National Electric Power Regulatory Authority
Islamic Republic of Pakistan

NEPRA Tower, Attaturk Avenue (East), G-5/1, Islamabad
Ph: +92-51-9206500, Fax: +92-51-2600026
Web: www.nepra.org.pk, E-mail: registrar@nepra.org.pk

Registrar

No. NEPRA/R/DL/LAG-428/ 16027-13 August 30, 2019

Mr. Yasser Malik,
Chief Executive Officer,
Enertech Quetta Solar (Private) Limited,
Office No. 712, 7th Floor, Al-Hafeez Business Centre,
89-B/III, Gulberg-III,
Lahore.
Phone No. 042-35772778

Subject: **Grant of Generation Licence No. SPGL/27/2019**
Licence Application No. LAG-428
Enertech Quetta Solar (Private) Limited (EQSPL)

Reference: EQSPL's application vide letter dated May 21, 2018 (received on June 05, 2018)

Enclosed please find herewith Determination of the Authority in the matter of Application of "Enertech Quetta Solar (Private) Limited (EQSPL)" for the Grant of Generation Licence along with Generation Licence No. SPGL/27/2019 annexed to this determination granted by the National Electric Power Regulatory Authority (NEPRA) to Enertech Quetta Solar (Private) Limited (EQSPL) for its 50.00 MW Solar Power Plant located at Moza Neeli Tappa Bostan, Tehsil Kerezat, District Pishin in the province of Balochistan, pursuant to Section 14B of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 (NEPRA Amended Act).

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

Enclosure: Generation Licence No. SPGL/27/2019

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY REGISTRAR

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(Syed Safeer Hussain)

Copy to:

1. Secretary, Power Division, Ministry of Energy, A-Block, Pak Secretariat, Islamabad.
2. Managing Director, NTDC, 414-WAPDA House, Lahore.
3. Chief Executive Officer, CPPA-G, ENERCON Building, Sector G-5/2, Islamabad.
4. Chief Executive Officer, Quetta Electric Supply Company (QESCO), 14-A Zarghoon Road, Quetta.
5. Director General, Environmental Protection Department, Government of Balochistan, Zarghoon Road, Quetta.
6. Chief Secretary, Government of Balochistan, Balochistan Secretariat, Quetta.

National Electric Power Regulatory Authority (NEPRA)

Determination of the Authority in the Matter of Application of Enertech Quetta Solar (Private) Limited for the Grant of Generation Licence

August 30, 2019
Case No. LAG-428

(A). Background

(i). In order to tap the huge indigenous potential of the province for power generation, the Government of Balochistan (GoB) has formulated a power policy titled Balochistan Power Generation Policy 2007 ("the Balochistan Power Policy").

(ii). In this regard, GoB has issued Letter of Intent (LoI) to different project developers/entrepreneurs for setting up solar power projects. One such LoI has been issued to Enertech Holding Company Limited of Kuwait under the Balochistan Power Policy. The LoI envisaged setting up a 50.00 MW solar based generation facility/Solar Power Plant/Solar Farm in the Bostan region of district Pishin, in the province of Balochistan. According to the terms and conditions of LoI, the sponsors of the project incorporated a Special Purpose Vehicle (SPV) in the name of Enertech Quetta Solar (Private) Limited (EQSPL).

(iii). Further to the above, the sponsors of the project carried out the feasibility study and the same was approved by Panel of Experts (PoEs) appointed by GoB. Thereafter, EQSPL decided to approach the Authority for the grant of generation licence.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY ★ NEPRA ★ REGISTRAR

(B). Filing of Application

(i). EQSPL submitted an application on June 05, 2018 for the grant of generation licence in terms of Section-14B/Section-15 of Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 ("the NEPRA Act") read 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, EQSPL was directed for submitting the missing information/documentation and the same was received on June 26, 2018. The Registrar submitted the application for the consideration of the Authority to decide the admission of the same or otherwise. Accordingly, 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 July 05, 2018 for consideration of the grant of the generation licence as stipulated in Regulation-7 of the Licensing Regulations. The Authority also approved a notice of admission to be published in the press for inviting comments of general public, interested and affected persons in the matter as stipulated in Regulation-8 of the Licensing Regulations. Accordingly, the said notices were published in one (01) Urdu and one (01) English newspapers on July 07&08, 2018.

(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 different stakeholders as per the approved list on July 10, 2018, soliciting their comments for assistance of the Authority.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

(C). Comments of Stakeholders

(i). In reply to the above, the Authority received comments from four (04) stakeholders. These included Engineering Development Board of Ministry of Industries & Production (EDB), Central Power Purchasing Agency (Guarantee) Limited (CPPA-G), Ministry of Science and Technology (MoS&T) and National Transmission and Despatch Company Limited (NTDC). The salient points of the comments offered by the said stakeholders are summarized below:-

(a). EDB submitted that the information pertaining to the project has been reviewed and it has been concluded that the same is not relevant to it. However, it is recommended that all efforts should be made to utilize the indigenous resources available for the implementation of the project;

(b). CPPA-G requested that before considering the application of EQSPL for the grant of generation licence the Authority may consider the relevant provisions of the Grid Code (i.e. Planning Code-Clause PC-4 of Grid Code) according to which NTDC is required to prepare on an annual basis a ten (10) year "Indicative Generation Capacity Expansion Plan (IGCEP)" covering 0-10 Year timeframe for the consideration and approval of the Authority. The IGCEP shall identify new capacity requirements, location and commissioning date. The said plan is required to satisfy loss of load probability criteria, load growth forecast, operating reserve requirements, and other related capacity planning criteria. Further, CPPA-G stated that the quantum specifically in the case of Renewable Energy (RE) for the year 2017-18, has not been approved/finalized by the Grid Code Review Panel (GCRP). Also, CPPA-G has not given

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR

any consent to the proposed project. The Authority may process the application of EQSPL duly considering the above mentioned observations;

(c). MoS&T stated that it may not be able to provide specific comments/views on the project without any detailed profile of the company and other technical parameters. Further, MoS&T cannot comment on the financial and other ToRs of the project. However, the proposed project will help to overcome the short fall of electric power in the country in general and that in the province of Balochistan in particular;

(d). NTDC remarked that the Grid Interconnection Study (GIS) carried out by the consultant of the project has been submitted and the same is currently under review.

