National Electric Power Regulatory Authority

Islamic Republic of Pakistan

Registrar

2nd Floor, OPF Building, G-5/2, Islamabad
Ph: 9206500, 9207200, Fax: 9210215
E-mail: registrar@nepra.org.pk

No.NEPRA/TRF-190/TGL-2011/4038-4040
April 26, 2012

Subject: **Determination of National Electric Power Regulatory Authority in the Matter of Tariff Petition filed by Tenaga Generasi Ltd. (TGL) [Case # NEPRA/TRF-190/TGL-2011]**
Intimation of Determination of Tariff pursuant to Section 31(4) of the Regulation of Generation, Transmission and Distribution of Electric Power Act (XL of 1997)

Dear Sir,

Please find enclosed herewith the subject Determination of the Authority along with Annexure-I & II (32 pages) in Case No. NEPRA/TRF-190/TGL-2011.

2. The Determination is being intimated to the Federal Government for the purpose of notification of the approved tariff in the official gazette pursuant to Section 31(4) of the Regulation of Generation, Transmission and Distribution of Electric Power Act (XL of 1997) and Rule 16(11) of the National Electric Power Regulatory Authority Tariff (Standards and Procedure) Rules, 1998.

3. Please note that only Order of the Authority at para 15 of the Determination relating to the reference tariff, adjustments, indexation & terms and conditions etc. along with Annexure-I & II needs to be notified in the official gazette.

Enclosure: As above

(Syed Safeer Hussain)

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Secretary
Ministry of Water & Power
'A' Block, Pak Secretariat
Islamabad

CC:
1. Secretary, Cabinet Division, Cabinet Secretariat, Islamabad.
2. Secretary, Ministry of Finance, Islamabad.

Determination of National Electric Power Regulatory Authority in the matter of tariff petition filed by Tenaga Generasi Limited
Case No.NEPRA/TRF-190/TGL-2011

1. Tenaga Generasi Limited (hereinafter referred to as the "petitioner") filed a tariff petition (hereinafter referred to as the "petition") under rule 3 of the National Electric Power Regulatory Authority (Tariff Standards and Procedure) Rules, 1998 (hereinafter referred to as the "tariff rules") on September 13, 2011 for determination of generation tariff in respect of its 49.50 MW wind power project envisaged to be set up at Kuttikhun, Taluka Mirpur Sakro, District Thatta in the province of Sindh.

2. In accordance with sub-rule 3 of rule 4 of the tariff rules, the petition was admitted for hearing by the National Electric Power Regulatory Authority (hereinafter referred to as "the Authority") on September 14, 2011. Consequent to the admission, notice of admission/public hearing was published in the national newspapers on October 02, 2011 inviting thereby all the stakeholders, interested/affected persons or parties to participate in the tariff setting process through filing of comments / intervention requests. Subsequently, due to declaration of public holiday on the scheduled date of public hearing, the hearing had to be rescheduled. Notice of rescheduling of public hearing was published in the national newspapers on October 26, 2011. Further, in accordance with sub-rule 5 of rule 4 of the tariff rules, the Authority also gave directions for service of notices to the respondents and other parties which in the opinion of the Authority were likely to be affected or interested or may be of assistance to the Authority in arriving at a just and informed determination, for filing comments, replies or communications in opposition or in support of the petition. In response to the notices of admission/public hearing, no intervention request was filed. However, comments were received from the stakeholders regarding net annual energy generation, size of the selected wind turbines, efficiency of selected wind turbines in the high ambient temperatures, various components of the project cost and some other matters. These comments have been considered by the Authority and where appropriate have been discussed in relevant parts of this determination. Public hearing in this regard was held on November 01, 2011 at Islamabad, which was attended by the petitioner, representatives of the proposed power purchaser, planning commission and various other stakeholders.

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3. Summary of the key information provided by the petitioner is as follows:

Type of the project	:	Wind power project
Project location	:	Kuttikhun, Taluka Mirpur Sakro, District Thatta, Sindh, Pakistan
Installed capacity	:	49.50 MW
Land area	:	4,881 acres
Concession period	:	20 years from commercial operations date
Proposed power purchaser	:	National Transmission And Despatch Company Limited (through Central Power Purchasing Agency)
EPC contractors	:	Consortium of China Machinery Engineering Corporation and China East Resource Import & Export Corporation
Turbine specifications		
Manufacturer	:	General Electric
Model	:	1.5 XLE
Number of turbines	:	33
Hub height	:	80 meters
Turbine capacity	:	1.50 MW each
20 Year equivalent Net Annual Energy Production	:	147.032 GWh.
Annual net plant capacity factor	:	33.9%
Financing structure	:	Debt 75% - Equity 25%
Debt composition	:	Foreign debt: 52%; Local debt: 48%
Interest rate	:	6 months US $ LIBOR + 4.75%; 3 months KIBOR + 3.00%
Debt repayment period	:	10 years plus up to 24 months grace period
Repayment schedule basis	:	Biannual
Return on equity	:	17%
Project cost		US $ in millions
EPC cost	:	109.940
Non-EPC costs	:	0.851
Project development costs	:	4.363
Land cost	:	0.211

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Duties and taxes	:	0.696
Pre-COD insurance	:	1.463
Financial charges	:	3.795
Working capital	:	0.750
Interest during construction	:	7.605
Total project cost	:	**129.674**
20 years levelized tariff	:	US cents 15.6721/Kwh (Rs. 13.3213/kwh.)
Exchange rate	:	1 US $ = 85 PKR

4. <u>Issues</u>

4.1 Based on the submissions of the petitioner, comments offered by the stakeholders as well as proceedings of the case, following main issues were framed for discussion and consideration by the Authority:

- Whether net benchmark annual energy generation as claimed by the petitioner is justified?
- Whether construction period claimed by the petitioner is justified?
- Whether the terms and conditions of debt claimed by the petitioner are justified?
- Whether EPC cost as claimed by the petitioner is justified?
- Whether other project costs as claimed by the petitioner are justified?
- Whether O &M costs claimed by the petitioner are justified?
- Whether insurance during operations as claimed by the petitioner is justified?
- Whether return on equity as claimed by the petitioner is justified?
- Whether payment of bonus energy as claimed by the petitioner is justified?

5. <u>Whether net benchmark annual energy generation as claimed by the petitioner is justified?</u>

5.1 The petitioner has claimed that its net annual benchmark energy generation will be 147.032 GWh. and has also provided following year wise break up of its net annual benchmark energy generation:

	GWh
Year 1 and years 11-20	145.569
Years 2 -10	148.819

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5.2 The petitioner has submitted that its technical consultant carried out detailed evaluations to estimate the energy generation and that its net annual benchmark energy generation has been calculated in line with the energy yield guarantee provided by the O & M contractors pursuant to the O & M terms and arrangements. The net annual plant capacity factor of the petitioner on the basis of above stated proposed benchmark annual energy works out to 33.9%.

