

## Zorlu Enerji Pakistan Ltd.

C-15, Block-2, Clifton, Karachi

Mobile no: 00905323374287

Email: Yagmur.ozdemir@zorlu.com

April 08, 2008

Mr. Mahjoob Ahmad Mirza

Registrar

National Electric Power Regulatory Authority (NEPRA)

2<sup>nd</sup> Floor, OPF Building,

Sector G-5/2

Islamabad

Pakistan

Subject: Tariff Petition

Dear Mr. Mirza ;

Please find enclosed Zorlu Enerji Pakistan Ltd. tariff petition for a 49.5 MW Wind Farm. This petition is based on the recent guidelines issued by the Ministry of Water & Power for Wind Power Tariffs and on the Renewable Energy Policy 2006. We are pleased to inform that we have purchased Vensys AND Goldwind Wind Turbines for this project.

2. The Wind Farm site is located at Jhimpir, District Thatta, Sindh. The levelized tariff for this project is 12.6556 US Cents/kWh.

3. We hope you find all in order. If you have any question or comments, kindly contact me at your convenience.

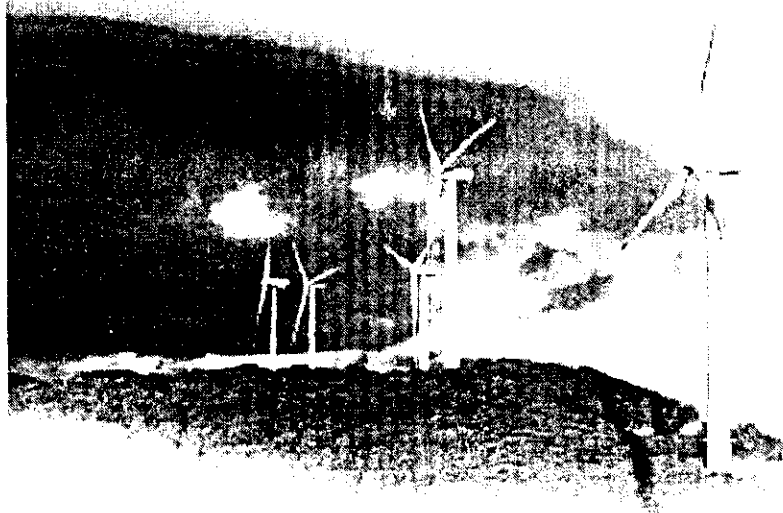
Yours Sincerely

(Yagmur OZDEMIR)  
Finance Manager

**ZORLU ENERJİ**  
**PAKISTAN LIMITED**

Registrar  
Dy. No. 5235  
Dated: 8.4.2008

# TARIFF PETITION ZORLU



## 49.5 MW Wind Power Project JHAMPIR - Pakistan

Prepared By:



IPEK energy GmbH  
Marktplatz 4, 48431 Rheine  
Germany  
Phone: +49 (5971) 914619 0  
Fax: +49 (5971) 914619 20  
E-mail: oi@ipek-energy.com  
Web: www.ipek-energy.com

Prepared For:



Zorlu Enerji Pakistan Limited  
Mandviwalla Chambers, C-15, Block 2  
Clifton, Karachi  
Pakistan

Phone No: +90 (212) 456 21 99  
Fax No: +90 (212) 422 00 99  
E-Mail: yagmur.oezdemir@zorlu.com  
Web: www.zorlu.com

**INDEX**

1	PRELIMINARY .....	3
1.1	Petitioner's Name And Address .....	3
1.2	Petitioner's Representative .....	3
1.3	Background .....	3
1.4	Petitioners Licensee .....	4
2	BRIEF FACTS FORMING BASIS OF PETITION .....	5
2.1	Pakistan's Power Scenario .....	5
2.2	Why Wind Power .....	6
2.3	Project Status .....	6
2.4	Selected Wind Turbines and Estimated Output .....	8
2.5	Project Cost and Annual O&M Cost .....	8
2.6	Indexation .....	9
2.7	Carbon Credits .....	9
3	TARIFF STRUCTURE .....	10
3.1	Introduction .....	10
3.2	Non-Escalable Energy Component .....	10
3.2.1	Debt Servicing .....	10
3.3	Escalable Energy Component .....	11
3.3.1	Local O&M Costs .....	11
3.3.2	Foreign O&M Costs .....	11
3.3.3	Return on Equity: .....	11
3.4	Tariff Assumptions .....	12
4	RATIONALE FOR PROPOSED TARIFFS .....	13
4.1	Introduction .....	13
4.2	Term of the Project /Tariff control period .....	13
4.3	Project Cost .....	14
4.3.1	Breakdown of the total project cost .....	14
4.3.2	Equipment Selection for the Wind Farm .....	14
4.3.3	EPC Costs .....	15
4.3.4	Project Development Costs .....	16
4.3.5	Euro-Dollar Conversion .....	16
4.4	Debt and Equity .....	16
4.4.1	Equity Structure .....	17
4.4.2	Debt Structure .....	17
4.5	Operating Cost .....	17
4.5.1	Insurance .....	17
4.6	Indexation, Escalations And Cost Adjustment .....	18
4.6.1	Foreign Exchange .....	18
4.6.2	LIBOR/ .....	18
4.6.3	KIBOR .....	18
4.6.4	Local Inflation .....	19
4.6.5	Eurozone Harmonized Index Of Consumer Prices .....	19
4.6.6	US Inflation .....	19
5	DETERMINATION SOUGHT .....	20
5.1	Introduction .....	20
5.2	Reference Tariff .....	20
5.3	Tariff Indexation .....	20
6	ANNEXURES .....	21
6.1	ANNEXURE- I: Assumptions .....	22
6.2	ANNEXURE-II: Table of Fees .....	23
6.3	ANNEXURE -III: Bank Draft / Pay Order .....	24
6.4	ANNEXURE- IV: Information Summary .....	25
6.5	ANNEXURE-V: Affidavit .....	27

## 1 PRELIMINARY

### 1.1 Petitioner's Name And Address

Zorlu Enerji Pakistan Limited ("ZORLU" or "Company")  
Mandviwalla Chambers, C-15, Block 2  
Clifton, Karachi - Pakistan  
Web: <http://www.zorlu.com>

### 1.2 Petitioner's Representative

Mr. Yagmur ÖZDEMİR, Finance Manager  
Telephone No: +90.212.456 21 99  
Fax No: +90.212. 422 00 99  
E-Mail: [yagmur.oezdemir@zorlu.com](mailto:yagmur.oezdemir@zorlu.com)

### 1.3 Background

Zorlu Holding has been active in the energy sector through the nine companies of the Zorlu Energy Group since 1993. ZORLU ENERJİ Electricity Production Inc. is supplying uninterrupted, high-quality, low-cost electricity to nearly 300 industrial and commercial companies with a total capacity of 420 MW provided by six power plants.

