National Electric Power Regulatory Authority
Islamic Republic of Pakistan

Registrar

NEPRA Tower, Attaturk Avenue (East), G-5/1, Islamabad
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No. NEPRA/R/DL/LAG-354/ 236-42

January 05, 2017

Mr. Mustafa Lakdawala
Director
Western Energy (Private) Limited
F-25, Block 5, Rojhan Street,
Kehkashan, Clifton, Karachi.

Subject: **Grant of Generation Licence No. WPGL/37/2017**
Licence Application No. LAG-354
Western Energy (Private) Limited (WEPL)

Reference: *Your application vide letter No. WEL/NEPRA/003/16, dated June 08, 2016 (received on June 9, 2016).*

Enclosed please find herewith Determination of the Authority in the matter of Application of "Western Energy (Private) Limited (WEPL)" for the "Grant of Generation Licence" along with Generation Licence No. WPGL/37/2017 annexed to this determination granted by the National Electric Power Regulatory Authority (NEPRA) to WEPL for its 50.00 MW Wind Power Plant located at Jhimpir, near Nooriabad, 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).

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

Enclosure: Generation Licence
(WPGL/37/2017)

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05.01.17
(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-e-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 Western Energy (Private) Limited

December 29, 2016
Case No. LAG-354

(A). Background

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

(ii). AEDB issued a LOI to Western Energy (Private) Limited (WEPL) on March 06, 2013, for setting up a 15 MW wind based generation facility/wind power plant in the Jhimpir wind corridor, district Thatta, in the province of Sindh. Later on AEDB vide its letter dated April 15, 214 upgraded the capacity of the project from 15 MW to 50 MW. According to the terms and conditions of the LOI, the applicant carried out a feasibility study of the project including *inter alia*, wind power plant equipment details, micro-sitting details, power production estimates based on wind mast data of the project site, soil tests reports, technical details pertaining to selected wind turbine generator and other allied equipment to be used in the wind power plant, electrical studies, environmental study and project financing etc. The said feasibility study has been approved by AEDB.

(B). Filing of Application

(i). In accordance with Section-15 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 ("the NEPRA Act"),

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WEPL submitted an application on June 09, 2016 requesting for the grant of generation licence.

(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 observed that the application lacked some of required information/documentation as stipulated in the Licensing Regulations. Accordingly, WEPL was directed to submit the missing information/documentation. WEPL completed the missing information/ documentation on August 12, 2016.

(iii). The Authority considered the matter and found the form and content of the application in compliance with Regulation-3 of the Licensing Regulations. The Authority admitted the application for the grant of the generation licence as stipulated in Regulation-7 of the Licensing Regulations. The Authority approved the advertisement containing (a). the prospectus; (b). a notice to the general public about the admission of the application of WEPL, 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 regarding admission of the application of WEPL and to seek their comments to assist the Authority in the matter, under Regulation-9 of the Licensing Regulations.

(iv). Accordingly, the advertisement was published in one (01) Urdu ("Daily Jang") and one (01) English ("Daily Times") national newspaper on August 26, 2016. Apart from the said, separate letters were also sent to government ministries, their attached departments, representative organizations and individual experts etc. on August 26, 2016. The said stakeholders were requested to submit their views/comments for assistance of the Authority.

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(C). Comments of Stakeholders

(i). In reply to the above, the Authority received comments from four (04) stakeholders. These included Board of Investment, Engineering Development Board, Anwar Kamal Law Associates and Energy Department Government of Sindh. The salient points of the comments of said stakeholders are summarized below:-

(a). Board of Investment submitted that it has no specific comments on determination of tariff of the project of WEPL. However, energy sector is the priority sector of the government to cater the short fall in the country. Smooth and affordable supply of energy is the backbone for industrial growth as well as attracting foreign direct investment in the country. Board of Investment supported the grant of generation licence subject to consumer friendly & competitive tariff and completion of all codal/technical formalities under rules & regulations;

(b). Engineering Development Board in its comments recommended that all efforts should be made to utilize the indigenous potential;

(c). Anwar Kamal Law Associates in its comments highlighted different issues of surplus capacity, underutilization of power plants and induction of new power plants on "take or pay basis" etc. Further, Anwar Kamal Law Associates has contended that RE power plants are not viable financially and economically due to higher upfront tariff and "must run condition". Anwar Kamal Law Associates also questioned the induction of RE projects in the current scenario (i.e. reduction in oil prices, RLNG contract with Qatar, upcoming coal power projects and introduction of competitive market etc.), affordability vs. availability of electric power and long term

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PPAs on "take or pay" basis etc. Anwar Kamal Law Associates requested the Authority that the application of WEPL may not be considered for grant of generation licence; and

(d). Energy Department Government of Sindh in its comments stated that it is actively supporting the project sponsors for early development of environmental friendly and fuel free power project in line with the RE policy, keeping in view the current energy crisis in the country.

(ii). The above comments of the stakeholders were examined and it was observed that Board of Investment, Engineering Development Board and Energy Department Government of Sindh have supported the grant of generation licence to WEPL. However, Anwar Kamal Law Associates has raised certain observations regarding grant of generation licence to WEPL. Therefore, the Authority considered it appropriate to seek perspective of WEPL on the observations of Anwar Kamal Law Associates.

