National Electric Power Regulatory Authority
Islamic Republic of Pakistan

Registrar

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Web: www.nepra.org.pk, E-mail: registrar@nepra.org.pk

No. NEPRA/R/DL/LAG-488/ 23948-53

May 05, 2021

Mr. Bilal Afzal,
Authorized Representative,
Zero Carbon Power (Private) Limited,
63 E 1, Gulberg-III,
Lahore.
Contact No. 0311-1111926/0333-4496883

Subject: **Grant of Generation Licence No. SGC/154/2021**
Licence Application No. LAG-488
Zero Carbon Power (Private) Limited (ZCPPL)

Reference: ZCPPL's application vide letter dated November 02, 2020.

Enclosed please find herewith Generation Licence No. SGC/154/2021 granted by National Electric Power Regulatory Authority (NEPRA) to Zero Carbon Power (Private) Limited (ZCPPL) for its 3.12 MWp PV based Generation Facility located at Packages Convertor Limited, Walton Road, Gulshan Colony, Lahore, in the province of Punjab, pursuant to Section 14(B) of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 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
(SGC/154/2021)

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(Syed Safeer Hussain)

Copy to:

1. Secretary, Ministry of Energy (Power Division), A-Block, Pak Secretariat, Islamabad.
2. Managing Director, NTDC, 488-WAPDA House, Lahore.
3. Chief Executive Officer, CPPA-G, ENERCON Building, Sector G-5/2, Islamabad.
4. Chief Executive Officer, Lahore Electric Supply Company Limited (LESCO), 22-A, Queen Road, Lahore.
5. Director General, Environment 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 Application of Zero Carbon Power (Private) Limited for Grant of the Generation Licence

May 05 ,2021
Case No. LAG-488

(A). Filing of Application

(i). Zero Carbon Power (Private) Limited (ZCPPL) submitted an application on November 03, 2020 for the grant of generation licence in terms of Section-14B of Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 (the "NEPRA Act") read with the relevant provisions of the NEPRA Licensing (Application and Modification Procedure) Regulations, 1999 (the "Licensing Regulations").

(ii). The Registrar examined the submitted application and found that application was deficient in terms of the Licensing Regulations. Accordingly, the Registrar directed ZCPPL for submitting the missing information/documents as required under the said regulations. ZCPPL completed the submission of missing information/documentation by November 05, 2020. The Registrar submitted the matter before the Authority to decide the admission of the application or otherwise.

(iii). 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 16, 2020 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 17, 2020.

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(iv). In addition to the above, the Authority also approved a list of stakeholders for seeking their comments for its assistance in the matter in terms of Regulation-9(2) of the Licensing Regulations. Accordingly, letters were sent to different stakeholders as per the approved list on November 17, 2020, soliciting their comments for assistance of the Authority.

(B). Comments of Stakeholders

(i). In reply to the above, comments were received from three (03) stakeholders including Central Power Purchasing Agency (Guarantee) Limited (CPPAGL), Ministry of Planning, Development and Special Initiatives (MoPD&SI) and Lahore Electric Supply Company Limited (LESCO). The salient points of the comments offered by the above stakeholders are summarized below: -

(a). CPPAGL submitted that ZCPPL is planning to set up a Photo Voltaic (PV) cell based generation facility of 3.12 MW_P for supplying/selling to Packages Convertor Limited (PCL) as its sole consumer. In light of the provisions of the NEPRA Licensing (Generation) Rules, 2000 (the "Generation Rules"), the Authority is required to scrutinize all applications for the generation licence on "Least Cost Option Criteria (LCOC)" including but not limited to (a). the short-term and the long-term forecasts for additional capacity requirements; (b). the tariffs resulting or likely to result from the construction or operation of the proposed generation facility; and (c). 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. As per the existing tariff structure for the end consumer, the major portion of fixed charge (capacity payment, Use of System Charges-UoSC, Market Operation Fee-MOF and Distribution Margin-DM is being recovered through sale of energy to end consumers (i.e. Volumetric Charges). As a result, the more the number of units being sold, the less will be the per

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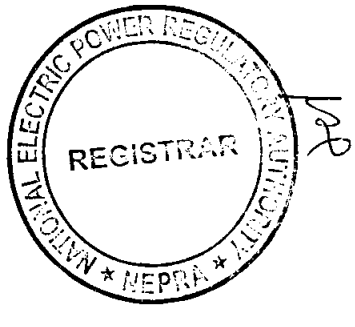
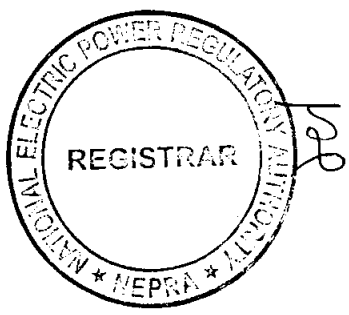
unit rate for the fixed capacity charges and vice versa. In this regard, CPPAGL suggested that the quantum of Distributed Generation (DG) may be ascertained keeping in view the demand projections and energy charge being avoided by distributed generators/consumers. Further, a new category of tariff may be introduced for grid connected consumers also having some other source of DG including net metering or self-generation or supply from a generation company. Also during the planning, specific provision should also be made to account for the distributed generation including net metering, self-generation and third party sale/purchase. Under the current tariff structure, large consumers pay higher tariff to cross-subsidize the small consumers. Cross-subsidization is a policy/regulatory decision and is applicable to all consumers irrespective of purchasing electricity from DISCOs or having bilateral contract with generators and such big consumers cannot be discriminated on the basis that if the consumers opt for self-generation, it can avoid cross-subsidy. If this practice is continued, this in turn will become an undue incentive for the remaining regulated BPC(s) to leave DISCO(s). Therefore, cross-subsidy charges should accordingly be charged to all the BPC(s) irrespective if they are consumers of DISCO(s) or doing bilateral trade. Further, CPPAGL stated that long term contracts with take-or-pay capacity regime are already committed resulting in capacity adequacy for the next few years. It is apprised that DISCO(s) are charged capacity charges (as fixed cost) which is independent of their end-consumer sales. However, DISCO(s) charges almost all of their Energy and Capacity Charges through a volumetric rate structure (i.e. per kWh basis) to the end consumers. Therefore, the regulator may provide for recovery of stranded costs arising on account of opt access/off-grid operation in the consumer-



end tariff. The demand/supply planning cycle starting from demand projection to the approval of Integrated Generation Capacity Expansion Plan (IGCEP) may be adjusted to account for the advance notices by the BPC(s) to exit the DISCO(s) and intimation to the planner to incorporate its planned generation capacity in the generation planning exercise as firm commitment and recognition by the DISCOs in demand forecasting that the demand of this BPC will only be utilized for wires planning and not for sales thus rationalization of timing of exit and return to the grid by the BPC. These changes are also very important for determining not only the period of stranded costs but also reducing further firm commitments for the pool to the extent of advance notices given by BPC(s) opting bilateral trade. If the stranded costs issue is not accounted for, then tariffs of different classes of remaining DISCO consumers will tremendously increase in case of reduction at different levels of sales.