Zorlu Enerji will also get involved with power plant projects abroad. Two power plants in Moscow with a total capacity of 360 MW (with an option of expanding the capacity to 900 MW) and two power plants in Israel with a total capacity of 900 MW will be accomplished by Zorlu Energy Group. Zorlu Enerji is committed to contributing to national development, maintaining the highest level of customer satisfaction with a professional approach focused on a dynamic and flexible structure, and continuously providing high-quality service. Zorlu Enerji's goal is to be a sought-after name in the energy sector through effective operations in the sector's highly competitive global market.

Awarded a TS/EN ISO 9001:2000 quality certificate in 2001, Zorlu Enerji received both its OHSAS 18001:1999 Work Health and Safety Certificate and its ISO 14001 Environmental Management System Certificate on 12 October 2004. Ranked among Europe's 100 fastest-growing companies, with its Energy everywhere: from source to outlet vision, Zorlu Enerji adheres to a strategy of pursuing growth by adapting state-of-the-art technologies to its needs as it proactively diversifies its activities.

Zorlu Enerji enjoys a superior position in its sector thanks to its advanced maintenance and operations techniques, to its control system and remote performance monitoring systems, and to its high-efficiency power station designs. Its primary goal is to develop a self sufficient engineering infrastructure fully capable of designing, installing, and maintaining power stations without the need for any external resources. The group has also been making significant progress in the direction of exploiting alternative energy resources.

In 2006 ZORLU decided to enter into wind energy and began to develop a 50 MW project near Karachi at the Arabian Sea and received the development license by the Alternative Energy Development Board of Pakistan (AEDB, [www.aedb.org](http://www.aedb.org)).

The target of ZORLU is to install 300MW wind farm in Pakistan, whereas this decision will be confirmed after the installation of first phase of 50MW.

ZORLU therefore formed a new company "Zorlu Enerji Pakistan Limited", registered under the Companies Ordinance 1984 in September 2007. One of the 'Objects' for which the company is established, as given in the Memorandum of Association, is "...To carry on business of power generation by installing wind turbines, allied equipment and power houses to feed electricity into the national grid..." To that end, the company acquired a Letter of Interest from the Alternative Energy Development Board for putting up a wind farm of 50MW capacity. Further, the company also acquired land in the wind corridor identified by AEDB in Jhampir near Nooriabad, District Thatta in the province of Sindh.

Realising the urgency of situation, the Company decided to carry out the project on a turn key basis. And since no expertise or experience existed within country, ZORLU decided to the job on own by hiring IPEK energy GmbH ("IPEK") as experienced wind energy consultant for technical support.

IPEK carried out the Feasibility for the project, which was completed and submitted to AEDB in September 2007. The same was scrutinized and approved by AEDB. Copy of approval letter, reference No B/3/1/ZE/07 dated 5<sup>th</sup> October 2007 is enclosed as Annexure I.

By September 2007, ZORLU had also completed the following:

1. Soil survey and analysis of the allocated land
2. Seismic tests
3. EIA study for the wind farm project
4. Signed delivery Agreement for wind turbines (ready to shipment)
5. Survey of international market for availability of necessary equipment
6. Negotiation and selection of a financial advisor (Standard Chartered Bank, or SCB) with the view of later appointing SCB as the debt provider

#### **1.4 Petitioners Licensee**

ZORLU has applied for the Generation License for this wind farm by NEPRA on 5<sup>th</sup> October 2007 (LAG-104) and received the Generation Licence dated 21<sup>st</sup> January 2008 with the number: WPG/06/2008.

#### **1.5 Reason for revised Petition**

ZORLU's first Tariff Application was made on October 5<sup>th</sup> 2007 whereas a public Hearing was held on 24<sup>th</sup> October in Islamabad.

AT 18<sup>th</sup> of December 2007 NEPRA issued a Tariff to ZORLU under the document "NEPRA/TRF/-88/ZEPL-2007".

In this approval unfortunately NEPRA had changed following main items:

- Reduction of ZORLU's Total Project Costs from USD 114.159 Mio to USD 106.971 Mio; although ZORLU had provided the copy of a signed WTG delivery Agreement.
- Reduction of the WF Energy Output just by comparing with other wind farms projects, although there are no scientific back ground available for such assumptions

However ZORLU had still tried to step up the WF Project with the approved Tariff of NEPRA, which was not possible to ZORLU because of the main Items described below:

- While ZORLU had already purchased 5 turbines of 1.2 MW from Vensys - CKD and had scheduled for the remaining 29 turbines of 1.5 MW to be also delivered by Vensys-CKD, ZORLU eventually entered into negotiations with GOLDWIND regarding the supply of WTGs built with the same technology (from VENSYS). On the one hand, it appeared that the time to delivery would be considerably shorter (by up to one year) with GOLDWIND. On the other hand, SCB advised that GOLDWIND being a more established player than Vensys CKD, the Project would

be more easily bankable. ZORLU has changed the supplier by applying the same WTG prices as last year, although there were significant price increasing in the WTG Market.

- Given that the installed base of 1.5 MW turbines with the VENSYS technology is still very limited and there is a lack of track record, SCB advised ZORLU that the Project would not be bankable without an extended guarantee for the WTGs of 60 Months instead the available 30 Months, whereas the additional 30 Months had brought additional costs of 4.0 Million EUROS to ZORLU
- Since the approval of the last Tariff, the Insurance costs have changed from .400 Million USD to 1.416 Million USD .
- Since the approval of the last Tariff, NEPRA deducts the cost of Step-up Transformer Station which is cost of 3.600 Million Euro. This cost was added in to the Feasibility again on the Energy Equipment item.
- Because of the widening of the margin over USD Libor of the international debt of the Government of Pakistan, SCB advised ZORLU that the financing strategy contemplated initially was no longer viable. According to the new structure, lenders will provide at least 50% of the debt in local currency and the rest in foreign currency (USD).
- Because of the change in the debt structure, Establishment / Commitment Fee of the dept changed from .457 Million USD to 1.398 Million USD
- Since the approval of the last Tariff , the Bank's Legal and Technical Consultants Fees have been reevaluated from USD 17,000 to USD 995,760 (If the documentations needed by the NEPRA, Zorlu is ready to give them in the confidentiality terms)
- In the first Tariff application the transportation cost was stated as 4.000 Million EUROS. However because of the changing in the petroleum prices in the world, this cost was changed to 5.725 Million EUROS. The petroleum prices was change from 66 USD/barrel to 110 USD/barrel in seven months period.

As a result ZORLU is no more able to do this Project with the available Tariff and hence apply now for a revised Tariff in order to install the WF Project as soon as possible.

It is to highlight that the more delay in the Project implementation will be accrued, the higher is the necessary for a further Tariff Petition, which ZORLU try to avoid.

