National Electric Power Regulatory Authority
Islamic Republic of Pakistan

Registrar

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

No. NEPRA/R/DL/LAG-443/ 26974-980

December 10, 2019

Mr. Mir Shahzad Khan Talpur,
Chief Executive Officer,
Asia Energy (Private) Limited,
D – 52, Block – 4, Clifton,
Karachi.
Contact No. 021-35294034-7

Subject: **Grant of Generation Licence No. SPGL/28/2019**
Licence Application No. LAG-443
Asia Energy (Private) Limited (AEPL)

Reference: AEPL's application vide letter dated November 28, 2018 (received on December 03, 2018)

Enclosed please find herewith Generation Licence No. SPGL/28/2019 granted by National Electric Power Regulatory Authority (NEPRA) to Asia Energy (Private) Limited (AEPL) for its 30.00 MW Solar Power Plant located at Mouza Khaza Singh, Tehsil and District Bahawalnagar, in the Province of Punjab, pursuant to Section 14B of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997/Amendment Act, 2018. Further, the determination of the Authority in the subject matter is also attached.

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

Enclosure: Generation Licence (SPGL/28/2019)

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

10.12.19

(Syed Safeer Hussain)

Copy to:

1. Secretary, Ministry of Energy (Power Division), A-Block, Pak Secretariat, Islamabad.
2. Chief Executive Officer, Alternative Energy Development Board (AEDB), 2nd Floor, OPF Building, G-5/2, Islamabad
3. Chief Executive Officer, NTDC, 414-WAPDA House, Lahore.
4. Chief Executive Officer, CPPA-G, ENERCON Building, Sector G-5/2, Islamabad.
5. Chief Executive Officer, Multan Electric Power Company (MEPCO), NTDC Colony, Khanewal Road, Multan.
6. Director General, Environment Protection Department, Government of Punjab, National Hockey Stadium, Ferozepur Road, Lahore.

National Electric Power Regulatory Authority (NEPRA)

Determination of the Authority in the Matter of Application of Asia Energy (Private) Limited for the Grant of Generation Licence

December 10 , 2019
Case No. LAG-443

(A). Background

(i). In order to harness the potential of Renewable Energy (RE) resources in the country, the Government of Pakistan (GoP) formulated a policy titled "Policy for Development of Renewable Energy for Power Generation 2006" (the "RE Policy"). The said policy had been in field since 2006 under which both Federal Government and the Provincial Governments had been supporting the implementation of RE projects in the country.

(ii). In consideration of the above, the Federal and the Provincial Governments had been issuing Letter of Intent (LoI) to various developers for setting up different type of RE projects across the country. In this regard, Alternate Energy Development Board (AEDB) issued LoI to Asia Petroleum Limited-APL/the Sponsor(s) for setting up a 30.00 MW solar based generation facility/Solar Power Plant/Solar Farm at Mouza Khaza Singh, tehsil & district Bahawalnagar in the province of Punjab. In order to implement the project, the Sponsors got incorporated a Special Purpose Vehicle (SPV) in the name of Asia Energy (Private) Limited (AEPL).

(iii). As per the terms of terms and conditions of the LoI, Sponsors hired the services of different world renowned consultant for the preparation of feasibility study of the project at internationally acceptable standards. After going through a process of iteration, the feasibility study was finally completed and accordingly, AEPL decided to approach the Authority for the grant of generation licence.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

(B). Filing of Application

(i). AEPL submitted an application on December 03, 2018 for the grant of generation licence in terms of Section-14B 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, AEPL was directed for submitting the missing information/documentation and the same was received on December 18, 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 January 24, 2019 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 January 29, 2019.

(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 January 29, 2019, 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 two (02) stakeholders. These included Multan Electric Power Company Limited (MEPCO) and Ministry of Science and Technology (MoST). The salient points of the comments offered by the said stakeholders are summarized below:-

(a). MEPCO submitted that presently there is no policy in place about RE projects and the quantum for such projects have not been approved/finalized by the Grid Code Review Panel (GCRP). The procurement of electric power under legal and regulatory framework required due consideration of the obligations placed under Planning Code (PC-4) of the Grid Code as well as DPC-5 of the Distribution Code. The project must meet the requirement of demand and supply in Integrated Generation Capacity Expansion Plan (IGCEP). NTDC should be directed to evaluate and analyze the subject project in terms of Demand Vs Supply. Therefore, the case for issuance of Generation Licence may kindly be processed keeping the abovementioned facts.

