振发新能源
ZHENFA NEW ENERGY

振发巴基斯坦新能源有限公司
Zhenfa Pakistan New Energy Company(Private) Limited

26th September 2017

The Registrar
National Electric Power Regulatory Authority
NEPRA Tower Attaturk Avenue (East),
Sector G-5/1, Islamabad.

Subject: Submission of the Tariff Petition of 100 MWp Solar Power Project of Zhenfa Pakistan New Energy Company (Private) Limited

Dear Sir,

We herewith submit the Company's Tariff Petition along with the fee as determined by the National Electric Power Regulatory Authority ("NEPRA" or the "Authority") for kind consideration and favorable approval by the Authority in accordance, inter alia, with section-31 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 read with Rule 3 of the National Electric Power Regulatory Authority (Tariff Standards and Procedure) Rules, 1998 and other applicable provisions of NEPRA law.

The Tariff Petition (including its Annexures) is submitted in triplicate together with:

a. The Bank Draft No. 00000008755 dated 21st September 2017, amounting to PKR 902,304.00 (Pakistan Rupees Nine Hundred And Two Thousand Three Hundred And Four only) as requisite for fee for Tariff Petition as communicated by NEPRA.

b. Board Resolution of Zhenfa Pakistan New Energy Company (Private) Limited

c. Affidavit of Mrs. Huiying Ju

Yours sincerely,

Huiying Ju
CEO
Zhenfa Pakistan New Energy Company (Private) Limited

Add : 01,6th Floor, 10-C, Liberty Gate Plaza, MM Alam Road, Gulberg III, Lahore, 54660
Tel : +92-42-3577 1571, Fax: +92-42-35874001, Email: Sales@zhenfa.com

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振发巴基斯坦新能源有限公司

Zhenfa Pakistan New Energy Company(Private) Limited

26th September 2017

The Registrar
National Electric Power Regulatory Authority
NEPRA Tower Attaturk Avenue (East),
Sector G-5/1, Islamabad.

Subject: Request for classification of documents as confidential

Dear Sir

We have submitted Tariff Petition of 100 MWp Solar Power Project (attached) of Zhenfa Pakistan New Energy Company (Private) Limited along with the required documents. However we hereby request Authority to mark following documents to be classified as confidential and not to be shown to general public, under rule 25 "Confidentiality" of NEPRA Tariff Standards and Procedures Rules 1998.

a) Agreements for design, supply, construction, erection and commissioning of the project - Annexure F of Tariff Petition
b) Letter of Intent for financing - Annexure G of Tariff Petition
c) Sinosure Letter - Annexure H of Tariff Petition
d) Bids Evaluation Report (along with its annexure) – Annexure I of Tariff Petition

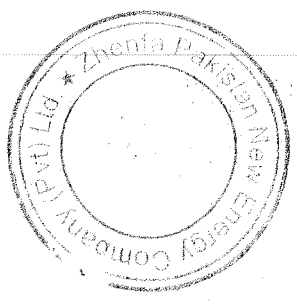
We shall be highly obliged for the above consideration.

Best Regards

Huiying Ju
CEO
Zhenfa Pakistan New Energy Company (Private) Limited

Add : 01,6th Floor, 10-C, Liberty Gate Plaza, MM Alam Road, Gulberg III, Lahore, 54660
Tel : +92-42-3577 1571, Fax: +92-42-35874001, Email: Sales@zhenfa.com

COPY OF BOARD RESOLUTION



ICBC

Customer's Advice

Pay Order

WE CONFIRM HAVING ISSUED THE FOLLOWING PAY ORDER AT YOUR REQUEST

00007539

PrNtIss

AreaNo.	[illegible]	InstNo.	0200	Teller:	[illegible]	AuthTelNo.	01039
TradDate.	21/09/2017	TradTime:	10:34:30	Trad S/N:	52	TradCode:	6219
PrNtTyp	PKR Pay Order	PrNtNo	7539			PrplPytMd	tran
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Pyee	NEPRA						

This is a system generated advice and does not require signatures

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Account Payee Only

ICBC

ICBC Islamabad Branch (0200)

P.O. No. [illegible]

Stationary/Ref No: 00007539

D	D	M	M	Y	Y

Pay to NEPRA or Order

Rupees NINE HUNDRED TWO THOUSAND THREE HUNDRED FOUR ONLY

PKR 902,304.00

PAYABLE AT ANY BRANCH IN PAKISTAN

Signatory PA/Attorney No

Signatory PA/Attorney No

Please do not write below this line.

⑈00007539⑈0880100⑆10100000000000231⑈020⑈

BEFORE
THE NATIONAL ELECTRIC POWER REGULATORY AUTHORITY (NEPRA)

TARIFF PETITION

PURSUANT TO NEPRA (TARIFF STANDARDS AND PROCEDURE) RULES, 1998
READ WITH THE PROVISIONS OF
THE REGULATION FOR GENERATION, TRANSMISSION AND DISTRIBUTION OF ELECTRIC POWER ACT (XL OF) 1997 & THE RULES AND REGULATIONS MADE THEREUNDER

&

THE FEDERAL GOVERNMENT'S
POLICY OF RENEWABLE ENERGY FOR POWER GENERATION 2006

ON BEHALF OF

ZHENFA PAKISTAN NEW ENERGY COMPANY (PRIVATE) LIMITED

FOR NEPRA'S APPROVAL OF REFERENCE GENERATION TARIFF FOR ZHENFA PAKISTAN NEW ENERGY COMPANY (PRIVATE) LIMITED

FOR A POWER PROJECT OF 100 MWP

AT

RAKH CHAUBARA, LAYYAH, PUNJAB

DATED: September 26, 2017

ZHENFA PAKISTAN NEW ENERGY COMPANY (PRIVATE) LIMITED
01, 6TH FLOOR, 10-C LIBERTY GATE PLAZA, M.M. ALAM ROAD
GULBERG III, LAHORE, PAKISTAN
TEL: +92 42 3577 1571
FAX: +92 42 3587 4001

Zhenfa Pakistan New Energy Company (Pvt) Ltd

Board Resolution

The following resolutions were discussed in detail by the Board and approved unanimously on 15h May 2017.

"RESOLVED THAT Zhenfa Pakistan New Energy Company (Pvt.) Limited, a company incorporated under the laws of Pakistan with its registered office located at 01, 6th Floor, 10-C Liberty Gate Plaza, MM Alam Road Gulberg III Lahore, Pakistan, (the **"Company"**) be and is hereby authorized to file tariff petition (including any review petitions and any motion for leave for review) for submission to the National Electric Power Regulatory Authority (**"NEPRA"**) for determination of the reference generation tariff in respect of its 100 MWp Solar Power Project to be located at Rakh Chaubara, Layyah, Punjab, Pakistan (the **"Project"**) and in relation thereto, enter into and execute all required documents, make all filings and pay all applicable fees, in each case, of any nature whatsoever, as required."

"FURTHER RESOLVED THAT in respect of filing a tariff petition (including any review petitions and any motion for leave for review) for submission to NEPRA, Huying Ju, CEO & Director be empowered and authorized for and on behalf of the Company to:

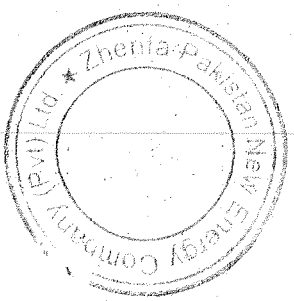
(i) review, execute, submit, and deliver the tariff petition (including any review petitions and any motion for leave for review) and any related documentation required by NEPRA for the determination of the reference generation tariff, including any contacts, documents, powers of attorney, affidavits, statements, letters, forms, applications, deeds, guarantees, undertakings, approvals, memoranda, amendments, letters, communications, notices, certificates, requests, statements and any other instruments of any nature whatsoever;

(ii) represent the Company in all negotiations, representations, presentations, hearings, conferences and /or meetings of any nature whatsoever with any entity (including, but in no manner limited to NEPRA, any private parties, companies, partnerships, individuals, governmental and /or semi-governmental authorities and agencies, ministries, boards, departments, regulatory authorities and /or any other entity of any nature whatsoever);

(iii) sign and execute the necessary documentation, pay the necessary fees, appear before NEPRA as needed, and do all acts necessary for the completion and processing of the tariff petition including any review petition and any motion for leave for review, and procuring NEPRA's tariff determination;

(iv) appoint or nominate any one or more officers of the Company or any other person or persons, singly or jointly, in its discretion to communicate with, make presentations to and attend NEPRA hearings;

(v) do all such acts, matters and things as may be necessary for carrying out the purposes aforesaid and giving full effect to the above resolutions / resolution."



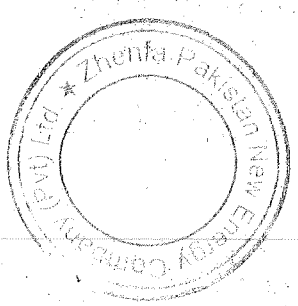
"AND FURTHER RESOLVED THAT Huiying Ju, CEO & Director, be and is hereby authorized to delegate all or any of the above powers in respect of the forgoing to any other officials of the Company as deemed appropriate.

Mrs Huiying Ju
Chief Executive Officer

Mr. Zhenfa Zha
Director

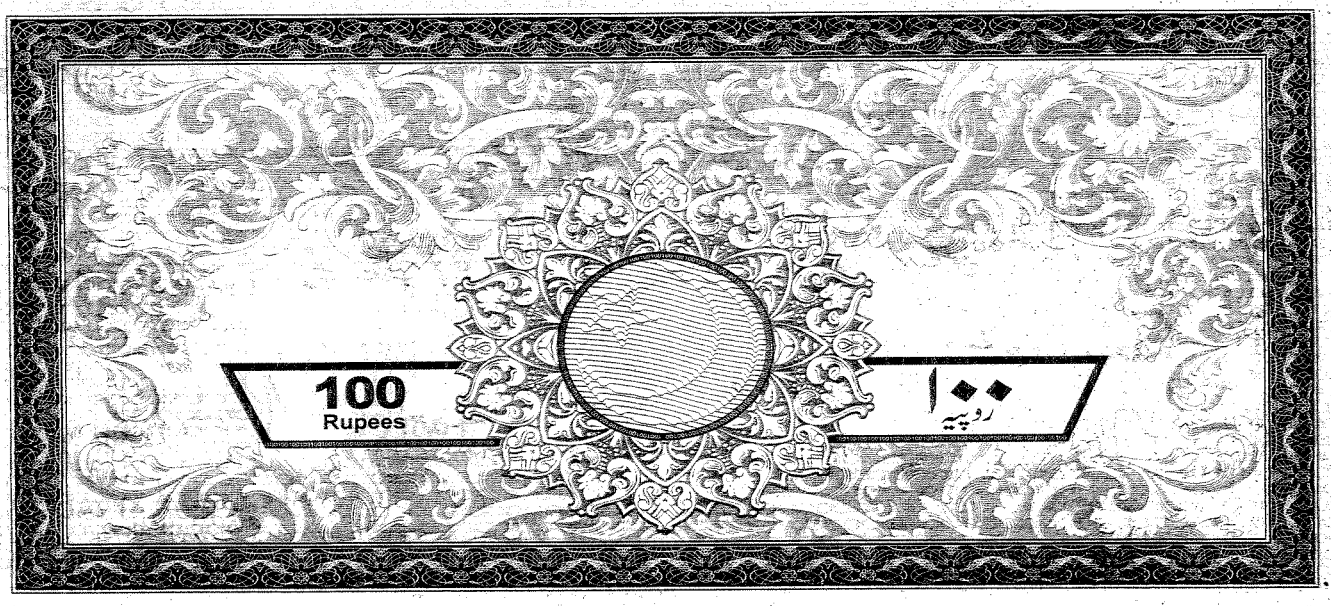
IN WITNESS THEREOF, I hereunder set my hands as such Chief Executive Officer and affixed the corporate seal of said company.

Mrs Huiying Ju
Chief Executive Officer



COPY OF AFFIDAVIT

T735285



BEFORE

THE NATIONAL ELECTRIC POWER REGULATORY AUTHORITY

100 MWP SOLAR POWER PROJECT OF ZHENFA PAKISTAN NEW ENERGY COMPANY (PRIVATE) LIMITED

AFFIDAVIT

I, Huiying Ju, CEO and Director of Zhenfa Pakistan New Energy Company (Private) Limited, a company incorporated under the laws of Pakistan with its registered office located at 01, 6th Floor, 10-C Liberty Gate Plaza, MM Alam Road, Gulberg III, Lahore, Pakistan, do hereby declare and affirm on oath as under:

1. That the accompanying Tariff Petition date 26th Sept has been filed before the National Electric Power Regulatory Authority and the content of the same may kindly be read as an integral part of this affidavit.

2. That the content of the accompanying Tariff Petition are true and correct to the best of my knowledge and belief, and nothing has been concealed or misstated therein.

Deponent

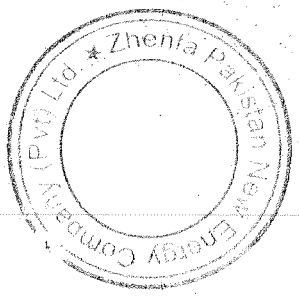
Verification

Verification on oath at Islamabad on this 26th September 2017 that the content of the above affidavit are true and correct to the best of my knowledge and belief.

