National Electric Power Regulatory Authority
Islamic Republic of Pakistan

Registrar

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No. NEPRA/R/DL/LAG-369/4104-10

August 16, 2017

Mr. Usman Ahmad,
Chief Executive Officer,
HNDS Energy (Private) Limited,
G-30/4, KDA Scheme No. 5, Block-8,
Clifton, Karachi.

Subject: **Grant of Generation Licence No. SPGL/21/2017**
Licence Application No. LAG-369
HNDS Energy (Private) Limited (HEPL)

Reference: HEPL's application vide letter dated September 07, 2016 (received on September 15, 2016)

Enclosed please find herewith Generation Licence No. SPGL/21/2017 granted by National Electric Power Regulatory Authority (NEPRA) to HNDS Energy (Private) Limited (HEPL) for its 50.00 MW Solar Power Plant located at Goth Gagrawara, Taluka, Saleh Pat, District Sukkur in the province of Sindh, pursuant to Section 15 of the Regulation of Generation, Transmission and Distribution of Electric Power Act (XL of 1997). 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/21/2017)

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(Syed Safeer Hussain)

Copy to:

1. Secretary, Ministry of Water and Power, 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, Sukkur Electric Power Company Limited (SEPCO), Old Thermal Power Station, Sukkhur
6. Director General, Environment Protection Department, Government of Sindh, Complex Plot No. ST-2/1, Korangi Industrial Area, Karachi.

National Electric Power Regulatory Authority (NEPRA)

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

August , 2017
Case No. LAG-369

(A). Background

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

(ii). In consideration of the above, the federal and provincial Governments have been issuing Letter of Intent (LoI) to various developers for setting up different type of RE projects across the country. In this regard, Energy Department of Government of Sindh (EDGoS) issued LoI to H. Nizam Din & Sons (Private) Limited for setting up a 50.00 MW solar based generation facility/solar power plant/solar farm at Goth Gagrawara, Taluka, Saleh Pat, district Sukkur, in the province of Sindh.

(iii). In order to implement the project, the sponsors of the project incorporated a Special Purpose Vehicle (SPV) in the name of HNDS Energy (Private) Limited (HEPL). Further, the services of various consultants were hired and a feasibility study of the project was carried out. The feasibility study *inter alia* included technical details of the project, power production estimates, soil test reports, electrical, environmental studies and financial analysis etc.

(B). Filing of Application

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

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

(ii). The Registrar examined the submitted application to confirm its compliance with the Licensing Regulations and observed that the application lacked some of the required information/documentation. Accordingly, HEPL was directed for submitting the missing information/documentation and the same was received on October 10, 2016. The Authority considered the matter and found the form and content of the application in substantial compliance with Regulation-3 of the Licensing Regulations. Accordingly, the Authority admitted the application on November 09, 2016 for consideration of the grant of the generation licence as stipulated in Regulation-7 of the Licensing Regulations. The Authority approved an advertisement to invite comments of general public, interested and affected persons in the matter as stipulated in Regulation-8 of the Licensing Regulations. Accordingly, notices were published in one (01) Urdu and one (01) English newspapers on November 12, 2016.

(iii). In addition to the above, the Authority also approved a list of stakeholders for seeking their comments for assistance of the Authority in the matter in terms of Regulation-9(2) of the Licensing Regulations. Accordingly, letters were sent to the said stakeholders on November 14, 2016, soliciting their comments for assistance of the Authority.

(C). Comments of Stakeholders

(i). In reply to the above, the Authority received comments from seven (07) stakeholders. These included EDGoS, Engineering Development Board (EDB), Karachi Shipyard & Engineering Works Limited (KS&EWL), Environmental Protection Agency Government of Sindh (EPAGoS), Anwar Kamal Law Associates (AKLA), Board of Investment (BoI) and Alternative Energy Development Board (AEDB). The salient points of the comments offered by the said stakeholders are summarized below:-

(a). EDGoS stated that there is a huge potential of solar energy in the province, available with high radiation and lower costs as compared to northern regions of the country, which has so far

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not been properly tapped despite severe energy crisis. The department is actively supporting the project sponsors for timely development of environmental friendly and fuel free power project in line with the RE policy and Pakistan Vision-2025. The RE sources have multiple benefits and far reaching impact on the national economy. Such projects have shorter gestation period and can be deployed more quickly as compared to other technologies. There is no fuel cost for these projects and substitute imported fuel resulting in huge foreign exchange savings. Such projects have very little or no global warming emissions and do not have any adverse effects on health and environment. Therefore, the indigenous power projects especially based on commercially viable solar power projects may needs to be encouraged. Moreover; the development of solar power projects in Sukkur will not only generate power but also benefit the local community at large by bringing in jobs, health, educational and clean water facilities. In view of the said, it is requested that the Authority may consider the request of HEPL for the grant of generation licence as it has completed all the milestone as per the LoI;

(b). EDB supported the grant of generation licence to HEPL and suggested that efforts should be made to utilize indigenous potential available for the proposed project;

(c). KSY&EWL stated that addition of a new solar based generation facility of 50.0 MW will definitely be helpful in decreasing the shortfall of electrical power in the country. In view of the said, KSY&EWL has no objection if the company is granted the generation licence. It was stated that KSY&EWL is fully capable of manufacturing the towers for solar power plant and the fabrication facilities are available in the vicinity of Karachi which is close to the project site. The rates of fabrication and site installation of KSY&EWL are quite competitive and at par with the market. Therefore, HEPL may consider the facilities of

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KSY&EWL for local fabrication, erection and installation of required solar power plant;

(d). EPAGoS submitted that HEPL is in violation of Section-17 of the Sindh Environmental Protection Act, 2014 and IEE/EIA rules and regulations 2014 as it has not conducted the Initial Environmental Examination /Environmental Impact Assessment and not obtained the required approval. EPAGoS stressed that generation license should not be granted without its approva

