

February 11th, 2019

The Registrar

National Electric Power Regulatory Authority

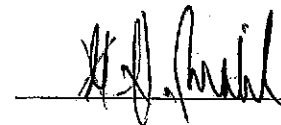
Subject: Application for Grant of Generation License for 1.897 MWp Roof Mounted Solar Power Plant at Packages Shopping Mall, Lahore

I, Usman Hamid Malik, Chief Executive Officer, being the duly authorized representative of Shams Power (Private) Limited by virtue of Board Resolution dated 4th January 2019, hereby apply to the National Electric Power Regulatory Authority for the grant of Generation License to the Shams Power (Private) Limited, pursuant to section 15 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997.

I certify that the documents-in-support attached with this application are prepared and submitted in conformity with the provisions of the National Electric Power Regulatory Authority Licensing (Application and Modification Procedure) Regulations, 1999, and undertake to abide by the terms and provisions of the above-said regulations. I further undertake and confirm that the information provided in the attached documents-in-support is true and correct to the best of my knowledge and belief.

A Bank Draft in the sum of Rupees One Hundred Sixty Three Thousand Nine Hundred and Twenty only (Rs 163,920), being the non- refundable license application fee calculated in accordance with Schedule II to the National Electric Power Regulatory Authority Licensing (Application and Modification Procedure) Regulations, 1999, is also attached herewith.

Date: _____



Signature

Usman Hamid Malik

Chief Executive Officer

Shams Power (Private) Limited

2nd Floor, Al Maalik, 19 Davis Road, Lahore, Pakistan

Phone +92 42 36313235 & 36

Fax +92 42 36312959

**TRUE COPY OF THE RESOLUTION OF BOARD OF DIRECTORS SHAMSPower
(PRIVATE) LIMITED**

Board of Directors of Shams Power Private Limited, by the resolution in circulation dated 4th of January 2019, has passed to resolve as under:

'Resolved, that the Company shall proceed with all acts necessary to comply with the legal and Regulatory requirements in relation to its business objectives and activities, inter alia, of the sale of electricity through the Generation Facilities to be provided by the Company at site(s) of Buyer(s).

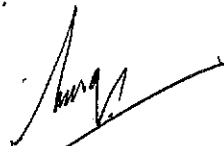
Further Resolved, that in order to apply for the Generation License for roof mounted Solar Power Plant at Packages Mall Lahore, the Chief Executive Officer of the Company (Usman H. Malik) shall be authorized to submit the application and / or to seek or submit any details, documents, evidence, clarification, or request as well as to represent the Company for the purposes of soliciting the grant of the aforementioned Generation License for the following site, either before NEPRA or any other appropriate forum and to do all or any other act that a man of ordinary prudence will do for the purposes mentioned above, including appearance before any department or forum or body, whether judicial or quasi-judicial, and to obtain the permission or no objection certificate where and when required.

1. Packages Mall, Walton Road, Nishter Town Lahore, Punjab

It is also resolved that Usman H. Malik, the Chief Executive Officer named above, may further delegate the powers so vested in him, in writing to one or more persons to the extent of the purposes as shall be mentioned in the deed of delegation.

Moreover, it is resolved that Usman H. Malik, the Chief Executive Officer named above, is authorized and empowered for and on behalf of the Company to sign, execute and file the Petition for the grant of Generation License to NEPRA/other appropriate forum along with the documents essential to be filed.

Stamp of the Company



Company Secretary
Certified to be a true copy

Shams Power (Private) Limited

2nd Floor, Al Maalik, 19 Davis Road, Lahore, Pakistan

Phone +92 42 36313235 & 36

Fax +92 42 36312959

CERTIFICATION

I hereby certify that the above resolution was duly passed on 04 January 2019 in circulation by the Board of Directors of Shams Power Company comprising of:

1. Usman H. Malik
2. Omar M. Malik
3. Zainul Abideen
4. Usaed Hafeez

I also certify that the Resolution has been entered in the minute's book of the company in accordance with the Articles of Association of the company.



Stamp of the Company



Company Secretary

Application Details

Subject: Application for Grant of Generation License

1.0 Background:

1.1 Shams Power Private Limited (SPPL) was incorporated on January 15, 2015 under Section-32 of the companies' ordinance, 1984, with corporate universal identification No. 0091515. The business office of the company is at 2nd Floor, AL-Maalik building, 19-Davis Road Lahore (Detailed Company Profile is presented in Section 2 of this document)

1.2 It is a joint venture of three of Pakistan's leading energy companies (Saba Power Limited, PITCO Private Limited and Orient Operating Company Limited), involved in setting up power projects in Pakistan since 1996.

1.3 Shams Power aims to pioneer solving the Pakistan's energy problems by accelerating the adoption of distributed solar energy. Our team is committed to excellence in every aspect of solar design, construction, and operations and maintenance.

1.4 Shams Power offers a complete range of solar energy services to commercial and industrial sector customers across the Pakistan. Backed by more than 20 years of industry experience and a dedicated technical team, SPPL handle every aspect of solar power installations—including financing, technology evaluation, engineering and design, construction, monitoring, and ongoing maintenance and support—to ensure the most efficient and reliable solution.

2.0 Project Rationale

2.1 Packages Limited, founded in 1956, is one of Pakistan's most prestigious manufacturing concerns, involved in the production & sale of packaging materials and tissue products. Packages Mall is the latest venture of Packages Limited. The Mall has been designed on international standards by a team of foreign and local professionals.

2.2 Current Electricity requirement at Packages Mall are met by a mix of different sources that includes a dedicated 132kV connection with sanctioned load of 8MW and six Diesel Generators.

2.3 Shams Power Private Limited is a Clean Energy Solution Provider which provides turnkey solutions to its customers, and takes care of CAPEX & OPEX (for time period agreed in PPA) making it the most feasible financial model, for customers, to switch to cleaner energy without upfront capital investment.

2.4 Packages Mall has very high electricity demand which is met by various sources as specified earlier. Mall's management is looking for affordable and environment friendly energy sources to add to their energy mix. They have ample, unutilized space available at their roof top which can be used for PV plant installation.

2.5 SPPL has proposed and designed 1,560 KWp AC (1,897 KWp DC) Solar Power Plant to be installed at roof top of Packages Mall, Lahore. A total of 5,748 Canadian Solar Polycrystalline PV Modules (CS6U-330P), of 330 Watt each, will be connected to 26 Huawei SUN2000-60KTL-m0 inverters (each inverter having Power rating of 60 KW) to attain the above mentioned DC and AC peak capacity. The plant is estimated to produce around 2,325 MWh of Energy (in its first year of operation) which translates to Net Capacity Factor of 17% and will result in offsetting approximately 1014 tons of carbon dioxide annually.

This is BOOT (Built Own Operate and Transfer) arrangement and Shams Power will provide electricity to Packages Mall under a 20 years Power Purchase Agreement.

2.6 After thorough financial & technical analysis and detailed discussions & negotiations, finally both parties have come to an agreement. Signing ceremony was held on 2nd of February 2019. According to the Agreement, SPPL will be installing 1.897 MWp Solar power plants on roof of the Packages Mall and will sell electricity to Packages Mall at an agreed (kWh) unit rate for 20 Years.

2.7 Shams Power will install the PV plant within the premises of Packages Mall and interconnection point is on LT system of Packages. All the electricity will be consumed internally by the Mall. Since this is business to business (B2B) arrangement and does not involve sale of electricity to CPPA-G, NTDC or any DISCO it will not have any impact on the Tariff.

3 Project Commencement and Completion

3.1 The project will be completed in a period of 6 Months. Breakup of time taken by Major Activities of project is as under:

Detailed Engineering Design will be completed in 3 to 4 weeks

Procurement/Import of Material will take 6 to 8 weeks

Construction activity will be completed in 10 to 12 weeks

Testing and Commissioning will take another 3 to 4 weeks

4 Environmental Benefit

4.1 Every energy generation and transmission method affects the environment. Conventional generating options can damage air, climate, water, land and wildlife, landscape as well as raise the levels of harmful radiation.

4.2 PV technology is substantially safer offering a solution to many environmental and social problems associated with fossil and nuclear fuels. Solar PV energy technology provides obvious environmental advantages in comparison to the conventional energy sources thus contributing to the sustainable development of human activities.

4.3 There are no global warming emissions associated with generating electricity from solar energy. Similarly, Solar PV Cells do not use water and other natural resources for production of Electricity. Water is only used during plant maintenance and it can be optimised to minimize the usage. The use of solar power has additional positive implications such as:

- Reduction of the emissions of the greenhouse gases (mainly CO₂, NO_x) and prevention of toxic gas emissions (SO₂, particulates)
- Reduction of the required transmission lines of the electricity grids

4.4 The proposed 1.897 MW Solar Power Plant at roof top of Packages mall will have an overall positive impact on the environment and it will result in offsetting approximately 1014 tons of carbon dioxide annually.

5 Prayer

SPPL has performed an in-depth technical and financial analysis for 1.897 MWp Solar Power Plant at Roof top of Packages Mall Lahore. Findings from these analyses suggest that the proposed site is suitable for installation of PV based power plant.

Technical details of the site along with feasibility report have been attached as Section 3 and Section 4 (Schedule I and Schedule II) to this application.

As considerable amount of effort and attention to minute details have been put into PV plant designing and proposal preparation, SPPL is confident that, if it is allowed to construct these plants, it will be able to achieve the required results without any problem.

Therefore SPPL request the authority to kindly Grant the Generation License for 1.897 MW Solar Power Plant at Packages Mall, Walton Road, Lahore

April 8th, 2019

The Registrar

National Electric Power Regulatory Authority

Subject: Clarification, with regards to "Power Purchaser" of Shams Power's Power Purchase Agreement (PPA)

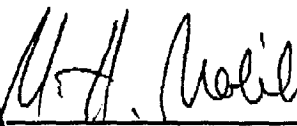
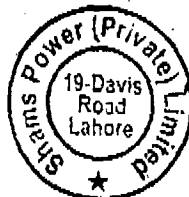
With reference to recent correspondence against Shams Power's application for 1.897 MWp Generation License at Packages Mall, there was a slight misunderstanding regarding the "Power Purchaser" of the PPA.

In that regards, Shams Power (Pvt) Ltd would like to inform the Authority (NEPRA), that Shams Power (Pvt) Ltd has entered into Power Purchase Agreement(PPA) with Packages Real Estate (Private) Ltd to install, operate and maintain a solar electric generating facility on the rooftop/premises of the Power Purchaser's properties located at Packages Mall, Shahrah-e-Roomi, Lahore, Pakistan. According to the terms of contract, Shams Power (Pvt) Ltd is termed as the "Seller" and Packages Real Estate (Private) Ltd is "Power Purchaser".

Shams Power (Pvt) Ltd would further like to clarify that, under this agreement, it does not intend to sell electricity directly to any other entity (e.g. Mall Shops, Retail Stores, offices etc.) apart from the "Power Purchaser" itself.

Please find enclosed the first Page of Power Purchase Agreement as evidence to the above declaration.

SPPL hopes that the compiled information and the responses to query is acceptable to the Authority. For any further information/documentation SPPL is at NEPRA's disposal and will gladly co-operate with the Authority.



Signature

Usman Hamid Malik

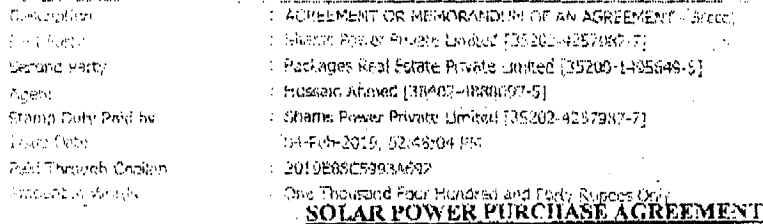
Chief Executive Officer

Shams Power (Private) Limited2nd Floor, Al Maalik, 19 Davis Road, Lahore, Pakistan

Phone +92 42 36313235 & 36

Fax +92 42 36312959

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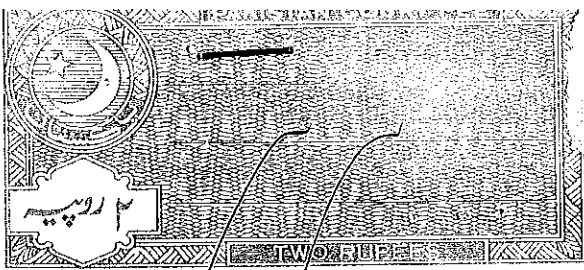


1. **Shams Power (Private) Limited**, a company incorporated and existing under the laws of Pakistan, having its registered office at 2nd Floor, Al-Mazalik Plaza, 19-Davis Road, Lahore (hereinafter referred to as the "**Seller**"), which expression, where the context so, permits shall include its successors in interest and permitted assigns)

2. Packages Real Estate (Private) Ltd (Formerly Known as Packages Construction (Private) Limited), a company incorporated and existing under the laws of the Pakistan, having its registered office at 4th Floor, The Forum, Suite No. 416-422, G-20, Block 9, Khayaban-e-Jami, Clifton, Karachi-75600 (hereinafter referred to as the "**Power Purchaser**", which expression, where the context so permits shall include its successors in interest and permitted assigns): -

WHEREAS

-

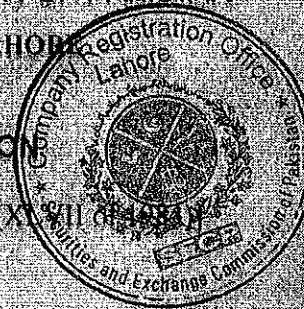


A005199

SECURITIES AND EXCHANGE COMMISSION OF PAKISTAN
COMPANY REGISTRATION OFFICE, LAHORE

CERTIFICATE OF INCORPORATION

[Under section 32 of the Companies Ordinance, 1984 (XLVII of 1984)]

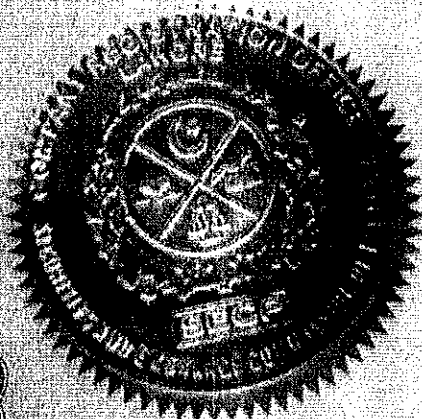
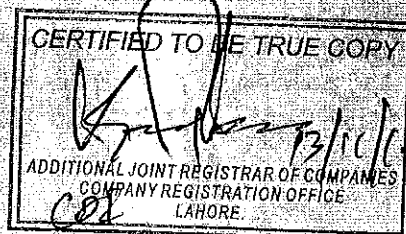


Corporate Universal Identification No: 0091515

Thereby certify that SHAMS POWER (PRIVATE) LIMITED is
this day incorporated under the Companies Ordinance, 1984 (XLVII of 1984) and that the
company is Limited by Shares,

Given under my hand at Lahore this Fifteenth day of January, Two
Thousand and Fifteen.