Deponent

ATTESTED
NOTARY PUBLIC
ISLAMABAD
Islamabad High Court
26 SEP 2017

COPY OF BANK DRAFT



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1. DETAILS OF THE PETITIONER

1.1. NAME AND ADDRESS

Zhenfa Pakistan New Energy Company (Private) Limited
01, 6th Floor, 10-C Liberty Gate Plaza, M.M. Alam Road
Gulberg III, Lahore, Pakistan
TEL: +92 42 3577 1571
FAX: +92 42 3587 4001

1.2. REPRESENTATIVES OF ZHENFA PAKISTAN NEW ENERGY COMPANY (PRIVATE) LIMITED

Huiying Ju
Authorized Representative, Zhenfa Pakistan New Energy Company (Private) Limited

1.3 PROJECT SPONSORS

1) Zhenfa Energy Group Co., Limited
2) Zhenfa New Energy Science & Technology Co., Limited

2. REGULATORY FRAMEWORK LEADING TO TARIFF PETITION

2.1 NATIONAL ELECTRIC POWER REGULATORY AUTHORITY – THE COMPETENT AUTHORITY FOR DETERMINATION OF TARIFF

Under the Regulation for Generation, Transmission and Distribution of Electric Power Act (XL of) 1997 (the **NEPRA Act**), the National Electric Power Regulatory Authority (**NEPRA**) is responsible, inter alia, for determining tariffs and other terms and conditions for the supply of electricity through generation, transmission and distribution. NEPRA is also responsible for determining the process and procedures for reviewing tariffs and recommending tariff adjustments. Further, pursuant to the enabling provisions of the NEPRA Act, the procedure for tariff determination has been prescribed in the NEPRA (Tariff Standards and Procedure) Rules, 1998 (the **NEPRA Rules**).

2.2 PROCESS LEADING TO TARIFF PETITION

2.2.1 Submission of the Feasibility Study and approval of the same

In compliance with the requirements laid out in the Punjab Power Generation Policy 2006 (Revised 2009) (the **Punjab Policy**) and the Letter of Interest dated March 19, 2015 (the **LOI**), Zhenfa Pakistan New Energy Company (Private) Limited (**ZPNECL**, or **Project Company**) completed the Grid Interconnection Study, Environmental Study and detailed Feasibility Study for the Project and submitted the same to Punjab Power Development Board (**PPDB**) for its approval.

Following completion of its detailed review by the Panel of Experts (**POE**), PPDB vide its letter # No. PPDB/1627/2015 dated December 1, 2015 (the **Feasibility Study Approval Letter**), granted approval of the Project Feasibility Study submitted by ZPNECL.

Following is a summary of the related dates of completed milestones:

Milestones	Dates
LOI, PPDB	March 19, 2015
Feasibility Study Approval, POE	December 1, 2015
NTDC Grid Data Permission	October 22, 2015
Environmental Approval	January 8, 2016
MEPCO's Interconnection Study Approval and Consent to CPPA-G for Power Purchase from Project Company	December 27, 2016
Grid Connectivity Approval, MEPCO	March 9, 2017
Grid Interconnection Study Submission	November 2, 2015
Approval of Grid Interconnection Study, NTDC	March 31, 2017
NTDC Power Evacuation Certificate	April 6, 2017
Grant of Generation License by NEPRA	July 10, 2017

2.2.2 Request for Determination of Tariff

As:

(a) the LOI has been granted by PPDB, Government of Punjab (**Annex-A**);

(b) land for the project has been allocated by Colonies Department, Board of Revenue Punjab (**Annex-B**) to ZPNECL;

(c) Grid Interconnection Study (**GIS**) has been approved by MEPCO and has also given consent to CPPA-G for Power Purchase from the Project Company (**Annexure C**);

(d) grid has been allocated, Power Evacuation Certificate has been issued and interconnection study approved by NTDC (**Annexure D**);

(e) the Project Feasibility Study has been approved by PPDB (**Annex-D**);

(f) applicable environmental approvals have been obtained from Environment Protection Agency, Punjab (**Annexure E**);

(g) binding agreements for design, supply, construction, erection and commissioning of the project are in place (**Annex-F**);

(h) China Eximbank has issued the Letter of Intent for arranging the project debt funding **(Annexure G)** and the equity portion is being be arranged by the sponsors; and

(i) Sinosure offer letter for the insurance premium rate for financing has been obtained **(Annexure H),**

it is submitted that the requirements of the regulatory process for applying to NEPRA for the tariff determination of ZPNECL's 100 MWp power generation facility to be located at Rakh Chaubara, Layyah, Punjab, Pakistan (the **Project**) have been completed.

2.3 SUBMISSION

Pursuant to the relevant provisions of the NEPRA Rules, read with the provisions of the NEPRA Act and the Rules and Regulations made thereunder; and in view of compliance with the applicable requirements by ZPNECL, the Project Company submits herewith before NEPRA, the competent regulatory authority lawfully authorized to determine tariff for solar PV power generation companies, a tariff petition (the **Tariff Petition**) for approval of:

(i) the reference generation tariff (the **Reference Generation Tariff**);

(ii) the indexations and adjustments;
(iii) onetime adjustments at commercial operations date; and
(iv) other matters set out in this tariff petition,

given the advance stage of the Project, NEPRA is requested to process the Tariff Petition at the earliest, thereby enabling ZPNECL to achieve financial close and start generation by the end of 2018.

Based on above approach the Project Company has selected PV module vendor Zhangjiagang SEG PV Co. Limited (**SEG PV**) and PV inverter supplier "Sungrow" for the Project, the construction services will be carried out by HydroChina International Engineering Co., Limited (**HydroChina**), while Zhenfa New Energy Science and Technology Co., Limited (**Zhenfa Science and Technology**) shall be responsible for the design.

PV Modules

The project will use SEG PV6-60 260W & 265W solar module, which can provides higher output power. Based on current high efficiency of solar cells, module efficiency goes to above 16.8%.This type of module takes special material to stand against high temperature, particularly in desert areas.

PV Inverters

The Project will use Sungrow SG630MX PV inverter, which provides maximum system efficiency up to ninety-nine percent (99%) with ½ MPPT wide MPPT voltage range. This inverter has IP54 protection degree and is suitable for harsh environment conditions.

3.3 O&M ARRANGEMENT

The Project Company shall be responsible for the O & M of the Project.

3.4 PROJECT SPONSORS

Zhenfa Group is one of the leading project developers in China. The company focuses on investing, developing, installation and commissioning of solar projects as well as does merger & acquisition of other valuable projects or companies. So far it has an accumulative installation of 4 GW solar projects in China, among them self-invested and owned 2 GW solar projects. Zhenfa Group has 10 years of solar engineering experience and they have installed and completed commissioning of several units of 100W solar projects in China. The Sponsors are continuing with developing solar projects in China and abroad with the aim of reaching their target to complete 10GW in next 5 years.

Zhenfa Group holds a strong financial position in China with total assets of around USD 2.8 billion and net equity of more than USD 1 billion. This remarkable financial standing of the company resulted in securing the Letter of Intent from the financers, for the proposed Project, at a substantially lower spread as compared to similar transactions, against a 100% unconditional corporate guarantee.

3.5 PROJECT FUNDING

The capital structure of the Project is envisaged at 70:30 (Debt:Equity). The Project Company intends to obtain a 100% of the debt through foreign financing sources. China

Eximbank has provided letter of commitment to contribute 100% of the required debt with a substantially low spread against the corporate guarantee of the sponsors. Sinosure arrangement for the debt amount is also in place. The letter of Intent for the financing of the Project and proposed Sinosure offer letter are attached to the petition as **Annexure G and H** respectively.

Zhenfa Group and Zhenfa Science and Technology will own 100% equity of the Project Company in a proportion of 80% and 20 % respectively.

3.6 SALIENT FEATURES OF THE PROJECT

Salient features of the Project, subject to the assumptions contained in this Tariff Petition, are summarized hereunder for the Authority's perusal:

Project Company	Zhenfa Pakistan New Energy Company (Private) Limited
Sponsor	Zhenfa Energy Group Co., Limited and Zhenfa New Energy Science and Technology Co., Limited.
Project Capacity	100 MWp
Project Location	Rakh Chaubara, District Layyah, Province of Punjab, Pakistan
Land Area	650 Acres
Concession Period	25 years from commercial operations date
Purchaser	Central Power Purchasing Agency (Guarantee) Limited
PV Modules	Zhangjiagang's SEG-P60 260W & 265W Si-poly solar modules
Invertor	Sungrow SG 630 MX PV inverter.
Energy Production	168.6 GWh per annum
Implementation Arrangement	The Project Company will implement the Project through multiple contractors and consultants for the design, supply of equipment, and construction, installation and commissioning services while assuming project completion risk itself.
Project Capital Cost	

	(US$ in '000)
Procurement and supply of equipment	69,732
Construction, installation and commissioning	14,272
Designing	364
Project Development Cost & Non-EPC Cost	2,728
Insurance during Construction	506
Financial Charges	1,466
Interest During Construction	1,525
Sinosure Fee	495
Total Project Cost (CAPEX)	***91,088***

Funding Plan	Debt 70%:Equity 30%
Equity	US$ 27.33 million
Long Term Debt	US$ 63.76 million
Lenders	*Foreign Financiers* • China Exim Bank
Terms of Long Term Debt	

Currency	US Dollars (100%)
Term	Up to 15 years (door to door)
Grace Period	Up to 12 months
Repayment Period	14 years
Debt Repayment	Mortgage-style repayments
Interest Rate	Base Rate: 6 months LIBOR Spread: 350 basis points

Sinosure	0.76 % (including WHT) of Long Term Debt on annual basis

Southern Punjab

<table>
<tr><td>O&M Contractor</td><td>Zhenfa Pakistan New Energy Company (Private) Limited</td></tr>
<tr><td>Project Operation Cost</td><td>
(US$ in '000)
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<tr><td>Years</td><td>1 – 14</td><td>15 – 25</td></tr>
<tr><td>O&M Cost</td><td>1,225</td><td>1,185</td></tr>
<tr><td>Insurance Cost</td><td>338</td><td>338</td></tr>
<tr><td>Total Operating Cost</td><td>1,563</td><td>1,523</td></tr>
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<tr><td>Levelized Tariff</td><td>Requested levelized tariff US¢ 6.4242 per kWh at 14% rate of return on equity.</td></tr>
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<tr><td>✓ Feasibility Study</td><td>✓ Solar Resource Assessment Study</td><td>✓ Land Acquired</td></tr>
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3.7 PROJECT - KEY FEATURES

Amongst various other factors, the following are proposed as key strengths of the Project:

3.7.1 Reference Tariff

Having a strong track record for financing, developing and delivering solar energy projects in other parts of the world, Zhenfa Group envisioned to extend its footprint in Pakistan through development of a commercially viable solar IPP at economical reference tariff.

Zhenfa Group insists on the photovoltaic power generation for economic and social benefits and has developed a strong footprint at home and abroad after years of struggle and accumulation. ZPNECL intends to bring social, commercial and environmental sustainability in the solar industry of Pakistan.

3.7.2 State-of-the-art Solar PV Modules & PV Inverter – SEG P60-60 260W & 265W & SG 630MX

SEG PV6-60 260W & 265W solar module can provide higher output power based on current high efficiency of solar cells and module efficiency goes to above 16.8%. This type of module takes special material to stand against high temperature.

19 - 20 MJ/m2 per day with annual mean sunshine duration of 8 to 8.5 hours a day. These values are among the highest in the world. For daily global radiation up to 23MJ/m2, 24 (80%) consecutive days are available in this area. If harnessed adequately, solar energy would eradicate energy shortages in the country. The Government of Pakistan is currently looking to build solar farms in the high solar irradiance areas.

The Government of Pakistan has clearly articulated its support for the development of renewable energies. Due to the fact that solar energy is one of the most economical and efficient of renewable energy production techniques, the focus is on supporting the development of solar farms through Independent Power Producers (the **Solar IPPs**).

4.2 PROCUREMENT PROCESS

Based on the Sponsor's expertise in implementation of solar power projects, the Project will be implemented through a non-traditional arrangement whereby the Project Company will be entering into separate contracts for Project design, supply of equipment, and construction, installation and commissioning services, whilst assuming the risks associated with the Project. For the selection of contractors for the supply of equipment and construction, installation and commissioning services, a comprehensive procurement process was followed which included issuance of the RFP, receiving of bids from various bidders, technical and financial evaluation of the bids, negotiations with shortlisted bidders and execution of contracts with selected bidders. (Complete report encompassing the whole procurement process is attached as **Annex-I**).

In response to the RFP the Project Company received the compliant offers from the following entities:

For Equipment Supply

- Zhangjiagang SEG PV Co., Limited
- HydroChina International Engineering Co., Limited
- Wuxi Changjiang Electrical Equipment Co., Limited
- Jiangsu Huayuan New Energy Technology Co., Limited

For Construction, Installation and Commissioning

- HydroChina International Engineering Co., Limited
- Pinggao Group Co., Limited
- Hubei Electric Power Construction Second Engineering Co.,
- CNECC Pakistan Engineering Co., Limited

Based on the evaluation conducted by technical consultants, following contractors were selected for supply of equipment and construction, installation and commissioning:

power grid construction, thermal power generation, environmental protection, municipal facilities, infrastructure, etc. HydroChina conducts its business in more than 60 countries, providing its clients with effective and value added services.

