



# National Electric Power Regulatory Authority

Islamic Republic of Pakistan

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Registrar

No.NEPRA/TRF-174/TGF-2011/11196-98

December 15, 2011

Subject: **Determination of the Authority in the Matter of Tariff Petition filed by Three Gorges First Wind Farm Pakistan (Pvt.) Ltd. [Case # NEPRA/TRF-174/TGF-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 the subject Determination of the Authority along with Annexure I, II & III and Dissenting Note of Member Licensing (total 36 pages) in Case No. NEPRA/TRF-174/TGF-2011.

2. The Determination is being intimated to the Federal Government for the purpose of notification 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 along with Annexures I, II & III needs to be notified in the official Gazette.

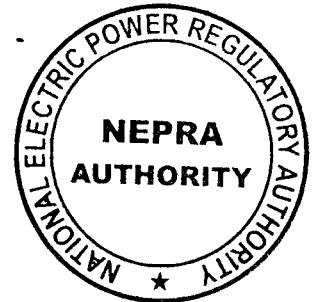
Enclosure: As above

( Syed Safer Hussain )

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

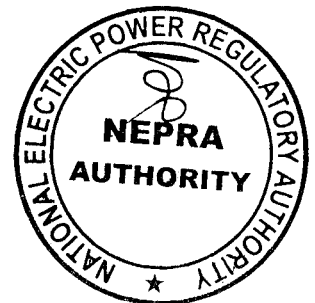
CC:

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



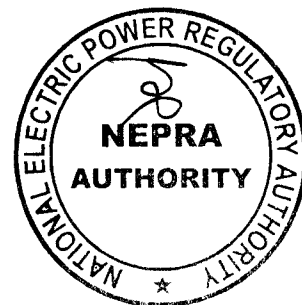
**Determination of National Electric Power Regulatory Authority in the matter of  
tariff petition filed by Three Gorges First Wind Farm Pakistan (Pvt.) Ltd.  
(Case No. NEPRA/TRF-174/TGF-2011)**

1. Three Gorges First Wind Farm Pakistan (Pvt.) Ltd. (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 June 09, 2011 for determination of generation tariff in respect of its 49.50 MW wind power project envisaged to be set up at Jhampir, 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 by the National Electric Power Regulatory Authority (hereinafter referred to as “the Authority”) on June 24, 2011. Consequent to the admission, notice of admission/public hearing was published in the national newspapers on June 26, 2011 inviting thereby all the stakeholders, interested/affected persons or parties to participate in the tariff setting process through filing of comments / intervention requests. 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 replies or communications in opposition or in support of the petition. In response to the notices of admission/public hearing no intervention was filed. However, comments were received from the stakeholders regarding net annual energy generation, wind turbine selection, various components of the project cost, terms of financing requested by the petitioner, O & M costs claimed 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 of the petition was held on July 14, 2011 at Islamabad, which was attended by the petitioner, representatives of the proposed power purchaser, Alternative Energy Development Board (hereinafter referred to as “AEDB”) and various other stakeholders.
3. Summary of the key information provided by the petitioner is as follows:



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Type of the project	:	Wind power project
Project location	:	Jhampir, District Thatta, Sindh, Pakistan
Installed capacity	:	49.50 MW
Land area	:	4.69 sq km (1,150 acres)
Concession period	:	20 years from commercial operations
Proposed power purchaser	:	National Transmission And Despatch Company Limited / Central Power Purchasing Agency
EPC contractors	:	Off shore – China Huashui Hydropower Development Corporation
		On shore – China International Water and Electric Corporation
Project construction period	:	18 months
Turbine specifications		
Manufacturer	:	Xinjiang Goldwind Science & Technology Co. Limited
Model	:	GW 1500/77
Number of turbines	:	33
Hub height	:	85 meters
Turbine capacity	:	1.50 MW each
Annual benchmark hours available	:	2,802
Estimated net annual benchmark energy	:	138.70 GWh.
Annual net plant capacity factor	:	31.99%
Financing structure	:	Debt 80% - Equity 20%
Debt composition	:	100% foreign (from Chinese financial institutions)
Interest rate	:	Six months LIBOR + 4.80%
Debt repayment period	:	9 years plus 12 months grace period
Repayment schedule basis	:	Biannual
Sinosure fee	:	6.53% of loan facility
Return on equity	:	18%
O & M contractors	:	For first five years : Xinjiang Goldwind Science & Technology Co. Limited For next fifteen years : The petitioner itself will carry out O & M

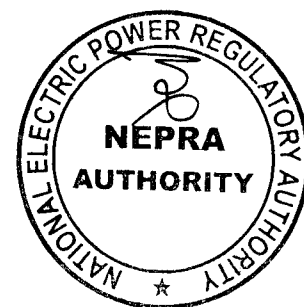


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Project cost		US \$ in millions			
Off shore cost	:	83.800			
On shore cost	:	26.180			
Letter of credit charges	:	0.335			
<b>Total EPC cost</b>	:	<b>110.315</b>			
Non-EPC costs	:	2.989			
Project development costs	:	4.013			
Land rental and survey cost of AEDB for first ten years	:	0.098			
Duties and taxes	:	0.419			
Pre-COD insurance	:	1.921			
Financial charges	:	3.099			
Sinosure fees	:	7.039			
Interest during construction	:	4.856			
<b>Total project cost</b>	:	<b>134.749</b>			
Project operations cost	:	(US \$ in millions)			
		Year 1 – 2	Year 3 – 05	Year 05 – 09	Year 10 – 20
O&M costs		2.485	3.681	3.765	4.081
Insurance cost		1.319	1.319	1.319	1.319
Total operating costs		3.804	5.000	5.084	5.400
20 years levelized tariff	:	US cents 14.72/Kwh (Rs. 12.51/kwh.)			
Exchange rate	:	1 US \$ = PKR 85			

#### Issues

4. Based on 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 of the Authority:
  - Whether net annual energy generation as claimed by the petitioner is justified?

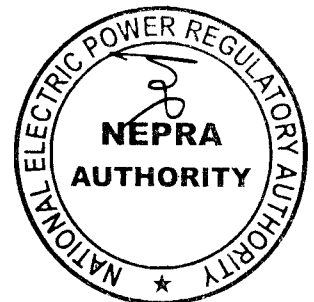


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- Whether construction period and pattern of funds injections claimed by the petitioner are justified?
- Whether EPC cost as claimed by the petitioner is justified?
- Whether other project costs as claimed by the petitioner are justified?
- Whether the terms and conditions of debt servicing claimed by the petitioner are justified?
- Whether return on equity as claimed by the petitioner is justified?
- Whether O &M costs claimed by the petitioner are justified?
- Whether insurance during operations as claimed by the petitioner is justified?
- Whether other matters raised by the petitioner are justified?

5. Whether net annual energy generation as claimed by the petitioner is justified?

- 5.1 The petitioner has submitted that its net annual benchmark energy will be 138.70 GWh. at P50 level on the basis of wind speed of 7.4 m/sec and its selected turbines of Xinjiang Goldwind Science & Technology Co. Limited (hereinafter referred to as "Goldwind") having hub height of 85 meters. The net annual plant capacity factor on the basis of above stated proposed benchmark annual energy works out to 31.99%.
- 5.2 National Transmission and Despatch Company Limited (hereinafter referred to as "NTDC") in its comments has submitted that the net annual plant capacity factor of the petitioner is lower than the other wind power projects for which tariff has recently been determined by the Authority. The petitioner in response to the said comments has clarified that in addition to the impact of wind speed and wind turbines, site conditions such as wake losses, altitude of the project site, etc. also impact the energy generation. Further, every project developer can have its own methodology to calculate annual energy generation. An authentic reliance could be placed on a single third party agency i.e. RISOE. The petitioner has submitted that it has taken a realistic and not over ambitious approach to its annual energy generation estimates.
- 5.3 The Authority has observed that the petitioner's project feasibility study report which has been prepared by Hydrochina Beijing Engineering Corporation of China and Renewable Resources (Pvt.) Limited of Pakistan has also estimated net annual benchmark energy of 138.70 GWh. at P50 level. The Authority further noted that the project feasibility study report has been approved by the AEDB vide letter no. B/3/1/CWE /07 dated June 22, 2011.



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5.4 The Authority has also observed that AEDB vide letter no. B/3/1/CWE /07 dated May 24, 2011 has confirmed that it has carried out verification of production estimates through its international independent consultant RISOE and has approved the benchmark annual energy generation of 138.70 GWh.

5.5 The Authority on the basis of verification exercise carried out by AEDB, approval of benchmark energy by AEDB and in the light of available documentary evidences allows 138.70 GWh as benchmark energy for the project.

