National Electric Power Regulatory Authority
Islamic Republic of Pakistan

Registrar

NEPRA Tower, Attaturk Avenue (East), G-5/1, Islamabad
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Web: www.nepra.org.pk, E-mail: registrar@nepra.org.pk

No. NEPRA/R/DL/LAG-352/ 1727-33

February 01, 2017

Mr. Nlu Chao
Chief Executive Officer
Cacho Wind Energy (Private) Limited
20th Floor, BRR Tower, Hassan Ali Street,
Off: I.I.Chundrigar Road, Karachi.

Subject: **Grant of Generation Licence No. WPGL/38/2017**
Licence Application No. LAG-352
Cacho Wind Energy (Private) Limited (CWEPL)

Reference: Your application vide letter No. Nil, dated Nil (received on May 30, 2016).

Enclosed please find herewith Generation Licence No. WPGL/38/2017 granted by National Electric Power Regulatory Authority (NEPRA) to Cacho Wind Energy (Private) Limited (CWEPL) for its 50.00 MW Wind Power Plant located at Deh Kohistan 7/1, Tapo Jhimpir, District Thatta in the province of Sindh, pursuant to Section 15 of the Regulation of Generation, Transmission and Distribution of Electric Power Act (XL of 1997). Further, the determination of the Authority in the subject matter is also attached.

2. Please quote above mentioned Generation Licence No. for future correspondence.

Enclosure: Generation Licence (WPGL/38/2017)

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01.02.17

(Syed Safeer Hussain)

Copy to:

1. Secretary, Ministry of Water and Power, A-Block, Pak Secretariat, Islamabad.
2. Chief Executive Officer, Alternative Energy Development Board (AEDB), 2nd Floor, OPF Building, G-5/2, Islamabad
3. Chief Executive Officer, NTDC, 414-WAPDA House, Lahore
4. Chief Executive Officer, CPPA-G, 6th Floor, Shaheed-r-Millat Secretariat, Jinnah Avenue, Blue Area, Islamabad
5. Chief Executive Officer, Hyderabad Electric Supply Company Limited (HESCO), WAPDA Offices Complex, Hussainabad, Hyderabad
6. Director General, Environment Protection Department, Government of Sindh, Complex Plot No. ST-2/1, Korangi Industrial Area, Karachi.

National Electric Power Regulatory Authority (NEPRA)

Determination of the Authority in the Matter of Application of Cacho Wind Energy (Pvt.) Limited for the Grant of Generation Licence

Case No. LAG-352

(A). Background

(i). Government of Pakistan has set up Alternative Energy Development Board (AEDB) for harnessing renewable energy resources in the Country. AEDB has issued Letter of Intent (LoI) to various renewable energy developers for setting up projects in the country, under the Policy for Development of Renewable Energy for Power Generation 2006 (the RE Policy).

(ii). The provinces are also empowered to set up generation facilities of any size, location and fuel of their choice. In view of the said, Government of Sindh has issued an LoI dated November 28, 2014 to Harvey Energy Private Limited (the sponsors) for establishing 2x50 MW wind based generation facility/wind power plant in the Jhimpir wind corridor, District Thatta, in the Province of Sindh. According to the terms and conditions of the LoI, the sponsors carried out a feasibility study of the project. In order to implement the projects, the sponsors have incorporated a special purpose vehicle in the name of Cacho Wind Energy (Pvt.) Limited -CWEPL for establishing 50 MW wind based generation facility/wind power plant in the Jhimpir wind corridor, District Thatta, in the Province of Sindh. According to the terms and conditions of the LoI, the sponsors carried out a feasibility study of the project.

(B). Filing of the Application

(i). In accordance with Section-15 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 ("the NEPRA Act"), CWEPL submitted an application on June 10, 2016 requesting for the grant of generation licence.

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(ii). The Registrar examined the submitted application to confirm its compliance with the NEPRA Licensing (Application and Modification Procedure) Regulations, 1999 (the Licensing Regulations). The Registrar found the application in compliant with the Licensing Regulations and submitted the matter for the consideration of the Authority seeking admission of the application or otherwise.

(iii). The Authority considered the matter in its Regulatory Meeting (RM-16-456), held on August 16, 2016 and found the form and content of the application in substantial compliance with Regulation-3 of the Licensing Regulations. The Authority admitted the application for consideration of the grant of the generation licence as stipulated in Regulation-7 of the Licensing Regulations and approved the advertisement containing (a). the prospectus; (b). a notice to the general public about the admission of the application of CWEPL, to invite the general public for submitting their comments in the matter as stipulated in Regulation-8 of the Licensing Regulations. Further, the Authority also approved the list of the relevant stakeholders to inform about the admission of the application of CWEPL and for seeking their comments to assist the Authority in the matter. Accordingly, the advertisement was published in the National Newspaper on August 19, 2016.

(iv). Apart from the above, separate letters were also sent to government ministries, their attached departments and representative organizations etc. on August 22, 2016. The said stakeholders were directed to submit their views/comments for the assistance of the Authority.

(C). Comments of Stakeholders

(i). In reply to the above, the Authority received comments from three (03) stakeholders. These included Board of Investment, Engineering Development Board and Energy Department, Govt. of Sindh. The salient points of the comments offered by the above mentioned stakeholders are summarized in the following paragraphs: -

(a). Board of Investment in its comments submitted that energy sector is the priority sector of the government to cater the

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short fall in the country. Board of Investment being an investment promoting and facilitating agency has also been making its efforts to attract investment in energy sector, Board of Investment understands that affordable and smooth supply of energy is the backbone for industrial growth as well as attracting foreign direct investment in the country. In view thereof, Board of Investment supports the grant of generation licence, subject to consumer friendly and competitive tariff and completion of all codal/technical formalities under rules & regulations;

(b). Engineering Development Board submitted that as per C.G.0-03/2015 power plants of capacity of 25 MW and above are exempted from payment of duties and taxes as defined under the relevant notifications, and no condition for the local manufacturing is applicable on the import of these power plants. While evaluating the list, it was observed that the list of importable items also contains items which otherwise could not be imported as part of Plant, Machinery & Equipment etc as the same do not fall in the criteria defined under CGO-3 2015. Therefore, while recommending the list of equipment, it may be ensured that irrelevant equipment are not permitted which are not directly used as power plant equipment;