(e). MoI&P commented that all efforts should be made to utilize the indigenous potential available for the project;

(f). AKLA highlighted various issues pertaining to the electric power sector of the country including (a). Surplus available generation capacity; (b). Underutilization of existing power plants; (c). Payment of idle charges by consumer due to "Take or Pay" contracts; (d). Affordability of the consumers of the country; (e). Induction of RE power plants in the era of low prices of furnace oil; (f). Setting up of wind and solar based RE power plants when thermal power plant on coal and RLNG are being constructed; (g). Wind and solar based generation facilities are not base load and have low plant factor; (h). Parallel investment in base load power plants is required when solar and solar power plants are installed; and (h). Wind and solar power plants had higher per MW and the same has declined sharply therefore, such plants may be inducted through competitive bidding instead of up-front tariffs. AKLA stated that it is not against the induction of RE power plants but the same may be inducted duly considering the financial and economic viability of such projects;

(g). BoI submitted that being an investment facilitating and promoting agency, it supports the grant of generation licence to

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HEPL subject to fulfillment of all technical and procedural formalities according to the rules and regulations; and

(h). AEDB supported the grant of generation licence to HEPL for its proposed solar based generation facility to be located in district Sukkur in the province of Sindh.

(ii). The Authority considered the above comments of the stakeholders and decided to seek the perspective of HEPL on the observations of EDB, KSY&EWL, EPAGoS and AKLA. On the observation of EDB and KSY&EWL it was confirmed that the project company shall make all efforts, as much as possible, in utilizing the indigenous potential available for development of the project, while remaining within the domain of RE Policy and other relevant rules and regulations. About the observations of EPAGoS, it was submitted that the company has already conducted the desired studies and has obtained the required No Objection Certificate (NOC) in the matter.

(iii). Regarding the observations of AKLA, it was submitted that comments offered by AKLA are general in nature and are not specifically related to the application of HEPL. It was stated that AKLA has raised various issues which are related to policy of GoP for promotion of RE in the country. HEPL stated that mainstreaming of RE and greater use of indigenous resources can help diversify the energy mix of the country and reduce dependence on any single source, particularly imported fossil fuels, thereby mitigating the supply disruptions and price fluctuation risks. Further, in the case of RE systems additional costs and risks relating to fuel stocking, transportation, and temporary substitute arrangements does not exist, except for backup purposes.

(iv). HEPL submitted that AKLA in its comments claimed that generation capacity of Pakistan is surplus. It appears that AKLA is not fully aware about the operational capacity and installed capacity, for instance the installed capacity of the hydro projects cannot operate at full load throughout the year as it is dependent on the hydrology. Furthermore, a sizeable portion of installed capacity is inefficient and not economically viable to be operated. HEPL submitted that fuel prices are volatile and it cannot be assumed to remain on the existing low level.

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HEPL acknowledged that there are projects under construction on coal and RLNG fuels however, the ever increasing demand of electricity will continue to exist therefore a sizeable share of RE projects in the overall energy mix should be maintained.

(v). HEPL expressed that indigenous RE projects will result in savings of precious foreign exchange. It was stated that at presently, the country has the lowest contribution of RE in its energy mix which needs to be improved to the level of other developing countries. HEPL stated that comparison of earlier upfront tariffs with the current upfront tariff reveals the improvement of technology/plant factor and reduction in cost, these benefits are reflected in the current upfront tariff offered by the Authority hence making RE projects much more cost effective on per MW basis. It was submitted that AKLA had raised the biggest concern over "Take or Pay" feature which is suggested to be changed to "Take and Pay". In this regard, AKLA has not taken into consideration a fundamental aspect that replacing "Take or Pay" with "Take and Pay" would result in the end of IPP industry in country.

(vi). In consideration of the above, the Authority observed that AKLA while submitting its comments has referred to its previous correspondences to NEPRA in different licence and tariff matters wherein it raised different issues including (a) surplus capacity; (b) capacity payment without supplying electricity (c); addition of high cost renewable plants (d); underutilization of power plants; and (e) induction of new power plants on "Take or Pay" basis and others etc. In this regard, the Authority has observed that it had duly addressed the aforementioned objections/comments and sent a comprehensive reply to AKLA through letter no. NEPRA/SAT-I/TRF-100/17060, dated December 27, 2016. The Authority reiterates its earlier findings and observations given in the aforementioned letter and is of the considered opinion that in fact there is considerable supply demand gap resulting in load-shedding and load management.

(vii). The aforementioned stance is strengthened from the fact that the proposed generation facility/solar power plant/solar farm of HPPL is included in the future expansion plan of National Transmission and Despatch Company Limited (NTDC). Regarding the observations of AKLA that RE projects should

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have "Take and Pay" tariff, it is hereby clarified that through its determination No. NEPRA/SPVPGT-2017/2915-2917 dated March 03, 2017, the Authority has decided to capture the falling prices of solar technology by having a market based competitive tariff instead of upfront tariff. In this regard, it is pertinent to mention that bidding based tariffs are tailored on unit delivered basis meaning thereby that a power producer/generation company is paid only for its delivered energy. In view of the foregoing, the Authority considers that the observations of AKLA stand addressed.

(viii). In consideration of the above and having addressed the comments/objections, the Authority considered it appropriate to proceed further in the matter of application of HEPL for the consideration of grant of generation licence as stipulated in the Licensing Regulations and NEPRA Licensing (Generation) Rules 2000 ("the Generation Rules").

(D). Evaluation/Findings

(i). The Authority has examined the submissions of HEPL including the information provided in its application for the grant of generation licence. The Authority has also considered the feasibility study of the project, Grid Interconnection Study (GIS), provisions of the RE Policy and the relevant rules & regulations.