(b). MoPD&SI stated that the proposed generation facility of ZCPPL will be generating and providing resource of Renewable Energy (RE). Therefore, the grant of generation licence to ZCPPL is supported subject to the fulfilment of the requisite codal, technical formalities and network evaluation by the respective utility; and

(c). LESCO submitted that ZCPPL is planning to install a PV based generation facility at PCL. The Packages Limited (TPL) is a BPC of LESCO as well as The Packages Mall (TPM). In this regard, TPM is bound under Section-22 of the NEPRA Act to give one (01) year notice before stopping purchasing from it. In view of the said, ZCPPL cannot involve itself in selling electric power in the service territory of LESCO. The proposed scheme



of arrangement if allowed will result in purchase of electricity from ZCPPL resulting in less sale from LESCO leading to loss to it. TPL has another power generation source from its existing 10.40 MW thermal power plant. Further, now TPL is now planning to have supply from ZCPPL also. It is neither permissible under the utility practices nor any law that a BPC can have multiple connections from different sources. CPPAGL through its different correspondence previously had raised various technical claims for similar schemes and the same may be considered as integral part of the comments of LESCO. It is pertinent to mention that LESCO is on the list of privatization and no action can be taken which may result in sale/transfer of the licensee's permits etc.; and closing of any line of business.

(ii). The Authority considered the above comments and in view of the observations raised, considered it appropriate seeking perspective of ZCPPL. On the observations of CPPAGL, it was submitted that the provisions of the Generation Rules regarding the LCOC are mostly directed towards projects connecting to the National Grid which is not the case of ZCPPL. In this regard, as explained in the application submitted to the Authority the generation facility being set up at the roof top of the proposed BPC to meet with its demand will not only provide low cost energy during the time of sunshine but will also increase the reliability of supply for the consumer. Further, it was submitted that the proposed project of ZCPPL fulfils the requirements of the LCOC considering the fact that the proposed generation facility will be directly connected to the BPC without going to the grid or the system of the utility without any constraints. Further, the tariff likely to be charged to the BPC will be quite competitive and much less than that being charged by the concerned utility. In view of the said, it is considered that the proposed generation facility fulfils the LCOC envisaged in the Generation Rules. Regarding the identification of the quantum for the DG, it was submitted that ZCPPL is aware that NTDC is in the process of formulating IGCEP and the quantity of the DG may be prescribed there as part of the demand side management. About the possible issue

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of the stranded cost due to switching of the BPC to other sources, it was submitted that the NEPRA Act clearly allows the switching for the BPC without imposing any charge/or consideration of the stranded cost. ZCPPL suggested that utilities must improve their services and try to expand portfolio to serve more consumers to address the issue of any stranded cost.

(iii). About the comments of LESCO, it was stated that as explained while responding to the observations of CPPAGL, it is reiterated that ZCPPL is setting up the PV cell based generation facility for supplying directly to PCL located at Walton road in Lahore which is a separate and distinct legal entity from TPL. It is clarified that ZCPPL plans supplying to PCL as BPC which will also be maintaining the connection from LESCO. As the connection from LESCO will be maintained there is no question of giving any notice etc. as stipulated in Section 22 of the NEPRA Act therefore the proposed arrangement is strictly in accordance with the law and there is no violation at all. The Authority has been allowing such arrangements previously and there is no exception that is being proposed now therefore, the objections of LESCO are uncalled for. Also the observations of LESCO about its privatization are not related to the current application of ZCPPL.

(iv). The Authority considered the above submissions and considered it appropriate to proceed further in the matter of the application of ZCPPL for the consideration of grant of Generation Licence as stipulated in the Licensing Regulations and the Generation Rules.

(C). Findings/Comments

(i). The Authority examined the submissions of ZCPPL including the information provided with its application for the grant of Generation Licence, the comments of the stakeholders, rejoinder submitted by the company/applicant/ZCPPL, the relevant rules & regulations in the matter.

(ii). The Authority has observed that the applicant i.e. ZCPPL is an entity incorporated under Section 16 of the Companies Act, 2017 (XIX of 2017), having Corporate Universal Identification No. 0157971 dated September 16, 2020. It is a

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private limited company with the principal line of business to generate and sell electricity and to carry on all or any ancillary businesses relating to generation, production, sale, storage, supply and distribution of electricity and to provide such services as are associated with or required for the said business activities and completion of installation of projects of generation and sale of electricity. Further, the Memorandum of Association (MoM) also envisages to perform all other acts which are necessary or incidental to the business of electricity generation, installation, storage, transmission, distribution, supply and sale subject to permission of concerned authorities. Also the MoM envisages to establish, construct, install, equip, operate, use, manage and maintain electricity generation power plants of all types and capacities subject to permission of the relevant authorities.

(iii). As explained above, in its application under consideration ZCPPL plans setting up PV based roof top facility of 3.12 MWp at PCL located at Walton Road, Gulshan Colony, Lahore in the province of Punjab. In consideration of the said, it is pertinent to that ZCPPL plans supplying to the aforementioned entity as BPC through cable located on private property owned by the respective BPC. According to the submitted information, the total cost of the project will be about Pak. Rs. 255.539 million which will be financed through a combination of debt (95% of the total cost of project i.e. Rs. 242.762 million) and equity (of 5% of the total cost of project i.e. Rs. 12.777 million). In this regard, a number of financial institution/commercial banks have shown their willingness to finance the debt portion of the project.

(iv). The sponsor carried out a feasibility study of the project including, *inter alia*, solar power plant equipment details, PV-sitting details, power production estimates based on solar irradiation data of the project sites, soil tests reports, technical details pertaining to selected photovoltaic (PV) cells and other allied equipment to be used in the solar power plant, electrical studies, environmental study and project financing etc. The review of the feasibility study reveals that for the proposed location to achieve the capacity of 3.12 MWp the company will be

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installing 5841 PV cells each of 535 WattP. In consideration of the said, it is clarified that the company plans installing PV cells from Tier-I manufactures including Jinko Solar, JA Solar or Renesola. It is pertinent to mention that the company has confirmed that deal for purchase of PV Cells of JAM72S3O —535 W has been locked with JA Solar where the manufacturer has assured an average capacity factor of 16.00%.