6. Whether construction period and pattern of funds injections claimed by the petitioner are justified?

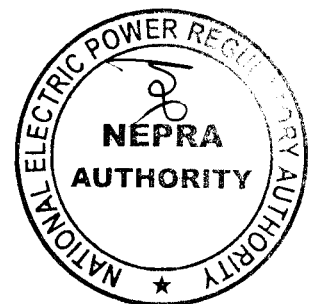
6.1 The petitioner has requested for allowing project construction period of 18 months. The petitioner has submitted that it will start construction six months prior to the financial close through equity injection. This means that at the time of financial close the remaining project construction period would be 12 months i.e. same as the grace period of debt facility. Summing up the terms proposed by the petitioner for allowing return on equity during construction and interest during construction are as follows:

		<u>Proposed construction period</u>
Return on equity during construction	:	18 months starting from 6 months prior to financial close
Interest during construction	:	12 months starting from the financial close

6.2 The Authority has considered the aforementioned request of the petitioner and has found it reasonable therefore the same is allowed. The petitioner is hereby directed to ensure that all the terms and conditions relating to construction period in the energy purchase agreement confirm with the aforesaid terms and conditions allowed by the Authority.

7. Whether EPC cost as claimed by the petitioner is justified?

7.1 The petitioner has requested for allowing EPC cost of US \$ 110.315 million and has provided the following break-up of EPC cost:



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	US \$ in <u>millions</u>
Off shore cost	: 83.800
On shore cost	: 26.180
Letter of credit charges	: 0.335
Total EPC cost	: <u>110.315</u>

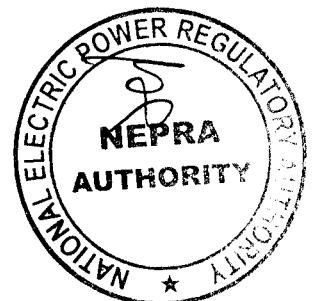
- 7.2 The petitioner has submitted that international tenders were floated through competitive bidding to select the EPC contractors. Comprehensive tender documents were prepared in which all technical, financial, legal and administrative terms were spelled out. Tender documents were issued to eight parties. EPC proposals were received from four parties. A detailed evaluation of all the proposals was carried out; mainly comprising of but not limited to performance specifications of wind turbines, relevant experience and credentials of the bidders, warranty, support claims and the commercial aspects. On the basis of evaluation one of the bids which was jointly submitted by China Huashui Hydropower Development Corporation (herein after referred to as "CHHD") and China International Water and Electric Corporation (herein after referred to as "CWE") which qualified both in technical and financial terms was selected.
- 7.3 The petitioner has further submitted that the EPC contracts for setting up the wind farm are split into two parts, which collectively form EPC of the project on a turnkey basis. Break-up of the EPC contracts with scope of work is as follows:

Off shore supply part

The off shore contractors are CHHD who will be responsible for procurement of all the permanent equipment of wind farm (including wind turbines, towers, blades, substation and allied accessories) based on design of the project, and supply of the same at project site on door to door basis.

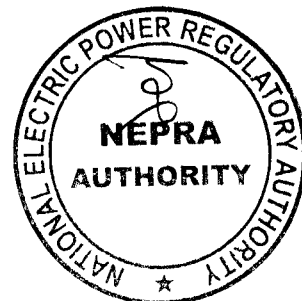
On shore design, build and construction part

The on shore contractors will be CWE who will be responsible for designing, building and construction of wind farm such that excluding the scope of work of



CHHD, the work to be done by CWE will be on turnkey basis to make the wind farm operational.

- 7.4 The petitioner has submitted that the price of both on shore and off shore contracts is fixed, firm and the contracts were signed and sealed on 13 May, 2011. AEDB vide its letter no. B/3/1/CWE/07 dated: 06 June, 2011 has approved CHHD and CWE as EPC contractors. The petitioner has also submitted copies of duly signed EPC contract and bids evaluation report in support of its claim.
- 7.5 Some of the commentators have submitted that the capacity of wind turbines selected by the petitioner is 1.50 MW whereas higher capacity turbines are being used worldwide these days. They have observed that in future small sized turbines upto 1.50 MW may become redundant. Some of the commentators also objected to the higher cost per MW of the wind turbines selected. The petitioner in response to these comments has argued that the 1.50 MW capacity wind turbines selected for the project are by far the most installed and popular size worldwide. For Pakistan where wind turbines are about to begin deployment it is appropriate to start with the most common turbine ratings. The petitioner has further submitted that its EPC cost per MW is lower than that allowed by the Authority in other cases. According to the petitioner the selection of plant and equipment has been done after due diligence with regard to reliability and suitability to local conditions.
- 7.6 AEDB during the public hearing also supported the wind turbine selection criteria of the petitioner and submitted that in view of nascent stage of development of wind energy sector in Pakistan it is prudent to install wind turbines having a proven track record of successful operations worldwide.
- 7.7 Some of the commentators also submitted that the wind turbines selected by the petitioner can maintain normal operations without reducing power for a range of temperatures between  $-10^{\circ}$  C to  $42^{\circ}$  C however temperature in the project area, during summer season, rise much above this limit. The petitioner in response has submitted that the temperatures recorded at site show that 99% of times the temperatures remain upto  $40^{\circ}$  C. Further, there is only 0.10% frequency of the temperatures recorded above  $42^{\circ}$  C. The petitioner has submitted that even for this little occurrence, Goldwind has made some modifications in the components.
- 7.8 In addition to the cost of EPC contract, the petitioner has also claimed US\$ 0.335 million as charges for the letter of credit to be opened in favor of the EPC



contractor. The Authority has observed that for wind power projects such letter of credit charges claimed have been separately allowed by the Authority in the past. Therefore keeping in view the size of wind power projects and to be consistent with its earlier decision, the Authority hereby allows US \$ 0.335 million letter of credit charges. These charges will be adjusted at commercial operations date (hereinafter referred to as "COD") on actual basis, not exceeding the maximum ceiling of US \$ 0.335 million, upon production of verifiable documentary evidence to the satisfaction of the Authority.

7.9 The Authority has noted that the EPC cost claimed by the petitioner is comparable to the EPC cost allowed to other wind power projects by the Authority. In the light of available documentary evidences and comparability of this cost with other projects the Authority hereby approves the EPC cost of US \$ 110.315 million (inclusive of letter of credit charges of US \$ 0.335 million).

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

8.1 The petitioner has claimed US\$ 24.434 million on account of other project costs split up under various heads as given hereunder:

	<u>US\$ in millions</u>
Non-EPC Costs	2.989
Project Development Costs	4.013
Land Cost	0.098
Duties and Taxes	0.419
Pre-COD Insurance Cost	1.921
Financial Charges	3.099
Sinosure Fees	7.039
Interest During Construction	4.856
<i>Total</i>	<u>24.434</u>

The above cost under each head is discussed in the following paragraphs:

8.2 Non-EPC Costs

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



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	<u>US \$ in</u> <u>millions</u>
Fixed assets	1.864
Administration cost	0.550
Accommodation cost	0.201
Security arrangement cost	0.174
Communication link cost	0.200
<b>Total non-EPC cost</b>	<u><u>2.989</u></u>

8.2.2 According to the petitioner abovementioned heads comprise of the following costs:

Fixed assets

This includes cost of vehicles, office equipment, furniture, electrical appliances and two sets of wind measurement masts (instruments, lattice towers, calibration, security, maintenance and insurance) as required under the energy purchase agreement.

Administration cost

This includes costs associated with rents, utilities, vehicles fuel and maintenance, site clinic and other allied expenses of running the offices during the development and construction period.

Accommodation cost

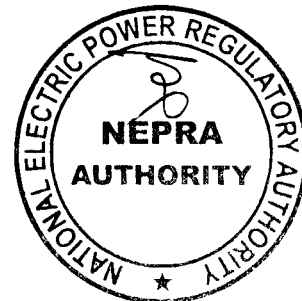
This includes cost of keeping rented accommodation in Karachi. The petitioner has submitted that since the project site is not far away from Karachi, therefore it has no intention to build a full-fledged residential colony.

Security arrangement cost

This represents costs associated with providing security at offices, security to be provided for expatriates engaged for the project, etc.

Communication link cost

In accordance with the energy purchase agreement, the petitioner is required to provide connectivity to the power purchaser. The total deployment cost (including equipment, materials and installation) has been included under this head.



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8.2.3 The Authority has found that the feasibility study report has estimated non-EPC costs of US \$ 2.20 million against US \$ 2.989 million claimed by the petitioner under this head.