To underline the strong serious intention of ZORLU

- we would highlight that the foundation parts of the first 5 WTG are already in Pakistan, so an immediate start of the Project could be realized
- all available agreements, such as the Delivery Agreements, O&M Agreements, EPC Agreements, Insurance Agreements, and the copies of other agreements will be provided to NEPRA, to show that the Tariff Application is based on real numbers and not only on the base of "cost assumptions"

## **2 BRIEF FACTS FORMING BASIS OF PETITION**

### **2.1 Pakistan's Power Scenario**

With fast track development in almost all sectors of economy, and an even more ambitious plan for the coming years, the country is faced with acute power shortages starting with 2007 unless some remedial measures are adopted.

The power demand and supply projected for the next four years is as follows:

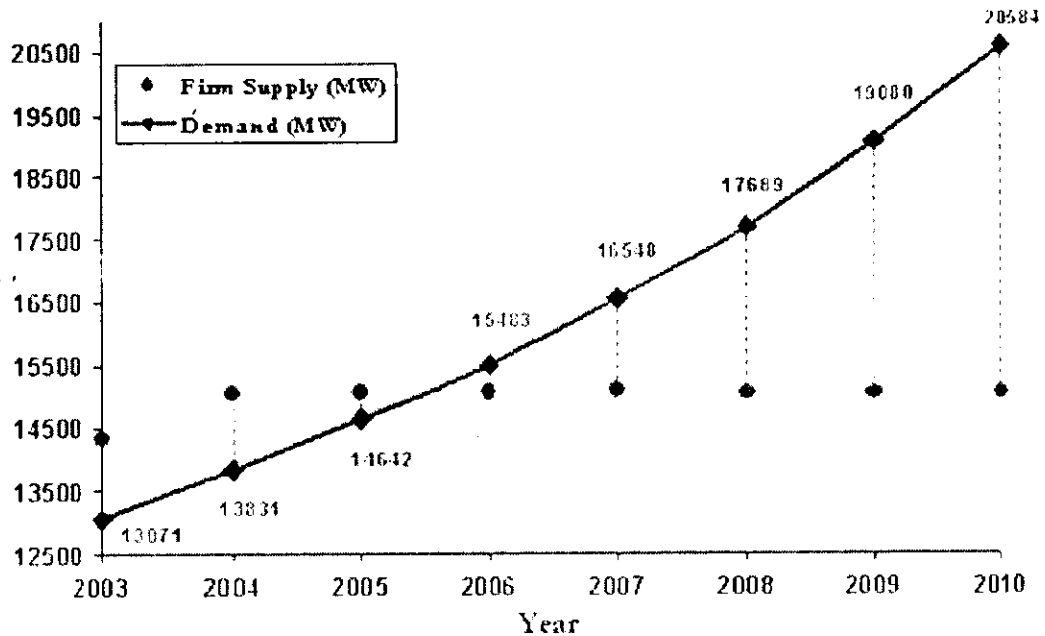


Figure 1: Power Supply and Demand; Source: PPIB

By the year 2010, the power shortage exceeds 5,000 MW. Hence requirement of new and additional power sources is established beyond question.

## 2.2 Why Wind Power

The next question is what options are available. Historically, Pakistan has had power from hydel projects and some nuclear power, to which was added thermal power from IPPs in the nineties. Ground reality is that the only major hydel project in hand is expected to be operational after 2016. Some run of the river projects are in hand. No thermal power plant has been put up in the last ten years, though some are currently under construction. No new nuclear power plant is in hand today. Briefly stated the sum total of approved projects expected to come on line by the year 2010 is 1,769 MW; a figure roughly 30% of the shortfall by that year. Furthermore, thermal power uses imported fossil fuels and hence burdens Pakistan's import bills, as well as is not environment friendly. Every increase in the international fuel prices, automatically means a "flow through" increase in the power cost.

GOP therefore decided to encourage application of Renewable Energy especially to the power sector. The fastest growing renewable energy today around the world is wind energy, because it's clean, it's green, and it is comparatively less expensive. Its biggest advantages in Pakistan would of course be freedom from dependence on imported oil, relief to the national exchequer on import bills, shortest commissioning time and last but not the least, that, it is *green* power.

## 2.3 Project Status

Although ZORLU got the LOI from the AEDB as 54<sup>th</sup> investor, ZORLU is the only one company who has signed delivery agreements for wind turbines with an installed capacity of 49.5MW whereas the installation of the first 6MW was scheduled for October 2007, but due to several reasons this schedule could not fulfil. However the foundation parts of this

5 WTG are already arrived in Karachi Port and ZORLU is ready to install the 5 WTG as soon as possible.

ZORLU is in a position to have commercial operation for the first 6MW within 3 months of signing the Energy Purchase Agreement/Implementation Agreement.

Briefly stated the project is based on BOO basis and planned for an operational life of twenty years, extendable to twenty five years. Equipment selected for this project are 29x GOLDWIND 77/1500 machines rated at 1.5MW each and 5 x VENSYS62 machines rated at 1.2MW each; in total the installed nominal capacity comes to 49.5MW.

Land allocated by AEDB is in Jhampir, located about 100 km east of Karachi. The next settlements are Jhampir (5km southeast) and Nooriabad (22km north-west). The geographical situation is shown in Figure 2.

The site is located in a strong and partly rocky area at 35m to 45m above sea level. One hill is passing the site from SSW direction to NNE with a height of about 60m asl. The size of the whole WF area with its almost 1,148 acres (~4,64km<sup>2</sup>) area is big enough for the installation of a 50 MW wind farm.



Figure 2: Location of WF Zorlu Land; Source of Map: Google Earth

The WF project will be installed in two phases whereas the financial structuring has been done for both phases at a debt/equity ratio of 80/20 to minimize the financial costs.

Standard Chartered Bank is financial advisor and will be arranging the debt.

The feasibility is completed, land acquired, debt arranged, equity in place, technical expertise on side and a willing power purchaser available, ZORLU sees no delay in project completion once the formalities are completed namely Tariff approval and signatures on the EPA/IA.



## 2.4 Selected Wind Turbines and Estimated Output

Selection criteria of the wind turbines included latest technology, high efficiency and reliability, low maintenance cost, conforming to latest IEC standards and the fastest delivery dates.

After a consummate search and due diligence, our wind expert recommended the turbines for the wind farm given in Table 1:

WF Jhampir	VENSYS62	GOLDWIND 77/1500
Type of Turbine	VENSYS62	GOLDWIND 77/1500
Turbine Capacity [kW]	1,200	1,500
Number of WTG [-]	5	29
Installed wind farm capacity [kW]		49,500
Hub Height [m]	69	85
Rotor Diameter [m]	62	77
Rotor Area [m <sup>2</sup> ]	3,019	4,657
Wind farm array losses [%]		4.7
Gross energy production [MWh/a]		163,887*
Losses [%]		9
warranted technical availability of 95 %,		155,693
scheduled maintenance which accounts for 2% extra losses		3,278
2% total for electrical losses [MW/a]		3,278
Losses in Total [MWh/a]		14,750
Net Output [MWh/a]		149,137
Full load hours [h/a] (net)		3,013
Capacity Factor [%] gross		37,80
Capacity Factor [%] net		34,39

Table 1: Summary of main estimation result for the planned VENSYS and Goldwind WTG for WF Jhampir

*\*) These values are under considering the wake effects not only the two planned wind farms north of Zorlu ("FFC" and "Masterwind") also several potential wind farms north-west of Zorlu site, which may could come in the next years. Details are provided within the Feasibility Study.*

To estimate output, wind data provided by AEDB from the Nooriabad Mast was used. The data has minute wise wind velocities for each twenty four hour period. Micrositing of turbines was done in the available land area so as to minimize the wake effect. The annual production figures are shown in Table 1.