(ii). The Authority reviewed the above comments of the stakeholders and considered it appropriate to seek the perspective of EQSPL on the observations of EDB, CPPA-G and NTDC. On the comments of EDB, the company confirmed that it will strive to utilize all the indigenous resources for the development of the project. About the observations of CPPA-G, it was submitted that according to Grid Code, NTDC is required to prepare a ten (10) year IGCEP, identifying the new capacity requirements, the anticipated locations of the new capacity and commissioning date of the same. The said plan, should satisfy the loss of load probability criteria, load growth forecast, operating reserve requirements, and other related capacity planning criteria. In consideration of the said, the attention of the Authority is drawn to the minutes of meeting of Grid Code Review Panel (GCRP) held on September 11, 2017 and circulated on July 09, 2018. In the said meeting, GCRP decided to inform the stakeholders including the Authority that the share of solar should be equal to 5% of the total installed grid connected capacity. Based on economic survey of Pakistan, the current grid capacity is around 29,573 MW and according to the said, the total capacity

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

pertaining to solar should be around 1,478 MW. However, as of now only 430.00 MW of solar projects are operational therefore, the proposed project is within the permissible limits. Furthermore, it was highlighted that NTDC vide its letter dated June 23, 2017 submitted a tentative demand supply analysis with the report namely Power Balance Position up to 2025. In the said report, NTDC had submitted that it plans to induct additional 600 MW of solar power projects in 2019-20. Further to the said, EQSPL submitted that the Authority in its latest State of Industry Report (SIR) has observed that Quetta Electric Supply Company Limited (QESCO) is one of the utilities which are unable to draw electric power from the high voltage system of NTDC due to constraints in their system. In view of the said, the proposed 50.00 MW generation facility/power plant is justified as the same is ideally located close to the load center of Quetta and will be dispatched at 132 KV, for which no system constraint is envisaged and will greatly help in supporting the overall grid in the area. Regarding the submission of CPPA-G with respect to non-issuance of consent for purchase of power to EQSPL, it was stated that there is no requirement of submission of the same for grant of generation licence and determination of tariff under the relevant rules and regulations. On the observation of approval of GIS, the company submitted that NTDC has already approved the same through its letter no. GMPSP/CETP/TRP-380/6726-31 dated October 26, 2018 confirming that the electric power generated from the project will not have any adverse effect on the National Grid as required under the prevailing grid code.

(iii). The Authority considered the above submissions of EQSPL and considered it appropriate to proceed further in the matter as stipulated in the Licensing Regulations and NEPRA Licensing (Generation) Rules 2000 ("the Generation Rules").

REGISTRAR

(D). Evaluation/Findings

(i). The Authority has reviewed the submissions of EQSPL including the information provided in its application for the grant of generation licence, comments of the stakeholders and the rejoinder in the matter. The Authority has also considered the feasibility study of the project, interconnection & dispersal arrangement studies etc., provisions of the RE Policy and the relevant rules & regulations.

(ii). The Authority has observed that the main sponsor of the project is Enertech Holding Company Limited which is a Kuwaiti shareholding company fully owned by National Technology Enterprises Company (NTEC) which is ultimately owned by the Kuwait Investment Authority. NTEC holds a large portfolio of assets and investments specialized in energy, renewables, water, and cleantech sectors since 2004. Based on the financial strength and other evaluation parameters, GoB issued LoI for development of the project. In this regard, GoB has allocated 250.00 acres of land in the Bostan region on Kuchlak-Zhob highway (N50), Tehsil Bostan, District Pishin, Balochistan. As explained above, for the implementation of the project, the sponsor has incorporated a SPV in the name of EQSPL under Section-32 of the Companies Ordinance, 1984 (Corporate Universal Identification No. 0102193, dated September 06, 2016). The Registered/Business office of the SPV is 712, Al Hafeez Business Centre, 89 B/3, Gulberg-III, Lahore, in the province of Punjab. According to the Memorandum of Association, the objects of the company, *inter alia*, include business of power generation and its sale thereof. According to the submitted information, the total outlay of the project will be U.S. $ 49.85 million which will be financed through a combination of debt (U.S. $ 39.88 million) and equity (U.S. $ 09.97 million) in a ratio of 80:20 which is in line with the benchmark set out in different determinations of the Authority in similar cases. The Authority has observed that the sponsors are in negotiation with different financial intuitions including United Bank Limited, CDC Investment UK and others multilateral

REGISTRAR

donors for financing the debt portion of the project. In consideration of the said, the Authority considers that sponsors have strong financial and technical background to carry out 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, solar power plant equipment details, micro-sitting details, power production estimates based on solar irradiation data of the project site, soil tests reports, technical details pertaining to selected photovoltaic (PV) cells and other allied equipment to be used in the solar power plant, electrical studies, environmental study and project financing etc.

(iv). The Authority has reviewed the feasibility study of the project and same has revealed that the company has considered various world class manufacturers of PV cells including Hanwha Q CELLS Co., Ltd., JA Solar Holdings Co., Ltd, Trina Solar Limited, First Solar, Inc., Jinko Solar Limited, Motech Industries Inc., Tongwei Solar Company Limited, Yingli Solar Limited, Canadian Solar Inc. and Shunfeng International Clean Energy Limited. After duly considering various factors including (a). Solar resource position of the proposed location; (b). Capital cost of equipment/PV Cells; (c). Lead time for supply of equipment/PV Cells; (d). Expected energy yield of PV Cells; (e). Reliability and compliance with Grid Code; (f). Availability of suitable operation and maintenance teams (including easiness/availability of spare/replacement parts for PV Cells etc.), the company decided to select Canadian Solar Inc. The feasibility study also optimized the size of the proposed generation facility/Solar Power Plant/Solar Farm to 50.00 MW, having 147060 x 340 W_P Poly Crystalline PV Modules of Canadian Solar (CS3U-340W_P). Canadian Solar Inc. was founded in 2001 in Ontario Canada and operates as a global energy provider with successful business subsidiaries in nineteen (19) countries on six (06) continents including Canada, China, Brazil and South East Asian countries. It has delivered more than 33 GW of premium quality solar modules to customers in over 150 countries in

the past 18 years. Further, Canadian Solar has a portfolio of 4.6GW of solar power projects globally. Canadian Solar was listed as Bloomberg New Energy Finance's Tier-1 module manufacturer in terms of bankability for Q4 2018, and was named in the Top 3 Global Utility-scale Solar PV Project Developers for 2017 by GTM Research.

(v). In view of the above, the Authority considers that the sponsors of the project have selected top of the line Tier-I company for supply of the PV panels. Further to said, the technology selected for PV cells for the project is polycrystalline which is a mature technology and is widely used due to its better energy yield to cost ratio. Accordingly, it can be safely said that the selected technology for PV cells is mature, cost effective and time tested. In view of the said, the Authority considers that the selected technology has distinctive features including versatility, flexibility and good performance.