(c). Energy Department, Govt. of Sindh in its comments submitted that there is a huge potential of wind energy in the province, which has so far not been properly utilized despite severe energy crisis faced by the country for the last ten years. The Energy Department is actively supporting the project sponsors for timely development of environmental friendly and fuel free power project in line with the RE policy. The renewable energy sources have multi dimensional benefits and far reaching impact over the national economy (i.e. shorter gestation period, rapid deployment, no fuel requirement, and substitution to imported fuel, energy security and environment friendly). Moreover, most renewable energy projects, especially wind

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power projects, are less prone to large scale failure because they are distributed and modular. If some of the equipment in the system is damaged, the rest can typically continue to operate. This makes renewable energy sources more resilient than other tradition power plants in the face of extreme weather events. Furthermore, no one can guarantee that the price of oil will remain at the current levels as there is no way to predict the same. Therefore, the indigenous power projects especially based on commercially viable wind power projects may needs to be encouraged. The development of wind power projects in remote areas of Jhimpir and Gharo will not only generate power but will also benefit the local community at large by bringing in jobs, health, educational and clean water facilities. The Project Company has opted for high yield capacity turbines of 2.5 MW, in line with NEPRA's policy of promoting latest technologies with higher efficiencies and higher outputs. The Energy Department, Govt. of Sindh, being a major stakeholder of the wind power development in the province requests the NEPRA to consider the request for issuance of generation license to the project company in respect of its proposed wind project and also direct the other stakeholders specially CPPA-G and NTDC for early arrangements of power evacuation.

(ii). The above comments of the stakeholders were examined. Comments of Board of Investment and Energy Department, Govt. of Sindh were found in favour of the grant of generation licence to CWEPL, whereas Engineering Development Board in its comments highlighted certain issues regarding import of plant equipment. Accordingly, it was considered appropriate seeking perspective of CWEPL on the comments/observations of Engineering Development Board.

(iii). In response to the comments/observations of Engineering Development Board, CWEPL submitted an undertaking wherein it is stated that, while recommending list of equipment, it will be ensured that irrelevant equipment are not permitted which are not directly used as power plant equipment.

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(iv). The reply submitted by the applicant were examined and found satisfactory. Accordingly, it was considered appropriate to process the application of the applicant for the grant of generation licence as stipulated in the Licensing Regulations and NEPRA Licensing (Generation) Rules, 2000 (the Generation Rules).

(D). Analysis of the Authority

(i). The Authority has examined the entire case in detail. This included the information provided by the applicant along with the generation licence application, feasibility study of the project, the interconnection and dispersal arrangement studies, environmental study, provisions of the RE Policy and other relevant information.

(ii). The main features of the application under consideration are that the applicant company i.e. CWEPL was incorporated as a company limited by shares under Section-32 of the Companies Ordinance 1984 (XLVII of 1984), having Corporate Universal Identification No. 0097935, dated February 22, 2016. The registered/business office of the company is 20th Floor, BRR Tower, Hassan Ali Street, Off: I.I. Chandigarh Road, Karachi. The memorandum of association of the company includes the business of power generation and sale as one of its objectives.

(iii). Energy Department, Government of Sindh has issued LoI to CWEPL. After the issuance of the LoI, the sponsors carried out various studies to assess the feasibility of the Project. These studies included the wind resource assessment, geo technical investigation, digital topographic map, initial environmental examination and grid interconnection study. The complete feasibility study has been submitted to Energy Dept. Govt. of Sindh. Further, Energy Dept. Govt. of Sindh has recommended CWEPL for grant of generation licence.

(iv). CWEPL is planning to install a 50.00 MW wind power plant in Deh Kohistan 7/1, Tapo Jhimpir, District Thatta, in the Province of Sindh. To implement the project, CWEPL has selected (GW121/2.5 MW) IEC wind class IIIB wind

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turbine generators of Goldwind, China. Goldwind is one of the leading WTG manufacturers and has significant market share in the world market. The proposed project will be consisting of twenty (20) wind turbine generators, making the total installed capacity of the generation facility to 50.00 MW. The cut-in, rated and cut-out wind speed for (GW121/2.5 MW) wind turbine generators are 3m/s, 9.3m/s and 22m/s respectively.

(v). Regarding grid interconnection of the project, the Authority observes that CWEPL has carried out an interconnection and system stability study for dispersal of electric power from the above mentioned wind power plant through NTDC. According to the said study, the power generated by CWEPL shall be dispersed at 132-KV level. The dispersal/interconnection arrangement will be consisting of 132-KV double circuit transmission line looping in-out a sub cluster and connecting nearby wind power plants to Jhimpir-New 132KV collector substation. NTDC through its letter No. 8805/GM/GSC/NTDC dated December 01, 2016 has approved the interconnection study of CWEPL and has issued power evacuation certificate to CWEPL. NTDC has further clarified that the power to be generated by CWEPL will be evacuated by July, 2019 and the power injected through the project of CWEPL will not have any adverse effect on the national grid as required under the grid code.

(vi). Regarding impact of the project on environment, the Authority is of the opinion that the proposed wind power plant of CWEPL is based on a renewable energy source and does not cause any pollution however, the operation of the wind power plant may cause some other type of pollution including soil pollution, water pollution and noise pollution during construction and operation. In this regard, CWEPL carried out an Initial Environment Examination Study and Environmental Protection Agency, Government of Sindh has accorded its approval for the same.

(vii). Regarding land of the project, the Authority has observed that that Land Utilization Department, Govt. of Sindh has allotted 930 acres of land (on 30 years lease basis), to the sponsors of the project in Deh Kohistan 7/1, Tapo Jhimpir, District Thatta, in the Province of Sindh for 100 MW wind power plant.

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(viii). In view of the clarification and justifications given above, the Authority is of the considered view that the project of CWEPL fulfills the eligibility criteria for grant of generation licence as given under the NEPRA Act, rules and regulations for grant of generation licence.

(E). Grant of Generation Licence

(i). The sustainable and affordable energy/electricity is a key prerequisite for socio-economic development of any country. In fact, the economic growth of any country is directly linked with the availability of safe, secure, reliable and cheaper supply of energy/electricity. In view of the said reasons, the Authority is of the considered opinion that for sustainable development, all indigenous power generation resources including renewable energy must be developed on priority basis.