5.3 National Transmission and Despatch Company Limited (hereinafter referred to as "NTDC") in its comments has submitted that the probability of exceedance used for calculating net annual benchmark energy generation has not been given in the tariff petition and has also observed that the net annual benchmark energy generation and complex power curve provided in the tariff petition are so far not verified and approved by the Alternative Energy Development Board (hereinafter referred to as "AEDB"). Punjab Power Development Board (hereinafter referred to as "PPDB") in its comments has submitted that it is advisable to do net annual benchmark energy generation calculations on P50 probability of exceedance. The petitioner in response to these comments has clarified that its net annual benchmark energy generation calculations are already based on P50 probability of exceedance.

5.4 AEDB vide letter no. B/3/1/TGL/07 dated March 12, 2012 has confirmed that it has carried out the independent review/verification of production estimates of the petitioner through its international independent consultant RISOE. In view of the verification of generation estimates carried out by RISOE, AEDB has approved the benchmark annual energy generation of 157.0 GWh at wind farm site of the petitioner based on 33 General Electric 1.5 XLE wind turbines, annual bench mark wind speed of 7.3 m/s and 80 m height above ground.

5.5 The Authority has noted that the net annual benchmark energy generation claimed by the petitioner is significantly lower than the one approved by AEDB. The Authority has further observed that AEDB has verified the power production estimates of the petitioner through its independent technical consultant and thereafter has approved the benchmark annual energy generation of 157.0 GWh for the petitioner. The Authority on the basis of verification exercise carried out by the AEDB and approval of benchmark annual energy of 157.0 GWh by AEDB, hereby allows 157.0 GWh as benchmark annual energy for the project.

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6. <u>Whether construction period claimed by the petitioner is justified?</u>

6.1 The petitioner has submitted that it has based its computation of return on equity during construction on 21 months construction period and computation of interest during construction on 18 months construction period. According to the EPC agreements submitted by the petitioner, its guaranteed taking over date from the EPC contractors is the date falling 18 months after the commencement date.

6.2 On a specific enquiry regarding construction period claimed for the project, the petitioner has submitted that its project is located on inter-tidal land and necessitates the use of deep piles for both the turbine and building foundations. Similarly the road construction is also not a simple process. These conditions require extended construction period. It was only after prolonged and lengthy negotiations that the EPC contractor agreed to bring the construction period down to 18 months.

6.3 The Authority has considered the aforementioned facts and has observed that in the recently determined cases of wind power projects, the Authority has allowed maximum project construction period of 18 months. Keeping in view the aforementioned facts and the timeframe considered reasonable for the construction of wind power generation farm of the petitioner, the Authority hereby allows the petitioner maximum project construction period of 18 months. The petitioner is hereby directed that detail of any liquidated damages, penalties, etc. (by whatever name called), actually recovered/recoverable by the petitioner from the EPC contractor(s), pertaining to the construction period allowed by the Authority, shall be submitted to the Authority for adjustment in the project cost, along with application for allowing tariff adjustments at the commercial operations date (hereinafter referred to as "COD"). Further, the construction start date should be negotiated by the petitioner with the power purchaser and should be incorporated in the energy purchase agreement (hereinafter referred to as "EPA"). The petitioner will be allowed adjustments at the COD for maximum project construction period of 18 months starting from the construction start date stipulated in the EPA.

6.4 The petitioner is hereby directed to ensure that all the terms and conditions relating to construction period in the EPA confirm with the aforesaid terms and conditions allowed by the Authority.

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7. **Whether the terms and conditions of debt claimed by the petitioner are justified?**

7.1 The petitioner has proposed the following debt terms:

	Foreign debt	Local debt
Percentage of total debt	52 %	48 %
Interest rate	Six months US $ LIBOR + 4.75%	Three months KIBOR + 3.00 %
Debt repayment period	10 years plus two years grace period	10 years plus two years grace period
Repayment basis	Semiannual	Semiannual

7.2 NTDC in its comments has submitted that the interest rate of six months LIBOR + spread of 4.75% on foreign financing claimed by the petitioner appears to be on the higher side and has referred to the recent tariff determinations of the Authority where interest rate of six months LIBOR + spread of 4.50% on foreign financing has been allowed by the Authority. The Authority has considered the foreign debt terms of the petitioner and has observed that 'Summary Of Indicative Financial Terms' of IFC provided by the petitioner stipulates interest rate range from 4.25% to 4.75% and states that the final loan spread will depend on IFC's assessment of the investment risk, and support/security arrangements. The Authority is of the opinion that the spread of 4.75% over six months LIBOR claimed by the petitioner is unjustified and after considering circumstances of the case has decided to allow maximum spread of 4.50% over six months LIBOR to the petitioner for its foreign financing. The Authority allows all the other terms and conditions of foreign debt detailed above to the petitioner.

7.3 The Authority has further observed that for local debt although the repayment terms requested by the petitioner are semi-annual, however it has requested for allowing interest rate linked with three months KIBOR and the same is also reflected in the document titled "Annexure B – Key Commercial Terms" on the MCB letter head provided by the petitioner. The Authority has noted that other than this fact, the local debt terms claimed by the petitioner are comparable to the local debt terms allowed to other projects. The Authority has considered the issue and has decided to

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allow all the terms and conditions of local debt detailed in paragraph 7.1 above to the petitioner.

7.4 The petitioner has also requested that its interest on local debt shall be quarterly indexed with 3 months KIBOR. The Authority has considered the request of the petitioner and has decided that variation in interest charges on local finances, corresponding to variation in 3 months KIBOR, will be allowed by the Authority on biannual basis. If the petitioner is able to substantiate, to the satisfaction of the Authority, that due to variation in 3 months KIBOR, mark-up rate on its local finances is revised by the relevant financial institutions quarterly, variation in interest charges on local finances will be computed from quarterly variation in 3 months KIBOR.

7.5 The Authority directs the petitioner to try to negotiate better financing terms than the one's allowed by the Authority. If the petitioner arranges better terms, the overall impact of reduction in debt servicing will be shared on yearly basis in the following ratio:

Power purchaser / Government : Petitioner = 60 : 40

8. <u>Whether EPC cost as claimed by the petitioner is justified?</u>

8.1 The petitioner has requested for allowing EPC cost of US $ 109.940 million. The break-up of EPC cost claimed by the petitioner is as follows:

	US $ in millions
Off shore supply and services agreement price	81.527
On shore supply and services agreement price	26.823
	108.350
Letter of credit confirmation charges	1.590
Total EPC cost	**109.940**

8.2 The petitioner has submitted that a thorough research was conducted of various wind turbine suppliers and EPC contractors in the global wind power generation EPC industry. Based on technical feasibility and other parameters; various technologies

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and wind turbine generator vendors were short listed. The petitioner has stated that it received expression of interest from various international wind turbine suppliers including Sinovel from China, Vestas from Denmark, Elswedy from Egypt, Gamesa from Spain, Nordex from Germany/China, Siemens from Denmark and from China Machinery & Equipment Import & Export Corporation (based upon General Electric wind turbines and technology). Based on a thorough due diligence exercise and following intense negotiation process with various EPC contractors, the petitioner selected General Electric wind turbines model 1.5 XLE as the technology for its wind farm and appointed a consortium of China Machinery Engineering Corporation and China East Resource Import & Export Corporation as its turnkey EPC contractors.