(iii). In reply to the comments/observations of Anwar Kamal Law Associates, WEPL submitted that:

(a). The comments are general in nature and not specifically related to application of WEPL for the grant of generation licence, rather they are related to working of NEPRA and policies of Government of Pakistan for promotion of RE sector in Pakistan. WEPL appreciates the professional competence of Anwar Kamal Law Associates in the field of Law, however, the comments have been filed without fully understanding and appreciating the dynamics of the project, energy sector, financial and technical considerations relevant for determining project parameters. Therefore, the comments are liable to be dismissed being irrelevant.

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(b). However, to clarify the concerns raised in the comments it is submitted that presently Pakistan has the lowest contribution of RE in the energy mix which needs to be improved to the level of other developing countries. Therefore, mainstreaming of RE and greater use of indigenous resources will be helpful in diversifying the energy mix, reducing the dependence on any single source (particularly imported fossil fuels), mitigating supply disruptions and price fluctuation risks. Further, additional costs and risks relating to fuel stocking, transportation, and temporary substitute arrangements are also irrelevant for RE projects;

(c). Anwar Kamal Law Associates is not fully aware about the operational capacity and installed capacity, for instance hydro projects are dependent on the hydrology. Further, sizeable portion of installed capacity is inefficient and not economically viable to be operated. Fuel prices are volatile and we cannot assume the fuel prices to remain on the existing low level; and

(d). Although there are projects under construction on coal and RLNG fuels, however, the ever increasing demand of electricity will continue to exist, therefore, RE must maintain a sizeable share in the overall energy mix of the country. It is pertinent to mention that indigenous RE contribution will result in savings of precious foreign exchange.

(e). Comparison of earlier upfront tariffs with the current upfront tariff reveals the improvement of technology/plant factor and reduction in cost, these benefits are reflected in the current upfront tariff offered by the Authority. About the concerns of Anwar Kamal Law Associates on "take or pay" feature of RE Policy, it is submitted that replacing "take or pay" to "take and pay" would result in the end of IPP industry in Pakistan, which

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to date has been one of the most successful industry in Pakistan .

(iv). The above submissions of the applicant were examined and found plausible. Regarding the comments of Anwar Kamal Law Associates, the Authority observed that most of the comments are related to regulatory and policy decisions and reiteration of its earlier comments which have already been deliberated in the upfront tariffs and generation licence applications in detail. Foregoing in view, the Authority considered it appropriate to process the application of WEPL 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 generation licence application, of WEPL along with information provided with the generation licence application including feasibility study of the project, interconnection and dispersal arrangement studies, provisions of the Renewable Energy Policy, 2006 and relevant rules & regulations.

(ii). The applicant company is a private limited company incorporated under Section-32 of the Companies Ordinance, 1984 (XLVII of 1984), having corporate universal identification No. 0084483, dated July 09, 2013. The registered/business office of the company is F-25, Block 5, Rojhan Street, Kehkashan, Clifton, Karachi. The memorandum of association of the company, interalia, includes the business of power generation and sale as one of its business objects. According to the submitted memorandum of association of the company, total 10,000 shares of the company, are held by four individuals namely Mr. Tajwar Tapal, Mr. Tabish Tapal, Mr. M. Sadiq Tapal and Mr. Mustafa Lakdawala as 2500, 4500, 2500 and 500 shares respectively.

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(iii). The sponsors have selected (CSIC H111L-2.0MW) wind turbine generator of CSIC (Chongqing) Haizhuang Windpower Equipment Company Limited 2.0 MW each for the project and have proposed to install twenty five (25) wind turbine generators, making the total installed capacity of the wind power plant to 50 MW.

(iv). The applicant company is planning to install a 50.00 MW wind based generation facility/wind power plant in the Jhimpir wind corridor, district Thatta, Sindh. According to provided information the proposed generation facility/wind power plant will be consisting of (25) wind turbine generators of generator of CSIC (Chongqing) Haizhuang Windpower Equipment Company Limited of 2.0 MW each. The cut-in, rated and cut-out wind speeds for (CSIC H111L-2.0MW) wind turbine generator are 3m/s, 12m/s (static) and 25m/s (10 min. avg.) respectively.

(v). Regarding feasibility study of the project, it is observed that according to the terms and conditions of the LOI, the applicant carried out a feasibility study of the project including *inter alia*, wind power plant equipment details, micro-sitting details, power production estimates based on wind mast data of the project site, soil tests reports, technical details pertaining to selected wind turbine generator and other allied equipment to be used in the wind power plant, electrical studies, environmental study and project financing etc. The said feasibility study has been approved by AEDB.

(vi). Regarding grid interconnection of the project, the Authority observes that WEPL carried out an interconnection and system stability study for dispersal of electric power from the above mentioned wind power plant. According to the said study, the dispersal/interconnection arrangement will be consisting of 3 KM 132-KV double circuit transmission line looping in-out with the sub-cluster connecting the Master Wind Energy (Pvt.) Limited and Shaheen Wind Energy (Pvt.) Limited to Jhimpir-1 220/132KV collector substation. The study confirmed that proposed wind turbine generators will be in conformity with the required stability and reliability standards of NTDC as stipulated in the

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Grid Code. NTDC has approved the submitted interconnection and stability studies and has issued certificate for evacuation of power from the wind power plant of WEPL. Further, NTDC has also confirmed that necessary interconnection arrangement for dispersal of power from TBCCPL will be available well before the Commercial Operation Date (COD) of the proposed wind power plant of TBCCPL (i.e. July 31, 2019).

