# National Electric Power Regulatory Authority
## Islamic Republic of Pakistan

Registrar

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No. NEPRA/R/DL/LAG-351/ 10800-006 June 30, 2017

Mr. Khurram Sayeed
Chief Executive Officer
Iran-Pak Wind Power (Private) Limited,
Suite # 214, 2nd Floor, Progressive Plaza,
Beaumont Road, Karachi.

Subject: **Grant of Generation Licence No. WPGL/45/2017**
**Licence Application No. LAG-351**
**Iran-Pak Wind Power (Private) Limited (IPWPPL)**

*Reference: IPWPPL's application vide letter No. IPWPPL/NEPRA/66/16, dated June 07, 2016 (received on June 10, 2016).*

Enclosed please find herewith Determination of the Authority in the matter of Application of "Iran-Pak Wind Power (Private) Limited (IPWPPL)" for the "Grant of Generation Licence" along with Generation Licence No. WPGL/45/2017 annexed to this determination granted by the National Electric Power Regulatory Authority (NEPRA) to IPWPPL for its 49.50 MW Wind Power Plant located at Deh Kohistan 7/3 Tapo Jungshahi, Taluka & 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/45/2017)**

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30/6/17

**(Syed Safeer Hussain)**

Copy to:

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

# National Electric Power Regulatory Authority (NEPRA)

## Determination of the Authority in the Matter of Application of Iran-Pak Wind Power (Pvt.) Limited for the Grant of Generation Licence

**June 15, 2017**
**Case No. LAG-351**

## (A). Background

**(i).** In order to harness the potential of Renewable Energy (RE) resources in the country, Government of Pakistan (GoP) has formulated the policy titled "Policy for Development of Renewable Energy for Power Generation 2006 (the "RE Policy"). The said policy is in field since 2006 under which the Federal Government or the Provincial Governments can support the implementation of RE projects.

**(ii).** In consideration of the above, the Federal and Provincial Governments have been issuing Letter of Intent (LoI) to various developers for setting up different type of RE projects across the country. In this regard, Energy Department of Government of Sindh (EDGoS) issued LoI to Iran-Pak Wind Power (Pvt.) Limited (IPWPPL) for setting up an approximately 50.00 MW wind based generation facility/Wind Power Plant/Wind Farm in the Jhimpir wind corridor of district Thatta, in the province of Sindh.

**(iii).** According to the terms and conditions of the above mentioned LoI, company carried out a feasibility study of the project. After completion of the said milestone, the sponsors of the project decided to approach the Authority for the grant of generation licence for the proposed generation facility/Wind Power Plant/Wind Farm.

## (B). Filing of Application

**(i).** IPWPPL submitted an application on June 10, 2016 for the grant of generation licence in terms of Section-15 of Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 (the "NEPRA Act") read

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with the relevant provisions of the NEPRA Licensing (Application and Modification Procedure) Regulations, 1999 (the "Licensing Regulations").

**(ii).** The Registrar examined the submitted application to confirm its compliance with the Licensing Regulations and observed that the application lacked some of the required information/documentation. Accordingly, IPWPPL was directed to submit the missing information/documentation and the same was submitted on July 21, 2016. The Authority considered the matter and found the form and content of the application in substantial compliance with Regulation-3 of the Licensing Regulations. Accordingly, the Authority admitted the application on August 10, 2016 for consideration of the grant of the generation licence as stipulated in Regulation-7 of the Licensing Regulations. The Authority approved an advertisement to invite comments of general public, interested and affected persons in the matter as stipulated in Regulation-8 of the Licensing Regulations. Accordingly, notices were published in one (01) Urdu and one (01) English newspapers on August 13, 2016.

**(iii).** In addition to the above, the Authority also approved a list of stakeholders for seeking their comments for assistance of the Authority in the matter in terms of Regulation-9(2) of the Licensing Regulations. Accordingly, letters were sent to said stakeholders on August 16, 2016 soliciting their comments for assistance of the Authority.

## (C). Comments of Stakeholders

**(i).** In reply to the above, the Authority received comments from four (04) stakeholders. These included Anwar Kamal Law Associates (AKLA), Board of Investment (BoI), EDGoS and Karachi Shipyard & Engineering Works Limited (KS&EWL). The salient points of the comments offered by the said stakeholders are summarized below:-

**(a).** AKLA raised various issues being faced by the electric power sector of the country. It was highlighted that there is under-utilization of various existing generation facilities and resultantly there is surplus capacity. Therefore, induction of new power plants on "Take or Pay" basis is not justifiable.

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AKLA contested that RE based generation facilities have higher upfront tariff and also enjoy the status of "must run" making such facilities not viable financially and economically. AKLA questioned the induction of RE projects in the scenario of reducing oil prices, proposed long term contracts of R-LNG, and the under construction coal power projects. AKLA opined that instead of setting up new power plants having higher cost, efforts should be made to utilize the available generation capacity first to its full. Further, efforts should be made to encourage investors to set up new generation facilities under "Take and Pay" regime in a competitive power market. AKLA opposed the grant of generation licence to IPWPPL;

**(b).** BoI supported the grant of generation licence to IPWPPL subject to a competitive tariff and completion of all codal/technical formalities under the relevant rules & regulations;

**(c).** EDGoS explained the huge potential of the RE in the country especially in the province of Sindh and the benefits that can be achieved through the use of the same in generation of electric power. EDGoS supported the grant of generation licence to IPWPPL; and

**(d).** KS&EWL submitted that it is fully capable of manufacturing towers for wind turbines. The facilities of KS&EWL are available in the vicinity of Karachi which is very close to wind corridors where the proposed generation facility will be located. Due to the said, the fabrication and site installation can be carried out at very competitive rates therefore, the company may consider the facilities of KS&EWL for local fabrication, erection and installation of the proposed wind power plant. KS&EWL expressed its no objection for the grant of generation licence to IPWPPL;

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**(ii).** The Authority reviewed the above comments of the stakeholders and decided to seek the perspective of the company/IPWPPL on the observations of AKLA and KS&EWL. On the comments of KS&EWL, the company submitted that the project is being developed through EPC contract arrangement and maximum effort will be made to utilize the indigenous skill and facilities.

**(iii).** Regarding the comments of AKLA, the company submitted that comments of AKLA are general in nature and not specifically related to its application. The company stated that AKLA has mainly raised issues which are related to policy of GoP for promotion of RE in the country. Further, AKLA has submitted its comments without fully appreciating the dynamics of the power sector of the country and other factors involved in the financing of such projects which have no nexus to the issue of the grant of generation licence to IPWPPL. The company submitted that greater use of indigenous resources including RE can help diversifying the energy mix and reduce dependence of the country on imported fossil fuels, mitigating against supply disruptions and price fluctuation risks. IPWPPL stated that AKLA in its comments claimed that generation capacity of Pakistan is surplus however, it appears that AKLA is not fully aware about the operational capacity and installed capacity. In this regard, IPWPPL quoted the example of the hydro power plants/projects which cannot be operated at full load throughout the year due to dependence on the hydrology of the site. Furthermore, the company stated that a sizeable portion of installed capacity is inefficient and not economically viable to be operated.