The Net-Output of 149,137 MWh/a are the approved numbers by the AEDB.

## 2.5 Project Cost and Annual O&M Cost

As is well known, wind energy is capital intensive but has the advantage of no fuel cost pass troughs. So has it turned out in our case; Equipment cost alone makes up for almost 87% of the total cost.

The figures in Million US Dollars are:

		<i>USD in 000</i>
<b>Total Project Cost</b>		<b>124.110</b>
Farm Size [MW]	49.5	
Cost / MW		2.507
Funded by:		
Equity	20%	24.822
Debt	80%	99.288
	<b>100%</b>	<b>124.110</b>
<b>O &amp; M cost:</b>		
Fixed O & M		0.5080 Rs/kWh
Insurance (pass through)		0.3046 Rs/kWh
Variable O & M		0.0030 Rs/kWh
Total O & M per year		0.8155 Rs/kWh

Table 2: Project and Annual O&M Cost

## 2.6 Indexation

While wind energy has the advantage of not having fuel as a pass through item in its cost breakdown, there are certain minor costs that are market driven and hence cannot be fixed. We are therefore asking for indexation and/or pass through to the off taker for following heads:

- Cost of Debt
- Variation during construction
- Return on Equity
- Dollar Rupee Parity
- Dollar Euro Parity
- Income Tax
- Withholding Tax
- O & M
- LIBOR / KIBOR Variation
- Local Inflation and US CPI
- Insurance Premium

These are presented in full details in Chapter 4.

## 2.7 Carbon Credits

Carbon Credits to be earned and disbursed as per "Guidelines for Determination of Wind Power Tariff Year 2006" and the GOP Policy on the subject as issued by the Ministry of Environment. It may however be added that Article III Section 3.2 of the draft EPA prepared by AEDB proposes Purchaser to work on grant of carbon credits and the credits to be shared between the Seller and the Purchaser. We accept this, subject to final negotiations with NTDC to fix the sharing ratio at 50:50.

However we are of the opinion that we will be a better position to manage realization of Carbon Credits and so would prefer that 100% be allocated to the Company.

## 3 TARIFF STRUCTURE

### 3.1 Introduction

The Tariff has been structured to cater for the project costs covering:

- Pre operating costs
- Development costs
- EPC costs
- Financing costs
- Debt service costs
- O&M costs, Foreign and Local
- Admin and Management costs
- ROE
- Insurance
- Other Soft Costs

It may be emphasized that this working of Tariff will hold good for sixty days from the date of submission. Beyond that date, a 2% increase per month must be added till financial close. This is to cater for local and foreign inflation as well as Euro/Dollar and Rupee/Dollar parity etc.

The present working is based on Rs 61.00 = US\$ 1.00 and US\$ 1.42 = Euro 1.00, as per the previous Tariff determination

The proposed Tariff consists of appropriate escalable components and the actual cost structures of the Project. The escalable portion takes care of the local and foreign inflation, and Rupee/Dollar and Dollar/Euro parity. Broadly the Tariff may be divided into:

- ➔ Non-escalable Energy Component
  - Debt service
- ➔ Escalable Energy Component
  - Local O&M costs
  - Foreign O&M costs
  - Return on equity

### 3.2 Non-Escalable Energy Component

#### 3.2.1 Debt Servicing

The only non escalable energy component is the debt service cost. It covers repayment of the principal amount and payment of interest charges. The debt is planned to be financed in both foreign currency (USD) and local currency (PKR), with a tenor of 10 year plus 12 months grace period which is based on estimated time required for the project to achieve Commercial Operation. Hence, the debt service cost is in the first ten years of the Project's operation. For the remaining ten years the debt service cost component would be zero.

As presented in the Tariff Table in Chapter 5, the debt service component will be fully indexed to the foreign exchange rate (PKR/USD), for the portion of debt financed in foreign currency. Since the debt is expected to be a mix of local and foreign currency funding, the interest charge portion will be indexed against variations in the LIBOR and KIBOR.

Additionally, a one-time adjustment in the EPC price will also be required at the time of the financial closing of the Project, which will result in an update to the debt service cost and return on equity components as of the closing date. Such concessions are already provided by NEPRA in Upfront Tariff of other power projects Details of debt financing are discussed in section 4.4.2.

### 3.3 Escalable Energy Component

The non-debt, escalable component covers the following items:

- Local O&M Costs
- Foreign O&M Costs; and
- Return on Equity

#### 3.3.1 Local O&M Costs

This represents the fixed costs of all the staff for O&M including the employees' pay and allowances, administrative costs including rent, utilities and local taxes. It also includes costs such as NEPRA annual fees and bank's commissions, audit fees, legal and consultancy fees, environmental monitoring and reporting fees etc. this component is therefore subject to local CPI indexation/adjustment.

#### 3.3.2 Foreign O&M Costs

Preventive and scheduled maintenance of all plant/equipment is required as per manufacturer's recommendations. This is to ensure that the Plant remains available for reliable dispatch and for completing its contracted life. This component also includes the cost of spare parts and time change items as well as Management Fee of the O&M Operator. This component would therefore be subject both to Eurozone CPI as well as Euro/PKR adjustment/indexation.

Insurance Cost is also included in foreign O&M cost. It consists of all risk insurance/re-insurance for the Project, as well as business-interruption insurance, which is the lender's stipulated requirement.

As per practice in Pakistan, such large projects are reinsured with foreign specialist companies. The local industry normally retains only about 5% of the risk while 95% is reinsured abroad. Lender also requires coverage of machinery breakdown, natural calamities (like earthquake), sabotage and business interruption. Since the plant/equipment cost is the major cost of the project and also totally in foreign currency, it is imperative that all aspects of the risk are covered adequately and no compromise is made in this respect. This cost would also therefore be subject both to Eurozone CPI inflation as well as to EUR/PKR adjustment/indexation.

#### 3.3.3 Return on Equity:

The Return on Equity (ROE) component includes return on invested equity giving an IRR of 15% net of withholding tax on the basis of maximum dividends payouts possible to the shareholders during each particular year and for the whole of the 20 year period.