8.3 The petitioner has submitted signed EPC agreements dated: 28 August, 2011 executed with the following parties:

Off shore supply and services agreement	- China Machinery Engineering Corporation
On shore supply and services agreement	- China East Resource Import & Export Corporation

8.4 The Authority has found that although the costs of EPC agreements claimed by the petitioner reconcile with the EPC agreements, however these EPC agreements allow reduction of the EPC agreement prices in case the petitioner issues the notice to commence prior to 12 months following the effective date of the EPC agreement. The Authority encourages the petitioner to commence EPC works at the earliest and make cost savings.

8.5 NTDC in its comments has submitted that they anticipate that a bigger sized wind turbine e.g. 2.5 MW instead of the selected wind turbine of 1.5 MW would have resulted into higher energy yield. They further submitted that such an option would not have required increase in the hub height, would have occupied lesser farm space and would have given benefit of other technological improvements in terms of efficiency and life of wind turbines. The petitioner in response to these comments has submitted that the bigger sized wind turbines (2.5 MW) being installed in the neighboring wind farms are giving lower output than the output it has claimed. The petitioner has further stated that there is no certainty that a bigger capacity wind turbine will provide a higher annual yield and has contended that the selected wind

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turbine is the work horse of the vendor company with more than 16,000 turbines installed worldwide and has been recognized as a very efficient and reliable machine.

8.6 NTDC in its comments has further submitted that the capability of wind turbines with respect to sustaining its maximum efficiency during the high ambient temperature phase is highly important. With the increase of temperature in the project area, loss of efficiency would occur causing a reduction in the output power. However, operating thresholds with respect to temperature and other basic operating limits of wind turbine generators are not given in the tariff petition. The petitioner in response to these comments has submitted that it has selected hot climate version of the wind turbine which takes into account the site conditions of high temperature as well as dusty and corrosive environment. The petitioner has further submitted that the energy yield table is based upon wind turbine output for up to 45° C. The survival temperature of the selected wind turbine is 50°C. For operating temperatures between 45°C and 50°C, the selected wind turbine will encounter de-rating of 6% per degree of temperature rise. The selected wind turbine is a high end model in the industry and there is no other wind turbine that has a higher operational temperature range. The historical data collected from the met office in the city shows that ambient temperature exceeds 42°C for 28 hours during a year. The temperature exceeding 45°C has not been indicated, but is expected to be much less, may be around 3 hours. The temperature data collected from the site mast, over a period of 36 months, shows a maximum temperature of 36°C at the hub height. This is lower than the operating range of the turbine procured.

8.7 PPDB in its comments stressed about the importance of compatibility of wind turbines with the power purchasers network. The petitioner in response to these comments has submitted that grid interconnection study has been conducted for the turbine to be installed and has been approved by NTDC. The turbine has been found compatible with the grid and meets the requirements of the grid code.

8.8 The Authority has noted that the EPC cost of US $ 108.350 million claimed by the petitioner is comparable to the EPC cost allowed to other projects and has therefore decided to allow the same. The EPC cost will be adjusted at COD on the basis of actual cost incurred, against the submitted EPC agreements, not exceeding the EPC cost of US $ 81.527 million for off shore supply and services agreement and US $ 26.823 million for on shore supply and services agreement. This adjustment

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mechanism at COD will not allow cost escalation for any change orders, alterations, etc.

8.9 In addition to the cost of EPC agreements, the petitioner has also claimed US $ 1.590 million as confirmation charges of the letter of credit (@ 1.95% of the price of off shore supply and services agreement) to be opened in favor of the EPC contractor. The Authority has noted that in recent determinations, keeping in view the size of wind power projects, the letter of credit confirmation charges have been separately allowed by the Authority. The Authority has further noted that letter of credit confirmation charges claimed by the petitioner are on the higher side and do not compare favorably with the same claimed by other projects. The Authority keeping in view the aforementioned facts has assessed US $ 1.200 million as maximum ceiling for letter of credit confirmation charges of the petitioner. These charges will be adjusted at COD on actual basis, not exceeding the maximum ceiling of US $ 1.200 million, upon production of verifiable documentary evidence to the satisfaction of the Authority.

8.10 In the light of available documentary evidence and comparability of this cost with other projects, the Authority approves the EPC cost of US $ 109.550 million (inclusive of letter of credit confirmation charges of US $ 1.200 million), subject to adjustments at COD as detailed above.

9. Whether other project costs as claimed by the petitioner are justified?

9.1 The other project costs claimed by the petitioner are as follows:

	US $ in millions
Non-EPC costs	0.851
Project development costs	4.363
Land cost	0.211
Duties and taxes	0.696
Pre-COD insurance	1.463
Financial charges	3.795
Working capital	0.750
Interest during construction	7.605
Total	**19.734**

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These costs are discussed under relevant sub heads in the proceeding paragraphs.

9.2 Non-EPC costs

9.2.1 The petitioner has provided following break-up of non-EPC costs:

	US $ in millions
Fixed assets	0.351
Site security	0.250
Data connectivity	0.250
Total non-EPC costs	**0.851**

9.2.2 The petitioner has provided following information in respect of the abovementioned costs:

Fixed assets
This includes cost of various instruments, equipment and other assets (excluding such assets that are supplied by the EPC contractors) including wind measurement mast, vehicles, furniture, fixtures and telecommunication equipment.

Site security
This represents the costs to be incurred for security arrangements.

Data connectivity
In accordance with the energy purchase agreement, the petitioner is required to provide connectivity to the power purchaser. This expenditure includes the cost of data connectivity including the expenses to be incurred for procurement and installation of various equipments, materials, etc. relating to data connectivity with the power purchaser.

9.2.3 The Authority has observed that there is a possibility of interchangeability in classification of some of the costs claimed under the head of non-EPC costs and

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project development costs. The Authority has therefore concluded that it would be better to assess the costs claimed by the petitioner under this head and project development costs collectively. Accordingly decision of the Authority regarding aggregate costs assessed in this regard is given in the proceeding paragraph 9.3.2.

