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/LAG-358/4756/-66 December 30, 2020

Mr. Maqsood Ahmed,
Chief Executive Officer,
Zhenfa Pakistan New Energy Company (Private) Limited,
64/XX, Khayaban-e-Iqbal, DHA Phase-III,
Lahore.

Subject: **Modification-I in Generation Licence No. SPGL/19/2017**
Licence Application No. LAG-358
Zhenfa Pakistan New Energy Company (Private) Limited (ZPNECPL)

Reference: ZPNECPL's LPM submitted vide letter No. Nil dated July 24, 2020.

The Authority has approved Modification in Generation Licence No. SPGL/19/2017 dated July 10, 2017 in respect of Zhenfa Pakistan New Energy Company (Private) Limited (ZPNECPL), pursuant to Section 26 of the Regulation of Generation, Transmission, Transmission and Distribution of Electric Power Act, 1997 (XL of 1997) read with Regulation 10(11) of the NEPRA Licensing (Application and Modification Procedure) Regulations 1999.

2. Enclosed please find herewith determination of the Authority in the matter of Licensee Proposed Modification in the Generation Licence of ZPNECPL along with Modification-I in the Generation Licence No. SPGL/19/2017 dated July 10, 2017 as approved by the Authority.

Encl: **As above**

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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, Faisalabad Electric Supply Company Limited (FESCO), Abdullahpur, Canal Road, Faisalabad.
5. Director General, Environmental Protection Department, Government of Punjab, National Hockey Stadium, Ferozpur Road, Lahore.

National Electric Power Regulatory Authority (NEPRA)

Determination of the Authority in the Matter of Licensee Proposed Modification in the Generation Licence of Zhenfa Pakistan New Energy Company (Private) Limited

December 30, 2020
Case No. LAG-358

(A). Background

(i). Zhenfa Pakistan New Energy Company (Private) Limited (ZPNECPL) holds a Generation Licence (No. SPGL/19/2017, dated July 10, 2017) in terms of Section-15 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 (the "NEPRA Act").

(ii). The Authority granted the abovementioned generation licence to ZPNECPL for its proposed Photo Voltaic (PV) Cell based generation facility of around 100.00 MW_P to be set up at Rakh Choubara, district Layyah in the Province of Punjab, for supplying to the National Grid.

(B). Communication of Modification

(i). ZPNECPL in accordance with Regulation-10(2) of the NEPRA Licensing (Application & Modification Procedure) Regulations, 1999 ("the Licensing Regulations") communicated a Licensee Proposed Modification (LPM) in its above mentioned generation licence on July 27, 2020.

(ii). In the "text of the proposed modification", ZPNECPL stated that it plans to change the type of the PV Cell from existing Polycrystalline to Monocrystalline with single axis tracking. In view of the said, there will be changes in Number of Panels/ Modules, Maximum Power (P_{max}), Installed Capacity, Expected Commercial Operation Date (COD), and Net Capacity Factor of the project.

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(iii). Regarding the "statement of the reasons in support of the modification", ZPNECPL, *inter alia*, submitted that the Authority awarded it a tariff vide its determination dated February 21, 2020 based on the latest technology and other related factors as per the decision of the Cabinet Committee on Energy (CCoE) dated April 04, 2019. The Authority vide its said determination directed the company to submit LPM to make the generation licence consistent with the above determination.

(iv). About the statement of "the impact on tariff", "Quality of Service (QoS)" and "the performance by the licensee of its obligation under the licence", ZPNECPL submitted that the proposed changes will not have any impact on the already determined tariff. Further, ZPNECPL also confirmed that the proposed modification will not have any effect on the QoS and the performance by the Licensee of its obligations under its existing generation licence.

(C). Processing of Modification

(i). After completion of all the required information as stipulated under the Regulation-10(2) and 10(3) of the Licensing Regulations, the Registrar published the communicated LPM in one (01) English and one (01) Urdu daily newspaper on August 14-15, 2020, informing the general public, interested/affected parties and other stakeholders about the said LPM as required under the Regulation-10(4) of the Licensing Regulations.

(ii). The Registrar also invited comments of the relevant Govt. Ministries, their attached Departments, representative organizations and individual experts etc. for the assistance of the Authority, by sending separate letters to the said stakeholders dated August 18, 2020, in favor or against the communicated LPM as stipulated in Regulation-10(9) of the Licensing Regulations.

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(D). Comments of Stakeholders

(i). In response to the above, the Authority received comments from three (03) stakeholders including Punjab Power Development Board (PPDB), Multan Electric Power Company Limited (MEPCO) and Central Power Purchasing Agency (Guarantee) Limited (CPPAGL). The salient points of the comments offered by the above mentioned stakeholders are summarized in the following paragraphs: -

(a). PPDB stated that according to the decision of the CCoE dated April 04, 2019, the project is allowed to proceed further in terms of the provisions of the Policy for Development of Renewable Energy for Power Generation 2006 (the "RE Policy 2006"). The Authority through its determination dated February 21, 2020 directed the company to get the required changes in the existing generation licence to make it consistent with the determination for tariff. Alternate Energy Development Board (AEDB) in the 50th meeting of its board held on August 05, 2020, approved the issuance of Tri-partite Letter of Support (LOS) for the project. In view of the said, the LPM of ZPNECPL is supported which will make the tariff determination and generation licence consistent;

(b). MEPCO submitted that the company through the LPM has proposed to change the PV Technology which is advanced and will result in better Capacity Factor. The Authority may impose a condition on the power producer that latest technology should be used to reduce the cost of production;

(c). CPPAGL remarked that the company is using the Monocrystalline PV technology whereas more advanced/state of art technologies available internationally

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including (a). Using Concentrated Photovoltaic (CPV) and (b). Using double Axis Tracking Technology, which will improve the capacity factor which will result in reduction in tariff.

(ii). The Authority considered the above mentioned comments of the stakeholders and in view of the observations of MEPCO and CPPAGL, considered it appropriate seeking the perspective of ZPNECPL. In response to the comments of MEPCO and CPPAGL, it was submitted that the said stakeholders have raised the issues that (a). a condition be imposed on the company to utilize latest technology; (b). Company should use Concentrated Photovoltaic (CPV) and (b). Double Axis Technology for better Capacity Factor for reduction of tariff.