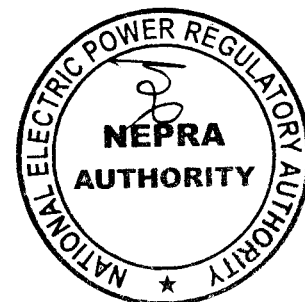
8.2.4 The Authority has also observed that the petitioner has claimed costs of luxurious vehicles, refrigerated truck, number of colored television sets, digital satellite receivers, rental costs of more than one office in the same city, etc. under this head. The Authority has noted that such costs are not desirable, as these are ultimately to be borne by the consumers. The Authority has further observed that the costs claimed by the petitioner are much higher than what has been allowed to comparable projects and what has been claimed by other wind power companies from the Authority. Accordingly the Authority has decided to rationalize the costs claimed by the petitioner. After careful scrutiny of the cost details provided by the petitioner and on the basis of other available information, the Authority has assessed an aggregate amount of US \$ 1.100 million under the head of non-EPC costs and has decided to allow the same to the petitioner.

8.3 Project Development Costs

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

	<u>US \$ in millions</u>
HR cost	1.998
Construction consultant supervision fee	0.800
Feasibility study	0.537
Project consulting and advisory fees since LOI issuance until COD	0.353
Others	0.325
<b>Total project development cost</b>	<b><u>4.013</u></b>

8.3.2 According to the petitioner HR costs represent salaries, wages and benefits of all staff employed by the project company. Others includes Government permit and licenses fees, charges for obtaining letter of interest from AEDB, performance guarantee charges for issuance of letter of support, sellers letter of credit to NTDC charges under energy purchase agreement, company incorporation and



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capitalization fees and travelling costs incurred for both domestic and international routes.

8.3.3 The Authority has found that the feasibility study report has estimated project development cost of US \$ 3.00 million against US \$ 4.013 million claimed by the petitioner under this head.

8.3.4 The Authority has noted that the petitioner has submitted documentary evidences regarding some of its cost claims. The Authority has however found that the cost claims of the petitioner are on higher side and even do not compare favorably with the costs claimed by similar projects. After scrutiny of the details provided by the petitioner and on the basis of other available information, the Authority has assessed an aggregate amount of US\$ 2.930 million under this cost head which is accordingly being allowed.

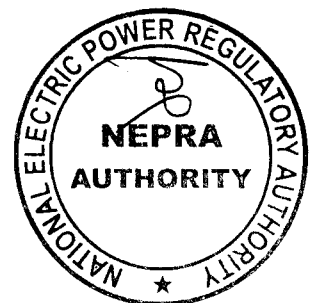
#### 8.4 Land Cost

8.4.1 The petitioner has claimed land cost of US \$ 0.098 million and has submitted that it has leased 1,150 acres of land for the project from AEDB. The cost claimed represents lease cost for the year 1 to 10, stamp duty, registration fees, cost of survey and demarcation of land which has already been paid to AEDB. The Authority in accordance with the previous practice has considered this cost as a part of operating cost/non-EPC cost and accordingly disallows the entire cost claimed here.

#### 8.5 Duties and Taxes

8.5.1 The petitioner has requested for allowing duties and taxes of US \$ 0.419 million. The petitioner has submitted that it has assumed that Sindh Infrastructure Development Surcharge will be levied @ 0.50% of the imports for the project, while all other duties and taxes have been assumed as nil. The petitioner has requested that any taxes (customs duty/sales tax/income tax/special excise duty) which are levied, the same should be reimbursed to the project company on the basis of actual levy at the time of COD.

8.5.2 The Authority has considered the request of the petitioner and has decided to allow duties and taxes of US \$ 0.419 million in accordance with the request of the



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petitioner. Further, duties and taxes will be subject to adjustment at actual on COD in accordance with the mechanism detailed in the order.

#### 8.6 Pre-COD Insurance Cost

8.6.1 The petitioner has claimed US\$ 1.921 million on account of insurance expense during the project construction period. NTDC has commented that this cost should be restricted to 1.35% of EPC cost, as has been done by the Authority in other cases. The Authority is cognizant of the fact that in comparable cases insurance during construction has been allowed with maximum ceiling of 1.35% of EPC cost. Accordingly, the petitioner is allowed US\$ 1.489 million on account of pre-COD insurance cost. This cost will be subject to adjustment at COD on the basis of actual expense, duly verifiable with the relevant supporting documents, up to a maximum limit of 1.35% of the approved EPC cost.

#### 8.7 Financial Charges

8.7.1 The petitioner has claimed US \$ 3.099 million on account of financial charges. The petitioner has provided following break-up of financial charges:

	<u>US \$ in millions</u>
Upfront fee @ 1.80 % of total borrowing	1.940
Facility management fee @ 1 % of total borrowing	1.078
Commitment fees @ 0.50 % of undrawn borrowing	0.081
Total	<u>3.099</u>

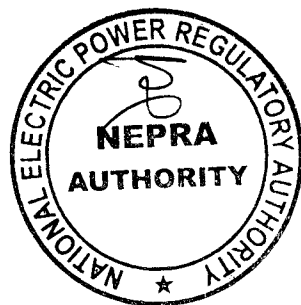
8.7.2 Some of the commentators have objected to the high financial charges claimed by the petitioner and suggested that financial charges should be negotiated with the lenders to arrive at an optimal figure of financial charges. The Authority has considered the claim of the petitioner and has decided to allow financial charges upto 3% of the total debt (excluding the impact of interest during construction, Sinosure fees and financial charges). Accordingly financial charges work out to US\$ 2.790 million which are hereby allowed. These financial charges are subject to adjustment 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,



Sinosure fees and financial charges), on production of authentic documentary evidence.

## 8.8 Sinosure Fees

- 8.8.1 The petitioner has claimed US\$ 7.039 million on account of Sinosure fees. The petitioner has submitted that it is a condition of lending by the Chinese banks to the companies with Chinese equity that the debt must be insured with the Chinese government agency 'China Export & Credit Insurance Corporation' and without Sinosure insurance, lending will not be provided by the Chinese banks. In support of its claim the petitioner has submitted a term sheet dated March 29 2011, of 'China Development Bank Corporation' requiring overseas investment insurance by Sinosure for financing the project. Further, letter dated March 29 2011, of 'China Export and Credit Insurance Corporation' confirms that they are interested in providing overseas investment insurance to the financing by 'China Development Bank Corporation' and the total premium rate will be no less than 6.53% based on the loan facility. Furthermore, the petitioner vide letter no. TGF/EX/OUT/2011-019 dated August 25, 2011 has also submitted Sinosure policy of another project outside Pakistan for consideration of the Authority.
- 8.8.2 NTDC has commented that the Sinosure fees claimed is high and is in addition to high financial charges claimed by the petitioner. It has opined that sponsor may be advised to get it waived from the Chinese Government.
- 8.8.3 The Authority for comparison purposes also obtained information about Sinosure insurance from Neelum Jhelum Hydropower Company (Pvt.) Limited. After considering submissions of the petitioner and facts of the case the Authority has decided to allow Sinosure fees of US \$ 6.806 million i.e. Sinosure fees @ 6.53% of the loan facility allowed. The Authority however directs the petitioner to make efforts for getting waiver of Sinosure fees from the Chinese Government. Further, simultaneously with making efforts for getting the aforesaid waiver, the petitioner should also negotiate for reduction of Sinosure fees as the Authority understands that the premium rate of Sinosure fees needs to be further negotiated.
- 8.8.4 The Sinosure fees will be adjusted at COD on the basis of actual expense, not exceeding the maximum limit of 6.53% of the loan facility allowed, on production of authentic documentary evidence.

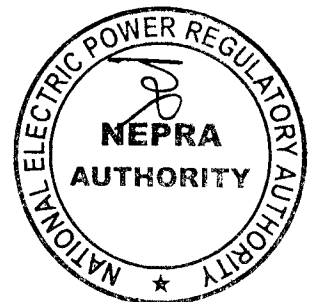


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8.9 Interest During Construction

- 8.9.1 The petitioner has estimated an amount of US\$ 4.856 million on account of interest during the project construction period (hereinafter referred to as “IDC”). According to the information provided by the petitioner, the IDC has been calculated on the basis of grace period of one year, with the assumption that 70% of the total debt will be drawn at the time of financial close and the remaining 30% of the total debt will be drawn after 6 months of the financial close. Further, interest rate of 5.30% (LIBOR plus spread of 4.80%) has been used for computation of IDC.
- 8.9.2 The Authority has considered the request of the petitioner and has decided to allow the construction period as requested and interest rate per annum of 6 months LIBOR plus spread of 4.50% as discussed in detail in other parts of this determination. Based on the project cost and other terms and conditions allowed by the Authority the IDC has been assessed as US \$ 4.430 million.
- 8.9.3 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 6 months LIBOR per annum plus 4.50%, during the project construction period allowed by the Authority.
9. Recapitulating the approved project cost for the petitioner under various heads is given hereunder:

	<u>Approved (US \$ in millions)</u>
EPC cost as per the EPC contract	109.980
Letter of credit charges	0.335
Non-EPC costs	1.100
Project development costs	2.930
Duties and taxes	0.419
Pre-COD insurance	1.489
Financial charges	2.790
Sinosure fees	6.806
Interest during construction	4.430
 Total Project Cost	 <hr/> 130.279 <hr/>



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10. Whether the terms and conditions of debt servicing claimed by the petitioner are justified?