9.3 Project development costs

9.3.1 The petitioner has provided following break-up of the project development costs:

	US $ in millions
HR costs	1.592
Project feasibility studies and cost of project consultants	0.780
Project administration costs and seller's letter of credit	0.615
Travelling expenses	0.487
Financial and legal advisers fees	0.455
Permits, licenses, letter of support performance guarantee to AEDB and AEDB's legal counsel fees	0.435
Total project development cost	**4.363**

9.3.2 The Authority has observed that the petitioner has claimed under non-EPC costs and project development costs an aggregate cost of US $ 5.214 million and has also claimed land cost separately. The Authority has observed that the cost claims of the petitioner are on higher side and even do not compare favorably with the costs claimed by some of the similar type of projects from the Authority. After scrutiny of the information provided by the petitioner and on the basis of other available information, the Authority has assessed an aggregate amount of US$ 4.000 million under these cost heads which is accordingly being allowed.

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9.4 Land cost

9.4.1 The petitioner has claimed land cost of US $ 0.211 million and has submitted that it has leased 4,881 acres of land for the project. The petitioner has further submitted that this cost also includes land demarcation cost and cost of acquiring right of way of land for the project site together with the stamp duty, registration fees and costs of survey. The Authority in accordance with the previous practice has considered this cost as a part of operating costs/non-EPC costs and accordingly disallows the entire cost claimed here.

9.5 Duties and taxes

9.5.1 The petitioner has requested for allowing duties and taxes of US $ 0.696 million and has submitted that it has assumed that Sindh Infrastructure Development Surcharge will be levied @ 0.85% on the imports for the project and Federal Excise Duty will be levied @ 16% on the payments made to the local financial institutions, while all other duties and taxes have been assumed as nil. The petitioner has requested that all local taxes and duties should be reimbursed on the basis of actual levy at the COD stage.

9.5.2 The Authority has considered the request of the petitioner and has decided to allow Sindh Infrastructure Development Surcharge of US $ 0.454 million claimed by the petitioner, as has been allowed to comparable projects at the tariff determination stage. Further, adjustment of duties and taxes on actual at COD stage, will be allowed for only those duties and taxes which are imposed on the petitioner and are non refundable in nature. Adjustment of taxes/duties payable on fees/charges, etc. of various third parties, not directly imposed on the petitioner, will not be allowed. The mechanism for adjustment of duties and taxes at actual on COD is detailed in paragraph (I) (c) of the order.

9.6 Pre-COD insurance cost

9.6.1 The petitioner has claimed US $ 1.463 million on account of insurance expense during the project construction period and has submitted that the insurance cost is envisaged to be 1.35% of the EPC price. The Authority has in comparable cases allowed insurance during construction with maximum ceiling of 1.35% of the EPC cost. Accordingly, the petitioner is allowed US$ 1.463 million on account of pre-COD

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insurance cost as claimed by it. This cost will be subject to adjustment at COD on the basis of actual expense, duly verifiable with the relevant supporting documents, up to maximum limit of 1.35% of the approved EPC cost.

9.7 Financial Charges

9.7.1 The petitioner has provided following break-up of financial charges:

	US $ in millions
Arrangement/upfront fee	1.660
Commitment fee	0.327
Agency, monitoring and security trustee/supervision fee	0.210
Letter of credit related charges	0.569
Lender's advisors fee	1.029
Total	3.795

9.7.2 The petitioner has submitted that the claimed financial charges are in excess of 3% of the total debt amount, normally allowed by the Authority. The petitioner in support of its claim has submitted that:

- The cap of 3% of debt amount was introduced for thermal power projects which are much larger in size than a 50 MW wind power project. All fixed financial charges remain unchanged irrespective of the size of the project; therefore cap of 3% of debt on financial charges for wind power projects of 50 MW is unrealistic.

- Lenders advisors, arrangement and commitment fees for foreign financing are significantly higher than for local financing and therefore in its case have resulted in higher financial charges.

- The Authority has allowed financial charges in excess of 3% of the debt amount to some other projects.

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9.7.3 The petitioner has also submitted that the payments to lenders technical and insurance advisors are subject to grossing up of all taxes and duties.

9.7.4 NTDC in its comments has submitted that the lender's advisors fee and arrangement fee should be further negotiated by the petitioner to arrive at an optimal figure. The petitioner in response to these comments has submitted that the financial charges should not be reviewed in isolation and the Authority should note the overall cost and the energy yield being provided by the project, thus resulting in a lower tariff. In addition, the petitioner has submitted that considering the prevailing local and international conditions including bank's exposure limits and circular debt issue, procurement of financing has been a challenge. The financial charges have been agreed after intense negotiations with the project lenders and are based on the executed term sheets/mandate letter. The petitioner has also referred to another wind power project where Sinosure fees has been allowed by the Authority in addition to the financing fees and charges.

9.7.5 The Authority has considered the claim of the petitioner and has observed that for wind power projects with foreign debt, the Authority has allowed the maximum limit of 3% of the allowed debt (excluding the impact of interest during construction and financial charges) in its tariff determinations given in the past one year. Sinosure fees allowed to another wind power project is not comparable with the financial charges claimed by the petitioner. Further, the case of a hydropower project quoted by the petitioner is also not comparable to wind power projects. The Authority has accordingly decided to allow the financial charges of US $ 2.598 million to the petitioner. These financial charges are subject to adjustment at COD on the basis of actual expense, up to a maximum of 3% of the allowed debt (excluding the impact of interest during construction and financial charges), on production of authentic documentary evidence to the satisfaction of the Authority.

9.7.6 The Authority has also considered the request of the petitioner regarding grossing up of all taxes and duties on payments to lenders technical and insurance advisors. The Authority hereby clarifies that adjustment of duties and taxes on actual at COD stage, will be allowed for only those Pakistani duties and taxes which are imposed on the petitioner and are non-refundable in nature. Adjustment of taxes/duties payable on fees/charges, etc. of various third parties, not directly imposed on the petitioner, will

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not be allowed under the head of duties and taxes. The mechanism for adjustment of Pakistani duties and taxes at actual on COD is detailed in paragraph (I) (c) of the order.

9.8 Permanent working capital

9.8.1 The petitioner has claimed permanent working capital of US $ 0.750 million and has submitted that under the terms of EPA, the petitioner will invoice the power purchaser for the settlement of monthly energy payment on or after the first day of the next month to which the monthly energy payment relates. The power purchaser is required to make payment of the same by the thirtieth day following the day of submission of the invoice. Keeping in view this inflow of funds, the petitioner has argued that an inherent mismatch in the availability of cash flows for meeting the following payments exists:

- The petitioner is required to collect sales tax from the power purchaser on behalf of the Government of Pakistan and deposit the same by the 25th day of the month i.e. earlier than the date of collection of invoice from the power purchaser.

- The petitioner is required to pay the cost of operating phase insurance upfront at COD and on each anniversary subsequently, whereas the same will be recovered from the power purchaser monthly in arrears.

- The petitioner would be making payments to the operations and maintenance contractor monthly in advance whereas the same will be recovered from the power purchaser in arrears.