The final portion of equity investment in (i) local currency (PKR) and (ii) foreign currency (USD) will be submitted at financial close. A minimum of fifty percent equity will be in USD. It is therefore requested that the following indexations be allowed:

Return on Foreign Equity

PKR/USD Exchange Rate and US CPI



Return on Local Equity

CPI

### 3.4 Tariff Assumptions

The following assumptions, which form the basis of the Tariff may change between now and the financial close. The Tariff will therefore have to be recalculated to account for these adjustments at financial close:

- Financing terms are as yet based on initial discussions with the financial institutions and hence are subject to final negotiations once Tariff has been determined by NEPRA and the EPA/IA are signed. This will include mainly the debt-equity ratio, grace period and loan repayment term, base currency of the loan, and benchmark index (LIBOR/KIBOR). Spread margins for the financial institutions will be capped at 3.00% over LIBOR/KIBOR, depending on the mix of funding.
- 100% equity investment has been assumed in US dollars. However, final currency of the equity investment (or portions thereof) will be decided among the shareholders at the time of financial close.
- Insurance cost has been assumed at 1.25% based on the indicative rates received from foreign insurance companies. Currency for the premium payment has been assumed as Euro. Premium rate and base currency for the insurance arrangements will be finalized at the time of financial close.
- Base currency for operations and maintenance costs (excluding administrative costs and land lease rental which have been denominated in Pak Rupees) has been assumed as USD. This, however, may be finalized when contracts will be signed with the O&M operator.

Any changes in the above terms will require automatic adjustment in the Tariff without referring back to NEPRA.

## 4 RATIONALE FOR PROPOSED TARIFFS

### 4.1 Introduction

The Tariff presented in Chapter 5, and for which ZORLU is seeking determination, is based on the following components:

- Term of the Energy Purchase Agreement (EPA);
- Capital cost for equipment and construction;
- Cost of Debt and Equity;
- O&M Costs;
- Variable cost (which may vary over the term of the EPA, based on inflation, foreign exchange rate and interest rate variations)

Each of these components is discussed in detail in this Chapter.

Major contributing costs to the Tariff may be summarized as shown in the Table 3 below.

Item	Average annual cost Years 1-10 (Rs/kWh)	Average annual cost Years 11-20 (Rs/kWh)
Debt service cost	6.6918	-
Return on equity*	2.0166	2.0166
O & M costs	0.5109	0.6115
Insurance costs	0.3046	0.3046
<b>Total Cost</b>	<b>9.5239</b>	<b>2.9403</b>

Table 3 Major contributing costs to the Tariff \*ROE including withholding tax

This is based on a 20-year asset life and an annual estimated production of 149,137GWh.

### 4.2 Term of the Project /Tariff control period

The proposed Tariff is sensitive to the term of the project i.e. length of the EPA. As in recent determinations made by NEPRA, typical power generation projects in Pakistan require long-term EPA's. This is driven both by the needs of debt providers/lenders, and in recognition of NTDC's role as the purchaser of the Project's electricity output.

The debt provider/lender's willingness to provide financing for power projects is often conditional on repayment of the loan within 10 years. As this project has a lenders commitment for 80% debt financing over a ten year loan repayment term, this implies a higher fixed charge in the first 10 years of the project, as compared to the remaining ten years (11-20) after the loan has been repaid.

NTDC may face higher Tariffs in the earlier years due to debt servicing (1-10), while in the latter years (11-20), the fixed Tariff will be reduced to reflect lower associated costs.

A 20-year EPA is therefore proposed for this project. The Tariff during this period would specify different rates for the first 10 years and the remaining 10 years, in accordance with Rule 6 of the NEPRA Licensing (Generation) Rules, 2000.

### 4.3 Project Cost

#### 4.3.1 Breakdown of the total project cost

Following Table 4 reflects a breakdown of the total project cost of US \$ 124.110 Million:

<b>Project Costs</b>	<b>Million US \$</b>
EPC contract	113.304
Project Development	2.288
Operating Fixed assets	0.081
Financing	8.438
Other Project Cost	0.000
<b>Total EPC Cost</b>	<b>124.110</b>

Table 4 Cost breakdown

In the above project cost, amounting to USD\$ 124.110 Million we have carried cost of the mentioned wind turbines. Vendor/Equipment selection process and criteria is discussed in Section 4.3.2. The main increase in cost has been attributed to increase prices of the equipment in particular the WTG due to increase in production cost and world-wide demand for WTGs, local inflation of 8% and variation in Euro/Dollar parity.

As this project is the first of its kind in Pakistan, no local wind generation cost information is available for comparison and, wind generation costs are not directly comparable with any other type of generation in use in Pakistan.

#### 4.3.2 Equipment Selection for the Wind Farm

Together with IPEK, who had the requisite experience, ZORLU sought proposals from wind generation equipment manufacturers based on the following defined criteria:

- Equipment to be latest technology, Megawatt class and high efficiency
- Compliance of proposed wind turbine with local wind conditions in Pakistan
- Relation between final investment costs and operation cost to the estimated energy yield
- Cost of Equipment to be competitive
- Commitment to the market: Willingness to commit to the Pakistan market with regard to set-up or support in setting up a local service organization
- Energy output: Warranted power curve, performance warranty
- Grid compatibility: WTG must comply with the latest grid condition requirements
- Suitability of O&M concept for the size and location of projects, availability of spare parts, consumables and main components

Since this project is the first of its kind in Pakistan, and equipment and expertise is not available in the local market, it would be feasible for ZORLU to seek a turnkey contract.

For example, the cranes required for the erection of the turbines are not available in Pakistan and will need to be brought in from overseas. Based on these criteria, and extensive evaluation of various manufacturers, the VENSYS/GOLDWIND wind turbines have been selected for this project.

For clarification: we will use VENSYS62 and GOLDWIND 77/1500 WTG whereas the GOLDWIND machine is being produced under the licence of VENSYS. In the end although the brands are differing, these are the same machines with exactly the same components.

The decision to use the VENSYS62 and GOLDWIND 77/1500 for the project was influenced mainly by the following reasons:

- VENSYS/ GOLDWIND shows a great interest in the Pakistan market and has - compared to the other manufactures - prepared itself best to supply to the Pakistan market.
- VENSYS62 WTGs are ready to shipment and the GOLDWIND 77/1500 can be delivered in January 2009.
- Both the GOLDWIND 77/1500 and VENSYS62 are gearless WTG. Gearboxes are noisy which necessitates expensive noise insulation measures. Gearless units do not require gear oil servicing nor do they produce leaks. Furthermore, there are no gear losses which is a great advantage particularly at partial load. As such, these advantages will result in higher energy output, lower insurance costs, increased turbine lifetime, and lower overall operating and maintenance costs.
- VENSYS/ GOLDWIND have a Synchronous generator with permanent magnet excitation with high efficiency. It has no energy losses because of an external excitation and no slip rings for external excitation needed and can generate electricity also in case of power shortage in the grid.
- No additional fans or control units are needed because of the passive air-cooling system. The cool air flow which drives the rotor is guided directly over the warm generator parts by specially formed cooling ducts. It is highly efficient cooling without any additional energy. Especially in Pakistan with extremely hot weather conditions, this is a big advantage
- The pitch control of the turbines do not need any oil, hence it is saving O&M costs
- The pitch system is working without gearwheels. Both types of WTG are using toothed belts which are maintenance friendly and have positive effects on the O&M costs.
- Instead of batteries which would need maintenance and replacement form time to time, the pitch system use capacitors as power source whereas the life design of the capacitors are twenty years.
- The total production of the total wind power plant (sum of all turbines) is higher than for any other WTG type
- VENSYS/ GOLDWIND provided the lowest cost per kWh due to its superior production numbers at the same wind speed.
- The VENSYS technology has been declared fit for purpose by independent experts appointed on behalf of lenders, providing that GOLDWIND was willing to provide an extended guarantee of 5 years.