4.2.3 Design Arrangement

Based on the vast experience of the Sponsors, design of the plant will be carried out by a dedicated team of experienced professionals from Zhenfa Science and Technology.

In order to develop a low tariff solar project in an efficient manner, Zhenfa Group shall utilize its experience of project development. Instead of entering into a turnkey EPC contract arrangement, the Sponsors have decided to undertake the Project as "self-EPC arrangement" i.e. by assuming all the responsibilities and entering into separate supply and construction contracts; and utilizing in-house designing services.

4.3 O&M CONTRACTOR

Zhenfa Pakistan New Energy Company (Priavte) Limited will be responsible for Operation & Maintenance and bear the risk for the performance ratio.

4.4 TECHNOLOGY & EQUIPMENT

4.4.1 Technology Selection Criteria

Zhenfa Group reviewed a vast range of PV technologies used for electricity generation globally. Various factors considered by the Zhenfa Group in selection of equipment and technology included:

(a) equipment to be of latest technology, high rated power and more efficiency;
(b) compliance of the proposed equipment with local climatic conditions;
(c) references and experiences of the equipment manufacturers under similar environmental conditions (e.g. temperature, solar farm size, area);
(d) Sufficient track record of the equipment in the projects of same size;
(e) Competitiveness of cost of equipment;
(f) energy output with guaranteed degradation and other performance guarantees;
(g) grid compatibility; and
(h) suitability of operation and maintenance concept for the size and location of projects with suitable availability of spare parts, consumables and main components.

4.4.2 The Selected Technology

After a consummate search and elaborated analysis, the following equipment has been selected for the Project:

by Zhenfa Holding Group, not only wins the national invention patent, but also becomes one of the advanced technologies applied by the global tracking power stations. With the same installed capacity, the generated energy of inclined single axis sun track can increase by 20-30% (depending on different location), while the cost of investment only increases by 10%-15%(depending on different land situation), around 500MW solar project with this kind of sun tracking device already put into operation.

The selected sun tracking device has the following distinctive features:

1) Without IC components to guarantee the reliability of tracking device in the outdoor severe environment.
2) Stable structure and simple installation. It adopts the three-legged support to bear the load with high intensity and stability. And it has lower requirements for the flatness of the installation ground.
3) Self-adaptive control, less anti-interference and low requirements for sunlight illumination. The sunlight with some irradiance can realize the self-adaptive solar tracking. The tracking system doesn't need any electric elements and external power source, and it can stand severe environment and has strong anti-interference ability.
4) Long service life and high generating efficiency. Its service life reaches a length of 25 years with high reliability. With above 20% higher output power, it can greatly reduce the generating cost.
5) The ground occupied by the project partially has sun exposure and the support is far away from the ground, so it is more possible for the combination of photovoltaic stations and agriculture (planting and breeding)

4.5 THE SITE

The Project Site is acquired at Rakh, Chaubara, and District Layyah-Punjab. The Project Site is located around 08 kilometers away from Chaubara city. The total land area of the project site is about 650 acres owned by the project owners for the implementation of 100 MW Solar PV project. The proposed site located at latitude of 30°54'11.86"N and longitude of 71°33'36.21"E with elevation of around 150 meters.

Figure below shows general overview of the Site.

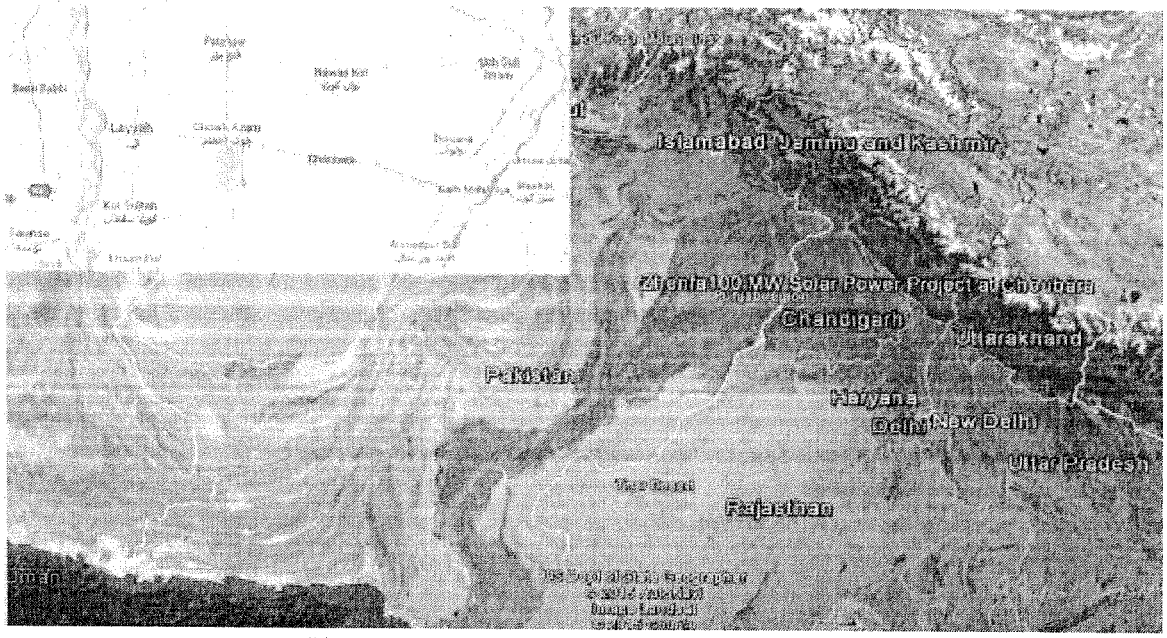


Figure 1: General Overview of the Site.

A copy of the land allocation letter is attached as **Annex- B**

4.6 SITE CONDITIONS, INTERCONNECTION & ACCESSIBILITY

(a) Location of the Grid:

132 kVA Chaubara grid station is approximately 6.5 km from the the Project site. A separate electrical and grid interconnection study has been conducted for the project including 'Power Quality', 'Load Flow', 'Short Circuit' and 'Power Evacuation', that has been vetted and approved by NTDC (refer **Annex-C**).

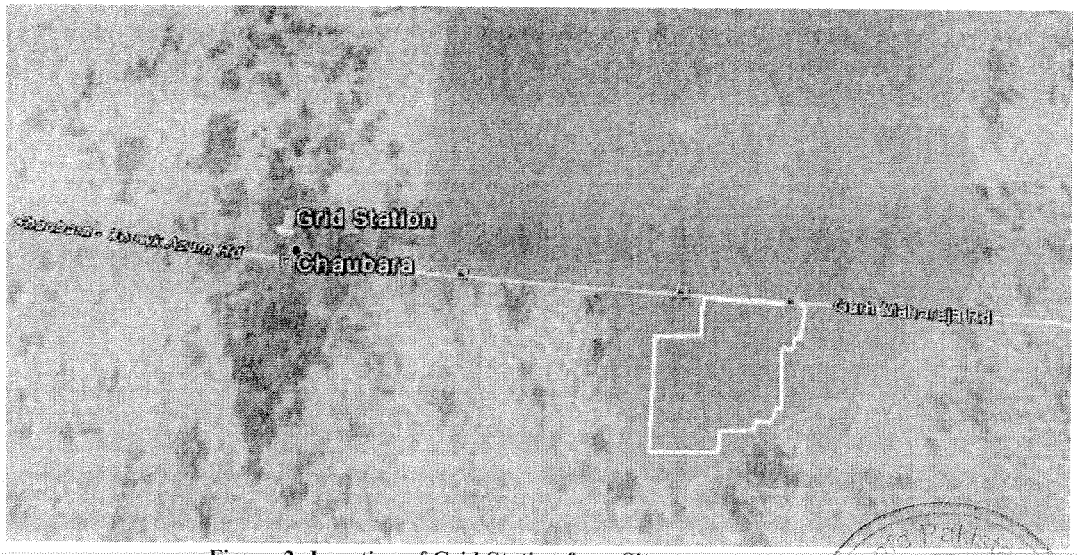


Figure 2: Location of Grid Station from Site

(b) Site Accessibility:

The major track from Multan to the site is a two-way Garh Maharaja road. The terrain is flat. In general, the route requires no major maintenance.

Multan dry port, one of the major dry ports in Punjab province and the point of delivery of equipment for the proposed solar power project; is approx. 148 km from the Project site. The track from dry port to site is good and till the Site and no development is required. The load bearing capacity of the bridges in between the dry port and the site is good and is enough to bear the load of trucks carrying heavy equipment.

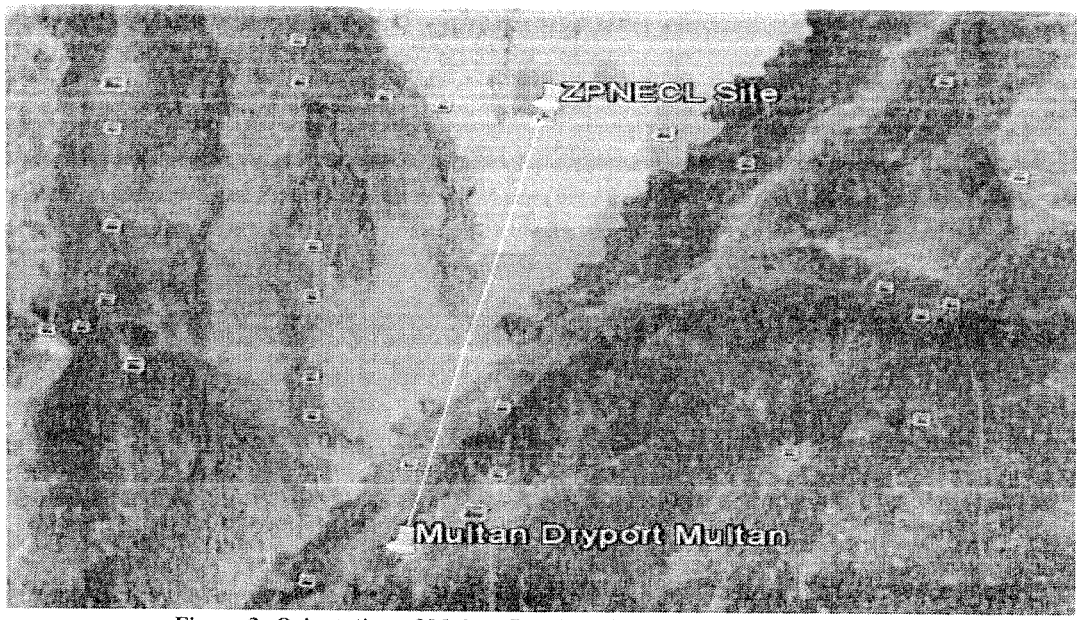


Figure 3: Orientation of Multan Dry Port from Site

(c) Climate Conditions:

Layyah has extreme climatic conditions. The summer season begins in April and continues until October. June and July are the hottest months with temperature averaging at 34.8°C with hottest days reaching 50°. The mean maximum and minimum temperature ranges between 12° and 5°.

Layyah receives approximately 8.3 hours of sunshine daily on average. Rainfall towards the end of June, monsoon conditions appear and during the following two months the rainy season alternates with humid weather. The winter rain falls during December, January and February ranging from 18 to 21 millimeters.

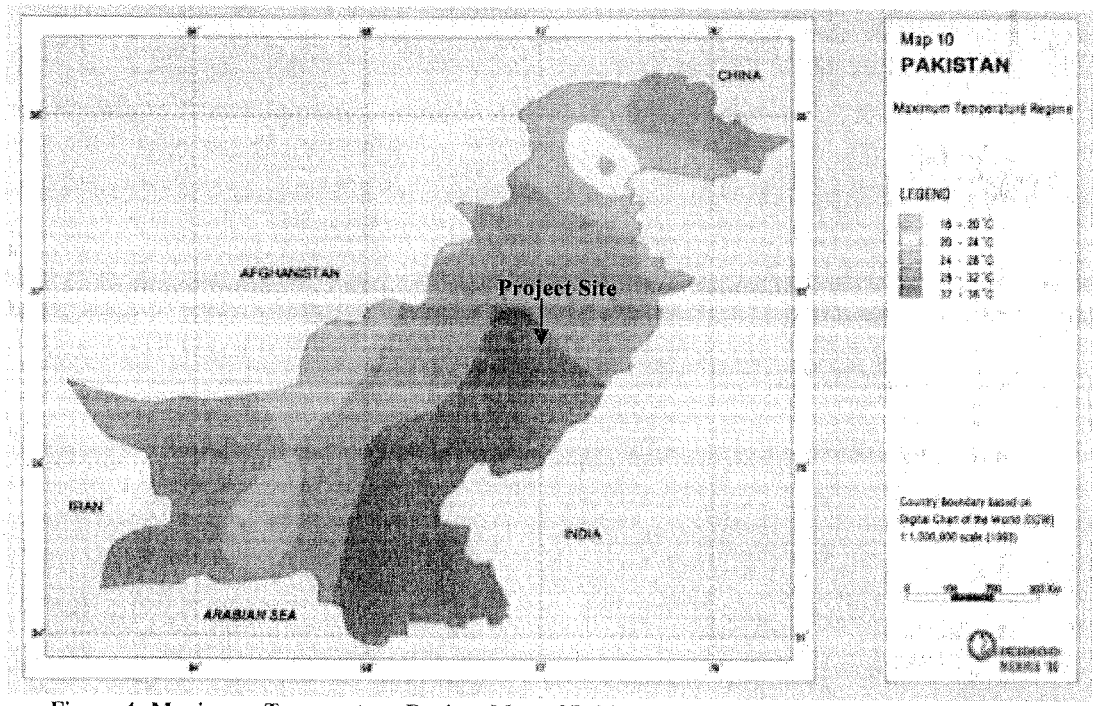


Figure 4: Maximum Temperature Regime Map of Pakistan and Project Site

4.7 POWER OFF-TAKE AND THE GOVERNMENT OF PAKISTAN'S IMPLEMENTATION AGREEMENT

The electricity generated through the Project will be sold to Central Power Purchasing Agency Guarantee Limited (**CPPA-G**) on behalf of ex-WAPDA distribution companies (the **Purchaser**) pursuant to the energy purchase agreement (the **EPA**), which in turn will distribute and modulate the electricity generated by ZPNECL.