9.8.2 The petitioner has further submitted that permanent working capital will also reduce its default risks emanating from the considerable time lags in the receipt of payments from the power purchaser. The petitioner has explained that keeping in view the fact that working capital for post COD period has not been allowed by the Authority in earlier cases, permanent working capital should be allowed to be injected upfront, in replacement of revolving credit line from banks.

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9.8.3 NTDC in its comments has submitted that the petitioner has claimed permanent working capital facility, to be injected upfront, in replacement of a revolving credit line. However, in case of renewable energy projects no fuel cost is involved therefore permanent working capital facility is not justified.

9.8.4 The Authority has noted that working capital cost/permanent working capital has not been allowed to any wind power project, as the Authority considers that arguments forwarded in its support do not justify the claim. Further, some of the wind power projects have even not claimed this cost. The Authority further noted that according to the billing mechanism provided in the EPA, an IPP also gets paid for certain components of tariff such as return on equity in advance, and is also compensated for late payments by the power purchaser, however these facts have not been highlighted by the petitioner. In view of the grounds detailed above, the Authority declines the request of the petitioner to allow permanent working capital of US $ 0.750 million as a part of the project cost.

9.9 Interest During Construction

9.9.1 The petitioner has estimated an amount of US$ 7.605 million on account of interest during the project construction period (hereinafter referred to as "IDC") in its tariff petition. According to the information provided by the petitioner, the IDC has been calculated on the basis of construction period of 18 months at interest rate of 16.26% (three months KIBOR plus spread of 3.00%) on local financing and interest rate of 5.18% (six months LIBOR plus spread of 4.75%) on foreign financing. Based on the interest rate of 14.92% (three months KIBOR plus spread of 3%) on local financing and interest rate of 5.29% (six months LIBOR plus spread of 4.50%) on foreign financing and other terms/conditions allowed to the petitioner, the Authority has assessed IDC of the petitioner as US $ 6.755 million.

9.9.2 The IDC will be adjusted at COD on the basis of actual debt draw downs (within the overall debt allowed by the Authority at COD), actual PKR/US$ exchange rate variation for foreign loan denominated in US $ and actual interest rates not exceeding the limit of 3 months KIBOR plus 3.00% for local financing and 6 months LIBOR plus 4.50% for foreign financing, during the project construction period allowed by the Authority.

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10. Recapitulating the approved project cost for the petitioner under various heads is given hereunder:

	Approved US $ in millions
EPC cost as per the EPC agreements	108.350
Letter of credit confirmation charges	1.200
Non-EPC costs and project development costs	4.000
Duties and taxes	0.454
Pre-COD insurance	1.463
Financial charges	2.598
Interest during construction	6.755
Total Project Cost	124.820

11. <u>Whether O &M costs claimed by the petitioner are justified?</u>

11.1 The petitioner has claimed the following O & M costs per annum:

Years	Outsourced cost	Other costs	Total
	US $ in millions		
01 – 02	0.715	1.171	1.886
03 – 10	2.215	1.171	3.386
11 – 20	2.215	1.059	3.274

11.2 The petitioner has submitted that outsourced O & M costs are based on the prices agreed with the EPC contractor for the O & M of the facility for the initial two years and with GE Wind Energy, GMBH and General Electric International Inc. for the O & M of the facility for the next eight years. The prices agreed include the costs associated with scheduled maintenance, routine maintenance, services required for unscheduled maintenance and any spare parts and consumables required for carrying out the scheduled and routine maintenance. The petitioner has explained that outsourced O & M costs are denominated in US $ and are lower for the initial two

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years compared to the succeeding years, as major spare parts for the first two years will be covered under warranty.

11.3 The petitioner has submitted that besides cost of outsourcing the O & M activity, this cost also includes the cost of following:

- Fixed assets
- Payroll and allied expenses
- Vehicles fuel and maintenance
- Loan administrative costs
- Other administrative costs
- Land cost
- DSRA SBLC cost

11.4 The Authority is of the opinion that O & M costs requested by the petitioner are considerably on the higher side and are not justified to be allowed as claimed. After detailed scrutiny of the information provided by the petitioner, comparison with the O & M costs already allowed to similar projects and information otherwise available, the Authority has assessed the following O & M costs of the petitioner (including land costs disallowed as a part of the project cost as discussed in the preceding part of this determination):

Years	US $ in millions
01 -02	1.450
03 – 10	2.806
11 -20	2.900

11.5 These costs have been further subdivided into foreign component and local component in the same ratio as claimed in the petition.

12. **<u>Whether insurance during operations as claimed by the petitioner is justified?</u>**

12.1 The petitioner has requested for allowing US $ 1.463 million per annum as insurance expense in the post-COD 20 years of tariff control period. The cost of insurance claimed by the petitioner is 1.35% of the aggregate amount of its EPC agreements.

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Moreover the petitioner has requested for allowing indexation of US $ to PKR for this cost.

12.2 The Authority considers the requested insurance cost of US $ 1.463 million per annum claimed by the petitioner as reasonable and hereby allows the same. In case of insurance denominated in US $, insurance cost component of tariff will be adjusted on account of US$/PKR exchange rate variation on annual basis. Further, insurance component of the reference tariff will be adjusted as per actually incurred prudent costs, subject to maximum of 1.35% of the EPC cost, on annual basis upon production of authentic documentary evidence by the petitioner to the satisfaction of the Authority.

13. <u>Whether return on equity as claimed by the petitioner is justified?</u>

13.1 The petitioner has requested for allowing 17% return on equity (IRR based). The Authority has already allowed 17% return on equity (IRR based) to other wind power projects, therefore the same is allowed to the petitioner.

13.2 The Authority has further noted that the petitioner has claimed return on equity during construction of US $ 5.462 million on the basis of 21 months construction period. On the basis of maximum construction period of 18 months plus other terms and conditions allowed to the petitioner, the Authority has assessed return on equity during construction as US $ 3.925 million. The return on equity will be adjusted at the COD on the basis of actual equity injections (within the overall equity allowed by the Authority at COD) during the project construction period allowed by the Authority.

14. <u>Whether payment of bonus energy as claimed by the petitioner is justified?</u>

14.1 The petitioner has submitted that the power purchaser be directed to pay for all bonus energy on monthly basis. The Authority has considered the issue and has observed that consistent with its previous decisions, bonus is allowed for supply of electric power in excess of annual benchmark energy generation in the instant tariff determination, and payment of bonus energy shall be made accordingly.