(b). MoST remarked that the proposed generation facility is being set up at district Bahawalnagar and would help to prevent/overcome the electricity shortfall in the designated area up to some extent. The type of technology proposed to be utilized for the project is Poly Crystalline; however, Mono Crystalline technology is better suited to the area where the project is planned to be set up. The Photovoltaic (PV) cells/Panels being proposed are IEC and UL certified. The Authority may consider allowing those cells/panels which are of Tier-I manufacturers.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

(ii). The Authority reviewed the above comments of the stakeholders and considered it appropriate to seek the perspective of AEPL on the observations of MEPCO and MoST. On the comments of MEPCO, the company submitted that it needs to be reiterated that being a statutory body, the Authority is mandated to adjudicate and exercise its quasi-judicial power pursuant to the act of Parliament of Pakistan and enabling rules framed thereunder. The factum that the absence of policy would render the application of the AEPL non-maintainable or infructuous is neither legally sustainable nor commercially plausible. In order to remove any ambiguity that may exist in this matter, it is reiterated that as a licensee, AEPL will at all times comply with the existing statutory and regulatory regime. MEPCO has highlighted that the quantum of RE is yet to be finalized by GCRP and purportedly for such reason the Authority should stop its statutory and regulatory functions till the time such quantum is finalized. This line of argument is frivolous, flippant and cannot be used to prevent the Authority from exercising its legal mandate. Without conceding, if at all the quantum has to be finalized in the Grid Code the same must factor in the decision and determinations, which has the force of law, to be integral part of such "quantum".

(iii). On the comments of MoST, it was clarified that NEPRA (selection of Engineering, Procurement and Construction (EPC) contractor by independent Power Producers) Guidelines, 2017 were followed to ensure that the optimum technology at competitive EPC costs is selected. This is also evident from the fact that EPC cost of the project determined after following the rigorous Guidelines, was one of the lowest proposed cost per MW for the single axis technology as of the date of submission and matching the highest plant factor determined by the Authority despite comparatively lower irradiance. The technology selected including the panels was done after rigorous technical evaluation process carried out by an International Consultant and the equipment was required to undergo detailed offsite and onsite tests to ensure that it meets the required quality standards.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

(iv). The Authority considered the above submissions of AEPL 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").

(D). Evaluation/Findings

(i). The Authority has reviewed the submissions of AEPL 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 Asia Petroleum Limited (APL) which is an energy and infrastructure company, headquartered in Karachi, Pakistan. It transports Residual Fuel Oil (RFO) through its state of the art oil terminal and pipeline system connecting Pakistan State Oil Company Limited (PSO) tank farm at Port Qasim, in the province of Sindh to Hub Power Company Limited (HUBCO) tank farm at Hub, in the Province of Baluchistan. APL owns and operates an oil terminal and pipeline system which was commissioned in November 1996. Its terminal is located at Pipri adjacent to Zulfiqarabad Oil Terminal of PSO at Port Qasim, Karachi, Pakistan. The Operational facilities include pumping system, 14" diameter, 82 km insulated pipeline with monitoring, control and telecommunication systems. The pipeline system has an annual maximum pumping capacity of 3.2 million Metric Tons. APL is a joint venture between Pakistan State Oil Company Limited-PSO (49%), Pakistan, Infraavest Limited (26%), Hong Kong, Independent Petroleum Group-IPG (12.5%), Kuwait and VECO International Incorporation USA (12.5%). According to the latest financial statement, the sponsors/APL has total assets of Rs. 4.10 billion.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

(iii). AEDB issued LoI to APL/AEPL for development of the project duly taking into consideration the financial strength and other evaluation parameters, as prescribed in the relevant policy. In this regard, the Sponsors have acquired a total of 205.00 acres of private land located at Mouza Khaza Singh, Tehsil & District Bahawalnagar in the Province of Punjab. As explained above, for the implementation of the project, the sponsor has incorporated a SPV in the name of AEPL under Section-32 of the Companies Ordinance, 1984 (Corporate Universal Identification No. 0096049, dated November 06, 2015). The Registered/Business office of the SPV is located at D–52, Block-4, Clifton, Karachi, in the province of Sindh. 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 approximately US $ 22.80 million which will be financed through a combination of debt (US $ 17.10 million) and equity (US $ 05.70 million) in a ratio of 75:25 which is in line with the benchmark set out in different determinations of the Authority in similar cases. It has been observed that the sponsors have signed a term sheet with Askari Bank Limited for financing the debt portion of the project. In consideration of the above, the Authority considers that the sponsors have strong financial and technical resources to carry out the project.

(iv). As explained above, the sponsors carried out a feasibility study of the project as stipulated in the term and conditions of the LoI. The said study, *inter alia*, included data collection, detail of equipment of the solar based generation facility/solar power plant, optimization of the selected layout of the details, power production estimates based on solar irradiation data of the project site, technical details pertaining to selected photovoltaic (PV) cells and other allied equipment to be used in the solar power plant, electrical studies, environmental study, geo technical investigation including soil testing etc. unit rate analysis, costing, economic & financial analysis and project financing, etc.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

(v). 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., Shunfeng International Clean Energy Limited and China Sunergy (Nanjing) Co., Ltd (CSNCL).

(vi). 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 CSNCL.

(vii). The feasibility study also optimized the size of the proposed generation facility/Solar Power Plant/Solar Farm to 30.00 MW, having 90915 x 330 W_P Poly Crystalline PV Modules of CSNCL (CSUN 330-72P) with single axis tracking. It is pertinent to mention that CSNCL was founded in 2004 in China and designs, manufactures and delivers high efficiency solar cells and modules to the world from its production centers based in China, Turkey, South Korea and Vietnam. The company is well known for its advanced solar cell technology, reliable product quality, and excellent customer service. CSNCL has delivered more than 4.00 GW of solar products to residential, commercial, utility and off-grid projects all around the world.