(vii). Regarding impact of the project on environment, the Authority is of the opinion that the proposed wind power plant of WEPL for which generation licence has been sought, 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, WEPL carried out an Initial Environment Examination study and has obtained No Objection Certificate from Environmental Protection Agency, Government of Sindh.

(viii). Regarding land of the project, the Authority has observed that Government of Sindh has allocated 428 acres of land to WEPL in Jhimpir, District Thatta, in the Province of Sindh for setting up its proposed 50.00 MW wind power plant.

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

(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

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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 fuel. The continuous import of furnace oil not only creates pressure on 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 renewable energy resources are given priority for power generation and their development is encouraged. The Energy Security Action Plan 2005 approved by the Government of Pakistan, duly recognizes this very aspect of power generation through renewable energy and envisages that at least 5% of total national power generation capacity (i.e. 9700 MW) to be met through RE resources by 2030.

(iii). The Authority considers that the proposed project of WEPL is consistent with the provisions of Energy Security Action Plan 2005. 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.

(iv). The term of a generation licence under Rules-5(1) of the Licensing 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. According to the information provided by WEPL, its wind power plant will achieve Commercial Operation Date (COD) by July 31, 2019 and will have a useful life of more than twenty (20) years from its COD. In this regard, WEPL has requested that the term of the proposed generation licence may be fixed as twenty (20) years, consistent with the term of its proposed Energy Purchase Agreement. The Authority considers that the information provided by WEPL on useful life of its wind power plant is consistent with the international benchmarks and with other

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similar cases. Forgoing in view, the Authority fixes the term of the generation licence as twenty (20) years from COD of the project.

(v). Regarding the tariff, 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 through Artcile-6 of the generation licence directs WEPL to charge the power purchaser only such tariff which has been determined, approved or specified by the Authority. The Authority directs WEPL to adhere to the Article-6 of the generation licence and the terms and conditions of the said up-front tariff determination in letter and spirit without any exception.

(vi). Regarding land of the project as mentioned in the Schedule-I of the generation licence, the Authority directs WEPL that the same shall be exclusively used by WEPL for the proposed wind power project and WEPL cannot carry out any other generation activity on this land except with prior approval of the Authority.

(vii). Regarding compliance with the environmental standards, the Authority directs WEPL 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. Artcle-10) in the generation licence along with other terms and conditions that the licensee will comply with relevant environmental standards. Further, the Authority directs WEPL 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.

(viii). The proposed wind power plant of WEPL 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. WEPL has informed that the project will achieve COD by July 31, 2019

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which is within the deadline of the Koyoto 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 WEPL to initiate the process in this regard at the earliest so that proceeds for the carbon credits are materialized. WEPL shall be required to share the proceeds of the carbon credits with the power purchaser as stipulated in Article-14 of the generation licence.

(ix). In view of the above, the Authority hereby approves the grant of generation licence to WEPL 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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05.01.17

National Electric Power Regulatory Authority (NEPRA)
Islamabad – Pakistan

GENERATION LICENCE

No. WPGL/37/2017

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:

WESTERN ENERGY (PRIVATE) LIMITED

Incorporated under the Companies Ordinance, 1984 Having Corporate Universal Identification No. 0084483, dated July 09, 2013

for its Wind Power Plant Located at Jhimpir, near Nooriabad, 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 05-th day of January Two Thousand & Seventeen and expires on 30th day of July Two Thousand & Thirty Nine.

05.01.17

Registrar

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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" have the same meaning as defined in the Rules;

(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 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;

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(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 the necessary approval by 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). "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;

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

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

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

(n). "Law" means the Act, relevant rules and regulations made there under and all the Applicable Documents;

(o). "Licensee" means **Western Energy (Private) Limited** and its successors or permitted assigns;

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

(q). "Policy" means "the Policy for Development of Renewable Energy for Power Generation, 2006" of Government of Pakistan as

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amended from time to time;

(r). "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;

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

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

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

(v). "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;

(w). "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.

Article-2
Applicability of Law

This Licence is issued subject to the provisions of the 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

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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.

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

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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.

Article-10
Compliance with Environmental Standards

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

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.

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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 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.