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15. Order

Pursuant to Rule 6 of the National Electric Power Regulatory Authority Licensing (Generation) Rules, 2000, Tenaga Generasi Limited (the petitioner) is allowed to charge the following specified/approved tariff for delivery of electricity to the power purchaser:

Tariff Components	Year 1-2	Year 3-10	Year 11-20	Indexation
	Rs./kWh.	Rs./kWh.	Rs./kWh.	
Fixed O&M				
Local	0.4358	0.4698	0.5078	WPI
Foreign	0.3492	1.0495	1.0622	PKR/US$ & US CPI
Insurance	0.7921	0.7921	0.7921	PKR/US$
Return on equity	2.8721	2.8721	2.8721	PKR/US$
Return on equity during construction	0.3776	0.3776	0.3776	PKR/US$
Debt service	8.1860	8.1860	-	PKR/US$ & LIBOR for foreign loan and KIBOR for local loan

i) The reference tariff has been calculated on the basis of net annual benchmark energy generation of 157.00 GWh at annual net plant capacity factor of 36.21 % for installed capacity of 49.50 MW.

ii) The above charges will be limited to the extent of net annual energy generation of 157.00 GWh. Net annual generation supplied to the power purchaser in a year, in excess of benchmark energy of 157.00 GWh will be charged at 10% of the prevalent approved tariff.

iii) In the above tariff, no adjustment for carbon emission reduction receipts, has been accounted for. However, upon actual realization of carbon emission reduction receipts, the same shall be distributed between the power purchaser and the petitioner in accordance with the approved mechanism given in the

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GoP Policy for Development of Renewable Energy for Power Generation 2006, as amended from time to time.

iv) The reference PKR/dollar rate has been taken as 85.00.

v) The above tariff is applicable for a period of twenty (20) years commencing from the commercial operations date.

vi) The monthly benchmark energy table along with monthly power curves should be verified by the Alternative Energy Development Board (AEDB)/power purchaser before finalization of the energy purchase agreement.

vii) The petitioner is entitled to payment of wind speed risk by the power purchaser in accordance with the GoP Policy for Development of Renewable Energy for Power Generation 2006, as amended from time to time and the mechanism approved by the AEDB.

viii) The component wise reference tariff is indicated at Annex-I.

ix) Debt Servicing Schedule is attached as Annex-II.

I. <u>One Time Adjustments</u>

The following onetime adjustments shall be applicable to the reference tariff:

a. The EPC cost will be adjusted at COD on the basis of actual cost incurred, against the submitted EPC agreements, not exceeding the EPC cost of US $ 81.527 million for off shore supply and services agreement and US $ 26.823 million for on shore supply and services agreement. This adjustment mechanism at COD will not allow cost escalation for any change orders, alterations, etc.

b. Confirmation charges for the letter of credit to be opened in favor of the EPC contractor will be adjusted at COD on actual basis, not exceeding the maximum ceiling of US $ 1.200 million, upon production of verifiable documentary evidence to the satisfaction of the Authority.

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c. Duties and/or taxes, not being of refundable nature, imposed on the petitioner upto the commencement of its commercial operations will be subject to adjustment at actual on COD, as against US $ 0.454 million allowed now, upon production of verifiable documentary evidence to the satisfaction of the Authority.

d. Insurance will be adjusted as per actually incurred prudent costs, subject to maximum limit of 1.35% of the approved EPC cost, on production of authentic documentary evidence at the time of COD tariff adjustments.

e. Financial charges will be adjusted at COD on the basis of actual expense, up to a maximum of 3% of the total debt allowed (excluding the impact of interest during construction and financial charges), on production of authentic documentary evidence.

f. Interest during construction will be adjusted at COD on the basis of actual debt draw downs (within the overall debt allowed by the Authority at COD), actual PKR/US$ exchange rate variation for foreign loan denominated in US $ and actual interest rates not exceeding the limit of 3 months KIBOR plus 3.00% for local financing and 6 months US $ LIBOR plus 4.50% for foreign financing, during the project construction period allowed by the Authority.

g. The return on equity (including return on equity during construction) 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 allowed by the Authority.

h. The return on equity (including return on equity during construction) will be adjusted at COD on the basis of PKR/US$ exchange rate variation.

i. All project costs i.e. costs incurred prior to commercial operations date (COD) have been allowed in the determination in US$ as the exact currency of payment is not known yet. At the COD for all project costs payable in PKR, the amounts allowed in US $ will be converted into PKR using the reference PKR/dollar rate of 85.00.

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j. The reference tariff table shall be revised at COD while taking into account the above adjustments. The petitioner shall submit its request to the Authority within 90 days of COD for necessary adjustments in tariff.

II. Pass-Through Items

No provision for income tax has been accounted for in the tariff. If any tax is imposed on the petitioner, the exact amount paid by the petitioner shall be reimbursed by the power purchaser to the petitioner on production of original receipts. This payment will be considered as a pass-through payment spread over a 12 months period. Furthermore, in such a scenario, the petitioner shall also submit to the power purchaser details of any tax shield savings and the power purchaser shall deduct the amount of these savings from its payment to the petitioner on account of taxation.

Withholding tax on dividends is also a pass through item just like other taxes as indicated in the government guidelines for determination of tariff for new IPPs. The power purchaser shall make payment on account of withholding tax at the time of actual payment of dividend, subject to maximum of 7.5% of 17% return on equity (including return on equity during construction). In case the petitioner does not declare a dividend in a particular year or only declares a partial dividend, then the difference in the withholding tax amount (between what is paid in that year and the total entitlement as per the net return on equity) would be carried forward and accumulated so that the petitioner is able to recover the same as a pass through from the power purchaser in future on the basis of the total dividend payout.

III. Indexations:

The following indexation shall be applicable to the reference tariff:

i) Indexation applicable to O&M

The local part of O&M cost will be adjusted on account of local inflation and O&M foreign component will be adjusted on account of variation in dollar/rupee exchange rate and US CPI. Quarterly adjustments for inflation and exchange rate variation will be made on 1st July, 1st October, 1st January and 1st April respectively on the basis of latest available information with respect to WPI (notified by the Federal Bureau of

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Statistics)/alternative index determined by the Authority, US CPI (notified by US bureau of labor statistics) and revised TT & OD selling rate of US Dollar as notified by the National Bank of Pakistan. The mode of indexation will be as follows:

$$F\ O\&M_{(LREV)} = O\&M_{(LREF)} * WPI_{(REV)} / 209.470$$

$$F\ O\&M_{(FREV)} = O\&M_{(FREF)} * US\ CPI_{(REV)} / 226.889 * ER_{(REV)} / 85.00$$

Where:

$F\ O\&M_{(LREV)}$	=	The revised applicable fixed O&M local component of tariff
$F\ O\&M_{(FREV)}$	=	The revised applicable fixed O&M foreign component of tariff indexed with US CPI and exchange rate variation
$O\&M_{(LREF)}$	=	The reference fixed O&M local component of tariff for the relevant period
$O\&M_{(FREF)}$	=	The reference fixed O&M foreign component of tariff for the relevant period
$WPI_{(REV)}$	=	The revised wholesale price index (manufactures) / alternative index determined by the Authority
$WPI_{(REF)}$	=	209.470 wholesale price index (manufactures) of July 2011 notified by the Federal Bureau of Statistics / alternative index determined by the Authority (refer to proceeding note).
$US\ CPI_{(REV)}$	=	The revised US CPI (all urban consumers)
$US\ CPI_{(REF)}$	=	226.889 US CPI (all urban consumers) for the month of September 2011 as notified by the US Bureau of Labor Statistics
$ER_{(REV)}$	=	the revised TT & OD selling rate of US dollar as notified by the National Bank of Pakistan