(ii). The Authority has observed that the main sponsors of the project include H. Nizam Din & Sons (Pvt.) Limited and Scatec Solar ASA. H. Nizam Din & Sons (Private) Limited is a fifth generation family business having interests in textile, hospitality, re-cycling, energy and retail. Nizam Energy (Pvt.) Limited, a subsidiary of H. Nizam Din & Sons (Private) Limited, provides a one-stop smart solutions, from system components to packaged construction services. These solutions continue throughout the entire lifecycle of every solar power plant, from project development, financing, Engineering, Procurement and Construction (EPC), to Operation and Maintenance (O&M) and asset management.

(iii). The other sponsor includes Scatec Solar ASA which is a leading, globally acting as independent solar power provider which leverages off an integrated business model by taking the lead for all components of a project i.e.

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from project development, design, EPC, O&M and finally as majority equity investor. Scatec Solar ASA has built more than 600 MW of Photo Voltaic (PV) based solar plants and currently has 430.00 MW under operation/ownership across the globe covering the US, Africa, Middle East, Latin America and Europe.

(iv). In order to implement the project, the sponsors incorporated a new company in the name of HEPL under Section-32 of the Companies Ordinance, 1984 (having Corporate Universal Identification No. 0093199, dated April 28, 2015). The registered office of the company is located at G-30/4, KDA Scheme No. 8, 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.

(v). The Government of Sindh (GoS) has allocated 710 acres at Deh Gagro, Taluka, Salehpat, district Sukkur, in the province of Sindh for setting up three (03) different generation facilities/solar power plants/solar farms of approximately 50.00 MW each. According to the latest balance sheet, the sponsor group has total assets of around Rs 2.44 billion. It is pertinent to mention that based on the financial strength and other evaluation parameters, EDGoS issued LoI to HEPL for development of the project.

(vi). In view of the explanation given above, the Authority considers that the sponsors have strong financial and technical background to carry out the project. It is pertinent to mention that different local and foreign banks have expressed their willingness to fund the debt part of the project. According to the submitted information, the total outlay of the project will be U.S. $ 76.93 million which will be financed through a combination of debt (U.S. $ 57.70 million) and equity (U.S. $ 19.23 million) in a ratio of 75:25 which is in line with the benchmark set out in the RE Policy and the determinations of the Authority.

(vii). As explained in the preceding paragraphs, HEPL had carried out a feasibility study of the project. The review of the feasibility study reveals that the company has considered various world class manufactures of PV cells including General BP Solar, Canadian Solar, China Sunergy, First Solar and BYD Company Limited etc. After duly considering the various factors including (a). Solar resource

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position of the locality (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 spare parts for PV cells etc., the company decided to select Si-Poly BYD 320-P6C-36 DG, 320 W consisting of 156260 modules. The feasibility study also optimized the size of the proposed generation facility/solar power plant/solar farm to 50.00 MW_P.

(viii). The Authority has noted that the sponsors of the project carried out the required interconnection and system stability study for dispersal of electric power from their three (03) proposed generation facilities/solar power plants/solar farms namely Helios Power (Private) Limited, HEPL and Meridian Energy (Private) Limited. According to the said study, the dispersal of electric power will be made on 132 KV Voltage. The dispersal/interconnection arrangement will be consisting of 132kV Double Circuit (D/C) transmission line on ACSR Rail conductor, for making an In-Out of one circuit of 132 KV D/C transmission line from new 220/132 KV new Rohri grid station to 132 KV Nara C-1 grid station. The distance for making In-Out arrangement will be approximately two (02) KM in length whereas the distance between substations of each of the above mentioned generation facilities/solar power plants/solar farms will be approximately 0.11 KM. In this regard, NTDC has confirmed that the electric power from the proposed generation facility/solar power plant/solar farm will not have any adverse effect on the National Grid. Further, the necessary arrangements for evacuation of electric power will be made available well before the Commercial Operation Date (COD) of the generation facility/solar power plant/solar farm.

(ix). The Authority considers that the proposed project, for which generation licence is being sought, is based on RE source and does not cause pollution as in the case of conventional power plants. However, the Authority considers that the construction and operation of the generation facility/Solar Power Plant/Solar Farm may cause soil pollution and noise pollution. In this regard, the Authority has observed that HEPL also carried out the Initial Environment Examination and submitted the same for the consideration and approval of Sindh Environmental Protection Agency, Government of Sindh

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(EPAGoS). The Authority is satisfied that EPAGoS has issued a No Objection Certificate (NOC) for the construction of the project.

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

(xi). Further, 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, 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 costs and right-of-way considerations related to the provision of transmission and interconnection facilities; (e). the constraints on the transmission system likely to result from the proposed generation facility 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.

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(xii). The Authority considers that the proposed project will result in optimum utilization of the RE resources which was earlier untapped, resulting in pollution free electric power. It is relevant to mention that solar is an indigenous resource and such resources have a preference for the energy security. As explained in the preceding paragraphs, the Authority through its determination No. NEPRA/SPVPGT-2017/2915-2917 dated March 3, 2017 has decided to capture the falling prices of solar technology by having a market based tariff for solar power projects which is expected to result in a very competitive tariff due to falling prices of the PV cells and related allied equipment.

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

(xiv). In view of the above, the Authority is of the considered view that the project of HEPL fulfills the eligibility criteria for grant of generation licence as stipulated in the NEPRA Act, rules and regulations and other applicable documents.

(E). Grant of Generation Licence

(i). The sustainable and affordable energy/electricity is a key prerequisite for socio-economic development of any country. In fact, the economic growth of any country is directly linked with the availability of safe, secure, reliable and cheaper supply of energy/electricity. In view of the said reasons, the Authority is of the considered opinion that for sustainable development, all indigenous power generation resources including RE must be developed on priority basis.