In furtherance of the Government of Pakistan's model for setting up IPPs in Pakistan, ZPNECL will also enter into an Implementation Agreement (the **IA**) with AEDB in respect of the Project.

The EPA will be finalized and executed by and between ZPNECL and the Purchaser and the IA will be finalized and executed by and between ZPNECL and the President of the Islamic Republic Pakistan (through AEDB), in each case, following NEPRA's approval of ZPNECL's twenty-five (25) years Reference Generation Tariff, the grant of a generation license to ZPNECL and after execution of the tripartite LOS with AEDB and PPDB.

4.8 ESTIMATED OUTPUT

The Project's technical consultant - Renewable Resources (one of Pakistan's leading consultants on renewable energy technology) carried out detailed evaluations to estimate the energy production for the Project, based on:

(a) the technical specifications of the plant components;
(b) the site conditions; and

(c) layout.

The summary of the results is as follows:

GROSS DC CAPACITY	100 MWp
NET CAPACITY FACTOR	19.25 %
ANNUAL ENERGY GENERATION	168,630 MWh

4.9 PROJECT COST AND CAPITAL STRUCTURE

Based on the assumptions contained in this Tariff Petition and in light of the proposed discussion contained in Section 5, the proposed Project cost is USD $ 91,087,544 (United States Dollars Ninety One Million Eighty Seven Thousand Five Hundred and Forty Four Only) (the **Project Cost**).

The planned financing of the Project Cost is by:
(a) 30% equity (the **Equity**); and
(b) 70% debt (the **Debt**).

4.10 MAIN SPONSOR – ZHENFA ENERGY GROUP CO., LIMITED

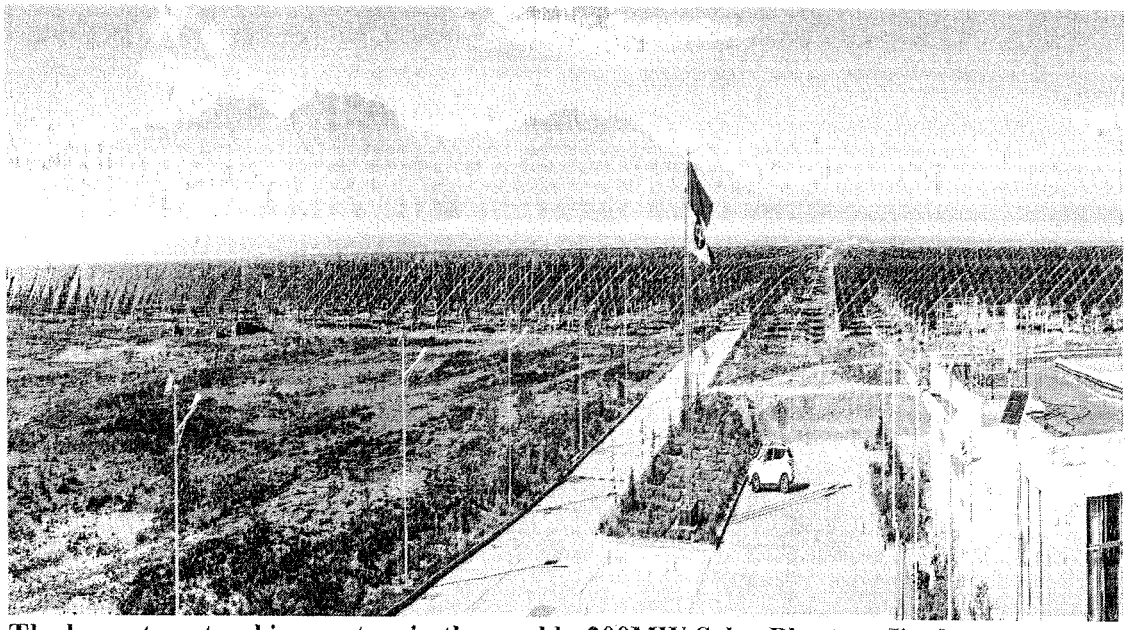
Zhenfa Group, the parent company of ZPNECL is one of the project developers in China. It focuses on investing, developing, and the installation and commissioning of solar power projects as well as does mergers & acquisitions of other valuable projects or companies. So far it has accumulative installation of 4GW solar projects in China, among them self-invested and owned 2GW solar projects with total assets of around USD 2.8 billion. With 10 years of solar engineering experience, today Zhenfa Group has installed and completed commissioning of 6 units 100W solar projects in china. Zhenfa Group has established "Green Power Corridor in Eastern Coastal Region" and "Green Power Silk Road in the West". Zhenfa Group continues to develop solar power projects in China and overseas with the target to complete 10GW in next 5 years.

Zhenfa Group continues to push for technology innovation, model innovation and market innovation, 10 years ago the company developed single-axis self-adaptive sun tracking device and got national invention patent. This sun tracking device can increase the generating efficiency by 22%, compared with the fixed generation devices, up to now around 500MW solar project with this kind of sun tracking system already put into operation.

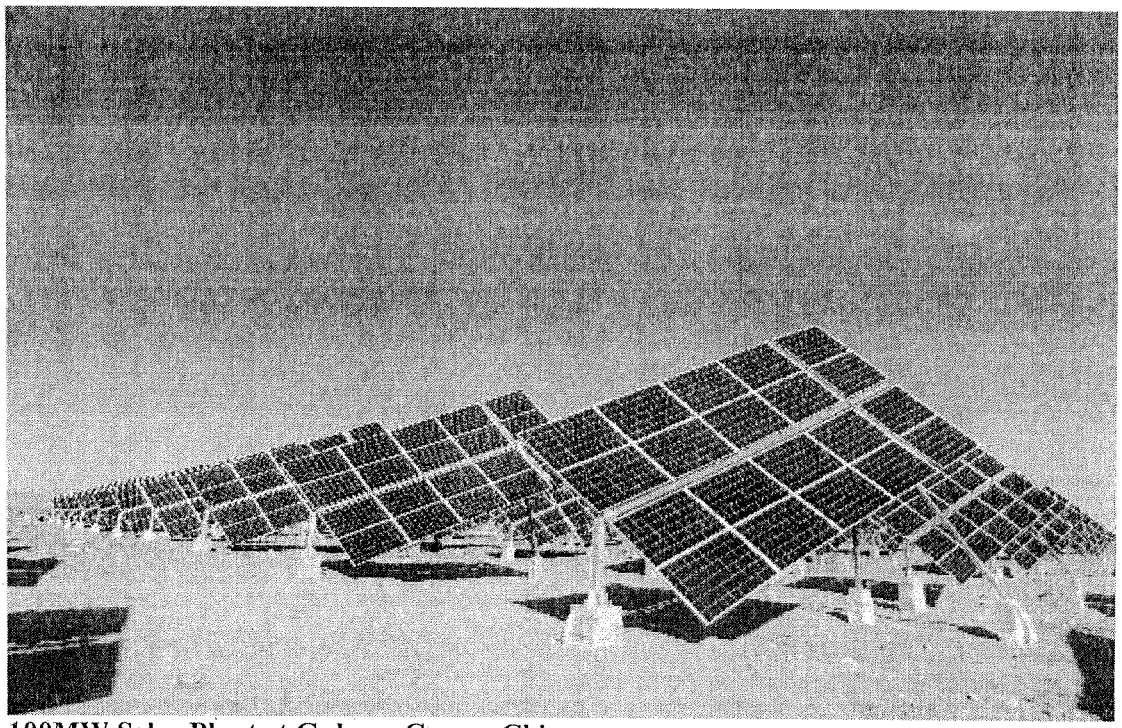
List of Key Projects by Zhenfa Energy Group Co.

PV Power Station	Location	DC (MW)	COD
Jiangsu Sheyang Photovoltaic Power Plant	China	20	in Dec 2009
Jiangsu Dongtai Photovoltaic Power Plant	China	60	in August 2010
Ningxia Wuzhong Photovoltaic Power Plant	China	50	in Feb 2011
Qinghai Geermu Photovoltaic Power Plant	China	50	in Sept 2011
Gansu Wuwei Photovoltaic Power Plant	China	30	in Sept 2011
Ningxia Zhongwei Jinyang Photovoltaic Power Plant	China	30	in Oct 2011
Shanxi Pinglu Photovoltaic Power Plant	China	20	in May 2011
Jiangsu Hongze Photovoltaic Power Plant	China	20	in Dec 2011
Jiangsu Jianhu Photovoltaic Power Plant	China	20	in Nov 2011
Shandong Zoucheng Photovoltaic Power Plant	China	10	in May 2011
Zhejiang Linping Photovoltaic Power Plant	China	10	In Aug 2011
Anhui Huangshan Photovoltaic Power Plant	China	10	In July 2011
Jiangxi Houtian Photovoltaic Power Plant	China	10	in Dec 2011
Gansu Zhangye Photovoltaic Power Plant	China	50	in Aug 2012
Gansu Jinchang Photovoltaic Power Plant	China	20	in Sept 2012
Qingyang Photovoltaic Power Plant	China	100	in Sept 2013
Gulang Photovoltaic Power Plant Phase II	China	100	in Nov 2013
Jinchang Zhenxin Photovoltaic Power Plant	China	100	in Aug 2013
Ningxia Zhenluo Photovoltaic Power Plant	China	50	in Nov 2013
Neimeng Sanxin Photovoltaic Power Plant	China	50	in Dec 2013
Jinchang Guoneng Photovoltaic Power Plant	China	50	in Oct 2013
Gulang Photovoltaic Power Plant Phase I	China	50	In Nov 2013
Jiayuguan Guoneng Photovoltaic Power Plant	China	50	In Nov 2013
Shanxi Dingbian Photovoltaic Power Plant	China	50	in Dec 2013
Ningxia Guyuan Photovoltaic Power Plant	China	30	in Aug 2013
Ningxia Haiyuan Photovoltaic Power Plant	China	30	In Aug 2013
Xinjiang Huocheng Tukai Photovoltaic Power Plant	China	30	In Sept 2013
Jianghu Jinhu Photovoltaic Power Plant	China	20	In Sept 2013
Jianghu Gaoyou Photovoltaic Power Plant	China	20	In Oct 2013
Jiangsu Binhai Photovoltaic Power Plant	China	20	In Dec 2013
Jiangsu Xuyu Photovoltaic Power Plant	China	20	In Nov 2013
Ningxia Sikouzi Photovoltaic Power Plant	China	10	In Nov 2013
Jiangsu Sihong Photovoltaic Power Plant	China	109.9	in June 2014
Jiangsu Jinhu Photovoltaic Power Plant	China	100	in June 2014
Jiangsu Gaoyou Photovoltaic Power Plant	China	100	In June 2014
Minqin Guoneng Photovoltaic Power Plant	China	50	In June 2014
Ningxia Zhenqi Photovoltaic Power Plant	China	30	In June 2014

Zhenfa Group - Solar Projects in China



The largest suntracking system in the world - 200MW Solar Plant at Jinchang, Ganzu, China



100MW Solar Plant at Gulang, Gansu, China

5. PROJECT COST AND TARIFF

5.1 PROJECT COST SUMMARY

The total Project Cost, expressed in United States Dollars, has been calculated after thorough analysis, evaluation and understanding of the dynamics that affect the development and operation of a solar PV project. The reference exchange rates used to convert the relevant costs into United States Dollars are USD 1 = PKR 105.

For NEPRA's benefit and approval, a summary of the Project Cost is given below:

SR. NO.	INVESTMENT / COST	US$ IN '000'
1.	Procurement and supply of equipment	69,732
2.	Construction, installation and commissioning	14,272
3.	Project design services	364
4.	Project development cost	2,728
5.	Insurance during construction	506
6.	Financing cost	1,466
7.	Interest during construction	1,525
8.	Sinosure fee during construction	495
	TOTAL PROJECT COST	**91,088**

5.2 DETAILS OF PROJECT COST

5.2.1 Design, Equipment and Construction Cost

The breakup of costs for designing, supply and construction services agreements are as follows:

SR. NO.	COST HEAD	US$ IN '000'
1	Procurement and supply of Equipment	69,732
2	Construction, installation and commissioning	14,272
3	Project design services	364
	TOTAL	**84,368**

Supply of equipment Cost includes the cost of 382,437 pcs (Three Hundred Eighty Two Thousand Four Hundred and Thirty Seven) PV Modules, 142 (One Hundred and Forty Two) PV inverters, electrical equipment, together with ancillary equipment and other goods, systems and machinery.

