National Electric Power Regulatory Authority
Islamic Republic of Pakistan

Registrar

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No. NEPRA/R/LAG-356/15449-55

August 16, 2022

Chief Executive Officer
Trans Atlantic Energy (Private) Limited
First Floor, Bahira Complex-III
Karachi

Subject: **Modification Generation Licence No. WPGL/43/2017 (Modification-I)**
Licence Application No. LAG-356
Trans Atlantic Energy (Private) Limited, (TAEPL)

Reference: TAEPL's LPM submitted vide letter No. nil dated 18.02.2021

It is intimated that the Authority has approved Modification-I in Generation Licence No. WPGL/43/2017 dated April 18, 2017 in respect of Trans Atlantic Energy (Private) Limited (TAEPL) pursuant to Section 26 of the NEPRA Act read with Regulation 10(11)(a) of the NEPRA Licensing Regulations.

2. Enclosed please find herewith determination of the Authority in the matter of Licensee Proposed Modification of TAEPL alongwith Modification-I in the Generation Licence No. WPGL/43/2017, approved by the Authority.

Enclosure: **As Above**

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(Syed Safeer Hussain)

Copy to:

1. Secretary, Power Division, Ministry of Energy, 'A' Block, Pak Secretariat, Islamabad
2. C.E.O Alternative Energy Development Board (AEDB), 2nd Floor, OPF Building, G-5/2, Islamabad
3. Managing Director, NTDC, 414 WAPDA House, Lahore
4. Chief Executive Officer, CPPA(G), 73 East, A.K. Fazl-ul-Haq Road, Blue Area, Islamabad
5. Chief Executive Officer, Hyderabad Electric Supply Company, HESCO Headquarters, WAPDA Complex, Hussainabad, Hyderabad
6. Director General, Environmental Protection Department, Government of Sindh, Plot No ST2/1, Sector 23, Korangi Industrial Area, Karachi

National Electric Power Regulatory Authority

(NEPRA)

Determination of the Authority in the Matter of Licensee Proposed Modification in the Generation Licence of Trans Atlantic Energy (Pvt.) Limited

August 16, 2022
Case No. LAG-356

(A). Background

(i). The Authority in terms of Section-15 (now Section-14B) of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 (the "NEPRA Act"), granted a Generation Licence (No. WPGL/43/2017 dated April 18, 2017) to Trans Atlantic Energy (Pvt.) Limited (TAEPL) for its 48.3 MW generation facility/Wind Power Plant (WPP) to be located at Deh Kohistan, Jhimpir, District Thatta, in the Province of Sindh.

(ii). Under the above-mentioned Generation Licence, the generation facility/WPP of TAEPL was proposed to consist of 14x3.45 MW Wind Turbine Generators (WTGs) of Vestas (V126-3.45 MW). The hub height of tower for installation of the WTGs was mentioned as 137m. Further, the term of the Generation Licence was set to twenty (20) years from the anticipated Commercial Operational Date (COD) of the generation facility/WPP.

(B). Communication of Modification

(i). TAEPL in accordance with Regulation-10(2) of the NEPRA Licensing (Application & Modification Procedure) Regulations, 1999 (the "Licensing Regulations"), communicated a Licensee Proposed Modification (LPM) in its existing Generation Licence on February 18, 2021.

(ii). In the "text of the proposed modification", TAEPL proposed to (a). Change the expected COD from July 31, 2019 to December 30, 2023; (b). Increase the term of the Generation Licence from twenty (20) years to twenty five (25) years from COD; (c). Change hub height from 137m to 95m; (d). Change the net capacity factor from 38.29% to 37.90%; (e). Correct/change the Power Curve from V126/3.3

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MW to V126/3.45 MW; and (f). Correct the name mentioned in the interconnection arrangement page from Artistic Wind Power (Pvt.) Limited to TAEPL.

(iii). Regarding the "statement of the reasons in support of the modification", TAEPL stated that (a). The project is at the tariff stage and it will take at least one (01) year after award of the tariff to reach financial close. Further, a period of at least eighteen (18) months will be required to complete the construction of the project; (b). In the earlier tariff determined for TAEPL on August 20, 2018 and tariff determinations of other wind power projects, the Authority has determined project life and tariff period of twenty five (25) years. However, the Generation Licence is based on the expected project operating life of twenty (20) years. The increased operational life results in the reduction of the levelized cost of energy; (c). The originally proposed hub height 137m was not supporting the project economics. Further, the infrastructure available in Pakistan (crane system, workforce etc.) also does not support the implementation of projects having a hub height of 137m, making it difficult for the Project to be implemented, as all wind projects being implemented in Pakistan are at a hub height of around 95m. In addition, Vestas is not providing towers of 137m to the market; and (d). The change in tower height (from 137m to 95m) will change the capacity factor from 38.29% to 37.90%, however, it is making the project more economical.

(iv). About the "statement of the impact on the tariff, quality of service and the performance by the Licensee of its obligations under the licence", TAEPL submitted that the proposed changes in the Generation Licence relating to a decrease in the hub height will result in lowering of project cost hence, it will have a major impact on tariff reduction. Further, the modification shall not have any adverse impact on the quality of service and obligations of the Licensee under the Generation Licence.

(C). Processing of LPM

(i). After completion of all the required information as stipulated under the Regulation-10(2) and 10(3) of the Licensing Regulations by TAEPL, the Registrar published the communicated LPM on March 05, 2021, in one (01) Urdu (Khabrain) and one (01) English (Business Recorder) newspaper, informing the general public and other stakeholders about the communicated LPM and inviting their comments within a period of fourteen (14) days from the date of publication of the notice of LPM.

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(ii). Apart from the above, separate letters were also sent to various other relevant stakeholders including Government Ministries and their attached departments, various representative organizations, individual experts, and others on March 05, 2021. Through the said letters, the stakeholders were informed about the communicated LPM and publication of notice in the press. Further, the said entities were invited to submit their views and comments in the matter, for the assistance of the Authority.

(D). Comments of Stakeholders

(i). In reply to the above, the Authority received comments from two (02) stakeholders, namely Ministry of Science & Technology (MoS&T) and Alternative Energy Development Board (AEDB). The salient points of comments offered by MoS&T are summarized in the following paragraph.