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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 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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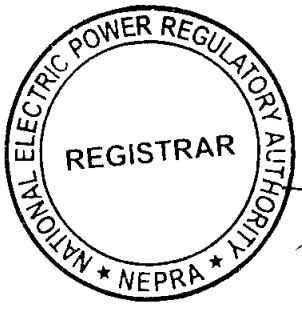
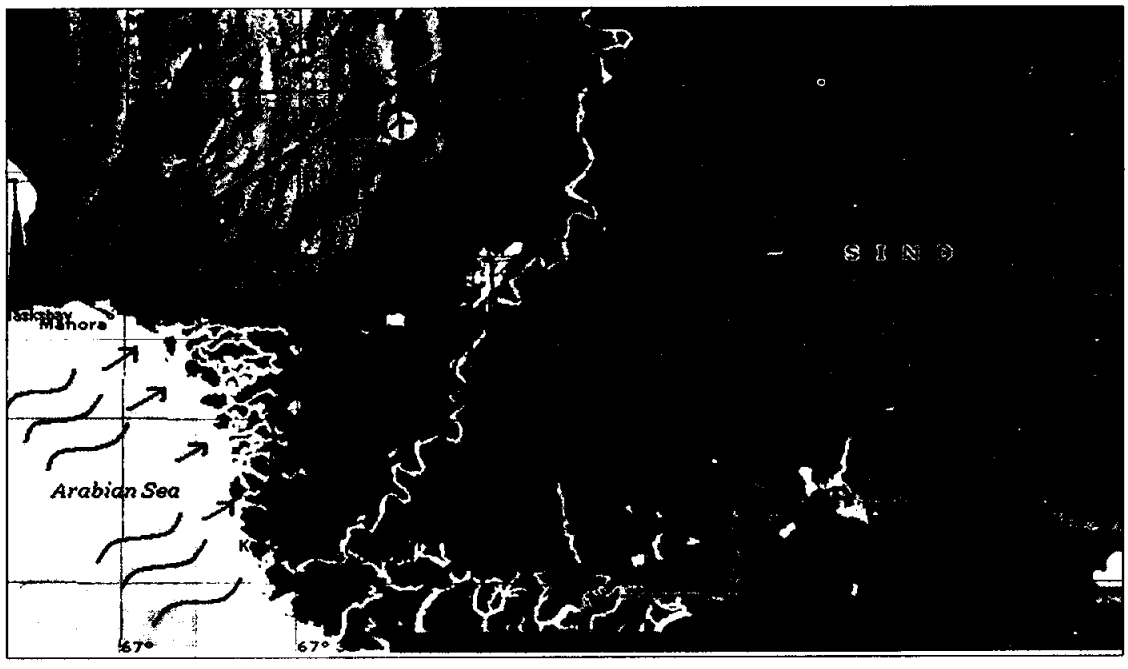
SCHEDULE-I

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 of the Licensee are described in this Schedule.



Location
of Generation Facility/Wind Power Plant



Land
of the Generation Facility/Wind Power Plant

	Total Land Area: 428 Acres	
	Geodetic Coordinates	
	Latitude (N)	Longitude (E)
1	25° 11' 12.32"	68° 02' 2[illegible]
Boundary 2	25° 11' 7.61"	68° 02' 40.98"
3	25° 10' 0.35"	68° 04' 2[illegible]
Boundary 4	25° 09' 59.05"	68° 04' 30.91"
5	25° 09' 42.21"	68° 05' [illegible]
Boundary 6	25° 09' 05.53"	68° 05' 5.14"
7	25° 09' 0.13"	[illegible]
Boundary 8	25° 09' 0.13"	68° 05' 1.84"
9	25° 09' 33.30"	[illegible]
Boundary 10	[illegible]	68° 04' 10.28"
11	25° 10' 39.92"	[illegible]
Boundary 12	[illegible]	68° 02' 20.59"

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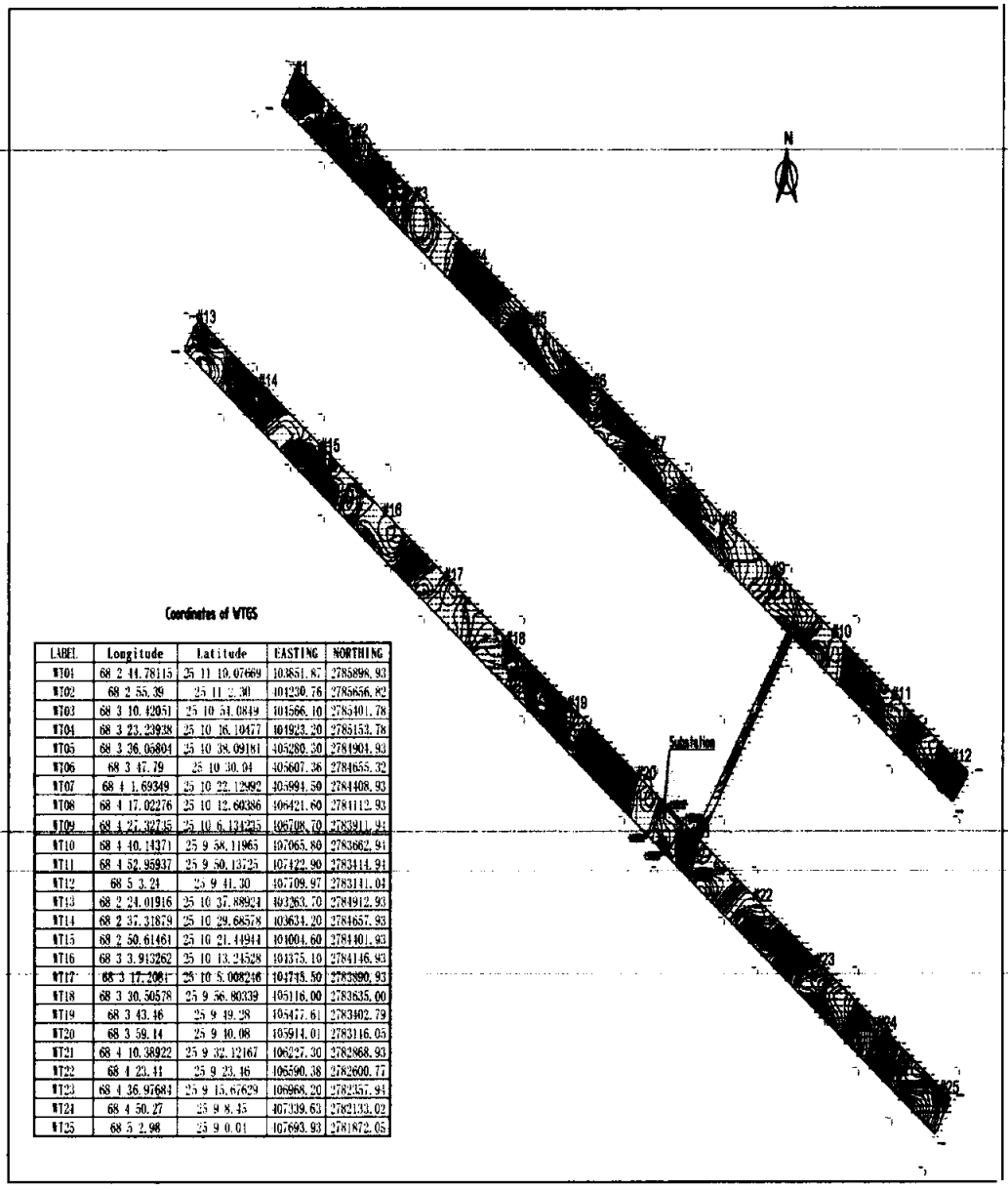
Micro-Sitting
of the Generation Facility/Wind Power Plant