(ii). The existing energy mix of the country is heavily skewed towards thermal power plants, mainly operating on imported fossil fuel. The continuous import of fossil fuel not only creates pressure on the precious foreign exchange

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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 power generation and their development is encouraged. The Energy Security Action Plan 2005 approved by GoP, duly recognizes this very aspect of power generation through renewable energy and envisages that at least 5% of total national power generation capacity (i.e. 9700 MW) to be met through RE resources by 2030.

(iii). The Authority considers that the proposed project of HEPL is consistent with the provisions of Energy Security Action Plan 2005. The project will help in diversifying the energy portfolio of the country. Further, it will not only enhance the energy security of the country by reducing the dependence on imported fuel but will also help in reducing in carbon emission by generating clean electricity, thus improving the environment.

(iv). As explained in the preceding paragraphs, HEPL 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 Sindh has allocated land to HEPL for setting up a generation facility/solar power plant/solar farm. The said details have been incorporated in Schedule-I of the proposed generation licence. The Authority directs HEPL to utilize the allocated land exclusively for the proposed generation facility/solar power plant/solar farm and not to carry out any other generation activity on the said land except with its prior approval.

(v). The term of a generation licence under Rule-5(1) of the Generation Rules is required to match with the maximum expected life of the units comprised in a generating facility, except where an applicant for a generation licence consents to a shorter term. According to the information provided by HEPL, its generation facility/solar power plant/solar farm will achieve COD by December 31, 2018 and will have a useful life of more than twenty five (25) years from its COD. In this regard, HEPL 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 HEPL about the useful life of the generation facility/solar power

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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 view of the said, the Authority through Article-6 of the generation licence directs HEPL to charge the power purchaser only such tariff which has been determined, approved or specified by the Authority. The Authority directs HEPL to adhere to the Article-6 of the generation licence in letter and spirit without any exception.

(vii). About the compliance with the environmental standards, as discussed in the preceding paragraphs, HEPL has provided the NOC from EPAGoS 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 separate article (i.e. Article-10) in the generation licence along with other terms and conditions making it obligatory for HEPL to comply with relevant environmental standards at all times. Further, the Authority directs HEPL 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 HEPL 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. HEPL has informed that the project will achieve COD by December 31, 2018, which is within the deadline of the Kyoto Protocol. In view of the said, an article (i.e. Article-14) for carbon credits and its sharing with the power purchaser has been included in the generation licence. Accordingly, the Authority directs HEPL to initiate the process in this regard at the earliest so that proceeds for the carbon credits are materialized. HEPL shall be required to share the

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proceeds of the carbon credits with the power purchaser as stipulated in Article-14 of the generation licence.

(ix). In view of the above, the Authority hereby approves the grant of generation licence to HEPL 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:

Maj. (R) Haroon Rashid
(Member)

Syed Masood-ul-Hassan Naqvi
(Member)

Himayat Ullah Khan
(Member)

Saif Ullah Chattha
(Member/Vice Chairman)

10.8.2017

Tariq Saddozai
(Chairman)

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National Electric Power Regulatory Authority
(NEPRA)
Islamabad – Pakistan

GENERATION LICENCE

No. SPGL/21/2017

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

HNDS ENERGY (PVT.) LIMITED

Incorporated Under Section-32 of the Companies Ordinance 1984 (XLVII of 1984) Having Corporate Universal Identification No. 0093199, dated April 28, 2015

for its Generation Facility/Solar Farm/Solar Power Plant Located at Goth Gagrawara, Taluka, Saleh Pat District Sukkur in the Province of Sindh

(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 16th day of August Two Thousand & Seventeen and expires on 30th day of December Two Thousand & Forty Three.

160817

Registrar

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
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Article-1
Definitions

1.1 In this licence

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

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

(c). "Applicable Documents" mean the Act, the rules and regulations framed by the Authority under the Act, any documents or instruments issued or determinations made by the Authority under any of the foregoing or pursuant to the exercise of its powers under the Act, the Grid Code, the applicable Distribution Code, if any, or the documents or instruments made by the Licensee pursuant to its generation licence, in each case of a binding nature applicable to the Licensee or, where applicable, to its affiliates and to which the Licensee or any of its affiliates may be subject;

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

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

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

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(g). "Carbon Credits" mean the amount of Carbon Dioxide (CO_2) and other greenhouse gases not produced as a result of generation of electric energy by the generation facility/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 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;

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

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

(k). "Energy Purchase Agreement (EPA)" means the energy purchase agreement, entered or to be entered into by and between the Power Purchaser and the Licensee, for the purchase and sale of electric energy generated by the generation facility/Solar Power Plant/Solar Farm, as may be amended by the parties thereto from time to time;

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

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

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

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

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

(q). "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;

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

(s). "Licensee" means **HNDS Energy (Pvt.) Limited** or its successors or permitted assigns;

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

(u). "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;

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

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

(x). "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;

(y). "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;

(z). "SEPCO" means Sukkur Electric Power Company Limited or its successors or permitted assigns;

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

(bb). "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.

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Article-3
Generation Facilities

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

4.2 Unless suspended or revoked earlier, the Licensee may apply for renewal of this Licence ninety (90) days prior to the expiry of the above term, as stipulated in the Licensing Regulations.

Article-5
Licence fee

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

Article-6
Tariff

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

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Article-7
Competitive Trading Arrangement

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

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

Article-8
Maintenance of Records

For the purpose of sub-rule(1) of Rule-19 of the Generation Rules, copies of records and data shall be retained in standard and electronic form and all such records and data shall, subject to just claims of confidentiality, be accessible by authorized officers of the Authority.

Article-9
Compliance with Performance Standards

The Licensee shall comply with the relevant provisions of the National Electric Power Regulatory Authority Performance Standards (Generation) Rules 2009 as amended or replaced from time to time.

Article-10
Compliance with Environmental & Safety Standards

10.1 The generation facility/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.

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10.2 The Licensee shall provide a certificate on a bi-annual basis, confirming that the operation of its generation facility/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.