(a). MoS&T submitted that the matter modification in the Generation Licence of TAEPL may be decided by the Authority on its own after considering all technical/financial parameters; and

(b). AEDB commented that TAEPL has not submitted the "Type Certificate" for its proposed WTG (i.e. V126/3.45 MW) and other information/documents required for processing of the approval of the project Feasibility Study, including (i). technical feasibility study including wind resource analysis & energy yield estimation report; (ii). approvals of the grid interconnection study & initial environmental examination study; (iii). certificates from Original Equipment Manufacturer (OEM) of the WTG certifying that the WTG and plant will have a design life of twenty five (25) years from the COD. Foregoing in view, TAEPL is required to provide the Type Certificate of the proposed WTG at hub height of 95m as well as the documents listed above.

(ii). The Authority examined the above comments of stakeholders and considered it appropriate to seek the perspective of TAEPL on the comments/observations of AEDB. In this regard TAEPL submitted that based on the observations of AEDB, the proposed hub height of the towers has been changed from

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95m to 87m, since the Type Certificate available is for a hub height of 87m. Further, based on the new hub height, TAEPL conducted a revised feasibility study and submitted the required documents to AEDB for approval.

(iii). Accordingly, AEDB through its letter dated February 17, 2022 accorded its approval for the revised feasibility study. In view of the said, the Authority considered it appropriate to proceed further in the matter as stipulated in the Licensing Regulations and the NEPRA Licensing (Generation) Rules, 2000 (the "Generation Rules").

(E). Evaluation/Findings

(i). The Authority has examined the entire case in detail, including the already granted Generation Licence, the communicated LPM, relevant provisions of the Policy for Development of Renewable Energy for Power Generation 2006 (the "RE Policy"), comments of the stakeholder and relevant rules & regulations.

(ii). In this regard, the Authority has observed that it originally granted a Generation Licence (No. WPGL/43/2017 dated April 18, 2017) to TAEPL for setting up a 48.3 MW generation facility/WPP at Deh Kohistan Jhimpir, District Thatta, Sindh. The generation facility/WPP of TAEPL was proposed to consist of fourteen (14) WTGs of Vestas (V126-3.45 MW) with a hub height of 137m. Further, the term of the Generation Licence was twenty (20) years from the then anticipated COD of the generation facility/WPP of TAEPL (i.e. July 31, 2019).

(iii). The Authority has also observed that as per decisions of Cabinet Committee on Energy (CCoE), the project of TAEPL falls under Category-II of the RE projects, and all Category-II projects are allowed to proceed towards the achievement of their requisite milestones as per RE-Policy 2006 and are included in the IGECP as committed projects.

(iv). Initially, TAEPL communicated an LPM in its above mentioned Generation Licence on February 18, 2021 and proposed to (a). extend the COD from July 31, 2019 to December 30, 2023; (b). to extend the lifespan of the generation facility/term of Generation Licence from twenty (20) years to twenty five (25) years; (c). change the hub height of tower from 137m to 95m; (d). change the net capacity factor from 38.29% to 37.90%; and (e). incorporate certain corrections in the

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Generation Licence (i.e. regarding power curve and name of the Licensee at one instance in the Licence).

(v). The Authority considered the communicated LPM for further processing and accordingly a notice of LPM was published in the press. In response to the notice of LPM, AEDB highlighted certain observations regarding the proposed modifications including *inter alia,* non-submittal of a valid Type Certificate for the proposed WTG (i.e. V126/3.45 MW) at the hub height of 95m. In this regard, due to non-availability of Type Certificate from the OEM (Vestas) for the proposed WTGs at hub height of 95m, TAEPL changed the hub height from 95m to 87m, as the required Type Certificate available is for a hub height of 87m. Based on the new tower hub height, TAEPL revised the relevant studies/documents and got approved the same from AEDB. Accordingly, TAEPL proposed further changes in the hub height of the tower (from 95m to 87m), expected COD (December 2023 to June 2024), and capacity factor (from 37.90% to 37.10%).

(vi). Regarding LPM in the Generation Licence, the Authority has observed that Regulation-10(2) of the Licensing Regulations stipulates that a licensee may, at any time during the term of a licence, communicate to the Authority an LPM setting out (a). the text of the proposed modification; (b). a statement of the reasons in support of the modification; and (c). a statement of the impact on the tariff, quality of service and the performance by the licensee of its obligations under the licence.

(vii). Further, Section-26 of the NEPRA Act read with Regulation-10(5) of the Licensing Regulations, empowers the Authority to modify an existing licence of any licensee subject to and in accordance with the LPM and such further changes as the Authority may deem fit if, in the opinion of the Authority such modification (a). does not adversely affect the performance by the licensee of its obligations; (b). does not cause the Authority to act or acquiesce in any act or omission of the licensee in a manner contrary to the provisions of the NEPRA Act or the rules or regulations made pursuant to it; (c). is or is likely to be beneficial to the consumers; (d). is reasonably necessary for the licensee to effectively and efficiently perform its obligations under the licence; and (e). is reasonably necessary to ensure the continuous, safe and reliable supply of electric power to the consumers keeping in view the financial and technical viability of the licensee. Further, as per Regulation-

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10(11)(a) of the Licensing Regulations, the Authority is also empowered to approve the LPM with or without changes.

(viii). Regarding the proposed change in hub height of towers and subsequent change in net capacity factor, the Authority has observerd that based on the existing hub height of the tower (i.e. 137m) the net capacity factor was assumed 38.29% with an annual energy generation of 167.72 GWh. However, TAEPL could not implement the project as the special requirement of the project at the said hub height (including import of special equipment, such as cranes, technical staff and additional ground support etc.) were not supporting the project economics. Further, the infrastructure available in Pakistan (crane system) etc., does not support the installation of WTGs on towers with a hub height of 137m, adding further difficulties in implementation of the project. In addition, the EPC contractor of the project (i.e. Vestas) has stopped providing towers with hub height of 137m to the Pakistani market.