**(iv).** Further to the above, IPWPPL submitted that fuel prices are volatile and it cannot be assumed that the same will remain on the existing low level. IPWPPL acknowledged that there are projects under construction on coal and RLNG fuels, however, the ever increasing demand of electricity will continue to exist therefore, RE has to maintain a sizeable share in the overall energy mix of the country. IPWPPL maintained that indigenous RE will result in savings of precious foreign exchange reserves of the country. The company stated that presently Pakistan has the lowest contribution of RE in its energy mix, which needs to be improved and brought in par with other developing countries. IPWPPL emphasized that with the passage of time and due to development in

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technology, the RE projects are now cost effective and therefore, must be considered owing to environmental consideration. On the issue of "Take or Pay" Viz-a-Viz "Take and Pay" tariff, IPWPPL submitted that under the current regime, only projects with "Take or Pay" are bankable as it ensures payments to the lenders therefore, changing the same will result in rending project non-bankable. In the end, IPWPPL requested the Authority to reject the comments of AKLA being irrelevant and vague.

**(v).** The Authority has considered the comments of the stakeholders, the reply of IPWPPL and observes that except AKLA, all the stakeholders have supported the grant of generation licence to IPWPPL. The Authority has observed that AKLA while submitting its comments has referred to its previous correspondences to NEPRA in different licence and tariff matters wherein it raised different issues including (a) surplus capacity; (b) capacity payment without supplying electricity (c); addition of high cost renewable plants (d); underutilization of power plants; and (e) induction of new power plants on "Take or Pay" basis and others etc. In this regard, the Authority has observed that it had duly addressed the aforementioned objections/comments and sent a comprehensive reply to AKLA through letter no. NEPRA/SAT-I/TRF-100/17060, dated December 27, 2016. The Authority reiterates its earlier findings and observations given in the aforementioned letter and is of the considered opinion that infact there is considerable supply demand gap resulting in load-shedding and load management. The aforementioned is strengthened from the fact that the proposed generation facility of IPWPPL is included in the future expansion plan of National Transmission and Despatch Company Limited (NTDC). Regarding the observations of AKLA that RE Projects should have "Take and Pay" tariff, the Authority hereby clarifies that through its determination No. NEPRA/TRF-WPT/2017/1542-1544 January 27, 2017 (the Determination for Bench Mark Tariff) it has already determined a benchmark tariff which is on unit delivered basis meaning thereby that a power producer/generation company is paid only for the energy it delivers. In view of foregoing, the Authority considers that the observations of AKLA stand suitably addressed.

**(vi).** In consideration of the above and having addressed the comments/objections, the Authority considered it appropriate to proceed further in

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the matter of application of IPWPPL for the consideration of grant of generation licence as stipulated in the Licensing Regulations and NEPRA Licensing (Generation) Rules 2000 (the "Generation Rules").

## (D). Evaluation/Findings

**(i).** The Authority has examined the submissions of IPWPPL including the information provided in its application for the grant of generation licence. The Authority has also considered the feasibility study of the project, interconnection & dispersal arrangement studies, provisions of the RE Policy and the relevant rules & regulations.

**(ii).** The Authority has observed that the main sponsor of the project include SUNIR (Iran Power & Water Equipment and Services Export Company) of the Islamic Republic of Iran whereas the minor sponsors include the Planet Group and the Tufail group of Pakistan. SUNIR is an Iranian group company, constituted of 24 independent companies involved in manufacturing of a wide range of different equipment & a rich experience of engineering services & consultancy in water & electricity industries. Since its establishment in 1994, SUNIR has successfully performed a wide range of activities in more than 18 countries. The Planet Group of Pakistan is a global channel marketing services and solutions company. According to the information provided, the main sponsor of the project has total assets of around Rs. 17.00 billion and is executing projects worth €177.00 billion. Based on the financial strength and other evaluation parameters, EDGoS issued LoI for development of the project and also allocated to the sponsors 1250 acres of land in the Jhimpir wind corridor at Deh Kohistan 7/3 Tapo Jungshahi, Taluka & District Thatta, in the province of Sindh for setting up a approximately 50.00 MW generation facility/Wind Power Plant/Wind Farm. As explained above, for the implementation of the project, the sponsors have incorporated the SPV in the name of IPWPPL under Section-32 of the Companies Ordinance, 1984 having corporate universal identification No. 0071078, dated December 15, 2009. The Registered/Business office of the SPV is located at Suite No. 414, on 4th Floor Progressive Plaza Beaumont Road, Karachi. According to the Memorandum of Association, the objects of the company, inter alia, include business of power generation and its sale thereof. In consideration of

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the above, the Authority has observed that the sponsors have sound financial and technical expertise to build the project.

**(iii).** According to the terms and conditions of the LoI, the sponsors 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.

**(iv).** The review of the feasibility study revealed that the company has considered various world class manufactures of WTG including General Electric-GE, VESTAS, Gamesa, Nordex, Suzlon, Ming Yang and Goldwind etc. After duly considering the various factors including (a). wind resource position of the corridor of Jhimpir (b). capital cost of equipment/WTG; (c). lead time for supply of equipment/WTG; (d). expected energy yield of WTG; (e). reliability and compliance with Grid Code; (f). availability of suitable operation and maintenance teams including easiness/availability spare parts for WTG etc., the company decided to select Vestas V126 (3.30 MW) WTG. The feasibility study also optimized the size of the proposed generation facility/Wind Power Plant/Wind Farm to 49.50 MW having 15 x 3.30 MW of WTG. It was clarified that proposed WTG is third generation (Type-III) machine having induction generator with gearbox. It is pertinent to mention that the Type-III WTG is the most populous type in terms of the number of units installed and total installed capacity worldwide. The WTG V 126-3.3 is a production of Vestas Wind Systems A/S, a manufacturer from Denmark. This manufacturer has been in business since 1979. The proposed WTG has better feedback and control system and stability for grid as required in the Grid Code. It is pertinent to mention that VESTAS is the top WTG manufacturer in the world and has its presence all over the world. In this regard, it is observed that VESTAS has provided or providing WTGs for three (03) projects in Pakistan with a cumulative capacity of around 150.00 MW. Further, the selected WTG are of Type-III with good characteristics for grid reliability and stability.

