0.7610	0.7610
Insurance during Operation	0.1515	0.1515
Return on Equity (ROE + ROEDC)	1.2762	1.2762
Debt Servicing	4.4722	-
Total	6.6609	2.1887

- Levelized tariff works out to be US Cents 4.3467 /kWh.
- EPC cost of USD 57.251 million has been considered.
- PDC including land cost of USD 2.500 million has been taken into account.
- Insurance during construction at the rate of 0.5% of the EPC cost has been approved.
- Financing fee at the rate of 2.5% of the debt portion of the capital cost has been approved.
- Net Annual Plant Capacity Factor of 41.40% has been approved.
- O&M Cost ceiling of USD 23,000 per MW per year has been approved.
- The aforementioned tariff is applicable for twenty five (25) years from COD
- Debt to Equity of 80:20 has been used.
- Debt Repayment period of 10 years has been taken into account.



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- The cost of financing of 6% for construction and operation has been used.
- Return on Equity during construction and operation of 14% has been allowed.
- Construction period of fifteen (15) months has been used for the workings of ROEDC and IDC.
- Insurance during Operation has been calculated as 0.4% of the allowed EPC Cost.
- Reference Exchange Rates of 120 PKR/USD has been used.
- Detailed component wise tariff is attached as **Annex-I** of this decision.
- Debt Servicing Schedule is attached as **Annex-II** of this decision.

A. One Time Adjustments at COD

- The EPC cost shall be 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, on production of authentic documentary evidence to the satisfaction of the Authority. The adjustment in approved EPC cost shall be made only 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 allowed on these accounts in USD will be converted in PKR using the reference PKR/USD rate of 120 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.
- 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 fifteen months allowed by the Authority.
- For full/part of conventional local or foreign loans or a mix of both, if availed by the company, the IDC shall also be allowed adjustment for change in applicable KIBOR/LIBOR.
- 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.

- The reference tariff has been worked out on the basis of cost of 6% offered under SBP financing scheme. In case cost negotiated by the company under SBP scheme is less than the said limit of 6%, the savings in that cost shall be shared between the power purchaser and the power producer in the ratio of 60:40 respectively.
- For full or part of local or foreign loan, if any, the savings in the approved spreads shall be shared between the power purchaser and power producer in the ratio of 60:40.
- ROEDC will be adjusted at COD on the basis of actual equity injections (within the overall equity allowed by the Authority at COD) for the project construction period of fifteen months allowed by the Authority.
- O&M components shall be adjusted on the basis of bidding results to be carried out by the petitioner considering the approved amount as the maximum limit.

B. Indexations

Adjustment of O&M, return on equity, return on equity during construction shall be made on quarterly basis for the quarters starting from 1st July, 1st October, 1st January and 1st April based on latest available information. Adjustment of Debt Servicing Component (if any) shall be made either quarterly or bi-annually depending upon the final terms approved by the Authority. For bi-annual adjustments, the periods shall start from 1st July and 1st January. Insurance component shall be adjusted on annual basis. The indexation mechanisms are given hereunder:

i) Operation and Maintenance Costs

O&M components of tariff shall be adjusted based on revised rates of local Inflation (CPI) as notified by Pakistan Bureau of Statistics, foreign inflation (US CPI) as notified by US Bureau of Labour Statistics and TT&OD selling rate of US Dollar as notified by National Bank of Pakistan according to the following formula;

F. O&M _(REV)	=	F. O&M _(REF) * US CPI _(REV) / US CPI _(REF) * ER _(REV) /ER _(REF)
L. O&M _(REV)	=	L. O&M _(REF) * CPI _(REV) / CPI _(REF)



Where;