(ix). In view of the above, TAEPL initially proposed to change the hub height of tower from 137m to 95m, however, due to non-availability of Type Certificate for the WTGs at the proposed hub height of 95m, TAEPL changed the hub height to 87m, with the approval of AEDB. As per submission of TAEPL, the proposed change in the hub height from 137m to 87m will reduce the EPC cost from USD 78.6 Million to USD 52.6 Million, net capacity factor from 38.29% to 37.10% and the annual energy generation from 167.72 GWh to ~156.909 GWh. However, this annual energy generation (~156.909 GWh) will be available for a period of twenty five (25) years instead of twenty (20) years, which will result in a reduction of levelized cost of energy. In this regard, the Authority considers it relevant to mention that although TAEPL has proposed the net capacity factor to be 37.10%, the final capacity factor, energy numbers and sharing mechanism etc., will be elaborated upon and determined while determining the tariff for the project.

(x). Regarding the proposed extension in operational span of the facility from twenty (20) years to twenty five (25) years, the Authority has observed that under Rule-5(1) of the Generation Rules, the term of Generation Licence is to commensurate with the maximum expected useful life of the units comprised in a generation facility, except where an applicant for a Generation Licence consents to a shorter term. It is noted that as per international benchmark, the useful life of WTGs

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is normally considered as 20 to 25 years. Further, the WTGs selected by TAEPL for its WPP are type certified, more robust, efficient and backed by Vestas' guarantees of twenty five (25) years. In this regard, it is relevant to mention that the earlier cost-plus tariff granted to TAEPL also envisages a control period of twenty five (25) years. Further, the proposed extension in the term of Generation Licence is in line with other similar projects. Therefore, it is considered that the proposed extension in the term of Generation Licence is in line with the said standards for useful life of WTGs and control period of tariff.

(xi). Regarding the impact of the communicated LPM on the tariff, it is clarified that under Section-7(3)(a) of the NEPRA Act, determining tariff, rates and charges etc. is the sole prerogative of the Authority. It is clarified that the Authority had already granted cost-plus tariff to TAEPL through determination (No. NEPRA/TRF-443/TAEL-2017/18234-18236 November 20, 2018). However, TAEPL failed to achieve financial close within the stipulated period and hence the tariff granted to TAEPL lapsed. TAEPL filed a review petition to extend the validity and applicability period of the tariff, however, the Authority through its decision dated September 11, 2020 advised the the company to file a fresh petition for determination of tariff. Accordingly, TAEPL filed a fresh petition for determination of cost-plus tariff on February 18, 2021. The Authority admitted the tariff petition and a public hearing in the matter was also conducted on May 25, 2021. However, the Authority through its letter dated March 11, 2022 returned the tariff petition stating that even after the lapse of a considerable amount of time, the LPM and the technology on which the tariff is to be determined has not been decided due to non-submission of certain pre-requisites. Further, the Authority directed TAEPL to file fresh tariff petition after issuance of decision on LPM.

(xii). Regarding technical and financial viability of the project, The Authority has observed that project of TAEPL is a Category-II project and already included in the IGCEP as a committed project. Further, the project is based on WTGs of Vestas (V-126 3.45 MW) with a track record of over 2,504 turbines installed worldwide. The revision of the hub height from 137m to 87m has significantly reduced the EPC cost from USD 78.6 Million to US$ 52.6 Million. Based on the wind energy assessment, the proposed WTG at 87m hub height, will produce ~37.1% annual plant capacity factor. The total cost of the project is submitted as US$ 58.25 Million which includes US$ 52.6 Million for EPC and US$ 2.7 Million for Project Development. In addition, there is

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an additional cost of US$ 2.95 Million towards Insurance during Construction, Financing Fee and Interest during construction. Out of the total project cost US$ 11. 6499 Million (20%) will be covered through equity while US$ 46.5998 Million (80%) will be covered through debt. Based on this project cost and the annual plant capacity factor, the project will have a much lower levelized tariff than the average basket price, that too for a period of 25 years.

(xiii). Further, being located at a reasonable distance from the population, the project will not result in extra costs and right-of-way issues for the provision of transmission and interconnection facilities. It is pertinent to mention that NTDC has already included the project in its long-term forecasts for additional capacity requirements, as a committed project. In view of the explanation given above, it is clear that the project fulfills the requirements of the Least Cost Option Criteria. Further, considering the financial and technical parameters of the project, AEDB has already approved the feasibility of the project. Foregoing in view, the Authority considers that the project is technically and financially viable.

(xiv). In view of the above, the Authority is of the opinion that the proposed LPM will not have any adverse effect on the performance of TAEPL of its obligations. Further, the LPM will not cause the Authority to act or acquiesce in any act or omission of the licensee in a manner contrary to the provisions of the NEPRA Act or the rules or regulations made pursuant to the NEPRA Act. The LPM will be beneficial to the consumers in general as more amount of clean electricity will be available to the power purchaser for a longer period, that too at a very low price. This will also help to meet the national target of RE in the overall energy mix. The Authority considers that the LPM is reasonably necessary for the Licensee to perform its obligations effectively and efficiently under the Licence. Further to the said, the LPM is necessary to ensure the continuous, safe and reliable supply of electric power to the consumers keeping in view the financial and technical viability of the Licensee.

(F). Approval of LPM

(i). In view of the above, the Authority is satisfied that the Licensee has complied with all the requirements of the Licensing Regulations pertaining to the modification. Therefore, the Authority in terms of Section-26 of the NEPRA Act read with Regulation-10(11)(a) of the Licensing Regulations approves the communicated

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LPM in the Generation Licence of TAEPL (with changes) to the extent of change of (a). anticipated COD from July 31, 2019 to June 30, 2024; (b). term of Generation Licence from twenty (20) years to twenty five (25) years from COD; (c). hub height from 137m to 87m; (d). net capacity factor from 38.29% to ≥37.10%; (e). the Power Curve of V126/3.45 MW.

(ii). Accordingly, the Generation Licence (No. WPGL/43/2017 dated April 18, 2017) of TAEPL is hereby modified. The changes made in the Generation Licence are attached as annexure to this determination. The approval of the LPM is subject to the provisions contained in the NEPRA Act, relevant rules framed thereunder, terms & conditions of the Generation Licence and other applicable documents.