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**(v).** The Authority has noted that sponsors of the project carried out the required Grid Interconnection Study (GIS) for dispersal of electric power from the proposed generation facility/Wind Power Plant/Wind Farm. According to the said GIS, the dispersal of electric power will be made at 132 kV Voltage. The scheme of interconnection of IPWPPL includes a 132 kV D/C transmission line approx. 5 km long, on twin bundled Greeley conductor for looping in/out of the 132kV Single Circuit (S/C) from Uni-Energy WPP and Artistic WPP, connecting the generation facility facility/Wind Power Plant/Wind Farm with 220/132 KV Jhimpir-2 grid station. In this regard, NTDC has also confirmed that necessary arrangements will be made ensuring availability of the dispersal arrangement well before the Commercial Operation Date (COD) of the generation facility/Wind Power Plant/Wind Farm.

**(vi).** The Authority considers that the proposed project, for which generation licence is being sought, is based on RE source and does not cause pollution as in the case of conventional power plants. However, the Authority considers that the construction and operation of the generation facility/Wind Power Plant/Wind Farm may cause soil pollution and noise pollution. In this regard, the Authority has observed that IPWPPL also carried out the Initial Environment Examination and submitted the same for the consideration and approval of Sindh Environmental Protection Agency, Government of Sindh (EPAGoS). The Authority is satisfied that EPAGoS has issued a No Objection Certificate (NOC) for the construction of the project.

**(vii).** In terms of Rule-3 of the Generation Rules, the Authority may grant a generation licence to any person to engage in the generation business. The said rule stipulates various conditions pertaining to the grant of generation licence as explained in Rule-3(2), Rule-3(3), Rule-3(4) and Rule-3(5) of the Generation Rules. In this particular case, the Authority has observed that conditions of Rule-3(2) and Rule-3(3) stands satisfied as IPWPPL has provided details of location, technology, size, net capacity/energy yield, interconnection arrangements, technical limits, technical functional specifications and other details specific to the generation facilities. The provision of Rule-3(4) of the Generation Rules regarding holding a public hearing is not applicable as there is no issue which require this exercise. The Rule-3(5) of the Generation Rules stipulates that the Authority may

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refuse to issue a generation licence where the site, technology, design, fuel, tariff or other relevant matters pertaining to the generation facility proposed in an application for a generation licence are either not suitable on environmental grounds or do not satisfy the least cost option criteria. In this regard, the Rule-3 of the Generation Rules also stipulates the conditions pertaining to least cost option criteria which include (a). sustainable development or optimum utilization of the renewable or non-renewable energy resources proposed for generation of electric power; (b). the availability of indigenous fuel and other resources; (c). the comparative costs of the construction, operation and maintenance of the proposed generation facility/Wind Power Plant/Wind Farm against the preferences indicated by the Authority; (d). the costs and right-of-way considerations related to the provision of transmission and interconnection facilities; (e). the constraints on the transmission system likely to result from the proposed generation facility/Wind Power Plant/Wind Farm and the costs of the transmission system expansion required to remove such constraints; (f). the short-term and the long-term forecasts for additional capacity requirements; (g). the tariff resulting or likely to result from the construction or operation of the proposed generation facility/Wind Power Plant/Wind Farm; and (h) the optimum utilization of various sites in the context of both the short-term and the long-term requirements of the electric power industry as a whole.

**(viii).** In consideration of the above, the Authority clarifies that AEDB/GoP has identified two wind corridors (of Jhimpir and Gharo) in the province of Sindh. The estimated potential for these two corridors is more than 50,000 MW. At the moment, around thirteen (13) projects with a cumulative installed capacity of around 650.00 MW have been installed and commissioned whereas another twenty five (25) projects including that IPWPPL with cumulative capacity of around 1400.00 MW are in various stages of implementation.

**(ix).** The proposed project will result in optimum utilization of the RE which was earlier untapped, resulting in pollution free electric power. It is pertinent to mention that wind is an indigenous fuel and such fuels have a preference for the energy security. It is pertinent to mention that the Authority has determined a Benchmark Levelized Tariff for the future wind projects which works out to be U.S. Cents 7.7342/kWh & 6.7467/KWh for local & foreign financing respectively. The

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said determination envisages conducting bidding among companies/sponsors of the project(s) as stipulated in NEPRA Competitive Bidding (Approval Procedure) Regulations, 2014. The said regulation envisages that companies/sponsors of the project(s) will be offering a discount on the announced benchmark tariff meaning thereby that tariff for future wind projects will be less than U.S Cents 7.7342/kWh & 6.7467/KWh for local & foreign financing respectively, which will be very competitive.

**(x).** As explained in the preceding paragraphs, the sponsors of the project carried out the GIS which concludes that the project will not face any constraints in transmission system. Further, being located at reasonable distance from the thick population, the project will not result in cost and right-of-way issues for the provision of transmission and interconnection facilities. It is pertinent to mention that NTDC has included the project in its long-term forecasts for additional capacity requirements.

**(xi).** In view of the above, the Authority is of the considered view that the project of IPWPPL fulfills the eligibility criteria for grant of generation licence as stipulated in 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 development, all indigenous power generation resources including RE must be developed on priority basis.

**(ii).** The existing energy mix of the country is heavily skewed towards thermal power plants, mainly operating on imported fossil fuel. The continuous import of fossil fuel 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 RE resources

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are given priority for power generation and their development is encouraged. The Energy Security Action Plan 2005 approved by GoP, 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 IPWPPL 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 fuel but will also help in reducing in carbon emission by generating clean electricity, thus improving the environment.

**(iv).** As explained in the preceding paragraphs, IPWPPL has provided the details of location, technology, size, net capacity/energy yield, interconnection arrangements, technical details and other related information for the proposed generation facility/Wind Power Plant/Wind Farm. In this regard, the Authority has observed that Govt. of Sindh allocated land to IPWPPL for setting up a generation facility/Wind Power Plant/Wind Farm. The said details have been incorporated in Schedule-I of the proposed generation licence. The Authority directs IPWPPL to utilize the allocated land exclusively for the proposed generation facility/Wind Power Plant/Wind Farm and not to carry out any other generation activity on the said land except with its prior approval.

**(v).** The term of a generation licence under Rule-5(1) of the Generation Rules is required to match with the maximum expected 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 IPWPPL, its generation facility/Wind Power Plant/Wind Farm will achieve COD by June 30, 2019 and will have a useful life of more than twenty (20) years from its COD. In this regard, IPWPPL has requested that the term of the proposed generation licence may be fixed as twenty (20) years. The Authority considers that said submission of IPWPPL about the useful life of the generation facility/Wind Power Plant/Wind Farm and the subsequent request of to fix the term of the generation

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licence is consistent with international benchmarks therefore, the Authority fixes the term of the generation licence to twenty (20) years from COD of the project.

**(vi).** 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 Article-6 of the generation licence directs IPWPPL to charge the power purchaser only such tariff which has been determined, approved or specified by the Authority. The Authority directs IPWPPL to adhere to the Article-6 of the generation licence in letter and spirit without any exception.