(v). As explained above, the supply from proposed generation facility will be supplied to a BPC in the name of PCL. According to the system study of the project, the dispersal to the BPC will be made at 220/400 Volt through cables located/placed on the roof top/private property owned by the BPC not involving any public or third party. In this regard, it is pertinent to mention BPC is a defined term as stipulated in Section 2 (ii) of the NEPRA Act. According to the said, a BPC is a consumer which purchases or receives electric power, at one premises, in an amount of one megawatt or more or in such other amount and voltage level and with such other characteristics as the Authority may specify and the Authority may specify different amounts and voltage levels and with such other characteristics for different areas. In terms of Section 2 (xxva) of the NEPRA Act, for the purpose of specified means specified by regulations made by the Authority under the NEPRA Act. It is pertinent to mention that the relevant regulation in this regard are still under formation and in the absence of the same the Authority has been allowing even amount of less than 1.00 MW to be treated as BPC therefore, the load of the above mentioned entity explained in the preceding Paras may be considered as BPC.

(vi). Further to the above, Section 2(v) of the NEPRA Act defines the term "Distribution" wherein the ownership, operation, management and control of distribution facilities located on private property and used solely to move or deliver electric power to the person owning, operating, managing and controlling those facilities or to tenants thereof is not included in the definition of "distribution". As explained above, the facilities to be used for delivery of electric power to above BPC are located on private property (without involving any public property or any third party) will be owned, operated, managed and controlled by

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the BPC therefore, the supply of electric power to PCL by ZCPPL does not constitute a distribution activity under the Act, and a distribution licence will not be required by the company.

(vii). ZCPPL has informed that necessary due diligence has been completed and there will be no environmental impact of the proposed arrangement as PV cells will be utilizing only the existing infrastructure of roof top of buildings. Further, being the proposed sizing of the project, there is no requirement to have Initial Environmental Examination (IEE). ZCPPL has confirmed that it will comply with the concerned environmental standards. In view of the said, ZCPPL is being made obligatory to comply with the relevant environmental standards for which a separate article has been proposed to be included in the proposed generation licence.

(viii). The grant of a generation licence is governed by the provisions of Rule-3 of the Generation Rules. The Authority has observed that ZCPPL has provided the details of the proposed generation facility about (a). location; (b). size; (c). technology; (d). interconnection arrangement; (e). technical limits; (f). technical functional specification and (g). other specific/relevant details as stipulated in Rule-3 (1) of the Generation Rules. According to the Rule-3(5) of the Generation Rules, the Authority may refuse to issue a generation licence where the site, technology, design, fuel, tariff or other relevant matters pertaining to the proposed generation facility/solar power plant/Roof Top Solar proposed in an application for a generation licence are either not suitable on environmental grounds or do not satisfy the LCOC. In this regard, the Rule-3(5) of the Generation Rules stipulates the conditions pertaining to LCOC which includes (a). sustainable development or optimum utilization of the RE or non-RE 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/solar power plant/Roof Top Solar against the preferences indicated by the Authority; (d). the cost and right-of-way considerations related to the provision of transmission and interconnection facilities; (e). the constraints on the transmission

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system likely to result from the proposed generation facility/solar power plant/Roof Top Solar 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/solar power plant/Roof Top Solar; 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.

(ix). In consideration of the above, it is considered that the proposed project will result in optimum utilization of the RE which was earlier untapped, resulting in pollution free electric power. It is pertinent to mention that solar is an indigenous source and such resources should have a preference for the energy security. As explained in the preceding paragraphs above, the company will be supplying to a BPC directly which only involve laying a few meters length of feeder which concludes that the project will not face any constraints in transmission of power. Further, being located in the same vicinity of the BPC, the project will not result in cost and right-of-way issue for the provision of interconnection facilities. In view of the said, it is considered that the project of ZCPPL fulfills the eligibility criteria for grant of generation licence as stipulated in the NEPRA Act, rules and regulations and other applicable documents.

(D). Grant of Licence

(i). The Authority considers that 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, the Authority is of the considered opinion that for sustainable development, all indigenous power generation resources especially RE must be developed on priority basis.

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(ii). The Authority observes that the existing energy mix of the country is heavily skewed towards the thermal power plants, mainly operating on imported fossil fuels. The continuous import of fossil fuels not only creates pressure on the precious foreign exchange reserves of the country but is also an environmental concern. Therefore, in order to achieve sustainable development, it is imperative that indigenous RE resources are given priority for power generation and their development is encouraged. The Authority is really encouraged to observe that with each passing day, the cost of RE technologies is showing downward trend making the same affordable for commercial use. The Authority is also encouraged to observe that the Govt. of Pakistan is planning to enhance the share of RE from its current level of 5% of the Installed capacity to 30% of the total installed capacity by 2030. Furthermore, a number of initiatives are also being undertaken in the private sector in this regard.

(iii). The Authority has observed that in the current case, ZCPPL has approached for the grant of a Generation Licence for setting up a generation facility with a cumulative Installed Capacity of 3.12 MW_P for supplying to a BPC which is also existing consumer of its respective DISCO. The Authority considers that the above proposal of ZCPPL is in line with the provisions of the NEPRA Act, relevant rules and regulations framed thereunder and vision of the Govt. of Pakistan to enhance the contribution of RE in generation of electric power. The project will not only help ZCPPL in diversifying its portfolio but will also enhance the energy security of the BPC. Further, the project will also help in reducing the carbon emission by generating clean electricity, thus improving the environment.

(iv). As explained above, ZCPPL has provided the details of location, technology, size, net capacity/energy yield, interconnection arrangements, technical details and other related information for the proposed PV based generation facility/solar power plant/ Roof Top Solar. In this regard, the Authority has observed that sponsors of the project have acquired/available with them the required land for setting up the distinct PV based generation facility. The said details are being incorporated in the generation licence.

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(v). The Authority has observed that proposed generation facility of ZCPPL will be used for supplying to PCL as a BPC. According to Section-2(ii) of the NEPRA Act, a consumer which purchases or receives electric power at one premises, in an amount of one megawatt or more or in such amount and voltage level and with such characteristics as the Authority may determine/specify is treated as BPC. It is pertinent to mention that the relevant regulation in this regard are still under formation and in the absence of the same the Authority has been allowing even amount of less than 1.00 MW to be treated as BPC therefore, the Authority allows all the above mentioned entity explained in the preceding Paras to be BPC of ZCPPL.