Construction, installation and commissioning includes the cost of erection, and completion of the equipment and construction of the facility that is fit for the intended purpose. This cost also includes staff accommodation (construction of container type

houses), supply of drinking water and electricity (to container houses), catering services for the staff, certain project vehicles, standby generator (including fuel), site security during construction period and internal access roads.

Project design services cost will include all the cost associated with conceptual design of the plant including design of mechanical, electrical and civil works for the project.

5.2.2 Project Development Cost

The Project Development Cost includes the cost of items that are not part of the Contractors' scope of work pursuant to the supply and construction contracts while Project development costs include the costs incurred for the purpose of Project development and all costs, fees and expenses incurred or to be incurred for such purpose. These costs include, inter alia, costs of feasibility studies, topographical survey of land, geotechnical investigation of land, electric grid interconnection studies; fees of consultants; costs related to the bank guarantee to be furnished to PPDB, costs related to the Purchaser letter of credit to be furnished to the Purchaser pursuant to the provisions of the EPA, various regulatory fees to be paid to NEPRA and other governmental agencies, costs incurred during ZPNECL's formation and capital enhancement; and costs relating to various permits for the Project, land cost, post financial close technical supervision and site security etc.

A breakdown of some of such costs is provided below:

SR. NO.	COST	US$ IN '000'
1.	Consultancy Costs & Technical Studies – Pre-Financial Close	587
2.	Owner's Engineer Supervision – Post Financial Close	360
3.	Independent Engineer - Pursuant to the EPA	100
5.	Permits, Permissions and Related Costs	355
6.	Site, Security and Infrastructure	206
7.	Administration Cost	649
8.	Travelling Costs	261
9.	Others	210
	TOTAL PROJECT DEV. COST	**2,728**

(a) Consultancy Costs & Technical Studies- Pre Financial Close:

ZPNECL has engaged highly reputed and leading consultants as Project advisors that have unmatched expertise in planning, engineering, financial, legal and technical matters. ZPNECL has endeavored to put together the best team of consultants for the Project so as to ensure that solar power sector in the country is developed and the Project is bankable from all aspects. Based on the requirements of technical consultants,

ZPNECL has already completed electrical, geotechnical, topographical, soil and other related studies for the purpose of completing Project's feasibility study.

(b) Owner's Engineer & Supervision Costs – Post Financial Close:

ZPNECL will engage an experienced engineering supervision team to ensure the contractor's compliance with the relevant contracts, as well as reporting on progress and budget. The construction supervision team will comprise a site engineer supported by technical experts. The Owner's Engineer will also conduct review of proposed designs, construction monitoring and witnessing of key tests to ensure Project's success.

(c) Independent Engineer:

ZPNECL is required to engage an Independent Engineer pursuant to the EPA. Under the terms of the EPA the Independent Engineer will be a firm of engineering consultants that would be appointed and hired by ZPNECL, with the approval of the CPPA-G, to monitor the construction of the Complex and Commissioning and to deliver the related certificates and carry out all of the responsibilities specified in the EPA, including certifying the results of the commissioning tests, readiness of interconnection facilities and synchronization.

(d) Permits, Permissions and Related Costs:

During development and construction of the Project ZPNECL will incur costs related to various fees and charges payable in respect of permits and permissions required from various authorities and regulatory bodies including but not limited to cost of bank guarantees for LOI and LOS, SBLC in favor of power purchaser, NOC from competition commission, LOI Fee, AEDB/PPDB facilitation and legal fee, NTDC vetting charges for Grid Electrical Grid Studies, NEPRA fee and charges, registration and other charges to SECP etc. to be incurred during development and construction of the Project.

(e) Site, Security and Infrastructure:

This head includes upfront payment of the site lease for 25 years and costs related to site leveling & preparation, site access, infrastructure, electricity connection and security costs etc. ZPNECL is also responsible for the security of its local and foreign personnel and the contractors' staff.

(f) Administration Costs:

ZPNECL's head office is based in Lahore and will coordinate the project related activities, liaise with various government agencies in Pakistan and coordinate with lenders regarding the financing arrangements up to COD. In addition there will be a site office with limited accommodation to coordinate the construction and monitoring

activities at site. This portion of the development cost includes costs associated with accounting and admin staff, rent, utilities, equipment inspection, communication charges, printing & stationery, supplies, communication charges, vehicles fuel and maintenance and other allied expenses during the construction period.

(g) Travelling Cost:

This head covers costs related to travelling, accommodation, daily allowances and other allied expenses of the Chinese and local staff, incurred for development, arrangement of financing and for progress/ monitoring meetings etc. during development and construction period of the Project.
Any other cost that relates to development and construction of the Project, if incurred, will be provided at True-up stage.

5.2.3 Pre-COD Insurance Cost

Pre-COD Insurance Cost covers the insurance cost of ZPNECL's assets during construction and the same are incurred prior to COD. These cost estimates have been developed based on the ZPNECL's determination to obtain Pre-COD insurance at relatively lower rates (0.60% of EPC cost) at the strength of its Zhenfa Group.

However in the event ZPNECL is not able to arrange the insurance at 0.60%, due to any reasons beyond its control, NEPRA is requested to allow the actual Pre-COD Insurance Cost at actual up to 1.0% of the EPC cost in line with earlier tariff determinations by NEPRA for other IPPs.

ZPNECL, in view of the practices set by other IPPs in Pakistan and in accordance with the requirements set out by the lenders funding the Project, intends to procure the following insurances during the construction phase of the Project:

(a) Construction All Risk Insurances (CAR);
(b) CAR Delay in Start-up Insurance
(c) Terrorism Insurance;
(d) Marine and Inland Transit Insurance;
(e) Marine - Delay-In Startup Insurances; and
(f) Comprehensive General Liability.

The premiums payable under the above stated Pre-COD insurances do not include the administrative surcharge, the Federal Insurance Fee and the Federal Excise Duty, and ZPNECL prays that the same kindly be allowed by NEPRA as part of the One-Time Adjustments allowed at the time of COD.

ZPNECL requests to allow pre-COD insurance cost at 0.60% of EPC however in case of any deviation NEPRA is requested to allow the actual Pre-COD Insurance Cost

capped at 1.0% of the EPC cost in line with earlier tariff determinations by NEPRA for other IPPs.

5.2.4 Financing Fee and Charges

Financing Fee and Charges include the costs related to the debt financing of the Project. Such costs include, inter alia, the lenders' up-front fee and commitment fee; mandate and processing fee, fees payable, and stamp duty applicable on the financing documents; agency fee; security trustee fee; lenders' Project monitoring fee and the fees for the lenders' various advisors.

These charges are in line with the prevailing market conditions and practices applicable for project financing transactions and as allowed by NEPRA in its other tariff determinations. The spread rate offered by the lenders is substantially lower pertaining to unconditional corporate guarantee of the sponsors. The Letter of Intent for arrangement of debt financing agreed with the lenders are attached with this Tariff Petition (**Annex-G**).

ZPNECL requests NEPRA that as ZPNECL has not considered any duties and taxes on account of Financial Fees and Charges, any duties and taxes if applicable on account of these costs may kindly be allowed as adjustment for actual cost at the time of COD.

5.2.5 Interest During Construction

The Interest During Construction (the **IDC**) has been calculated on the basis of the Letter of Intent from the lenders i.e. China Eximbank, which stipulate a base rate equal to 6 months LIBOR plus a margin in the range of 350 basis points (USD financing).

Actual IDC, however, shall be subject to change depending on the fluctuations in base rate (i.e. 6-month LIBOR), funding requirement (draw-downs) of the Project during the construction period, changes in Project Cost including changes due to Taxes and Duties, and variations in PKR / USD exchange rate.

BASIS FOR IDC CALCULATIONS	6 – MONTH LIBOR
BASE RATE	1.45%
SPREAD	3.50%
TOTAL INTEREST RATE	**4.95%**

IDC, at this stage, is an estimated figure, which is adjustable at COD, based on actual LIBOR, timing and amount of loans drawdown during the Project construction period after financial close, therefore, it is prayed that NEPRA kindly allow adjustment for the same at the time of tariff true-up at COD.

5.2.6 Sinosure Fee

Sinosure is China's official export credit insurance agency, offering export credit insurance and overseas investment insurance. The policy covers equity and debt portion of the project and is intended to provide the insured with risk guarantee when they suffer economic losses because of war, currency exchange ban, requisition, or breach of contract by the government or related counterparts in countries where the insured have made investments. It is designed to support and promote Chinese companies and financial organizations to invest and lend outside China.

As loan is being arranged from a Chinese Bank, therefore in order to comply with the requirement, Project Company has opted for Overseas Investment Insurance for the loan, which provides cover for Political Risks and Commercial Risks. The Project has been offered a Sinosure rate @ 0.72%. Given that (1) payments made to Sinosure are currently subject to 5% withholding tax at source and (2) as per terms primarily agreed with Sinosure, which require premium to be received after tax deduction must be the same as those that would have been received had there been no tax, the rate has been grossed up to 0.76% (0.72 %/(1-5%)). The Sinosure fee is computed based on the following parameters:

Policy	Overseas Investment Insurance
Total Loan	USD 63,761,281
Interest During Construction	USD 1,524,780
Total	**USD 65,286,061**
Premium Rate (Excl. Tax)	0.72%
Withholding Tax Rate	5%
Premium Rate (Incl. Tax)	**0.76%**
Total Premium – Construction	USD 494,800
Total Premium – Operations	0.76% p.a.

The Authority is requested to allow Sinosure on debt, as the same is mandatory for all monies lent by Chinese banks to Pakistani projects.

5.2.7 Permanent Working Capital

Inflow of funds during operating period:

Under the terms of the EPA to be executed between ZPNECL and the Purchaser, ZPNECL shall invoice the Purchaser for the settlement of the Monthly Energy Payment on or after the first day of the month following the month to which the Monthly Energy Payment relates. The Purchaser has to make the payment of the same by the thirtieth day following the day of submission of the invoice i.e. 31st day.

Outflow of Funds & Requirement for Working Capital:

(a) ZPNECL is required to collect sales tax from the Purchaser on behalf of the Government of Pakistan and deposit the same by the 25th day of the month to

which it relates. However, as explained above, the Purchaser is only obligated to make payment to ZPNECL against the invoice raised within 30 days from the date of invoice – thus creating an inherent mismatch in the availability of cash flows to ZPNECL for settlement of its liabilities.

(b) The terms of debt financing stipulate repayment of debt on semi-annual basis commencing from COD. By the time the first repayment is to be made to the lenders, assuming the Purchaser pays without even one day of delay, ZPNECL would have received only 4-5 months of revenue in accordance with the 30-day payment terms under the EPA. Thus a permanent shortfall of 1/3rd of the debt installment would be created which ZPNECL intends to fund through upfront permanent working capital; this requirement is standard in all financing transactions of this type.

(c) Besides above there is also an expected mismatch of cash flows for meeting O&M expenses.

Zhenfa Group has agreed to provide a working capital line to ZPNECL. NEPRA is requested to allow the interest on working capital incurred by the company on actual basis.

5.2.8 Taxes & Customs Duty

(a) Customs Duty:

The amount of customs duty to be paid on renewable energy projects is to be calculated based on Section 18(1A) of the Customs Act 1969 read with Serial 11 to the Part I of Fifth Schedule of the Customs Act 1969 (the Schedule), which allows Customs Duty at a rate of Zero% for the following items;

"Machinery, equipment and spares meant for initial installation, balancing, modernization, replacement or expansion of projects for power generation through nuclear and renewable energy sources like solar, wind, micro-hydel bio-energy, ocean, waste-to-energy and hydrogen cell etc."

Accordingly, ZPNECL has assumed Zero% customs duty regarding imported plant, equipment, machinery etc. in accordance with the above.

However, in case of applicability of any duty, ZPNECL prays NEPRA to allow adjustment of capital cost of the Project and tariff at COD, for actual customs duty paid.

(b) Special Excise Duty:

Special Excise Duty is assumed at Zero%, as the same is correlated with the rate of customs duty (discussed above - Zero Rated). In case the Project has to pay customs duty then the Special Excise Duty at 1% is levied. Accordingly,

ZPNECL requests NEPRA to kindly allow adjustment in capital cost of the Project and the tariff at COD, for actual special excise duty paid.

(c) Sales Tax:

No Sales Tax is assumed on import and local supply of the imported plant, equipment, and machinery etc., as per Sixth Schedule (the Schedule) to the Sales Tax Act 1990 read with Section 13 (1) of the Sales Tax Act 1990 wherein exemption from applicability of sales tax is provided. Serial # 7 of the Schedule cites following items which are exempt from sales tax;

"1. Machinery, equipment and spares meant for initial installation, balancing, modernization, replacement or expansion of projects for power generation through nuclear and renewable energy sources like solar, wind, micro-hydel bio-energy, ocean, waste-to-energy and hydrogen cell etc."