Fee Rs. 54,000/-

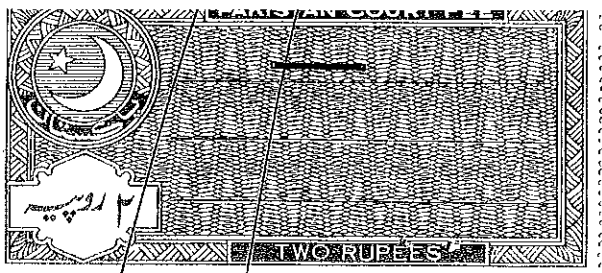


(LIAQAT ALI DOLLA)
Additional Registrar

No. ARL/ 15410

DATED: 15/1/2015

ANNEXURE II
MEMORANDUM/ARTICLES OF ASSOCIATION



THE COMPANIES ORDINANCE, 1984

(COMP ANY LIMITED BY SHARES)

MEMORANDUM OF ASSOCIATION

OF

SHAMS POWER (PRIVATE) LIMITED

I. NAME

The name of the Company is Shams Power (Private) Limited

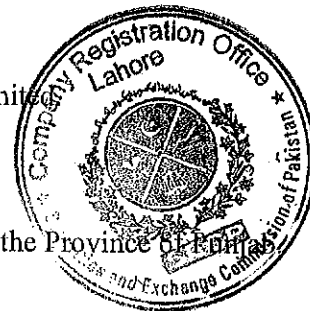
II. REGISTERED OFFICE

The registered office of the Company will be situated in the Province of Punjab

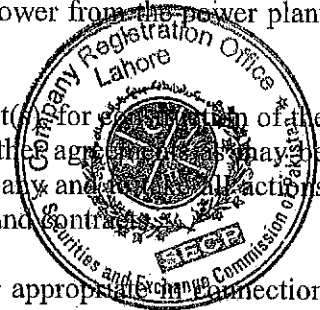
III. OBJECT

The objects for which the Company is established are:

1. To develop, design, construct, complete, own, possess, manage, operate and maintain solar electric power generation plant(s) in Pakistan at such location(s) as the applicable Laws/policies permit, and in connection therewith to engage in the business of rental or sale of solar and other power generation equipment, generation, transmission, sale, supply and distribution of electricity within Pakistan and to do all and everything necessary, suitable, proper, incidental or conducive to the accomplishment of this object and to do every other act or thing incidental or appurtenant to or arising out of or connected with this object subject to the permission (if any) of the relevant authorities.
2. To carry on and undertake the business of construction and development of solar power plants in all its forms and perspectives and for that purpose to take on lease, own or acquire all types of land, building and requisite facilities and to do all such acts, deeds or things as would be required for the effective discharge of this object.
3. To acquire or purchase machinery, plant, equipment, spare parts, raw materials, supplies and related goods and services necessary and/or incidental to the development, ownership, construction, management, operation and maintenance of solar power plant (s).
4. To establish and maintain housing, transportation, communication and utility lines and other requisite logistic facilities for the construction, operation and maintenance of power plant(s).



5. To secure, subject to applicable laws, foreign equity and technical collaboration for the development, ownership, construction, operation and management of power plant(s).
6. To obtain loans, credit and financial facilities in local and/or foreign currency from banks and other financial institutions operating in Pakistan, and subject to necessary approvals under the applicable laws/policies, financing from international sources, proceeds of which can be used for the objects of the Company including for the development, ownership, construction, operation and maintenance of power plant(s).
7. To mortgage, hypothecate, create charges and other encumbrances on the properties and assets of the Company in such manner and on such terms and conditions as the Company may determine.
8. To enter into any arrangement or agreement with purchasers of power from the power plant(s).
9. To enter into contracts for the purchases of fuel for the power plant(s) for operation of the power plant(s), for operation and maintenance of the same and other agreements may be necessary in the conduct and furtherance of business of the company and all actions before competent forums for the enforcement of such agreements and contracts.
10. To take out any insurance that the Company deems necessary or appropriate in connection with its business, including the ownership, construction, operation and maintenance of power plant(s), and to pay the premium thereof.
11. To enter into any arrangement with, obtain consents and approvals of, secure interim and final orders from the Government of Pakistan, and any other governmental agency or body and to undertake efforts to promote or modify laws, regulations and policies, and where required, to seek like dispensation from any government or public authority or any corporation or private persons, or any foreign government, authority or person for the business of the Company, including the development, ownership, construction, management, operation or maintenance of power plant(s), and to oppose by legal means within or outside Pakistan any actions or measures as are taken by any governmental or other authority which the Company considers likely to adversely affect its business, including the development, ownership, construction, management, operation or maintenance of power plant(s), and to obtain or endeavor to obtain from any governmental or other public authority any charters, contracts, rights, grants, loans, subsidies, privileges, concessions, indemnities, sanctions or consents as the Company may think proper for its business, including the development, ownership, construction, operation or maintenance of power plant(s).
12. To guarantee the performance of contracts and obligations (including payment of loans) of any person providing goods or services in connection with the business of the Company,



including construction, operation or maintenance of power plant(s) or purchasing electricity generated by power plant(s), but not in any event to carry on the business of banking.

13. To operate, maintain and manage power generation facilities, power stations, power houses and grid stations together with all machinery, equipment and works ancillary thereto and plan, survey, design, supply equipment and to do all such acts, deeds and things, without limitation whatsoever, as may be necessary or desirable in furtherance of this object.
14. To carry on the business as engineers, designers, architects, operators, concessionaries, surveyors, builders, masonry and general construction contractors, erectors and to establish, operate, manage, maintain, equip, construct, repair, renovate, improve, work on, industrial,, commercial and residential buildings, parks, clubs, roads, motorways, highways, playlands, stadiums, gymnasiums, railways, roadways, airports, runways, docks, harbors, wharves, canals, water courses, reservoirs, embankments, irrigations, reclamations, sewerages, drainage and other sanitary works and systems, water, gas, electric and other supply works, godowns, mills, factories, installation and related or other works of all kinds and description and to quip the same or any part t thereof with all or any conveniences and utilities which include, but are not limited to, electricity, gas, telephone, internet, drainage and sewage facilities and to do all such acts, deeds or things as would be required for effective discharge of these objects.
15. To carry on the business of estimation, drawing up of specifications and co-ordinating all surveying, supervision and execution of construction works and maintenance thereof.
16. To equip and furnish any property for the purpose of letting or hiring the same and to receive guests whether in single or double rooms, suites, chalets, cottages or otherwise.
17. To carry on and undertake trading business of all sorts and to act as indentors, importers, exporters, traders, suppliers and commission agents of products, - commodities and materials in any form or shape manufactured or supplied by any company, firm, association of person body, whether incorporated or not, individuals, government, semi-government or any local authority.
18. To apply for, tender, offer, accept, purchase or otherwise acquire any contracts and concessions for or in relation to the projection, execution, carryout out, improvements, management, administrations or control of works and conveniences and to undertake, execute, carry out, dispose of or otherwise turn to account the same.
19. To carry on all or any of the business as manufacturers, buyers, sellers, indentors, importers, exporters, distributors, agents, factors, stockists, commission agents and dealers of engineering goods, machine tools, hand tools, small tools, metals, alloys, iron pipe fittings, nuts and bolts, bicycles and accessories, automobile parts, steel and stainless steel and iron products, cutleries, ores, and scraps.



20. To carry on agency business (except managing agency) and to acquire and hold selling agencies and to act as general agents, selling agents, mercantile agents, commission agents, carrier's agents, shipping agents, clearing and forwarding agents, indenting agents, managers, advertisers, stockists, manufacturers' representative and distributing agents of and for the distribution of all kinds of local and foreign merchandise, goods, commodities, products, materials, substances, articles and things whether finished, semi-finished, raw, under process, refined, treated or otherwise pertaining to trade and commerce and for that purpose to remunerate them and to open and maintain depots and branches.
21. To purchase, take on lease or in exchange, hire, apply for or otherwise acquire and hold for any interest, any rights, privileges, lands, building, easements, trade marks, patent rights, copyrights, licenses, machinery, plants, stock-in-trade and any moveable and immovable property of any kind necessary or convenient for the purpose of or in connection with the Company's business or any branch or department thereof and to use, exercise, develop, grant licenses in respect of or otherwise turn to account any property, rights and information so acquired, subject to any permission required under the law.
22. To build construct, alter, maintain, enlarge, pull down, remove or replace any work and control; to develop any property acquired, purchased or owned by the company or any other company including buildings, offices, mills, ware-houses, shops, stores, machinery, roads, railways, bridges, reservoirs, watercourses, wharves, electric works, and commercial concerns and other works and conveniences in furtherance of the business of the company and to perform professional engineering work or enter into agreements with any person or company for performing professional. Engineering work.
23. To act as representatives, for any local or foreign person, firm or company and to undertake and perform sub-contracts, and also act in the business of the Company through or by means of agents, sub-contractors and to do all or any of the things mentioned herein in any part of the world and either alone or in collaboration with others and by or through agents, sub-contractors or otherwise.
24. To enter into agreement(s) with any government or authority (foreign, supreme, municipal, local or otherwise) or any corporation, company or persons that may seem conducive to the Company's objects or any of them and to obtain from any such government, authority, corporation, company or person any charters, contracts, rights, privileges and commission which the Company may think desirable and to carry on exercise and comply with any such charters, contracts, decrees, rights, privileges and concessions.
25. To apply for and obtain necessary consents, permissions and licenses, rights, privileges and concessions from any local or foreign Government, State, Municipal, Local and other authorities or persons for enabling the Company to carry on its objects and to oppose any proceedings or application which may seem calculated directly or indirectly to prejudice the interests of the Company.



26. To, subject to the approval of the competent authority, make, amend and modify Articles of Association and rules and regulations not inconsistent with this Memorandum of Association to provide for all matters for which provision is necessary or expedient for the purpose of giving effect to the provisions of this Memorandum of Association and the efficient conduct of its objects.
27. To adopt such means of making known the Company as may seem expedient and in particular by advertising in the media, by circulars, by purchase and exhibition of works of art or interests, by publication of books and periodicals and by granting prizes, rewards and donations.
28. To appoint agents, sub-agents, attorneys, consultants, and contractors or to act as agent, sub-agent, attorney, consultants and contractors in connection with the objects of the Company but not to act as managing agents.
29. To open close and operate bank account of the Company with any bank or banks or financial institutions or cooperatives societies and to draw, make, accept, endorse, discount, execute and issue promissory notes, bills of exchange, bills of lading, warrants, debentures, and other negotiable or transferable instruments, but not to act as a finance or banking company.
30. To borrow or raise money in such manner as the Company shall think fit for its objects, and in particular by the issue of debentures, or debenture stock (whether perpetual or otherwise), Modaraba Certificates, Participation Term Certificates (PTCs), Term Finance Certificates (TFCs) or otherwise and by issue of all securities including securities not based on interest for raising redeemable capital, resource funds from banks or financial institutions and by issue of shares in lieu of outstanding balance of any loan and by issue of securities as required by the rules and regulations of the banks, financial institutions and loan giving agencies and, to secure the repayment of any money borrowed, raised or owing by mortgage, charge or lien upon all or any of the property or assets of the Company (both present and future).
31. To sell, improve, manage, develop, exchange, mortgage, enfranchise, dispose of or otherwise deal with, all or any part of the property, assets or undertaking of the Company for such consideration as the Company may think fit and to distribute among the members in specie any property of the Company, or any proceeds of sale or disposal of any property of the Company, but so that no distribution amounting to a reduction in capital may be made without the sanction of the Court, if required; and in the event of winding up of the Company.
32. Subject to the applicable laws, give any guarantee or provide any security (including but not limited to charge, lien or mortgage) in order to secure the repayment of any loan, finance or advance.
33. To accept or give security, including but not limited to promissory notes, indemnity bonds, guarantees, assignments, receipts, bailments, pledges, hypothecations, liens,



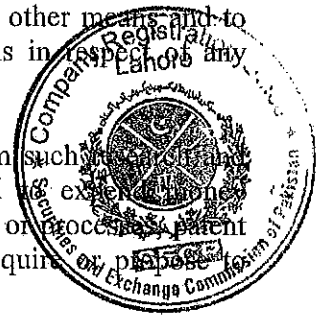
mortgages and charges, against the credit extended or moneys borrowed in connection with its objects.

34. To employ and remunerate managers and other officers, employees and servants of the Company or any person or firm or company rendering services to the Company upon such terms as the Company may determine.
35. To establish and maintain or procure the establishment and maintenance of any contributory or non-contributory pension, superannuation funds for the benefit of, and give or procure the giving of donations, gratuities, pensions, allowances or emoluments to any person who are or were at any time in the employment or service of the Company, or who are or were at any time directors or officers of the Company and the wives, widows, families and dependents of any such persons, and also to establish subsidies and subscribe to any institutions, associations, clubs or funds calculate to be for the benefit of or to advance the interests and well-being of the Company.
36. To enter into joint venture or a partnership or cooperation with any person or other legal entity, local or foreign, or otherwise assist any such person or company or entity in furtherance of its objects.
37. To pay out of the funds of the Company all expenses of and incidental to the formation, registration, advertisement of the Company and the issue and subscription of the share or loan capital or placing or guaranteeing the placing of shares or any debentures, debenture-stock and other securities of this Company and also all expenses relating to the issue of any circular or notice and the printing, stamping, circulating of proxies and forms to be filled up by the members of the Company.
38. To insure the property, assets, and employees of the Company in any manner deemed fit by the Company, and to create any reserve funds, sinking fund, insurance fund or any other special fund whether for depreciation or for repairing, insuring, improving, extending or maintaining any of the property of the Company or for any other purpose conducive to its objects but not to act as an insurance company.
39. To subscribe for, take or otherwise acquire and hold shares, debentures or securities of any other company having objects altogether or in part similar to those of this Company or carrying on any business capable of being conducted so as directly or indirectly to benefit this Company and to invest the moneys not immediately required for the business of the Company in, and to hold, sell and deal with the stocks, shares, bonds, debentures, debenture stocks, PTCs, TFCs, mutual fund certificates, NIT units, Modaraba certificates or certificates of investment obligations, notes and securities of any Government, Province, company, Corporation, Municipal or Local or other Body or Authority and to deal with the monies of the Company for such purposes conducive to the interest of the Company and to vary investments from time to time but not to act as an investment company.
40. To receive, declare and distribute profits and to capitalize such portion of the profits of the Company as are not distributed among shareholders of the Company in the form of dividends,



and as the Directors of the Company may think fit, and to issue bonus shares, as fully paid up, in favour of the shareholders of the Company.