**(vii).** About the compliance with the environmental standards, as stated at preceding paragraphs, IPWPPL has provided the NOC from EPAGoS and has confirmed that project will comply with the required standards during the term of the generation licence. In view of the importance of the issue, the Authority has decided to include a separate article (i.e. Article-10) in the generation licence along with other terms and conditions making it obligatory for IPWPPL to comply with relevant environmental standards at all times. Further, the Authority directs IPWPPL to submit a report on a bi-annual basis, confirming that operation of its generation facility/Wind Power Plant/Wind Farm is in compliance with the required environmental standards as prescribed by the concerned environmental protection agency.

**(viii).** The proposed generation facility/Wind Power Plant/Wind Farm of IPWPPL will be using RE 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. IPWPPL has informed that the project will achieve COD by June 30, 2019 which is 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 IPWPPL to initiate the process in this regard at the earliest so that proceeds for the carbon credits are materialized. IPWPPL shall be required to

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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 IPWPPL 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)

Saif Ullah Chattha
(Member/Vice Chairman)

20.6.2017

Tariq Saddozai
(Chairman)

30-6-17

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# National Electric Power Regulatory Authority (NEPRA)
# Islamabad – Pakistan

## GENERATION LICENCE

## No. WPGL/45/2017

In exercise of the powers conferred under Section-15 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997, the Authority hereby grants Generation Licence to

**IRAN-PAK WIND POWER (PVT.) LIMITED**

Incorporated under Section-32 of Companies Ordinance, 1984 (XLVII of 1984) Having Corporate Universal Identification No. 0071078, dated December 15, 2009

**for its Generation Facility/Wind Power Plant/Wind Farm Located at Deh Kohistan 7/3 Tapo Jungshahi, Taluka & District Thatta in the Province of Sindh**

(Installed Capacity: 49.50 MW Gross ISO)

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

Given under my hand on 30th day of June Two Thousand & Seventeen and expires on 29th day of June Two Thousand & Thirty Nine.

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 as amended or replaced from time to time;

**(b).** "AEDB" means the Alternative Energy Development Board or any other entity created for the like purpose established by the GOP to facilitate, promote and encourage development of renewable energy in the country;

**(c).** "Applicable Documents" mean the Act, the rules and regulations framed by the Authority under the Act, 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;

**(d).** "Applicable Law" means all the Applicable Documents;

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

**(f).** "Bus Bar" means a system of conductors in the generation facility/Wind Power Plant/Wind Farm of the Licensee on which the electric power from all the WTGs is collected for supplying to the Power Purchaser;

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

**(h).** "Commercial Operations Date (COD)" means the day immediately following the date on which the generation facility/Wind Power Plant/Wind Farm of the Licensee is commissioned;

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

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

**(k).** "Energy Purchase Agreement (EPA)" 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/Wind Farm, as may be amended by the parties thereto from time to time;

**(l).** "Generation Rules" mean the National Electric Power Regulatory Authority Licensing (Generation) Rules, 2000 as amended or replaced from time to time;

**(m).** "Grid Code" means the grid code prepared and revised from time to time by NTDC with necessary approval of the Authority;

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**(n).** "GoP" means the Government of Pakistan acting through the AEDB which has issued or will be issuing to the Licensee a LoS for the design, engineering, construction, insuring, commissioning, operation and maintenance of the generation facility/Wind Power Plant/Wind Farm;

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

**(p).** "IEC" means "the International Electrotechnical Commission or its successors or permitted assigns;

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

**(r).** "Implementation Agreement (IA)" means the implementation agreement signed or to be signed between the GoP and the Licensee in relation to this particular generation facility/Wind Power Plant/Wind Farm, as may be amended from time to time;

**(s).** "Letter of Support (LoS)" means the letter of support issued or to be issued by the GoP through the AEDB to the Licensee;

**(t).** "Licensee" means **Iran-Pak Wind Power (Pvt.) Ltd** or its successors or permitted assigns;

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

**(v).** "Net Delivered Energy" means the net electric energy expressed in kWh generated by the generation facility/Wind Power Plant/Wind Farm of the Licensee at its outgoing Bus Bar and delivered to the Power Purchaser;

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

**(x).** "Policy" means the Policy for Development of Renewable Energy for Power Generation, 2006 of GoP as amended from time to time;

**(y).** "Power Purchaser" means CPPA-G which will be purchasing electric energy from the Licensee either on behalf of all XW-DISCOs or any single XW-DISCO, pursuant to an EPA for procurement of electric energy;

**(z).** "SCADA System" means the supervisory control and data acquisition system for gathering of data in real time from remote locations to control equipment and conditions;

**(aa).** "Wind Power Plant/Wind Farm" means a cluster of WTGs situated in the same location of a generation facility used for production of electric energy;

**(bb).** "Wind Turbine Generator (WTG)" means the machines installed at the generation facility/Wind Power Plant/Wind Farm with generators for conversion of wind energy into electric energy;

**(cc).** "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 Generation Rules and Licensing Regulations issued under the Act.

## Article-2
## Applicability of Law

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

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## Article-3
## Generation Facilities

**3.1** The location, size (capacity in MW), technology, interconnection arrangements, technical limits, technical functional specifications and other details specific to the generation facility/Wind Power Plant/Wind Farm of the Licensee are set out in Schedule-I of this licence.

**3.2** The net capacity/Net Delivered Energy of the generation facility/Wind Power Plant/Wind Farm of the Licensee is set out in Schedule-II of this licence. The Licensee shall provide the final arrangement, technical and financial specifications and other specific details pertaining to its generation facility/Wind Power Plant/Wind Farm before its COD.

## Article-4
## Term of Licence

**4.1** This licence shall become effective from the date of its issuance and will have a term of thirty (30) years from the COD of the generation facility/Wind Power Plant/Wind Farm of the Licensee.

**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 Licensing Regulations.

## Article-5
## Licence fee

The Licensee shall pay to the Authority the licence fee as stipulated in the National Electric Power Regulatory Authority (Fees) Rules, 2002 as amended or replaced from time to time.

## Article-6
## Tariff

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

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## 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 Generation 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 or replaced from time to time.

## Article-10
## Compliance with Environmental & Safety Standards

**10.1** The generation facility/Wind Power Plant/Wind Farm of the Licensee shall comply with the environmental and safety standards as may be prescribed by the relevant competent authority from time to time.

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**10.2** The Licensee shall provide a certificate on a bi-annual basis, confirming that the operation of its generation facility/Wind Power Plant/Wind Farm is in conformity with required environmental standards as prescribed by the relevant competent authority.