(iii). In this regard, ZPNECPL submitted the project was envisaged in the year 2015 under the Letter of Intent (LOI) of PPDB and completed all the required milestones as envisaged in the said LOI including the preparation of the feasibility study and it approval by the Panel of Experts (PoE). The feasibility study of the project duly locked the technology for the project i.e. PV cells. It is pertinent to mention that CCoE in its decision dated April 04, 2019, placed the project under Category-II, requiring the tariff to be reviewed by the Authority if the same had been determined for more than one year before. In view of the said, the company filed a petition with the regulator and the Authority gave its determination dated February 21, 2020 fixing the parameters of the project with (a). Mono-crystalline half cut cells panels with more shade tolerance from tier-1 manufacturer; (b). 100% single axis tracking; (c). the highest capacity factor of 21.51% in the project area and (d). One of the lowest tariffs i.e. USC 3.739/ kWp at that time.

(iv). It was submitted that the company has communicated the LPM to reflect the above mentioned parameters in its generation licence. The above suggestions of CPPAGL are somewhat belated considering the fact that the

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determination of tariff for the project has already been made thus complying with the decision of CCoE. Any further changes in technology as suggested, will delay the implementation of the project and may not result in lowering of tariff as envisaged by CPPAGL due to higher cost of the proposed equipment.

(v). The Authority considered the above submissions/rejoinder of ZPNECPL and found the same plausible/convincing considering the scope of LPM and accordingly, considered it appropriate to proceed further as stipulated in the NEPRA Licensing (Generation) Rules, 2000 (the "Generation Rules") and the Licensing Regulations.

(E). Evaluation/Findings

(i). The Authority examined the entire case in detail including the already granted licence, the communicated LPM, comments of stakeholders and rejoinder from the Licensee. In this regard, the Authority observed that it granted a Generation Licence No. SPGL/19/2017, dated July 10, 2017 to ZPNECPL for setting up a PV based generation facility of 100.00 MW_P to be set up at Rakh Choubara, District Layyah in the province of Punjab. The above generation licence envisaged installing PV cells of 113,208 x 265W_P and 269,232x260 W_P having Polycrystalline technology with a mix of fixed tilt and single tracking systems. Further, the generation licence envisaged a Capacity Factor of 18% with Commercial Operation Date (COD) of the project March 30, 2018.

(ii). The Authority has observed that the main features of the LPM communicated by the company/Licensee/ ZPNECPL are (a). change in the type of PV modules from Polycrystalline to Half-cut Monocrystalline; (b). change in number of Panel/Modules for selecting PV Cell of 435 Watt; (c). change in the COD of the generation facility and expected useful life of the generation facility ; and (d). modification in the schedule-I & II of the existing generation licence to reflect the above mentioned changes in the equipment and other related characteristics etc.

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

(iv). In consideration of the above, the Authority observes that (a). LPM will not be affecting adversely the performance by the Licensee of its obligations but will enable the Licensee to have better performance as the new equipment will be more efficient and reliable in terms of performance at site; (b). the LPM will not cause it to act or acquiesce in any act or omission of the licensee in a manner contrary to the provisions of the NEPRA Act or the rules or regulations made pursuant to it; (c). the proposed LPM will be beneficial to the consumers due to selection of more robust equipment which will result in better capacity factor; (d). the LPM is reasonably necessary for the licensee to effectively and efficiently perform its obligations under the licence; (e). it is reasonably necessary for the Licensee to have this LPM to ensure the continuous, safe and reliable supply of electric power to the utility/consumers keeping in view its financial and technical viability.

(F). Approval of LPM

(i). In view of the above, the Authority is satisfied that the Licensee has complied with all the requirements of the Licensing Regulations pertaining to the

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modification. Therefore, the Authority in terms Section-26 of the NEPRA Act read with Regulation-10(11) of the Licensing Regulations approves the communicated LPM of ZPNECPL without changes.

(ii). Accordingly, the generation licence (No. SPGL/19/2017, dated July 10, 2017) of ZPNECPL is hereby modified. The changes made in the said licence are attached as annexure to this determination. The approval is subject to the provisions contained in the NEPRA Act, relevant rules, regulations, terms & conditions of the generation licence and other applicable documents.

Authority

Rafique Ahmed Shaikh
(Member)

Rehmatullah Baloch
(Member)

Engr. Bahadur Shah
(Member)

Saif Ullah Chattha
(Member/Vice Chairman)

Tauseef H. Farooqi
(Chairman)

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National Electric Power Regulatory Authority
(NEPRA)
Islamabad – Pakistan

GENERATION LICENCE
No. SPGL/19/2017

In exercise of the Powers conferred under Section-26 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 (as amended from time to time), the Authority hereby modifies the Generation Licence (No. SPGL/19/2017, dated July 10, 2017) granted to Zhenfa Pakistan New Energy Company (Private) Limited to the extent of changes mentioned hereunder: -

(a). The expiry date of the Licence mentioned on the face sheet of the original licence may be read as **20th day of December 2046**;

(b). The Changes made in Articles of the Generation Licence are attached as **Revised/Modified Articles of Generation Licence**;

(c). The Changes made in Schedule-I of the Generation Licence are attached as **Revised/Modified Schedule-I**;

(d). The Changes made in Schedule-II of the Generation Licence are attached as **Revised/Modified Schedule-II**.

This **Modification-I** is given under my hand on this 30th day of **December Two Thousand & Twenty**

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Article-1
Definitions

1.1 In this licence

(a). "Act" means the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 as amended or replaced from time to time;

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

(c). "Applicable Documents" mean the Act, the rules and regulations framed by the Authority under the Act, any documents or instruments issued or determinations made by the Authority under any of the foregoing or pursuant to the exercise of its powers under the Act, the Grid Code, the applicable Distribution Code, 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 Photo Voltaic Cells is collected for supplying to the Power Purchaser;

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(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). "CPPAGL" 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 it may be revised from time to time with necessary approval of the Authority;

(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;

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(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). "GoPb" means the Government of the province of Punjab acting through the PPDB 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;

(q). "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;

(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 Zhenfa Pakistan New Energy Company (Private) Limited or its successors or permitted assigns;

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

(y). "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;

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

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

(bb). "Power Purchaser" means CPPAGL 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;

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

(dd). "Punjab Power Policy" means the "Punjab Power Generation Policy 2006" of GoPb as amended from time to time;

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(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.