41. To subscribe or contribute or otherwise to assist or to guarantee money to charitable, benevolent, religious, literary, scientific, technical, national, public or any other institutions or for any exhibition or purpose.
42. To file or register any document required to be filed or registered under law, and to pay any fees, charges, expenses, rents, taxes, duties and other dues payable in connection with its objects.
43. To settle dispute by negotiation, reconciliation, arbitration, litigation or other means and to enter into compromise with creditors, members and any other persons in respect of any difference.
44. To establish laboratories, research and development centres to perform such research and development as the Company may deem advisable or feasible, and to experiment upon and testing and improving or securing any process, or process patent or protecting any invention or inventions which the company may acquire or deal with in furtherance of its objects.
45. To develop and/or transfer technology and to acquire or pass on technical know-how incidental or conducive to the attainment of its objects.
46. To train personnel and workers, both in Pakistan and abroad to obtain technical proficiency in various specialties connected with its objects.
47. To undertake and execute any trust or trusts which the Company may deem to be desirable, expedient or necessary and to act as trustees of any deeds constituting or securing any debentures, debenture stock, or other securities or obligations and to undertake and execute any other trust and also to undertake the office of executor or administrator and to keep for any company, Government, authority or body, any register relating to any stocks, funds, shares or securities, to undertake any duties in relation to the registration of transfers, the issue of certificates or otherwise.
48. To do all such other things as may be deemed incidental or conducive to the attainment of the main objects or any of them in any part of the world, and as principals, agents, contractors, trustees or otherwise, and by or through trustees, agents or otherwise and either alone or in conjunction with others.
49. It is hereby declared that:
 - a) The Company shall have full authority, power and competence to do any and all other things and acts to further the activities specified in sub-Clauses 1 to 48 in support of and



in relation to (directly or indirectly) of the objects of the Company.

- b) Notwithstanding anything contained in the foregoing Object Clause of this Memorandum of Association, nothing contained therein shall be construed as empowering the Company to undertake or indulge in the business of banking company to undertake or indulge in the business of banking company, banking, leasing, investment, managing agency or insurance business indirectly as restricted under law or in any lawful operation.
- c) The company would not indulge in any short of real estate business, housing colonies/purchase and sale of plots and developments of land and housing company business as required by the applicable laws.
- d) The Company undertakes that the Company shall not, by advertisement, pamphlet any other means or through negotiation offer for sale or take advance money for sale of plots, houses, flats etc. to the general public or individuals unless such plots, houses flats etc are owned and/or have been developed by the Company.
- e) Notwithstanding any thing stated in the foregoing Object Clause of this Memorandum of Association, the Company shall obtain such other approval or license from competent authority, as may be required under any law for the time being in force, to undertake a particular business.



IV. LIABILITY

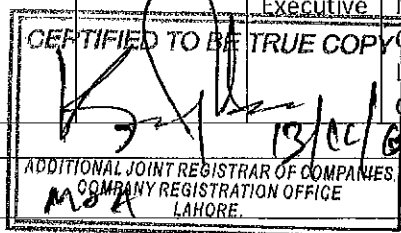
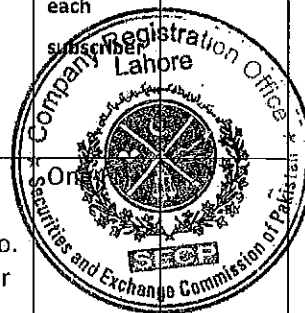
The liability of the members is limited.

V. SHARE CAPITAL

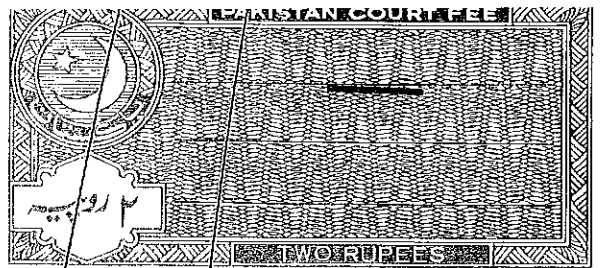
The authorized capital of the company is Rs. 50,000,000/- (Rupees Fifty Million Only) divided into 5,000,000 (five million only) ordinary shares of Rs. 10 (Rupees ten only) each with the rights, privileges and conditions attaching thereto as are provided by the regulations of the company for the time being, with power to increase or reduce the capital and to divide the share in the capital for the time being into several kinds and classes and to attach thereto respectively such special rights, privileges or conditions as may be determined by or in accordance with the regulations of the Company, and to vary, modify or abrogate any such rights, privileges or conditions in such manner as may for the time being be provided by the regulations of the company in accordance with law provided, however, that rights as between various classes of ordinary shares, if any, as to profits, votes and other benefits shall be strictly proportionate to the paid up value of shares.

We, the several persons whose names and addresses are subscribed, are desirous of being formed into a company in pursuance of these Memorandum of Association and we respectively agree to take the number of shares in the capital of the company set opposite our respective names.

S. No.	Name and Surname (present & former) in full (in Block Letters)	NIC No. (in case of foreigner, Passport No.)	Father's/ Husband's Name in full	Nationality(ies) with any former Nationality	Occupation	Residential address in full	Number of shares taken by each subscriber	Signatures
1	ZAIN-UL-ABDIN	42201-0622607-1	Fazal Hussain Amin	Pakistani	Business Executive	House No. 573 Street No. 11 Sector A Township, Lahore	One (1)	
2	OMAR MOHYUDDIN MALIK	35202-4257987-7	Saleem Hamid Malik	Pakistani	Business Executive	House No. 15-A Denpur Road GOR I, Lahore	One (1)	
3	USMAN HAMID MALIK	35202-9452021-3	Saleem Hamid Malik	Pakistani	Business Executive	House No. 15-A Denpur Road GOR I, Lahore	One (1)	
4	FAISAL ISLAM	35201-6640002-1	Muhammad Islam	Pakistani	Business Executive	97/16-B, Nisalr Colony, Lahore Cantt.	One (1)	
Total number of shares to be taken							Four (4)	
Dated the 6 th day of January 2015								



Witness to the above signatures	
Signature	
Full Name	Saleem Akhtar
CNIC No.	32204-1586952-1
Father's Name	Ghulam Qasim
Full Address	115/7A, Sarwar Road, Lahore Cantt.
Occupation	Advocate High Court



THE COMPANIES ORDINANCE, 1984

(COMPANY LIMITED BY SHARES)

ARTICLES OF ASSOCIATION

OF

SHAMS POWER (PRIVATE) LIMITED

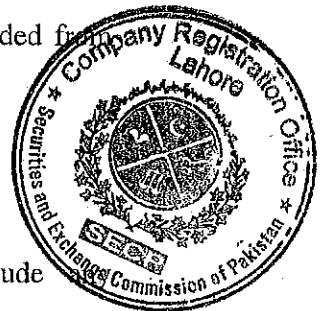


1. The regulations of table "A" contained in First Schedule to the Companies Ordinance, 1984, as amended, shall not apply to the Company, except so far as the same are contained or deemed to be contained in these Articles.

INTERPRETATION

2. In the interpretation of These Presents, unless contrary to the context, words signifying the singular number shall include the plural, and vice versa, and words signifying the masculine shall include the feminine, and the following words and expression shall have the following meanings unless excluded by the subject or context, namely:-
 - a) "Board" means a meeting of Directors duly called and constituted or as the case may be the Directors assembled at a meeting.
 - b) "Capital", "Shares" and "debentures" mean respectively the capital (including authorized capital), shares into which the capital is divided and the interest corresponding to such shares and debentures from time to time of the Company. "Shares" include stock and "debentures" include debenture stock, bonds, participation term certificates, term financing certificates and other securities, other than a share, whether constituting a charge on the assets of the Company or not.
 - c) "Commission" means the Securities and Exchange Commission of Pakistan established under Section 3 of the Securities and Exchange Commission of Pakistan Act, 1997.
 - d) "Company" when used with reference to the Company means Shams Power (Private) Limited.

- e) "Directors" means the Directors for the time being of the Company and the Alternate Directors appointed by them, or as the case may be the Directors assembled at a Board.
- f) "Dividend" includes a bonus.
- g) "General Meeting" means an ordinary general meeting or extraordinary general meeting.
- h) "MOA" means the Memorandum of Association of the company as amended from time to time.
- i) "Office" mean the registered office for the time being of the company.
- j) "Ordinance" means the Companies Ordinance, 1984 and shall include amendments, modifications or reenactments thereof
- k) "Ordinary Meeting" and "Extraordinary Meeting" means respectively an ordinary general meeting or an extraordinary general meeting of the Company duly called and constituted or any adjournment thereof.
- l) "Person" includes a corporation or a company.
- m) "Proxy" means an instrument in writing whereby a person as defined herein authorizes another to vote for him at a meeting or meetings and includes Attorney duly constituted under a power of attorney.
- n) "Register" means the register of the members of the Company kept at the registered office of the Company pursuant to Section 147 of the Ordinance and under Article 107.
- o) "Secretary" means the Secretary of the Company for the time being or any duly authorized person acting in the place of such Secretary (if any).
- p) "Section" means a Section of the Ordinance and all amendments thereof.
- q) "Share Warrants" means warrants issued in respect of shares or stock of the Company



in pursuance of the Statutes and These Presents.

- r) "Shareholder" or "Member" means the registered holder of any share, scrip or other security which gives him voting rights in the Company.
- s) "Special Resolution" shall have the same meaning as in the Ordinance.
- t) "Statutes" include the Ordinance and any and every other Act or Ordinance from time to time in force, as may be applicable to it.
- u) "Stock" means stock into which any moneys of the Company have been converted.
- v) "These presents" means and includes the Articles of Association of the Company and the regulations of the Company from time to time in force.
- w) "Writing" includes printing, typewriting, electronic, transmission, or lithography or any other mechanical or electronic process, or partly one and partly the other.
- x) "Years" means a calendar year, and "month" mean a calendar month according to English Calendar.



Unless the context otherwise requires, words or expressions contained in these Articles shall bear the same meaning as in the Ordinance.

CAPITAL

- 3. The Capital of the Company shall be as per Clause V of the MOA as may be altered from time to time divided into Shares of the nominal value of Rs. 10 (Rupees ten) each, unless the Shares are issued at a discount or a premium subject to the applicable laws.
- 4. Save as provided by Section 95 and Section 95A, no part of the funds of the Company shall, directly or indirectly be employed in the purchase or in loans on the security of shares in the Company or of any company of which it is a subsidiary company or in loans to any company of which it is a subsidiary company.

5. Subject to the provisions of the Ordinance and these Articles, the shares of the Company shall be under the control of the directors, who may allot or otherwise dispose of the same to such persons, on such terms and conditions, and at such times and for such consideration as the directors think fit.
6. No shares shall be offered to the public for subscription except upon the term that the amount payable on application shall be the full amount of the nominal amount of the share.
7. No share shall be issued at a discount except in accordance with the provisions of the Ordinance, in particular, Section 84. The directors shall, as regards any allotment of shares, duly comply with such of the provisions of Sections 67 to 73, as may be applicable to the Company.

SHARES

8. All the shares in the Company shall be numbered in a regular series.
9. The Directors may allot and issue shares in the Capital of the Company in part payment for any property sold or transferred, goods or machinery supplied, or service rendered to the Company in the conduct of its business or in lieu of outstanding balance of loans subject to Section 87 of the Ordinance, as fully paid-up shares, and if so issued, such shares shall be deemed to be fully paid-up.
10. Any application signed by or on behalf of the applicant followed by an allotment of any shares thereon shall be an acceptance of shares within the meanings of these Articles, and every person who thus or otherwise accepts any share and whose name is thus or otherwise placed on the Register shall be a shareholder.
11. When two or more persons are registered as the holders of any share they shall be deemed to hold the same as joint tenants with benefits of survivorship subject to be the following and other provisions contained in these articles:
 - a) The company shall be entitled to decline or register more than four (4) persons as holders of any share.
 - b) On the death of any such Joint-holder, the survivor or survivors shall be the only person or persons recognized by the Company as having any title to the shares but the Directors may require such evidence of death as they may deem fit and nothing herein contained shall be taken to release the estate of a deceased joint-holder from any liability of shares held by him jointly with any other person.

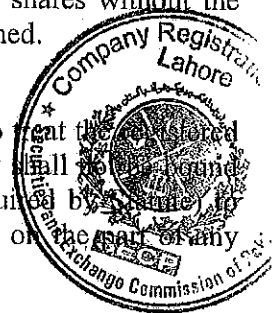


- c) Any one of such joint-holders may give effectual receipt of any dividends or other moneys payable in respect of such share.
- d) Only the person whose name stands first in the Register as one of the joint-holders of any share shall be entitled to delivery of the certificate relating to such share or to receive - notice (which expression shall be deemed to include all documents) from the Company and any notice given to such person shall be deemed notice to all the joint-holders.
- e) Any one of two or more joint-holders may vote at any meeting either personally or by an agent duly authorized under a power of attorney or by proxy in respect of such share as if he is solely entitled thereto and if more than one of such joint-holders be present at any meeting personally or by proxy or by attorney that one of such persons so present whose name stands first or higher (as the case may be) on the Register in respect of such share shall alone be entitled to vote in respect thereof, provided always that a joint-holder present in person shall have priority over a person present by an agent duly authorized under power of attorney or by proxy, although the name of such person present by an agent or proxy stands first or higher in the Register in respect of such shares.
- f) Several executors or administrators of a deceased member in whose name any share stands shall for the purpose of this section be deemed joint-holders.
12. Every member shall name a place to be registered as his address and such address shall for all purposes be deemed his place of residence.
13. Any shareholder who shall change his name or place of abode, or who being a female, shall marry, and the husband of any such last mentioned shareholder, respectively shall not be entitled to recover any dividend or to vote until notice of change of name, or abode, or marriage be given to the Company in order that the same may be registered.
14. subject to the provisions of the ordinance, in particular, Section 82 and 85, shares shall be issued on such terms conditions, and with such rights and privileges attached thereto, as a General Meeting may determined, provided that the Company may, resolution direct that the shares shall be issued by the Directors on such terms and conditions with such rights and privileges attached thereto as the Directors may determined.
15. Rights attached to shares may be modified, affected or abrogated but only in accordance with the Ordinance.
16. Subject to the provisions of the Ordinance, any preference share may with the sanction of a Special Resolution, be issued on the terms that it is, or at the opinion of the



Company is, liable to be redeemed as provided in Section 85 of the Ordinance.

17. The Company may at any time pay a commission to any person for subscribing or agreeing to subscribe (whether absolutely or conditionally) for any shares in the Company, or procuring or agreeing to procure subscriptions (whether absolute or conditional) for any shares in the Company, and any such commission may be paid or agreed to be paid out of capital or out of profits, whether current or standing to reserve or carried forward, or out of both capital and profits, but so that the commission shall not exceed as required by the applicable law on the shares in each case subscribed or to be subscribed, and statutory conditions and requirements, with particular reference to Section 82 of the Ordinance, shall be observed and complied with in respect thereof. Any such commission shall be calculated on the price on which the shares are issued, and may be satisfied in whole or in part in fully paid up shares in the company, provided that no such commission nor any portion thereof shall be paid in shares without the sanction of the Company in General Meeting first having been obtained.
18. Save as herein otherwise provided, the Company shall be entitled to treat the registered holder of any shares as the absolute owner thereof, and accordingly shall not be bound to recognize any equitable or other claim to or interest in such share or part thereof of any other person.