(vi). Regarding supply to the BPC, the Authority observes that the BPC and the proposed generation facility of ZCPPL is located within the same premises and the BPC will be supplied through cable/feeder of 220/440 Volt. Pursuant to proviso to Section-21 of the NEPRA Act, the Authority is empowered to allow a generation company to sell electric power to a BPC located in the service territory of a distribution company. In view of the said, the Authority allows the ZCPPL to sell electricity to BPC. Further, under Section-2(v) of the NEPRA Act, ownership, operation, management and control of distribution facilities located on private property and used solely to move or deliver electric power to the person owning, operating, managing and controlling those facilities or to tenants thereof has not been included in the definition of "distribution". Based on the said considerations that the proposed BPC is located within the same premises and no public areas are involved, the supply of power to BPC by ZCPPL does not constitute a distribution activity under the NEPRA Act, and ZCPPL will not require a distribution licence for supplying to the BPC.

(vii). The term of a generation licence under Rule-5(1) of the Generation Rules is required to match with the maximum expected useful life of the units comprised in a generation facility. According to the information provided by ZCPPL, the Commercial Operation Date (COD) of the proposed generation facility/solar power plant/ Roof Top Solar will be December 31, 2021 and it will have a useful life

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of around twenty five (25) years from its COD. In this regard, ZCPPL has requested that the term of the proposed generation licence may be fixed as per the said useful life of generation facility/solar power plant/ Roof Top Solar. The Authority considers that said submission of ZCPPL about the useful life of the generation facility/solar power plant/ Roof Top Solar and the subsequent request of ZCPPL to fix the term of the generation licence is consistent with international benchmarks; therefore, the Authority fixes the term of the generation licence to twenty five (25) years from COD of the project subject to Section-14 B of the NEPRA Act.

(viii). Regarding compliance with the environmental standards, ZCPPL has confirmed that it 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 in the generation licence along with other terms and conditions making it obligatory for ZCPPL to comply with relevant environmental standards at all times.

(ix). Regarding the rates, charges and terms and conditions of tariff between ZCPPL and its BPC, it is reiterated that under Section-7(3)(a) of the NEPRA Act, determining tariff, rate and charges etc. is the sole prerogative of the Authority. However, the Authority observes that tariff between ZCPPL and its BPC, does not affect any other consumer or third party. Therefore for the purpose of tariff, the Authority considers it appropriate directing ZCPPL and its BPC to agree on a bilateral agreement and accordingly ZCPPL will be allowed to charge the agreed tariff subsequent to the grant of the generation licence.

(x). The Authority has duly considered the comments of different stakeholders as explained above. In this regard, the Authority has observed that CPPAGL and LESCO has raised various concerns including (a). compliance/ consideration of the LCOC for the grant of Generation Licence; (b). introduction of a new tariff for consumers having dual connection as being proposed in the current case; (c). the quantum of DG may be ascertained in IGCEP keeping in view the demand projections and energy charge being avoided by distributed generators; (d). introduction of a new tariff for consumers having connection from the utility as well

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as other sources including net metering/self-consumption/supply from generation company; (e). BPC(s) must continue to pay the cross-subsidy charges despite having other sources of supply; (f). recovery of stranded costs arising on account of open access/off-grid operation in the consumer-end tariff; (g). compliance of BPC for the required notice period before switching over to other supply; (h). BPC is not permissible to have multiple sources of supply including the utility as per standard practices or any other law; (i). the supply from ZCPPL to PCL will result in reduction in consumption from LESCO which may result in loss of its business; (j). LESCO is in the list of Privatization, and therefore steps like sale or transfer of licenses and closing of any line of business cannot be carried out without prior consent of the Privatization Commission.

(xi). In consideration to the above, the Authority has observed that proposal of ZCPPL is P2P arrangement and envisages supplying to PCL as a BPC. As explained in the preceding paragraphs, the Authority has duly considered the relevant provisions of related rules to confirm that proposal of ZCPPL fulfils the requirements prescribed under the relevant rules and regulations including LCOC. About the introduction of a suitable tariff for consumers having dual connection, the Authority considers that current case is that of the grant of a generation licence and not related to tariff. If CPPAGL or DISCO has any issue in this regard then the same may be taken up through a suitable petition to determine the same. Regarding determining the quantum of DG, the Authority considers that the integrated plan for generation of electric power is still in the stage of formulation and if NTDC and DISCSO(s) considers that the quantum of Distribution Generation is likely to affect their future forecasted then quantum of such generation may be duly considered in the future plan in the matter. About the observations of CPPAGL pertaining to stranded cost and cross subsidy, the Authority is of the considered opinion that these are sector-wise issues and the same are under deliberation at various forums therefore, any decision taken in the matter will be applicable across the board including the proposed BPC of ZCPPL. Regarding the issue of BPC giving notice to LESCO, the Authority has considered the submissions of ZCPPL and agrees to the same. Further, about the supply to BPC from multiple sources, the Authority has

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been allowing such proposals in the past on a case to case basis and considers that such an arrangement viable subject to having suitable protection system in place. The Authority directs ZCPPL and its BPC to deploy suitable protection scheme. The Authority hereby confirms that grant of generation licence to ZCPPL will not have any impact on the assets of LESCO and will not have any effect on its future privatization. In view of the said, the observations of CPPAGL and LESCO stands addressed and settled.

(xii). In consideration of the above, the Authority hereby approves the grant of generation licence to ZCPPL 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:

Rafique Ahmed Shaikh
(Member)

Rehmatullah Baloch
(Member)

Engr. Bahadur Shah
(Member)

(Did not attend-Away)

Saif Ullah Chattha
(Member/Vice Chairman)

Engr. Tauseef H. Farooqi
(Chairman)

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National Electric Power Regulatory Authority
(NEPRA)
Islamabad – Pakistan

GENERATION LICENCE
No. SGC/154/2021

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

Zero Carbon Power (Private) Limited

Incorporated under Section-16 of
the Companies Act, 2017 (XIX of 2017) having Corporate Universal
Identification No. 0157971, dated September 16, 2020

for its PV based Generation Facility located at Packages Convertor Limited, Walton Road, Gulshan Colony in the Province of Punjab

(Installed Capacity: ≈ 3.12 MW_P)

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

Given under my hand on 25th day of May Two Thousand & Twenty One
and expires on 30th day of December Two Thousand & Forty-Six

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). "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;

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

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

(e). "Bulk Power Consumer (BPC)" means a consumer which purchases or receives electric power, at one premises, in an amount of one (01) megawatt or more or in such other amount and voltage level and with such other characteristics as the Authority may specify and the Authority may specify different amounts and voltage levels and with such other characteristics for different areas;

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

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

(g). "Commercial Operations Date (COD)" means the day immediately following the date on which the generation facility/Solar Power Plant/Roof Top Solar of the Licensee is Commissioned;

(h). "Commissioned" means the successful completion of commissioning of the generation facility/Solar Power Plant/Roof Top Solar for continuous operation and despatch to the Power Purchaser;

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

(j). "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/ Roof Top Solar, as may be amended by the parties thereto from time to time;

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

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

(m). "Law" means the Act, relevant rules and regulations made there under and all the Applicable Documents;

(n). "Licence" means this licence granted to the Licensee for its generation facility/Roof Top Solar;

(o). "Licensee" means **Zero Carbon Power (Private) Limited** or its successors or permitted assigns;

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

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

(r). "Power Purchaser" means the BPC which will be purchasing electric power from the Licensee, pursuant to a EPA for procurement of electric power;

(s). "Roof Top Solar" means a cluster of photovoltaic cells installed on the roof top of a building or any other suitable place in the same location used for production of electric power";

(t). "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 rules and regulations issued under the Act.