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.

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SCHEDULE-I

The Location, Size (i.e. Capacity in MW), Type of Technology, Interconnection Arrangements, Technical Limits, Technical/Functional Specifications and other details specific to the Generation 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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Land Coordinates of the Generation Facility/Solar Power Plant/Solar Farm of the Licensee

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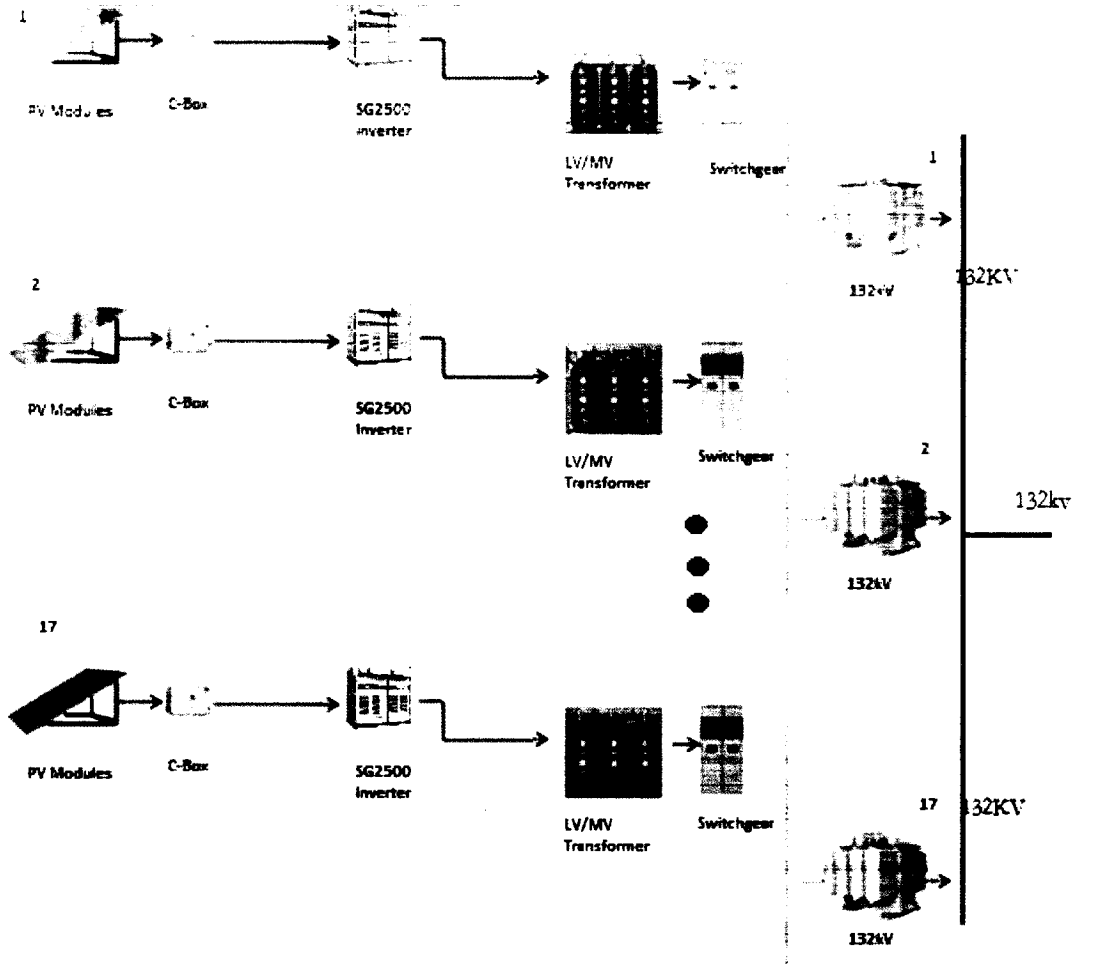
Process Flow Diagram of the Generation Facility/Solar Power Plant/Solar Farm of the Licensee