10.1 The petitioner has submitted that its entire debt will be provided by the Chinese banks in US dollars. The petitioner has requested for allowing following terms for debt:

Interest rate	:	Six months LIBOR + 4.80%
Debt repayment period	:	9 years plus 12 months grace period
Repayment schedule basis	:	Biannual

In support of its claim the petitioner has provided a term sheet dated March 29, 2011 (non binding and not an offer document) of China Development Bank Corporation.

10.2 NTDC has objected to the interest rate claimed by the petitioner and has submitted that the same should be lower than LIBOR plus 3% allowed to thermal IPPs since wind power projects operate with lower operating risk as wind risk is borne by the power purchaser. The petitioner in response to the comments of NTDC has submitted that the limit of 3% referred to by the NTDC is applied for local KIBOR based financing for thermal power projects which have a proven track record of operations. The petitioner has further submitted that keeping in view the prevalent market conditions even interest rate requested is on the lower side.

10.3 The Authority has considered the comments of NTDC and submissions of the petitioner regarding the issue of circular debt in the power sector, non-availability of financing for power sector due to over exposure of local banks in the power sector, the need to encourage Chinese banks to finance power sector in the prevailing circumstances, etc. The Authority has observed that Sinosure insurance allowed by the Authority provides additional comfort to the lenders. The Authority further observed that it has allowed interest rate of 6 months LIBOR plus 4.50% for foreign financing in its recent determination of a wind power project. The Authority considers that the petitioner should be able to get financing on the same terms i.e. 6 months LIBOR plus 4.50% and therefore allows the same to the petitioner.



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- 10.4 The Authority has also considered the request of the petitioner for allowing debt repayment in 9 years instead of standard 10 years allowed by the Authority. During the hearing the petitioner explained that it has limited its debt term to 10 years (9 years plus one year grace period) as the terms offered by the Chinese banks will become much more stringent if the total debt period exceeds 10 years. The Authority has observed that allowing shorter debt period makes the tariff front loaded but reduces the interest charges. The Authority considering the circumstances of the case, hereby allows the requested debt term of 9 years plus one year grace period.
- 10.5 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

11. Whether return on equity as claimed by the petitioner is justified?

- 11.1 The petitioner has requested for allowing 18% return on equity (IRR based) net of 7.5% withholding tax on dividends. In support of its claim the petitioner has submitted that risk perceptions are high for investing in Pakistan energy sector, there is no history of wind power projects in Pakistan, GOP is only covering the wind speed risk while the investor is taking the risk of other wind characteristics (air density, wind frequency distribution, temperature and humidity), etc.
- 11.2 Some of the commentators have opined that 17% return on equity (IRR based) as already allowed by the Authority in comparable cases should also be allowed to the petitioner. The Authority considers that the rate of return allowed should be commensurate to that earned by other investments of comparable risk. The Authority has already allowed 17% return on equity (IRR based) to promote wind power sector. The return on equity allowed to wind power sector is 2% more than the return on equity allowed in the case of thermal power projects. In view of these facts the Authority has decided to allow 17% (IRR based) return on equity to the petitioner as has already been allowed to other wind power projects.
- 11.3 The Authority has further noted that the petitioner has not included return on equity during construction (hereinafter referred to as "ROEDC") in its tariff



computations and has requested for allowing the same at COD stage. The Authority has observed that this practice is consistent with the treatment allowed by the Authority to other wind power generation projects. The Authority has however decided that after the announcement of recent upfront tariff for wind power generation projects, it is desirable for comparison purposes, that ROEDC should be included in the tariff at determination stage. Accordingly ROEDC is made a part of the tariff by the Authority at determination stage in the instant case. The ROEDC will be adjusted at COD on the basis of actual equity injections (within the overall equity allowed by the Authority at COD) during the project construction period allowed by the Authority.

12. Whether O &M costs claimed by the petitioner are justified?

12.1 The petitioner has claimed following O & M costs:

	Foreign O & M	Local O & M	Total
US \$ in millions			
Year 01 -02	1.189	1.296	2.485
Year 03 – 05	2.357	1.324	3.681
Year 06 -09	2.013	1.752	3.765
Year 10- 20	2.193	1.888	4,081

12.2 The petitioner has submitted that its wind turbine supplier Goldwind is providing the O & M services for the first five years of operations under separate O & M contract out of which first two years are also covered under the manufacturer's warranty. The O & M costs for first two years are lower compared to the next three years as major spare parts during the first two years will be covered under warranty. After five years the petitioner will carry out the O & M itself.

12.3 The petitioner has submitted that O & M costs include the following:

- Cost of outsourced O & M for the first five years.
- Cost of O & M by the project company after the first five years.
- Technical support and services cost after the first five years.
- Operating cost of fixed assets.



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- Payroll and allied expenses.
- Security arrangement cost.
- Vehicles fuel and maintenance.
- Administration cost.
- Land lease cost payable to AEDB for the years 11 to 20.

- 12.4 The petitioner has submitted signed O & M contract and documentary evidences including quotations for various items in support of its claim and has submitted that according to the Chinese experience O & M costs range between US cents 2.5 per kwh per year to US cents 2.8 per kwh per year and the O & M costs claimed are in line with the sponsors experience in China. The petitioner has also submitted that another important factor to consider is that there is no allied infrastructure available in Pakistan and it is anticipated that for the first 300 MWs to 500 MWs the O & M costs can be even higher than the available benchmarks of China. The petitioner has also quoted from the research report on O & M costs "The Wind Energy Operations & Maintenance Report 2011" and has submitted that as per the report O & M costs are around three percent of the total project cost and has stated that the project company has estimated its O & M costs within that range.
- 12.5 The high quantum of O&M costs claimed was objected to by the NTDC and other stakeholders during hearing of the petition. Some of the commentators submitted that instead of delegating the O & M responsibility to foreign companies, local companies should be selected for this purpose which will substantially reduce the O & M costs. The petitioner in support of its claim argued that it has signed O&M contract after extensive negotiations and stated that its O & M costs are higher than the local companies as its management is from China with no benefit of existing set-up or infrastructure in Pakistan.
- 12.6 The Authority has found that the O&M costs requested by the petitioner are considerably on the higher side in comparison to the O & M costs allowed by the Authority in comparable cases, including the O & M costs allowed to companies with foreign sponsors. The Authority has also found that in contrast to the claim of the petitioner, feasibility study report has estimated the following O & M costs:



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	US \$ in millions
Year 01 -02	1.500
Year 03 – 05	2.699
Year 06 -20	2.501

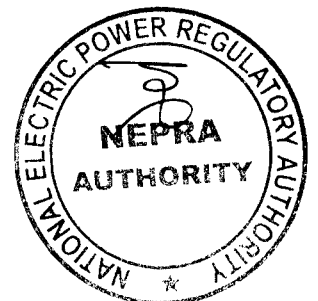
- 12.7 It was also noted by the Authority that according to the details and supporting documents submitted by the petitioner its claim for O & M costs including for payroll and allied expenses, vehicles fuel, vehicles maintenance and administrative costs are based on prices and quantities which are considered to be on the higher side by the Authority. 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):

	US \$ in millions
Year 01 -02	1.262
Year 03 – 05	2.412
Year 06 – 09	2.099
Year 10 -20	2.363

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

**13. Whether insurance during operations as claimed by the petitioner is justified?**

- 13.1 The petitioner has requested for allowing US\$ 1.319 million per annum as insurance expense in the post COD period for 20 years of tariff control period. The petitioner has submitted that it has based its estimates on the quotes received from the insurance providers. The cost of insurance claimed by the petitioner is about 1.20% of its approved EPC cost.
- 13.2 The Authority considers the request of the petitioner reasonable and hereby allows the insurance expense of US\$ 1.319 million per annum claimed by the petitioner. This cost will be adjusted at actually incurred prudent cost upon production of verifiable documentary evidence at the time of COD, in accordance with the mechanism prescribed in the order.



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14. Whether other matters raised by the petitioner are justified?

14.1 Indexation of return on equity with US CPI

The petitioner has requested for allowing indexation of return on equity with US CPI. The Authority has considered the request of the petitioner and has observed that the petitioner has not been able to justify its claim with sound arguments. Further, this indexation has not been allowed by the Authority to other comparable projects. In view of these facts the Authority has decided not to allow indexation of return on equity with US CPI.