Authority

Engr. Maqsood Anwar Khan
(Member)

Rafique Ahmed Shaikh
(Member)

Tauseef H. Farooqi
(Chairman)

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National Electric Power Regulatory Authority
(NEPRA)
Islamabad – Pakistan

GENERATION LICENCE

No. WPGL/43/2017

In exercise of the Powers conferred under Section-26 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997, the Authority hereby modifies the Generation Licence (No. WPGL/43/2017 dated April 18, 2017 granted to Trans-Atlantic Energy (Pvt.) Limited, to the extent of changes mentioned hereunder:

(a). In the Face Sheet of the Generation Licence, the expiry date may be read as **June 29, 2049**;

(b). Changes made in **Articles** of the generation licence are attached as **Revised/Modified Articles.**

(c). Changes made in **Schedule-I** of the generation licence are attached as **Revised/Modified Schedule-I**.

(d). Changes made in **Schedule-II** of the generation licence are attached as **Revised/Modified Schedule-II**.

This **Modification-I** is given under my hand on this 16 **day** of **August Two Thousand & Twenty Two**

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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 NEPRA rules and regulations, any documents or instruments issued or determinations made by the Authority under any of the foregoing or pursuant to the exercise of its powers under the Act, the grid code, the applicable distribution code, commercial 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 of all the wind turbine generators or 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 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 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 after the COD;

(h). "Commercial Code" means the commercial code under National Electric Power Regulatory Authority (Market Operator Registration, Standards and Procedure) Rules, 2015 as amended or replaced from time to time;

(i). "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;

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

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

(l). "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/Wind Farm, as may be amended by the parties thereto from time to time;

(m). "Generation Rules" mean the National Electric Power Regulatory Authority Licensing (Generation) Rules, 2000 as amended or replaced

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from time to time;

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

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

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

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

(s). "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;

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

(u). "Licensee" means **TRANS ATLANTIC ENERGY (PRIVATE) LIMITED** or its successors or permitted assigns;

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

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(w). "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;

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

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

(z). "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;

(aa). "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;

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

(cc). "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;

(dd). "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 relevant Rules and Regulations issued under the Act.

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Article-2
Applicability of Law

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

Article-3
Generation Facilities

3.1 The location, size (capacity in MW), technology, interconnection arrangements, technical limits, technical and functional specifications and other details specific to the generation facility/Wind Power Plant/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 before its COD.

Article-4
Term of Licence

4.1 This licence shall become effective from the date of its issuance of the original licence (i.e. April 18, 2017) and will have a term of twenty five (25) years from the COD of the generation facility/Wind Power Plant/Wind Farm of the Licensee, subject to provisions of Section-14B of the Act.

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.

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Article-6
Tariff

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

Article-7
Competitive Trading Arrangement

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

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

Article-8
Maintenance of Records

For the purpose of sub-rule (1) of Rule-19 of the 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.

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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.

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 environmental standards as prescribed by the relevant competent authority.

Article-11
Power off take Point and Voltage

The Licensee shall deliver power to the Power Purchaser at the outgoing bus bar of its 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 of Wind Power Plant

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

15.1 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
Revised/Modified

The Type of Technology, 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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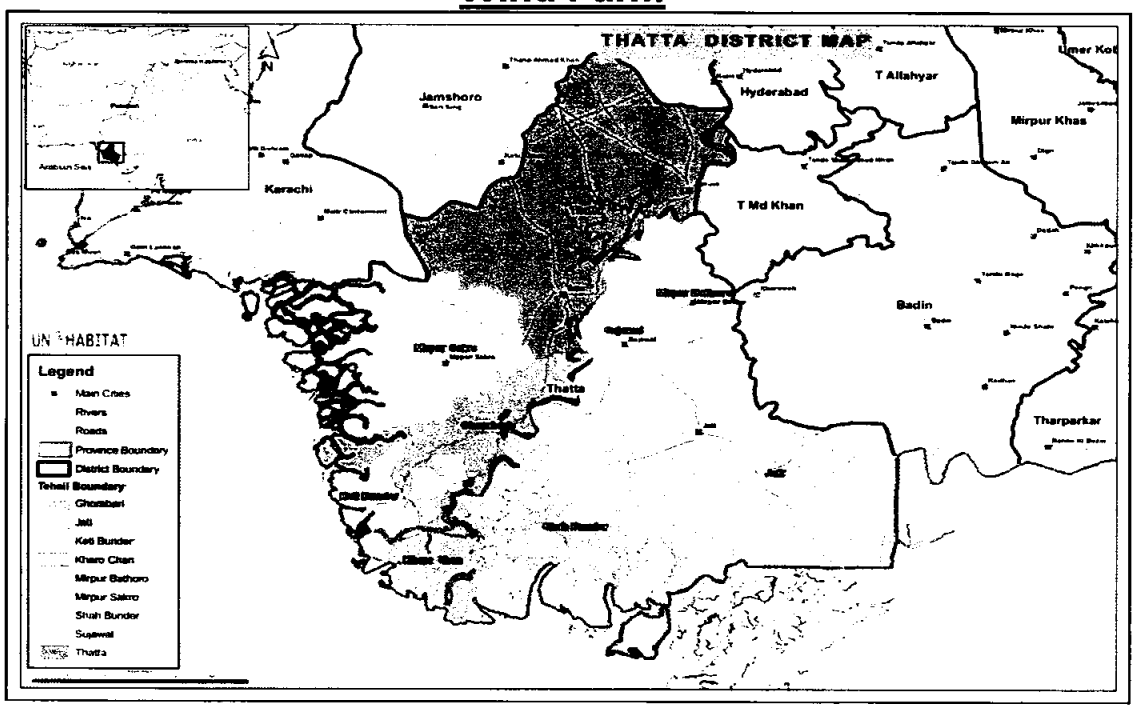
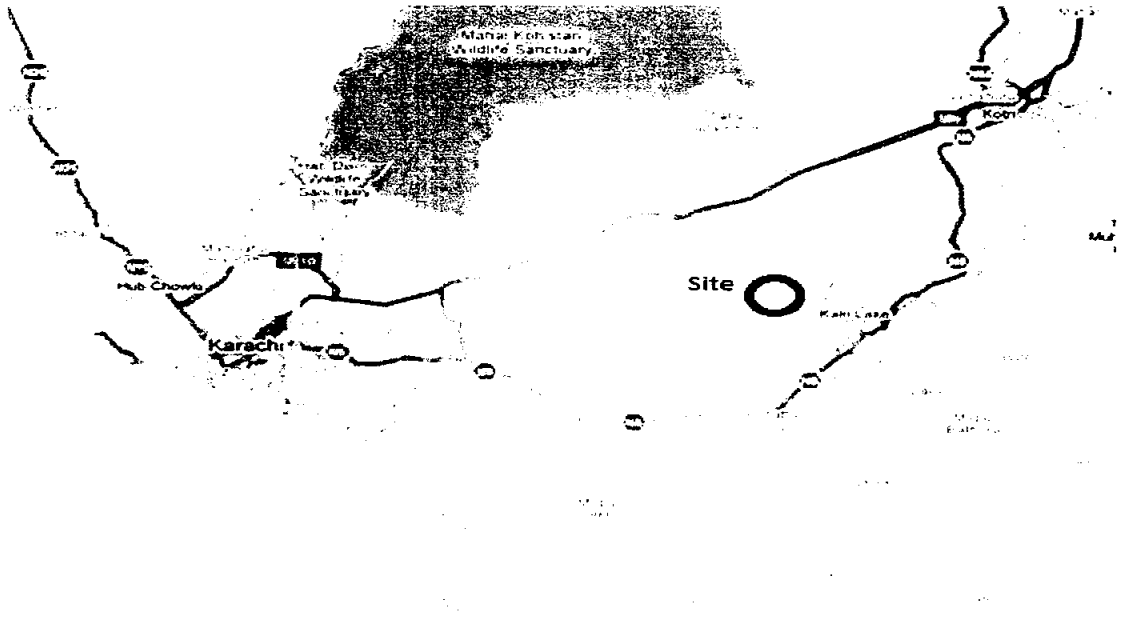
Location Map
Of the Generation Facility/Wind Power Plant/ Wind Farm