Furthermore, for the purpose of this Tariff Petition, ZPNECL has not taken into account the impact (if any) of the Punjab Sales Tax on Services Act, 2012. The true implications and procedures with regard applicability of the 'Punjab Sales Tax of Services Act, 2012' are not clear at this time, however, in case the said Sales Tax on services become applicable on the Onshore Agreement, then the related impact will be adjusted against output sales tax on electricity sales receipts (post COD) and there will be no impact on the Project Cost because of provincial sales tax on services.

However, in case of change in laws by virtue of which if either (a) federal sales tax applicable on procurement of plant, machinery and equipment becomes applicable, or (b) provincial sales tax on services does not remain adjustable against sales tax charged on sale of electricity, the same is requested to be adjusted in Project Cost and Tariff allowed at COD / Tariff true-up stage.

(d) Advance Income Tax:

Advance Income Tax @ 0.00% (Zero Percent) has been assumed at the time of import of machinery, equipment, goods, spares and materials for the Project in line with exemption provided under Section 53 of the Income tax Ordinance 2001, read with clause 77 to the Part II of 2nd Schedule to the Income Tax Ordinance, as reproduced hereunder

"(77) Provisions of sections 148 and 153 shall not be applicable on import and subsequent supply of items with dedicated use of renewable sources of energy like solar and wind etc., even if locally manufactured, which include induction lamps, SMD, LEDs with or without ballast with fittings and fixtures, wind turbines including alternator and mast, solar torches, lanterns and related instruments, PV modules (with or without) the related components including invertors, charge controllers and batteries.".

However, in case of change in laws before import of related plant, equipment

and machinery by virtue of which such advance income tax rate is increased from currently applicable zero percent then the same is requested to be adjusted in Project Cost and Tariff allowed at COD / Tariff true-up stage.

(e) Sindh Infrastructure Development Surcharge (SIDS):

SIDS is dependent upon the weight and distance covered in the Sindh province from the port for delivery of imported plant, machinery, equipment and other ancillary items to the Project site, ZPNECL has not assumed Sindh Infrastructure Development Surcharge on account of imports under the Off-Shore Contract, and same is requested to be allowed at actual in the Project Cost/ tariff at the COD /true-up stage.

(f) The Punjab Infrastructure Development CESS (PIDC):

PIDC is a levy in the form of infrastructure development cess on transportation of goods manufactured, produced or consumed in, imported into or exported out of the Punjab. ZPNECL has not assumed Punjab Infrastructure Development CESS at on account of imports under the Off-Shore Contract, and same is requested to be allowed at actual in the Project Cost/ tariff at the COD /true-up stage.

(g) Federal Excise Duty (FED):

FED on the payments to be made to (1) local financial institutions; and (2) insurer's, has not been assumed. In case FED is levied on the financial advisors and lead arrangers' fee, debt arrangement fee and commitment fee, L/C commission and charges, loan administration charges, and insurance premium the same should be allowed as pass-through under the tariff.

The taxes and duties are requested to be adjusted at actual at the COD stage tariff adjustment / Tariff true-up.

5.3 PROJECT COST COMPARISON WITH NEPRA'S PREVIOUS UPFRONT TARIFFS

The Petitioner respectfully submits hereunder a comparison of proposed levelized tariff and Project costs with NEPRA's previous upfront tariffs.

Project Cost & Tariff comparison	USD/MWp					
	Proposed by ZPNECL	Suo-Moto May 2016	Upfront Tariff Dec, 2015	Upfront Tariff May, 2015	Upfront Tariff Jan, 2015	Upfront Tariff Jan, 2014
EPC Cost	843,676	968,847	1,071,431	1,358,865	1,358,865	1,692,708
Non-EPC & PDC	27,281	60,468	60,468	80,158	80,158	132,000
Pre-COD Insurance Cost	5,062	9,688	10,714	10,191	10,191	12,695
Base Project Cost / Sub-total	**876,019**	**1,039,003**	**1,142,613**	**1,142,613**	**1,449,214**	**1,837,404**
Financial Charges	14,661	23,378	29,994	38,042	38,042	48,232
Interest During Construction	15,248	18,544	21,334	38,042	38,042	15,052
Sinosure Fee	4,948					
Total Project Cost - USD/MWp	910,875	1,080,925	1,193,941	1,514,314	1,514,314	1,900,688
Savings 100 MW – USD		17,004,956	28,306,556	60,343,856	60,343,856	98,981,256
Levelized Tariff - US¢/kWh	**6.4242**	**9.4511**	**10.7251**	**14.1516**	**14.1516**	**16.3063**

Above comparison indicates that the Project cost and ZPNECL's proposed levelized tariff is substantially lower than the previously allowed project costs and levelized tariffs.

6. PROJECT FUNDING STRUCTURE (DEBT & EQUITY)

6.1. THE FUNDING ARRANGEMENT

The Project Cost will be funded on the basis of a Debt: Equity ratio of 70:30, thereby resulting in the following capital structure for the Project:

		US $
DEBT	FOREIGN (100%)	63,761,281
EQUITY		27,326,263
TOTAL PROJECT COST		**91,087,544**

6.2. BRIEF ABOUT DEBT AND EQUITY FINANCING

The envisaged debt-equity structure of the Project is 70:30 implying a total debt requirement of USD 63.76 million (based on a project cost of USD 91.09 Million.

The debt financing will be funded by China Exim Bank and entire debt amount will be denominated in USD (repayment in USD, interest payments to be indexed to LIBOR).

Based on the current Project cost estimates, the equity required to be injected by the Sponsor amounts to USD 27.33 million. Zhenfa Energy Group Co. Limited. will subscribe for 100% of the equity requirement.

6.3. RETURN ON EQUITY

The Tariff Standards prescribed under Rule 17.3(ii) of the Tariff Rules require that the return on investment should be "*commensurate with other investments of comparable risk*". In this regard it is submitted that:

- NEPRA has allowed 17% return to hydel projects where the hydrology risk and unforeseen soil conditions are both well mitigated under the Power Purchase Agreement and NEPRA's tariff guidelines which permit a "3 stage" tariff process permitting a reopening of the tariff parameters, whereas resource risk in solar power projects rests with the project companies/ sponsors.

- Solar and wind energy projects were allowed IRR based ROE at 17% in previous upfront tariff determinations by NEPRA. However, in a recent Determination for Wind Power Generation Projects dated 27th January 2017 and "Suo Moto Proceedings for Development of New Tariff for Solar PV Power Projects", by NEPRA, an ROE of 16% on IRR basis has been allowed to RE Projects.

Provided hereunder are CAPM calculations for assessment of ZPNECL's rate of return, NEPRA's consideration:

6.3.1. Calculation of ROE under Capital Asset Pricing Model (CAPM)

Based on the internationally accepted methods for calculation of required rate of returns, the required rate of returns is follows:

Required Return Calculations	
Risk-Free rate	2.38%
Equity Market Return (S&P 500)	7.70%
Re-levered Beta	1.82
Country Risk Premium (Credit Rating)	7.29%
Required Rate of Return	**19.43%**

a) Risk-Free Rate:

The 10 year US Treasury bond rate has been used as the risk free rate, by taking cut-off yield of 2.38% as at 27th March, 2017. The same can be accessed using the following link:

https://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/TextView.aspx?data=yield

Date	1 Mo	3 Mo	6 Mo	1 Yr	2 Yr	3 Yr	5 Yr	7 Yr	10 Yr	20 Yr	30 Yr
3/27/2017	0.73	0.78	0.91	1.00	1.27	1.51	1.93	2.20	2.38	2.73	2.98

b) Equity Market Return (S&P 500):

To calculate Market risk premium, last 30 years S&P 500 Index is used based on which the geometric mean return comes to be 7.70%. This period takes into account economic upturns and downturns sufficiently. Data as collected by Damodaran since 1960-2016 has been used for the Index level. The same may be accessed on the following link:

http://www.stern.nyu.edu/~adamodar/pc/datasets/histimpl.xls

Year	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
S&P 500	247	278	353	330	417	436	466	459	616	741	970	1229	1469	1320	1148
YoY Growth	2%	12%	27%	-7%	26%	4%	7%	-2%	34%	20%	31%	27%	20%	-10%	-13%

Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
S&P 500	880	1112	1212	1248	1418	1468	903	1115	1258	1258	1426	1848	2059	2044	2239
YoY Growth	-23%	26%	9%	3%	14%	4%	-38%	23%	13%	0%	13%	30%	11%	-1%	10%

30 years		
Cumulative Aggregate Growth	Geometric Mean	Arithmetic Mean
7.62%	7.69%	9.10%

c) Calculation of 'Beta'

For the computation of Beta, a dataset of 68 power companies in the United States of America, has been analyzed, keeping in view the debt-equity structure of ZPNECL. For the calculation of Beta, we have considered the dataset from Damodaran, which is a comprehensive list of existing publicly, traded IPPs in the USA. The dataset includes unlevered Betas of the companies.

We have calculated adjusted Beta as per Blume method to account for the fact that Beta is expected to revert to the mean level in the long term. This is calculated using the adjusted Beta formula ((Beta) x 2/3) + ((Market Beta of 1) x 1/3). The adjustment is required as the Beta is to be used for a Project that has 25 years project life (long term perspective) while associated risk-free rates used in CAPM calculations are based on 10 year US treasury bond rates. Accordingly, the associated adjusted unlevered Beta for US power sector is 0.55.

This is re-levered on 70:30 Debt-to-Equity basis, as allowed by NEPRA. Given the 0% tax rate applicable to ZPNECL, the same has been used for calculation of Beta. The final levered beta based on adjusted unlevered beta comes out to 1.82, which appropriately reflects the associated risks of the project.

d) Country Risk Premium (Credit Rating)

We have used Moody's Default Spread for the credit rating of Pakistan (B3) as a measure of country risk premium. This corresponds to a country risk premium of 7.29%. We have not applied the adjustment (using adjustment factor of 1.4) to the CRP as suggested by Damodaran, which increases the CRP to 10.21%. The same can be accessed at the following link:

http://www.stern.nyu.edu/~adamodar/pc/datasets/ctrypremJuly16.xls

6.3.2. ROE requested by ZPNECL

It is pertinent to mention here that rationale provided above, the appropriate required rate of equity return for the Project should be around 19.43%. However, in line with recent determinations by NEPRA and commitment of sponsors to provide clean energy at lowest possible tariff as discussed in Sections **Error! Reference source not found.** and **Error! Reference source not found.** above respectively, the Project Company is proposing the Reference Generation Tariff calculated at, *inter alia*, 14% ROE on IRR basis.

Based on the facts detailed above, it is justified to request NEPRA to determine the ROE component based on a return of 16 percent or higher (IRR basis) for the Project, however given the brotherly relations between China and Pakistan and Zhenfa Group's strategic vision to help eradicate the electricity shortfall in Pakistan by investing in low cost clean energy projects, ZPNECL accepts ROE at 14% (IRR basis), subject to the condition that the assumptions and Project Costs detailed in this Tariff

Petition are accepted and allowed by NEPRA. In the event the NEPRA disallows or reduces any Project Costs or assumptions of ZPNECL, the ROE requested shall proportionately increase, in all cases to arrive at a levelized tariff of US 6.4242 Cents/kWh.

Further ZPNECL has not assumed any Return on Equity During Construction Period and same is requested to be allowed at the time of one-time adjustment / tariff true-up at COD

A comparison of the tariff based on different rates of return are provided hereunder:

Impact of ROE on Levelized Tariff	US¢/kWh		
	At 14% proposed by ZPNECL	Based on 16% allowed in recent tariffs	Based on 19.43% under CAPM
Tariff during 1st 14 Year (avg.)	7.1485	7.4726	8.0285
Tariff during remaining 11 Years	3.1717	3.4958	4.0516
Levelized Tariff - US¢/kWh	**6.4242**	**6.7483**	**7.3042**

6.4. DEBT SERVICING

The capital structure of the Projects is envisaged at 70:30 (Debt: Equity). China Exim Bank will contribute 100% of the required debt respectively. The door to door tenor of the loan agreed with the lenders is 15 year. The financing will be based on 6-month LIBOR plus assuming a margin of 3.5% adjustable on semi-annual basis.

7. OPERATIONAL COSTS

7.1. UNDERSTANDING & BENCHMARKS

Zhenfa Pakistan New Energy (Pvt.) Limited will take the responsibility for operation & Maintenance and take the risk for performance ratio.

The initial term of 14 years for O&M is to match the debt repayment period of the Project and provide additional comfort to the Lenders.

ZPNECL requests that the O&M costs presented below may kindly be allowed by NEPRA for smooth, efficient, and effective functioning of the Project.

7.2. BREAKUP OF OPERATING COST

The operations cost of ZPNECL comprises of the operations and maintenance cost and the cost of the operational insurances to be taken out by ZPNECL. Break-up of the same is provided hereunder:

	USD IN THOUSANDS (PER ANNUM)	
YEARS	1 – 14	15 – 25
O&M COST (FOREIGN COMPONENT)	560	520
O&M COST (LOCAL COMPONENT)	665	665
INSURANCE COST	338	338
TOTAL OPERATING COST	*1,563*	*1, 523*

7.2.1. Comparison of O&M Cost with NEPRA's previous upfront tariff determinations for Solar PV Projects

ZPNECL has proposed O&M cost of US$ 15,628/MW/annum, compared to US$ 27,005/MW/annum proposed by NEPRA in Suo-Moto proceedings held in May 2016 and previous tariff upfront determinations for Solar Tariff determinations.