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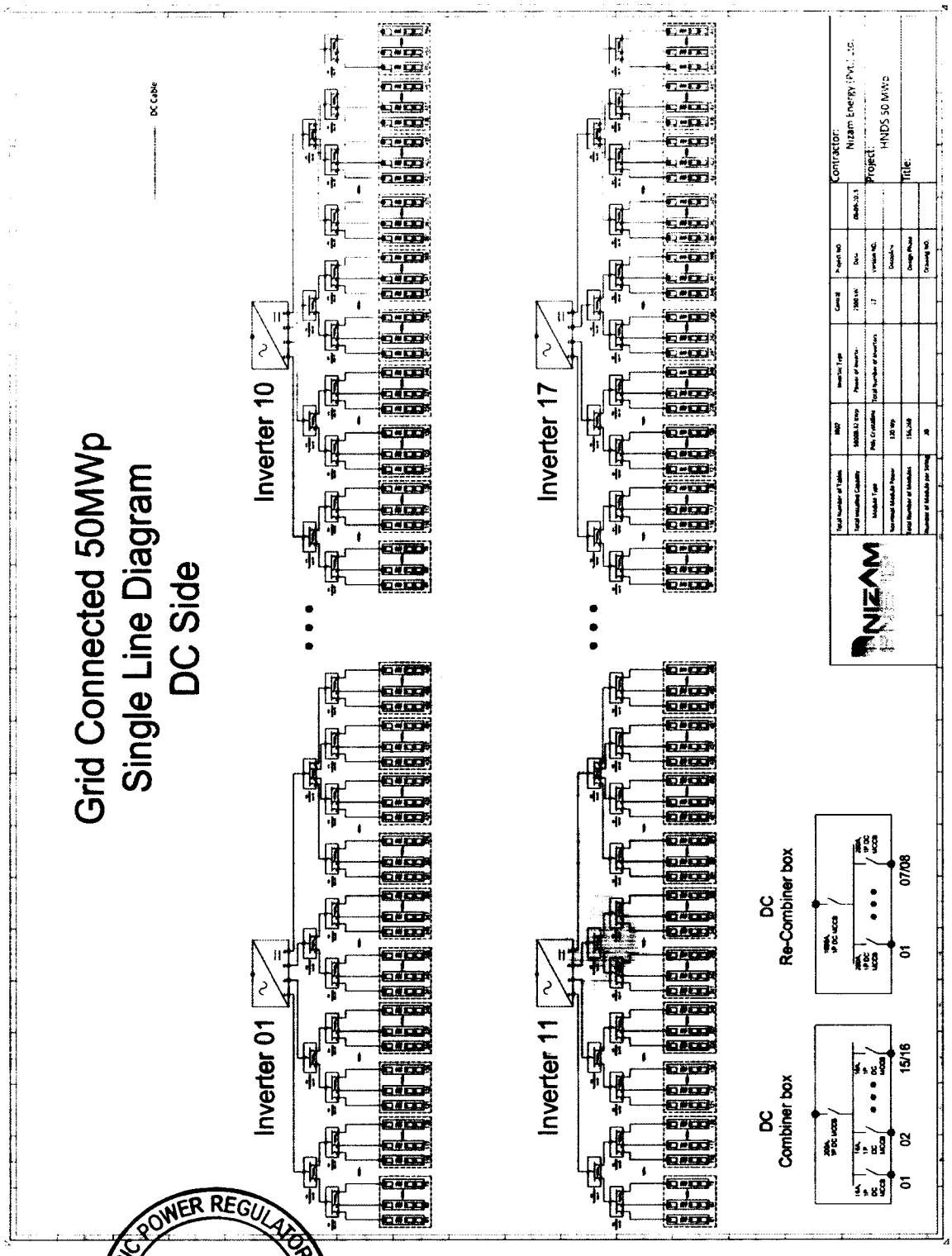
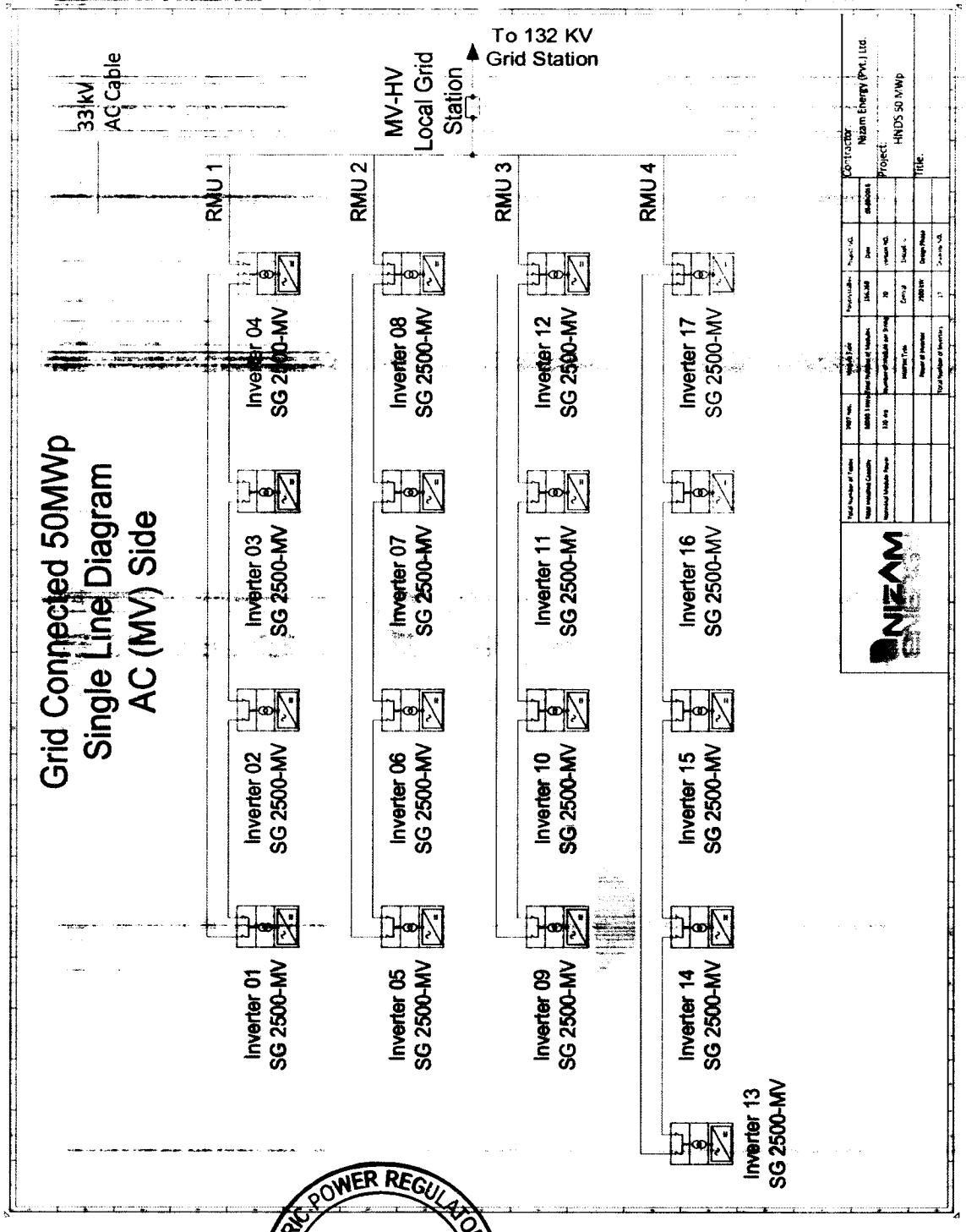
Single Line Diagram
of the Generation Facility/Solar Power Plant/Solar Farm
of the Licensee



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/Solar Power Plant/Solar Farm of the Licensee/HNDS Energy (Pvt.) Limited/HEPL shall be dispersed to the load center of SEPCO.