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Layout
of the Generation Facility/Wind Power Plant/ Wind Farm

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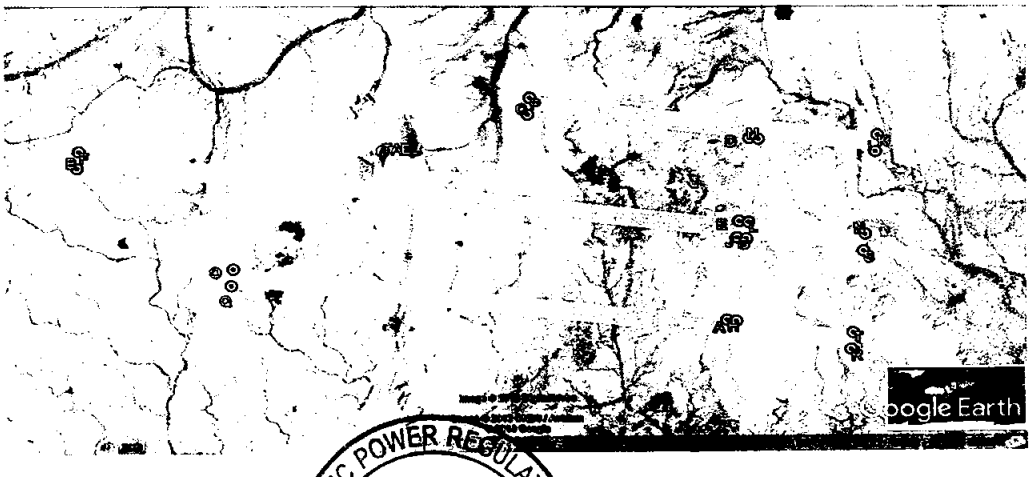
Micro-Sitting
Of the Generation Facility/Wind Power Plant/ Wind Farm

Total Land Area: 1000 Acres

	Geodetic Coordinates	
Point No.	**Latitude (N)**	**Longitude (E)**
Boundary 1	24.935261	67.800444
Boundary 2	24.977914	67.744131
Boundary 3	24.964225	67.790686
Boundary 4	24.952592	67.811139
Boundary 5	24.944931	67.805894
Boundary 6	24.979447	67.745178
Boundary 7	24.943400	67.804847
Boundary 8	24.935739	67.799606
Boundary 9	24.945953	67.822808
Boundary 10	24.942922	67.805686
Boundary 11	24.947486	67.823856
Boundary 12	24.944453	67.806736
Boundary 13	24.952114	67.811978
Boundary 14	24.938294	67.817564
Boundary 15	24.961608	67.754106
Boundary 16	24.965756	67.791733
Boundary 17	24.960075	67.753058
Boundary 18	24.927569	67.810225
Boundary 19	24.936761	67.816717
Boundary 20	24.929100	67.811272



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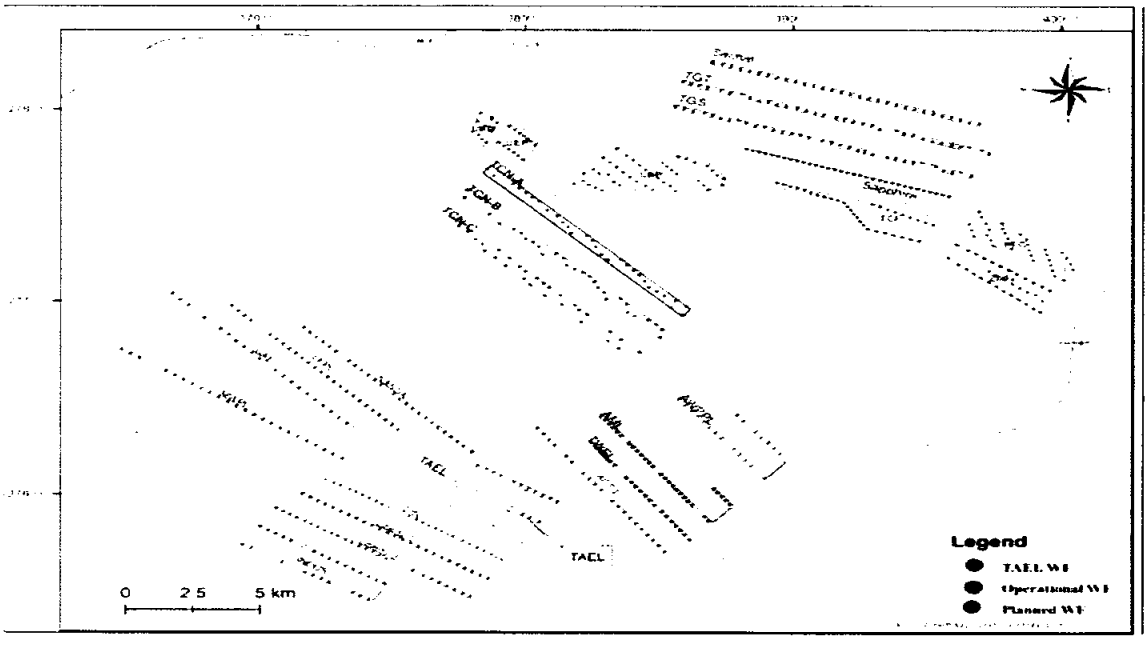
Micro-Sitting of the Generation Facility/Wind Power Plant/ Wind Farm