#### 4.3.3 EPC Costs

The EPC cost under the Zorlu Endüstriyel proposal is USD 113.304 million and is valid till December 31, 2008. Besides the cost of wind turbines, towers, electrical equipment, spare parts and civil works which are integrated in the proposal, transportation cost specifically includes C&F to wind farm site.



#### 4.3.4 Project Development Costs

Details of the project development costs (costs other than EPC) are exhibited in Table 5:

<b>Project Development Costs</b>	<b>Mio. US-\$</b>
Project Development	2.288
Other fix Assets	0.081
Financing	8.438
Other Project Cost	-
<b>Total EPC Cost</b>	<b>10.807</b>

Table 5: Project Development Costs

The project development cost is based (other than consultants' fees and financial expenses) the following items:

- ◆ Project Development
  - This is the cost of developing the projects since the on set of obtaining the initial LOI in June 2006 to financial close.
- ◆ Project Management
  - This is cost of administering and managing the company and project contracts.
- ◆ Other Fees
  - This includes the initial cost for setting up the company and its operations.
- ◆ Operating Capital
  - While estimating this cost component, we have taken into consideration the average working capital ZORLU would require for the first few months of operations.
- ◆ Financing
  - This consists of the interim financing required for the construction period of the project. In addition, the lenders structuring fees are included in the figure.

#### 4.3.5 Euro-Dollar Conversion

The cost of the EPC contract quoted above has been converted to US\$ figures, based on an exchange rate of 1.42 Dollar to 1.00 Euro. The actual EPC cost is subject to possible fluctuations in the exchange rate between the Euro (being the currency of EPC price) and the Dollar (being the currency for the funding of the EPC contract) at the time of the Project's financial closing.

#### 4.4 Debt and Equity

The total project cost is approximately USD 124.110million. The capital structure of the company has been envisaged at a Debt/Equity ratio of 80/20. Given this capital structure and the reference project cost detailed in the prior section, the Table 6 details the amount of equity contributed and the debt to be raised from the capital markets.



Debt & Equity Structure	Percentage	Million US \$
Debt	80	99.288
Equity	20	24.822
<b>Total EPC Cost</b>		<b>124.110</b>

Table 6: Debt and Equity

#### 4.4.1 Equity Structure

Based on the ownership structure of the company, the principal sponsors will be committing up to 20% of the equity.

The projected total equity required as per the capital structure is approximately USD 24.822 million to be shared equally between the three shareholders of Zorlu Enerji Pakistan Ltd.

#### **Rationale for Return on Equity for Wind Power Projects**

Guidelines for the Determination of Tariffs for Wind Power Projects ("IPP") requires that the Tariff should be determined after allowing for reasonable Internal Rate of Return ("IRR") on equity investment while taking into account the carbon credit which the IPP may get. At present, the mechanism for pricing of carbon credits is uncertain. For the sake of clarity, we have presented the formula below for claiming IRR on equity investment, which equity investors would require. Any incremental income from carbon credits will be shared with the Purchaser separately.

#### **Equity Investment in Foreign Currency [USD]**

In line with recent determinations by NEPRA, we are proposing return on invested equity of 15.00% net of 7.5% withholding tax on dividends. This is based on the premise that the Project will be implemented on a Built Own and Operate Basis ("BOO") over a 20 year term for the Energy Purchase Agreement ("EPA").

#### **Withholding Tax on Dividends**

According to the Income Tax Ordinance, 2001 income from dividends is subject to withholding tax (7.5% for power generation projects).

#### 4.4.2 Debt Structure

The commercial loan of approximately USD 49.644 and PKR 3,028.290 million, at the reference project cost detailed in the prior section, will be raised from the debt capital markets, in local and foreign currency. The commercial loan facility will have 10-year repayment period with a previous grace period of approximately 1-year grace, foreign currency term facilities, and will be payable on a quarterly basis.

An annual interest rate of LIBOR and KIBOR plus our lender's spread of 300 basis points, which covers their risk assessment of the project, therefore equating to around 8.50% for foreign debt based on LIBOR rate as per previous Tariff determination and to around 13% for local debt, based on current KIBOR rate of 9.50% has been assumed for our initial working purposes.

### 4.5 Operating Cost

#### 4.5.1 Insurance

The fixed annual insurance expense during the operational phase is estimated at USD 0,738 million. We have taken approximately 0.6% of the Plant & Machinery Cost each year, which is to an extent based on indicative quotes of international insurance brokers.

This expense is expected to be denominated in foreign currency since the underlying costs are also based in foreign currency. The rationale for the assumed cost is as under:

- Local insurance companies would not be in a position to adequately provide cover for this kind of project given the total cost (in foreign currency) and the lack of precedents for wind power projects in Pakistan.
- The lender/financial institutions will require insurance of the Project's assets on a replacement cost basis, which will inevitably be in foreign currency.

#### **4.6 Indexation, Escalations And Cost Adjustment**

The purpose of indexation is to remove any exposure of an investor to cost escalations, over the life of a project, over which they have no direct control. With that principle in mind, the following sections discuss the proposed indexation for various components of the Tariff. Indexation formulae have been prepared taking into account the guidelines presented in the Ministry of Water and Power/Alternative Energy Development Boards, "Guidelines for Determination of Tariff for Wind Power Generation 2006."

##### **4.6.1 Foreign Exchange**

A foreign exchange indexation should be applied to those cost elements that are denominated in foreign currency (US\$ or €). For these items, the investor will have no control over cost changes caused by exchange rate fluctuations, and these should therefore be passed through to the purchaser. The proposed Tariff structure for ZORLU implies that the following components should be indexed to variations in foreign exchange rate (Rs/US\$ and or Rs/€):

- Portions of the O&M components that are denominated in foreign currency;
- The debt service component. The Project debt is intended to be funded in a mix of local and foreign currency;
- The insurance component as discussed previously will provide cover on a replacement cost basis, which will be incurred in Euros. Premiums will therefore be constructed on that basis, and insurance costs will therefore fluctuate with exchange rate movements; and
- The portion of the ROE component that reflects the equity investments in foreign currency (US\$ or €)

Indexation for these components should be applied quarterly, on-January 1, April 1, July 1 and October 1 on the basis of the TT & OD selling rate as notified by the National Bank of Pakistan (in Rs/US\$ or Rs/€).