(ii). The existing energy mix of the country is heavily skewed towards the costlier thermal power plants, mainly operating on imported furnace oil. The import of furnace oil for electric power generation not only causes depletion of the precious foreign exchange reserves of the country but is also an environmental concern. Therefore, in order to achieve sustainable development it is imperative that indigenous RE resources are given priority for power generation and their development be encouraged. The Energy Security Action Plan 2005 (ESAP) of GoP, also recognizes this very aspect of power generation through RE and envisages that at least 5% of total national power generation capacity to be met through RE resources by 2030. The Authority considers that the proposed project of CWEPL is consistent with the provisions of ESAP. The project will help in diversifying the energy portfolio of the country. Further, it will not only enhance the energy security of the country by reducing the dependence on imported furnace oil but will also help reduction in carbon emission by generating clean electricity, thus improving the environment.

(iii). The term of a generation licence under Rules-5(1) of the Generation Rules is to commensurate with the maximum expected useful life of the units comprised in a generating facility, except where an applicant for a generation licence consents to a shorter term. As per international benchmark, the useful life of wind turbine generators is considered as 20 to 25 years. In this regard, it is

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observed that the anticipated Commercial Operation Date (COD) of the wind power plant of CWEPL is July 31, 2019 and it will have a useful life of more than twenty (20) years from its COD. Forgoing in view, the Authority fixes the term of the generation licence as twenty (20) years from COD of the project.

(iv). Regarding the tariff that CWEPL will charge from its power purchaser/CPPA-G, it is hereby clarified that under Section-7(3)(a) of the NEPRA Act, determining tariff, rate and charges etc. is the sole prerogative of the Authority. In view of the said, the Authority directs CWEPL to charge the power purchaser only such tariff which has been determined, approved or specified by the Authority.

(v). Regarding land of the of the project, it is clarified that Land Utilization Department, Govt. of Sindh has allotted 930 acres of land to CWEPL for development of 100 MW wind power plant out of which 502.70 acres of land would be utilized for this project as shown in schedule-I of the licence. In this regard, the Authority directs CWEPL that the aforementioned land shown in schedule-I shall be exclusively used by CWEPL for the proposed wind power project and CWEPL cannot carry out any other activity on this land except with prior approval of the Authority.

(vi). Regarding compliance with the environmental standards, the Authority directs CWEPL to ensure that the project will comply with the environmental standards during the term of the generation licence. In view of the said, the Authority has included a separate article (i.e. Article-10) in the generation licence along with other terms and conditions that the licensee will comply with relevant environmental standards. Further, the Authority directs CWEPL to submit a report on a bi-annual basis, confirming that operation of its project is compliant with required environmental standards as prescribed by the concerned environmental protection agency.

(vii). The proposed wind power plant of CWEPL will be using renewable energy resource for generation of electric power. Therefore, the project may qualify for the carbon credits under the Kyoto Protocol. Under the said protocol, projects coming into operation up to the year 2020 can qualify for the carbon credits. CWEPL has informed that the project will achieve COD by July 31, 2019 which is

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within the deadline of the Kyoto Protocol. In view of this, an article (i.e. Article-14) for carbon credits and its sharing with the power purchaser has been included in the generation licence. In view of the said, the Authority directs CWEPL to initiate the process in this regard at the earliest so that proceeds for the carbon credits are materialized. CWEPL shall be required to share the proceeds of the carbon credits with the power purchaser as stipulated in Article-14 of the generation licence.

In view of the above, the Authority hereby approves the grant of generation licence to CWEPL on the terms and conditions set out in the generation licence annexed to this determination. The grant of generation licence will be subject to the provisions contained in the NEPRA Act, relevant rules, regulations framed there under and other applicable documents.

Authority:

Maj. (R) Haroon Rashid
(Member)

Syed Masood-ul-Hassan Naqvi
(Member)

Himayat Ullah Khan
(Member/Vice Chairman)

Tariq Saddozai
(Chairman)

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01.02.17

National Electric Power Regulatory Authority
(NEPRA)
Islamabad – Pakistan

GENERATION LICENCE

No. WPGL/38/2017

In exercise of the Powers conferred upon the National Electric Power Regulatory Authority (NEPRA) under Section-15 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997, the Authority hereby grants Generation Licence to:

CACHO WIND ENERGY (PVT.) LIMITED

Incorporated under the Companies Ordinance, 1984
Corporate Universal Identification No. 0097935, dated February 22, 2016,

for its Generation Facility/Wind Power Plant Located at Deh Kohistan 7/1, Tapo Jhimpir, District Thatta, in the Province of Sindh

(Installed Capacity: 50.00 MW Gross ISO)

to engage in generation business subject to and in accordance with the Articles of this Licence.

Given under my hand on 01st day of ~~January~~ February Two Thousand & Seventeen and expires on 30th day of July Two Thousand & Thirty Nine.

Registrar 01.02.17

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Article-1
Definitions

1.1 In this Licence

(a). "Act" means the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997";

(b). "Applicable Documents" mean the Act, the NEPRA rules and regulations, any documents or instruments issued or determinations made by the Authority under any of the foregoing or pursuant to the exercise of its powers under the Act, the grid code, the applicable distribution code, if any, or the documents or instruments made by the licensee pursuant to its generation licence, in each case of a binding nature applicable to the licensee or, where applicable, to its affiliates and to which the licensee or any of its affiliates may be subject;

(c). "Authority" means the National Electric Power Regulatory Authority constituted under Section-3 of the Act;

(d). "Bus Bar" means a system of conductors in the generation facility/wind power plant of the Licensee on which the electric power of all the wind turbine generators or WTGs is collected for supplying to the Power Purchaser;

(e). "Carbon Credits" mean the amount of Carbon Dioxide (CO_2) and other greenhouse gases not produced as a result of generation of energy by the generation facility/ wind power plant, and other environmental air quality credits and related emissions reduction credits or benefits (economic or otherwise) related to the generation of energy by the generation facility/ wind power plant, which are available or can be obtained in relation to the generation facility/ wind power plant after the COD;

(f). "Commercial Operations Date (COD)" means the day immediately

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following the date on which the generation facility of the Licensee is Commissioned;

(g). "CPPA-G" means Central Power Purchasing Agency (Guarantee) Limited or any other entity created for the like purpose;

(h). "Distribution Code" means the distribution code prepared by XW-DISCO(s) and approved by the Authority, as it may be revised from time to time with necessary approval of the Authority;