Wind Turbine Coordinates
UTM Z42, WGS 84

Wind Turbine	Easting [m]	Northing [m]
V1	381211	2759641
V2	380936	2759808
V3	380656	2759976
V4	380379	2760146
V5	380104	2760321
V6	379836	2760504
V7	379566	2760679
V8	379078	2760988
V9	378804	2761166
V10	378528	2761337
V11	378224	2761510
V12	380526	2758563
V13	380155	2758797
V14	379881	2758974

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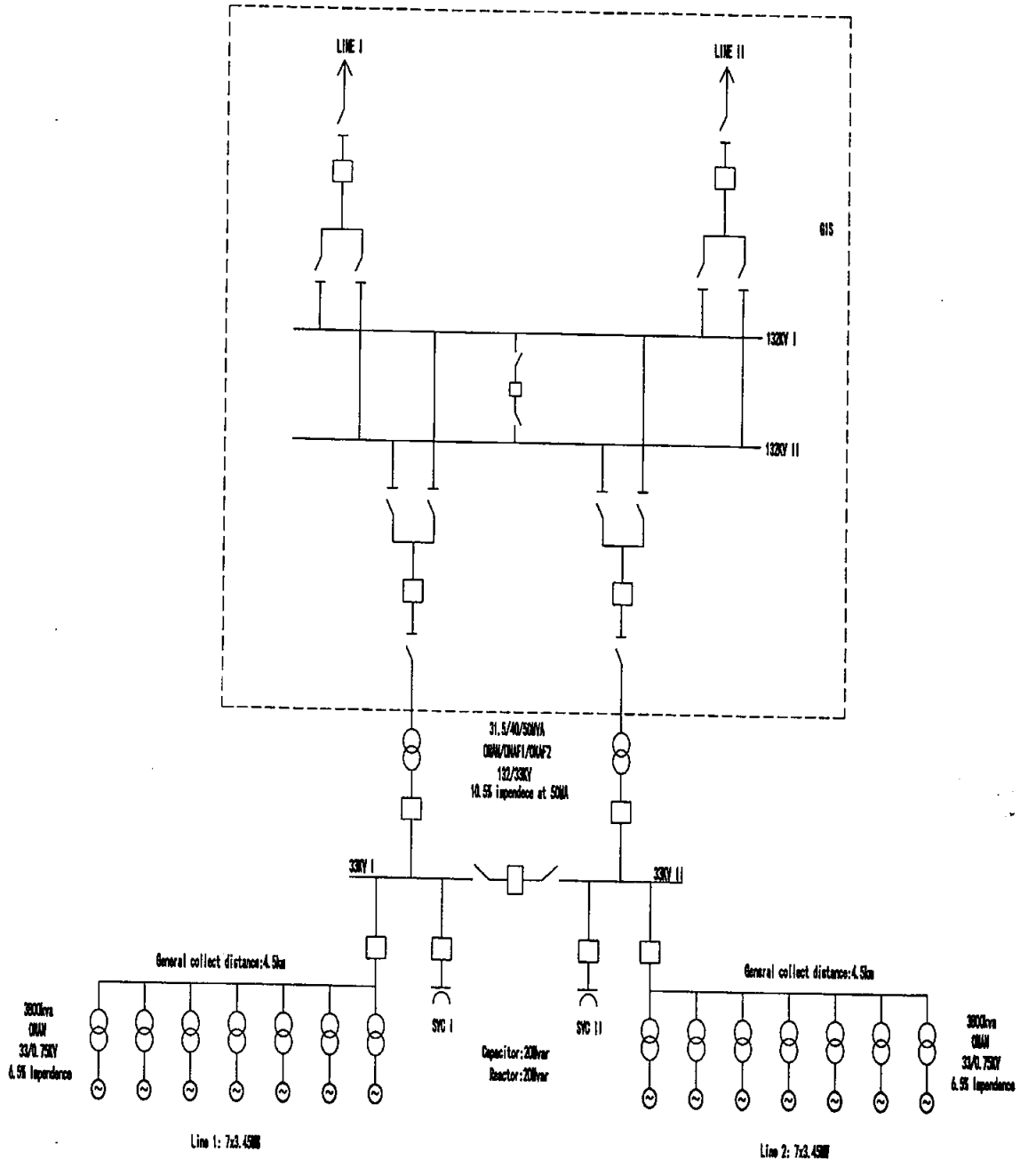
Single Line Diagram (Electrical System) of the Generation Facility/Wind Power Plant/ Wind Farm of the Licensee



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

The electric power generated from the Generation Facility/Wind Power Plant/Wind Farm of Trans-Atlantic Energy (Private) Limited (TAEPL) 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/Wind Farm of TAEPL will consist of the following:-

(a). A 132 KV double circuit transmission line looping in-out between sub clusters of 50.00 MW Wind Power Plants of Act2 Din Wind (Private) Limited and Din Energy Limited to Jhimpir-New 220/132 KV collector substation

(3). The scheme of interconnection of Generation Facility/Wind Power Plant/Wind Farm of TAEPL also proposes the following reinforcement already in place in Jhimpir cluster:-

(a). 220/132 KV Jhimpir-New Substation at suitable location in Jhimpir cluster;
(b). 80 KM long double circuit from Jhimpir-New 220 KV Substation to the existing T.M. Khan Road 220 KV Substation;
(c). A 132KV double circuit of 82 km using Greeley conductor would be constructed to connect Jhimpir-New 220/132 KV Substation with T.M. Khan in HESCO network;
(d). 220/132 KV Gharo-New substation at suitable location in Gharo cluster;
(e). 65 km long 220 KV double circuit from Gharo-New 220 KV Substation to Jhimpir-New 220 KV Substation;
(f). Five sub-collectors groups will be connected to Jhimpir 220/132 KV collector substation through 132 KV double circuits;

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(g). Four Wind Power Plants in the collector system of Gharo 220/132 KV substation;

(h). Rehabilitation of the exiting 132 KV lines in the vicinity of WPP clusters, i.e. Jhimpir-Kotri, Jhimpir-Thatta, Thatta-Sujawal and Nooriabad-Jamshoro Old.