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Article-2
Applicability of Law

This Licence is issued subject to the provisions of the Applicable Law, as amended or replaced 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 or Roof Top Solar 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 or Roof Top Solar 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 or Roof Top Solar before it is Commissioned.

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 or Roof Top Solar, subject to the provisions of Section-14(B) of the Act.

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

Article-5
Licence fee

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

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Article-6
Tariff

The Licensee is allowed to charge the Power Purchaser/BPC a mutually agreed tariff.

Article-7
Competitive Trading Arrangement

7.1 The Licensee shall participate in such manner as may be directed by the Authority from time to time for development of a Competitive Trading Arrangement.

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

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

Article-8
Maintenance of Records

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

Article-9
Compliance with Performance Standards

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

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Article-10
Compliance with Environmental & Safety Standards

10.1 The generation facility/Solar Power Plant or Roof Top Solar of the Licensee shall comply with the environmental and safety standards as may be prescribed by the relevant competent authority as amended or replaced 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 or Roof Top Solar is in conformity with required environmental standards as prescribed by the relevant competent authority as amended or replaced from time to time.

Article-11
Power off take Point and Voltage

The Licensee shall deliver the electric power to the Power Purchaser at the outgoing Bus Bar of its generation facility/Solar Power Plant or Roof Top Solar. The Licensee shall be responsible for the up-gradation (step up) of generation voltage up to the required dispersal voltage level.

Article-12
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-13
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.

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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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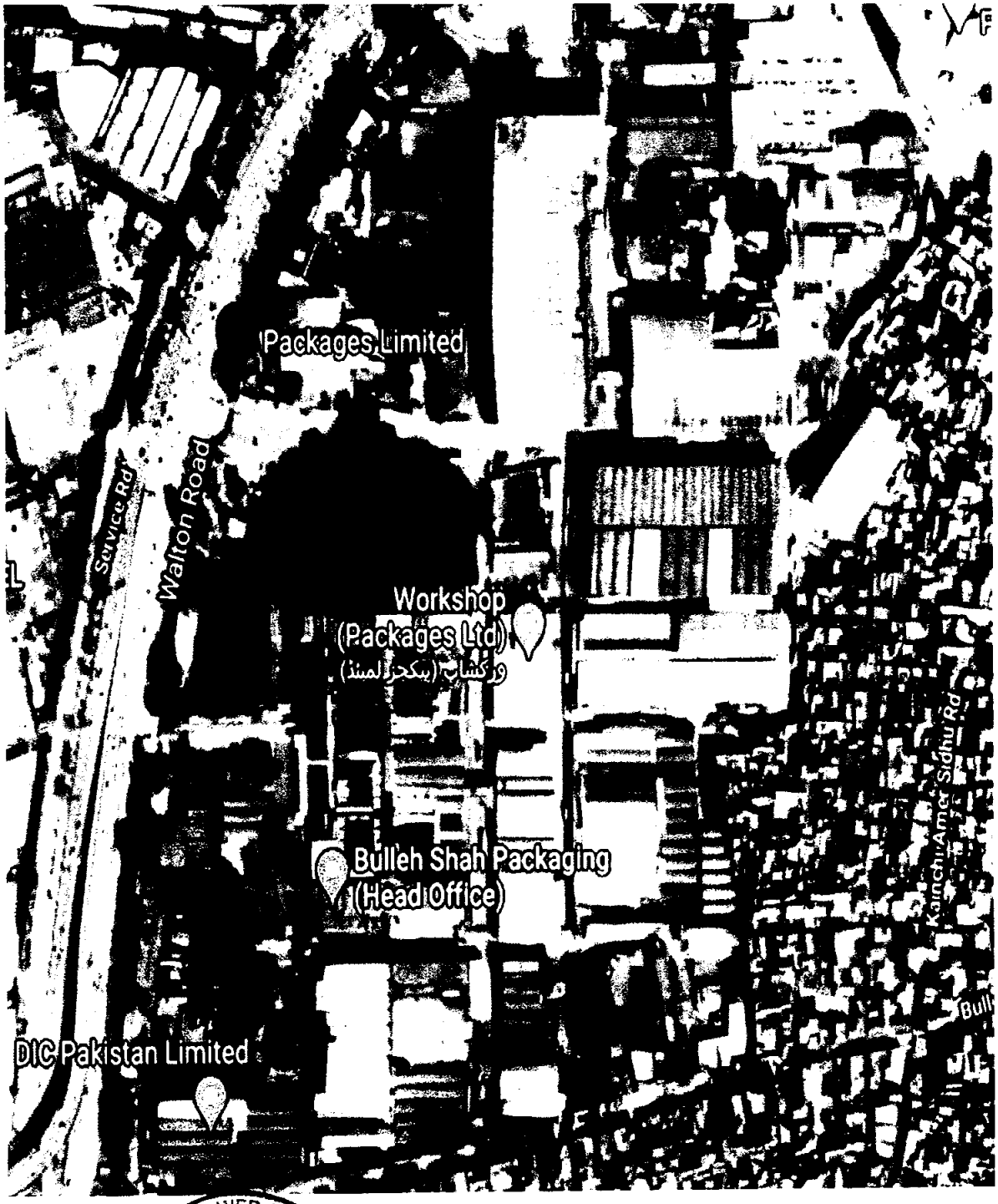
Location of the Generation Facility/Solar Power Plant/Roof Top Solar of the Licensee



Packages Convertor Limited (PCL)