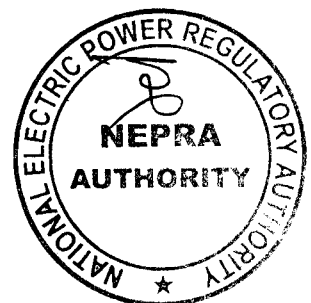
14.2 Bonus energy

The petitioner has submitted that the power purchaser be directed to purchase and 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.

14.3 Pre COD sale of energy

The petitioner has submitted that the energy generated during construction and prior to COD be allowed to be sold to the power purchaser at the rate applicable to bonus energy. NTDC has commented that under the provisions of energy purchase agreement executed in the case of an earlier wind power project, the power purchaser has no obligation to pay for any net delivered energy to the interconnection point during testing because as a matter of principal any costs on this account are to be capitalized.

The Authority has in earlier comparable determinations allowed sale of electricity prior to COD pursuant to bilateral agreement on mutually agreed terms between



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the buyer and seller. The Authority here by maintains its decision on this issue in the case of the petitioner.

15. Order

Pursuant to Rule 6 of the National Electric Power Regulatory Authority Licensing (Generation) Rules, 2000, Three Gorges First Wind Farm Pakistan (Pvt.) 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 3-5	Year 6-9	Year 10-20	Indexation
	Rs./kwh.	Rs./kwh.	Rs./kwh.	Rs./kwh.	
Fixed O&M					
Local	0.4035	0.5318	0.5986	0.6699	WPI
Foreign	0.3702	0.9467	0.6877	0.7782	PKR/US\$ & US CPI
Insurance	0.8081	0.8081	0.8081	0.8081	PKR/US\$
Debt Service	8.8999	8.8999	8.8999	-	PKR/US\$, LIBOR
Return on equity	2.7145	2.7145	2.7145	2.7145	PKR/US\$
Return on equity during construction	0.7645	0.7645	0.7645	0.7645	PKR/US\$
Total	13.9607	14.6655	14.4733	5.7352	

- i) The reference tariff has been calculated on the basis of net annual benchmark energy generation of 138.700 GWh at annual net plant capacity factor of 31.99% for installed capacity of 49.50 MW.
- ii) The above charges will be limited to the extent of net annual energy generation of 138.700 GWh. Net annual generation supplied to the power purchaser in a year, in excess of benchmark energy of 138.700 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



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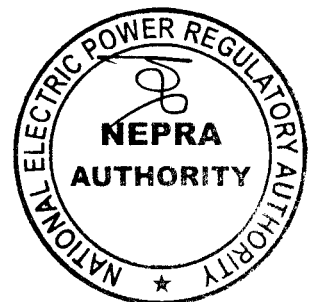
power purchaser and the petitioner in accordance with the approved mechanism given in the GoP Policy for Development of Renewable Energy for Power Generation 2006, as amended from time to time.

- iv) The reference PKR/dollar rate has been assumed at 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 is attached herewith as Annex-I, which should be verified by the Alternative Energy Development Board (AEDB)/power purchaser before finalization of 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 tariff is indicated at Annex-II.
- ix) Debt Servicing Schedule is attached as Annex-III.

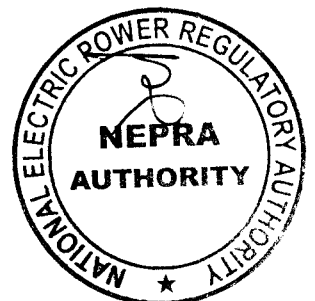
#### I. One Time Adjustments

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

- a. 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 \$ 0.335 million, upon production of verifiable documentary evidence to the satisfaction of the Authority.
- b. Duties and/or taxes, not being of refundable nature, imposed on the company upto the commencement of its commercial operations for the import of its plant, machinery and equipment will be subject to adjustment at actual on COD, as against US \$ 0.419 million allowed now, upon production of verifiable documentary evidence to the satisfaction of the Authority.



- c. 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.
- d. 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, Sinasure fees and financial charges), on production of authentic documentary evidence.
- e. The Sinasure fees will be adjusted at COD on the basis of actual expense, not exceeding the maximum limit of 6.53% of the loan facility allowed, on production of authentic documentary evidence.
- f. The 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 6 months LIBOR per annum plus 4.50%, during the project construction period allowed by the Authority.
- g. The 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.
- 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.



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## 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.

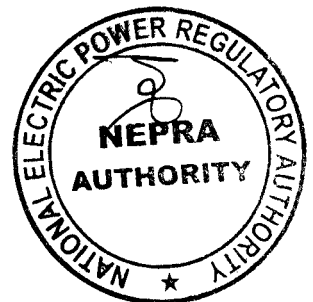
Withholding tax is also a pass through item just like other taxes as indicated in the government guidelines for determination of tariff for new IPPs. The power purchaser shall make payment on account of withholding tax at the time of actual payment of dividend, subject to maximum of 7.5% of 17% return 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 WPI 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 1<sup>st</sup> July, 1<sup>st</sup> October, 1<sup>st</sup> January and 1<sup>st</sup> April respectively on the basis of latest available information with respect to WPI (notified by the Federal Bureau of Statistics), 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:



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$$F O\&M_{(LREV)} = O\&M_{(LREF)} * WPI_{(REV)} / 210.61$$

$$F O\&M_{(FREV)} = O\&M_{(FREF)} * US\ CPI_{(REV)} / 225.722 * ER_{(REV)} / 85$$

Where:

- $F O\&M_{(LREV)}$  = The revised applicable fixed O&M local component of tariff indexed with WPI
- $F O\&M_{(FREV)}$  = 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 (manufacturers)
- $WPI_{(REF)}$  = 210.61 wholesale price index (manufacturers) of June 2011 notified by the Federal Bureau of Statistics
- $US\ CPI_{(REV)}$  = The revised US CPI (all urban consumers)
- $US\ CPI_{(REF)}$  = 225.722 US CPI (all urban consumers) for the month of June 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

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 EPC cost, on annual basis upon production of authentic documentary evidence by the petitioner.



iii) Adjustment for LIBOR variation

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

$$\Delta I = P_{(REV)} * (LIBOR_{(REV)} - 0.50\%) / 2$$

Where:

$\Delta I$  = the variation in interest charges applicable corresponding to variation in 6 months LIBOR.  $\Delta I$  can be positive or negative depending upon whether 6 months LIBOR<sub>(REV)</sub> per annum > or < 0.50%. The interest payment obligation will be enhanced or reduced to the extent of  $\Delta I$  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-III) on a biannual basis at the relevant six monthly calculations date.

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.

iv) Return on equity

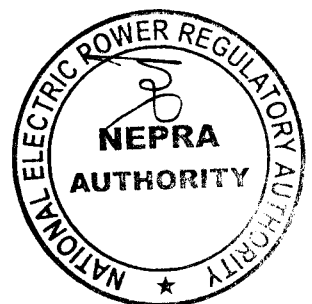
The return on equity component of tariff will be adjusted on the basis of revised TT & OD selling rate of US Dollar as notified by the National Bank of Pakistan according to the following formula:

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

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.



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$ER_{(REV)}$  = 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) 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

Note:

Adjustments on account of inflation, foreign exchange rate variation, LIBOR 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.

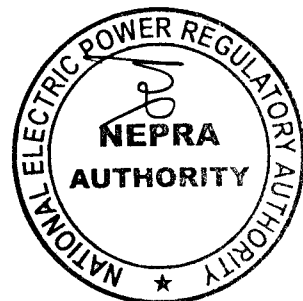
IV. **Terms and Conditions of Tariff:**

**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



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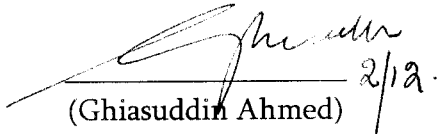
turbine generators and a compatible communication/SCADA system both at the wind farm and power purchaser's control room for transmission of wind speed and power output data to the power purchaser's control room.

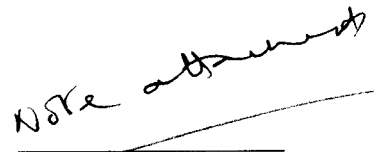
**Emissions Trading/ Carbon Credits:**


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.