(vi). The Authority has observed that the sponsors of the project carried out the required GIS to determine the arrangement for dispersal of electric power from the proposed generation facility/Solar Power Plant/Solar Farm. According to the said study, the interconnection arrangement for despatch of electric power will be on 132kV voltage and will be consisting of a double circuit (D/C) transmission line (on ACSR Rail conductor measuring around 17.00 km approximately) for making In-Out of existing 132 KV S/C Noshar-Yaru Transmission line at the proposed generation facility/Solar Power Plant/Solar Farm connecting it to the system of QESCO. In this regard, NTDC has also vetted/approved the above mentioned GIS, confirming that all the relevant parameters are within permissible limits of the Grid Code.

(vii). The Authority observes 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 operation of the generation facility/Solar Power Plant/Solar Farm may cause soil pollution, water pollution and noise pollution during construction and operation. In this

ELECTRIC POWER REGULATORY AUTHORITY REGISTRAR

regard, the Authority has observed that EQSPL carried out the Initial Environment Examination (IEE) study for the project and submitted the same for the consideration and approval of Balochistan Environmental Protection Agency, Government of Balochistan (BEPA). In this regard, BEPA had already issued a No Objection Certificate (NOC) to the company for the construction of the project.

(viii). 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 the particular case under consideration, the Authority considers that conditions of Rule-3(2) and Rule-3(3) stand satisfied as EQSPL 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 facility/Solar Power Plant/Solar Farm. The provision of Rule-3(4) of the Generation Rules regarding holding a public hearing is not applicable as there was no issue which required this exercise.

(ix). The Rule-3(5) of the Generation Rules stipulates that the Authority may 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(5) 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 against the preferences indicated by the Authority; (d). the cost and right-of-way considerations related to the provision of transmission and interconnection facilities; (e). the constraints on the

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR

transmission system likely to result from the proposed generation facility 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; 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.

(x). The Authority considers that the proposed project will result in optimum utilization of the RE of the province of Balochistan which is untapped, resulting in pollution free electric power. It is pertinent to mention that solar is an indigenous RE resource and such resources should have a preference for the energy security. There is a global trend of reduction in the prices of PV Cells which results in lower tariffs as is evident from various determinations of the Authority. These lower tariffs will result in reduction of the overall basket price which will be beneficial to the public at large.

(xi). As explained in the preceding paragraphs, the sponsor 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 thin population of the area, the project will not result in cost and right-of-way issues for the provision of transmission and interconnection facilities. In view of the said, the Authority considers that the project of EQSPL fulfills the eligibility criteria for grant of generation licence as stipulated in the NEPRA Act, rules, 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

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY REGISTRAR

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 are given priority for electric power generation and their development is encouraged. Recently, the world market for RE technologies have seen a sharp declining trend in terms of prices, making these technologies very attractive and cost effective for generation of electric power. Further, there are developments in the sector which are paving the way to address the intermittency issues of these technologies. In view of the said, the Authority is of the considered opinion that there is a worldwide trend to increase the share of RE in the energy mix of any country and it is very likely that the Govt. of Pakistan will also be considering to increase the share of RE substantially in the coming years.

(iii). The Authority considers that the proposed project of EQSPL will help in diversifying the energy portfolio as well increasing share of RE in 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 carbon emissions by generating clean electricity, thus improving the environment.

(iv). As explained in the preceding paragraphs, EQSPL 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/Solar Power Plant/Solar Farm. In this regard, the Authority has observed that Government of Balochistan has allocated land to EQSPL for setting up the generation facility/Solar Power Plant/Solar Farm. The said details are being incorporated in the generation licence. The Authority directs EQSPL to

REGISTRAR

utilize the allocated land exclusively for the proposed generation facility/Solar Power Plant/Solar Farm and not to carry out any other activity on the said allocated land except with the prior approval of the competent authority.

(v). The term of a generation licence under Rule-5(1) of the Generation Rules is required to commensurate 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 EQSPL, its generation facility/Solar Power Plant/Solar Farm will achieve COD by June 30, 2020 and will have a useful life of more than twenty five (25) years from its COD. In this regard, EQSPL has requested that the term of the proposed generation licence may be fixed as twenty five (25) years. The Authority considers that said submission of EQSPL about the useful life of the generation facility/Solar Power Plant/Solar Farm and the subsequent request to fix the term of the generation licence is consistent with international benchmarks therefore the Authority fixes the term of the generation licence as twenty five (25) 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 this regard, it is pertinent to mention that EQSPL has filed a tariff petition for determination of its tariff on cost plus basis. The Authority has admitted the same and the same is in advance stage of processing. Further, to the said, Cabinet Committee on Energy (CCoE) through its decision dated April 04, 2019 has decided that projects of RE at the stage of LoI will be going through Competitive Bidding (CB). In view of the said, it is still not clear whether EQSPL will be having a cost plus tariff or a tariff through CB. In view of the said, the Authority considers appropriate to direct EQSPL to charge the power purchaser only such tariff which has been determined, approved or specified by it. In view of the said, the Authority decides to include a specific article in the generation licence. Further, the Authority directs EQSPL to adhere to the said in letter and spirit without any exception.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

(vii). About the compliance with the environmental standards, as discussed in the preceding paragraphs, EQSPL has provided the NOC from BEPA and has confirmed that the 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 specific article in the generation licence along with other terms and conditions making it obligatory for EQSPL to comply with relevant environmental standards at all times. Further, the Authority directs EQSPL to submit a report on a bi-annual basis, confirming that operation of its generation facility/Solar Power Plant/Solar Farm is in compliance with the required environmental standards as prescribed by the concerned environmental protection agency.

(viii). The proposed generation facility/Solar Power Plant/Solar Farm of EQSPL 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. EQSPL has informed that the project will achieve COD by June 30, 2020, which is within the deadline of the Kyoto Protocol. In view of the said, an article for carbon credits and its sharing with the power purchaser has been included in the generation licence. Accordingly, the Authority directs EQSPL to initiate the process in this regard at the earliest so that proceeds for the carbon credits are materialized. EQSPL shall be required to share the proceeds of the carbon credits with the power purchaser as stipulated in the generation licence.

(ix). In view of the above, the Authority hereby approves the grant of generation licence to EQSPL 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 thereunder and other applicable documents.

REGISTRAR

Authority:

Engr. Rafique Ahmed Shaikh
(Member)

Engr. Rehmatullah Baloch
(Member)

Saif Ullah Chattha
(Member)

Engr. Bahadur Shah
(Member/Vice Chairman)

Engr. Tauseef H. Farooqi
(Chairman)

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR

National Electric Power Regulatory Authority (NEPRA)
Islamabad – Pakistan

GENERATION LICENCE

No. SPGL/27/2019

In exercise of the powers conferred upon the National Electric Power Regulatory Authority (NEPRA) under Section 14B of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997, as amended or replaced from time to time, the Authority hereby grants a Generation Licence to:

ENERTECH QUETTA SOLAR (PRIVATE) LIMITED

Incorporated Under Section-32 of the Companies Ordinance 1984 (XLVII of 1984) Having Corporate Universal Identification No. 0102198; dated September 06, 2016

for its Generation Facility/Solar Farm/Solar Power Plant Located at Moza Neeli Tappa Bostan, Tehsil Karezat, District Pishin in the Province of Balochistan

(Total Installed Capacity: 50.00 MW_P Gross)

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

Given under my hand this on 30th day of August Two Thousand & Nineteen and expires on 29th day of June Two Thousand & Forty-Five.