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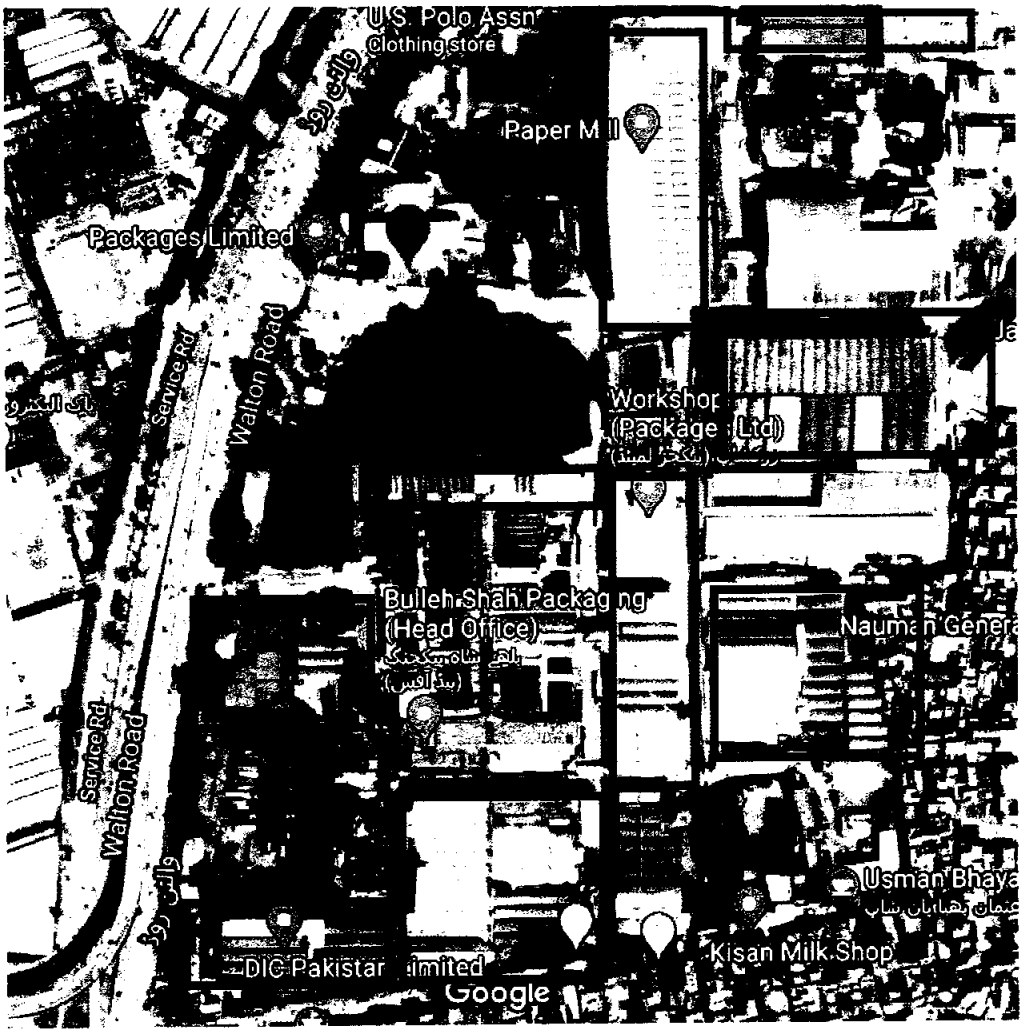
Land Coordinates of the Generation Facility/Solar Power Plant/Roof Top Solar of the Licensee



Serial Number	Location	Site Coordinates	
1.	Packages Converter Limited	Latitude	31°28'07.0"N
		Longitude	74°21'02.2"E

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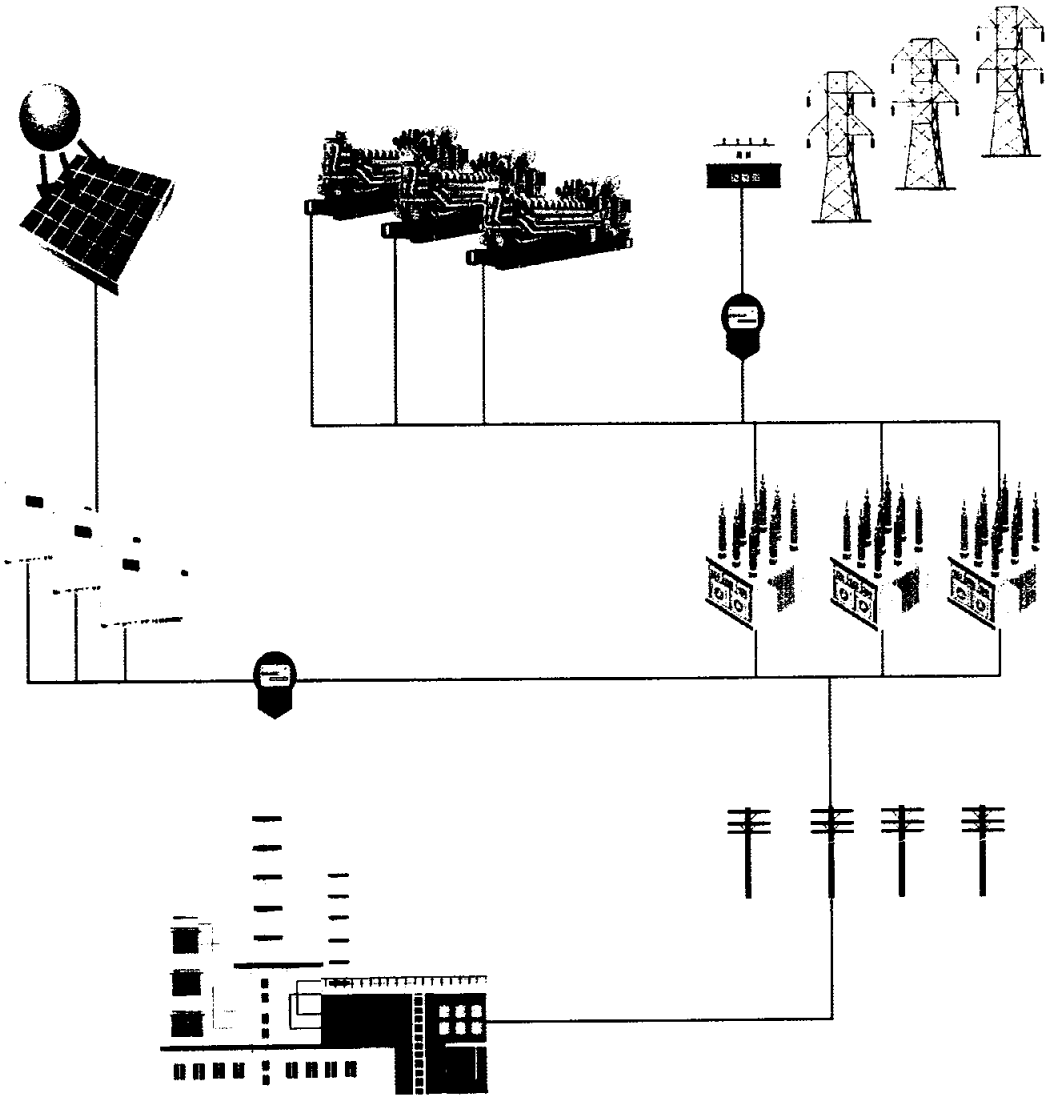
Process Flow Diagram of the Generation Facility/Solar Power Plant/Roof Top Solar of the Licensee