Coordinates of WTGS

LABEL	Longitude	Latitude	EASTING	NORTHING
WT01	68 2 44.78115	25 11 10.07669	103851.87	2785898.93
WT02	68 2 55.39	25 11 2.30	104230.76	2785656.82
WT03	68 3 10.42051	25 10 54.0849	104566.10	2785401.78
WT04	68 3 23.23938	25 10 46.10477	104923.20	2785153.78
WT05	68 3 36.06804	25 10 38.09181	105280.30	2784904.93
WT06	68 3 47.79	25 10 30.04	105607.36	2784655.32
WT07	68 4 1.69349	25 10 22.12992	105994.50	2784408.93
WT08	68 4 17.02276	25 10 12.60386	106421.60	2784112.93
WT09	68 4 27.32735	25 10 6.134225	106708.70	2783911.91
WT10	68 4 40.14371	25 9 58.11965	107065.80	2783662.94
WT11	68 4 52.95937	25 9 50.13725	107422.90	2783414.94
WT12	68 5 3.24	25 9 41.30	107709.97	2783141.04
WT13	68 2 24.01916	25 10 37.88924	103263.70	2784912.93
WT14	68 2 37.31879	25 10 29.68578	103634.20	2784657.93
WT15	68 2 50.61461	25 10 21.44944	104004.60	2784401.93
WT16	68 3 3.913262	25 10 13.24528	104375.10	2784146.93
WT17	68 3 17.2081	25 10 5.008246	104745.50	2783890.93
WT18	68 3 30.50578	25 9 56.80339	105116.00	2783635.00
WT19	68 3 43.46	25 9 49.28	105477.61	2783402.79
WT20	68 3 59.14	25 9 10.08	105914.01	2783116.05
WT21	68 4 10.38922	25 9 32.12167	106227.30	2782868.93
WT22	68 4 23.41	25 9 23.46	106590.38	2782600.77
WT23	68 4 36.97684	25 9 15.67629	106968.20	2782357.94
WT24	68 4 50.27	25 9 8.45	107339.63	2782133.02
WT25	68 5 2.98	25 9 0.01	107693.93	2781872.05