(viii). 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

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

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.

(ix). 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 dispersal of electric power will be on 132kV voltage and will be consisting of a double circuit (D/C) transmission line (on ACSR Lynx conductor measuring around 12.00 km approximately) for connecting the generation facility/Solar Power Plant/Solar Farm to 132 kV Noorser Grid Station of MEPCO. 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.

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

(xi). 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 AEPL has provided details of location, technology, size, net capacity/energy yield, interconnection

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY ★ NEPRA ★ REGISTRAR

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.

(xii). 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 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.

(xiii). The Authority considers that the proposed project will result in optimum utilization of the RE of the province of Punjab 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

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

Authority. These lower tariffs will result in reduction of the overall basket price which will be beneficial to the public at large.

(xiv). 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 AEPL 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 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

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY ★ NEPRA ★ REGISTRAR

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 AEPL 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, AEPL 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 Sponsors/AEPL has acquired private land to the tune 205 acres for setting up the generation facility/Solar Power Plant/Solar Farm. The said details are being incorporated in the generation licence. The Authority directs AEPL to 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 AEPL, 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, AEPL 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 AEPL 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.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

(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 AEPL has filed a tariff petition for determination of its tariff on cost plus basis. The Authority has admitted the same and is expected to be decided in during course of time. 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 AEPL will be having a cost plus tariff or a tariff through CB. In view of the said, the Authority considers appropriate to direct AEPL 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 AEPL to adhere to the said in letter and spirit without any exception.

(vii). About the compliance with the environmental standards, as discussed in the preceding paragraphs, AEPL has provided the NOC from EPAGoPb 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 AEPL to comply with relevant environmental standards at all times. Further, the Authority directs AEPL 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 AEPL 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. AEPL has informed that the project will achieve COD by June

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

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 AEPL to initiate the process in this regard at the earliest so that proceeds for the carbon credits are materialized. AEPL 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 AEPL 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.

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
NEPRA

10 12 19

National Electric Power Regulatory Authority (NEPRA)
Islamabad – Pakistan

GENERATION LICENCE

No. SPGL/28/2019

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/Amendment Act, 2018, the Authority hereby grants a Generation Licence to:

ASIA ENERGY (PVT.) LIMITED

Incorporated Under Section-32 of the Companies Ordinance 1984 (XLVII of 1984) Having Corporate Universal Identification No. 0096049, dated November 06, 2015

for its Generation Facility/Solar Farm/Solar Power Plant Located at Mouza Khaza Singh Tehsil & District Bahawalnagar in the Province of Punjab

(Total Installed Capacity: 30.00 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 10th day of December Two Thousand & Nineteen and expires on 29th day of June Two Thousand & Forty-Five.

10.12.19

Registrar

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY ★ NEPRA ★ REGISTRAR

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). "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;

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

(g). "Carbon Credits" mean the amount of Carbon Dioxide (CO2) 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;

(h). "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;

(i). "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;

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

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

(l). "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;

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

(m). "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;

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

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

(p). "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;

(q). "MEPCO" means Multan Electric Power Company Limited or its successors or permitted assigns;

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

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

(t). "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;

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

(v). "Licensee" means Asia Power (Private) Limited or its successors or permitted assigns;

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

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

(x). "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;

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

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

(aa). "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;

(bb). "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;

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

(dd). "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.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

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.

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 or Licence ceases to have effect, 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.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

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.

7.2 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.

7.3 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.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY ★ NEPRA ★ REGISTRAR

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.

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.

12.3 The Licensee shall transmit the solar radiation data and power output data of its generation facility/Solar Power Plant/Solar Farm to the control room of the Power Purchaser.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

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.

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.

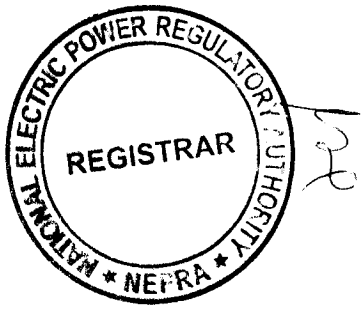
Article-17
Compliance with Applicable Law

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.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

Article-18
Corporate Social Responsibility

The Licensee shall provide the descriptive as well as monetary disclosure of its activities pertaining to corporate social responsibility (CSR) on an annual basis.