Registrar 30 08 19

REGISTRAR

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY ★ NEPRA ★ ISLAMABAD

28

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;

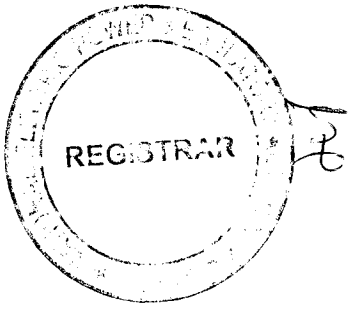
(b). "AEDB" means the Alternative Energy Development Board or any other entity created for the like purpose established by the GoP to facilitate, promote and encourage development of renewable energy in the country;

(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, the 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). "Balochistan Power Policy" means the "Balochistan Power Generation Policy 2007" of GoB as amended from time to time;



(g). "BPDB" means Balochistan Power Development Board or any other entity created for the like purpose established by the GoB to facilitate, promote and encourage development of private sector participation for development of projects for electric power in the province of Balochistan;

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

(i). "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/Solar Power Plant/Solar 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/Solar Power Plant/Solar Farm, which are available or can be obtained in relation to the generation facility/Solar Power Plant/Solar Farm after the COD;

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

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

(l). "Commissioning" means the undertaking of the Commissioning Tests of the generation facility/Solar Power Plant/Solar Farm as stipulated in the EPA;

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

REGISTRAR

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

(o). "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/Solar Power Plant/Solar Farm, as may be amended by the parties thereto from time to time;

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

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

(r). "GoB" means the Government of the province of Balochistan acting through the BPDB which has issued letter of intent to the Licensee for the design, engineering, construction, insuring, commissioning, operation and maintenance of the generation facility/Solar Power Plant/Solar Farm;

(s). "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/Solar Power Plant/Solar Farm;

(t). "QESCO" means Quetta Electric Supply Company Limited or its successors or permitted assigns;

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

REGISTRAR

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

(w). "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/Solar Power Plant/Solar Farm, as may be amended from time to time;

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

(y). "Licensee" means **Enertech Quetta Solar (Private) Limited** or its successors or permitted assigns;

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

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

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

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

(dd). "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;

REGISTRAR

(ee). "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;

(ff). "Solar Power Plant/Solar Farm" means a cluster of photovoltaic cells in the same location used for production of electric power;

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

1.2 The 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.

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/Solar Power Plant/Solar 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/Solar Power Plant/Solar 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/Solar Power Plant/Solar Farm before its COD.

REGISTRAR

Article-4
Term of Licence

4.1 This licence shall become effective from the date of its issuance and will have a term of twenty-five (25) years from the COD of the generation facility/Solar Power Plant/Solar Farm of the Licensee subject to Section 14-B 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.

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.

REGISTRAR

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/Solar Power Plant/Solar 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/Solar Power Plant/Solar Farm is in conformity with required environmental standards as prescribed by the relevant competent authority.

REGISTRAR

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/Solar Power Plant/Solar 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 properly calibrated automatic computerized solar radiation recording device(s) at its generation facility/Solar Power Plant/Solar Farm for recording of data.

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

Article-14
Emissions Trading /Carbon Credits

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

REGISTRAR

Article-15
Design & Manufacturing Standards

The photovoltaic cells and other associated equipment of the generation facility/Solar Power Plant/Solar 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 generation facility/Solar Power Plant/Solar Farm shall be unused and brand new.

Article-16
Power Curve

The power curve for the individual photovoltaic cell 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/Solar Power Plant/Solar Farm.

Article-17
Compliance with Applicable Law

The Licensee shall comply with the provisions of the Applicable Law, guidelines, directions and prohibitory orders of the Authority as issued from time to time.