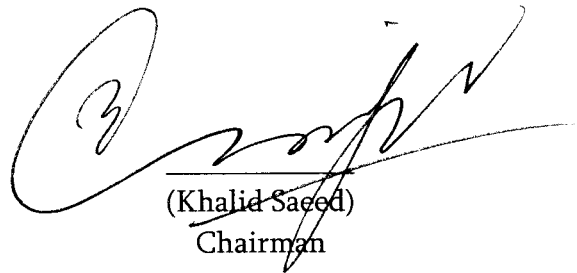
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**AUTHORITY**

  
(Ghiasuddin Ahmed) 2/12  
Member

*Note attached*  
  
(Shaukat Ali Kundi)  
Member


  
(Maqbool Ahmad Khawaja)  
Vice Chairman

  
(Khalid Saeed)  
Chairman



**DISSENTING NOTE OF MR. SHAUKAT ALI KUNDI  
MEMBER NEPRA  
IN THE MATTER OF TARRIF PETITION FILED BY  
THREE GORGES FIRST WIND FARM PAKISTAN (PVT.) LIMITED**

1. I agree with the majority decision in this case, except for the grant of Sinosure fees of US \$ 6.806 million @ 6.53% of the loan facility, in addition to the interest rate of 6 months LIBOR plus spread of 4.50% allowed on long term debt.
2. Sinosure insurance allowed by the Authority provides additional comfort to the lenders. I am of the opinion that the cumulative impact on tariff of interest rate on long term debt plus Sinosure fees allowed should not have exceeded the impact on tariff of interest rate of 6 months LIBOR plus spread of 4.50% allowed in a recently determined comparable case.
3. I therefore do not approve the demand of the petitioner regarding grant of Sinosure fees in addition to the interest rate allowed on long term debt of 6 months LIBOR plus spread of 4.50%.

  
Shaukat Ali Kundi  
Member 14.12.2011

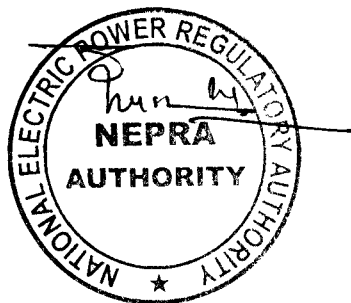
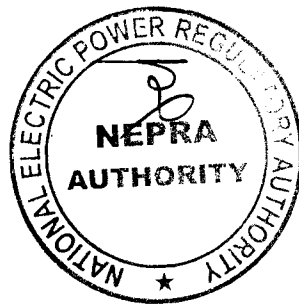


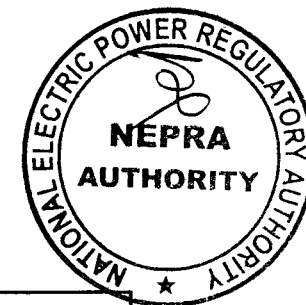
Table-1 - Benchmark Energy Production Table

Month	85 m Benchmark Wind Speed (m/s)	Benchmark Energy (GWh)
Jan	5.3	5.9
Feb	5.7	6.2
March	6	7.1
April	7.9	12.4
May	10	19.8
June	10.4	20
July	10.5	21.6
Aug	9.6	19.6
Sep	8.1	13.3
Oct	5.3	5
Nov	4.5	3.1
Dec	5	4.7
Annual Value	7.4	138.7



Refer clause 15 vi of the determination

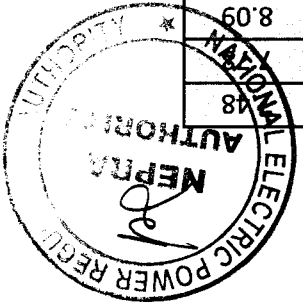
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**Table-2 - Monthly Complex Power Curves – Energy Production Estimates**

Monthly mean wind	Energy Production Estimates(GWH)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.5	1.90	1.87	1.49	1.60	1.70	1.79	1.81	1.88	1.70	1.60	1.61	1.74
3.6	1.90	2.01	1.64	1.64	1.88	1.92	2.01	2.03	1.88	1.88	1.74	1.88
3.7	2.00	2.16	1.81	1.81	2.03	2.03	2.22	2.19	2.03	2.03	1.88	2.03
3.8	2.10	2.31	1.97	1.97	2.19	2.11	2.37	2.36	2.19	2.19	2.03	2.19
3.9	2.20	2.47	2.15	2.15	2.36	2.21	2.45	2.53	2.36	2.36	2.19	2.36
4	2.19	2.63	2.33	2.33	2.53	2.32	2.52	2.72	2.53	2.53	2.36	2.53
4.1	2.46	2.79	2.52	2.52	2.72	2.39	2.61	2.91	2.72	2.72	2.53	2.72
4.2	2.73	2.96	2.71	2.71	2.91	2.50	2.72	3.11	2.91	3.00	2.72	2.91
4.3	3.01	3.14	2.91	2.91	3.11	2.62	2.88	3.32	3.11	3.31	2.91	3.11
4.4	3.29	3.32	3.12	3.12	3.32	2.73	2.91	3.53	3.32	3.54	3.01	3.32
4.5	3.57	3.51	3.33	3.33	3.53	2.83	3.01	3.75	3.53	3.68	3.09	3.53
4.6	3.85	3.70	3.54	3.54	3.75	2.94	3.12	3.98	3.68	3.82	3.31	3.75
4.7	4.13	3.90	3.77	3.77	3.98	3.01	3.29	4.21	3.82	3.97	3.53	3.98
4.8	4.41	4.10	3.99	3.99	4.21	3.12	3.32	4.45	3.97	4.13	3.75	4.21
4.9	4.70	4.31	4.23	4.23	4.45	3.27	3.43	4.70	4.13	4.30	3.98	4.45
5	4.99	4.52	4.46	4.46	4.70	3.32	3.51	4.96	4.30	4.47	4.22	4.70
5.1	5.27	4.74	4.71	4.71	4.96	3.47	3.62	5.21	4.47	4.66	4.46	4.96
5.2	5.56	4.96	4.95	4.94	5.21	3.60	3.89	5.48	4.66	4.85	4.71	5.21
5.3	5.86	5.19	5.20	5.08	5.48	3.78	4.02	5.75	4.85	5.04	4.96	5.48
5.4	6.15	5.42	5.46	5.22	5.75	3.91	4.23	6.03	5.04	5.25	5.22	5.75
5.5	6.44	5.66	5.72	5.39	6.03	4.35	4.46	6.31	5.25	5.46	5.49	6.03
5.6	6.74	5.90	5.98	5.57	6.31	4.64	4.83	6.59	5.46	5.68	5.76	6.31
5.7	7.04	6.15	6.25	5.76	6.59	4.92	5.19	6.88	5.68	5.91	6.03	6.59
5.8	7.34	6.41	6.52	5.97	6.88	5.44	5.53	7.18	5.91	6.15	6.31	6.88
5.9	7.64	6.67	6.80	6.19	7.18	5.78	5.82	7.48	6.15	6.39	6.59	7.18

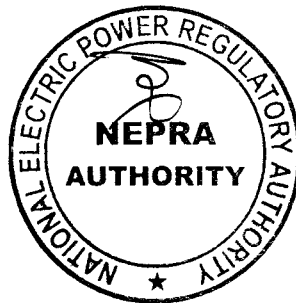
6	7.94	6.93	7.08	6.43	7.48	6.10	6.30	7.78	6.39	6.64	6.88	6.88
6.1	8.24	7.20	7.36	6.68	7.78	6.30	6.40	8.09	6.64	6.90	7.17	7.17
6.2	8.55	7.47	7.65	6.93	8.09	6.40	6.50	8.40	6.90	7.17	7.47	8.09
6.3	8.86	7.75	7.94	7.20	8.40	6.50	6.56	8.69	7.18	7.44	7.77	8.40
6.4	9.17	8.04	8.23	7.48	8.72	6.56	6.69	8.82	7.45	7.72	8.08	8.72
6.5	9.48	8.33	8.52	7.77	9.04	7.02	7.20	8.98	7.73	8.01	8.39	9.04
6.6	9.79	8.62	8.82	8.07	9.36	7.47	7.69	9.15	8.03	8.31	8.70	9.36
6.7	10.10	8.92	9.12	8.37	9.68	7.91	8.18	9.34	8.33	8.62	9.02	9.68
6.8	10.42	9.23	9.42	8.69	10.11	8.35	8.65	9.55	8.65	8.93	9.35	10.01
6.9	10.74	9.54	9.73	9.00	10.54	8.78	9.12	9.78	8.97	9.25	9.67	10.34
7	11.05	9.86	10.03	9.33	10.83	9.21	9.57	10.02	9.30	9.58	10.00	10.67
7.1	11.37	10.18	10.34	9.66	11.02	9.63	10.02	10.28	9.64	9.91	10.34	11.01
7.2	11.69	10.50	10.65	9.99	11.23	10.04	10.46	10.55	9.98	10.25	10.68	11.35
7.3	12.02	10.84	10.96	10.33	11.45	10.45	10.89	10.84	10.34	10.61	11.02	11.69
7.4	12.34	11.17	11.28	10.67	11.68	10.85	11.31	11.13	10.69	10.96	11.37	12.03
7.5	12.67	11.51	11.59	11.01	11.93	11.24	11.73	11.45	11.06	11.33	11.72	12.37
7.6	13.00	11.86	11.91	11.36	12.18	11.63	12.13	11.77	11.42	11.70	12.07	12.71
7.7	13.33	12.21	12.23	11.71	12.44	12.01	12.53	12.10	11.80	12.09	12.42	13.06
7.8	13.66	12.57	12.54	12.05	12.72	12.39	12.93	12.45	12.17	12.47	12.78	13.40
7.9	13.99	12.93	12.86	12.40	13.00	12.76	13.31	12.80	12.55	12.87	13.15	13.75
8	14.32	13.30	13.18	12.74	13.29	13.12	13.69	13.17	12.93	13.28	13.51	14.10
8.1	14.66	13.67	13.50	13.09	13.59	13.48	14.06	13.54	13.32	13.69	13.88	14.45
8.2	15.00	14.05	13.83	13.43	13.89	13.83	14.42	13.92	13.71	14.11	14.25	14.79
8.3	15.34	14.44	14.15	13.77	14.20	14.18	14.78	14.30	14.09	14.54	14.63	15.14
8.4	15.68	14.82	14.47	14.10	14.51	14.52	15.14	14.69	14.48	14.97	15.00	15.49
8.5	16.02	15.22	14.79	14.43	14.83	14.85	15.48	15.09	14.87	15.41	15.38	15.84
8.6	16.36	15.62	15.11	14.76	15.16	15.18	15.83	15.49	15.26	15.86	15.77	16.18