CERTIFICATES

19. Subject to Section 74 of the Ordinance, the certificates of title to shares shall be issued under the authority of the Directors, or of a local committee or board when authorised thereto by the Directors in such manner and form as the directors may from time to time prescribe, and shall bear the autographic signature of two or more Directors or one Director and of the Secretary or of some other person appointed for the purpose by the Directors.
20. Every member shall be entitled to one certificate for the shares registered in his name, or to several certificates each for a part of such shares. Every certificate of shares shall specify the number and distinctive numbers of the shares in respect of which it is issued and the amount paid up thereon. Every member shall be entitled to one certificate of shares gratis, but for every subsequent certificate issued, the Directors shall be at liberty to make such charge, not exceeding Rupees one (Rs. 1), as they may from time to time see fit.
21. Subject to section 75 of the ordinance, if any certificate be worn and or defaced then, upon production thereof to Directors, they may order the same to be cancelled and may issue a new Certificate in lieu thereof, and if any certificate be lost or destroyed then,

upon proof thereof to the satisfaction of the Directors, and on such indemnity being given and after such advertisement (if any) of the loss or destruction as the Directors deem adequate, at the expense of the party claiming the new certificate, a new certificate in lieu thereof may be given to the party entitled to such lost or destroyed certificate. In case of loss or destruction the members to whom the new certificate is given shall repay to the Company all expenses incidental to the investigation by the Company of the evidence of such destruction or loss and to such indemnity.

22. where any shares under the powers in that behalf herein contained are sold by the Directors and the certificate thereof has not been upto the Company by the former holder of the said shares, the Directors may issue new Certificate for such shares distinguished it in such manner as they may think fit from the certificate not so delivered up.
23. Every endorsement upon the certificate of any share in favour of any transferee thereof shall be signed by the person for the time being duly authorized by the Directors in that behalf. In case, any holder or transferee of shares applies for a new certificate in lieu of the old or existing certificate or applies for the splitting up of the existing certificates on payment by him in addition to the transfer fee such sum as the Directors may determine and upon his delivering up every old or existing certificate which he is to deliver up, in the event of a certificate being filled up with endorsements and a further transfer, the fee to which it refers being made or required, a new certificate shall be issued on payment of a fee to be fixed from time to time by the Directors.
24. The certificate of shares registered in the names of two or more persons shall be delivered to the person first named in the Register in respect thereof, or to his authorised agent, and in case of the death of any one or more of the joint registered holders of any shares the survivor then first named in the Register shall be the only person recognized by the Company as being entitled to such certificate or any new certificate which may be issued in place thereof.



TRANSFER AND TRANSMISSION

25. The Directors shall not refuse to transfer any fully paid shares unless the transfer deed is defective or invalid. The Directors may decline to recognize any instrument of transfer unless:
 - a) a fee not exceeding Rupees two (Rs. 2) as may be determined by the Directors is paid to the Company in respect thereof; and
 - b) the duly stamped instrument of transfer is accompanied by the certificate of the shares to which it relates, and such other evidence as the Directors may reasonably require to show the right of the transferor to make the transfer.

If the Directors refuse to register a transfer of shares, they shall within one (1) month, or when the transferee is a central depository, within five (5) days, after the date on which the transfer deed was lodged with the Company send to the transferee and the transferor notice of the refusal indicating the defect or invalidity to the transferee, who shall, after removal of such defect or invalidity be entitled to re-lodge the transfer deed with the Company.

26. Application for the registration of the transfer of a share may be made enter by the transferor or the transferee.

27. The Directors shall not incur any liability for registering or acting upon a transfer of shares apparently made by sufficient parties, although the same may by reason of any fraud or other cause not known to the Directors, be legally inoperative or insufficient to pass the property in the shares proposed or professed. to be transferred'. and although the transfer may as between the transferor and transferee be liable to be set aside, and notwithstanding that the Directors may have notice that such instrument of transfer was signed or executed and delivered by the transferor in blank as to the name of the transferee or the particulars of the share transferred, or otherwise in defective manner

28. Instrument of transfer of Shares:

- a) The instrument of transfer of any Share shall be in writing in the usual form.
- b) Shares of different classes shall not be comprised in the same instrument of transfer.



29. No transfer shall be made to an infant or person of unsound mind.

30. Every instrument of transfer shall be left at the office for registration, accompanied by the certificate of the share to be transferred, and such other evidence as the Directors may require to prove the title of the transferor or his right to transfer the shares, and upon payment of the proper fee, the transferee shall (subject to the Directors' right to decline to register hereinbefore mentioned) be registered as a member in respect of such shares. The Directors may waive the production of any certificate upon evidence satisfactory to them of its loss or destruction. The transferor shall be deemed to remain the holder of the shares until the name of the transferee is entered in the Register in respect thereof.

31. All instruments of transfer which shall be registered shall be retained by the Company.

32. A fee not exceeding Rupees two (Rs. 2) may be charged for each transfer, and shall, if required by the Directors, be paid before the registration thereof. This shall also be paid to the Company in respect of the registration of any Probate, Letters of Administration, Certificate of Marriage or Death, Power of Attorney or other documents relating to or

affecting the title of any shares or for making any entry in the Register affecting the title of any shares such fee not exceeding Rupees two (Rs. 2) as the Directors may from time to time require or prescribe.

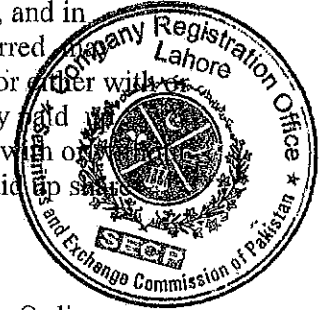
33. On giving seven (7) days previous notice by a newspaper circulating in the province in which the Company is situated and by a newspaper circulating in the province in which the Stock Exchange on which the Company is listed is situated, the Transfer Books and Register may be closed during such *time* as the Directors, think fit, not exceeding in the whole forty-five (45) days in each year, but not exceeding thirty (30) days at a time.
34. The executors, administrators or nominees under section 80 of the Ordinance of a deceased member (not being one of several joint-holders) shall be the persons recognized by the Company as having any title to the shares registered in the name of such member, and in case of the death of any one or more of the joint-holders of any registered share the survivors shall be the only persons recognized by the Company as having any title to or interest in such shares, but nothing herein contained shall be taken to release the estate of a recognized any executor or administrator thereof, who may require him to obtain a Grant of probate or Letters of Administration or other legal representation as the case may be from some Competent Court, having jurisdiction there: Provided nevertheless that in case where the Board in their absolute discretion think fit it shall be lawful for the Directors to dispense with the production of probate or Letter of Administration or such other legal representation upon such terms as to indemnity or otherwise as the Directors, in their absolute discretion, may consider necessary.
35. Any committee or guardian of a lunatic or infant member or any person becoming entitled to or to transfer shares in consequence of the death or bankruptcy or insolvency of any members, upon producing such evidence that he sustains the character in respect of which he proposes to act under this Article, or of his title as the Directors think sufficient, may with the consent of the Directors (which they shall not be under any obligation to give), be registered as a member in respect of such shares, or may subject to the regulations as to transfer hereinbefore contained, transfer such shares. This Article is hereinafter referred to as "the Transmission Article".
36. A person so becoming entitled shall have the right to receive and give a discharge for any dividends or other moneys payable or other advantages arising in respect of the share, but he shall have no right to receive notice of or to attend or vote at meetings of the Company, or (save as aforesaid) to any one of the rights or privileges of members in respect of the share, unless and until he shall be registered as the holder thereof.

INCREASE AND REDUCTION OF CAPITAL

37. The Company may, from time to time by Ordinary resolution, increase the capital of the

Company by the creation of new shares of such amount as may be deemed expedient.

38. All further issue of share capital shall first be subject to such of the provisions of Section 86 as are applicable to the Company. Thereafter, the Directors may dispose of the same in such manner as they think most beneficial to the Company.
39. Except in so far as otherwise provided by the Ordinance or by the conditions of issue or by These Presents, any capital raised by the creation of new shares shall be considered part of the original capital, and shall be subject to the provisions herein contained with reference to transfer and transmission or otherwise.
40. The Company may from time to time, by Special resolution, but subject to the provisions of section 96 to 106 of the Ordinance, reduce its share capital in any way, and in particular, without prejudice to the generality of the powers hereby conferred, extinguish or reduce the liability on any of its shares capital not paid up, or either with or without extinguishing or reducing liability on any of its shares, cancel any paid up share capital which is lost, or unrepresented by available assets, or either with or without extinguishing or reducing the liability on any of its shares, pay off any paid up share capital which is in excess of the wants of the Company.
41. The Company is General Meeting may, subject to section 92 (1) (d) of the Ordinance, cancel shares which, at the date of the passing of the resolution in that behalf, have not been taken or agreed to be taken by any person, and diminish the amount of its share capital by the amount of the shares so cancelled.



CONSOLIDATION AND SUBDIVISION OF SHARES

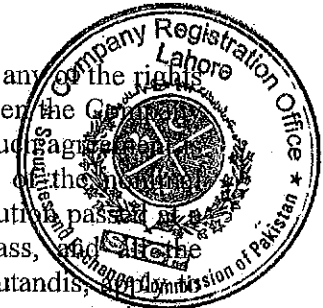
42. In accordance with the provisions of Sections 92 (1) (d), 92 (3) and 93 of the Ordinance, the Company may, by Ordinary resolution:
- (a) consolidate and divide its share capital into shares of larger amount than its existing shares;
 - (b) sub-divide its existing shares or any of them into shares of smaller amount than is fixed by the Company's Memorandum of Association;
 - (c) cancel any shares which, at the date of the passing of the resolution, have not been taken or agreed to be taken by any person.
43. Subject to the prior approval of the Government, debentures, debenture stock, and other

securities may be made assignable free from any equities between the Company and the person to whom the same may be issued.

44. Subject to the provisions of the Ordinance, particularly Section 114, any debentures, debenture-stock, bonds or other securities may be issued at a discount, premium or otherwise with any special privileges as to redemption, surrender, drawings, allotment of shares, attending and voting at General Meetings of the Company, appointment of Directors and otherwise.
45. Holders of debentures shall have the same right to receive and inspect the Balance Sheet of the Company and the Report of the auditors and other reports as are possessed by members of the Company.

MODIFYING RIGHTS

46. If at any time the capital is divided into different classes of shares, all or any of the rights and privileges attached to each class may be varied by agreement between the Company and any person purporting to contract on behalf of that class, provided such agreement is either (a) ratified in writing by holders of at least three fourth (3/4) of the nominal amount of the issued shares of that class, or is (b) confirmed by a resolution passed at a separate Extraordinary Meeting of the holders of shares of that class, and the provisions hereinafter contained as to General Meeting shall mutatis mutandis, apply to every such Meeting that the quorum thereof shall be members holding or representing by proxy one-third of the nominal amount of the issued shares of that class. This clause is not by implication to curtail the power of modification which the Company would have if the clause were omitted.



BORROWING POWERS

47. Without prejudice to the General Powers conferred on the Board by these Presents, the Directors shall have power from time to time at their discretion to raise, borrowing or secure the payment of any sum or sums of money for the purposes of the Company. The payment or repayment of such moneys may be raised or secured in such manner and upon such terms and conditions as the Directors may think fit and to mortgage or charge its undertaking, property and assets (both present and future) and to issue debentures, debenture stock and other securities, including but not limited to, participation term certificates, term finance certificates, Modaraba certificates and other modes of financing whether on mark-up basis or otherwise and whether outright or as collateral security for any debt, liability or obligation of the Company or of any third party.
48. The Directors shall, in accordance with the Statutes, particularly Section 135 of the Ordinance, cause a proper register to be kept of all mortgages and charges specifically affecting the property of the Company.

GENERAL MEETINGS

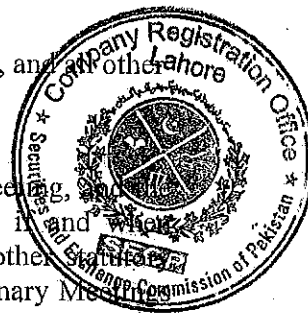
49. A General Meeting, shall be held within eighteen (18) months from the date of incorporation of the Company and thereafter once at least in every calendar year, within a period of four (4) months from the close of its financial year and not more than fifteen (15) months after the holding of the last preceding General Meeting, at such place and at such time as the Directors place be not available, to such other place as the Directors may appoint, but should such day be a public holiday, then it shall be adjourned to the first business day next following such public holiday, at the same time, and if at such adjourned meeting a quorum is not present, the meeting shall be dissolved.
58. At any General Meeting a resolution put to the vote of the meeting shall unless a poll is demanded be decided, in the first instance, by a show of hands, and in the case of an equality of votes the Chairperson shall, both on the show of hands and at the poll, have a casting vote in addition to the vote or votes to which he may be entitled as a member.
59. At any General Meeting, unless a poll is demanded (before or on the declaration of the result of the show of hands) in accordance with the provision of Section 168, a declaration by the Chairperson that a resolution has been carried by a particular majority, or lost or not carried by a particular majority, and an entry to that effect in the book of the proceedings of the Company, shall be conclusive evidence of the fact without proof of the number or proportion of the votes recorded in favour of or against such resolution.
60. No resolution shall be carried as being passed unless the said resolution receives the affirmative vote of a majority on a show of hands, or if a poll is demanded a majority vote of shares outstanding and entitled to vote on the resolution at the time it is taken.
61. If a poll is demanded as aforesaid, it shall be taken in accordance with the provisions of Section 168 and the result of the poll shall be deemed to be the resolution of the meeting at which the poll was demanded.
62. The Chairperson of a General Meeting may, with the consent of the Meeting, adjourn the same from time to time and from place to place, but no business shall be transacted at any adjourned meeting other than the business left unfinished at the meeting from which the adjournment took place.
63. The demand of a poll shall not prevent the continuance of a meeting for the transaction of any business other than the question on which a poll has been demanded.
64. Any minutes of resolutions and proceedings at General Meeting made in the Minute Book of the Company, to be maintained and made available for inspection in accordance with Section 173 of the Ordinance, if signed by any person purporting to be the Chairperson of the meeting to which it relates, or by any person present there at and appointed by the Directors to sign the same in his place, or by the Chairperson of the



next succeeding meeting, shall be receivable as evidence of the facts therein stated without further proof.