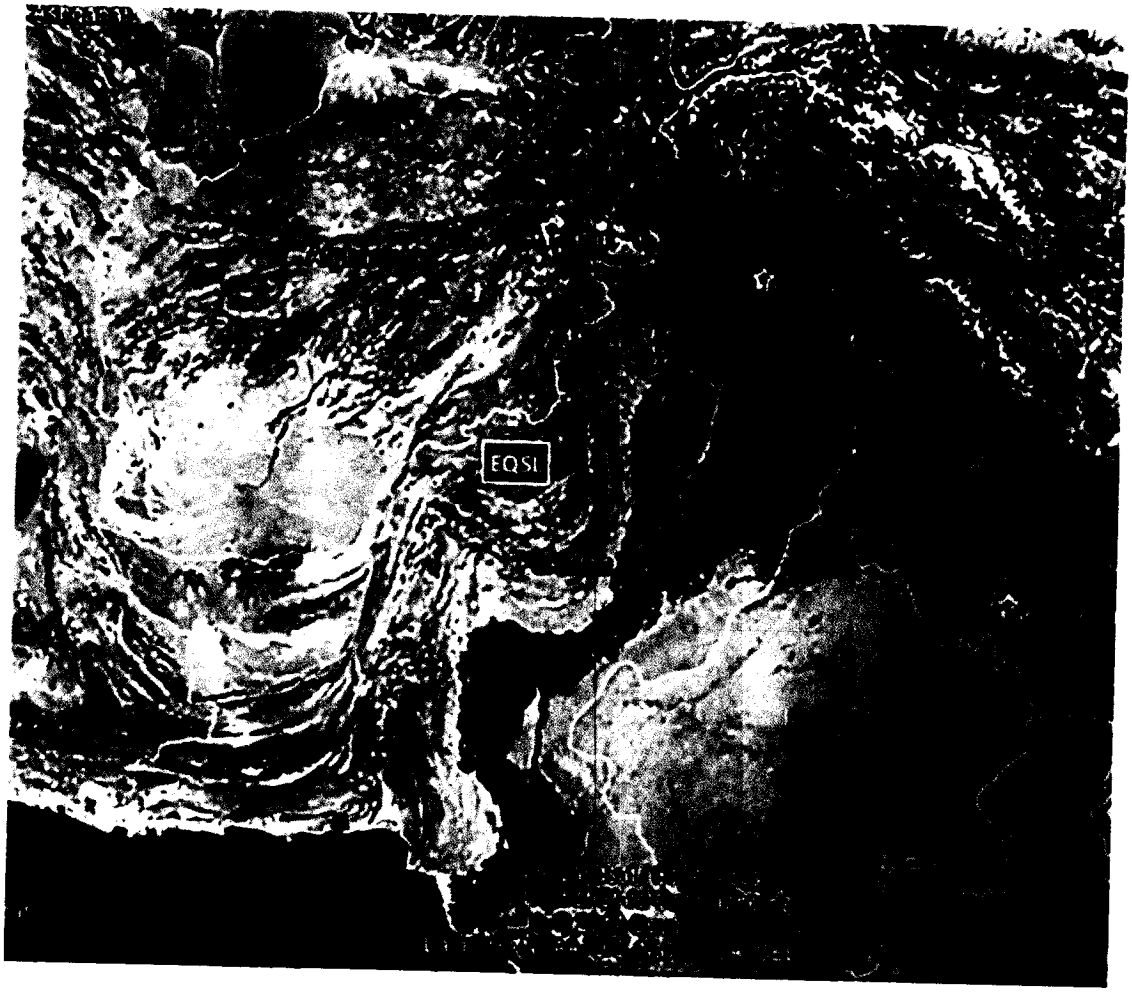
REGISTRAR

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 Facilities of the Licensee are described in this Schedule.

REGISTRAR

Location of the Generation Facility/Solar Power Plant/Solar Farm of the Licensee



REGISTRAR

Location of the Generation Facility/Solar Power Plant/Solar Farm of the Licensee

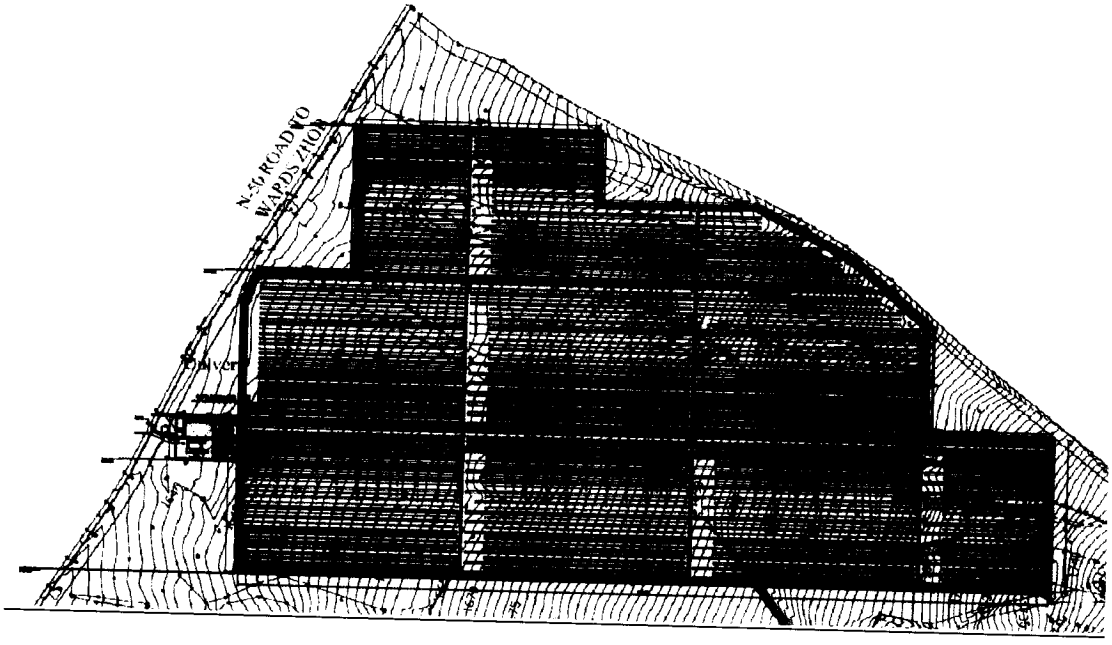
REGISTRAR

Land Coordinates of the Generation Facility/Solar Power Plant/Solar Farm of the Licensee

Sr. No.	Latitude	Longitude
(1).	30.452256	67.100602
(2).	30.460173	67.110318
(3).	30.454661	67.116144
(4).	30.447349	67.106555

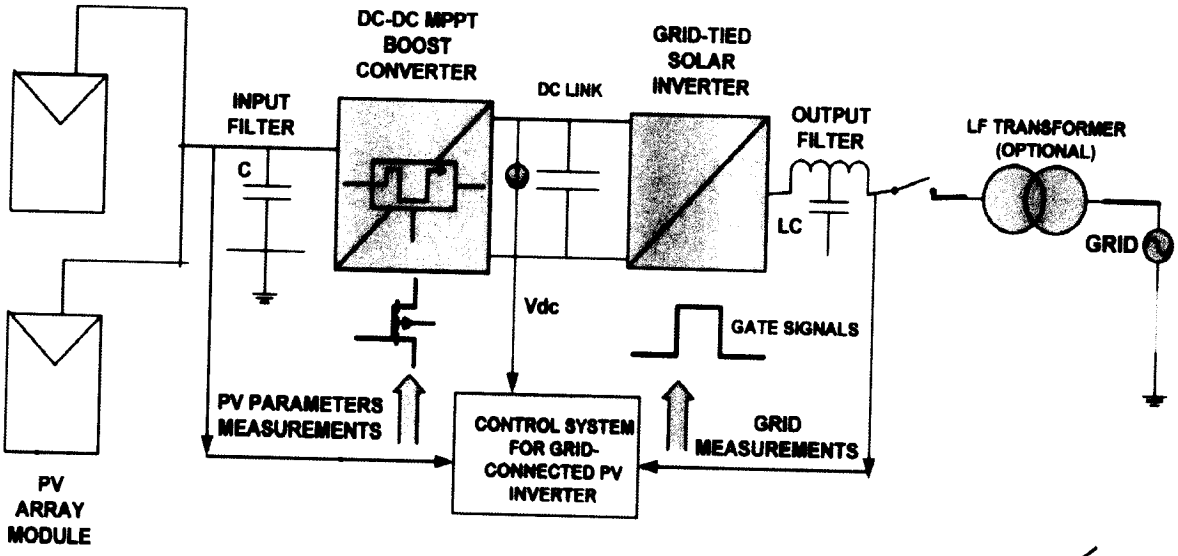
REGISTRAR

Schematic Diagram of the Layout of the Generation Facility/Solar Power Plant/Solar Farm of the Licensee