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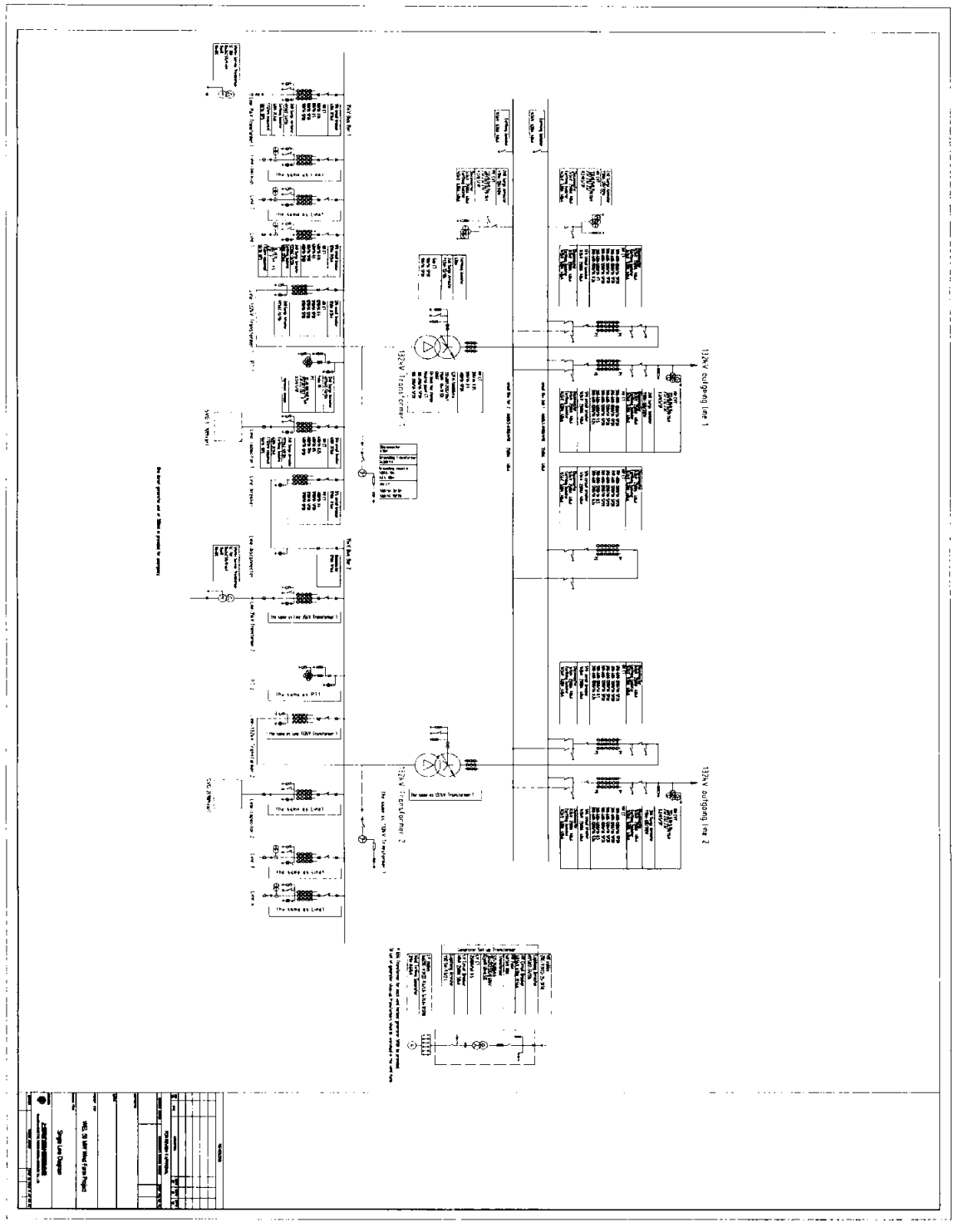
Single Line Diagram
of the Generation Facility/Wind Power Plant



Interconnection Arrangement/Transmission Facilities for Dispersal of Power from Generation Facility/Wind Power Plant

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

(2). The proposed Interconnection Arrangement/Transmission Facilities for dispersal of power from Generation Facility/ Wind Power Plant of WEPL will consist of the following:-

(a). A 3 KM 132-KV double circuit transmission line looping in-out with the sub-cluster connecting the Master Wind Energy (Private) Limited and Shaheen Wind Energy (Private) Limited to Jhimpir-1 220/132KV collector substation.

(b). Addition of 4th 220/132 kV transformer at the under construction Jhimpir-1 220/132 kV substation.

(3). The scheme of interconnection of Wind Power Plant of WEPL also proposes the following reinforcement already in place in Jhimpir cluster:-

(a). 220 kV D/C transmission line, approximately 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;

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

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(4). Any change in the above mentioned Interconnection Arrangement/Transmission Facilities duly agreed by WEPL, NTDC and HESCO, shall be communicated to the Authority in due course of time.

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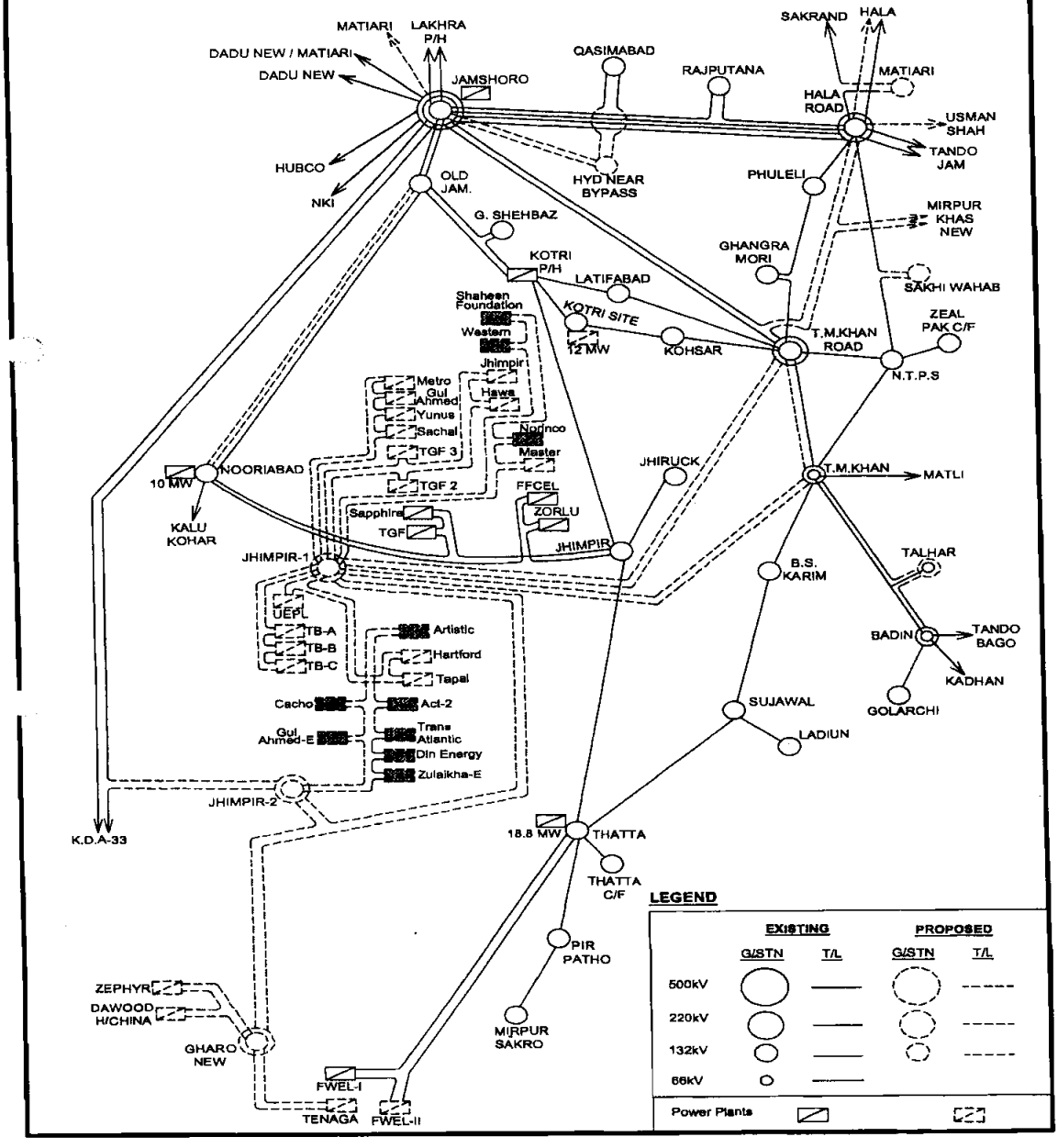
Schematic Diagram of Interconnection Arrangement/Transmission Facilities for Dispersal of Power from Generation Facility/Wind Power Plant