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

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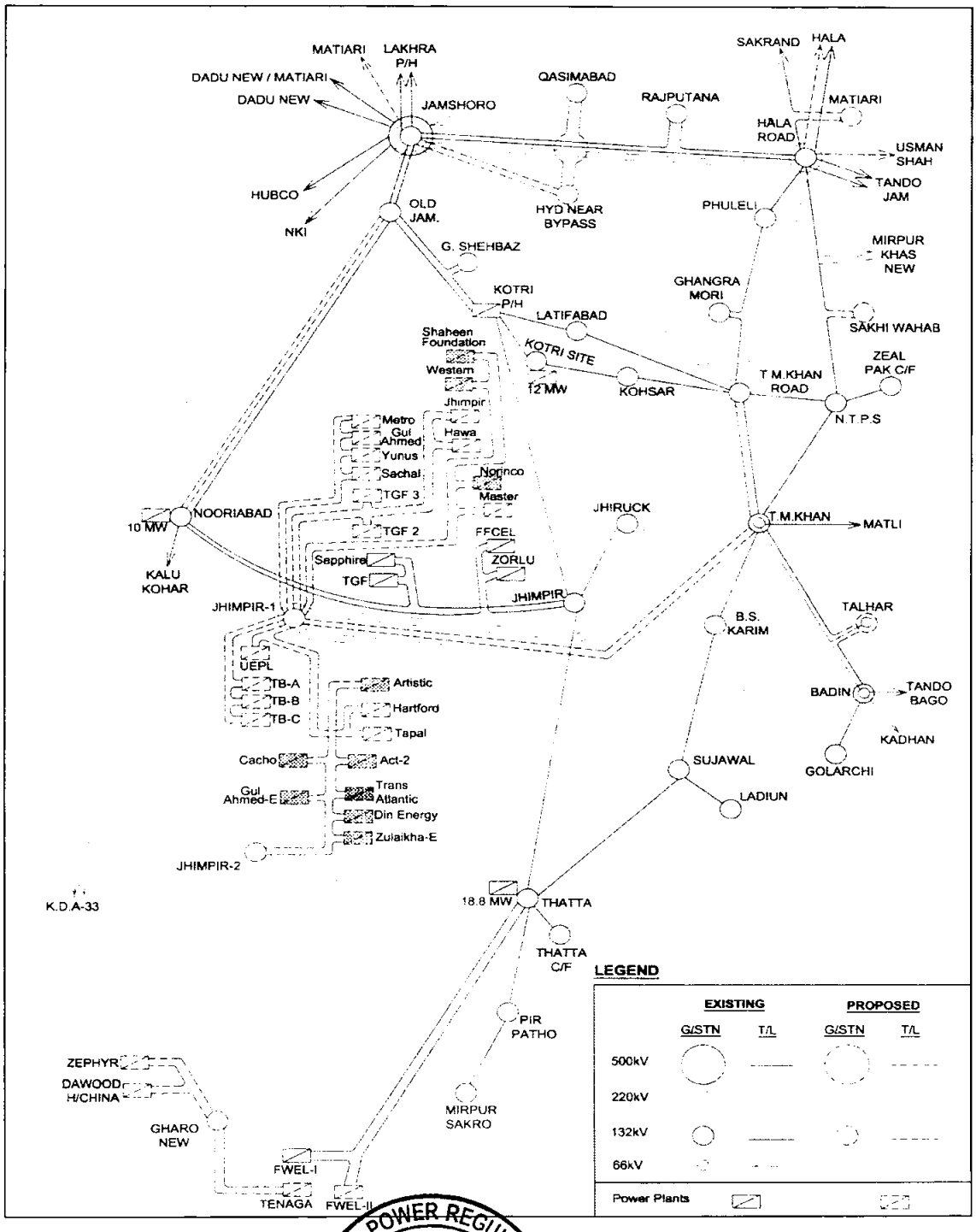
Schematic Diagram of Interconnection Arrangement/Transmission Facilities for Dispersal of Power from the Generation Facility/Wind Power Plant/Wind Farm



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

(A). General Information

(i).	Name of the Company/Licensee	Trans Atlantic Energy (Private) Limited
(ii).	Registered/Business Office of the Company	First Floor, Bahria Complex III, M.T. Khan Road, Karachi
(iii).	Location of the Generation Facility	Deh Kohistan, Jhimpir, District Thatta, Sindh
(iv).	Type of Generation Facility	Wind Power Plant

(B). Wind Farm Capacity & Configuration

(i).	Wind Turbine Type, Make & Model	Vestas (V126-3.45 MW)
(ii).	Installed Capacity of the Generation Facility	48.30 MW
(iii).	Number of Units/Size of each Unit	14 x 3.45 MW

(C). Wind Turbine Details

(a). Rotor		
(i).	Number of Blades	3
(ii).	Rotor Speed	5.9-16.0 rpm
(iii).	Rotor Diameter	126 m
(iv).	Swept Area	12,469 m^2
(v).	Power Regulation	Combination of blade pitch angle adjustment, and converter control
(vi).	Cut-in wind speed	3 m/s
(vii).	Rated power wind speed	12.2 m/s (air density = 1.160 kg/m^3)