(i). "Energy Purchase Agreement" means the energy purchase agreement, entered or to be entered into by and between the Power Purchaser and the Licensee, for the purchase and sale of electric energy generated by the generation facility/ wind power plant, as may be amended by the parties thereto from time to time;

(j). "Financing Documents" will have the same meaning as defined in the respective Implementation Agreements to be signed by the Licensee for its generation facility/ wind power plant;

(k). "Grid Code" means the grid code prepared by NTDC and approved by the Authority, as it may be revised from time to time by NTDC with the approval by the Authority;

(l). "HESCO" means Hyderabad Electric Supply Company Limited and its successors or permitted assigns;

(m). "IEC" means the International Electro-technical Commission and its successors or permitted assigns;

(n). "IEEE" means the Institute of Electrical and Electronics Engineers and its successors or permitted assigns;

(o). "Law" means the Act, relevant rules and regulations made there

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under and all the Applicable Documents;

(p). "Licensee" means **Cacho Wind Energy (Pvt.) Limited** and its successors or permitted assigns;

(q). "NTDC" means National Transmission and Despatch Company Limited and its successors or permitted assigns;

(r). "Policy" means the Policy for Development of Renewable Energy for Power Generation, 2006 of Government of Pakistan as amended from time to time;

(s). "Power Purchaser" means the CPPA-G purchasing electric power on behalf of XW-DISCO(s) from the Licensee, pursuant to an Energy Purchase Agreement for procurement of electricity;

(t). "Regulations" mean the National Electric Power Regulatory Authority Licensing (Application & Modification Procedure) Regulations, 1999 as amended or replaced from time to time;

(u). "Rules" mean the National Electric Power Regulatory Authority Licensing (Generation) Rules, 2000;

(v). "Wind Power Plant" or "Wind Farm" means a cluster of Wind Turbines in the same location used for production of electric power;

(w). "Wind Turbine Generator" or "WTG" means the machines installed at the generation facility/ wind power plant with generators for conversion of wind energy into electric power/energy;

(x). "XW DISCO" means an Ex-WAPDA distribution company engaged in the distribution of electric power.

1.2 Words and expressions used but not defined herein bear the meaning given thereto in the Act or rules and regulations issued under the Act.

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Article-2
Applicability of Law

This Licence is issued subject to the provisions of the Applicable Law, as amended from time to time.

Article-3
Generation Facilities

3.1 The location, size (capacity in MW), technology, interconnection arrangements, technical limits, technical and functional specifications and other details specific to the generation facility/ wind power plant of the Licensee are set out in Schedule-I of this Licence.

3.2 The net capacity of the generation facility/ wind power plant of the Licensee is set out in Schedule-II hereto.

3.3 The Licensee shall provide the final arrangement, technical and financial specifications and other specific details pertaining to its generation facility/ wind power plant before its COD.

Article-4
Term of Licence

4.1 The Licence is granted for a term of twenty (20) years from the COD of the generation facility/wind power plant.

4.2 Unless suspended or revoked earlier, the Licensee may apply for renewal of this licence ninety (90) days prior to the expiry of the above term, as stipulated in the Regulations.

Article-5
Licence fee

After the grant of this licence, the Licensee shall pay to the Authority the Licence fee, in the amount, manner and at the time set out in the National Electric Power Regulatory Authority (Fees) Rules, 2002.

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Article-6
Tariff

The Licensee shall charge only such tariff which has been determined, approved or specified by the Authority.

Article-7
Competitive Trading Arrangement

7.1 The Licensee shall participate in such manner as may be directed by the Authority from time to time for development of a Competitive Trading Arrangement. The Licensee shall in good faith work towards implementation and operation of the aforesaid Competitive Trading Arrangement in the manner and time period specified by the Authority. Provided that any such participation shall be subject to any contract entered into between the Licensee and another party with the approval of the Authority.

7.2 Any variation or modification in the above-mentioned contracts for allowing the parties thereto to participate wholly or partially in the Competitive Trading Arrangement shall be subject to mutual agreement of the parties thereto and such terms and conditions as may be approved by the Authority.

Article-8
Maintenance of Records

For the purpose of sub-rule (1) of Rule-19 of the Rules, copies of records and data shall be retained in standard and electronic form and all such records and data shall, subject to just claims of confidentiality, be accessible by authorized officers of the Authority.

Article-9
Compliance with Performance Standards

The Licensee shall comply with the relevant provisions of the National Electric Power Regulatory Authority Performance Standards (Generation) Rules 2009 as amended from time to time.

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Article-10
Compliance with Environmental Standards

10.1 The Licensee shall comply with the environmental standards as may be prescribed by the relevant competent authority from time to time.

10.2 The Licensee shall provide a certificate on a bi-annual basis, confirming that the operation of its generation facility is in line with environmental standards as prescribed by the relevant competent authority.

Article-11
Power off take Point and Voltage

The Licensee shall deliver power to the Power Purchaser at the outgoing bus bar of its grid station. The up-gradation (step up) of generation voltage up to the required dispersal voltage level will be the responsibility of the Licensee.

Article-12
Performance Data of Wind Power Plant

The Licensee shall install monitoring mast with properly calibrated automatic computerized wind speed recording meters at the same height as that of the wind turbine generators and a compatible communication/SCADA system both at its wind power plant and control room of the Power Purchaser for transmission of wind speed and power output data to the control room of the Power Purchaser for record of data.

Article-13
Provision of Information

13.1 The obligation of the Licensee to provide information to the Authority shall be in accordance with Section-44 of the Act.

13.2 The Licensee shall in addition to 13.1 above, supply information to the Power Purchaser regarding the wind data specific to the site of the Licensee and other related information on a regular basis and in a manner required by it.

13.3 The Licensee shall be subject to such penalties as may be specified in the relevant rules made by the Authority for failure to furnish such information as may be

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required from time to time by the Authority and which is or ought to be or has been in the control or possession of the Licensee.

Article-14
Emissions Trading /Carbon Credits

The Licensee shall process and obtain emissions/Carbon Credits expeditiously and credit the proceeds to the Power Purchaser as per the Policy.

Article-15
Design & Manufacturing Standards

15.1 The Wind Turbine Generator or WTG and other associated equipments of the generation facility/ wind power plant shall be designed, manufactured and tested according to the latest IEC, IEEE standards or other equivalent standards in the matter.