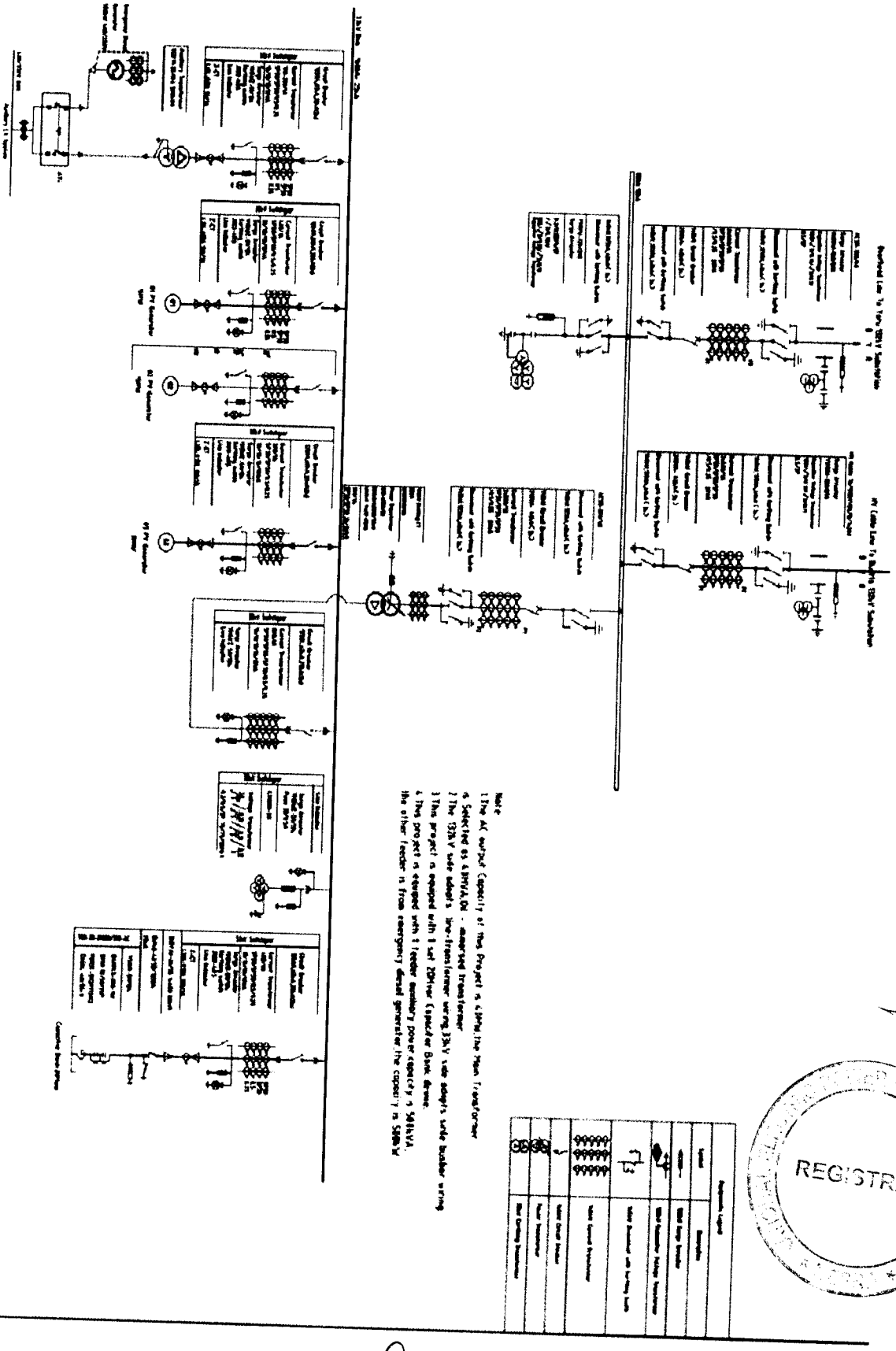
REGISTRAR

Process Flow Diagram of the Layout of the Generation Facility/Solar Power Plant/Solar Farm of the Licensee



REGISTRAR

Single Line Diagram
of the Generation Facility/Solar Power Plant/Solar Farm
of the Licensee



REGISTRAR

Interconnection Arrangement for Dispersal of Electric Energy/Power from the Generation Facility/ Solar Power Plant/Solar Farm

The electric power generated from the generation facility/Solar Power Plant/Solar Farm of the Licensee/Enertech Quetta Solar (Private) Limited/EQSPL shall be dispersed to the load center of QESCO.

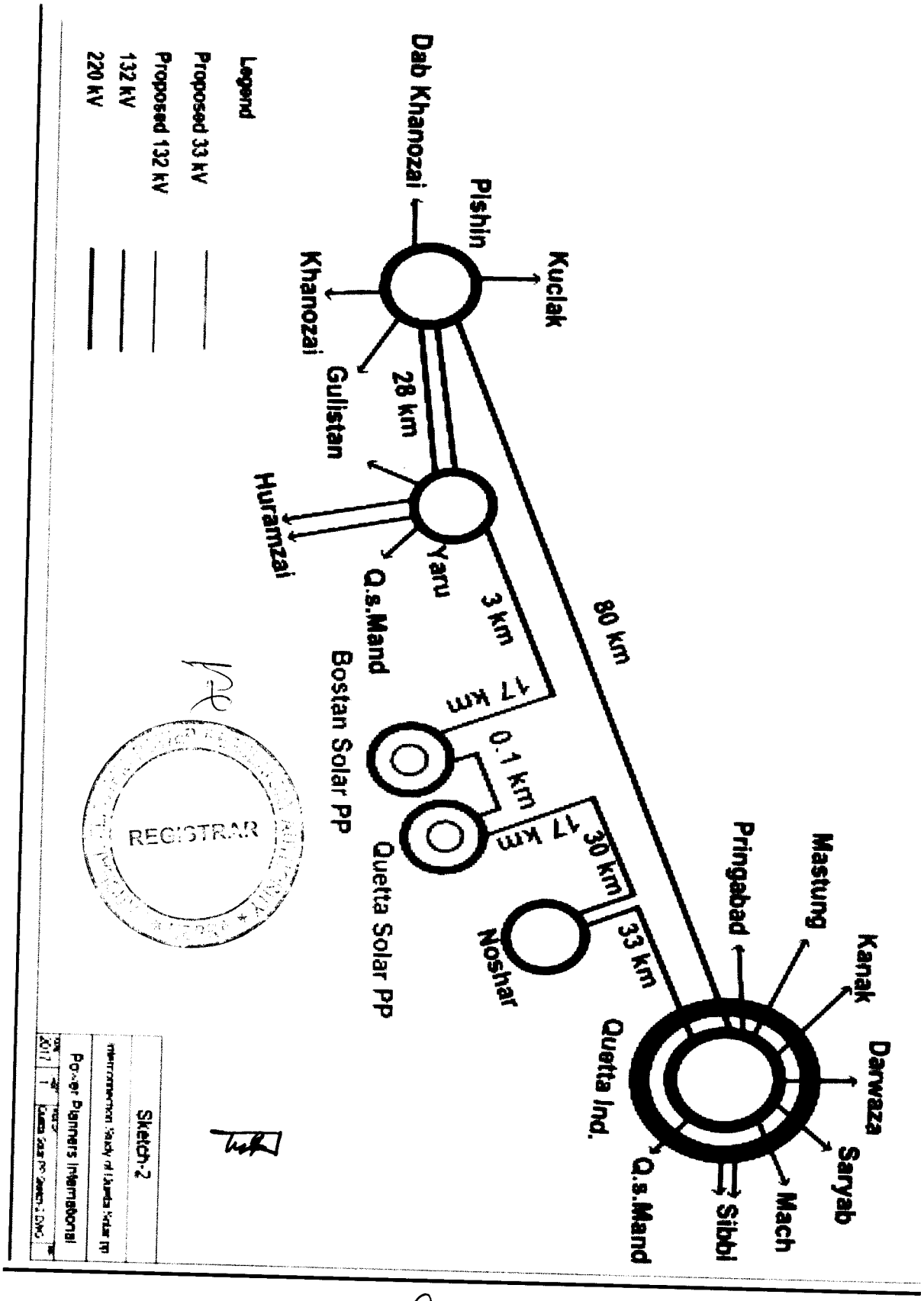
(2). The proposed Interconnection Arrangements/Transmission Facilities for dispersal of power from generation facility/Solar Power Plant/Solar Farm of the Licensee/EQSPL and another generation facility/Solar Power Plant/Solar Farm in the name of Enertech Bostan Solar (Private) Limited (EBSPL), separated by an approximate distance of 0.1 km, will consist of the following: -