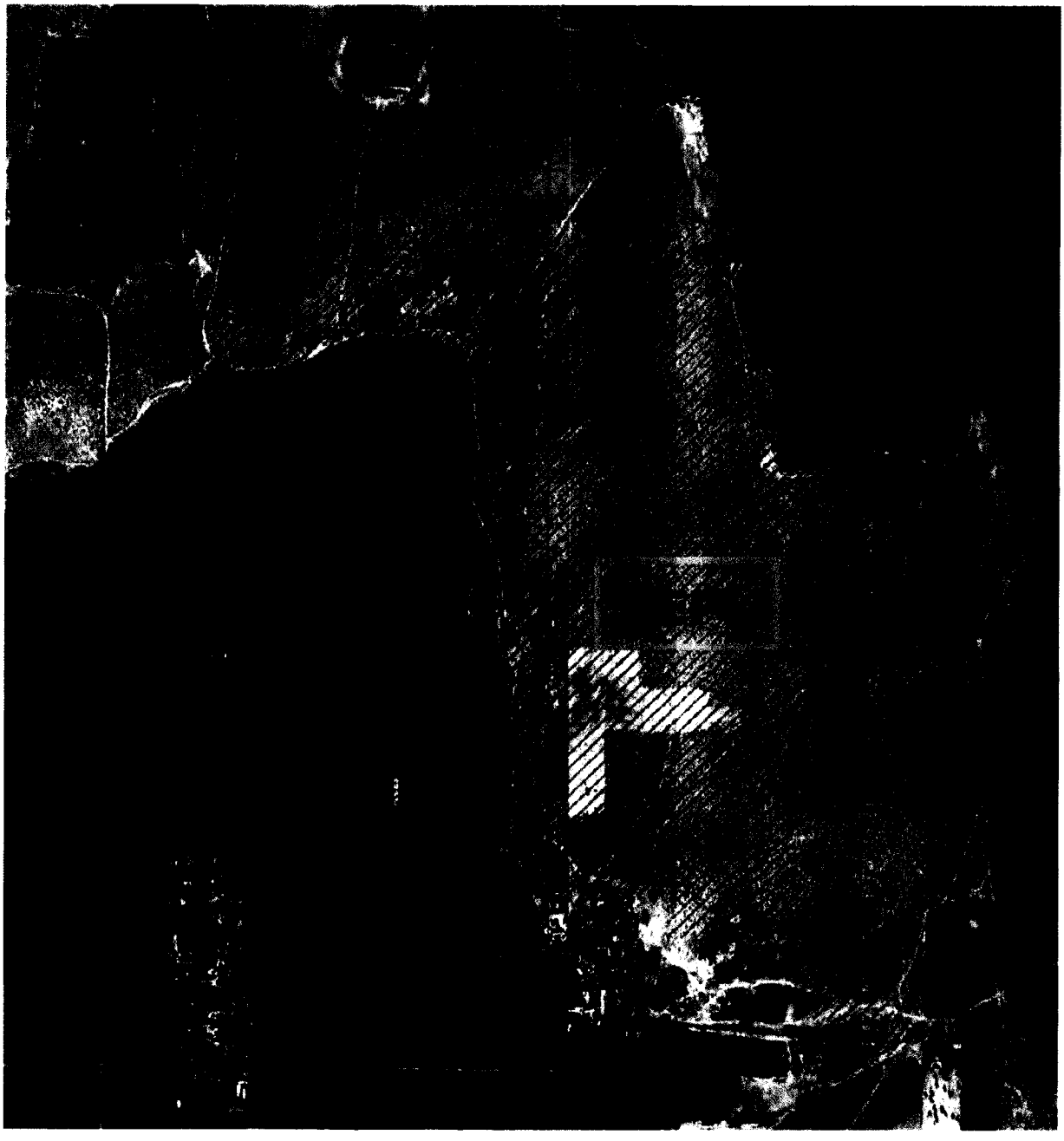


SCHEDULE-I

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.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

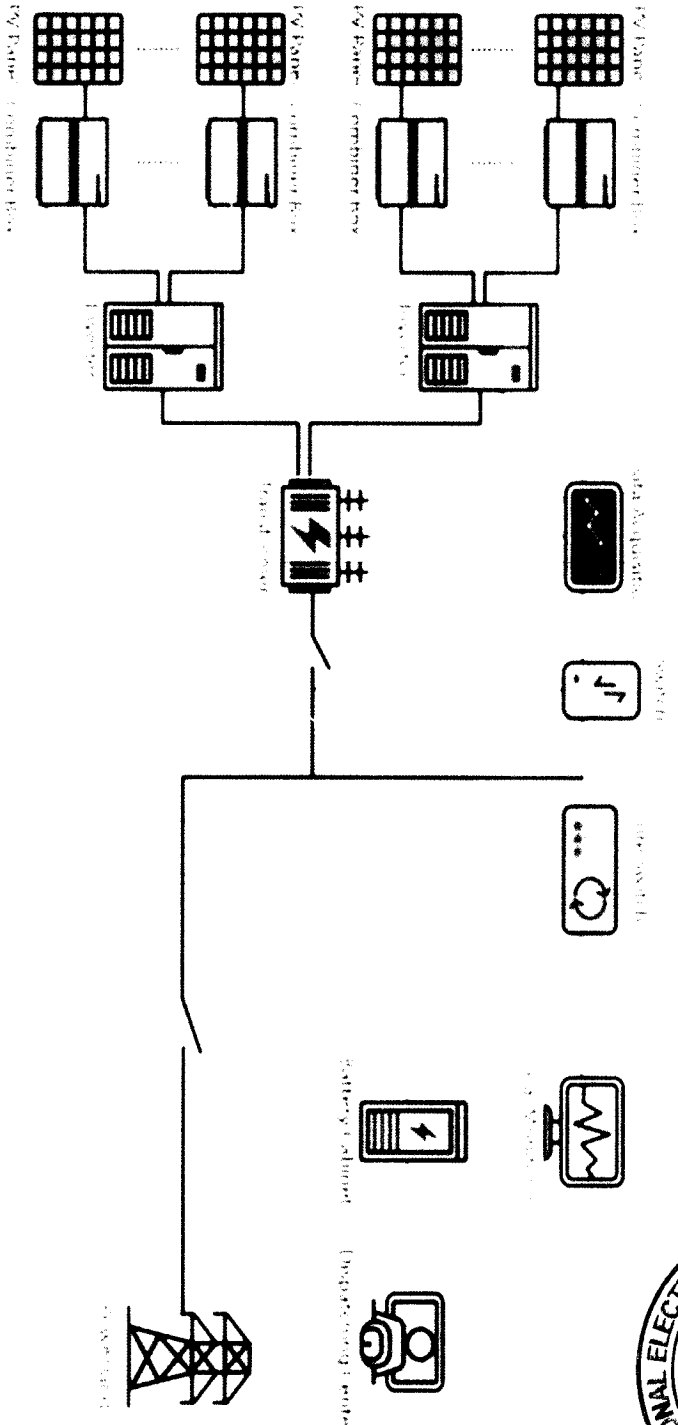
Location of the Generation Facility/Solar Power Plant/Solar Farm of the Licensee