15.2 All the plant and equipment of the generation facility/ wind power plant shall be unused and brand new.

Article-16
Power Curve

The power curve for the individual Wind Turbine Generator or WTG provided by the manufacturer and as mentioned in Schedule-I of this Generation Licence, shall form the basis in determining the cumulative power curve of the generation facility/wind power plant.

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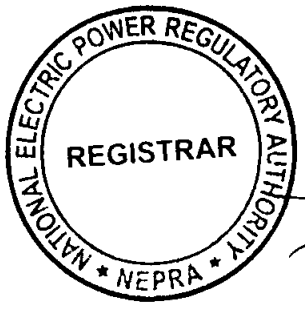
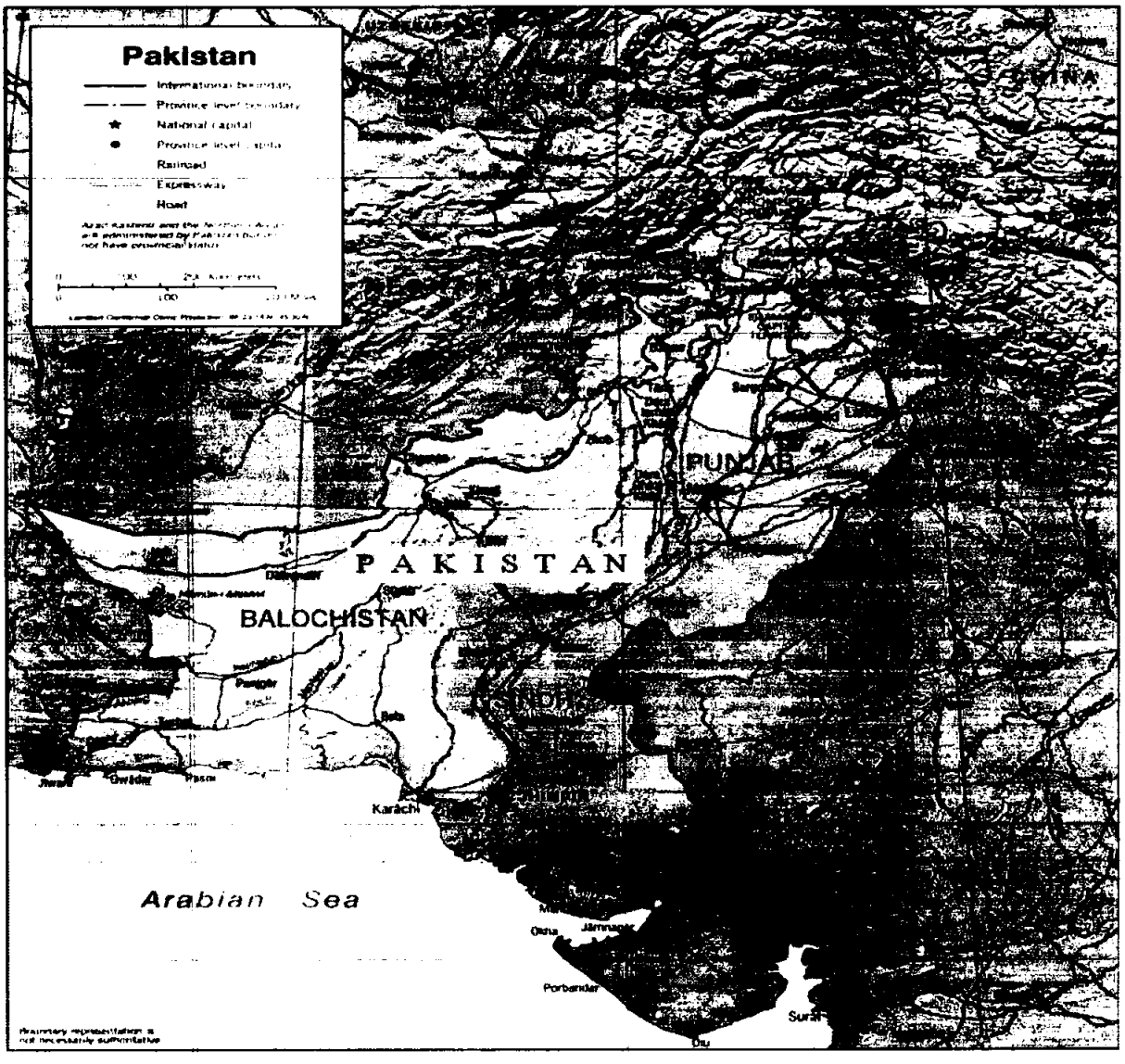
SCHEDULE-I

The Location, Size (i.e. Capacity in MW), Type of Technology,
Interconnection Arrangements, Technical Limits,
Technical/Functional Specifications and other details specific to the Generation Facility/Wind Farm of
the Licensee are described in this Schedule.



Site Location of the Generation Facility/Wind Power Plant of Cacho Wind Energy (Pvt.) Limited (CWEPL)