(i). A 132 kV D/C transmission line (measuring approx. 17.00 km long on ACSR Rail conductor) for making In-Out of one circuit of 132 KV S/C Noshar-Yaru transmission line at the proposed generation facility/Solar Power Plant/Solar Farm;

(3). Any change in the above Interconnection Arrangement/Transmission Facility duly agreed by Licensee/EQSPL, EBSPL, NTDC and QESCO, shall be communicated to the Authority in due course of time.

REGISTRAR

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



Detail of Generation Facility/Solar Power Plant/ Solar Farm

(A). General Information

(i).	Name of the Company/Licensee	Enertech Quetta Solar (Pvt.) Limited
(ii).	Registered/Business Office of the Company	712, Al Hafeez Business Centre, 89 B/3, Gulberg 3, Lahore.
(iii).	Location of the Generation Facility/Solar Power Plant/Solar Farm	Bostan, District Pishin, Balochistan
(iv).	Type of Generation Facility Solar Power Plant/Solar Farm	Solar Photovoltaic (PV)

(B). Solar Power Generation Technology & Capacity

(i).	Type of Technology	Poly Crystalline PV Cell
(ii).	System Type	Grid Connected
(iii).	Installed Capacity of Solar (MW)	50 MW_P

(C). Technical Details of Equipment

(a).	**Solar Panels – PV Modules**	
(i).	Type of Module	Poly Crystalline PV modules Canadian Solar CS3U-340P (1500 V)
(ii).	Type of Cell	Poly Crystalline
(iii).	Dimension of each Module	2000 mm x 992 mm x 35 mm
(iv).	No. of Panel/ Modules	147,060
(v).	Total Module Area	291,743 m^2
(vi).	Total Land Area Used	250 Acres
(vii).	Frame of Panel	Anodized aluminum alloy

REGISTRAR

(viii).	Weight of one Module	22.5 Kg
(ix).	Module Output Warranty	25 years linear power output warranty
(x).	Number of Solar Cells in each module	144 Half Cells
(xi).	Efficiency of module	17.14%
(xii).	Environment Protection System	Encapsulation and sealing arrangements for protection from environment.
(xiii).	Maximum Power (P_{max})	340WP
(xiv).	Voltage @ (P_{max})	38.4V
(xv).	Current @ P_{max}	8.86A
(xvi).	Open circuit voltage (V_{oc})	45.9V
(xvii).	Short circuit current (I_{sc})	9.36 A
(xviii).	Maximum system open Circuit Voltage	1500V
(b).	**PV Array**	
(i).	No. of Sub-arrays	2
(ii).	Modules in a string	30
(iii).	Total No. of Strings	4902 (30 x 2)
(iv).	Total Modules	147,060
(c).	**PV Capacity**	
(i).	Total	50 MW_P
(d).	**Inverters**	
(i).	Capacity of each unit	100 KW
(ii).	Inverter Model	Sun2000 100KTL
(iii).	Manufacturer	Huawei
(iv).	Rated Input Voltage	1080 V
(v).	Input Operating Voltage Range	600-1500 V

REGISTRAR

(vi).	Number of Inverters	464 units	
(vii).	Total Power	39.57 MW_{AC}	
(viii).	Efficiency	99% (Euro: 98.8%; CEC:98.9%)	
(ix).	Max. Allowable Input voltage	1500V	
(x).	Max. Current	3104A	
(xi).	Max. Power Point Tracking Range	0~1422 KW	
(xii).	Output electrical system	AC	
(xiii).	Rated Output Voltage	85V	
(xiv).	Rated Frequency	50 Hz	
(xv).	Power Factor	Adjustable 0.9 Induction to 0.9 Capacitance	
(xvi).	Power Control	MPP Tracker	
(xvii).	Environmental Enclosures	Operating Temperature Range	-25° C to 60° C
		Relative Humidity	15% - 95% non-condensing
		Audible Noise	<61 dB(A)
		Operating Elevation	<2000 m
		Warranty Period	10 Years
(xviii).	Grid Operation Protection	(a).	DC circuit breaker
		(b).	AC circuit breaker
		(c).	DC overvoltage protection
		(d).	Lightning protection level III
		(e).	Grid monitoring
		(f).	Insulation monitoring
		(g).	Anti-Islanding
(e).	**<u>Junction Boxes Installed</u>**		
(i).	Number of Junction Box units	232	
(ii).	Input circuits in each box	16	