Land Coordinates	Latitude 29.833o N, Longitude 73.075o E

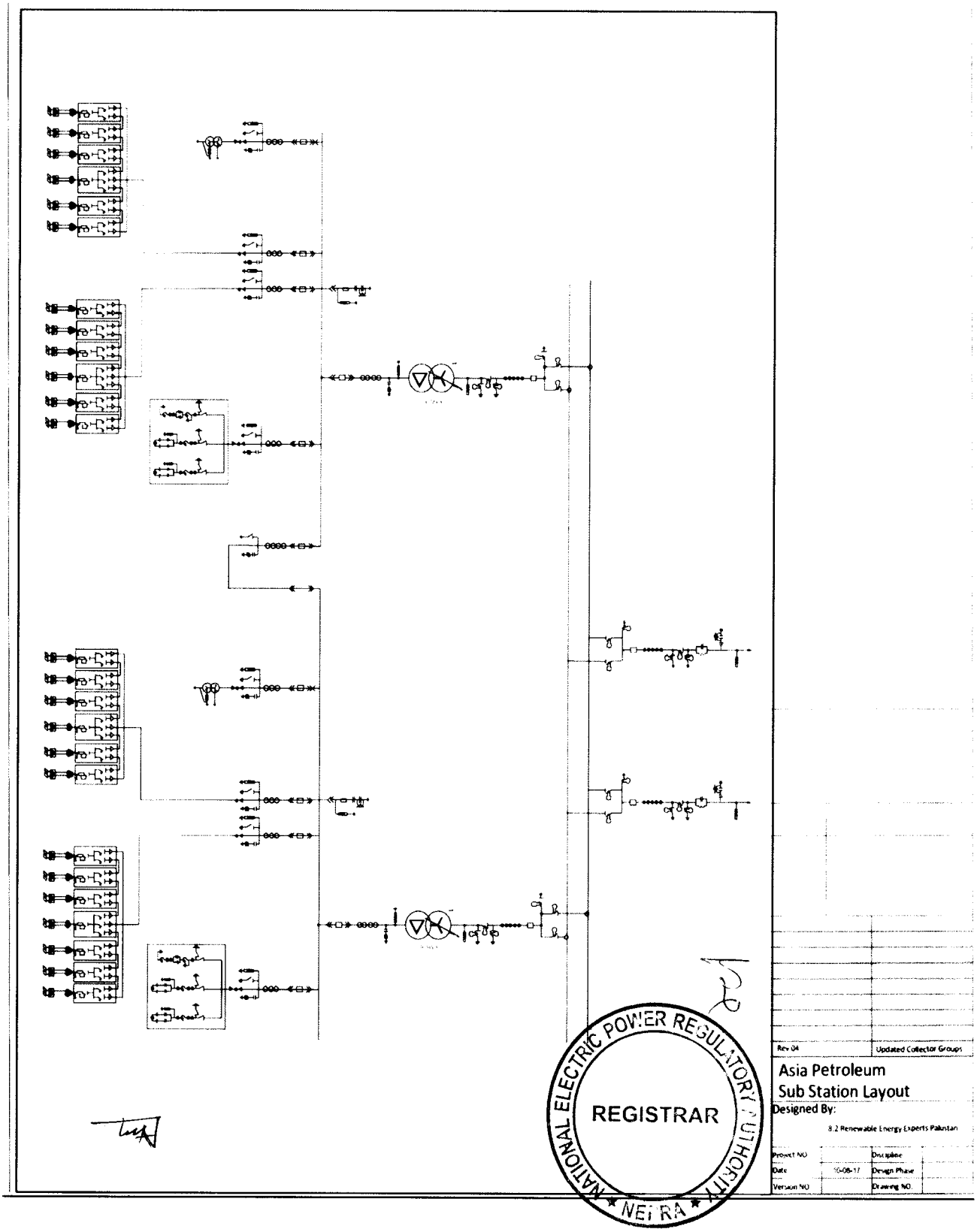
NATIONAL ELECTRIC POWER REGULATORY AUTHORITY ★ NEPRA ★ REGISTRAR

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



NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

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



NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

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/Asia Energy (Private) Limited/AEPL shall be dispersed to the load center of MEPCO.