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



Details
of Generation Facility/Wind Power Plant

(A). General Information

(i).	Name of the Company/Licensee	Western Energy (Private) Limited
(ii).	Registered/Business Office	F-25, Block 5, Rojhan Street Kehkashan, Clifton Karachi, Pakistan
(iii).	Plant Location	Jhimpir, District Thatta, Sindh
(iv).	Type of Generation Facility	Wind Power Plant

(B). Wind Farm Capacity & Configuration

(i).	Wind Turbine Type, Make & Model	Haizhuang Windpower H111-2.0 MW
(ii).	Installed Capacity of Wind Farm (MW)	50 MW
(iii).	Number of Wind Turbine Units/Size of each Unit (KW)	25 x 2.0 MW

(C). Wind Turbine Details

(a).	**Rotor**	
(i).	Number of Blades	3
(ii).	Rotor Speed	8 – 15.3 rpm
(iii).	Rotor Diameter	111 m
(iv).	Swept Area	9677 m^2
(v).	Power Regulation	Pitch Control
(vi).	Rated Power at	9.6 m/s (air density = 1.225 kg/m^3)

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(vii).	Cut-in wind speed	3 m/s
(viii).	Cut-out wind speed	25 m/s
(ix).	Survival wind speed	59.5 m/s, 3s average
(x).	Pitch regulation	Electric motor drives a ring gear mounted to the inner race of the blade pitch bearing
(b). Blades		
(i).	Blade Length	55.2 m
(ii).	Material	Fiberglass polyester resin
(iii).	Weight	33,000kg (three blades)
(c). Gear Box		
(i).	Type	Planetary level with two balance shaft
(ii).	Gear ratio	1:128
(iii).	Weight	22,500 kg
(iv).	Oil quantity	300 – 450 Liters
(v).	Main shaft bearing	Roller bearing mounted in a pillow-block housing arrangement
(d). Generator		
(i).	Power	2150 kW
(ii).	Voltage	690 V
(iii).	Type	Double-fed asynchronous type
(iv).	Speed	Range: 950-2050 rpm (Synchronous speed 1500 rpm)
(v).	Enclosure class	IP 54
(vi).	Coupling	Flexible coupling
(vii).	Efficiency	≥ 97%

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(viii).	Weight	7,700 kg
(ix).	Power Factor	±0.95 (Leading to Lagging)
(e). Yaw System		
(i).	Yaw Bearing	Roller bearing
(ii).	Brake	Planetary yaw drives (with brakes that engage when the drive is disabled)
(iii).	Yaw Drive	4 planetary yaw drives.
(iv).	Speed	0.54 degree/s
(f). Control System		
(i).	Type	Automatic or manually controlled
(ii).	Grid Connection	Via IGBT converter
(iii).	Scope of Monitoring	Remote monitoring of different parameters, e.g. temperature sensors, pitch parameters, speed, generator torque, wind speed and direction, etc.
(iv).	Recording	Production data, event list, long and short-term trends
(g). Brake		
(i).	Design	Three independent systems, fail safe (individual pitch)
(ii).	Operational Brake	Adjustable Pitch aerodynamic braking with motor driving
(iii).	Secondary Brake	Active, Hydraulic braking, Machine discal brake
(h). Tower		
(i).	Type	Tubular steel tower
(ii).	Hub Heights	80 m