REGISTRAR

(iii).	Max. Input current for each circuit	10 A	
(iv).	Max. Input voltage	1500 V	
(v).	Power at each box	99.2 KW	
(vi).	Protection Level	IP 65	
(vii).	Over-Current protection	Fuse	
(viii).	Output switch	125A, 1000V disconnector	
(ix).	Surge protection	1500V, Type II	
(x).	Purpose of Junction Box	(a).	Providing Isolation of Sub Arrays
		(b).	In case of fault provide arrangement for disconnection of each of the Sub-Arrays or Strings.
		(c).	Ensuring safety of the electric works in the Solar Module Arrays
		(d)	Protection from back flow of short circuit current through use of semi-diodes.
		(e)	Combining groups of strings into Sub-Arrays that will be wired into the Inverter
(f).	**<u>Data Collecting System</u>**		
(i).	Weather Data	(a).	data collected for Direct Solar Radiation (W/m^2) using two Li-COR Pyranometer installed with the NRG Symphonies Plu3 Data Logger at the site
		(b).	data collected for Temperature (0^oC) using NRG 110s Sensor attached to the Solar Resource Assessment Equipment
		(c).	data collected for Rain in mm/m2 using Rain Sensor attached to the Solar Resource Assessment Equipment
		(d).	data collected for Wind Speed (ms^{-1}) using Wind Speed Sensor attached to the Solar Resource Assessment Equipment
		(e).	data collected for Wind Direction (deg) using Wind

REGISTRAR

			Vane Sensor attached to the Solar Resource Assessment Equipment
(ii).	System Data	(a).	DC input voltage (V), Current (A) of each module, string, sub array & Inverter
		(b).	Total Sub Array Power Generated and Inverter Power
		(c).	AC output voltage (V) and current (A) of each inverter (Phase, total)
		(d).	AC Output power (kW) and Energy (kwh) of each inverter
		(e).	Frequency (Hz)
		(f).	Power Factor (PF)
		(g).	Temperature inside inverter station
(g).	**<u>Isolating Transformer</u>**		
(i).	Rating	132KV/33KV 1260/630-630KVA	
(ii).	Type of Transformer	Box Type Oil Immersed	
(iii).	Input voltage	3150V	
(iv).	Output Voltage	132kV	
(v).	Purpose of Transformer	Step Up Voltage, Galvanic Isolation and Eliminate DC Current Injection	
(vi).	Efficiency	98.89%	
(h).	**<u>Outdoor Cubicle Control Room</u>**		
(i).	Data record	Data Logging using software and hardware provided by Huawei	
(ii).	Control Room System	Computerized Data Monitoring and communication systems using latest Satellite Technology	
(iii).	Control room System Detail	Interfacing, Hardware and Software suitable for such Multi-MW systems	

REGISTRAR

(i).	**Mounting Structure**	
(i).	Structure	HDG Steel
(ii).	Tilt of Array Frame	27 Degrees
(iii).	Array Specification	Designed and Certified for Wind Speed and Seismic Requirements.
(j).	**Foundation Pillars**	
(i).	No. of Foundations	31,863
(ii).	Foundation Structure	Ground Screw or concrete pillar

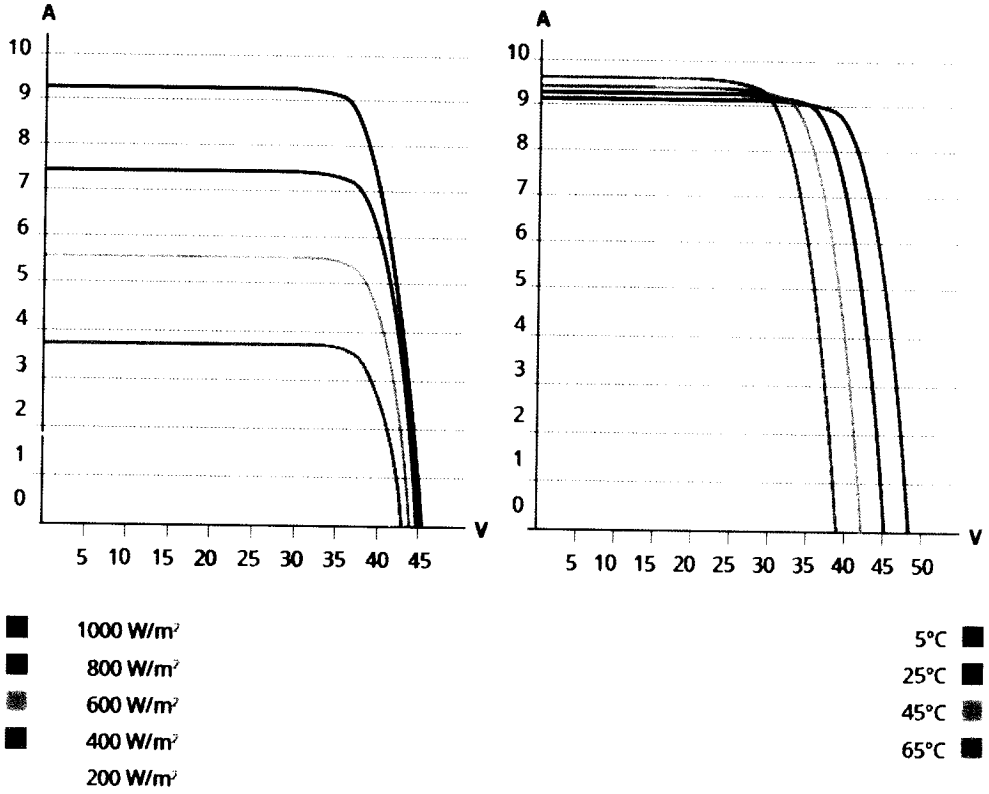
(D). Other Details

(i).	COD of the Generation Facility/Solar Power Plant/Solar Farm (Anticipated)	June 30, 2020
(ii).	Expected Useful Life of the Generation Facility/ Solar Power Plant/Solar Farm from the COD	25 Years

REGISTRAR

V-I Curve of PV Cell Proposed to be Installed At the Generation Facility/ Solar Power Plant/Solar Farm

CS3U-340P / I-V CURVES



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SCHEDULE-II

The Total Installed Gross ISO Capacity of the Generation Facility/Power Plant/Solar Plant (MW), Total Annual Full Load (Hours), Average Sun Availability, Total Gross Generation of the Generation Facility/Solar Farm (in kWh), Annual Energy Generation (25 years Equivalent Net Annual Production-AEP) KWh and Net Capacity Factor of the Generation Facility/Power Plant/Solar Farm of Licensee is given in this Schedule.

REGISTRAR

SCHEDULE-II

(1).	Total PV Installed Capacity of Generation Facility	50 MWp
(2).	Average Sun Hour Availability/Day (Irradiation on Inclined Surface)	6.0 Hrs
(3).	Days per Year	365
(4).	PV Plant Generating Capacity Annually (As Per Simulation)	95.081 GWH
(5).	Expected Total Generation in 25 years Life Span	2238.72 GWH
(6).	Generation per Year from plant keeping 24 Hours Working	438.161 GWH
(7).	Net Capacity Factor (4/6)	21.70%

Note

All the above figures are indicative as provided by the Licensee. The Net Delivered Energy available to Power Purchaser for dispatch will be determined through procedures contained in the Energy Purchase Agreement (EPA) or the Applicable Document(s).

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