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Article-4
Term of Licence

4.1 This licence is effective from the original date of its issuance i.e. July 10, 2017 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.

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.

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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.

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.

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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.

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.

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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.

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.

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Revised/Modified
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.

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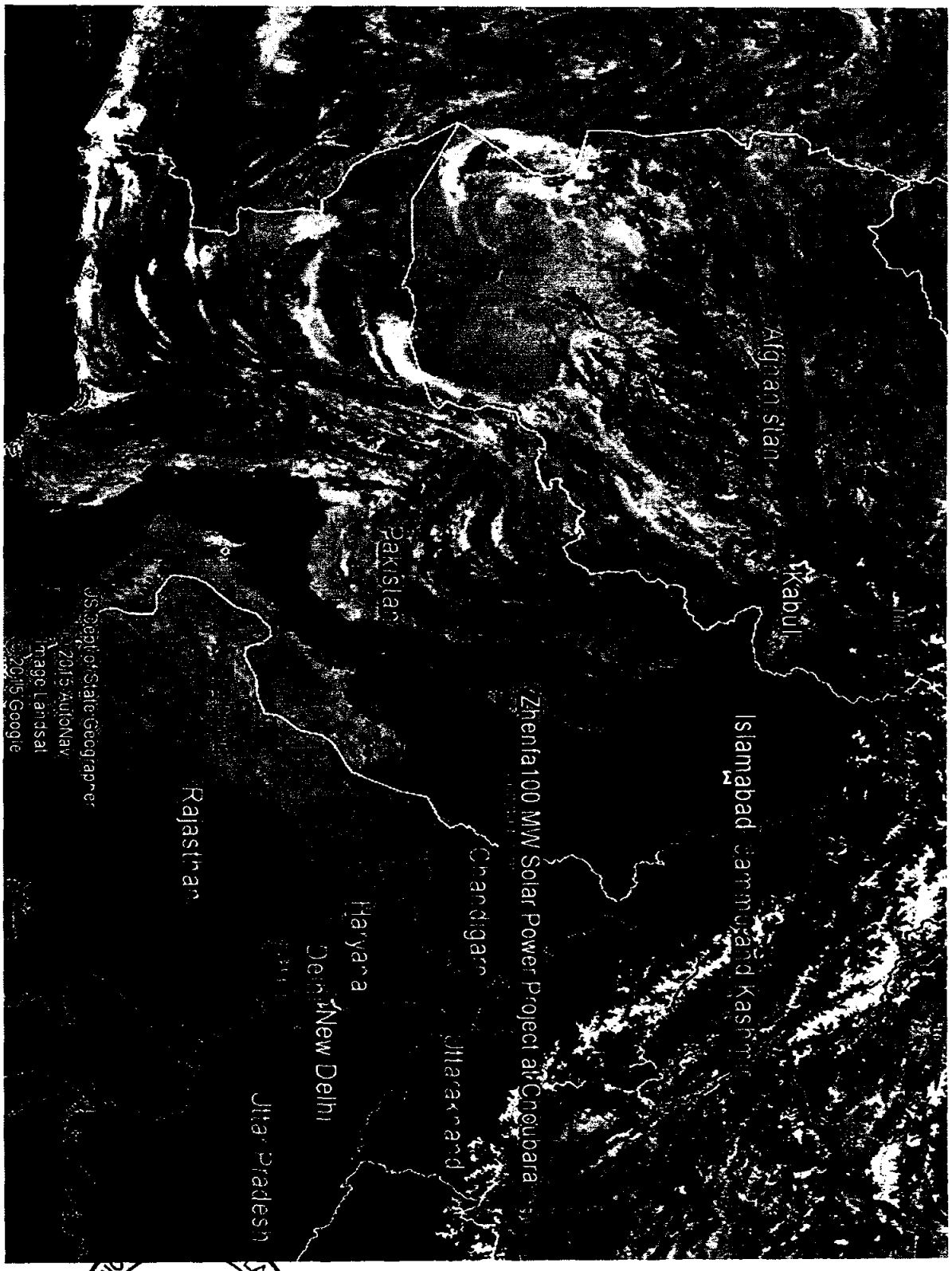
Location of the Generation Facility/Solar Power Plant/Solar Farm of the Licensee