VOTES OF MEMBERS

65. Subject to Section 178 and any special terms as to voting upon which any share may be issued, on a show of hands every member present in person shall have one vote, and upon a poll every member present in person or by attorney or proxy shall have one vote for every share held by him. A corporation (whether a company within the meaning of the Act or not) who is0020 may from time to time determine, in accordance with Section 158 of the Ordinance or other relevant statutory provisions for the time being in force.
50. The above mentioned General Meetings shall be called "Ordinary Meeting", and other meetings of the Company shall be called "Extraordinary Meeting".
51. The Directors, may whenever they think fit, convene an Extraordinary Meeting, and Directors shall forthwith proceed to convene an Extraordinary Meeting if and when required so to do in accordance with the provisions of Section 159 or other provisions for the time being in force relating to requisitions for Extraordinary Meeting by members.
52. Twenty one (21) clear days notice at least shall be given to the members of all meetings, but an Extraordinary Meeting may be held on shorter notice in accordance with the provisions of Section 159 of the Ordinance. The notice shall specify the place, day and hour of meeting, and, in the case of special business, the general nature of such business.
53. The accidental omission to give any such notice to any of the members, or the non-receipts of such notice by any member shall not invalidate any resolution passed at any such meeting.

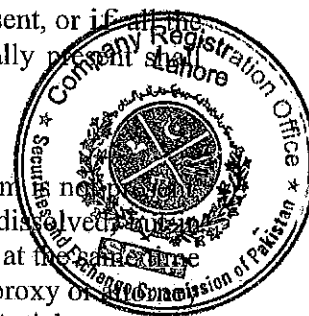


PROCEEDINGS AT GENERAL MEETIN

54. The business of Ordinary Meeting shall be to receive and consider the profit and loss account, the balance sheet, the report of the Directors and of the Auditors, to elect Directors, Auditors and other officers in the place of those retiring or otherwise, to declare dividends, fix the remuneration of the Auditors, and to transact any other business which, under These Presents, ought to be transacted at an Ordinary Meeting, and any business, which is brought under consideration by the report of the Directors laid before such meeting.
55. Two (2) members of the Company present in person who represent not less than twenty

five percent (25%) of the total voting powers, either of their own account or by proxy shall be a quorum for a General Meeting and no business shall be transacted by a General Meeting unless the quorum requisite be present at the commencement of the business. A company being a member of this Company and present by a representative duly appointed in pursuance of Section 162 shall be deemed to be a member personally present for the purpose of this Article.

56. The Chairperson of the Directors shall be entitled to take the chair at every General Meeting, or if there be no Chairperson, or if at any meeting he shall not be present within fifteen (15) minutes of the time appointed for holding such meeting, or if he shall have notified his inability to be present at the meeting, the members personally present, shall choose another Director as Chairperson; and if no Director be present, or if all the Directors present decline to take the chair, then the members personally present shall choose one of their number to be Chairperson.
57. If within half an hour from the time appointed for the meeting a quorum is not present at the meeting, if convened upon such requisition as aforesaid, shall be dissolved; but in any other case it shall stand adjourned to the same day in the next week at the same time and place, or if such represented in accordance with Section 162 or by proxy or otherwise shall be deemed to be member present in person for the purpose of this Article.
66. Any person entitled under the Transmission Article to transfer shares may vote, at General Meetings in respect thereof in the same manner as if he were the registered holder of such shares, provided that at least forty-eight (48) hours before the time of holding the meeting at which he proposes to vote he shall satisfy the Directors of his right to transfer such shares, unless the Directors shall have previously admitted his right to vote at such meeting in respect thereof.
67. No member who is not personally present shall be entitled to vote on a show of hands, unless such member is a corporation present by a proxy or a company present by a representative duly authorised under Section 162 in which case such proxy or representative may vote on the show of hands as if he were a member of the Company.
68. When there are joint registered holders of shares, any one of such persons may vote at any meeting, either personally or by proxy, in respect of such shares, as if he were solely entitled thereto; but if more than one of such joint holders be present at any meeting, personally or by proxy, that one of the said persons whose name stands first in the Register in respect of such shares shall alone be entitled to vote respect in thereof. Several executors or administrators of a deceased member, in whose name any shares stand, shall, for the purpose of this article, be deemed joint holder thereof.
70. Where a corporation, whether incorporated in Pakistan or not, or a local body or any other official or semi-official institution is a member of the company a person duly appointed to represent such corporation, local body or institution at a meeting of the



Company in accordance with the provisions of Section 162 shall be deemed to be a proxy and the production at the meeting of a copy of a resolution or a letter of authority duly signed by a Director, Secretary or an officer of such Corporation or local body or institution be accepted by the Company as sufficient evidence of the validity of his appointment and such representative shall be entitled to vote as if he were a shareholder of the Company including voting on a show of hands.

71. The instrument appointing a proxy and the power of attorney or other authority (if any) under which it is signed shall be deposited at the office not less than forty eight (48) hours before the time for holding the meeting or adjourned meeting (as the case may be) at which the person named in such instrument proposes to vote, but no instrument appointing a proxy shall be valid after the expiration of twelve (12) months from the date of its execution unless specifically so stated on the proxy itself. Any instrument appointing a proxy may be cancelled at any time by the appointer or by his attorney authorized in writing and a new proxy issued in the name of the same appointer, new appointee, otherwise the proxy shall be valid until cancelled or modified by the appointer, subject to the above expiration period of twelve (12) months.



72. A vote given in accordance with the terms of an instrument of proxy shall be valid notwithstanding the previous death of the principal, or revocation of the proxy, or transfer of the shares in respect of which the vote was given, unless an intimation in writing of the death, revocation or transfer shall have been received at the office of the Company before the meeting.

73. The instrument appointing a proxy shall be either (a) Special Proxy to vote at particular Annual or Extraordinary General Meeting or (b) General Proxy to vote at every Annual or Extraordinary General Meeting during a certain period. A member shall not be entitled to appoint more than one (1) proxy to attend any one (1) meeting. If a member appoints more than one (1) proxy and such instruments of proxy are deposited with the Company all such instruments of proxy shall be deemed invalid.

74. All instruments of proxy if in the form distinguished by the letter (a) mentioned in the last preceding clause shall remain in the custody of the Company permanently or for such time as the Director may determine, or if in the form distinguished by the letter (b) shall be duly registered and returned after the business of the meeting at which it is used is over to the person by whom they are delivered. A vote given in accordance with the terms of an instrument of proxy shall be valid notwithstanding the previous death of the principal or revocation of the proxy or transfer of the share in respect of which the voter was given, provided no intimation in writing of the death, revocation or transfer shall have been received at the Office of the Company before the meeting.

75. Every instrument of proxy, whether for a specified meeting or otherwise, shall, as nearly as circumstances will admit, be in the form or to the effect following:

"I _____ being a member of the Shams Power (Private) Limited
 _____ and entitled to _____ votes, do hereby appoint
 _____ of _____ failing him
 _____ of
 _____ as my proxy to vote for me and on
 my behalf, at the Ordinary or Extraordinary, (as the case may be) General
 Meeting of the Company to be held on the _____ day of
 _____ 20 ____ and at any adjournment thereof.

Singed by me this _____ day of _____ 20 or in such other
 form as the Directors shall from time to time approve."



76. No member shall be entitled to be present or to vote on any question either personally or by proxy, or as proxy for another member, at any General Meeting, or upon a poll, to be reckoned in a quorum, whilst any sum shall be due and payable to the Company in respect of any of the shares of such member.

77. No objections shall be made to the validity of any vote except at the meeting or poll at which such vote shall be rendered, and every vote whether given personally or by proxy and not disallowed at such meeting or poll, shall be deemed valid for all purposes of such meeting or poll whatsoever.

CHIEF EXECUTIVE OFFICER AND OTHER PRINCIPAL OFFICERS OF THE COMPANY

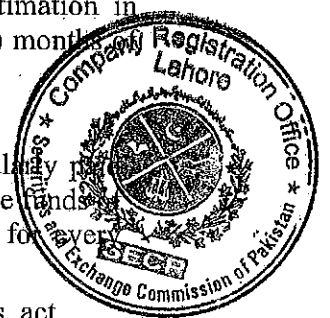
78. The Directors shall elect a Chief Executive Officer from amongst their body or from outside it and give such Chief Executive Officer the designation of Managing Director or such other designation as the Directors may determine from time to time. The Chief Executive Officer shall be appointed for a period of three (3) years, extendable by the Directors. The Directors shall vest in the Chief Executive Officer, such powers and functions as they deem fit in relation to the management and administration of the affairs of the Company subject to their general supervision and control. If the Chief Executive Officer is not already a Director he shall be deemed to be a Director of the Company and be entitled to all the rights and privileges and subject to *all* the liabilities of that office.

81. The Directors may appoint other principal officers of the Company including the chief financial officer (by whatever designation called) and the Secretary on such terms and conditions and with such responsibilities as they may determine.

DIRECTORS

82. Directors' number and powers:

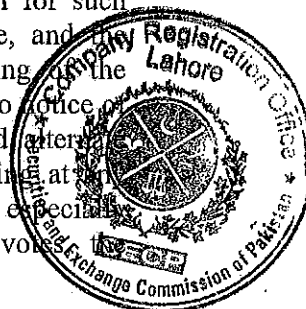
- a) Until otherwise determined by the Board of Directors, the number of directors shall be not less than three (3) including Debenture/Creditor Directors.
- b) The Directors shall have the power at any time and from time to time to appoint any other qualified person or persons as officer(s) of the Company for a period and terms as may be determined by the Board.
83. Save as provided by Section 187 or otherwise required by law or determined by the Directors, Directors need not have any qualification shares. When the Directors are required as aforesaid to hold any qualification shares, they shall do so within the time presented by law. In the case of Directors representing interest holding shares of the requisite value, no such share qualification shall be required provided intimation in writing as to such representation is lodged with the Company within two (2) months of the appointment of such directors.
84. Each Director including alternate or substitute Directors but excluding regularly paid Chief Executive Officer and full time working Directors shall be paid out of the funds of the Company a fee, as may be determined and approved by the Directors, for every meeting of the Board attended by him.
above fixed, the Directors shall not, except for the purpose of filling vacancies, act so long as the number remains below the minimum.
92. The Directors may elect one of their number as the Chairperson of the Board and vest in him such powers and functions as they may deem fit in relation to the management and administration of the affairs of the Company subject to their general supervision and control.
93. The Company may enter into a contract of service with the Chief Executive Officer (Managing Director) for such period and on such terms and conditions as the Directors consider appropriate in the interest of the Company.
94. If so required under law, the remuneration of the Chief Executive Officer (Managing Director) shall, from time to time, be fixed by the Directors and may be by way of salary or commission or participation in profits or by any or all of these modes or otherwise.
95. The Directors may, from time to time, entrust to and confer upon the Chief Executive Officer (Managing Director) for the time being such of the powers exercisable under These Presents by the Directors, as they may think fit, and may confer such powers for such time and to be exercised for such objects and purposes and upon such terms and conditions and with such restrictions as they think expedient, and they may confer such powers either collaterally with or to the exclusion of and in substitution for all or any of the powers of the Director.



96. A Director of this Company may be, or become a director of any company promoted by this Company or in which it may be interested as a vendor, shareholder or otherwise provided written notice has been given to the Board and no such Director shall be accountable for any benefits as a director or member of such company.

PROCEEDINGS OF DIRECTORS

97. The Directors may meet for the dispatch of business and may adjourn and otherwise regulate their meetings and proceedings as they think fit, subject to such minimum meetings as may be provided by law. The quorum for such meetings shall be two (2) Directors. A Director may at any time, and the Secretary upon the request of a Director, shall convene a meeting of the Directors. A Director who is not within Pakistan shall not be entitled to attend any such meeting, but notice shall be given to all duly appointed Directors who may at the time be within Pakistan. Questions arising at a meeting shall be decided by majority of votes except in cases especially provided for in These Presents and in case of an equality of votes the Chairperson shall have a second or casting vote.



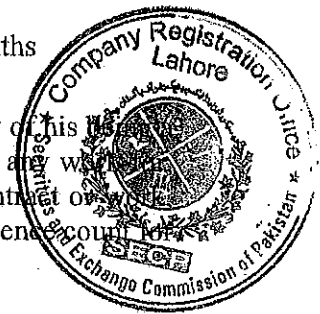
98. The Directors may elect a Chairperson of their meetings and determine the period for which he is to hold office, but if no such Chairperson is elected, or if at any meeting the Chairperson is not present within ten (10) minutes after the time appointed for holding the same or is unwilling to act as Chairperson, the Directors present shall choose some one of their number to be Chairperson of such meeting.
85. The Directors may pay to any Director who for the time being is resident out of the place at which any Meeting of the Directors may be held and who shall come to that place for the purpose of attending such Meeting such sum as the Directors may consider fair and reasonable for his expenses and loss of time in connection with his attending at the Meeting in addition to his remuneration as above specified.
86. If any Director is called upon to perform extra services or to make special exertions for any of the purposes of the Company, or to give any special attendance to the business of the Company, the Directors may remunerate the Directors so doing, which remuneration, if required by law, shall be subject to the approval of the Company in General Meeting, and/or the prior approval of the Controller of Capital Issues.
87. The continuing Directors may act, notwithstanding any vacancy in their body, but if their number falls below the minimum fixed the remaining Directors shall fill up such vacancy and except for the purpose of filling such vacancy or of calling a General Meeting the continuing Directors shall not act so long as their number is below the

minimum.

88. No person shall become a Director of the Company if he suffers from any of the disabilities or disqualifications mentioned in Section 187 and , if already a Director, shall cease to hold such office from the date he so becomes disqualified or disable or:

- (a) if removed by a resolution of members as hereinafter provided;
- (b) if by notice in writing given to the Company he resigns his officer; or
- (c) if he fails to acquire his qualification shares within two (2) months

Provided, however, that no Director shall vacate his office by reason only of his being a member of any company which has entered into contracts with, or done any work for, the Company but such Director shall not vote in respect of any such contract or work and if he does so vote, his vote shall not be counted and nor shall his presence count for forming a quorum at the time of any such vote.



89. In accordance with Section 205 of the Ordinance, the Company shall keep at the Office a register, containing the names, addresses and occupations of its Directors and officers, and shall send to the Registrar of Companies a copy of such register, and shall notify to him any change that takes place in such Director or officer within fourteen (14) days of such change taking place.
90. A Director may be removed by passing a resolution at a General Meeting in accordance with Section 181.
91. Any casual vacancy occurring among the Directors may be filled up by the Directors provided that any person so chosen shall remain in office so long as the vacating Director would have retained the same if no vacancy had occurred. The continuing Directors may act notwithstanding any vacancy in their body, but so that if the number falls below the minimum
99. A meeting of the Directors at which a quorum is present shall be competent to exercise all or any of the authorities, powers and discretions by or under These Presents or regulations of the Company for the time being vested in or exercisable by the Directors generally.
100. Subject to Section 196 and in addition to the powers which may be delegated by the Directors, the Directors may delegate any of their powers, other than the powers to

borrow, to a committee consisting of such member or members of their body as they think fit, and they may from time to time revoke and discharge any such committees, so formed which shall, in the exercise of the power so delegated conform to any regulations that may from time to time be imposed on it by the Directors. All acts done by any such committee in conformity with such regulations and in fulfillment of the purposes of their appointment but not otherwise shall have the like force and effect as if done by the Board. The Board may from time to time fix the remuneration to be paid to any member or members of their body constituting a committee appointed by the Board in terms of these Articles, and may pay the same.