(2). The sponsors of the project are developing three (03) generation facilities/Solar Power Plants/Solar Farms namely Helios Power (Private) Limited, HEPL and Meridian Energy (Private) Limited.

(3). The proposed Interconnection Arrangement/Transmission Facility for dispersal of electric power for the above mentioned three (03) generation facilities/Solar Power Plants/Solar Farms will consist of following:-

(a). A 132kV Double Circuit (D/C) transmission line on ACSR Rail conductor, for making an In-Out of one circuit of 132 KV D/C transmission line from new 220/132 KV new Rohri grid station to 132 KV Nara C-1 grid station. The distance for making In-Out arrangement will be approximately two (02) KM in length whereas the distance between substations of each of the above mentioned generation facilities/Solar Power Plants/Solar Farms will be approximately 0.11 KM

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

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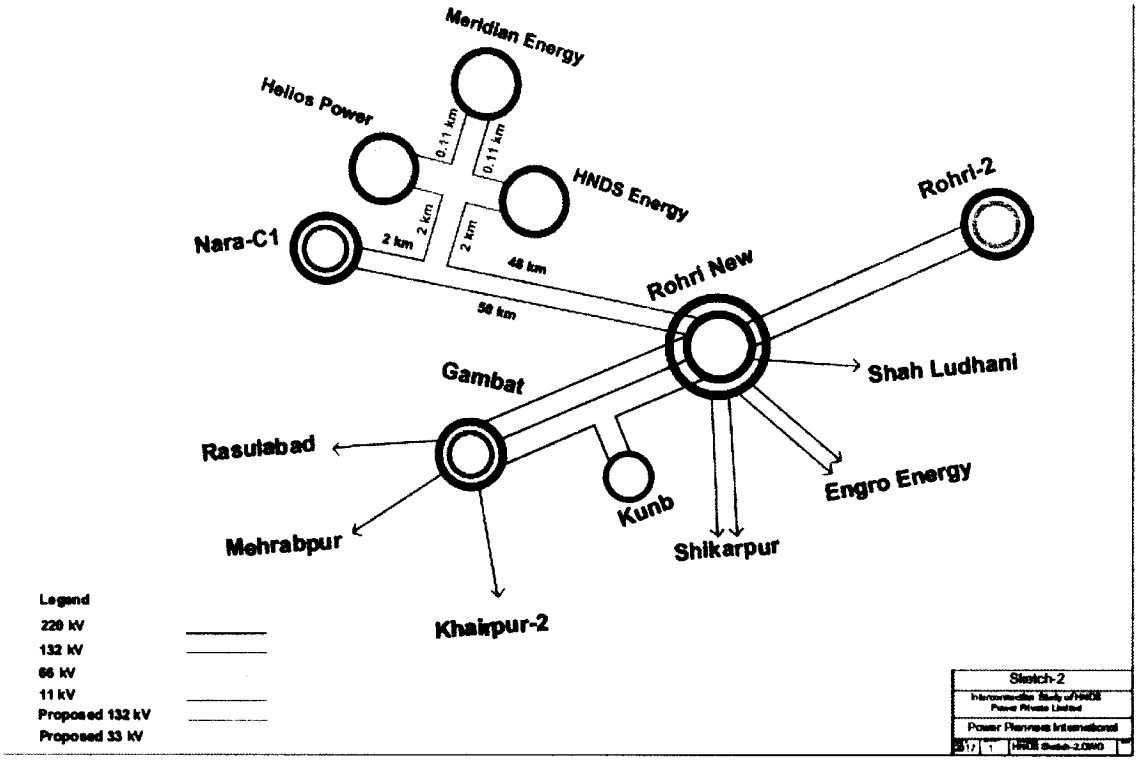
Schematic Diagram of the Interconnection Arrangement/Transmission Facility for Dispersal of Power from the Generation Facility/Solar Power Plant /Solar Farm of the Licensee



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Detail of Generation Facility/Solar Power Plant/ Solar Farm

(A). General Information

(i).	Name of Company/ Licensee	HNDS Energy (Pvt.) Limited
(ii).	Registered/Business Office	G30/4, KDA Scheme No. 5, Block-8, Clifton, Karachi, Pakistan.
(iii).	Location of the Generation Facility	Goth Gagrawara, Taluka, Saleh Pat District Sukkur in the Province of Sindh
(iv).	Type of the eneration Facility	Solar Photovoltaic (PV) Power Plant

(B). Solar Technology & Capacity

(i).	Type of Technology	PV Cell
(ii).	System Type	Grid Connected
(iii).	Installed Capacity* of the Generation Facility/Solar Power Plant/Solar Farm (MW)	=50.00 MW_p

(C). Technical Details of Equipment

(a).	**Solar Panels – PV Modules**	
(i).	Type of Module	Polycrystalline PV Module Type Peak Energy 320W;
(ii).	Type of Cell	Polycrystalline
(iii).	Dimension of each Module	1980mmx995mmx30mm
(iv).	Module Surface Area	1.9701m^2
(v).	No. of Panel	156,260

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* The exact Installed Capacity of the Generation Facility/Solar Power Plant/Solar Farm is 50.0032 MWp which is approximated to 50.00 MWp