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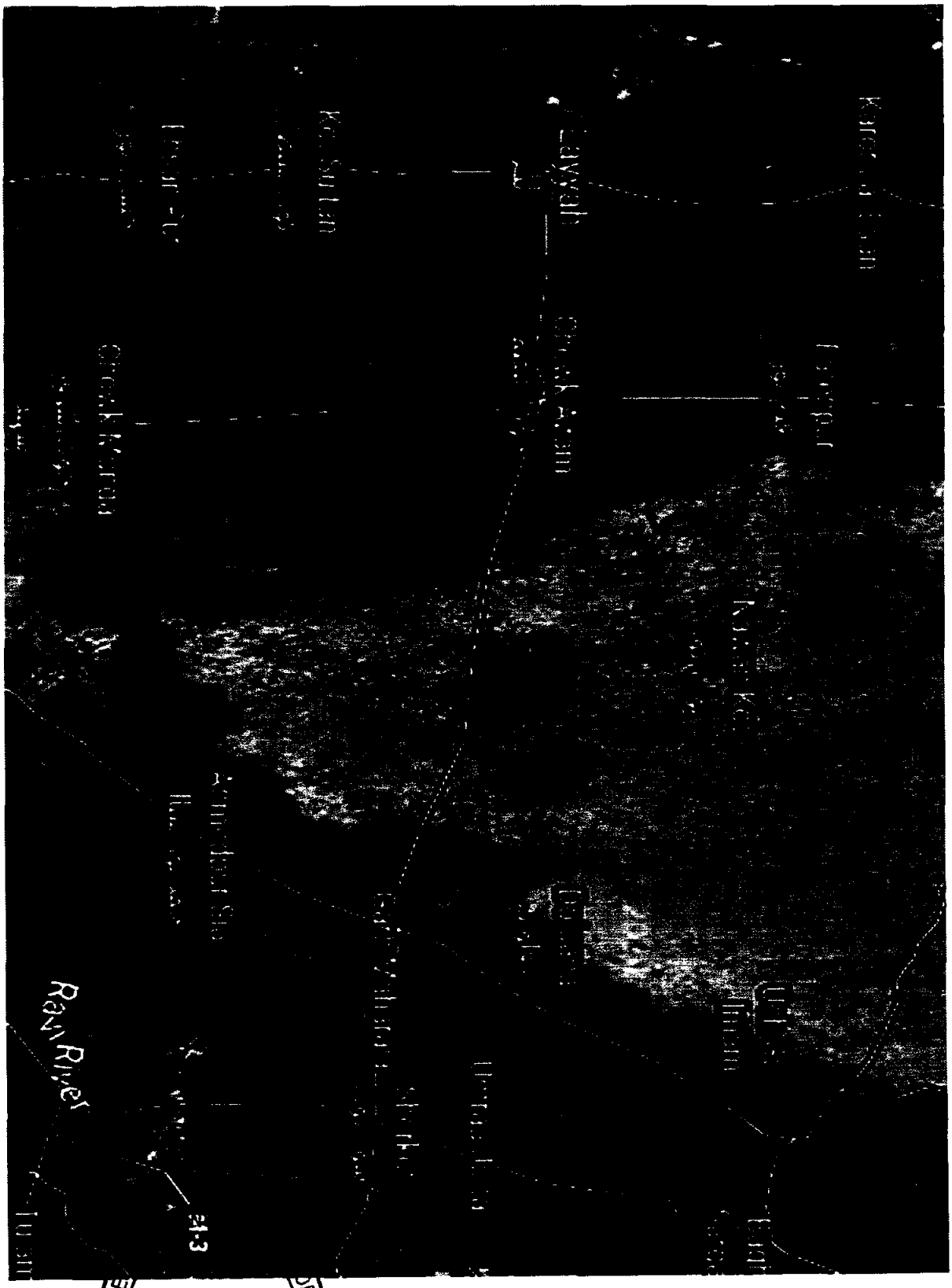
Location of the Generation Facility/Solar Power Plant/Solar Farm of the Licensee



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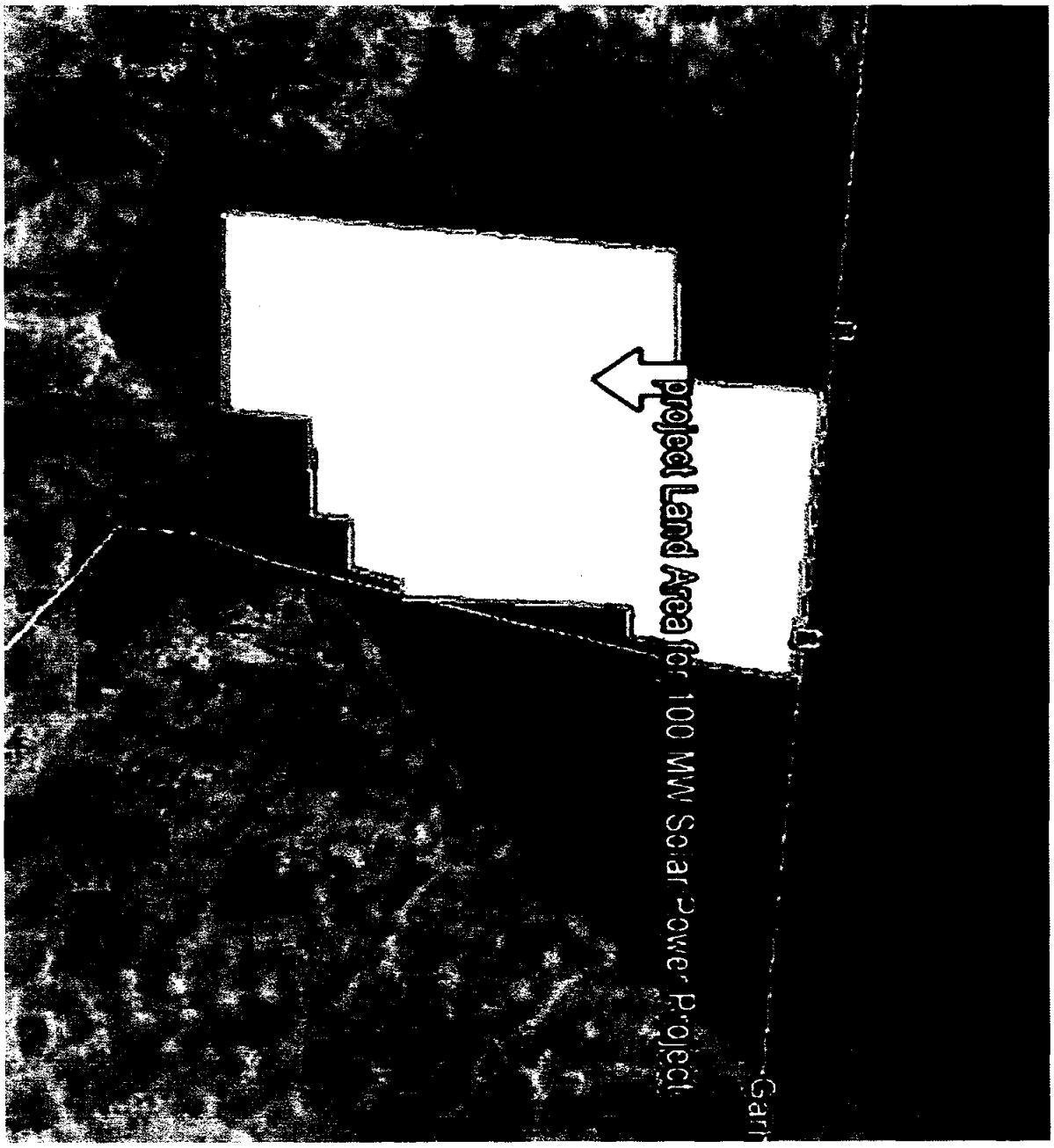
Land Coordinates of the Generation Facility/Solar Power Plant/Solar Farm of the Licensee