101. A resolution in writing, signed by Directors for the time being entitled to receive notice of a meeting of Directors, shall be as valid and effectual as if it had been passed at a meeting of the directors duly called and constituted provided that where a Director is not so present in Pakistan but has an alternate who is so present, then such resolution must also be signed by such alternate.

102. The meetings and proceedings of any such committee consisting of two or more members, shall be governed by the provisions herein contained for regulating the meetings and proceedings of the Directors, so far as the same are applicable thereto and are not superceded by any regulations made by the Directors under these Articles.

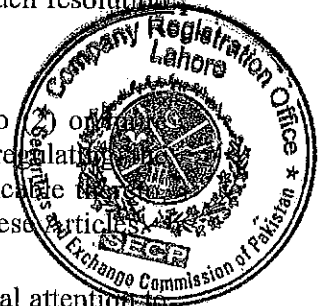
103. Any Director who serves on any special Committee, or who devote special attention to the business of the Company, or who otherwise performs services which, in the opinion of the Directors, are outside the scope of the ordinary duties of a Director, remuneration (in addition to the remuneration he may be entitled to as a Director) by way of salary, percentage of profits, or otherwise as the Directors may determine.

104. All acts done at any meeting of the Directors or of a special committee of the Directors, or by any person acting as a Director shall, notwithstanding that it shall afterwards be discovered that there was some defect in the appointment of the Directors or persons acting as aforesaid, or that they or any of them were disqualified, be as valid as if every such person had been duly appointed and was qualified to be a Director.

105. Subject to the provisions of Section 191, a Director may be employed by or hold any office of profit under the Company in conjunction with the office of Director other than of an Auditor of the Company, and on such terms as to remuneration and otherwise as the Directors may arrange.

MINUTES

106. The Directors shall cause minutes to be duly entered in books provided for the purposes



- (a) of all appointments of officers made by the Directors.
- (b) of the name of Directors present at each meeting of the Directors and of any committee of Directors.
- (c) of all resolutions and proceedings of General Meetings, and of meeting of the Directors and committee and resolution made in accordance with the provisions of Article 101 hereof.

Any such minutes of any meetings of the Directors, or any committee, or of the Company, or of a resolution in pursuance of these Articles, and any extract therefrom if purporting to be signed by the Chairperson of such meeting or by some person present there at and appointed by the Directors to sign the same in his place, or by the Chairperson of the next succeeding meeting, shall be receivable as evidence of the matters stated in such minutes or extracts.

REGISTER OF MEMBERS

107. The Directors shall cause to be kept, in one or more books, a Register of Members, in accordance with Section 147.

108. The Register shall be kept at the office of the Company, and except when under the provisions of these Articles, shall be open to the inspection of the members during business hours, subject to any reasonable restriction from time to time imposed by the company in General Meeting. No notice of any trust shall be entered in the Register.

REGISTER OF DIRECTORS' INTERESTS

109. In accordance with Section 219 of the Ordinance, the Company shall maintain at its office a register in which shall be entered separately particulars of all contracts, arrangements or appointments in which Directors are interested, such register shall be open to inspection in the same manner and on payment of the same fee as specified for the Register of Members.

REGISTER OF DIRECTORS' SHAREHOLDINGS

110. In accordance with Section 220 of the Ordinance, the Company shall maintain at its office a register of the Directors, Chief Executive, Chief Financial Officer (Chief Accountant), Secretary or Auditor who is or has been the beneficial owner of listed securities and every person who is directly or indirectly the beneficial owner of not less than ten percent (10%) of the beneficial interest in the Company. This register shall be open to inspection during business hours subject to Sections 220 (5) (6) and (7) of the Ordinance.



ALTERNATE DIRECTORS

111. A Director who is out of Pakistan or about to go out of Pakistan for a period of not less than three (3) months may with the approval of the Directors appoint a person to act as alternate Director in his place, and at his discretion remove such alternate Director and appoint another in his stead, and on such appointment being made and approved the alternate Director shall in all respects be subject to the terms and conditions existing with reference to the other Directors of Company, save and except that he shall not be required to hold any share qualification. Such alternate Director shall be entitled to act at all meetings and in all proceedings in which, and on all occasions when the Director who appointed him shall not act himself. An alternate Director shall look for his remuneration to the Director appointing him, and shall have no claim against the Company for such remuneration.
112. An alternate Director, whilst acting in the place of the Director who appointed him, shall exercise and discharge all the duties and functions of the Director he represents. The appointment of an alternate Director shall be cancelled and the alternate Director shall cease to hold office whenever the Director who appointed him shall return to Pakistan he shall give notice in writing to the Secretary that the alternate Director representing him shall have ceased to do so.



POWERS OF DIRECTORS

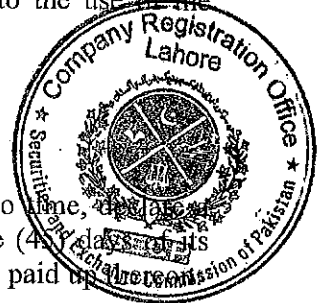
113. The management of the business and the control of the Company shall be vested in the Directors, who in addition to the powers and authorities by These Presents expressly conferred upon them, may exercise all such powers, and do all such acts and things as may be exercised or done by the Company, and are not hereby or by the Statutes expressly directed or required to be exercised or done by the Company in meetings, but subject, never the less to such management not being inconsistent with These Presents nor with any resolution members in accordance therewith; but no resolution passed by the company in meeting shall invalidate any prior act of the Directors which would have been valid if such resolution had not been passed. The general powers given by this Article shall not be limited or restricted by any special authority or powers given to the Directors by any other Article. It is hereby declared that although the Directors shall have power to enter into provisional contract for the sale or alienation of all or the major portion of the property and assets of the Company and the rights belonging thereto or connected therewith, such provisional contract shall only become binding on the Company in the event of the same being ratified and confirmed by a majority of the votes of the members present in person or by proxy at an Extraordinary Meeting convened for that purpose. All the provisions of These Presents as to General Meetings shall apply mutatis mutandis to meetings convened under this Article.
114. The Directors may at any time and from time to time, by power of attorney, appoint any person or persons to be the attorney or attorneys of the Company for such

SEALS

120. The Directors shall provide a common Seal of the Company which shall not be affixed to any instrument except by the authority of a resolution of the Board or by a committee of Directors authorised in that behalf by the Directors, and two (2) Directors or one (1) Director and the Secretary of the Company or such other person as the Directors may appoint for the purpose shall sign every instrument to which the common Seal is affixed.
121. The Directors may provide for the use in any territory, district or place not situated in Pakistan, of an official Seal which shall be a facsimile of the common Seal of the Company, with the addition on its face of the name of every territory, district or place where it is to be used. The provisions of Section 213 shall apply to the use of the official Seal.

DIVIDENDS

122. The Company in General Meeting or the Directors may, from time to time, declare a dividend, such dividend to be paid to the members within forty five (45) days of its declaration, in proportion to the number of their shares and the amount paid up thereon.
123. No larger dividend shall be declared by the Company in General Meeting than is recommended by Directors, but the Company in General Meeting may declare a smaller dividend.
124. No dividend shall be payable except out of the profits of the Company of the year or any - other undistributed profits and no dividend shall carry interest as against the Company. Dividends may be declared either free of or subject to the deduction of Zakat, income tax and any other tax or duty in respect of which the Company may be chargeable. All unclaimed dividends may be invested or otherwise made use of by the Directors for the benefit of the Company until claimed.
125. The declaration of the Directors as to the amount of the profits of the Company shall be conclusive.
126. The Directors, may from time to time, pay to the members on account of the next forthcoming dividend such interim dividends as in their judgment the person of the Company justifies.
127. In case several persons are registered as the joint holders of any share, any one of such persons may give effectual receipts for all dividends and payments on account of dividends to respect of such share.



purposes and with such powers, authorities and discretions (not exceeding those vested in or exercisable by the Directors under These Presents), and for such period and subject to such conditions as the Directors may from time to time think fit, and any such appointments may, if the Directors think fit, be made in favour of any company, or the members, directors, nominees or managers of any company or firm, or otherwise in favour of any fluctuating body of persons, whether nominated directly or indirectly by the Directors, and any such power whether nominated directly or indirectly by the Directors, and any such power of attorney may contain such provisions for the protection or convenience of persons dealing with such attorneys as the Directors may think fit.

115. Subject to such limitations as may be imposed by Section 196 of the Ordinance or by the shareholders in General Meetings, all powers shall vest with the Directors.

ELECTION OF DIRECTORS

116. The number of Directors determined by the Board pursuant to Article 8 shall be elected to office by the members in General Meeting in the following manner:

(a) A member shall have such number of votes as is equal to the product of the number of voting shares held by him and the number of Directors to be elected.

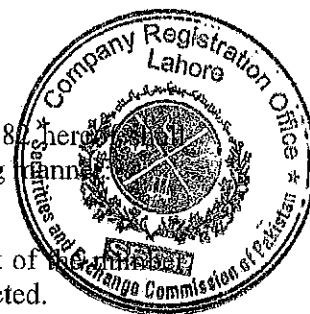
(b) A member may give all his votes to a single candidate or divide them between more than one of the candidates in such manner as he may choose.

(c) The candidate who gets the highest number of votes shall be declared elected as Director and then the candidates who get the next highest number of votes shall be so declared and so on until the total number of Directors to be elected has been so elected.

117. A retiring Director shall be eligible for re-election.

118. Any person who seeks to contest an election to the office of Directors shall, whether he is a retiring Director or otherwise, file with the Company, not later than fourteen (14) days before the date of the meeting at which elections are to be held, a notice of his intention to offer himself for election as a Director; provided that any such person may, at any time before the holding of elections, withdraw such notice.

119. A Director elected in accordance with these Articles shall hold office for a term of three (3) years unless he earlier resigns, becomes disqualified from becoming a Director or otherwise ceases to hold office.



128. Each dividend may be paid by cheque, warrants, coupon, or otherwise, as the Directors may from time to time determine, and may if paid otherwise than by coupon, be sent by post to the last registered address of the member entitled thereto, or any other address requested by him or in the case of joint registered holders to that one of them first named in the register in respect of such joint holdings, and the payment of such cheque or warrant in purporting to be duly endorsed, or the surrender of any coupon shall be a good discharge to the Company in respect thereof.
129. The Company shall not be responsible for the loss in transmission of any cheque, warrant or other document sent through the post to the registered address of any member, whether or not at his request.
130. No dividend shall bear interest against the Company.
131. The Directors may retain the dividends payable upon shares in respect of which any person is under the transmission clauses entitled to become a member or when a person under the clause is entitled to transfer until such person shall become a member in respect thereof or shall duly transfer the same.
132. All dividends unclaimed for one (1) year after having been declared may be invested or otherwise made use of by the Directors for the benefit of the Company until claimed and all dividends unclaimed for three (3) years after having been declared may be forfeited by the Directors for the benefit of the Company.



CAPITALISATION

133. The Company in General Meeting may at any time and from time to time pass a resolution that it is expedient to capitalize any sum forming part of the undivided profits standing to the credit of the Company's reserve or reserve fund or in the hands of the Company and available for dividend, or any sum received by way of premium on the issue of any shares, debentures or debenture stock of the Company, and that any such sum or sums be set free for distribution and be appropriated to and amongst the members, either with or without deduction for income tax rateably, according to their shareholding, in such manner as the resolution may direct, provided that no such distribution shall be made unless recommended by the Directors and the Directors shall in accordance with such resolution apply such sum or sums in paying up shares, debentures, or debenture stock of the Company, and appropriate such shares, debentures, the same amongst the holders of such shares rateably according to their shareholding thereof respectively as aforesaid, or otherwise deal with such sums as directed by such resolution. Where any difficulty arises in respect of such distribution, the Directors may settle the same as they think expedient, and in particular they may issue fractional certificates, fix the value for distribution of any fully held shares, debentures, or debenture stock, make cash payment to any holders of shares on the

footing of the value so fixed in order to adjust rights, and may seem just or assets in trusts for the persons entitled in the appropriation or distribution and expedient to the Directors. When deemed requisite a contract shall be with Section 73 and the Directors may appoint any person to sign such contract on behalf of the persons entitled in the appropriation or distribution, and such appointment shall be effective, and the contract may provide for the acceptance by such holders of the shares to be allotted to them respectively in satisfaction of their claims in respect of the sum so capitalized.

RESERVES

134. The Directors may, before recommending any dividends, whether preferential or otherwise, carry to reserve out of the profits of the Company such sums as they think proper, and may also carry to reserve any premiums received upon the issue of securities, or obligations of the Company. All sums standing to reserve may be applied from time to time in the discretion of the Directors for meeting depreciation contingencies or for special dividends or bonuses or for equalizing dividends or for repairing improving or maintaining any of the property of the Company or for any other purposes as the Directors may think conducive to the objects of the Company or any of them, and pending such application may at the like discretion either be employed in the business of the Company or be invested in such investments as the Directors think fit. The Directors may divide the reserve into such special funds or any parts of any special funds into which the reserve may have been divided as they think fit. The Directors may also, without placing the same to reserve, carry over any profits which they may think it not prudent to divide.
135. The reserve or reserve fund shall, at the discretion of the Directors, be applicable for the equalization of dividends or for making provision for exceptional losses, expenses or contingencies or the extension or development of the Company's business or for writing down the value of any of the assets of the Company, or for repairing, improving and maintaining any buildings, plants, machinery or works connected with the business of the Company or to cover the loss by wear and tear or other depreciation in value of any property of the Company, or for any of the objects of the Company as defined by the Company's Memorandum of Association or for any other purpose to which the profit of the Company may be properly applied, and the Directors may at any time divide among the members by way of bonus or special dividends any part of the reserve funds which they in their discretion may determine not to be required for the purposes aforesaid.
136. All moneys carried to the Reserve Fund and the Depreciation Fund respectively shall nevertheless remain and be profits of the Company applicable, subject to due provisions being made for actual loss or depreciation, for the payment of dividends and such moneys and all the other moneys of the Company not immediately required for the purposes of the Company may be invested by the Directors in or upon such investments or securities as they may select or may be used as working capital or may be kept at any bank on deposit or otherwise as the Directors may from time to time



think proper.