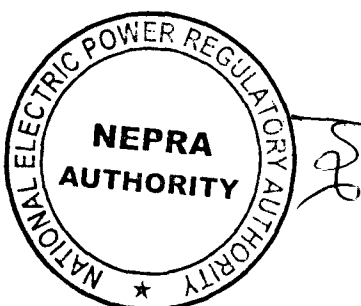
F. O&M _(REV)	=	The revised O&M Foreign Component of Tariff
L. O&M _(REV)	=	The revised O&M Local Component of Tariff
F. O&M _(REF)	=	The reference O&M Foreign Component of Tariff
L. O&M _(REF)	=	The reference O&M Local Component of Tariff
US CPI _(REV)	=	The revised US CPI (All Urban Consumers)
US CPI _(REF)	=	The reference US CPI (All Urban Consumers) of 251.588 of May, 2018
CPI _(REV)	=	The revised CPI (General)
CPI _(REF)	=	The reference CPI (General) of 225.40 for the month of May, 2018
ER _(REV)	=	The revised TT & OD selling rate of US dollar
ER _(REF)	=	The reference TT & OD selling rate of RS. 120/USD

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

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 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 EPC Cost at Rs. 120
P _(Act)	=	Actual premium or 0.4% of the EPC Cost converted into Pak Rupees on exchange rate prevailing at the time of insurance premium payment of the insurance coverage period whichever is lower



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iii) **Return on Equity**

The total ROE (ROE + ROEDC) component of the tariff will be adjusted on quarterly basis 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. 120/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 full or part of conventional foreign debt, if any, respective principle 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 quarter, over the applicable reference exchange rate. The interest part of the foreign loan shall be allowed adjustment with respect to change in the applicable LIBOR. For full or part of local loan, if any, the interest component shall be allowed adjustment with respect to change in applicable KIBOR.

C. Terms and Conditions

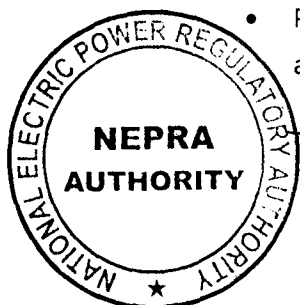
The following terms and conditions shall apply to the determined tariff:

- 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 41.40% net annual plant capacity factor. Net annual energy generation supplied to the power purchaser in a year, in excess of 41.40% net annual plant capacity factor will be charged at the following tariffs:



<u>Net annual plant capacity factor</u>	<u>% of prevalent tariff</u>
Above 41.4% to 42.4%	80%
Above 42.4% to 43.4%	90%
Above 43.4%	100%

- The risk of wind resource shall be borne by the power producer.
- In the tabulated 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.
- In case the company shall secure full or part of local conventional loan then the tariff of company shall be adjusted at the time of COD at applicable KIBOR + spread of 1.75%. The tenor of the debt servicing shall not be less than thirteen years for this loan.
- In case the company shall secure full or part of foreign conventional loan then the tariff of company shall be adjusted at the time of COD at applicable LIBOR + spread of 4.25%. The tenor of the debt servicing shall not be less than thirteen years for this loan.
- In case the company shall secure foreign loan under any credit insurance (Sinosure etc.) then the cost of that insurance shall be allowed to the maximum limit of 0.6% of the yearly outstanding principal and interest amounts. For that purpose, the spread over that full/part of loan shall be considered as 3.5% as the maximum limit.
- The company will have to achieve financial close within six months from the date of issuance of this determination. The tariff granted to the company will no longer remain applicable/valid, if financial close is not achieved by the company in the abovementioned timeline or its generation license is declined/revoked by NEPRA.
- The targeted maximum construction period after financial close is fifteen 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 fifteen months will not invalidate the tariff granted to it.
- Pre COD sale of electricity is allowed to the project company, subject to the terms and conditions of Energy Purchase Agreement, at the applicable tariff excluding



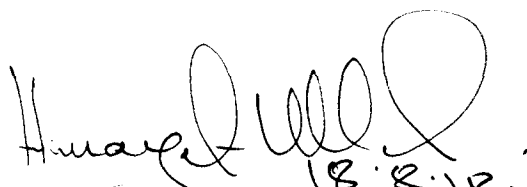



principal repayment of debt component and interest component. However, pre COD sale will not alter the required commercial operations date stipulated by the Energy Purchase Agreement in any manner.