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

Boundary Point	Geodetic	
	Latitude	Longitude
Boundary 1	30°54'11.86"N	71°33'36.21"E
Boundary 2	30°53'55.07"N	71°33'35.19"E
Boundary 3	30°53'54.59"N	71°33'13.89"E
Boundary 4	30°53'5.81"N	71°33'11.43"E
Boundary 5	30°53'5.98"N	71°33'42.08"E
Boundary 6	30°53'14.86"N	71°33'42.96"E
Boundary 7	30°53'15.18"N	71°33'58.07"E
Boundary 8	30°53'18.98"N	71°33'58.82"E
Boundary 9	30°53'19.16"N	71°34'6.43"E
Boundary 10	30°53'24.73"N	71°34'8.65"E
Boundary 11	30°53'24.82"N	71°34'11.15"E
Boundary 12	30°53'50.08"N	71°34'12.40"E
Boundary 13	30°53'50.04"N	71°34'17.54"E
Boundary 14	30°53'53.91"N	71°34'18.24"E

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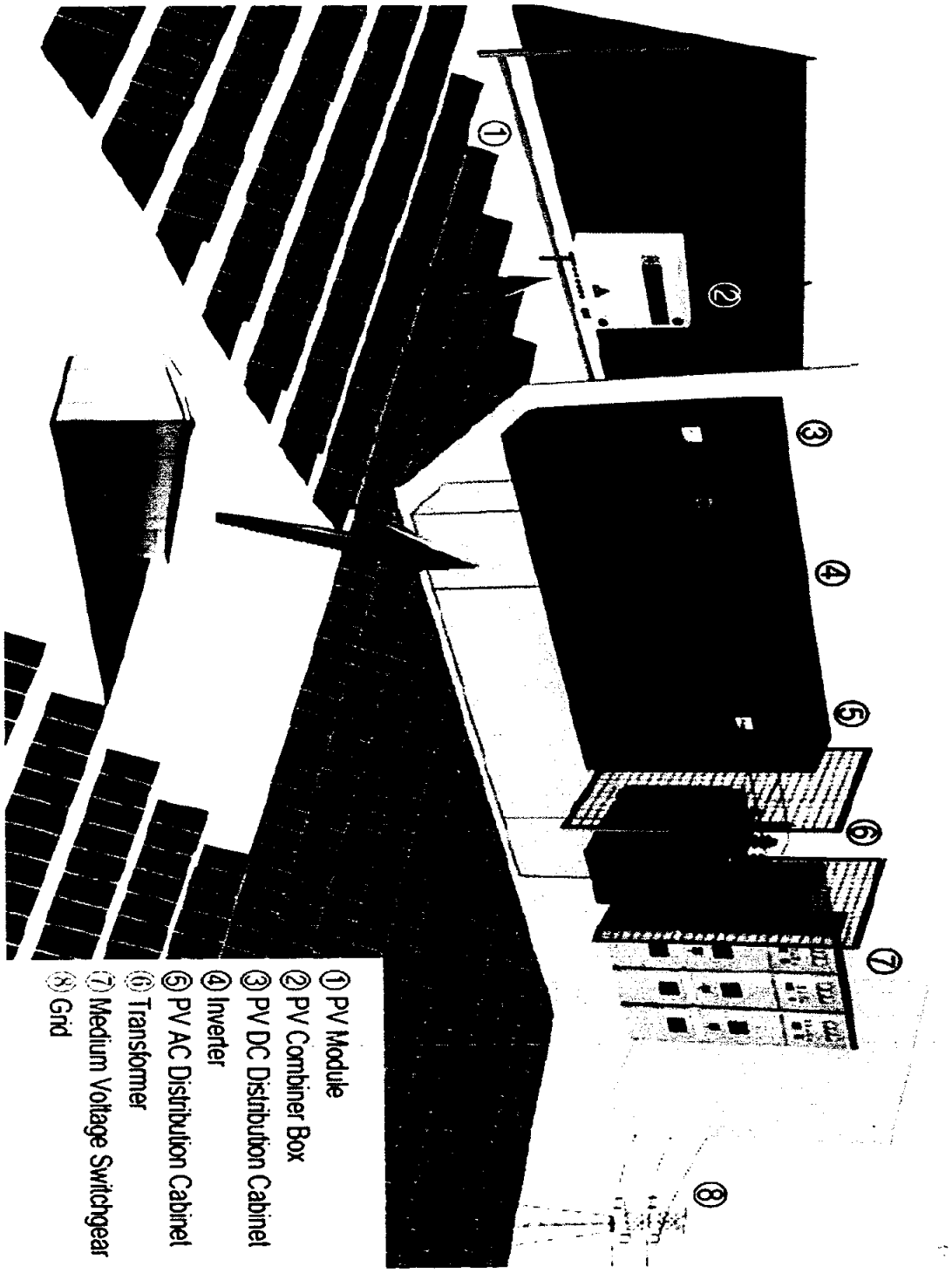
Process Flow Diagram of the Layout of the Generation Facility/Solar Power Plant/Solar Farm of the Licensee