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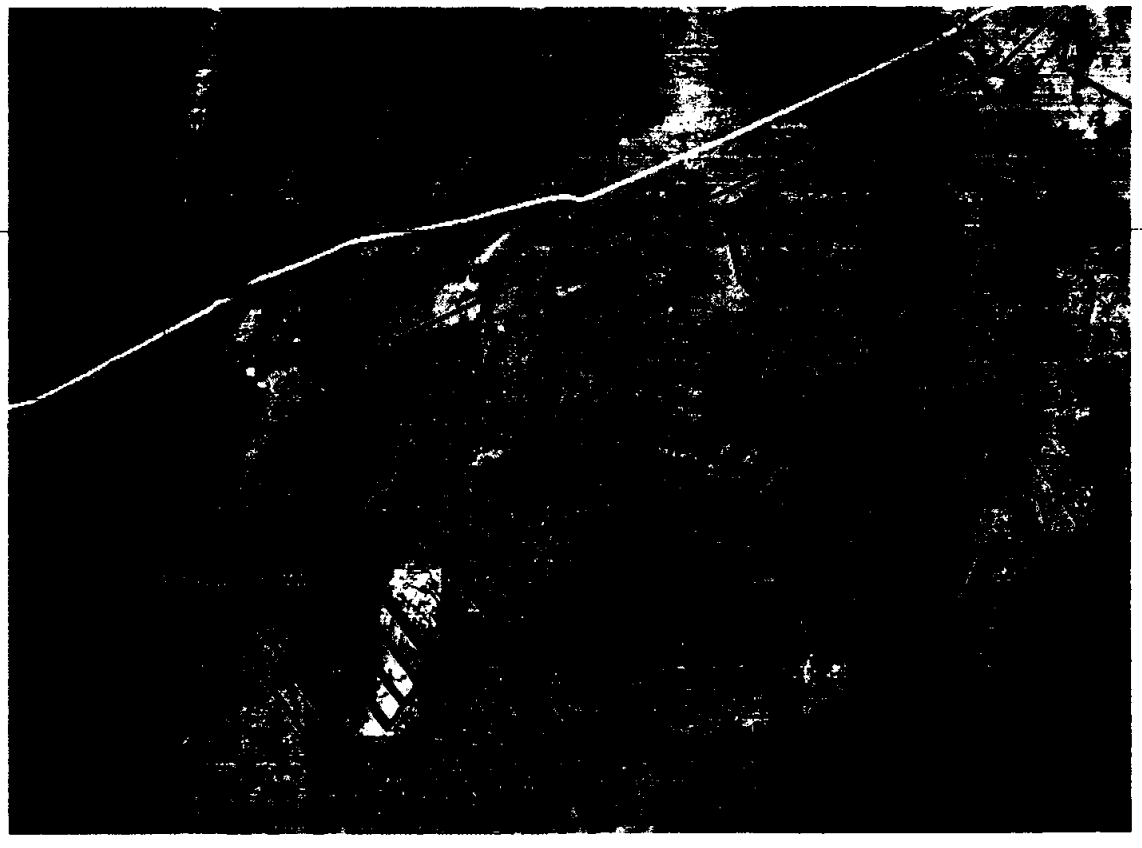
Layout of the Generation Facility/ Wind Power Plant of CWEPL



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Land Coordinates and Micro-Sitting of the Generation Facility/Wind Power Plant of CWEPL

Total Project Land:	502.70 Acres

S.NO	NAME	EASTING	NORTHING	LEVEL	LATITUDE	LONGITUDE
1	CA	375967.523	2770517.123	138.255	25°02'23.64207"	67°46'31.68823"
2	M1	379164.792	2767347.593	97.542	25°01'58.17673"	67°46'40.50606"
3	M2	376885.145	2764898.742	115.219	24°59'54.30997"	67°46'33.43055"
4	CE	375543.521	2766249.712	113.206	25°02'23.64207"	67°46'31.68823"
5	CF	375976.708	2768754.005	136.902	25°01'58.17673"	67°46'40.50606"
6	CG	375784.961	2770327.137	133.105	24°59'54.30997"	67°46'33.43055"

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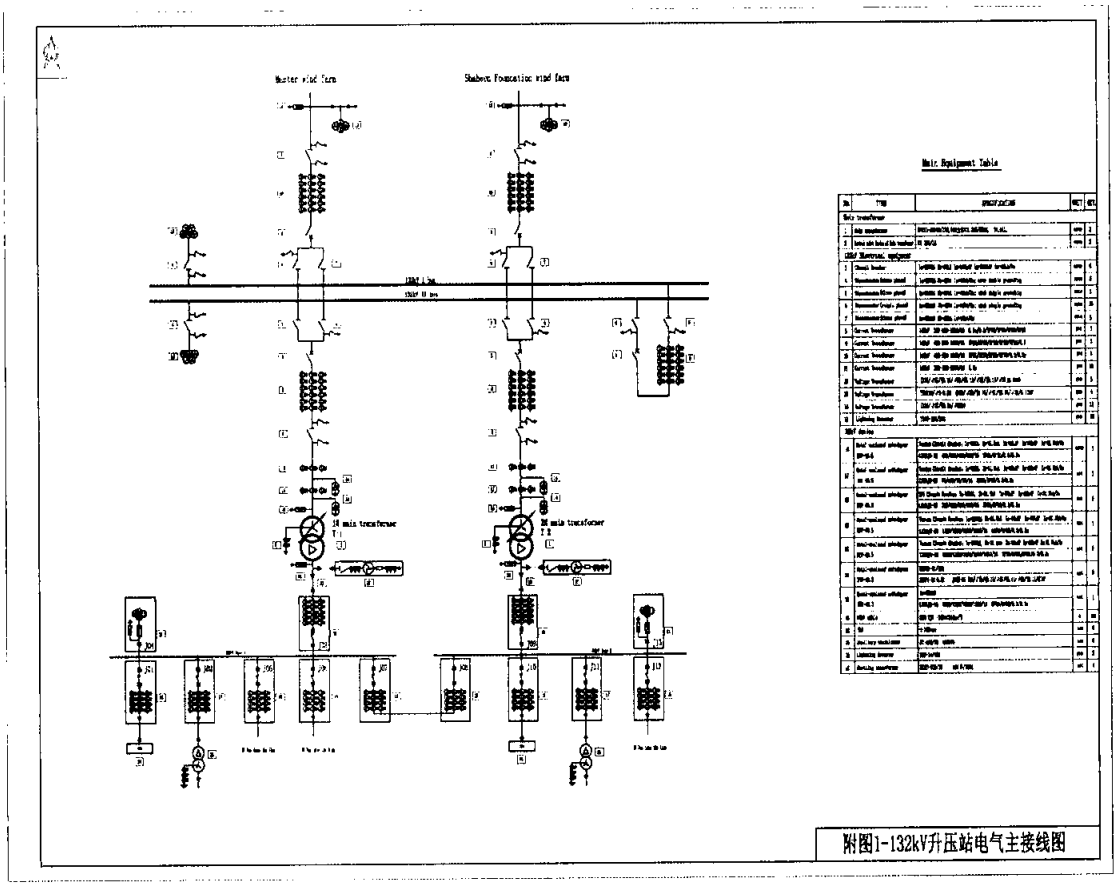
Single Line Diagram (Electrical) of the Generation Facility/Wind Power Plant of CWEPL



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Interconnection Arrangement for Dispersal of Power from the Generation Facility/Wind Power Plant of CWEPL

The power generated from the Generation Facility/Wind Power Plant/Wind Farm of CWEPL shall be dispersed to the National Grid through the load center of HESCO.