##### **4.6.2 LIBOR**

The wind farm investor will have no direct control over changes in interest rates. Appropriate indexation should therefore be applied so that the interest charge portion of the debt service component of the Tariff reflects changes in the London Interbank Offered Rate (LIBOR). This portion should thus be adjusted quarterly for variations in the 6-month Dollar LIBOR as published by the British Bankers Association.

##### **4.6.3 KIBOR**

The wind farm investor will have no direct control over changes in interest rates. Appropriate indexation should therefore be applied so that the interest charge portion of the debt service component of the Tariff reflects changes in the Karachi Interbank Offered Rate (KIBOR). KIBOR is defined as the Average rate, Ask Side, for the relevant tenor, as published on Reuters page KIBR or as published by the Financial Markets Association of Pakistan in case Reuters page is unavailable

#### 4.6.4 Local Inflation

As with currency exchange rates and interest rates, a wind farm investor will not be able to influence local inflation. Appropriate indexation should therefore be applied to reflect the portion of the Tariff that is subject to local inflation. For the proposed Tariff structure, the following components should be indexed to the local CPI:

- Portions of the O&M component that are denominated in local currency (Rs);
- The portion of the ROE component that reflects the equity investments in local currency (Rs).

Indexation for these components should be applied quarterly, on the basis of CPI as notified by the Federal Bureau of Statistics (FBS) for the month of February, May, August and November.

#### 4.6.5 Eurozone Harmonized Index Of Consumer Prices

The O&M and insurance costs are partially denominated in Euros. These are recurrent costs whose amount will be affected by the home country inflation. It is thus proposed that these costs should be adjusted for Eurozone inflation per Harmonized Index of Consumer Prices (HICP) as published by the European Central Bank (ECB). The index is published on monthly basis by ECB.

#### 4.6.6 US Inflation

The equity investment is denominated in US Dollars. As with currency exchange rates and interest rates, a wind farm investor will not be able to influence US inflation. Appropriate indexation should therefore be applied to reflect the portion of the Tariff. It is thus proposed that these costs should be adjusted for US inflation per United States Consumer Prices Index (USCPI) as published monthly by the Department of Labor, United States Government.

## 5 DETERMINATION SOUGHT

### 5.1 Introduction

Determination is sought from NEPRA in respect of the following:

- A) Grant of Tariff, as presented in Section 5.2 below, to remain effective for a period of 20 years from the date of Commercial Operations; and
- B) Approval of proposed escalations in the Tariff, as set out in the subsequent Section 5.3.

### 5.2 Reference Tariff

The proposed Reference Tariff comprising the non-escalable cost component, as described in Section 3.2, and the escalable cost component, as described in Section 3.3 is presented in the Table below:

		PKR	US Cents
Average Tariff		6.2576	10.2584
Discount Rate	10%		
Net Present Value		65.7238	107.7439
Levelized Tariff		7.7199	12.6556
<b>The Tariff shown above is subject to indexation as given in Annexure V</b>			
<b>This Tariff is valid for 30 days</b> from date of submission (08-04-2008)			
Beyond that date a 2% increase per month will be required to account for Local and foreign inflation and euro/dollar and dollar/rupee parity			

To be revised once we have agreed on the costs of O&M

Details of the Reference Tariff are shown in Table placed at Annexure-1 and Assumption for Tariff Table at Annexure-1.

The Project's financial projections on the basis of this Tariff are shown in Annexure-1

The specified Tariff, along with the indexation, when approved, would set the maximum rate at which ZORLU will sell power to the off taker.

### 5.3 Tariff Indexation

Indexation of cost of components of a Tariff provides an investor certainty with regard to return on investment by removing exposure to such cost escalations over which investor has no control. This approach is efficient and hence minimizes total cost. Commonly, indexation protects investors against risks arising from exchange rate fluctuations, and local inflation.

Tariff indexation for the ZORLU Tariff has been requested in relation to known and accepted consumer price indices (CPI), LIBOR/KIBOR, on a quarterly basis and the Euro/Dollar and Dollar/Rupee parity as discussed in detail in Section 4.6. These adjustments are consistent with those that have been provided in other upfront Tariffs or to other IPPs by NEPRA and are also the norm around the world.

Summary of proposed indexations requested is placed at Annexure-1

## 6 ANNEXURES

AEDB Letter approving ZORLU Feasibility  
Summary of Tariff Indexations Requested  
Reference Tariff Table  
Tariff Assumptions  
Financial Projections  
Project Summary

## 6.1 ANNEXURE– I: Assumptions

The following are the only changes to approve Upfront Tariff for Wind Power Plants issued by NEPRA on January 17<sup>th</sup> 2007.

Pursuant to Rule 6 of the NEPRA Licensing (Generation) Rules 2000, NEPRA hereby approves the following Upfront Tariff for Wind Power Generation for delivery of electricity to CPPA of NTDC for procurement on behalf of EX-WAPDA Distribution Companies:

Tariff Components	Reference Tariff	
	Year 1-10	Year 11-20
	Rs./kWh	
<b>Fixes Charges</b>		
Fixed o&M Foreign	0.2062	0.3068
Fixed O&M Local	0.3017	0.3017
Insurance	0.3046	0.2960
Debt Service	6.6918	-
Return on Equity	2.0166	1.9601
<b>Variable O&amp;M</b>	0.0030	0.0030
<b>Levelized Tariff</b>	7.7199	

- i) The reference Tariff has been calculated on the basis of 34.39% Net Capacity Factor
- ii) The above charges have been assessed on the basis of annual generation of 149,137MWh
- iii) Any annual generation in excess of Benchmark generation would be charged on 10% of the above sale rate
- iv) The above Tariff is applicable for a period of 20 years commencing from the date of Commercial Operation

## 6.2 ANNEXURE-II: Table of Fees

### LICENCE APPLICATION AND MODIFICATION FEES

Category of licence	Fee (Rs)	Fee with CPI (Rs)
Opting for an upfront tariff	1,000.000	1,149.300

### INDEXATION OF FEES

1. The licence application and modification fee payable by an applicant or the licensee, as the case may be, shall be indexed to the Consumer Price Index ("CPI") published from time to time by the Federal Bureau of Statistics.

2. The indexation shall be done on the basis of the most recent CPI prevailing on the date of payment of the licence application fee or the modification fee, as the case may be, and the fee payable on the date of payment shall be increased or decreased, as the case may be, in accordance with the following formula:

$$F_{pd} = F_t \left[ \frac{CPI_{pd}}{CPI_{rd}} \right]$$

Where

$F_{pd}$  = The actual fee payable on the date of payment.

$F_t$  = The respective fee set out in Part I of this Schedule II.

$CPI_{pd}$  = The most recent CPI prevalent on the last day of the month immediately preceding the month in which the application or the modification proposal is made.

$CPI_{rd}$  = The reference or base CPI, prevalent on the last day of the month in which the National Electric Power Regulatory Authority Licensing (Application and Modification Procedure) Regulations, 1999, are notified in the official gazette.