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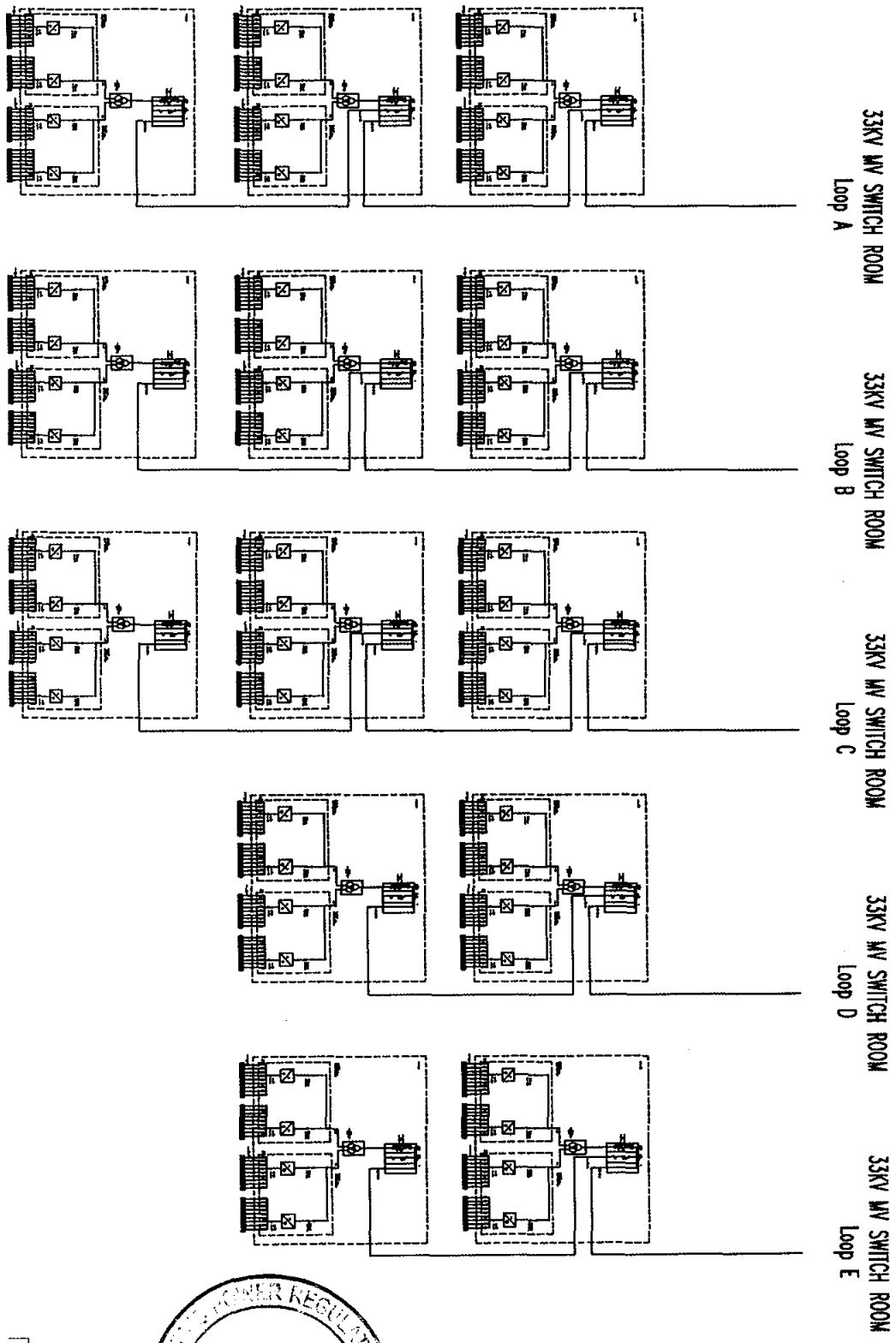
Single Line Diagram of the Generation Facility/Solar Power Plant/Solar Farm of the Licensee



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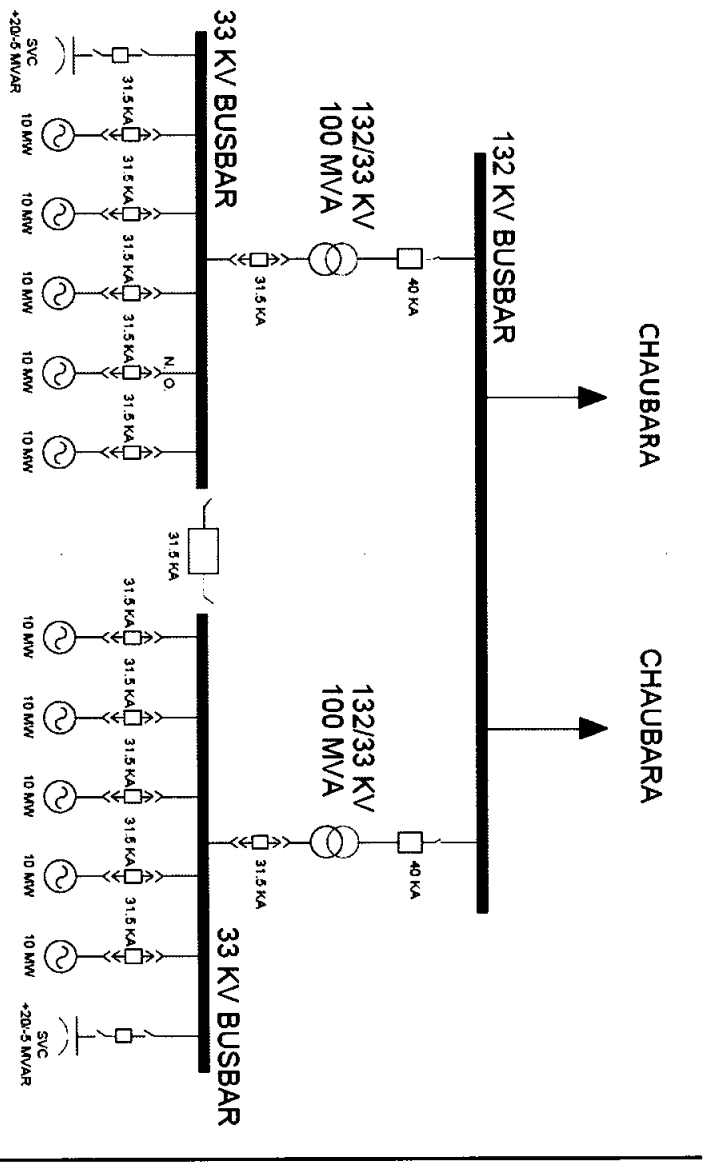
Single Line Diagram of the Generation Facility/Solar Power Plant/Solar Farm of the Licensee



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

The electric power generated from the Generation Facility/Power Plant/Solar Farm of Zhenfa Pakistan New Energy Company (Private) Limited-ZPNECPL shall be dispersed to the load center of MPCO.