(2). The proposed interconnection arrangement /transmission facilities for dispersal of power will consist of the following:-

(a). A new 220/132 kV Jhimpir-2 substation 3x250 MVA, 220/132 kV transformers.

(b). 220 kV double circuit (D/C) transmission line, approx. 18 km long, on twin-bundled Greeley conductor for looping in/out of one circuit of the existing Jamshoro- KDA-33 D/C transmission line at Jhimpir-2.

(c). 220 kV D/C transmission line, approx. 7 km long, on twin-bundled Greeley conductor for looping In/Out of one of the planned Jhimpir New (Jhimpir-1)- Gharo New D/C transmission line at Jhimpir-2.

(d). 132 kV D/C transmission line, approx. 50 km long on twin bundled Greeley conductor for connecting 7 wind power plants including CWEPL with Jhimpir-2. In this scheme, the interconnection of CWEPL includes 132 kV double circuit transmission line (approximately 3 KM), on twin-bundled Greeley conductor for looping in/out from CWEPL on the 132 kV single circuit from the wind power plants of Artistic and Gul Ahmed.

(3). Any change in the above mentioned interconnection arrangement /transmission facilities duly agreed by CWEPL, NTDC and HESCO shall be communicated to the Authority in due course of time.

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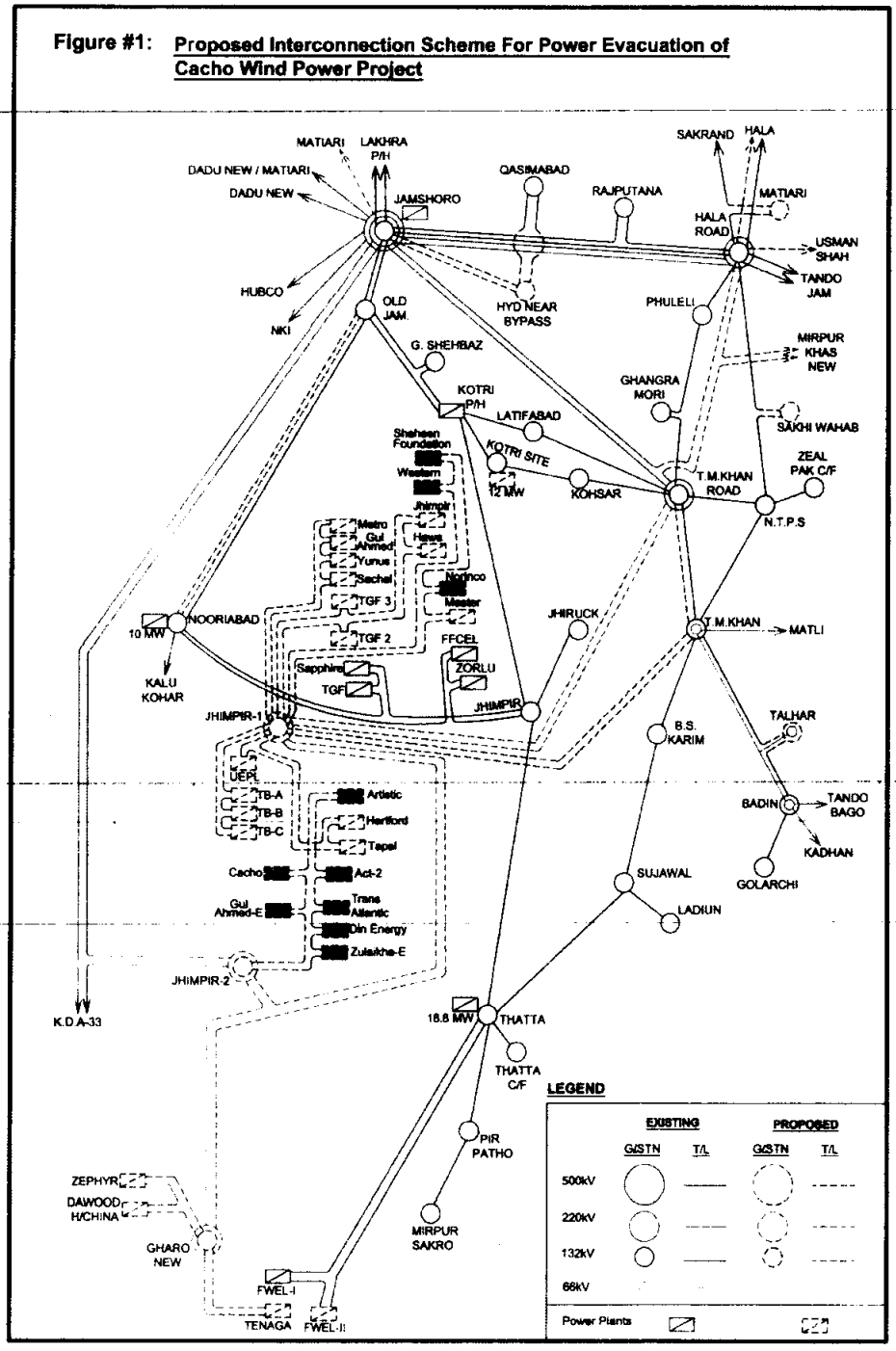
Schematic Diagram for Interconnection Arrangement for Dispersal of Power from the Generation Facility/Wind Power of CWEPL

Figure #1: **Proposed Interconnection Scheme For Power Evacuation of Cacho Wind Power Project**



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Detail of Generation Facility/Wind Power Plant/ Wind Farm of CWEPL

(A). General Information

(i).	Name of the Company/Licensee	Cacho Wind Energy (Pvt.) Limited
(ii).	Registered/Business Office	20th Floor, BRR Tower, Hassan Ali Street. Off: I.I. Chandigarh Road, Karachi.
(iii).	Plant Location	Deh Kohistan 7/1, Tapo Jhimpir, District Thatta, in the Province of Sindh
(iv).	Type of Generation Facility	Wind Farm/Wind Power Plant

(B). Wind Farm Capacity & Configuration

(i).	Wind Turbine Type, Make & Model	Goldwind GW121/2500, Permanent Magnet Direct Drive (PMDD)
(ii).	Installed Capacity of Wind Farm (MW)	50.00 MW
(iii).	Number of Wind Turbine Units/Size of each Unit (KW)	20x2.50 MW