## Article-11
## Power off take Point and Voltage

The Licensee shall deliver the electric energy to the Power Purchaser at the outgoing Bus Bar of its generation facility/Wind Power Plant/Wind Farm. The Licensee shall be responsible for the up-gradation (step up) of generation voltage up to the required dispersal voltage level.

## Article-12
## Performance Data

**12.1** The Licensee shall install monitoring mast with properly calibrated automatic computerized wind speed recording meters at the same height as that of the WTG.

**12.2** The Licensee shall install SCADA System or compatible communication system at its generation facility/Wind Power Plant/Wind Farm as well as at the side of the Power Purchaser.

**12.3** The Licensee shall transmit the wind speed and power output data of its generation facility/Wind Power Plant/Wind Farm to the control room of the Power Purchaser.

## Article-13
## Provision of Information

In accordance with provisions of Section-44 of the Act, the Licensee shall be obligated to provide the required information in any form as desired by the Authority without any exception.

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## Article-14
## Emissions Trading /Carbon Credits

The Licensee shall process and obtain expeditiously the Carbon Credits admissible to the generation facility/Wind Power Plant/Wind Farm. The Licensee shall share the said proceeds with the Power Purchaser as per the Policy.

## Article-15
## Design & Manufacturing Standards

The WTGs and other associated equipment of the generation facility/Wind Power Plant/Wind Farm shall be designed, manufactured and tested according to the latest IEC, IEEE standards or any other equivalent standard in the matter. All the plant and equipment of the generation facility/Wind Power Plant/Wind Farm shall be unused and brand new.

## Article-16
## Power Curve

The power curve for the 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/Wind Farm.

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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 Power Plant/Wind Farm of the Licensee are described in this Schedule.

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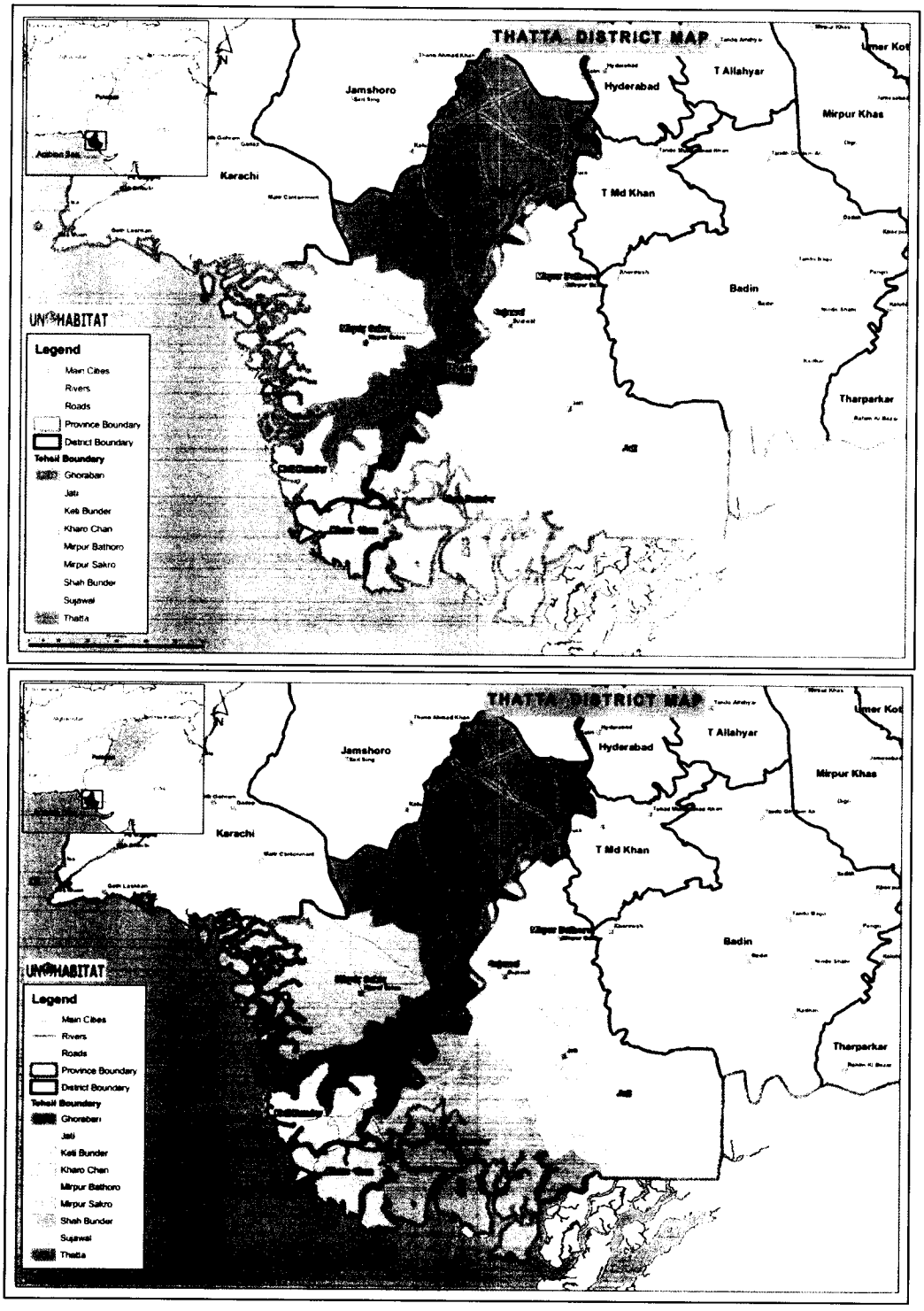
# Location of the Generation Facility/Wind Power Plant/Wind Farm of the Licensee