137. The Directors shall cause to be kept such books of account as are prescribed by section 230. The books of account shall be kept at the office of the Company places as the Directors think fit, and shall always be open to the inspection of Directors.
138. The Directors shall, from time to time determine whether and to what extent, and at what extent, and at what times and places and under what conditions or regulations the accounts and books of the Company, or any of them, shall be open to the inspection of members, and no member (not being a Director) shall have any right of inspecting any account or book or document of the Company, except as conferred by Statute or authorised by the Directors, or by a resolution of the Company in General Meeting.
139. The Directors shall from time to time in accordance with Section 233, 234 and 236 cause to be prepared and to be laid before the Company in General Meeting such profit and loss account, balance sheet and reports as are referred to in these Sections and in accordance with Section 242, within thirty (30) days of such meeting the Directors shall file with the Registrar at least three (3) duly authenticated copies thereof.
140. Every such balance sheet shall be accompanied by a report of the Directors as to the state and condition of the Company, and as to the amount (if any) which has been paid, or which they recommend to be paid, out of the profits by way of dividend to the members, and the amount (if any) which they have carried, or propose to carry, to reserve according to the provisions in that behalf hereinbefore contained; and the report and balance sheet shall be signed by the Chief Executive and one other Director. When the Chief Executive is for the time being not in Pakistan, the report and balance sheet shall be signed by two (2) Directors in accordance with Section 241. The balance sheet and accounts which are to be laid before the Company in General meeting shall contain the particulars prescribed by the Statute.
141. The Company shall within one (1) month of the close of the first, second and third quarter of its year of account, prepare and transmit to its members and any Stock Exchange on which the Company may choose to be listed, a profit and loss account for, and balance sheet as at the end of that quarter, whether audited or otherwise, and simultaneously file with the Registrar and the Commission at least three (3) copies thereof.
142. Once at least in every year the accounts of the Company shall be examined and the correctness of the profit and loss account balance sheet ascertained by one or more auditor or auditors. The auditors shall be appointed at each annual general meeting and hold office from the conclusion of the meeting until the conclusion of next Annual General Meeting.



143. The duly appointed auditor(s) of the Company shall, subject to the provisions of the statutes, particularly Section 252 of the Ordinance, hold office until another appointment or other appointments to the office shall be made in accordance with the statutes, proposed to be made or made of an auditor(s) of the Company. The remuneration of the auditor(s) shall be fixed by the Company at Annual General Meeting.

144. An auditor may not be a member of the Company but no person shall be eligible as auditor who is interested otherwise than as a member, in any transaction of the Company, in accordance with Section 254 (3) of the Ordinance no person who is, or at any time during the preceding three years, was a Director, Manager, Secretary, employee or other officer of the Company shall be eligible for the post of auditor.

145. Any casual vacancy occurring in the office of auditor may be filled up by the Directors, and any person so appointed shall continue in office until the Ordinary Meeting next after his appointment, but while any such vacancy continues the surviving and continuing auditor(s) (if any) may continue to act.

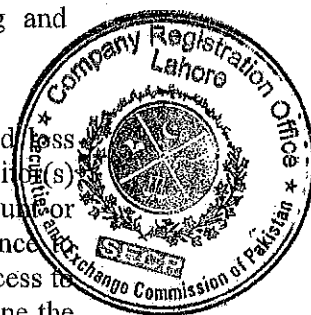
146. The auditor(s) shall be supplied with copies of the balance sheet and profit and loss account intended to be laid before the Company in General Meeting. The auditor(s) shall make a report to the members upon the balance sheet, profit and loss account or income and expenditure account in terms of the Statutes, with particular reference to Section 255 of the Ordinance. The auditor(s) shall at all reasonable times have access to the books and accounts of the Company, and they may, in relation thereto, examine the Directors' or other officers of the Company.

147. Every account of the Company, when audited and approved by an Ordinary Meeting, shall be deemed conclusively correct, and shall not be reopened, though if any error is discovered therein within three (3) months next after the approval thereof the account shall forthwith be corrected and thenceforth shall be conclusive.

NOTICE

148. A notice may be given by the Company to any member either personally or by sending it by post to his registered address or (if he has not a registered address in Pakistan) to the address if any within Pakistan supplied by him to the Company for the giving of notices to him.

149. Where a notice is sent by post, service of the notice shall be deemed to be effected by properly addressing, pre-paying and posting a letter containing the notice and unless contrary is proved to have been effected at the time at which the letter would be delivered in the ordinary course of post.



150. If a member has no registered address in Pakistan, and has not address in Pakistan, and has not supplied to the Company an within Pakistan for the giving of notice to him, a notice address to him and advertised in a newspaper circulating in the neighborhood of the Office of the Company and addition a notice published in one issue each of an English and an Urdu daily newspaper the province of its registered office or if the Company is listed where the St in which it is listed is situated, shall be deemed to be duly given to him on the day on which the advertisements appear.

151. A notice may be given by the Company to the joint-holders of a share by giving the notice to the joint-holder named first in the Register in respect of the share.

152. A notice may be given by the Company to the persons entitled to a share in consequence of the death or insolvency of a member by sending it through the post in a pre-paid letter addressed to them by name, or by the title of representative of the deceased, or assignees of the insolvent, or by any like description, at the address, if any, in Pakistan supplied for the purpose by the person claiming to be so entitled, or until such an address has been so supplied by giving the notice in any manner in which the same might have been given if the death or insolvency had not occurred.

153. Notice of every General Meeting shall be given in some manner herein for authorised to (a) every member of the Company except those members who (having no registered address within Pakistan) have not supplied to the Company an address within Pakistan for the giving of notices to them, to (b) every person entitled to a share in consequence of the death or insolvency of a member, who but for his death or insolvency would be entitled to receive notice of the meeting, and (c) to auditors of the Company for the time being.

154. Every person who by operation of law, transfer, or other means whatsoever shall become entitled to any shares, shall be bound by every notice in respect of such shares which previously to his name and address being entered on the Register shall have been duly given to the person from whom he derived his title to such shares.

155. The signature to any notice to be given by the Company may be written or printed or in the form of an advanced electronic signature as referred to in Article 2 (r).

156. If the Company is wound up, the liquidator may, with the sanction of a special Resolution of the Company and any other Sanction required by law, divide amongst the members in specie or kind the whole or any part of the assets of the Company (whether they shall consist of property of same kind or not) and may, for such purpose, set forth value as he deems fair upon any property to be divided as aforesaid and may determine how such division shall be carried out as between the members or different classes of members. The liquidator may with the like sanction, vest the whole or any part of such assets in trustees upon such trust for, the benefit of the contributories, as the liquidator



with the like sanction, shall think fit, but so that no member shall be compelled to accept any shares or other securities whereon there is any liability.

157. Subject to the provisions of the Ordinance, every Director, Manager, Secretary and other officer or servant of the Company shall be indemnified by the Company against, and it shall be the duty of the Directors, out of the funds of the Company, to pay all costs, losses and expenses which any such officer or servant may incur or become liable to by reason of any contract entered into or not or deed done by him as such officer or servant, or in any way in the discharge of his duties, including traveling expenses.
158. Subject of the provisions of the Statutes, no Director, Manager, Secretary, officer or servant of the Company shall be liable for the acts, receipts, neglects, or defaults of any other Director or officer or servant, or for joining in any receipt or other act for conformity, or for loss or expense happening to the Company through insufficiency or deficiency of title to any property acquired by order of the Directors or on behalf of the Company; for the insufficiency or deficiency of title to any property acquired by order of the Directors for or on behalf of the Company; for the insufficiency or deficiency of any security in or upon which any of the moneys of the Company shall be invested or for any loss or damage arising from the bankruptcy, insolvency or tortuous act of any person with whom any moneys, securities or effects shall be deposited, or for any loss or damage occasioned by any error of judgment or oversight on his part or of any other loss, damage, or misfortune whatsoever which shall happen in execution of the duties of his office or in relation thereto, unless the same happen through his own dishonesty, negligence, default, breach of duty or breach of trust.



SECRECY

159. Every Director, auditor, trustee, member of a committee, officer, manager, servant, agent, accountant or other persons employed in the business of the Company shall, if so required by the Directors, before entering upon his duties sign a declaration pledging himself to observe strict secrecy respecting all transactions of the Company with the customers and the state of accounts with individuals and all matters relating thereto, and by such declaration pledge himself not to reveal any of the matter which may come to his knowledge in the discharge of his duties, except when required so to do by the Directors or by a Court of Law or by the person to whom such matters relate, and that too with the permission of the Board except so far as may be necessary in order to comply with any of the provisions in These Presents contained.
160. Any Director or officer of the Company shall be entitled, if he thinks fit, to decline to answer any question concerning the business of the Company which may be put to him on the ground that the answer to such question would disclose or tend to disclose the trade interests of the Company.

161. Any officer or employee of the Company proved to the satisfaction of the Company to have been guilty of disclosing the secrets of the Company shall be liable without prejudice to any other claim of the Company against him, to instant dismissal without notice at the discretion of Directors.
162. No member or other person not being a Director or other officer of the Company shall be entitled to enter upon the property of the Company or to inspect or examine of or any require discovery of or any information respecting any detail of the Company's trading or any matter which is or may be in the nature of a trade secret, mystery or secret process which may relate to the conduct of the business of the Company, and which in the opinion of the Directors, it will be inexpedient in the interests of the members of the Company to communicate to the public.

OTHER REGULATIONS

163. The Company shall (if it is listed) comply, in so far as its provisions are applicable to the Company, with the Code of Corporate Governance announced by the Commission, subject to amendment from time to time.
164. The Company shall (if it is listed) comply with the Listing Regulations of the Stocks Exchanges on which it may choose to have its shares listed from time to time.
165. The Company shall comply with the Companies (General Provisions and Forms) Rules, 1985, as may be applicable to it.



We, the several persons whose names and addresses are subscribed, are desirous of being formed into a company in pursuance of these Articles of Association and we respectively agree to take the number of shares in the capital of the company set opposite our respective names.

S. No.	Name and Surname (present & former) in full (in Block Letters)	NIC No. (in case of foreigner, Passport No.)	Father's/ Husband's Name in full	Nationality(ies) with any former Nationality	Occupation	Residential address in full	Number of shares taken by each subscriber	Signatures
	ZAIN-UL-ABDIN	42201-0622607-1	Fazal Hussain Amin	Pakistani	Business Executive	House No. 573 Street No. 11 Sector A Township, Lahore	One (1)	
	OMAR MOHYUDDIN MALIK	35202-4257987-7	Saleem Hamid Malik	Pakistani	Business Executive	House No. 15-A Denpur Road GOR I, Lahore	One (1)	
	USMAN HAMID MALIK	35202-9452021-3	Saleem Hamid Malik	Pakistani	Business Executive	House No. 15-A Denpur Road GOR I, Lahore	One (1)	
	FAISAL ISLAM	35201-6640002-1	Muhammad Islam	Pakistani	Business Executive	97/16-B, Nisalr Colony, Lahore Cantt.	One (1)	
Total number of shares to be taken							Four (4)	

Dated the 6th day of January 2015

CERTIFIED TO BE TRUE COPY

ADDITIONAL JOINT REGISTRAR OF COMPANIES
COMPANY REGISTRATION OFFICE
LAHORE.

Witness to the above signatures	
Signature	
Full Name	Saleem Akhtar
CNIC No.	32204-1586952-1
Father's Name	Ghulam Qasim
Full Address	115/7A, Sarwar Road, Lahore Cantt.
Occupation	Advocate High Court

SECTION 3:
**SCHEDULE I – Technical
Details**

Contents

SCHEDULE-I.....	2
Site Location: Packages Mall, Lahore	3
Location of the Packages Mall Lahore, Generation Facility/Solar Farm/Solar Power Plant of the Licensee/SPPL on	3
Map of Pakistan.....	3
Location of the Packages Mall Lahore, Generation Facility/Solar Farm/Solar Power Plant of the Licensee/SPPL on	4
Map of the Province of Punjab	4
Location of the Packages Mall Lahore, Generation Facility/Solar Farm/Solar Power Plant of the Licensee/SPPL on	5
Map of Lahore	5
Access Road/Link of the Packages Mall Lahore Generation Facility/Solar Farm/Solar Power Plant of the Licensee/SPPL on	6
Map of Lahore	6
Location of the Packages Mall Lahore Generation Facility/Solar Farm/Solar Power Plant of the Licensee/SPPL	7
Process Flow Diagram of the Proposed Generation Facility/Solar Farm/Solar Power Plant of the Licensee/SPPL.....	8
Location Coordinates of the Generation Facility/Solar Farm/Power Plant of the Licensee/SPPL	9
Single Line Diagram of the Generation Facility/Solar Farm/Solar Power Plant of the Licensee/SPPL.....	10
Interconnection.....	11
Arrangement for Dispersal of Power from the Generation Facility/Solar Power Plant of Shams Power (Private) Limited	11
Detail of Generation Facility/Solar Power Plant	12
Solar Panels-PV Modules.....	13
PV Array.....	14
Inverters	14
VI Curve of Solar Panel at STC for the Generation Facility/Solar Farm/Solar Power Plant of the Licensee/SPPL.....	17

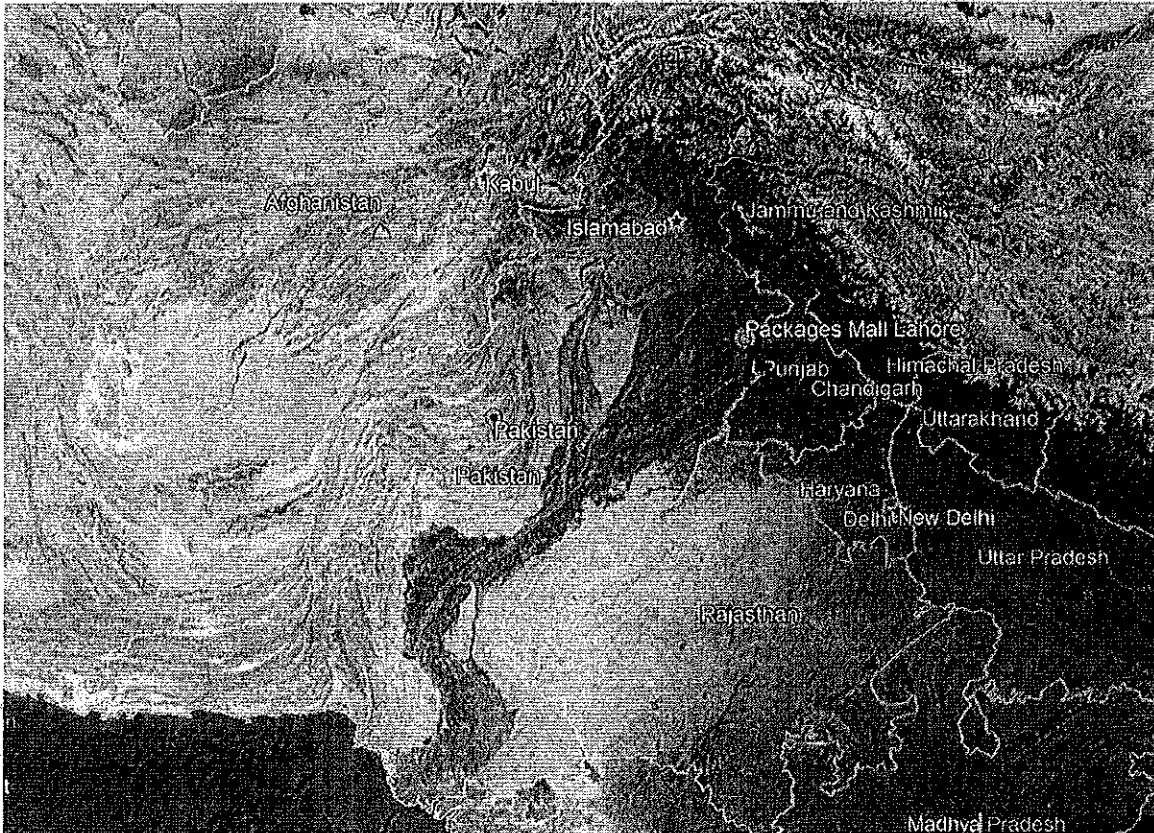
SCHEDULE-I

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.