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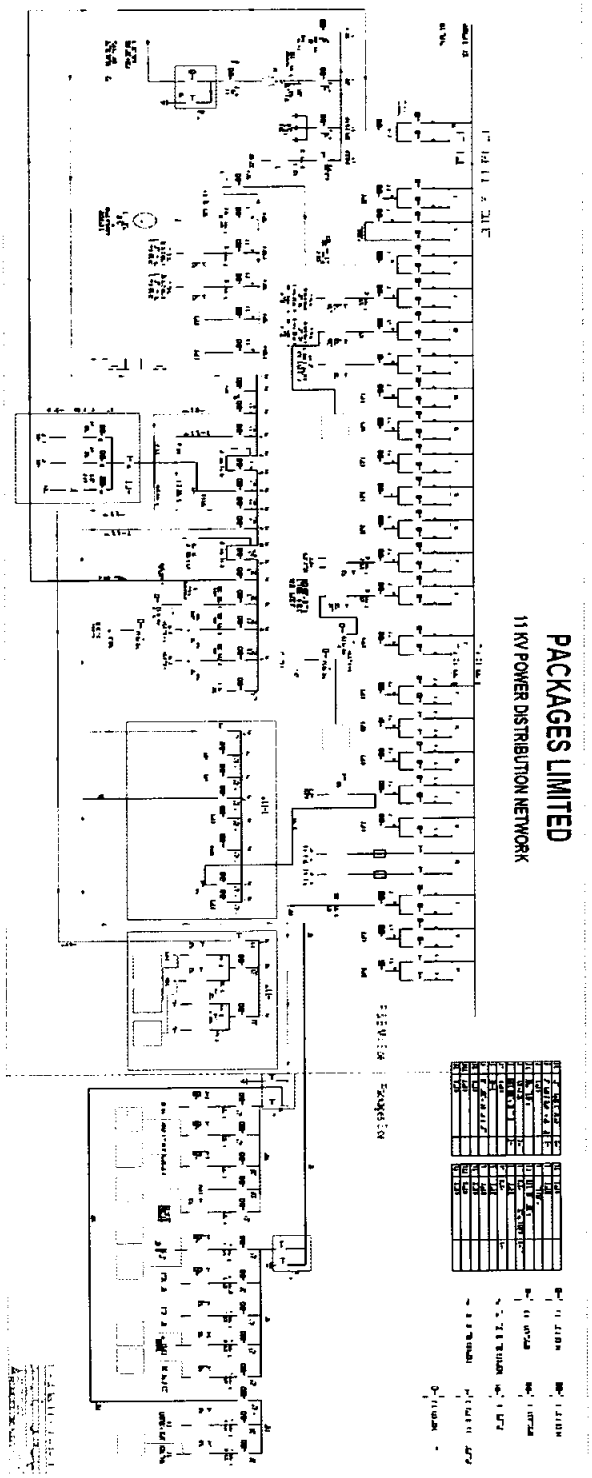
Single Line Diagram of the Generation Facility/Solar Power Plant/Solar Farm of the Licensee



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

The electric power generated from the generation facility/Solar Power Plant/Solar Farm /Roof Top Solar of the Zero Carbon Power (Private) Limited-ZCPPL/Licensee will be delivered/supplied to PCL as a Bulk Power Consumer (BPC).

(2). The details pertaining to BPC, the supply arrangements and other relating information are provided in the subsequent description of this schedule. Any changes in the said, shall be communicated to the Authority in due course of time.

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Details of Generation Facility/Solar Power Plant/ Solar Farm

(A). General Information

(i).	Name of the Company/Licensee	Zero Carbon Power Private Limited
(ii).	Registered/ Business office of the Company/Licensee	63 E-1, Gulberg III, Lahore
(iii).	Type of the generation facility/Solar Power Plant/Solar Farm	Photovoltaic (PV) Cell
(iv).	Location(s) of the generation facility Solar Power Plant/ Solar Farm	Walton Road, Gulshan Colony, Lahore in the province of Punjab

(B). Solar Power Generation Technology & Capacity

(i).	Type of Technology	Photovoltaic (PV) Cell	
(ii).	System Type	On-Grid	
(iii).	Installed Capacity of the generation facility Solar Power Plant/ Solar Farm (MW/KW)	3.12 MW_P	
(iv).	No. of Panel/Modules	5841 x 535 Watt	
(v).	PV Array	Nos. of Strings	80
		Modules in a string	19
(vi).	Invertor(s)	Quantity	9
		Make	Huawei
		Capacity of each unit	60 kW

(C). Technical Details of Equipment

(a).	**Solar Panels – PV Modules**	
(i).	Type of Module	Cheetah HC JKM400M-72H

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(ii).	Type of Cell	Mono crystalline	
(iii).	Dimension of each Module	2008x1002x40mm(79.06x39.45x1.57 inch)	
(iv).	Total Module Area	2.012016 m^2	
(v).	Frame of Panel	Anodized aluminium alloy	
(vi).	Weight of one Module	22.5 kg	
(vii).	No of Solar Cells in each module	144 (6×24)	
(viii).	Efficiency of module	19.88%	
(ix).	Maximum Power (P_{max})	400 W_P	
(x).	Voltage @ P_{max}	41.7 V	
(xi).	Current @ P_{max}	9.60 A	
(xii).	Open circuit voltage (V_{oc})	49.8V	
(xiii).	Short circuit current (I_{sc})	10.36A	
(xiv).	Maximum system open Circuit Voltage	1000VDC (IEC)	
(b).	**Inverters (SUN2000-60KTL-M0-60 KW)**		
(i).	Input Operating Voltage Range	200 V to 1000 V	
(ii).	Efficiency of inverter	98.7 %	
(iii).	Max. Allowable Input voltage	1100V	
(iv).	Max. Current	22 A	
(v).	Max. Power Point Tracking Range	200 V to 1000 V	
(vi).	Output electrical system	3 Phase AC	
(vii).	Rated Output Voltage	380 to 480	
(viii).	Power Factor (adjustable)	0.8 LG...0.8 LD	
(ix).	Power control	MPP tracker	
(x).	Rated Frequency	50 Hz	
(xi).	Environmental Enclosures	Relative Humidity	0-100%
		Audible Noise	50 DB @ 1m