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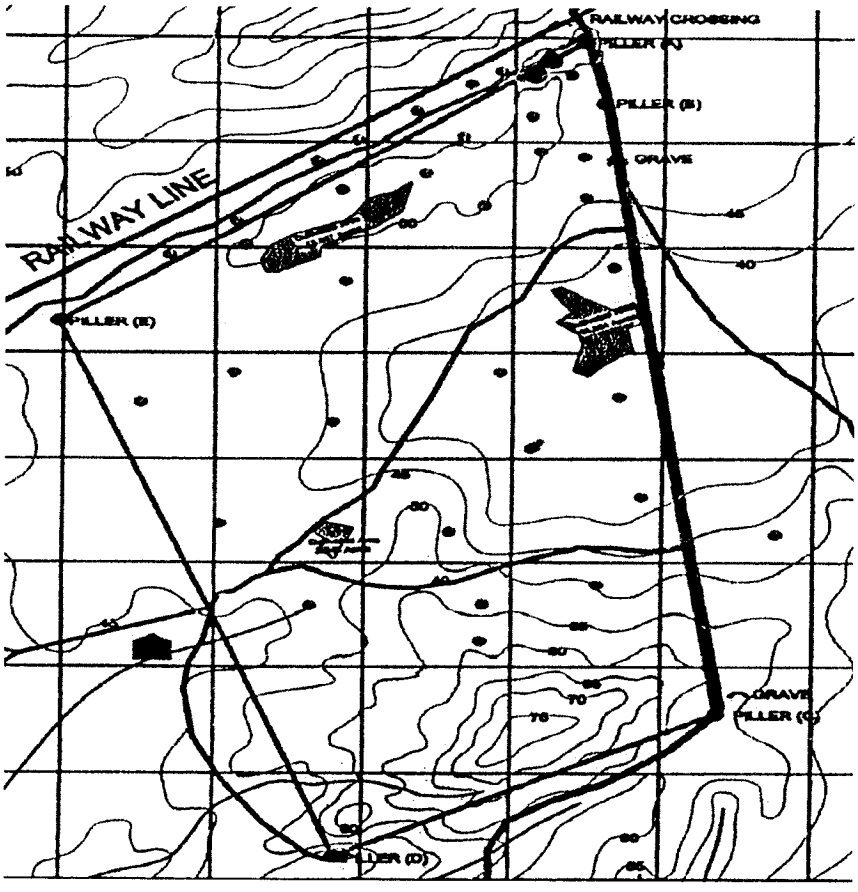
# Land Coordinates of the Generation Facility/Wind Power Plant/Wind Farm of the Licensee

| Points | East | North |
|---|---|---|
| a | 67° 53' 33.47" | 24° 55' 33.94" |
| b | 67° 53' 36.16" | 24° 55' 24.68" |
| c | 67° 53' 54.68" | 24° 53' 50.88" |
| d | 67° 53' 10.38" | 24° 53' 26.96" |
| e | 67° 52' 33.26" | 24° 54' 48.27" |
| Total Area 1249.99 acres | | |

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# Layout/Micro-Sitting of the Generation Facility/Wind Power Plant/Wind Farm of the Licensee


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# Micro-Sitting of the Generation Facility/Wind Power Plant/Wind Farm of the Licensee

| WTG | East | North |
|---|---|---|
| 1 | 387,967 | 2,576,535 |
| 2 | 388,150 | 2,756,091 |
| 3 | 388,333 | 2,755,647 |
| 4 | 387,310 | 2,756,131 |
| 5 | 387,493 | 2,755,687 |
| 6 | 387,073 | 2,755,707 |
| 7 | 387,858 | 2,754,800 |
| 8 | 387,913 | 2,755,667 |
| 9 | 388,224 | 2,753,912 |
| 10 | 386,653 | 2,755,728 |
| 11 | 386,836 | 2,755,284 |
| 12 | 387,019 | 2,754,840 |
| 13 | 387,201 | 2,754,396 |
| 14 | 387,384 | 2,753,952 |
| 15 | 387,566 | 2,753,508 |

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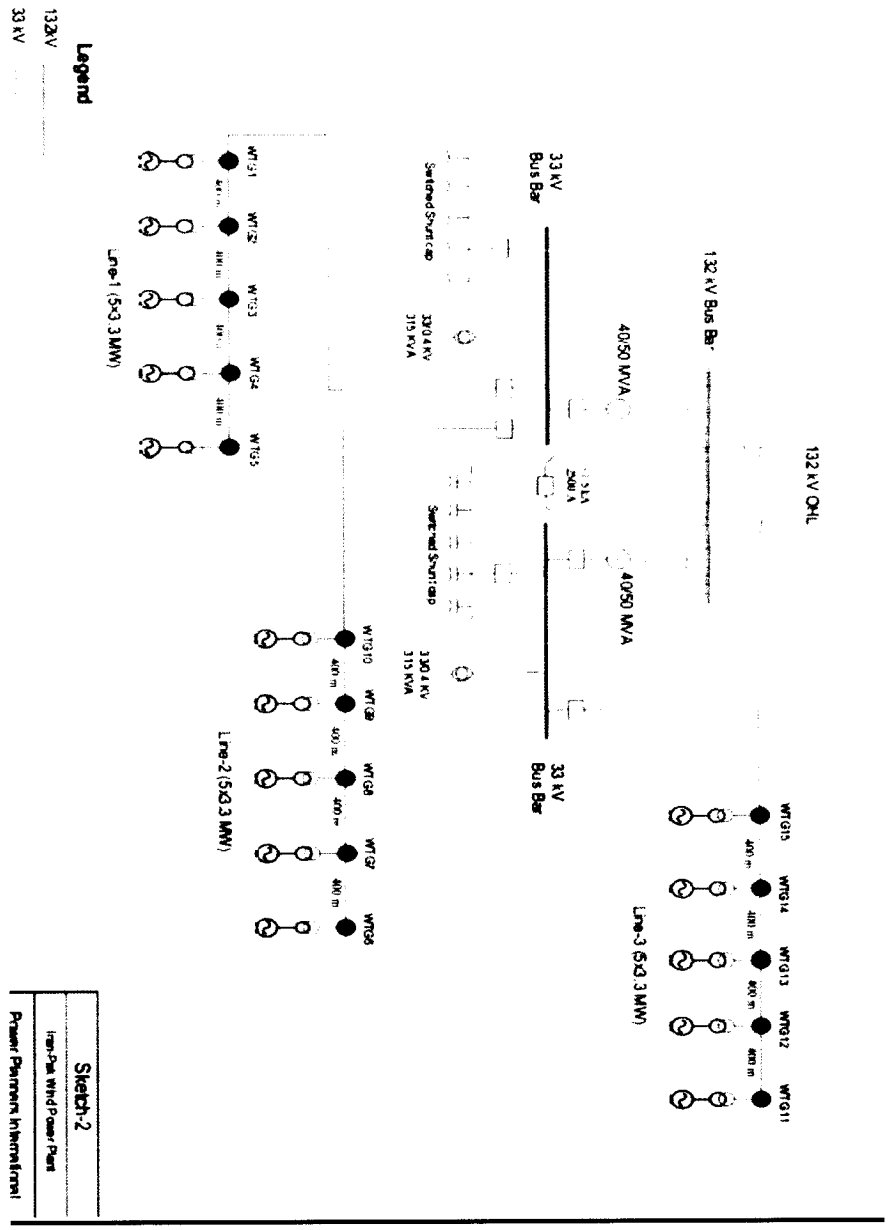
# Single Line Diagram (Electrical System) of the Generation Facility/Wind Power Plant/Wind Farm of the Licensee



## Interconnection Facilities/ Transmission Arrangements for Dispersal of Electric Power from the Generation Facility/Wind Power Plant/Wind Farm

The electric power generated from the generation facility/Wind Power Plant/Wind Farm of the Licensee i.e. Iran Pak Wind Power (Pvt.) Limited (IPWPPL) shall be dispersed to the National Grid through the load center of HESCO.