(2). The proposed Interconnection Arrangement/Transmission Facility for dispersal of electric power for the Generation Facility/Solar Power Plant/Solar Farm comprises the following: -

(a). A direct 132 kV double circuit of measuring about 6.5 km in length on ACSR Lynx Conductor connecting the Generation Facility/Solar Power Plant/Solar Farm with Chubara grid station of MEPCO.

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

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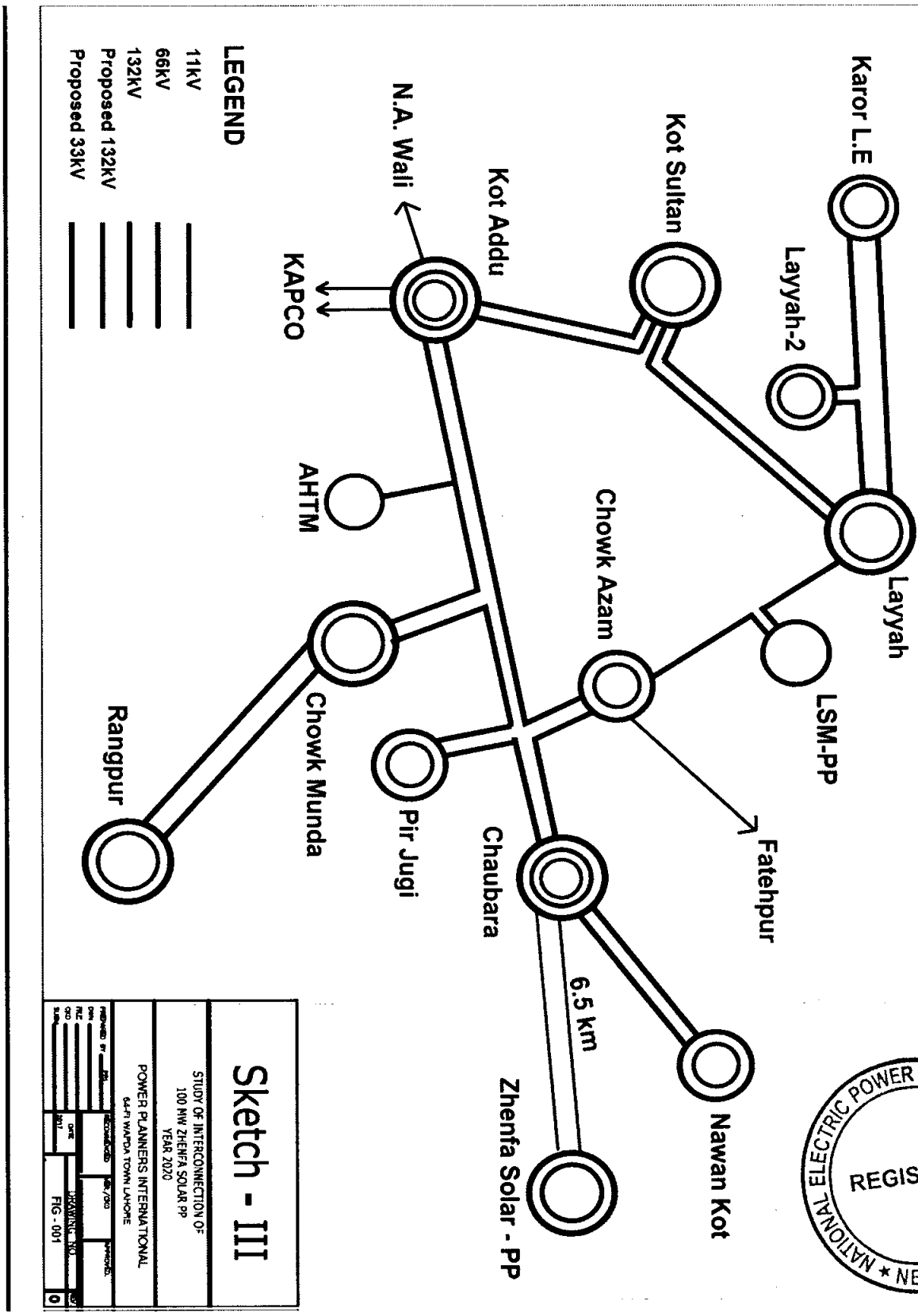
Schematic Diagram of the Interconnection Arrangement/Transmission Facility for Dispersal of Power from the Generation Facility/Solar Power Plant /Solar Farm



Detail of Generation Facility/Solar Power Plant/ Solar Farm

(A). General Information

(i).	Name of the Company/Licensee	Zhenfa Pakistan New Energy Company (Pvt.) Limited (ZPNECL)
(ii).	Registered/ Business office of the Company/Licensee	64/XX, Khayaban-e-Iqbal, DHA Phase-3, Lahore, Pakistan.
(iii).	Location of the generation facility Solar Power Plant/ Solar Farm	Rakh Choubara, District Layyah, in the Province of Punjab
(iv).	Type of the generation facility/ Solar Power Plant/Solar Farm	Solar PV Power Plant

(B). Solar Power Generation Technology & Capacity

(i).	Type of Technology	Photovoltaic (PV) with single-axis tracking	
(ii).	System Type	Grid Connected	
(iii).	Installed Capacity of the generation facility Solar Power Plant/Solar Farm (MW)	100.00 MW_P	
(iv).	No. of Panel/Modules	229,908	
(v).	PV Array	Nos. of Strings	8211
		Modules in a string	28
(vi).	Invertor(s)	Quantity	26
		Make	Sungrow
		Capacity of each unit	3125KW

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(C). Technical Details of Equipment