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Note: At the time of this determination, the Authority is still in the process of establishing an alternative index for WPI (manufactures) which has been discontinued by the Federal Bureau of Statistics since August 2011. Pending the determination of alternative index by the Authority, the last available WPI (Manufactures) for the month of July 2011 has been used as reference. Upon determination of alternative index by the Authority, reference indexation value shall be revised with the alternative index value for the month of September 2011.

ii) Adjustment of insurance component

In case of insurance denominated in US $, insurance cost component of tariff will be adjusted on account of US$/PKR exchange rate variation on annual basis. Further, insurance component of the reference tariff will be adjusted as per actually incurred prudent costs, subject to maximum of 1.35% of the approved EPC cost, on annual basis upon production of authentic documentary evidence by the petitioner.

iii) Return on equity

The return on equity component of tariff will be adjusted on the basis of revised TT & OD selling rate of US Dollar as notified by the National Bank of Pakistan according to the following formula:

$$ROE_{(REV)} = ROE_{(REF)} \times ER_{(REV)} / ER_{(REF)}$$

Where:

$ROE_{(REV)}$	=	Revised return on equity component of tariff expressed in Rs/kWh.
$ROE_{(REF)}$	=	Reference return on equity component of tariff expressed in Rs/kWh.
$ER_{(REV)}$	=	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 US dollar

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iv) Return on equity during construction

The return on equity during construction component of tariff will be adjusted on the basis of revised TT & OD selling rate of US Dollar as notified by the National Bank of Pakistan according to the following formula:

$$ROEDC_{(REV)} = ROEDC_{(REF)} \times ER_{(REV)} / ER_{(REF)}$$

Where:

$ROEDC_{(REV)}$	=	Revised return on equity during construction component of tariff expressed in Rs/kWh.
$ROEDC_{(REF)}$	=	Reference return on equity during construction component of tariff expressed in Rs/kWh.
$ER_{(REV)}$	=	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 US dollar

v) Adjustment for LIBOR/KIBOR variation

The interest part of fixed charge component will remain unchanged throughout the term except for the adjustment due to variation in LIBOR/KIBOR, while spread of 4.50% on 6 months LIBOR and 3.00% on 3 months KIBOR remaining the same, according to the following formula:

For foreign financing

$$\Delta I = P_{(REV)} * (LIBOR_{(REV)} - 0.79\%)/2$$

Where:

ΔI = the variation in interest charges applicable corresponding to variation in 6 months US$ LIBOR. ΔI can be positive or negative depending upon whether 6 months US$ LIBOR $_{(Rev)}$ per annum > or < 0.79%. The interest payment obligation will be enhanced or reduced to the extent of Δ I for each half year under adjustment.

$P_{(REV)}$ = is the outstanding principal (as indicated in the attached debt service schedule to this order at Annex-II) on a biannual basis at the relevant six monthly calculations date.

For local financing

$\Delta I = P_{(REV)} * (KIBOR_{(REV)} - 11.92\%) / 2$

Where:

Δ I = the variation in interest charges applicable corresponding to variation in 3 months KIBOR. Δ I can be positive or negative depending upon whether 3 months $KIBOR_{(Rev)}$ > or < 11.92%. The interest payment obligation will be enhanced or reduced to the extent of Δ I for each half year under adjustment.

$P_{(REV)}$ = is the outstanding principal (as indicated in the attached debt service schedule to this order at Annex-II) on a biannual basis at the relevant six monthly calculations date.

- The variation in interest charges on local finances corresponding to variation in 3 months KIBOR will be allowed by the Authority on biannual basis. If the petitioner is able to substantiate, to the satisfaction of the Authority, that due to variation in 3 months KIBOR, mark-up rate on its local finances is revised by the relevant financial institutions quarterly, variation in interest charges on local finances will be computed from quarterly variation in 3 months KIBOR.

- Foreign debt and its interest will also be adjusted on bi-annual basis on account of actual variation in PKR/US $ over the applicable reference exchange rate.

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Note:

Adjustments on account of inflation, foreign exchange rate variation, LIBOR/KIBOR variation and actual insurance will be approved and announced by the Authority within fifteen working days after receipt of the petitioner's request for adjustment in tariff in accordance with the requisite indexation mechanism stipulated herein.

IV. **Terms and Conditions of Tariff:**

Design & Manufacturing Standards:

Wind turbine generation system shall be designed, manufactured and tested in accordance with the latest IEC standards or other equivalent standards. All plant and equipment shall be new.

Wind Power Plant's Performance Data:

The petitioner shall install monitoring masts with properly calibrated automatic computerized wind speed recording meters at the same height as that of the wind turbine generators and a compatible communication/SCADA system both at the wind farm and power purchaser's control room for transmission of wind speed and power output data to the power purchaser's control room.

Emissions Trading/ Carbon Credits:

The petitioner shall process and obtain emissions/carbon credits expeditiously and credit the proceeds to the power purchaser as per the GoP Policy for Development of Renewable Energy for Power Generation 2006, as amended from time.

Other:

The Authority has allowed/approved only those cost(s), term(s), condition(s), provision(s), etc. which have been specifically approved in this tariff determination. Any cost(s), term(s), condition(s), provision(s), etc. contained in the tariff petition or any other document which are not specifically allowed/approved in this tariff

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determination, should not be implied to be approved, if not adjudicated upon in this tariff determination.