(2). The Interconnection Arrangement/Transmission Facilities for dispersal of electric power from Generation Facility/Wind Power Plant/Wind Farm of IPWPPL requires the reinforcement as follows:-

(i). 220 kV Double Circuit (D/C) transmission line approx. 5 km long on twin bundled Greeley conductor looping In/out of second circuit of existing Jamshoro – KDA-33 D/C transmission line at the proposed Jhimpir-2 220/132 kV substation;

(ii). Addition of 4th transformer (220/132 kV) at the newly proposed 220/132 kV Jhimpir-2 substation;

(iii). 132kV D/C transmission line approx. 135 km long on twin bundled Greeley conductor for connecting eight (08) Wind Power Plants (WPPs) in the first loop of proposed 220/132 kV Jhimpir-2 substation;

(iv). 132kV D/C transmission line approx. 168 km long on twin bundled Greeley conductor for connecting eight (08) WPPs in the second loop of proposed 220/132 kV Jhimpir-2 substation;

(3). The scheme of interconnection of IPWPPL (which is placed in first loop) includes 132 kV D/C transmission line approx. 5 km long, on twin bundled Greeley conductor for looping in/out on the 132kV Single Circuit (S/C) from Uni-Energy WPP

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to Artistic WPP connecting the generation facility/Wind Power Plant/Wind Farm with 220/132 KV Jhimpir-2 grid station.

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

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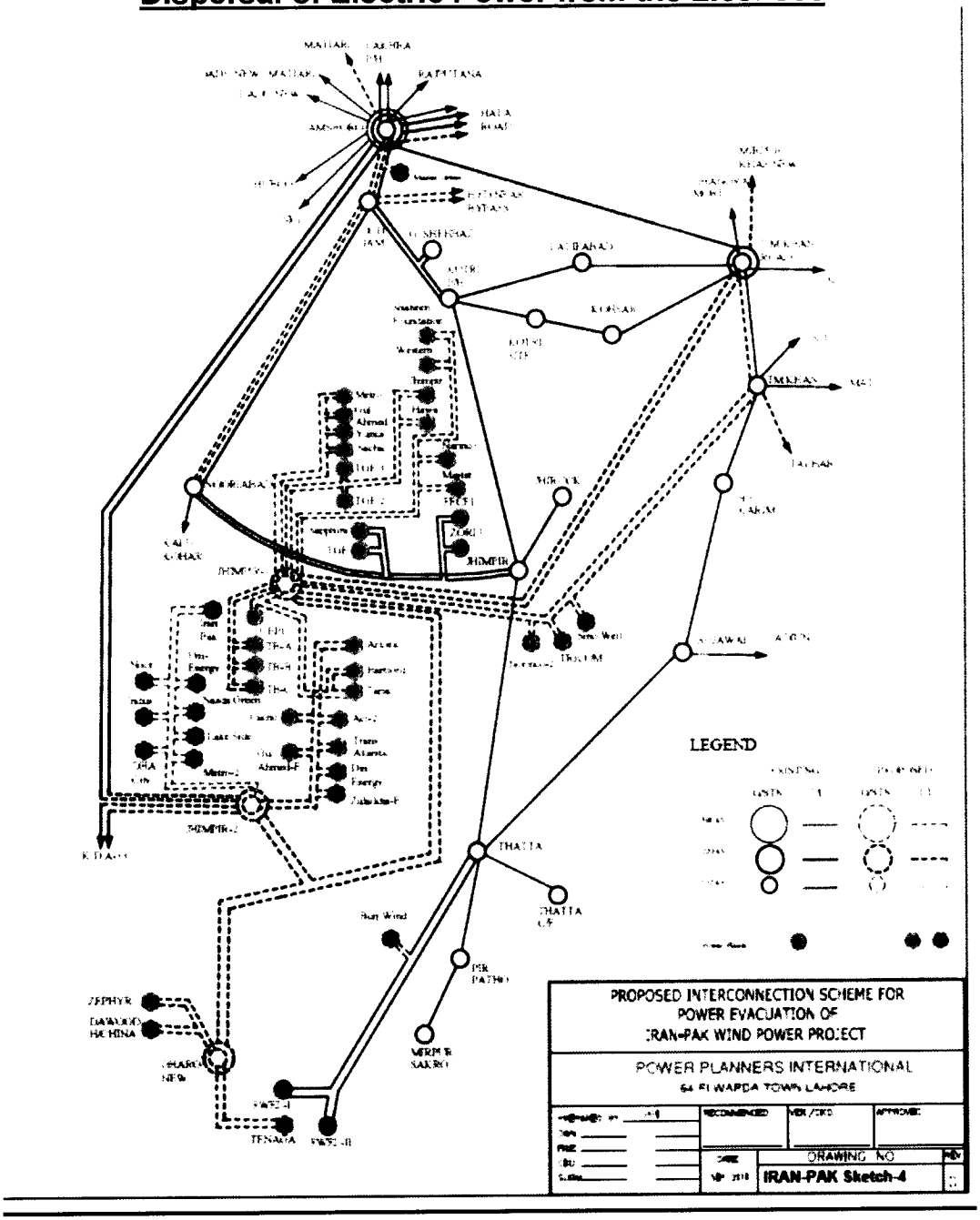
# Schematic Diagram
# for Interconnection Arrangement/Transmission Facilities for Dispersal of Electric Power from the Licensee

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# Details of Generation Facility/Wind Power Plant/ Wind Farm

## (A). General Information

| | | |
|---|---|---|
| (i). | Name of the Company/Licensee | Iran Pak Wind Power (Pvt.) Limited |
| (ii). | Registered/Business Office of the Company | Suite No. 414, 4th Floor Progressive Plaza Beaumont Road, Karachi |
| (iii). | Location of the Generation Facility | Deh Kohistan 7/3, Tapo Jungshahi, Taluka/ District Thatta |
| (iv). | Type of Generation Facility | Wind Power Plant |

## (B). Capacity & Configuration

| | | |
|---|---|---|
| (i). | Wind Turbine Type, Make & Model | Vestas V126 — 3.3 MW |
| (ii). | Installed Capacity of the Generation Facility | 49.50 MW |
| (iii). | Number of Units/Size of each Unit | 15 x 3.30 MW |

## (C). Details of Wind Turbine

| | | |
|---|---|---|
| **(a).** | **Rotor** | |
| (i). | Number of Blades | 3 |
| (ii). | Rotor Speed | 5.3-16.5 |
| (iii). | Rotor Diameter | 126 m |
| (iv). | Swept Area | 12469 $m^2$ |