(a).	**Solar Panels – PV Modules**	
(i).	Type of Module	Mono 435W
(ii).	Type of Cell	Half cell
(iii).	Dimension of each Module	2180±2mmX996±2mm X40mm±1mm
(iv).	Total Module Area	2.17 m2
(v).	Frame of Panel	Anodized Aluminium Alloy
(vi).	Weight of one Module	24.6 kg±3%
(vii).	No of Solar Cells in each module	156
(viii).	Efficiency of module	20.0%
(ix).	Maximum Power (P_{max})	435Wp
(x).	Voltage @ P_{max}	44.50V
(xi).	Current @ P_{max}	9.78A
(xii).	Open circuit voltage (V_{oc})	52.73V
(xiii).	Short circuit current (I_{sc})	10.40A
(xiv).	Maximum system open Circuit Voltage	1500VDC
(b).	**PV Array**	
(i).	No of string	8211
(ii).	Modules in string	28
(c).	**Inverters**	
(i).	Input Operating Voltage Range	3125 kW
(ii).	Efficiency of inverter	98.7%
(iii).	Max. Allowable Input voltage	1500VDC
(iv).	Max. Current	4178A
(v).	Max. Power Point Tracking Range	875-1300V

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(vi).	Output electrical system	3 phase, 3 wire	
(vii).	Rated Output Voltage	600V	
(viii).	Power Factor (adjustable)	0.8 leading~0.8 lagging	
(ix).	Power control	MPP tracker	
(x).	Rated Frequency	50/60 Hz	
(xi).	Environmental Enclosures	Relative Humidity	0-95%
		Audible Noise	IP55
		Operating Elevation	4000m
		Operating temperature	-35°C~+60°C
(xii).	Grid Operating protection	A	DC circuit breaker
		B	AC circuit breaker
		C	DC overload protection
		D	Lighting protection
		E	Grid monitoring
		F	Insulation monitoring
		G	Anti-islanding
(d).	**Junction Boxes Installed and fixed on main steel structure in Array Yard**		
(i).	Number of Junction Box units	370	
(ii).	Input circuits in each box	24	
(iii).	Max. Input current for each circuit	15A	
(iv).	Protection Level	IP65	
(v).	Over Current protection	Include	

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(vi).	Surge Protection	Class II
(e).	**Data Collecting System**	
(i).	System Data	Hardwire connection via RS485 and/or Ethernet
(f).	**Power Transformer**	
(i).	Rating	2*90MVA
(ii).	Type of Transformer	ONAN/ONAF
(iii).	Purpose of Transformer	Step-up(33kv/132kv)
(iv).	Output Voltage	132kv
(g).	**Unit Transformer**	
(i).	Rating	13*6250KVA
(ii).	Type of Transformer	33kv Oil Typed Transformer
(iii).	Purpose of Transformer	Step-up(2x0.6kv/33kv)
(iv).	Output Voltage	33kv

(D). Other Details

(i).	Expected COD of the generation facility Solar Power Plant/Solar Farm	December 21, 2021
(ii).	Expected useful Life of the generation facility Solar Power Plant/Solar Farm from the COD	25 years

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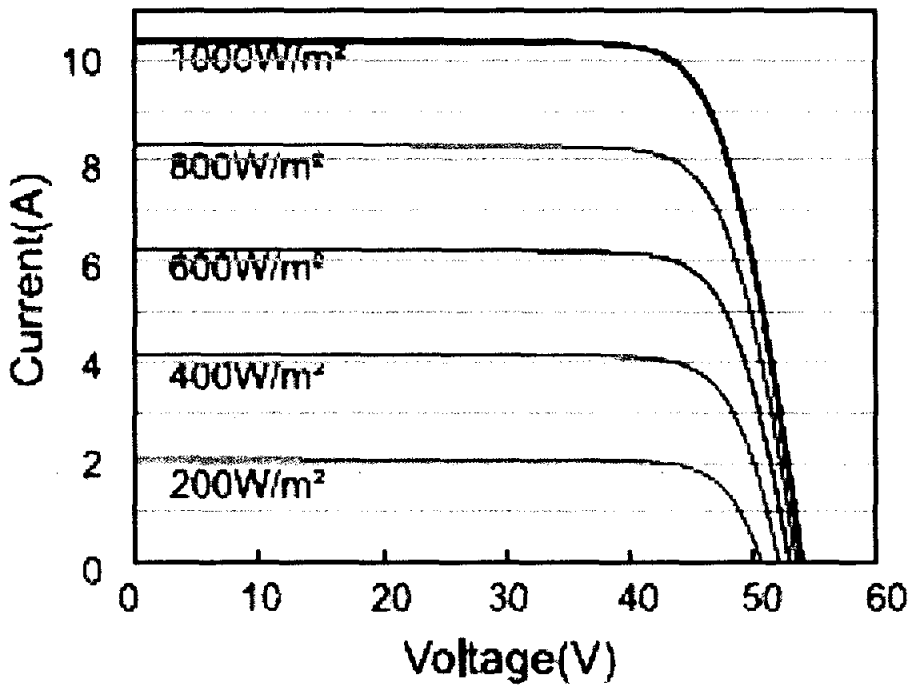
V-I Curve of PV Cell of Generation Facility/Solar Power Plant/ Solar Farm



NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
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NEPRA

Revised/Modified
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.

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SCHEDULE-II

(1).	Total Installed Capacity of the Generation Facility/Solar Power Plant/Solar Farm	100.00 MW_P
(2).	Average Sun Hour Availability/Day (Irradiation on Inclined Surface)	5-6 hours
(3).	No. of days per Year	365
(4).	Annual generating capacity of Generation Facility/Solar Power Plant/Solar Farm (As Per Simulation)	188,427 MWh
(5).	Total expected generation of the Generation Facility/Solar Power Plant/Solar Farm during the twenty five (25) years term of this licence	4,438,591 MWh
(6).	Annual generation of Generation Facility/Solar Power Plant/Solar Farm based on 24 hours of working	100x24x365 =876,000 MWh
(7).	Net Capacity Factor of Generation Facility/Solar Power Plant/Solar Farm	21.51%

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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