The Project Company requests the Authority to allow the requested O&M cost for smooth operation of the Project.

7.3. INSURANCE DURING O&M

The Insurance Cost consists of the insurances required under the Implementation Agreement and the Energy Purchase Agreement coupled with those customarily required for project financing transactions, including all-risk insurance/reinsurance, business interruption insurance, and machinery break-down, natural calamities, sabotage and terrorism. It is critical that all risks associated with the Project are adequately addressed and all insurable events are adequately covered. Keeping in view the generally adopted global trends and the magnitude of the Project, a comprehensive

operational insurance and reinsurance arrangement is also fundamental to ensure bankability of the Project.

During the operations phase, ZPNECL intends to acquire insurance from one of the leading insurance companies in the country. As it is standard practice for local insurers to only retain 5% of the risk and acquire reinsurance for the remaining 95% through foreign re-insurer, it is prayed to NEPRA that the insurance costs for the operations phase be allowed in US Dollars (as has been done in case of all other power projects). The requirement to have the operational phase insurance cost denominated in US Dollars is further supported by the fact that the lenders financing the Project will inevitably require the Project to be insured on replacement cost basis; since a major part of the total Project Cost is already denominated in US Dollars, the replacement cost basis insurance would also need to be taken out in US Dollars. It is pertinent to highlight, that any replacement costs incurred as a consequence of the occurrence of an insurable event will also be incurred in US Dollars.

In view of the practices set by the other IPP's in Pakistan and in accordance with the requirements set by the lenders, ZPNECL proposes to procure the following insurance during the operational phase of the Project:

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

The insurance cost has been estimated at 0.40% of the EPC Cost, however any increase therefrom up to 0.75% of the EPC Cost may kindly be allowed upon submission of evidences. The insurance cost shall be charged by ZPNECL at actual (subject to proposed cap) and will be recoverable as the insurance cost component of the Reference Generation Tariff.

The insurance cost (for the operations phase) set out in the Tariff Petition does not, however, covers the administrative surcharge, Federal Excise Duty and Federal Insurance Fee, that might be applicable on the insurance cost, the same should be treated as a pass-through item under the tariff determination.

8. REFERENCE GENERATION TARIFF & DEBT SCHEDULE

8.1. TARIFF CONTROL PERIOD

As 70% of the Project is to be funded by debt to be repaid in 14 years, which results in higher reference tariff due to debt service cost in the first 14 years of the Project. In the last 11 years of the Project, the tariff will be decreased due to zero debt service related costs.

The proposed tariff is for the life of the Project i.e. term of the EPA, signed with the Purchaser, which is 25 years from COD. The tariff is divided into two (02) bands i.e. year 1 – 14 and year 15 – 25 to cover the variations due to the debt repayment period.

8.2. SUMMARY OF REFERENCE GENERATION TARIFF

A summarized Reference Generation Tariff table setting out the two bands is provided below:

PKR /kWh

YEARS		1 – 14	15 – 25
FIXED O&M	LOCAL	0.4143	0.4143
	FOREIGN	0.3487	0.3238
ROE		2.3821	2.3821
DEBT SERVICING		3.9641	0.0000
INSURANCE		0.2101	0.2101
SINOSURE (AVG.)		0.1867	-
TOTAL		**7.5060**	**3.3303**

8.3. REFERENCE GENERATION TARIFF

Year	O&M (Local)	O&M (Foreign)	Insurance	ROE	Loan Repayment	Interest Payment	Sinosure	Total Tariff	Total Tariff
	PKR/kWh	PKR/kWh	PKR/kWh	PKR/kWh	PKR/kWh	PKR/kWh	PKR/kWh	PKR/kWh	US¢/kWh
1	0.4143	0.3487	0.2101	2.3821	2.0245	1.9396	0.3156	7.6349	7.2713
2	0.4143	0.3487	0.2101	2.3821	2.1259	1.8382	0.2995	7.6188	7.2560
3	0.4143	0.3487	0.2101	2.3821	2.2324	1.7317	0.2826	7.6019	7.2399
4	0.4143	0.3487	0.2101	2.3821	2.3442	1.6199	0.2648	7.5841	7.2229
5	0.4143	0.3487	0.2101	2.3821	2.4616	1.5025	0.2461	7.5654	7.2052
6	0.4143	0.3487	0.2101	2.3821	2.5849	1.3792	0.2266	7.5458	7.1865
7	0.4143	0.3487	0.2101	2.3821	2.7144	1.2497	0.2060	7.5253	7.1669
8	0.4143	0.3487	0.2101	2.3821	2.8504	1.1137	0.1844	7.5037	7.1463
9	0.4143	0.3487	0.2101	2.3821	2.9931	0.9710	0.1617	7.4810	7.1247
10	0.4143	0.3487	0.2101	2.3821	3.1431	0.8210	0.1379	7.4572	7.1021
11	0.4143	0.3487	0.2101	2.3821	3.3005	0.6636	0.1129	7.4321	7.0782
12	0.4143	0.3487	0.2101	2.3821	3.4658	0.4983	0.0866	7.4059	7.0532
13	0.4143	0.3487	0.2101	2.3821	3.6394	0.3247	0.0590	7.3783	7.0269
14	0.4143	0.3487	0.2101	2.3821	3.8217	0.1424	0.0300	7.3493	6.9994
15	0.4143	0.3238	0.2101	2.3821	0.0000	0.0000	0.0000	3.3303	3.1717
16	0.4143	0.3238	0.2101	2.3821	0.0000	0.0000	0.0000	3.3303	3.1717
17	0.4143	0.3238	0.2101	2.3821	0.0000	0.0000	0.0000	3.3303	3.1717
18	0.4143	0.3238	0.2101	2.3821	0.0000	0.0000	0.0000	3.3303	3.1717
19	0.4143	0.3238	0.2101	2.3821	0.0000	0.0000	0.0000	3.3303	3.1717
20	0.4143	0.3238	0.2101	2.3821	0.0000	0.0000	0.0000	3.3303	3.1717
21	0.4143	0.3238	0.2101	2.3821	0.0000	0.0000	0.0000	3.3303	3.1717
22	0.4143	0.3238	0.2101	2.3821	0.0000	0.0000	0.0000	3.3303	3.1717
23	0.4143	0.3238	0.2101	2.3821	0.0000	0.0000	0.0000	3.3303	3.1717
24	0.4143	0.3238	0.2101	2.3821	0.0000	0.0000	0.0000	3.3303	3.1717
25	0.4143	0.3238	0.2101	2.3821	0.0000	0.0000	0.0000	3.3303	3.1717
						AVERAGE TARIFF		5.6687	5.3987
						LEVELIZED TARIFF		6.7455	6.4242

8.4. DEBT REPAYMENT SCHEDULE

Half Years	Principal Repayment - US$	Principal Repayment - Tariff Component (Rs/kWh)	Interest - US$	Interest - Tariff Component (Rs/kWh)	Instalments US$	Installment - Tariff Component (Rs/kWh)
1	1,605,810	0.9999	1,577,358	0.9822	3,183,168	1.9820
2	1,645,535	1.0246	1,537,633	0.9574	3,183,168	1.9820
3	1,686,243	1.0500	1,496,925	0.9321	3,183,168	1.9820
4	1,727,958	1.0759	1,455,210	0.9061	3,183,168	1.9820
5	1,770,705	1.1026	1,412,463	0.8795	3,183,168	1.9820
6	1,814,510	1.1298	1,368,658	0.8522	3,183,168	1.9820
7	1,859,398	1.1578	1,323,770	0.8243	3,183,168	1.9820
8	1,905,397	1.1864	1,277,771	0.7956	3,183,168	1.9820
9	1,952,534	1.2158	1,230,635	0.7663	3,183,168	1.9820
10	2,000,836	1.2459	1,182,332	0.7362	3,183,168	1.9820
11	2,050,334	1.2767	1,132,834	0.7054	3,183,168	1.9820
12	2,101,056	1.3083	1,082,112	0.6738	3,183,168	1.9820
13	2,153,033	1.3406	1,030,135	0.6414	3,183,168	1.9820
14	2,206,296	1.3738	976,872	0.6083	3,183,168	1.9820
15	2,260,877	1.4078	922,292	0.5743	3,183,168	1.9820
16	2,316,807	1.4426	866,361	0.5395	3,183,168	1.9820
17	2,374,122	1.4783	809,047	0.5038	3,183,168	1.9820
18	2,432,854	1.5149	750,314	0.4672	3,183,168	1.9820
19	2,493,039	1.5523	690,129	0.4297	3,183,168	1.9820
20	2,554,713	1.5907	628,455	0.3913	3,183,168	1.9820
21	2,617,913	1.6301	565,255	0.3520	3,183,168	1.9820
22	2,682,676	1.6704	500,492	0.3116	3,183,168	1.9820
23	2,749,041	1.7117	434,127	0.2703	3,183,168	1.9820
24	2,817,049	1.7541	366,120	0.2280	3,183,168	1.9820
25	2,886,738	1.7975	296,430	0.1846	3,183,168	1.9820
26	2,958,152	1.8419	225,017	0.1401	3,183,168	1.9820
27	3,031,332	1.8875	151,836	0.0945	3,183,168	1.9820
28	3,106,322	1.9342	76,846	0.0478	3,183,168	1.9820

9. INDEXATIONS, ESCALATIONS AND COST ADJUSTMENT

9.1. INDEXATIONS

NEPRA is requested to allow indexation for the various Reference Generation Tariff components in the following manner.

9.1.1. Fixed O&M (Local) Cost Component

The Reference Fixed O&M (Local) Cost Component shall be quarterly indexed to the WPI of manufacturing in Pakistan, as notified by the Federal Bureau of Statistics based on the following formula:

$$FO\&M_{(LRev)} = \text{Relevant Reference Generation Tariff Component} * (WPI_{(Rev)} / WPI_{(Ref)})$$

Where:

$FO\&M_{(LRev)}$ = the revised Fixed O&M (Local) Cost Component applicable for the relevant quarter.

$WPI_{(Rev)}$ = the revised WPI of manufacturing in Pakistan for the month prior to the month in which indexation is applicable, as notified by the Federal Bureau of Statistics.

$WPI_{(Ref)}$ = the WPI of manufacturing in Pakistan for the month in which tariff is determined, as notified by the Federal Bureau of Statistics.

9.1.2. Fixed O&M (Foreign - USD) Cost Component

The Reference Foreign Fixed O&M (Foreign - USD) Cost Component shall be quarterly indexed to both:

(a) the USD/PKR exchange rate, based on the revised TT & OD selling rate of USD notified by the National Bank of Pakistan; and

(b) the US CPI (for all Urban-consumers), issued by the US Bureau of Labor Statistics.

The applicable formula shall be as follows:

$$FO\&M_{(FUSD\text{ - }Rev)} = \text{Relevant Reference Generation Tariff Component} * (US\ CPI_{(Rev)} / US\ CPI_{(Ref)}) * (FX\ USD_{(Rev)}/105)$$

Where:

$FO\&M_{(FUSD\text{ - }Rev)}$	=	the revised Foreign O&M (Foreign – USD) Cost Component, applicable for the relevant quarter
$US\ CPI_{(Rev)}$	=	the revised US CPI (for all Urban-consumers) for the month prior to the month in which indexation is applicable, issued by US Bureau of Labor Statistics.
$US\ CPI_{(Ref)}$	=	the US CPI (for all Urban-consumers) for the month in which tariff is determined, as issued by US Bureau of Labor Statistics.
$FX\ USD_{(Rev)}$	=	the revised TT & OD selling rate of PKR/USD as on the date on which indexation is applicable, as notified by the National Bank of Pakistan.

9.1.3. Insurance Cost

The Reference Insurance Cost Component shall be quarterly indexed to USD/PKR exchange rate, based on the revised TT & OD selling rate of USD notified by the National Bank of Pakistan.

Furthermore, the Reference Insurance Cost Component has been calculated on the basis of insurance premium of US$ 340 thousands (0.40% of the EPC Price) per annum, which is subject to a maximum cap of 0.75% of the EPC Price per annum on the production of actual insurance premium. This adjustment of Insurance Cost Component of the Reference Generation Tariff for increased insurance premium shall only be applicable if the actual insurance premium for any year is more than US$ 340,000 (0.40% of the EPC Price) and shall be applied for by ZPNECL along with the quarterly indexations and shall be applicable for the then subsequent year.

(a) Indexation Formula

The indexation of the Insurance Cost Component shall be based on the following formula:

$Insurance_{(Rev)}$ = Relevant Reference Generation Tariff Component

*

($FX\ USD_{(Rev)}$ / 105)

Where:

$Insurance_{(Rev)}$ = the revised Insurance Cost Component applicable for the relevant quarter.

$FX\ USD_{(Rev)}$ = the revised TT & OD selling rate of PKR/USD as on the

date on which indexation is applicable, as notified by the National Bank of Pakistan.

(b) Adjustment Formula

The adjustment of the Insurance Cost Component for increase in insurance premium shall be based on the following formula:

$Insurance_{(Adj)}$ = Relevant Reference Generation Tariff Component

*

($P_{(Act)}$ / $P_{(Ref)}$)

Where:

$Insurance_{(Adj)}$ = the revised Insurance Cost Component applicable for the relevant year.