8.7	16.71	16.02	15.43	15.08	15.49	15.50	16.16	15.90	15.64	16.32	16.15	16.53
8.8	17.05	16.43	15.75	15.39	15.82	15.81	16.50	16.31	16.03	16.79	16.54	16.88
8.9	17.40	16.84	16.07	15.70	16.15	16.12	16.82	16.72	16.41	17.26	16.93	17.22
9	17.75	17.26	16.39	15.99	16.49	16.42	17.15	17.13	16.79	17.74	17.32	17.56
9.1	18.10	17.69	16.71	16.28	16.82	16.71	17.46	17.54	17.17	18.23	17.71	17.90
9.2	18.46	18.12	17.02	16.56	17.16	17.00	17.78	17.96	17.55	18.73	18.11	18.24
9.3	18.81	18.55	17.34	16.83	17.50	17.29	18.09	18.37	17.92	19.23	18.51	18.58
9.4	19.17	18.99	17.65	17.09	17.83	17.56	18.40	18.78	18.28	19.74	18.91	18.92
9.5	19.52	19.44	17.97	17.34	18.17	17.83	18.70	19.19	18.64	20.26	19.31	19.25
9.6	19.88	19.89	18.28	17.58	18.50	18.10	19.00	19.60	19.00	20.79	19.72	19.58
9.7	20.24	20.24	18.59	17.80	18.83	18.35	19.30	20.00	19.35	21.32	20.12	19.91
9.8	20.61	20.61	18.89	18.01	19.15	18.61	19.60	20.40	19.69	21.86	20.53	20.24
9.9	20.97	20.97	19.20	18.28	19.47	18.85	19.89	20.80	20.02	22.41	20.94	20.56
10	21.34	21.34	19.50	18.59	19.79	19.09	20.18	21.19	20.35	22.97	21.35	20.88
10.1	21.70	21.70	19.80	18.89	20.10	19.32	20.47	21.57	20.67	23.54	21.76	21.19
10.2	22.07	22.07	20.10	19.20	20.41	19.55	20.76	21.95	20.98	24.11	22.17	21.51
10.3	22.44	22.44	20.40	19.50	20.71	19.77	21.05	22.32	21.28	24.69	22.58	21.82
10.4	22.81	22.81	20.69	19.80	21.00	19.99	21.33	22.68	21.57	25.28	23.00	22.12
10.5	23.19	23.19	20.98	20.10	21.28	20.19	21.62	23.03	21.85	25.87	23.42	22.42
10.6	23.56	23.56	21.27	20.40	21.56	20.40	21.90	23.37	22.12	26.48	23.83	22.72
10.7	23.94	23.94	21.55	20.69	21.83	20.59	22.19	23.70	22.38	27.09	24.25	23.01
10.8	24.32	24.32	21.84	20.98	22.08	20.78	22.47	24.02	22.62	27.71	24.67	23.30
10.9	24.70	24.70	22.11	21.27	22.33	20.96	22.75	24.33	22.86	28.33	25.09	23.58
11	25.08	25.08	22.39	21.55	22.57	21.14	23.04	24.62	23.08	28.97	25.51	23.85
11.1	25.46	25.46	22.66	21.84	22.79	21.31	23.32	24.90	23.28	29.61	25.93	24.13
11.2	25.85	25.85	22.92	22.11	23.00	21.48	23.61	25.17	23.47	30.26	26.35	24.39
11.3	26.23	26.23	23.19	22.39	23.20	21.63	23.89	25.42	23.65	30.92	26.77	24.65



11.4	26.62	26.62	23.44	22.66	23.39	21.79	24.18	25.66	23.82	31.58	27.19	24.91
11.5	27.01	27.01	23.70	22.92	23.56	21.93	24.47	25.88	23.96	32.25	27.61	25.16
11.6	27.40	27.40	23.95	23.19	23.72	22.07	24.76	26.08	24.09	32.93	28.04	25.40
11.7	27.79	27.79	24.19	23.44	23.86	22.21	25.05	26.27	24.21	33.62	28.46	25.63
11.8	28.19	28.19	24.43	23.70	23.98	22.33	25.35	26.43	24.30	34.32	28.88	25.86
11.9	28.58	28.58	24.67	23.95	24.25	22.45	25.64	26.58	24.38	35.02	29.30	26.09
12	28.98	28.98	24.90	24.19	24.43	22.57	25.94	26.71	24.44	35.73	29.72	26.30
12.1	29.38	29.38	25.12	24.43	24.67	22.68	26.25	26.82	24.48	36.45	30.14	26.51
12.2	29.78	29.78	25.34	24.67	24.90	22.78	26.55	26.90	24.50	37.17	30.56	26.71
12.3	30.18	30.18	25.55	24.90	25.12	22.88	26.86	26.97	24.51	37.91	30.98	26.91
12.4	30.58	30.58	25.76	25.12	25.34	22.96	27.18	27.18	24.49	38.65	31.40	27.09
12.5	30.99	30.99	25.96	25.34	25.55	23.05	27.49	27.49	24.67	39.40	31.82	27.27
12.6	31.39	31.39	26.16	25.55	25.80	23.13	27.81	27.81	24.90	40.15	32.24	27.44
12.7	31.80	31.80	26.35	25.76	25.96	23.20	28.14	28.14	25.12	40.92	32.66	27.60
12.8	32.21	32.21	26.54	25.96	26.16	23.26	28.47	28.47	25.34	41.69	33.07	27.75
12.9	32.62	32.62	26.71	26.16	26.35	23.32	28.80	28.80	25.55	42.47	33.49	27.90
13	33.03	33.03	26.89	26.35	26.50	23.37	29.14	29.14	25.76	43.26	33.90	28.03



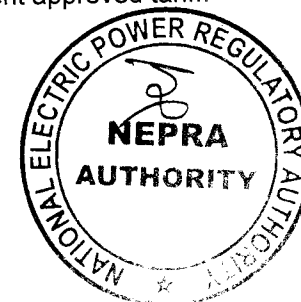
**THREE GORGES FIRST WIND FARM PAKISTAN (PVT.) LIMITED  
REFERENCE TARIFF TABLE**