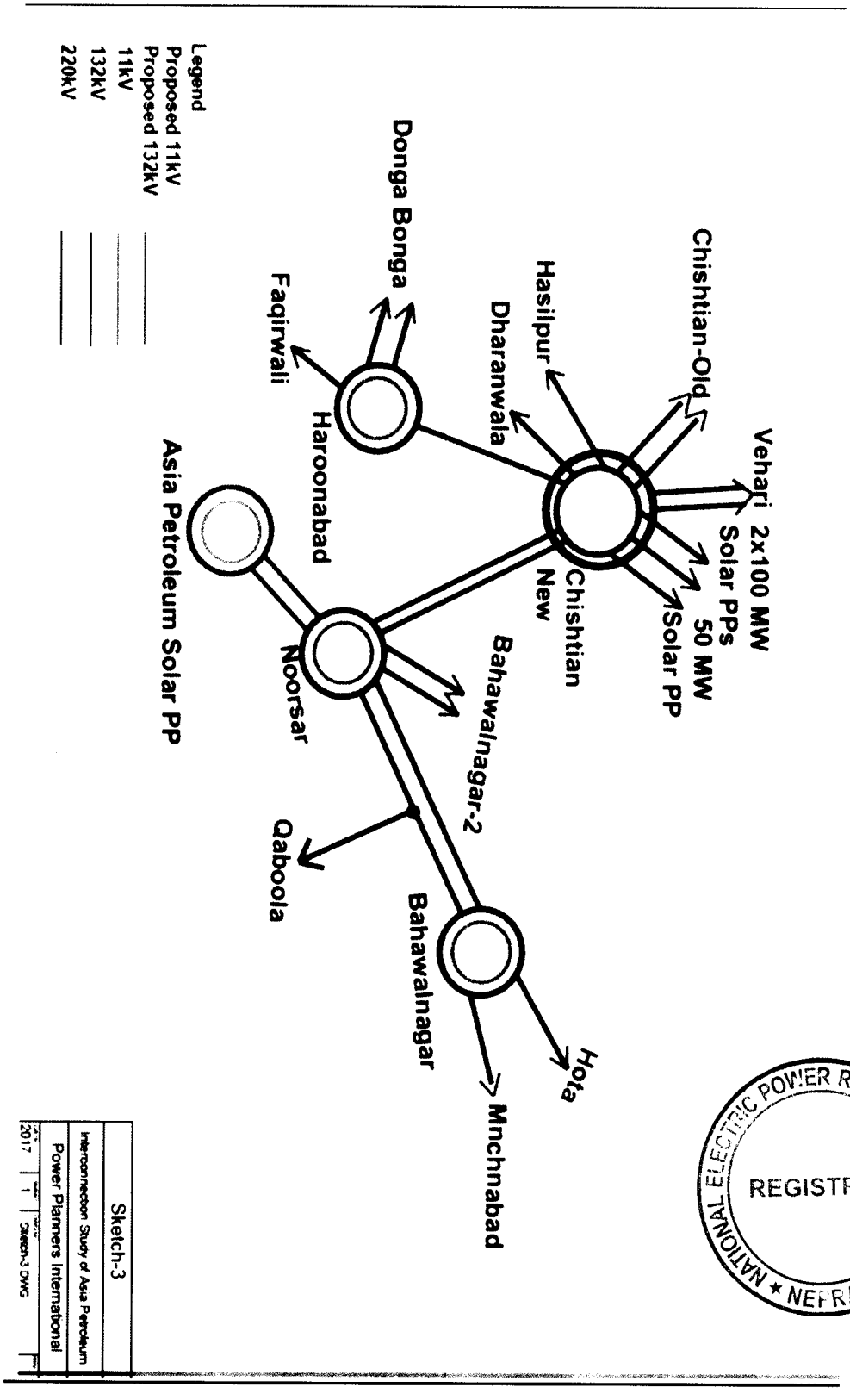
(2). The proposed Interconnection Arrangement/Transmission Facilities for dispersal of power from generation facility/Solar Power Plant/Solar Farm of the Licensee/AEPL will consist of the following:-

(a). A 132 kV D/C transmission line (measuring approx. 12.00 km long on ACSR Lynx conductor) connecting directly with 132kV Noorsar grid station/substation;

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

ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

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



NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

Detail of Generation Facility/Solar Power Plant/ Solar Farm

(A). General Information

(i).	Name of the Company/ Licensee	Asia Energy (Private) Limited
(ii).	Registered/Business Office of the Company	D–52, Block-4, Clifton, Karachi, Province of Sindh.
(iii).	Location of the Generation Facility/Solar Power Plant/Solar Farm	Mouza Khaza Singh Tehsil & District Bahawalnagar in the Province of Punjab
(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)	30.00 MW_P