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(viii).	Cut-out wind speed	27.5 m/s
(ix).	Survival wind speed	52.5 m/s for 3 Sec, 37.5 m/s for 10 Mins
(x).	Pitch regulation	Hydraulic pitch cylinder drives a ring gear mounted to the inner race of the blade pitch bearing
(b). Blades		
(i).	Blade Length	61.66 m
(ii).	Material	Fiberglass reinforced epoxy, carbon, fibers and Solid Metal Tip (SMT)
(iii).	Weight	12,400 kg
(c). Gear Box		
(i).	Type	Two planetary stages and one helical stage
(ii).	Gear ratio	1 :112.8
(iii).	Weight	27,127 kg
(iv).	Oil quantity	1000-1200 Liters
(v).	Main shaft bearing	Roller bearing mounted in a pillow-block housing arrangement
(d). Converter		
(i).	Type	Full Scale Converter
(ii).	Rated Voltage	750 V
(iii).	Rated Current	3286 A
(e). Generator		
(i).	Power	3650 Kw
(ii).	Voltage	750 V
(iii).	Type	Asynchronous with cage rotor
(iv).	Speed	1450 – 1550 rpm

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(v).	Enclosure class	IP-54
(vi).	Coupling	Flexible coupling
(vii).	Efficiency	≥ 97%
(viii).	Weight	8,050 kg
(ix).	Power Factor	±0.90 (Leading to Lagging)
(f). Yaw System		
(i).	Yaw Bearing	Plain bearing system
(ii).	Brake	Forged yaw ring heat-treated. Plain bearings PETP
(iii).	Yaw Drive	Multiple stages geared
(iv).	Speed	0.45 Degree/Sec
(g). Control System		
(i).	Type	Automatic or manually controlled
(ii).	Grid Connection	Via Full scale converter
(iii).	Scope of Monitoring	Remote monitoring of more than 500 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
(h). Brake		
(i).	Design	Three independent systems, fail safe (individual pitch)
(ii).	Operational Brake	Aerodynamic brake achieved by feathering blades
(iii).	Secondary Brake	Mechanical brake on (high speed) shaft of gearbox

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(i). **Tower**		
(i).	Type	Cylindrical tubular steel tower
(ii).	Hub Heights	87 m

(D). Other Details

(i).	COD of the Generation Facility (Anticipated)	June 30, 2024
(ii).	Minimum Useful Life of the Generation Facility from COD	25 years

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Power Curve
of Wind Turbine Generator
Vestas (V126-3.45 MW)
(Tabular)

Wind speed [m/s]	Power [kW]	Ct
3	30.00	0.89
4	170.00	0.82
5	376.00	0.83
6	678.00	0.82
7	1,098.00	0.81
8	1,654.00	0.78
9	2,339.00	0.76
10	3,068.00	0.69
11	3,415.00	0.53
12	3,449.00	0.38
13	3,450.00	0.29
14	3,450.00	0.23
15	3,450.00	0.18
16	3,450.00	0.15
17	3,450.00	0.13
18	3,450.00	0.11
19	3,450.00	0.09
20	3,450.00	0.08
21	3,450.00	0.07
22	3,450.00	0.06
23	3010.00	0.05
24	2492.00	0.04
25	1682.00	0.2
26	955.00	0.01
27	696.00	0.01

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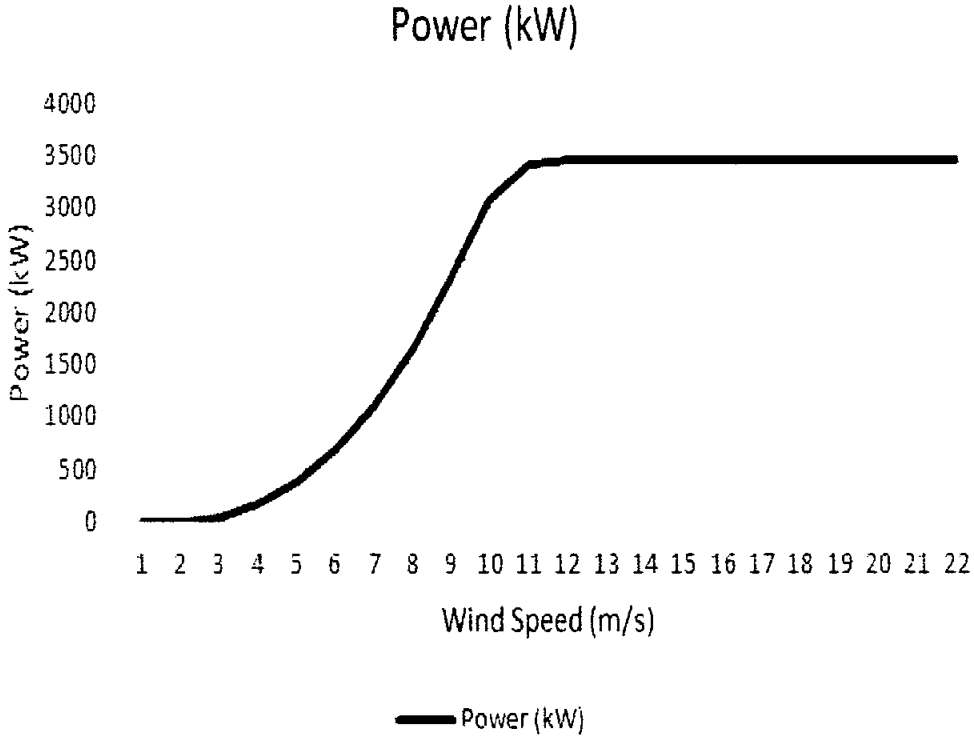
Power Curve
of Wind Turbine Generator
Vestas (V126-3.45 MW)
(Graphical)



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SCHEDULE-II
Revised/Modified

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)	48.30 MW
(2).	Total Annual Full Load Hours	3248 Hrs
(3).	Average Wind Turbine Generator (WTG) Availability	99.0%
(4).	Total Gross Generation of the Generation Facility/Wind Farm (in GWh)	≥182.665 GWh
(5).	Array & Miscellaneous Losses GWh	≤20.779 GWh
(6).	Availability Losses GWh	≤1.8266GWh
(7).	Balance of Plant Losses GWh	≤4.5666 GWh
(8).	Annual Energy Generation (25 years equivalent Net AEP) GWh	≥156.909 GWh
(9).	Net Capacity Factor	≥37.1%

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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