	/Modules		
(vi).	Total Module Area	195 acres	
(vii).	Total Land Area Used	240 acres	
(viii).	Panel's Frame	Tempered Glass	
(ix).	Weight of one Module	34kg	
(x).	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 Each Year
(xi).	Number of Solar Cells in each module	72 Cells	
(xii).	Efficiency of module	16.24%	
(xiii).	Environment Protection System	Encapsulation and sealing arrangements for protection from environment.	
(xiv).	Nominal Maximum Power (Pmax) at STC	320 W	
(xv).	Power Tolerance at STC	0 ~ +5W	
(xvi).	Optimum Operating Voltage at STC	36.78 V	
(xvii).	Optimum Operating Current at STC	8.70 A	
(xviii).	Open circuit voltage (Voc) at STC	46.14 V	
(xix).	Short circuit current (Isc) at STC	9.15 A	
(xx).	Optimum Operating Voltage at NOCT	34.37 V	
(xxi).	Optimum Operating Current at NOCT	6.75 A	
(xxii).	Open circuit voltage (Voc) at NOCT	43.36 V	
(xxiii).	Short circuit current (Isc) at NOCT	7.33 A	
(xxiv).	Maximum system Voltage at STC	1000V(IEC)	
(b).	**PV Array**		

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(i).	No. of PV modules	156,260	
(ii).	Modules in a string	20	
(iii).	Total number of strings	7,813	
(c).	**PV Capacity**		
(i).	Total	50 MWp	
(d).	**Inverters**		
(i).	Max. DC power Input	2856 kW	
(ii).	Inverter Model	Sungrow SG 2500	
(iii).	Rated Input Voltage	460VDC~850VDC	
(iv).	Minimum Input Voltage	460VDC	
(v).	Number of Inverters	17	
(vi).	Efficiency	euro:98.7%; Max:99%	
(vii).	Max. Allowable Input voltage	DC 1000V	
(viii).	Max. Input Current	DC 6208 A	
(ix).	Output electrical system	3-phase, 3-wire	
(x).	Nominal Output Voltage (AC)	315 V	
(xi).	Rated Frequency	50 Hz /60Hz	
(xii).	Power Factor	Adjustable 0.9 Induction to 0.9 Capacitance	
(xiii).	Power Control	MPP Tracker	
(xiv).	Environmental Enclosures	Operating Temperature Range	-30° C to 60° C
		Relative Humidity	0 - 95% non-condensing
		Audible Noise	<55 dB(A)
		Operating Elevation	6000m (Derating above 3000m)
(xv).	Grid Operation Protection	(a).	DC overvoltage protection
		(b).	AC overvoltage protection
		(c).	Grid monitoring

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		(d).	Ground fault monitoring
		(e).	Insulation monitoring
		(f).	Overheat protection
(e).	**Isolating Transformer**		
(i).	Rating	2500 kVA	
(ii).	Type of Transformer	LV/MV 33kV transformer	
(iii).	Input voltage	AC315V	
(iv).	Output Voltage	AC33KV	
(v).	Purpose of Transformer	Step Up Voltage	
(vi).	Efficiency	98.9%	

(D). Other Details

(i).	Expected COD of the Generation Facility/Solar Power Plant/Solar Farm (Anticipated)	December 31, 2018
(ii).	Expected Useful Life of the Generation Facility/Solar Power Plant/Solar Farm (Anticipated) from COD	25 Years

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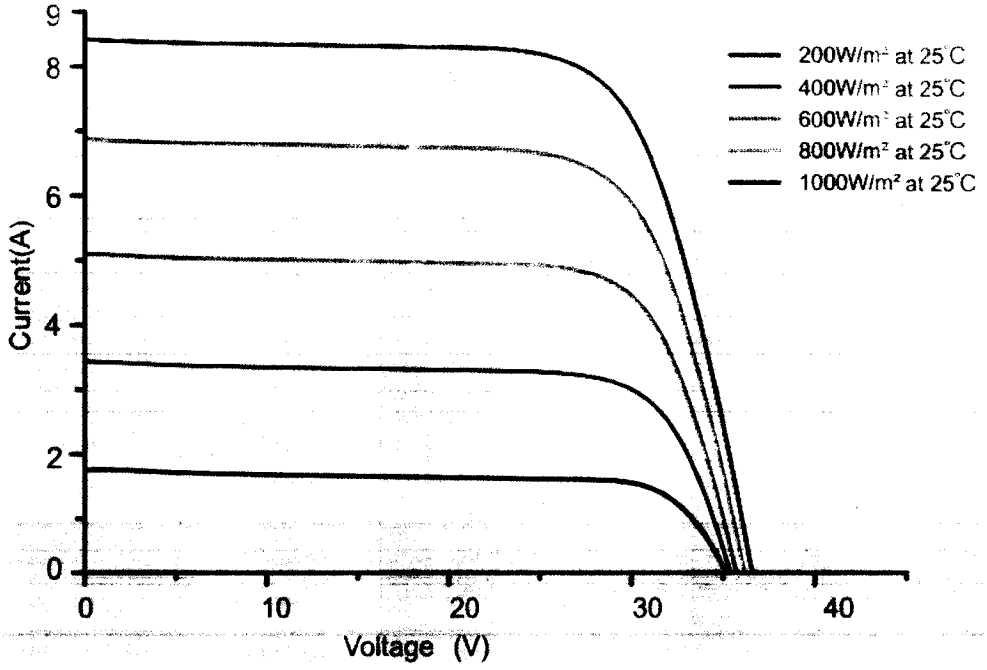
V-I Curve of Solar Cell



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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.

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SCHEDULE-II

(1).	Total PV Installed Capacity of Generation Facility	≈50.00 MWp
(2).	Average Sun Hour Availability/Day (Irradiation on Inclined Surface)	4.8 Hrs
(3).	Days per Year	365
(4).	PV Plant Generating Capacity Annually (As Per Simulation)	87,600 MWh/year
(5).	Expected Total Generation in 25 years Life Span	2,065,373 MWh
(6).	Generation per Year from plant keeping 24 Hours Working	50.00 x 24 x 365 = 438,000 MWh
(7).	Net Capacity Factor (4/6)	20.00%

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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