(C). Technical Details of Equipment

(a).	**Solar Panels – PV Modules**	
(i).	Type of Module	Polycrystalline PV Module 330 Watt
(ii).	Type of Cell	Poly Crystalline
(iii).	Dimension of each Module	1956 mm x 992 mm x 40 mm
(iv).	No. of Panel/ Modules	90,915
(v).	Total Module Area	44 Acres
(vi).	Total Land Area Used	205 Acres
(vii).	Frame of Panel	Anodized Aluminum Alloy

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY ★ NEPRA ★ REGISTRAR

(viii).	Weight of one Module	22.1 kg	
(ix).	Module Output Warranty	For 1st year	For 2nd to 25th year
		Not more than 2.5% output reduction	Not more than 0.5% output reduction per annum
(x).	Number of Solar Cells in each module	72 cells	
(xi).	Efficiency of module	17.04%	
(xii).	Environment Protection System	Encapsulation and sealing arrangements for protection from environment	
(xiii).	Nominal Maximum Power (P_{max}) at STC	330 W	
(xiv).	Power Tolerance at STC	-3W to +3W	
(xv).	Optimum Operating Voltage at STC	45.3 V	
(xvi).	Optimum Operating Current at STC	9.31 A	
(xvii).	Open circuit voltage (V_{oc}) at STC	36.4 V	
(xviii).	Short circuit current (I_{SC}) at STC	9.08 A	
(xix).	Maximum system Voltage at STC	1000 V DC (IEC)	
(b).	**PV Array**		
(i).	No. of PV modules	90,915	
(ii).	(iii). Modules in a string	19	
(iv).	(v). Total number of strings	4785	
(c).	**PV Capacity**		
(i).	Total	30.00 MW_P	
(ii).	Junction boxes	IP 65 rated	
(d).	**Inverters (Central)**		
(i).	Inverter Model	SG 1250	

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

(e).	**Input (DC)**			
(i).	Max. input voltage	1000 V		
(ii).	MPP voltage range [@ 25°C/@ 40°C/@ 50°C]	520 V to 850 V/ 520 V to 850 V/ 520 to 850 V		
(iii).	Rated input voltage	780 V		
(iv).	Maximum input current	2712 A		
(v).	Max. DC short-circuit current	3390 A		
(f).	**Output (AC)**			
(i).	AC power [@ 25°C/@ 40°C/@50°C]	1386 kVA/ 1386 kVA / 1260kVA		
(ii).	AC power frequency/ range	50 Hz, 60 Hz /55 – 65 Hz		
(iii).	Rated power frequency/rated grid voltage	50 Hz / 360 V		
(iv).	Power factor at rated power/ Displacement power factor, adjustable	0.99 / 0.8 leading to 0.8 lagging		
(v).	Feed-in phases/ connection phases	3/3		
(g).	**Efficiency**			
(i).	Max. efficiency/ European efficiency	99.0% / 98.7%		
(h).	**Protective Devices**	(a).	Input-side disconnection device	
		(b).	Output-side disconnection device	
		(c).	DC overvoltage protection	
		(d).	Stand-alone grid detection active/passive	
		(e).	Grid monitoring	
		(f).	Ground fault monitoring	
		(g).	Insulation monitoring	
		(h).	Overhearing protection	
(i).	**Environmental Enclosures**	Operating temperature range		-35° C to +60° C/-31° .....140°F
		Maximum permissible value for relative humidity (non-condensing)		0 – 95 %

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA

		Noise emission	80 dB(A)
(j).	**Data Collection System**		
(i).	Weather Data	(a).	Pyranometer – Sets (to record irradiation level) [Yes]
		(b).	Thermometer – Sets (to record ambient temp) [Yes]
(ii).	System Data	(a).	DC input voltage (V) & current (A) of each inverter (phase, line) [Yes]
		(b).	Total DC power (kw) generated by PV array [Yes]
		(c).	AC output voltage (V) and current (A) of each Inverter (Phase, Total) [Yes]
		(d).	AC output power (kW) and energy (kwh) of each inverter [Yes]
		(e).	Frequency (Hz) [Yes]
		(f).	Power Factor (PF) [Yes]
		(g).	Temperature inside inverter station [Yes]
(k).	**Isolating Transformer**		
(i).	Model	S11-M-1450/11	
(l).	**Medium-Voltage side**		
(i).	Rated power (@25°C)	1450 kVA	
(ii).	Nominal AC power @ 45°C)	1450 kVA	
(iii).	Rated grid voltage	11 kV	
(iv).	Nominal AC voltage range	10.45 kV – 11.55 kV	