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| | | |
|---|---|---|
| (v). | Power Regulation | pitch regulated |
| (vi). | Cut-in wind speed | 3 m/s |
| (vii). | Rated power wind speed | 12 m/s |
| (viii). | Cut-out wind speed | 22.5 m/s |
| (ix). | Survival wind speed | 52.5 m/s |
| (x). | Pitch regulation | Hydraulic pitch cylinder |
| **(b).** | **Blades** | |
| (i). | Blade Length | 61.66 m |
| (ii). | Material | Fibreglass reinforced epoxy, carbon fibres and Solid Metal Tip (SMT) |
| (iii). | Weight | 12.4T |
| **(c).** | **Gear Box** | |
| (i). | Type | Planetary stages + one helical stage |
| (ii). | Gear ratio | 1/95 |
| (iii). | Weight | 27,127 kg |
| (iv). | Oil quantity | Pressure-fed system 1000-1200 |
| (v). | Main shaft bearing | Double-row spherical roller bearing |
| **(d).** | **Converter** | |
| (i). | Type | Full scale |
| (ii). | Rated Voltage | 650 V |
| (iii). | Rated Current | 3286 A |

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| | | |
|---|---|---|
| **(e).** | **Generator** | |
| (i). | Power | 3650kW |
| (ii). | Voltage | 750V |
| (iii). | Type | Asynchronous with cage rotor |
| (iv). | Enclosure class | IP 54 |
| (v). | Coupling | Cage rotor corrected to the grid through a full scale converter |
| (vi). | Efficiency | 97.4% |
| (vii). | Power Factor | 0.88 |
| **(f).** | **Yaw System** | |
| (i). | Yaw Bearing | Plain bearing system |
| (ii). | Brake | PETP as friction material |
| (iii). | Yaw Drive | Multiple stages geared |
| (iv). | Speed | 0.46°/sec |
| **(g).** | **Control System** | |
| (i). | Type | microprocessor |
| (ii). | Grid Connection | Vestas Grid streamer |
| (iii). | Scope of Monitoring | Voltage & current |
| (iv). | Recording | Yes |
| **(h).** | **Brake** | |
| (i). | Design | Vestas |
| (ii). | Operational Brake | Aerodynamic |
| (iii). | Secondary Brake | Hydraulic |

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| (i). | **Tower** | |
|---|---|---|
| (i). | Type | Cylindrical/conical tubular |
| (ii). | Hub Heights | 87 m |

## (D). Other Details

| | | |
|---|---|---|
| (i). | COD of the Generation Facility (Anticipated) | June 30, 2019 |
| (ii). | Minimum Useful Life of the Generation Facility from COD | 20 years |

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# Power Curve
# of Wind Turbine Generator Vestas V126-3.3 MW
# (Tabular)

| Wind Speed [m/s] | Power [kW] |
|---|---|
| 3.0 | 25 |
| 3.5 | 88 |
| 4.0 | 167 |
| 4.5 | 260 |
| 5.0 | 371 |
| 5.5 | 505 |
| 6.0 | 668 |
| 6.5 | 859 |
| 7.0 | 1083 |
| 7.5 | 1338 |
| 8.0 | 1626 |
| 8.5 | 1947 |
| 9.0 | 2302 |
| 9.5 | 2673 |
| 10.0 | 2994 |
| 10.5 | 3192 |
| 11.0 | 3276 |
| 11.5 | 3296 |
| 12.0 | 3300 |
| 12.5 | 3300 |
| 13.0 | 3300 |
| 13.5 | 3300 |
| 14.0 | 3300 |
| 14.5 | 3300 |
| 15.0 | 3300 |
| 15.5 | 3300 |
| 16.0 | 3300 |
| 16.5 | 3300 |
| 17.0 | 3300 |
| 17.5 | 3300 |
| 18.0 | 3300 |
| 18.5 | 3300 |
| 19.0 | 3300 |

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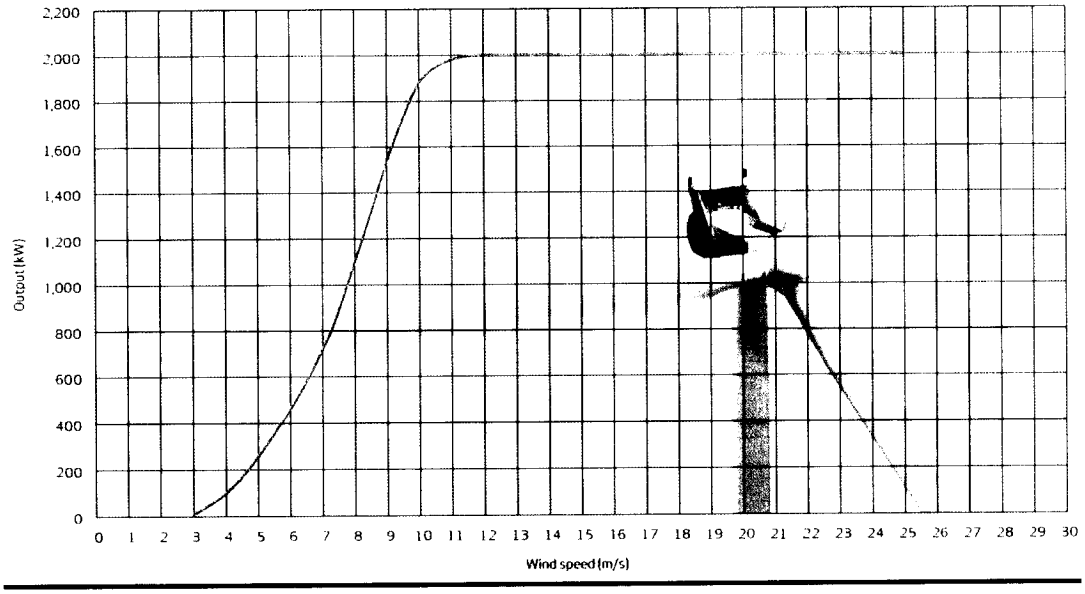
# Power Curve
# of Wind Turbine Generator Vestas V126 /3300)
# (Graphical)

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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 Power Plant/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) | 49.50 MW |
| (2). | Total Annual Full Load Hours | 3499 Hrs |
| (3). | Average Wind Turbine Generator (WTG) Availability | 97% |
| (4). | Total Gross Generation of the Generation Facility/Wind Farm (in GWh) | 205.8 GWh |
| (5). | Array & Miscellaneous Losses GWh | 19.10 GWh |
| (6). | Availability Losses GWh | 7.14 GWh |
| (7). | Balance of Plant Losses GWh | 4.77 GWh |
| (8). | Annual Energy Generation (20 year equivalent Net AEP) GWh | 174.7 GWh |
| (9). | Net Capacity Factor | 39.9 % |

**Note**

All the above figures are indicative as provided by the Licensee. The Net Energy Available to Power Purchaser for dispatch will be determined through procedures contained in the EPA.

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