- 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.

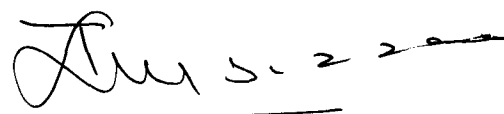
50. The Order part along with two Annexures is recommended for notification by the Federal Government in the official gazette in accordance with Section 31(7) of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997.

AUTHORITY

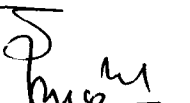

(Himayat Ullah Khan)
Member


(Saif Ullah Chattha)
Member
17.8.2018


(Rehmatullah Baloch)
Vice Chairman
17/8/2018

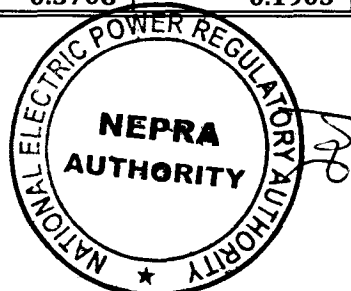

(Brig (R) Tariq Saddozai)
Chairman




20.08.18

REFERENCE TARIFF FOR WESTERN ENERGY PRIVATE LIMITED

Year	Foreign O&M	Local O&M	Insurance	Return on Equity	ROEDC	Loan Repayment	Interest Charges	Tariff
	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh
1	0.5708	0.1903	0.1515	1.1706	0.1055	2.5214	1.9508	6.6609
2	0.5708	0.1903	0.1515	1.1706	0.1055	2.6761	1.7961	6.6609
3	0.5708	0.1903	0.1515	1.1706	0.1055	2.8403	1.6319	6.6609
4	0.5708	0.1903	0.1515	1.1706	0.1055	3.0146	1.4576	6.6609
5	0.5708	0.1903	0.1515	1.1706	0.1055	3.1996	1.2726	6.6609
6	0.5708	0.1903	0.1515	1.1706	0.1055	3.3959	1.0762	6.6609
7	0.5708	0.1903	0.1515	1.1706	0.1055	3.6043	0.8679	6.6609
8	0.5708	0.1903	0.1515	1.1706	0.1055	3.8254	0.6467	6.6609
9	0.5708	0.1903	0.1515	1.1706	0.1055	4.0602	0.4120	6.6609
10	0.5708	0.1903	0.1515	1.1706	0.1055	4.3093	0.1628	6.6609
11	0.5708	0.1903	0.1515	1.1706	0.1055	-	-	2.1887
12	0.5708	0.1903	0.1515	1.1706	0.1055	-	-	2.1887
13	0.5708	0.1903	0.1515	1.1706	0.1055	-	-	2.1887
14	0.5708	0.1903	0.1515	1.1706	0.1055	-	-	2.1887
15	0.5708	0.1903	0.1515	1.1706	0.1055	-	-	2.1887
16	0.5708	0.1903	0.1515	1.1706	0.1055	-	-	2.1887
17	0.5708	0.1903	0.1515	1.1706	0.1055	-	-	2.1887
18	0.5708	0.1903	0.1515	1.1706	0.1055	-	-	2.1887
19	0.5708	0.1903	0.1515	1.1706	0.1055	-	-	2.1887
20	0.5708	0.1903	0.1515	1.1706	0.1055	-	-	2.1887
21	0.5708	0.1903	0.1515	1.1706	0.1055	-	-	2.1887
22	0.5708	0.1903	0.1515	1.1706	0.1055	-	-	2.1887
23	0.5708	0.1903	0.1515	1.1706	0.1055	-	-	2.1887
24	0.5708	0.1903	0.1515	1.1706	0.1055	-	-	2.1887
25	0.5708	0.1903	0.1515	1.1706	0.1055	-	-	2.1887
Levelized Tariff	0.5708	0.1903	0.1515	1.1706	0.1055	2.1613	0.8661	5.2161