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		Operating Elevation	4000 m
		Operating temperature	-25 to +60°C
(xii).	Grid Operating protection	A	DC circuit breaker
		B	AC circuit breaker
		C	DC overload protection (Type 2)
		D	Overheat protection
		E	Grid monitoring
		F	Insulation monitoring
		G	Ground fault monitoring
(c).	**Data Collecting System**		
(i).	System Data	Continuous online logging with data logging software to portal.	
(d).	**Unit Transformer**		
(i).	Not Applicable		

(D). Other Details

(i).	Expected COD of the generation facility Solar Power Plant/ Roof Top Solar	December 31, 2021
(ii).	Expected useful Life of the generation facility/Solar Power Plant/Roof Top Solar from the COD	25 years

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Information
Regarding Bulk Power Consumer(s)/BPC(s) to be Supplied by the Licensee

(i).	No. of Consumers		One
(ii).	Location of consumers (distance and/or identity of premises)		PCL, Walton Road, Gulshan Colony, Lahore in the province of Punjab.
(iii).	Contracted Capacity and Load Factor for consumer		3.12 MWp/ 15 - 20%
(iv).	Specify Whether		
	(a).	The consumer is an Associate undertaking of the Licensee -If yes, specify percentage ownership of equity;	No
	(b).	There are common directorships:	No
	(c).	Either can exercise influence or control over the other.	No
(v).	Specify nature of contractual Relationship		
	(a).	Between each consumer and Licensee.	Licensee will construct, own and operate the solar generation facilities and provide electricity to BPC.
	(b).	Consumer and Distribution Company.	
(vi)	Any other network information deemed relevant for disclosure to or consideration of the Authority.		Not Applicable

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Information
Regarding Distribution Network for Supply of Electric Power to BPC

(i).	No. of Feeders		One (01)
(ii).	Length of Each Feeder (Meter)		50-100 meter
(iii).	Length of Each Feeder to each Consumer		-do-
(iv).	In respect of all the Feeders, describe the property (streets, farms, Agri land, etc.) through, under or over which they pass right up to the premises of customer, whether they cross-over.		The underground cable supplying to BPC from the generation facility will be located on private property owned by BPC
(v).	Whether owned by Licensee, Consumer or Distribution Company -(deal with each Feeder Separately)		
	(a).	If owned by Distribution Company, particulars of contractual arrangement	NA
	(b).	Operation and maintenance responsibility for each feeder	By BPC
(vi).	Whether connection with network of Distribution Company exists (whether active or not)- If yes, provide details of connection arrangements (both technical and contractual)		Yes
(vii).	Any other network information deemed relevant for disclosure to or consideration of the Authority.		NA

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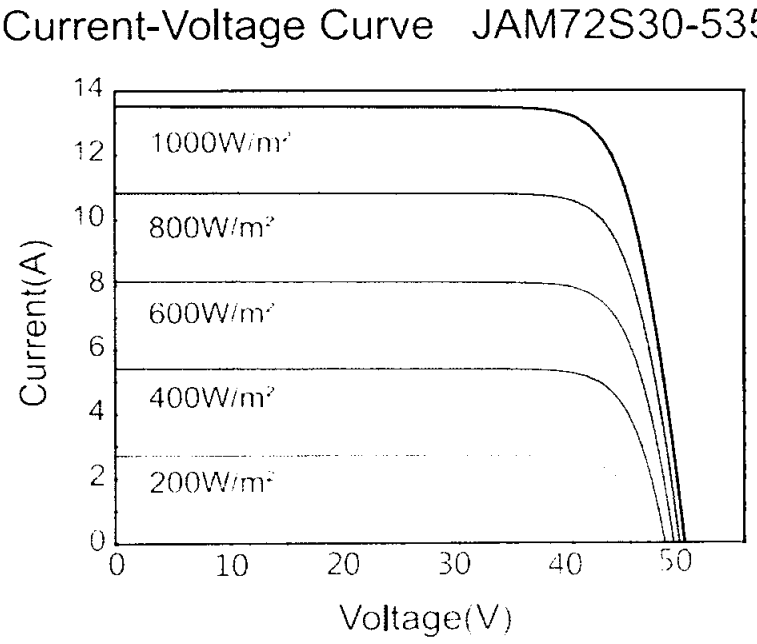
V-I Curve
Generation Facility/Solar Power Plant/Roof Top Solar of the Licensee



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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/Solar Farm of Licensee are given in this Schedule.

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SCHEDULE-II

(1).	Total Installed Capacity of the Generation Facility/Solar Power Plant/Solar Farm	3.12 MW_P
(2).	Average Sun Hour Availability/ Day (Irradiation on Inclined Surface)	5 to 6.0 Hours
(3).	No. of days per year	365
(4).	Annual generating capacity of Generation Facility/Solar Power Plant/Solar Farm (As Per Simulation)	4320 GWh
(5).	Total (approximated) expected generation of the Generation Facility/Solar Power Plant/Solar Farm during the twenty five (25) years term of this licence	108 GWh
(6).	Annual generation of Generation Facility/Solar Power Plant/Solar Farm based on 24 hours working	2,733 GWh
(7).	Net Capacity Factor of Generation Facility/Solar Power Plant/Solar Farm	16.00 %

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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Authorization
by National Electric Power Regulatory Authority (NEPRA) to

Zero Carbon Power (Private) Limited

Incorporated under Section-16 of the Companies Act, 2017 (XIX of 2017) having Corporate Universal Identification No. 0157971, dated September 16, 2020

NEPRA GENERATION LICENCE No. SGC/154/2021
For Sale to Bulk Power Consumer(s)

Pursuant to Section-22 of the Act and Rule-7 of the NEPRA Licensing (Generation) Rules-2000, the Authority hereby authorize Zero Carbon Power (Pvt) Limited-ZCPPL (the Licensee) to engage in second-tier supply business, limited to the following consumers:-

(a). Packages Convertor Limited, Walton Road, Gulshan Colony in the Province of Punjab.

Engr. Rafique Ahmed Shaikh
(Member)

Engr. Rehmatullah Baloch
(Member)

(Did not attend-Away)
Engr. Bahadur Shah
(Member)

Saif Ullah Chattha
(Member)/Vice Chairman

Engr. Tauseef H. Farooqi
Chairman

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