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(D). Other Details

(i).	Project Commercial Operation Date-COD (Anticipated)	July 31, 2019 (Anticipated)
(ii).	Expected Life of the Generation Facility/WPP from COD	20 years

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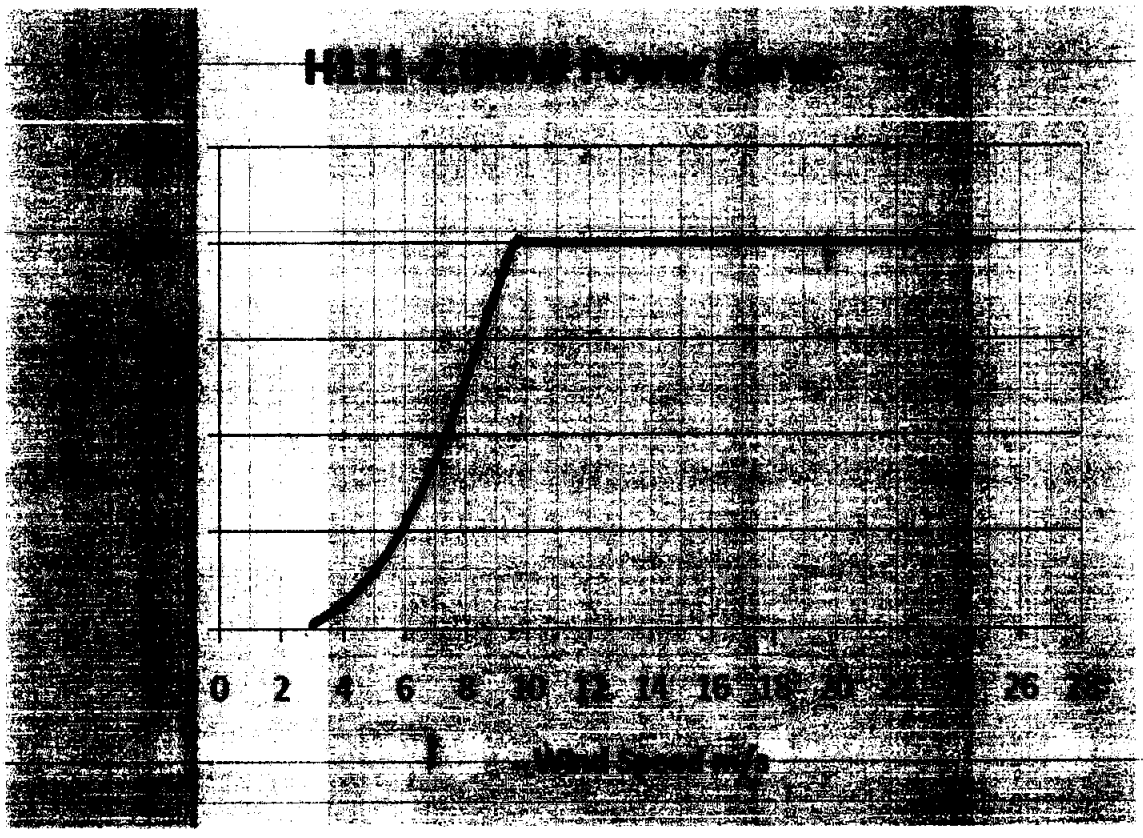
Power Curve
of Wind Turbine Generator of
(CSIS H111L-2.0MW)
(Graphical)



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Power Curve
of Wind Turbine Generator of
(CSIS H111L-2.0MW)
(Tabular)

H111-2.0MW		
Wind speed (m/s)	**Warranted Power output (kW)**	**Thrust coefficient**
3.06	18.24	1.192
4.00	117.96	0.943
5.00	275.7	0.824
6.00	505.66	0.818
7.00	823.96	0.821
8.00	1232.4	0.803
9.00	1676.01	0.715
9.98	2000.00	0.590
10.00	2000.00	0.527
11.00	2000.00	0.374
12.00	2000.00	0.277
13.00	2000.00	0.214
14.00	2000.00	0.170
15.00	2000.00	0.138
16.00	2000.00	0.114
17.00	2000.00	0.096
18.00	2000.00	0.081
19.00	2000.00	0.070
20.00	2000.00	0.061
21.00	2000.00	0.053
22.00	2000.00	0.047
23.00	2000.00	0.042
24.00	2000.00	0.037
25.00	2000.00	0.034
25.50	2000.00	0.032

Standard Atmospheric Condition: Air density = 1.160kg/m3

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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) and Annual Energy Generation (GWh) of the Generation Facility /Wind Farm of Licensee is 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 MW
(2).	Total Annual Full Load Hours	3545 Hrs
(3).	Average Wind Turbine Generator (WTG) Availability	95.0 %
(4).	Total Gross Generation of the Generation Facility/Wind Farm (in GWh)	221.58 GWh
(5).	Array & Miscellaneous Losses GWh	26.60 GWh
(6).	Availability Losses GWh	11.08 GWh
(7).	Balance of Plant Losses GWh	6.65 GWh
(8).	Annual Energy Generation (20 year equivalent Net AEP) GWh	177.25 GWh
(9).	Net Capacity Factor	40.47 %

Note

All the above figures are indicative as provided by the Licensee. The Net energy available to NTDC for dispatch will be determined through procedures contained in the Energy Purchase Agreement.

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