AUTHORITY

23/4/2012

(Habibullah Khilji)
Member

(Shaukat Ali Kundi) 25.04.2012
Member

20/4

(Ghiasuddin Ahmed)
Acting Chairman/ Member

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Annex - I

TENAGA GENERASI LIMITED
REFERENCE TARIFF TABLE

Year	O&M		Insurance	Return on equity	Return on equity during construction	Withholding tax @7.5%	Loan repayment	Interest charges	Tariff
	Local	Foreign							
	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh	Rs. / kWh
1	0.4358	0.3492	0.7921	2.8721	0.3776	0.2437	3.2311	4.9550	13.2565
2	0.4358	0.3492	0.7921	2.8721	0.3776	0.2437	3.5227	4.6634	13.2565
3	0.4698	1.0495	0.7921	2.8721	0.3776	0.2437	3.8482	4.3378	13.9908
4	0.4698	1.0495	0.7921	2.8721	0.3776	0.2437	4.2124	3.9736	13.9908
5	0.4698	1.0495	0.7921	2.8721	0.3776	0.2437	4.6206	3.5655	13.9908
6	0.4698	1.0495	0.7921	2.8721	0.3776	0.2437	5.0788	3.1072	13.9908
7	0.4698	1.0495	0.7921	2.8721	0.3776	0.2437	5.5942	2.5918	13.9908
8	0.4698	1.0495	0.7921	2.8721	0.3776	0.2437	6.1749	2.0112	13.9908
9	0.4698	1.0495	0.7921	2.8721	0.3776	0.2437	6.8301	1.3559	13.9908
10	0.4698	1.0495	0.7921	2.8721	0.3776	0.2437	7.5707	0.6154	13.9908
11	0.5078	1.0622	0.7921	2.8721	0.3776	0.2437	-	-	5.8555
12	0.5078	1.0622	0.7921	2.8721	0.3776	0.2437	-	-	5.8555
13	0.5078	1.0622	0.7921	2.8721	0.3776	0.2437	-	-	5.8555
14	0.5078	1.0622	0.7921	2.8721	0.3776	0.2437	-	-	5.8555
15	0.5078	1.0622	0.7921	2.8721	0.3776	0.2437	-	-	5.8555
16	0.5078	1.0622	0.7921	2.8721	0.3776	0.2437	-	-	5.8555
17	0.5078	1.0622	0.7921	2.8721	0.3776	0.2437	-	-	5.8555
18	0.5078	1.0622	0.7921	2.8721	0.3776	0.2437	-	-	5.8555
19	0.5078	1.0622	0.7921	2.8721	0.3776	0.2437	-	-	5.8555
20	0.5078	1.0622	0.7921	2.8721	0.3776	0.2437	-	-	5.8555
Levelized	**0.4735**	**0.9103**	**0.7921**	**2.8721**	**0.3776**	**0.2437**	**3.3969**	**2.5113**	**11.5774**

The reference tariff has been calculated on the basis of net annual benchmark energy generation of 157.00 GWh. Net annual generation supplied to the power purchaser in a year, in excess of benchmark energy of 157.00 GWh will be charged at 10% of the prevalent approved tariff.

Exchange rate 1 US $ = 85 PKR

Levelized tariff @ 10% works out to be US cents 13.6205

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Annex - II

TENAGA GENERASI LIMITED
DEBT SERVICING SCHEDULE

Period	Local Debt Principal Million US$	Local Debt Repayment Million US$	Local Debt Interest Million US$	Local Debt Balance Million US$	Local Debt Total Debt Service Million US$	Foreign Debt Principal Million US$	Foreign Debt Repayment Million US$	Foreign Debt Interest Million US$	Foreign Debt Balance Million US$	Foreign Debt Total Debt Service Million US$	Annual Principal Repayment Rs./kWh	Annual Interest Rs./kWh	Annual Debt Servicing Rs./kWh
	44.94	1.04	3.35	43.89	4.39	48.68	1.88	1.29	46.80	3.17			
	43.89	1.12	3.27	42.77	4.39	46.80	1.93	1.24	44.87	3.17			
1	**44.94**	**2.16**	**6.63**	**42.77**	**8.79**	**48.68**	**3.81**	**2.53**	**44.87**	**6.33**	**3.2311**	**4.9550**	**8.1860**
	42.77	1.20	3.19	41.57	4.39	44.87	1.98	1.19	42.90	3.17			
	41.57	1.29	3.10	40.28	4.39	42.90	2.03	1.13	40.86	3.17			
2	**42.77**	**2.50**	**6.29**	**40.28**	**8.79**	**44.87**	**4.01**	**2.32**	**40.86**	**6.33**	**3.5227**	**4.6634**	**8.1860**
	40.28	1.39	3.00	38.89	4.39	40.86	2.08	1.08	38.78	3.17			
	38.89	1.49	2.90	37.39	4.39	38.78	2.14	1.03	36.64	3.17			
3	**40.28**	**2.88**	**5.91**	**37.39**	**8.79**	**40.86**	**4.22**	**2.11**	**36.64**	**6.33**	**3.8482**	**4.3378**	**8.1860**
	37.39	1.60	2.79	35.79	4.39	36.64	2.20	0.97	34.44	3.17			
	35.79	1.72	2.67	34.06	4.39	34.44	2.25	0.91	32.19	3.17			
4	**37.39**	**3.33**	**5.46**	**34.06**	**8.79**	**36.64**	**4.45**	**1.88**	**32.19**	**6.33**	**4.2124**	**3.9736**	**8.1860**
	34.06	1.85	2.54	32.21	4.39	32.19	2.31	0.85	29.87	3.17			
	32.21	1.99	2.40	30.22	4.39	29.87	2.38	0.79	27.50	3.17			
5	**34.06**	**3.84**	**4.94**	**30.22**	**8.79**	**32.19**	**4.69**	**1.64**	**27.50**	**6.33**	**4.6206**	**3.5655**	**8.1860**
	30.22	2.14	2.25	28.08	4.39	27.50	2.44	0.73	25.06	3.17			
	28.08	2.30	2.09	25.78	4.39	25.06	2.50	0.66	22.56	3.17			
6	**30.22**	**4.44**	**4.35**	**25.78**	**8.79**	**27.50**	**4.94**	**1.39**	**22.56**	**6.33**	**5.0788**	**3.1072**	**8.1860**
	25.78	2.47	1.92	23.31	4.39	22.56	2.57	0.60	19.99	3.17			
	23.31	2.66	1.74	20.65	4.39	19.99	2.64	0.53	17.35	3.17			
7	**25.78**	**5.13**	**3.66**	**20.65**	**8.79**	**22.56**	**5.21**	**1.13**	**17.35**	**6.33**	**5.5942**	**2.5918**	**8.1860**
	20.65	2.85	1.54	17.80	4.39	17.35	2.71	0.46	14.65	3.17			
	17.80	3.07	1.33	14.73	4.39	14.65	2.78	0.39	11.87	3.17			
8	**20.65**	**5.92**	**2.87**	**14.73**	**8.79**	**17.35**	**5.48**	**0.85**	**11.87**	**6.33**	**6.1749**	**2.0112**	**8.1860**
	14.73	3.30	1.10	11.44	4.39	11.87	2.85	0.31	9.02	3.17			
	11.44	3.54	0.85	7.89	4.39	9.02	2.93	0.24	6.09	3.17			
9	**14.73**	**6.84**	**1.95**	**7.89**	**8.79**	**11.87**	**5.78**	**0.55**	**6.09**	**6.33**	**6.8301**	**1.3559**	**8.1860**
	7.89	3.81	0.59	4.09	4.39	6.09	3.00	0.16	3.08	3.17			
	4.09	4.09	0.31	(0.00)	4.39	3.08	3.08	0.08	0.00	3.17			
10	**7.89**	**7.89**	**0.89**	**(0.00)**	**8.79**	**6.09**	**6.09**	**0.24**	**0.00**	**6.33**	**7.5707**	**0.6154**	**8.1860**

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