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY ★ NEPRA ★ REGISTRAR

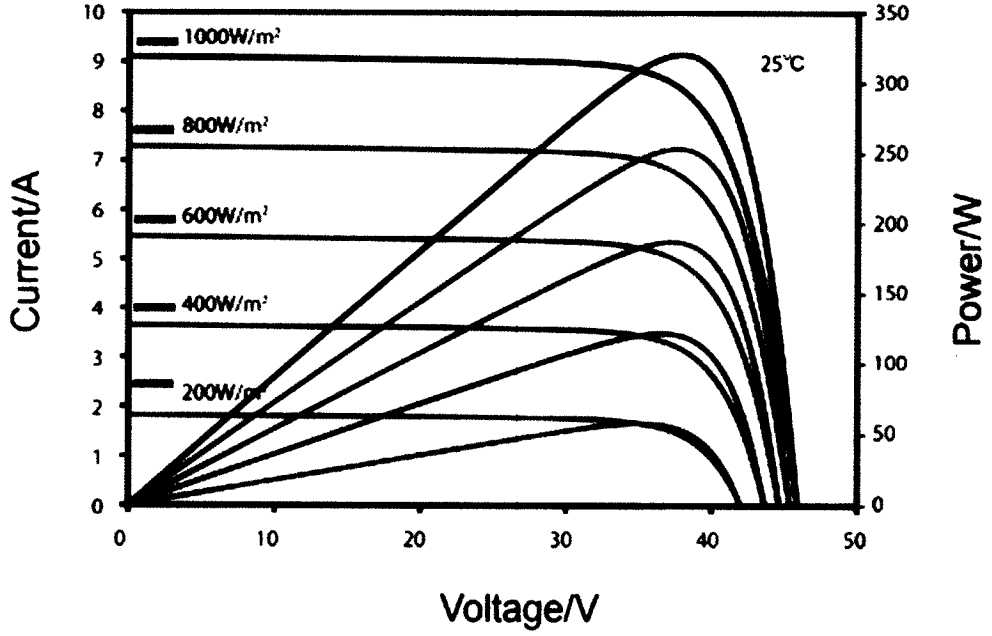
(m).	**Low-Voltage side**	
(i).	Nominal input voltage	360 V
(n).	**Outdoor Cubicle Control Room**	
(i).	Data record	Continuous logging with data logging software [Yes]
(ii).	Control room system	Computerized data acquisition system [Yes]
(iii).	Control room system detail	Interfacing hardware & software, Industrial type PC, which will be robust & rugged suitable to operate in the control room environment [Yes]
(o).	**Mounting Structure**	
(i).	Application	Ground Mounted
(ii).	Model	Single-axis tracking system
(iii).	Module Layout	ATH-20-57 per tracker
(iv).	Module inclination	5°
(v).	Quantity	80 trackers
(vi).	Structure Profile/s	Steel spiral pile Hot dip galvanized Stainless Steel
(vii).	Foundation structure	Reinforced concrete pile or Spiral steel piles

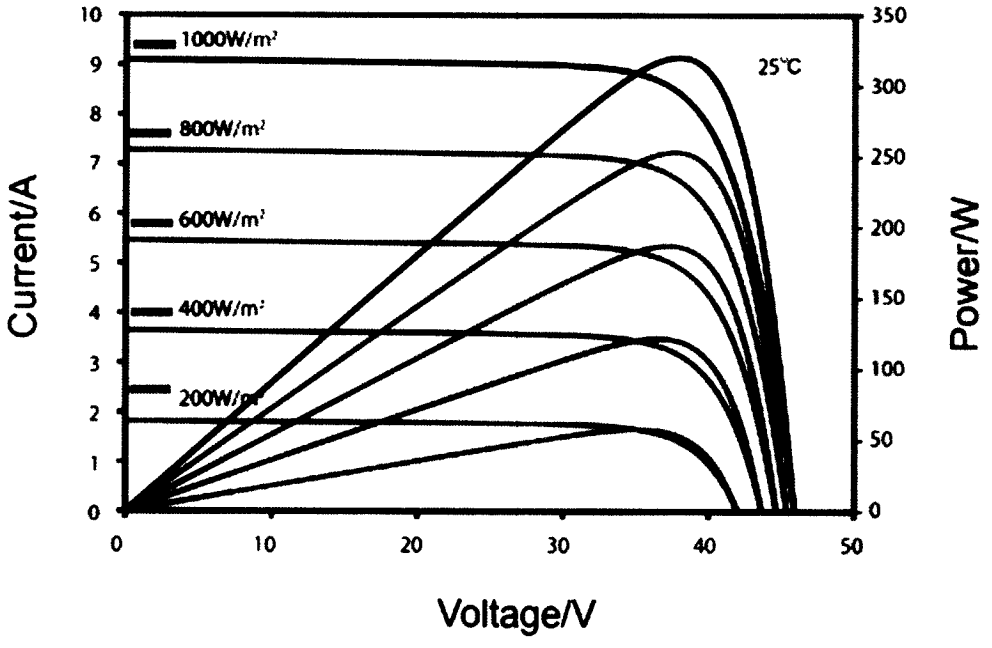
(D). Other Details

(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

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY ★ NEPRA ★ REGISTRAR

V-I Curve of Solar Cell





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.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR

SCHEDULE-II

(1).	Total PV Installed Capacity of Generation Facility	≈30.00 MW_P
(2).	Average Sun Hour Availability/Day (Irradiation on Inclined Surface)	5.33 Hours
(3).	Days per Year	358 Days
(4).	PV Plant Generating Capacity Annually (As Per Simulation)	58,372 MWh/1st year
(5).	Expected Total Generation in 25 years Life Span	1,333,585 MWh
(6).	Generation per Year from plant keeping 24 Hours Working	30.00 x 24 x 365 = 262,800 MWh
(7).	Net Capacity Factor (4/6)	22.21%

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).

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
REGISTRAR
NEPRA