$P_{(Act)}$ = Actual Insurance Premium or 0.75% of the EPC Price whichever is lower.

$P_{(Ref)}$ = Reference Insurance Premium of US$ 340,000 (0.40% of the EPC Price).

9.1.4. Return On Equity

In line with NEPRA's previous determinations for thermal IPPs and the RE IPPs, the ROE Component of the Reference Generation Tariff shall be quarterly indexed to the USD/PKR exchange rate, based on the revised TT & OD selling rate of USD notified by the National Bank of Pakistan.

The applicable formula shall be as follows:

$ROE_{(Rev)}$ = Relevant Reference Generation Tariff Component* ($FX\ USD_{(Rev)}$ /105)

Where:

$ROE_{(Rev)}$ = the revised ROE component applicable for the relevant quarter.

$FX\ USD_{(Rev)}$ = the revised TT & OD selling rate of PKR/USD as on the date on which indexation is applicable, as notified by the National Bank of Pakistan.

9.1.5. Principal Component (Foreign)

The Reference Principal Component (Foreign) shall be semi-annually indexed to USD/PKR exchange rate, based on the revised TT & OD selling rate of USD notified by the National Bank of Pakistan.

The applicable formula shall be as follows:

$PRIN_{(FRev)}$ = Relevant Reference Generation Tariff Component * ($FX\ USD_{(Rev)}$ / 105)

Where:

$PRIN_{(FRev)}$ = the revised Principal Component (Foreign) applicable for the relevant semi-annual period.

$FX\ USD_{(Rev)}$= the revised TT & OD selling rate of PKR/USD as on the date on which indexation is applicable, as notified by the National Bank of Pakistan.

9.1.6. Interest Charges (Foreign)

The Interest Charges (Foreign) part of the Reference Debt Service Component shall be semi-annually adjusted for variations in interest rate as a result of variation in 6 months LIBOR & foreign exchange fluctuations in the PKR / USD exchange rate.

The Interest Charges (Foreign) of the Debt Service Component shall be indexed based on the following formula:

$$I_{(Rev)} = \text{Relevant Generation Tariff Component} * (LIBOR_{(Rev)} + 3.5\%) / (LIBOR_{(Ref)} + 3.5\%) * (FX\ USD_{(Rev)} / 105)$$

Where:

$I_{(Rev)}$	=	the revised Interest Charge component applicable for the relevant semi-annual period.
$Libor_{(Rev)}$	=	the revised 6 month LIBOR rate at the end of each 6 months period.
$Libor_{(Ref)}$	=	6 month LIBOR rate prevailing on the date of tariff determination.
$FX\ USD_{(Rev)}$	=	the revised TT & OD selling rate of PKR/USD as on the date on which indexation is applicable, as notified by the National Bank of Pakistan.

9.2. SINOSURE FEE

Sinosure on Debt has been calculated using assumptions of Overseas Investment Insurance based on annual cost at 0.72%. The Authority is requested to allow Sinosure cost on actual basis, subject to documentary evidence provided by the Project Company.

9.3. ANNUAL DEGRADATION ADJUSTMENT

Ageing and degradation of PV modules has an impact on the electricity generation and revenue inflows of the Project over 25 years, accordingly ZPNECL requests that actual degradation subject to a cap of 0.7% per annum of initial power may kindly be allowed through adjustment in Reference Tariff in respective years in line with the "Determination of National Electric Power Regulatory Authority in the Matter of Upfront Generation Tariff for Solar PV Power Plants" dated January 22, 2015.

For this purpose the following formula is proposed for adjustment of annual degradation on the Project:

End of Year	Energy (GWh) at the busbar
1	$X_1=X_0$
2	$X_2=X_1*0.993$
3	$X_3=X_2*0.993$
4	$X_4=X_3*0.993$
....	

X_o= Energy generation assumed for development of Tariff that is 168,630,000 kWh

a) 0.993 corresponds to a degradation factor of 0.7% which will be changed according to the actual degradation in the respective year.
b) $X_1, X_2, X_3, \ldots$ are energy values at the end of year 1, year 2, year 3, and so on if degradation is allowed subject to conditions to be satisfied are not above.
c) Reference tariff will be correspondingly adjusted in respective years.

9.4. ADJUSTMENTS AT COD

NEPRA is requested to allow the below adjustments to the Reference Generation Tariff at the time of true up at COD.

9.4.1. Adjustments to Project Cost

It is submitted that the Project Cost be adjusted at COD for the following based on the assumptions detailed in Section 5 (*Project Cost & Tariff*) and the adjustment to the Project Cost to be reflected in the relevant tariff components (Return on Equity and Debt Servicing):

(a) The Principal Repayment and cost of debt be adjusted at COD as per the actual borrowing composition;

(b) Interest During Construction be adjusted as per actual based on actual disbursement of loans and prevailing LIBOR rates during the project construction period;

(c) Sinosure on Debt has been calculated using assumptions of Overseas Investment Insurance based on annual cost at 0.76% (including WHT). In case of any change in assumptions NEPRA to allow adjustment on COD, based on actual documentary evidence provided by the Project Company.

(d) The specific items of Project Cost to be incurred in foreign currency (US$) be adjusted at COD based on the PKR / US$ exchange rate prevailing on the date the transaction was carried out;

(e) Customs duty and other taxes (including SIDS and PIDC) be adjusted/allowed as per actual;

(f) Any negative financial implications resulting from changes in tax rates, duties etc. and currently applicable sales tax structure may kindly be adjusted in the Project Cost.

(g) Pre-COD Insurance Cost be adjusted at actual subject to a cap of 1.0% of the EPC cost in line with earlier tariff determinations by NEPRA for other IPPs.

(h) Return on Equity be adjusted at COD in order to ensure an IRR based return of 14.00% on equity (while treating the project as a Build-Own-Operate type project). However as discussed in the relevant section of this Tariff Petition that 14.00% on equity is subject to acceptance of assumptions and Project Costs detailed in this Tariff Petition. Any resultant upward revision in 14.00%, because of any revision in assumptions or Project Cost, the revised increased rate is to be used for adjustments in Project Costs at COD.

10. CONSIDERATIONS WITH RESPECT TO EPA

10.1. ENERGY PRODUCTION

ZPNECL has assumed an initial energy estimate of 168,630 MWh for development of this tariff petition. This estimate is based on *Probability of Exceedance (PoE)* level of P50.

The probability of Exceedance describes how confident a calculated result is; in this case it relates to energy production.

For calculation of P-50 based energy estimate following method has been used for resource assessment of the Project:

In order to conduct the detailed resource assessment, Site assessment surveys were conducted, solar resource from different commonly used meteorological database were reviewed and conceptual PV plant design was modelled in "PVsyst".

Based on the preliminary findings from site assessment, Solar GIS is selected for the solar resource and energy yield calculations. The long term annual average solar resources i.e. Global Horizontal Irradiation (GHI) estimated based on 10 years of solar data (2005-2014) is found to be 1754.4 kWh/m^2. This level of solar resource is attractive for the development of PV project. The Project energy has been estimated based on the specifications provided by the equipment manufacturer (datasheet).

For the energy estimation, following equipment is considered:

- Panels: Zhangjiagang SEG-P60 260W & 265W
- Inverters: Sungrow SG630 MX

The calculations are performed in professional software PVSyst 6.3.8 and all losses have been taken into account. The energy yield estimation considers a preliminary conceptual design comprising of Si-Poly solar PV module from Zhangjiagang and central inverter from Sungrow.

The 100 MWp solar PV project is expected to produce 168,630 MWh during its first year of operation. The corresponding capacity factor is estimated as 19.25%.

11. GENERAL ASSUMPTIONS

The following have been assumed while calculating the Reference Generation Tariff and changes in any of these assumptions will result in changes in the Reference Generation Tariff.

1. Debt: Equity ratio is assumed to be 70:30

2. Foreign lenders shall contribute towards funding 100% of the Debt (LIBOR based financing).

3. Interest rate for LIBOR based debt has been determined based on 6 Month LIBOR (1.45 % as on June 30, 2017) plus 3.5% spread and semi-annual indexation on the same will be allowed by NEPRA.

4. Sinosure fee will be 0.76 % p.a. (including WHT).

5. Indexation against PKR / USD variations will be permitted for debt servicing payments to be made for settlement of foreign source debt.

6. ROE of 14% (IRR based) is assumed, that is subject to the acceptance by NEPRA of the assumptions and Project Costs set out in this Tariff Petition.

7. Exchange rate have been assumed to be PKR 105 / USD.

8. Any taxes federal, provincial, local or district, stamp duties and levies etc. which are not factored in the tariff calculation shall be treated as pass through items, in terms of the EPA.

9. No customs duties and income tax have been considered for imports. Any changes in the customs duties or any other duty or tax on import of equipment and material will be treated as "pass through" to the Purchaser. Similarly, customs duties on spare parts after COD will be "passed through" to the Purchaser.

10. Any change in the existing structure of sales tax that results in negative impact on project is assumed to be adjusted in tariff at COD.

11. Deduction of withholding tax is assumed only in the construction contract. No withholding tax has been considered in the suppliers contract. Any additional tax, if levied, will be "pass through" to the Purchaser.

12. 7.5% withholding tax on dividend is assumed. Any changes in the aforesaid withholding tax regime will be "pass through" to the Purchaser.

13. The Zakat deduction on dividends (currently @ 2.5%), as required to be deducted under Zakat Ordinance, is to be considered as "pass through".

14. Sindh Infrastructure Development Surcharge and Punjab Infrastructure Development Cess on the imports for the Project have not been assumed and the same shall be adjusted upon COD as per actual.

15. Federal Excise Duty has not been assumed as part of the Project Cost; in case the same is required to be paid by the Project, the same should be treated as pass-through under the tariff.

16. The Purchaser shall be exclusively responsible for the financing of construction, operation and maintenance of the interconnection and transmission lines as per the prevailing policy at the time of tariff determination

17. Main Energy meter will be provided by the Purchaser at its own cost.

18. Financing terms are based on the initial discussion 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, benchmark index (LIBOR) and the spread margin of the financial institution.

19. Pre-COD insurance costs are considered based on the estimates in line with market rates and Group's strengths. Premium rate for the insurance arrangements will be finalized at the time of financial close.

20. No hedging cost is assumed for exchange rate fluctuations during construction and all cost overruns resulting from variations in the exchange rate during construction shall be included in the Project Cost.

21. Project contingency and maintenance reserves are not included in Reference Generation Tariff calculations. If required by lenders, these will be adjusted accordingly in the Reference Generation Tariff.

22. Any other assumptions that are not expressly stated herein but are based on the EPA draft negotiated by ZPNECL with the Purchaser. Consequently, any change in any such assumptions may lead to change in the Reference Generation Tariff,

23. The payments to Workers Welfare Fund and Workers Profit Participation Fund have not been accounted for in the Project budget and have been assumed to be reimbursed at actual by the Purchaser.

24. Adjustment in Reference Tariff in respective years for annual degradation, as provided under Section 9.3 (*Annual Degradation Adjustment*).

25. Insurance during operations will be allowed annually by NEPRA subject to the maximum cap of 0.75% of EPC cost.

26. In case of any unintentional error or omissions, typographic errors, and any genuine assumption being overlooked, the same will be corrected/incorporated and advised to NEPRA as soon as the Project Company becomes aware of it.

27. Any incentives given to any other solar IPP shall also be given to ZPNECL.

12. TARIFF SUMMARY

In summation, ZPNECL herewith most respectfully submits before NEPRA for its approval the matters set out in this Tariff Petition and further prays for NEPRA to kindly approve the following:

12.1. The Project Costs and related arrangements stated in this Tariff Petition be allowed to the Petitioner.

12.2. Energy production estimate of 168.63 GWh per annum for calculation of the tariff and energy payments for the years 1 – 25 after COD.

12.3. Funding of the Project on a 70:30 – Debt: Equity basis.

12.4. 100 % foreign debt on LIBOR basis.

12.5. LIBOR based debt financing (100%) with a base rate equal to 6-Month LIBOR plus a spread of 3.50%.

12.6. Sinosure has been calculated at 0.76% (inclusive of 5% withholding tax), it can be adjusted based on actual figure after financial close

12.7. Sharing of any CER related revenues subsequently realized, as per the Government of Pakistan policy.

12.8. A Return on Equity of 14%, reasons for which have been provided in detail in Section 6.3 (*Return on Equity*) above.

12.9. The Reference Generation Tariff provided under Section 4.1 (*Reference Generation Tariff*) above along with individual tariff components and debt schedule provided under Section 8.4 (*Debt Repayment Schedule*) above.

12.10. Indexations and adjustments for the individual tariff components, as detailed in Section 9 (*Indexations, Escalations and Cost Adjustment*) above.

12.11. Adjustment in Reference Tariff in respective years for annual degradation, as provided under Section 9.3 (*Annual Degradation Adjustment*).

12.12. Adjustments at COD, as provided under Section 9.4 (*Adjustments at COD*) above.

12.13. The General Assumptions, as provided in this Section 11 (*General Assumptions*).

Furthermore, given the advance stage of the Project, NEPRA is kindly requested to process the Tariff Petition at the earliest thereby enabling ZPNECL to proceed further with the development process.

Zhenfa Pakistan New Energy Company (Private) Limited
Dated: September 26, 2017