(C). Wind Turbine Details

(a).	Rotor	
(i).	Number of blades	3
(ii).	Rotor diameter	121 m
(iii).	Swept area	11595 m^2
(iv).	Power regulation	Combination of blade pitch angle adjustment, and generator / converter torque control.
(v).	Cut-in wind speed	3 m/s
(vi).	Rated wind Speed	9.3 m/s
(vii).	Cut-out wind speed	22 m/s
(viii).	Extreme wind speed	52.5 m/s

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(ix)	Pitch regulation	Integrated PLC Control
(b).	**Blades**	
(i).	Blade length	59.5 m
(ii).	Material	Reinforced fiberglass plastic
(iii).	Weight	14697 Kg
(c).	**Generator**	
(i).	Nominal Power	2650 kW
(ii).	Voltage	690 V
(iii).	Type	Permanent magnet synchronous generator
(iv).	Degree of Protection	IP54
(v).	Coupling	Y-Connection
(vi).	Power factor	±0.95
(d).	**Control System**	
(i).	Type	PLC
(ii).	Scope of monitoring	Central and Remote monitoring of different parameters, e.g. temperature sensors, pitch parameters, speed, generator torque, wind speed and direction, etc.
(iii).	Recording	Normal Operation, Safety Protection, Fault Inspection and Handling, Operation Parameters setting and data recording
(e).	**Brake**	
(i).	Design	3 Aerodynamic brakes for each blade
(ii).	Operational brake	Aerodynamic Brake
(iii).	Secondary brake	Hydraulic Rotor Lock (for maintenance only)
(f).	**Tower**	
(i).	Type	Conical barrel tube
(ii).	Hub height	90 m

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(D). Other Details

(i).	Project Commissioning Date (Anticipated)	July 31, 2019
(ii).	Expected Life of the Project from Commercial Operation Date (COD)	20 Years

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Power Curve of Wind Turbine Generator of Goldwind GW12/2500 (Tabular)

3.5	113
4.5	279
5.5	513
6.5	876
7.5	1365
8.5	1904
9.5	2428
10.5	2520
11.5	2538
12.5	2550
13.5	2550
14.5	2550

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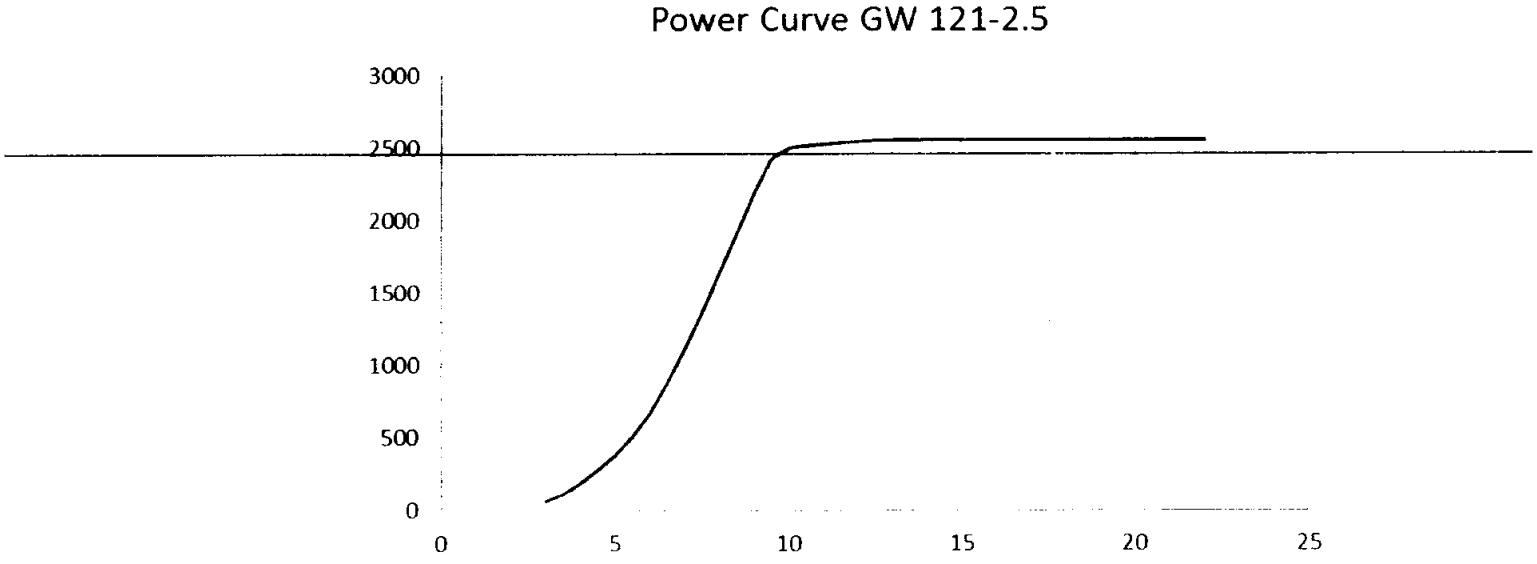
Power Curve of Wind Turbine Generator of Goldwind GW12/2500 (Graphical)



SCHEDULE-II

The Total Installed/Gross ISO Capacity (MW), Total Annual Full Load Hours, Average Wind Turbine Generator (WTG) Availability, Total Gross Generation of the Generation Facility/Wind Farm (in GWh), Array & Miscellaneous Losses (GWh), Availability Losses (GWh), Balance of Plant Losses (GWh) Annual Energy Generation (GWh) and Net Capacity Factor of the Generation Facility /Wind Farm of Licensee are given in this Schedule

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SCHEDULE-II

(1).	Total Installed Gross ISO Capacity of the Generation Facility /Wind Farm (MW/GWh)	50.00 MW
(2).	Total Annual Full Load Hours	3369 Hrs
(3).	Average Wind Turbine Generator (WTG) Availability	95.0 %
(4).	Total Gross Generation of the Generation Facility/Wind Farm (in GWh)	210.59 GWh
(5).	Array & Miscellaneous Losses GWh	23.66 GWh
(6).	Availability Losses GWh	10.52 GWh
(7).	Balance of Plant Losses GWh	7.94 GWh
(8).	Annual Energy Generation (20 years equivalent Net AEP) GWh	168.47 GWh
(9).	Net Capacity Factor	38.45 %

Note

All the above figures are indicative as provided by the Licensee/CWEPL. The net energy available to power purchaser for dispatch will be determined through procedures contained in the energy purchase agreement.

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