---

**6.3 ANNEXURE –III: Bank Draft / Pay Order**

### 6.4 ANNEXURE– IV: Information Summary

1. Generator Name: Zorlu Enerji Pakistan Ltd.

Address  
ZIP, Karachi

2. Location: Jhampir, Nooriabad, in the District of Thatta in the province of Sindh.

Coordinates of the site corner are as follows:

Corner	X (east)	Y (north)
Z1:	25°02'20.70"	68°00'07.60"
Z2:	25°02'49.76"	68°00'23.90"
Z3:	25°04'12.80"	67°58'08.00"
Z4:	25°03'48.10"	67°57'54.70"

3. Project Cost:

Total Project Cost		USD	PKR
		----- Millions -----	
EPC Costs		113.304	6,911.518
Project Development Costs		2.288	139.544
Operating Fixed Assets		0.081	4.946
Financial Charges		8.438	514,717
Other Project Costs		0	0
<b>Total Costs:</b>		<b>124.110</b>	<b>7,570,725</b>
Cost / MW (including Financial costs)		2.507	152.944
<b>Funding Structure</b>			
Equity	20%	24.822	1,514,117
Debt	80%	99.288	6,056,580
	100%	124.110	7,570,725

4. Technology:

Gearless Wind Energy Converter with passive air-cooling system and Synchronous generator with permanent magnet excitation with high efficiency.

It has no energy losses because of an external excitation and no slip rings for external excitation needed and can generate electricity also in case of power shortage in the grid.

5. Installed Capacity Gross ISO: 49.50MW

6. No. of Units / Turbines: 29x1.5MW + 5x1.2MW

7. Capacity of each Turbine (MW): 29x1.5MW + 5x1.2MW

8. Hub Height (m): 85m in case of the 1.5MW WTG and 69m in case of 1.2MW WTG
9. Mean Wind Speed (m/s): 7.2m/s at 69m height a.g.l.  
7.4m/s at 85m height a.g.l.
10. Annual Plant Factor: 34.39% (net capacity factor)
11. Net Estimated Annual Output at Interconnection: 149,137 MWh/a
12. Voltage Level at Delivery Point:  
11kV for the first phase (Phase I) consisting of 5x1.2MW WTG  
132kV for the Phase II whereas the Phase I will be also re-switched to the 132kV after commissioning of Phase II
13. The expected time of commercial operation of the generation facility:  
Phase I (5x1.2MW at 11kV): December 2007  
Phase II (5x1.2MW + 29x1.5MW at 20/132kV): November 2008
14. Expected commissioning date:  
Phase I (5x1.2MW at 11kV): November - December 2007  
Phase II (5x1.2MW + 29x1.5MW at 20/132kV): September-  
November 2008



## 6.5 ANNEXURE-V: Affidavit

I, **Yagmur ÖZDEMİR s/o Mehmet**, adult, resident of Pehlivan Sokak Hakan Apartmani 3/13, Gayrettepe / Istanbul, TURKEY, holding passport number TR-U 043090, Finance Manager of Zorlu Enerji Elektrik Üretim A.S. and authorized representative of Zorlu Enerji Pakistan Limited, do hereby solemnly affirm on oath that:

1. I have been authorised by the Board of Directors of Zorlu Enerji Pakistan Limited ("**Company**") pursuant to their Board Resolution dated October 1<sup>st</sup>, 2007, to file the accompanying "**Acceptance of Upfront Tariff for Wind Power Plants**" ("**Tariff Application**") at the National Electric Power Regulatory Authority ("**NEPRA**") in Islamabad;
2. I am well conversant with the affairs of the Company and the contents of the Tariff Application;
3. The contents of the Tariff Application and the statements made therein are true and correct, to the best of my knowledge and belief; and
4. Whatever is stated above is correct and true to the best of my knowledge and belief.

Name: **Yagmur ÖZDEMİR**

Date: \_\_\_/04/2008

# REFERENCE TARIFF

Agreement Year	Variable O&M	Operations and Maintenance		Return on Equity		Insurance	Reference Foreign		Reference Local Debt		Total Tariff	
		Foreign Component	Local Component	ROE	Tax		Principal	Interest	Principal	Interest	Rs./kWh	¢/kWh
1	0.0030	0.2062	0.3017	1.8653	0.1512	0.3046	1.3509	1.6837	1.0682	2.5890	9.5239	15.6129
2	0.0030	0.2062	0.3017	1.8653	0.1512	0.3046	1.4695	1.5651	1.2140	2.4432	9.5239	15.6129
3	0.0030	0.2062	0.3017	1.8653	0.1512	0.3046	1.5984	1.4362	1.3797	2.2775	9.5239	15.6129
4	0.0030	0.2062	0.3017	1.8653	0.1512	0.3046	1.7387	1.2959	1.5680	2.0892	9.5239	15.6129
5	0.0030	0.2062	0.3017	1.8653	0.1512	0.3046	1.8912	1.1433	1.7820	1.8753	9.5239	15.6129
6	0.0030	0.3068	0.3017	1.8653	0.1512	0.3046	2.0572	0.9774	2.0252	1.6321	9.6245	15.7778
7	0.0030	0.3068	0.3017	1.8653	0.1512	0.3046	2.2377	0.7969	2.3016	1.3557	9.6245	15.7778
8	0.0030	0.3068	0.3017	1.8653	0.1512	0.3046	2.4341	0.6005	2.6157	1.0416	9.6245	15.7778
9	0.0030	0.3068	0.3017	1.8653	0.1512	0.3046	2.6477	0.3869	2.9727	0.6846	9.6245	15.7778
10	0.0030	0.3068	0.3017	1.8653	0.1512	0.3046	2.8800	0.1546	3.3784	0.2789	9.6245	15.7778
11	0.0030	0.3068	0.3094	1.8653	0.1512	0.3046	-	-	-	-	2.9403	4.8202
12	0.0030	0.3068	0.3094	1.8653	0.1512	0.3046	-	-	-	-	2.9403	4.8202
13	0.0030	0.3068	0.3094	1.8653	0.1512	0.3046	-	-	-	-	2.9403	4.8202
14	0.0030	0.3068	0.3094	1.8653	0.1512	0.3046	-	-	-	-	2.9403	4.8202
15	0.0030	0.3068	0.3094	1.8653	0.1512	0.3046	-	-	-	-	2.9403	4.8202
16	0.0030	0.3068	0.3094	1.8653	0.1512	0.3046	-	-	-	-	2.9403	4.8202
17	0.0030	0.3068	0.3094	1.8653	0.1512	0.3046	-	-	-	-	2.9403	4.8202
18	0.0030	0.3068	0.3094	1.8653	0.1512	0.3046	-	-	-	-	2.9403	4.8202
19	0.0030	0.3068	0.3133	1.8653	0.1512	0.3046	-	-	-	-	2.9442	4.8265
20	0.0030	0.3068	0.3133	1.8653	0.1512	0.3046	-	-	-	-	2.9442	4.8265
											6.2576	10.2584
											7.7199	12.6556
											Levelized Energy Price:	
											Discount Rate: 10% NPV: 65.7238 107.7439	