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							
1	0.4035	0.3702	0.8081	2.7145	0.7645	0.2609	5.7776	3.1223	14.2216
2	0.4035	0.3702	0.8081	2.7145	0.7645	0.2609	6.0701	2.8298	14.2216
3	0.5318	0.9467	0.8081	2.7145	0.7645	0.2609	6.3774	2.5225	14.9264
4	0.5318	0.9467	0.8081	2.7145	0.7645	0.2609	6.7003	2.1996	14.9264
5	0.5318	0.9467	0.8081	2.7145	0.7645	0.2609	7.0395	1.8604	14.9264
6	0.5986	0.6877	0.8081	2.7145	0.7645	0.2609	7.3959	1.5040	14.7343
7	0.5986	0.6877	0.8081	2.7145	0.7645	0.2609	7.7703	1.1296	14.7343
8	0.5986	0.6877	0.8081	2.7145	0.7645	0.2609	8.1637	0.7362	14.7343
9	0.5986	0.6877	0.8081	2.7145	0.7645	0.2609	8.5769	0.3230	14.7343
10	0.6699	0.7782	0.8081	2.7145	0.7645	0.2609	-	-	5.9962
11	0.6699	0.7782	0.8081	2.7145	0.7645	0.2609	-	-	5.9962
12	0.6699	0.7782	0.8081	2.7145	0.7645	0.2609	-	-	5.9962
13	0.6699	0.7782	0.8081	2.7145	0.7645	0.2609	-	-	5.9962
14	0.6699	0.7782	0.8081	2.7145	0.7645	0.2609	-	-	5.9962
15	0.6699	0.7782	0.8081	2.7145	0.7645	0.2609	-	-	5.9962
16	0.6699	0.7782	0.8081	2.7145	0.7645	0.2609	-	-	5.9962
17	0.6699	0.7782	0.8081	2.7145	0.7645	0.2609	-	-	5.9962
18	0.6699	0.7782	0.8081	2.7145	0.7645	0.2609	-	-	5.9962
19	0.6699	0.7782	0.8081	2.7145	0.7645	0.2609	-	-	5.9962
20	0.6699	0.7782	0.8081	2.7145	0.7645	0.2609	-	-	5.9962
<b>Levelized</b>	<b>0.5658</b>	<b>0.7148</b>	<b>0.8081</b>	<b>2.7145</b>	<b>0.7645</b>	<b>0.2609</b>	<b>4.6533</b>	<b>1.3671</b>	<b>11.8490</b>

The reference tariff has been calculated on the basis of net annual benchmark energy generation of 138.700 GWh. Net annual generation supplied to the power purchaser in a year, in excess of benchmark energy of 138.700 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 13.9399



*(Handwritten signatures and initials)*

## THREE GORGES FIRST WIND FARM PAKISTAN (PVT.) LIMITED DEBT SERVICING SCHEDULE

Six months Libor per annum	0.50%
Spread	4.50%
Interest rate	5.00%

Period	Foreign Debt					Annual Principal Repayment Rs./kWh	Annual Interest Rs./kWh	Annual Debt Servicing Rs./kWh																																																																																																																																																													
	Principal	Repayment	Interest	Balance	Total Debt Service																																																																																																																																																																
	Million US \$	Million US \$	Million US\$	Million US \$	Million US \$																																																																																																																																																																
1	104,223,630	4,655,678	2,605,591	99,567,953	7,261,269	5.7776	3.1223	8.8999																																																																																																																																																													
	99,567,953	4,772,070	2,489,199	94,795,883	7,261,269				2	<b>104,223,630</b>	<b>9,427,748</b>	<b>5,094,790</b>	<b>94,795,883</b>	<b>14,522,537</b>	6.0701	2.8298	8.8999	94,795,883	4,891,372	2,369,897	89,904,511	7,261,269	89,904,511	5,013,656	2,247,613	84,890,855	7,261,269	3	<b>94,795,883</b>	<b>9,905,028</b>	<b>4,617,510</b>	<b>84,890,855</b>	<b>14,522,537</b>	6.3774	2.5225	8.8999	84,890,855	5,138,997	2,122,271	79,751,858	7,261,269	79,751,858	5,267,472	1,993,796	74,484,385	7,261,269	4	<b>84,890,855</b>	<b>10,406,470</b>	<b>4,116,068</b>	<b>74,484,385</b>	<b>14,522,537</b>	6.7003	2.1996	8.8999	74,484,385	5,399,159	1,862,110	69,085,226	7,261,269	69,085,226	5,534,138	1,727,131	63,551,088	7,261,269	5	<b>74,484,385</b>	<b>10,933,297</b>	<b>3,589,240</b>	<b>63,551,088</b>	<b>14,522,537</b>	7.0395	1.8604	8.8999	63,551,088	5,672,492	1,588,777	57,878,597	7,261,269	57,878,597	5,814,304	1,446,965	52,064,293	7,261,269	6	<b>63,551,088</b>	<b>11,486,795</b>	<b>3,035,742</b>	<b>52,064,293</b>	<b>14,522,537</b>	7.3959	1.5040	8.8999	52,064,293	5,959,661	1,301,607	46,104,631	7,261,269	46,104,631	6,108,653	1,152,616	39,995,978	7,261,269	7	<b>52,064,293</b>	<b>12,068,314</b>	<b>2,454,223</b>	<b>39,995,978</b>	<b>14,522,537</b>	7.7703	1.1296	8.8999	39,995,978	6,261,369	999,899	33,734,609	7,261,269	33,734,609	6,417,904	843,365	27,316,706	7,261,269	8	<b>39,995,978</b>	<b>12,679,273</b>	<b>1,843,265</b>	<b>27,316,706</b>	<b>14,522,537</b>	8.1637	0.7362	8.8999	27,316,706	6,578,351	682,918	20,738,355	7,261,269	20,738,355	6,742,810	518,459	13,995,545	7,261,269	9	<b>27,316,706</b>	<b>13,321,161</b>	<b>1,201,377</b>	<b>13,995,545</b>	<b>14,522,537</b>	8.5769	0.3230	8.8999	13,995,545	6,911,380	349,889	7,084,165	7,261,269	7,084,165	7,084,165	177,104	-	7,261,269		<b>13,995,545</b>	<b>13,995,545</b>	<b>526,993</b>	<b>-</b>
2	<b>104,223,630</b>	<b>9,427,748</b>	<b>5,094,790</b>	<b>94,795,883</b>	<b>14,522,537</b>	6.0701	2.8298	8.8999																																																																																																																																																													
	94,795,883	4,891,372	2,369,897	89,904,511	7,261,269																																																																																																																																																																
	89,904,511	5,013,656	2,247,613	84,890,855	7,261,269																																																																																																																																																																
3	<b>94,795,883</b>	<b>9,905,028</b>	<b>4,617,510</b>	<b>84,890,855</b>	<b>14,522,537</b>	6.3774	2.5225	8.8999																																																																																																																																																													
	84,890,855	5,138,997	2,122,271	79,751,858	7,261,269																																																																																																																																																																
	79,751,858	5,267,472	1,993,796	74,484,385	7,261,269																																																																																																																																																																
4	<b>84,890,855</b>	<b>10,406,470</b>	<b>4,116,068</b>	<b>74,484,385</b>	<b>14,522,537</b>	6.7003	2.1996	8.8999																																																																																																																																																													
	74,484,385	5,399,159	1,862,110	69,085,226	7,261,269																																																																																																																																																																
	69,085,226	5,534,138	1,727,131	63,551,088	7,261,269																																																																																																																																																																
5	<b>74,484,385</b>	<b>10,933,297</b>	<b>3,589,240</b>	<b>63,551,088</b>	<b>14,522,537</b>	7.0395	1.8604	8.8999																																																																																																																																																													
	63,551,088	5,672,492	1,588,777	57,878,597	7,261,269																																																																																																																																																																
	57,878,597	5,814,304	1,446,965	52,064,293	7,261,269																																																																																																																																																																
6	<b>63,551,088</b>	<b>11,486,795</b>	<b>3,035,742</b>	<b>52,064,293</b>	<b>14,522,537</b>	7.3959	1.5040	8.8999																																																																																																																																																													
	52,064,293	5,959,661	1,301,607	46,104,631	7,261,269																																																																																																																																																																
	46,104,631	6,108,653	1,152,616	39,995,978	7,261,269																																																																																																																																																																
7	<b>52,064,293</b>	<b>12,068,314</b>	<b>2,454,223</b>	<b>39,995,978</b>	<b>14,522,537</b>	7.7703	1.1296	8.8999																																																																																																																																																													
	39,995,978	6,261,369	999,899	33,734,609	7,261,269																																																																																																																																																																
	33,734,609	6,417,904	843,365	27,316,706	7,261,269																																																																																																																																																																
8	<b>39,995,978</b>	<b>12,679,273</b>	<b>1,843,265</b>	<b>27,316,706</b>	<b>14,522,537</b>	8.1637	0.7362	8.8999																																																																																																																																																													
	27,316,706	6,578,351	682,918	20,738,355	7,261,269																																																																																																																																																																
	20,738,355	6,742,810	518,459	13,995,545	7,261,269																																																																																																																																																																
9	<b>27,316,706</b>	<b>13,321,161</b>	<b>1,201,377</b>	<b>13,995,545</b>	<b>14,522,537</b>	8.5769	0.3230	8.8999																																																																																																																																																													
	13,995,545	6,911,380	349,889	7,084,165	7,261,269																																																																																																																																																																
	7,084,165	7,084,165	177,104	-	7,261,269																																																																																																																																																																
	<b>13,995,545</b>	<b>13,995,545</b>	<b>526,993</b>	<b>-</b>	<b>0</b>																																																																																																																																																																