DEBT SEVICING SCHEDULE WESTERN ENERGY PRIVATE LIMITED

Annex -II

Relevant Quarters	Base amount (USD)	Principal Repayment (USD)	Interest (USD)	Balance Principal (USD)	Total Debt Service (Million USD)	Annual Principal Repayment Rs./kWh	Annual Interest Rs./kWh
1	50,541,751	931,338	758,126	49,610,413	1,689,464	2.5214	1.9508
2	49,610,413	945,308	744,156	48,665,105	1,689,464		
3	48,665,105	959,488	729,977	47,705,617	1,689,464		
4	47,705,617	973,880	715,584	46,731,737	1,689,464		
5	46,731,737	988,488	700,976	45,743,249	1,689,464	2.6761	1.7961
6	45,743,249	1,003,316	686,149	44,739,934	1,689,464		
7	44,739,934	1,018,365	671,099	43,721,569	1,689,464		
8	43,721,569	1,033,641	655,824	42,687,928	1,689,464		
9	42,687,928	1,049,145	640,319	41,638,782	1,689,464	2.8403	1.6319
10	41,638,782	1,064,883	624,582	40,573,900	1,689,464		
11	40,573,900	1,080,856	608,608	39,493,044	1,689,464		
12	39,493,044	1,097,069	592,396	38,395,976	1,689,464		
13	38,395,976	1,113,525	575,940	37,282,451	1,689,464	3.0146	1.4576
14	37,282,451	1,130,227	559,237	36,152,223	1,689,464		
15	36,152,223	1,147,181	542,283	35,005,043	1,689,464		
16	35,005,043	1,164,389	525,076	33,840,654	1,689,464		
17	33,840,654	1,181,854	507,610	32,658,799	1,689,464	3.1996	1.2726
18	32,658,799	1,199,582	489,882	31,459,217	1,689,464		
19	31,459,217	1,217,576	471,888	30,241,641	1,689,464		
20	30,241,641	1,235,840	453,625	29,005,802	1,689,464		
21	29,005,802	1,254,377	435,087	27,751,424	1,689,464	3.3959	1.0762
22	27,751,424	1,273,193	416,271	26,478,231	1,689,464		
23	26,478,231	1,292,291	397,173	25,185,941	1,689,464		
24	25,185,941	1,311,675	377,789	23,874,266	1,689,464		
25	23,874,266	1,331,350	358,114	22,542,915	1,689,464	3.6043	0.8679
26	22,542,915	1,351,321	338,144	21,191,595	1,689,464		
27	21,191,595	1,371,590	317,874	19,820,004	1,689,464		
28	19,820,004	1,392,164	297,300	18,427,840	1,689,464		
29	18,427,840	1,413,047	276,418	17,014,794	1,689,464	3.8254	0.6467
30	17,014,794	1,434,242	255,222	15,580,551	1,689,464		
31	15,580,551	1,455,756	233,708	14,124,795	1,689,464		
32	14,124,795	1,477,592	211,872	12,647,203	1,689,464		
33	12,647,203	1,499,756	189,708	11,147,447	1,689,464	4.0602	0.4120
34	11,147,447	1,522,253	167,212	9,625,194	1,689,464		
35	9,625,194	1,545,086	144,378	8,080,108	1,689,464		
36	8,080,108	1,568,263	121,202	6,511,845	1,689,464		
37	6,511,845	1,591,787	97,678	4,920,059	1,689,464	4.3093	0.1628
38	4,920,059	1,615,663	73,801	3,304,395	1,689,464		
39	3,304,395	1,639,898	49,566	1,664,497	1,689,464		
40	1,664,497	1,664,497	24,967	(0)	1,689,464		