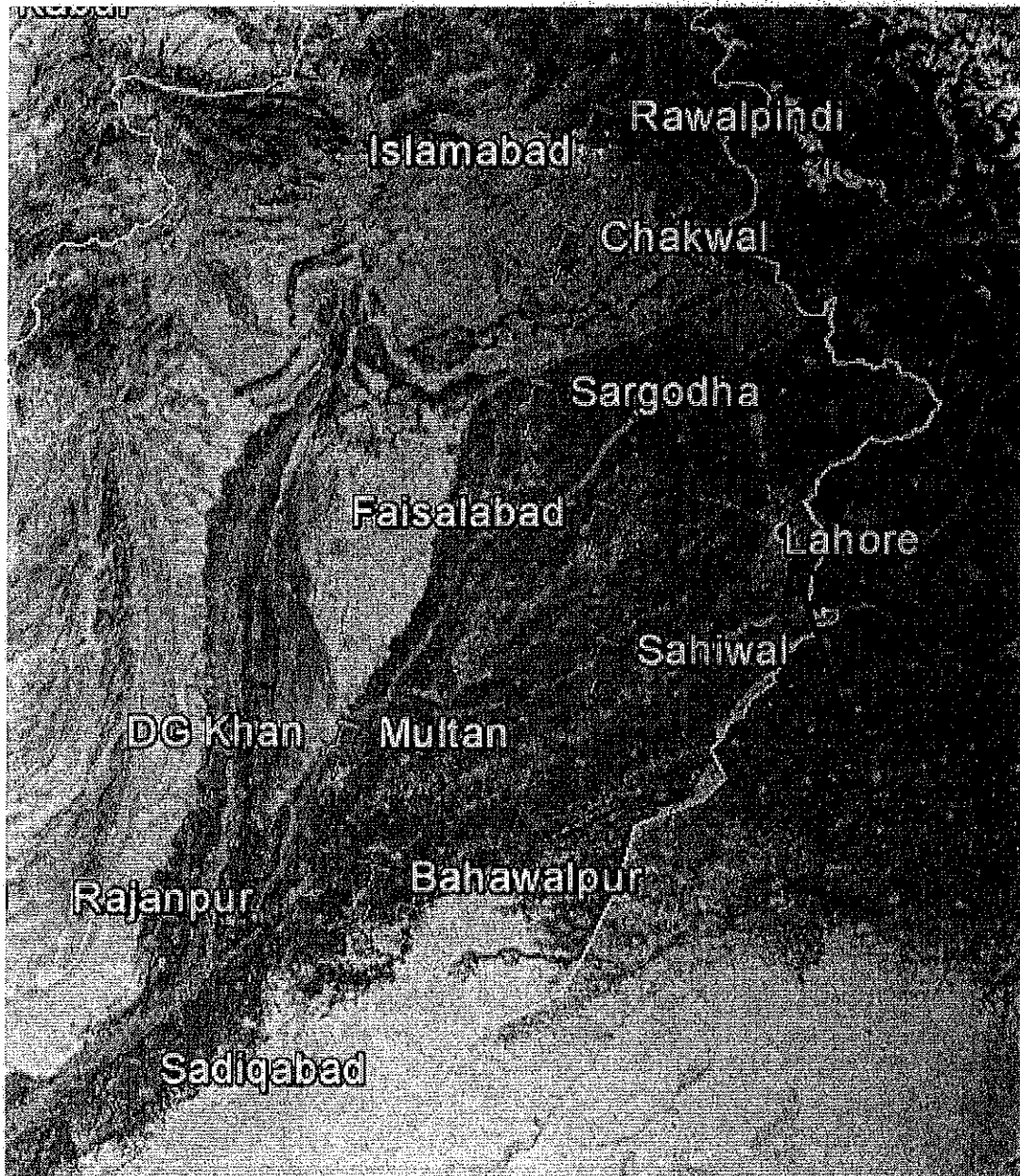
Site Location: Packages Mall, Lahore

Location of the Packages Mall Lahore, Generation Facility/Solar
Farm/Solar Power Plant of the Licensee/SPPL on

Map of Pakistan



Location of the Packages Mall Lahore, Generation Facility/Solar
Farm/Solar Power Plant of the Licensee/SPPL on
Map of the Province of Punjab



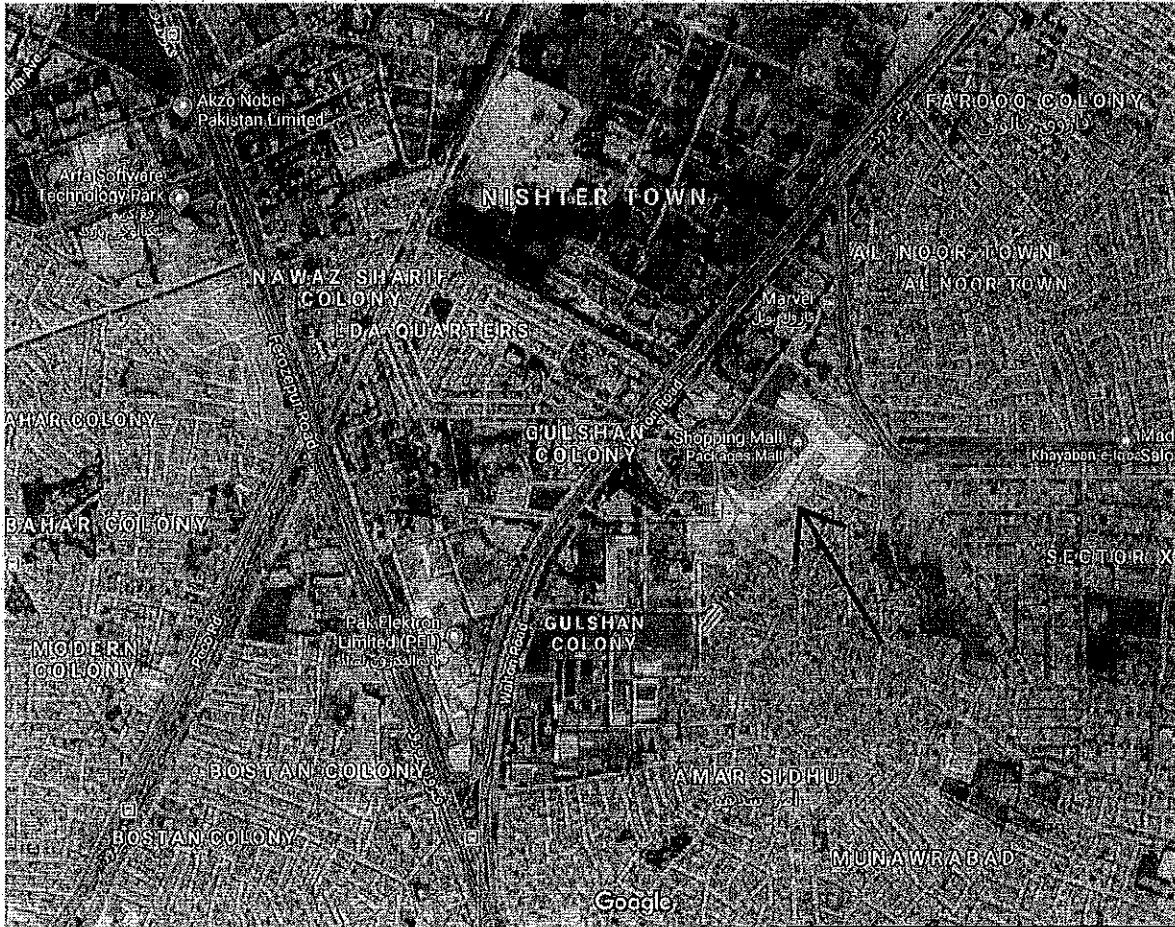
Location of the Packages Mall Lahore, Generation Facility/Solar
Farm/Solar Power Plant of the Licensee/SPPL on

Map of Lahore

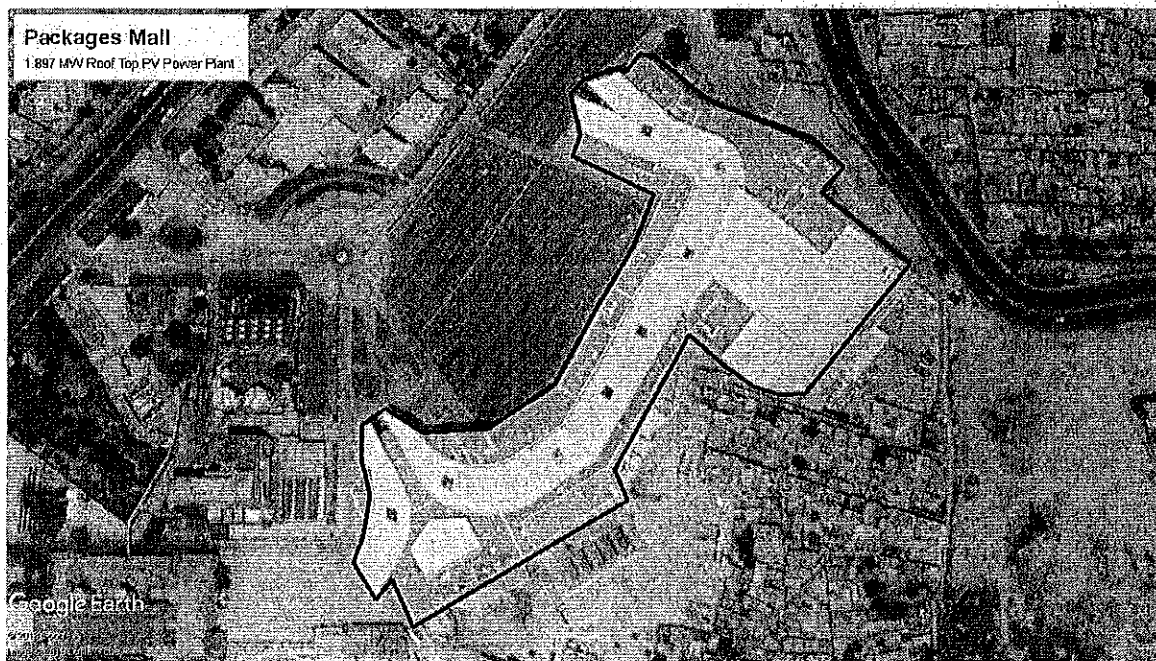


Access Road/Link of the Packages Mall Lahore Generation
Facility/Solar Farm/Solar Power Plant of the Licensee/SPPL on

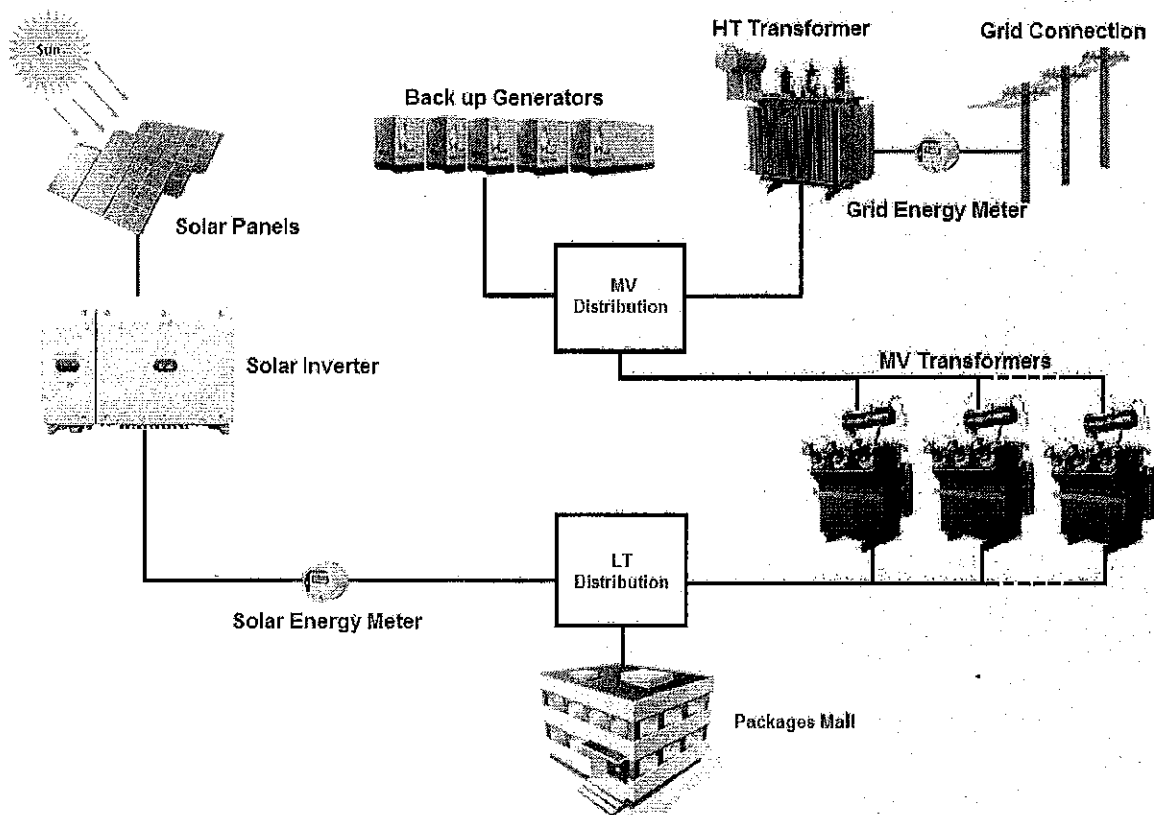
Map of Lahore



Location of the Packages Mall Lahore Generation Facility/Solar
Farm/Solar Power Plant of the Licensee/SPPL



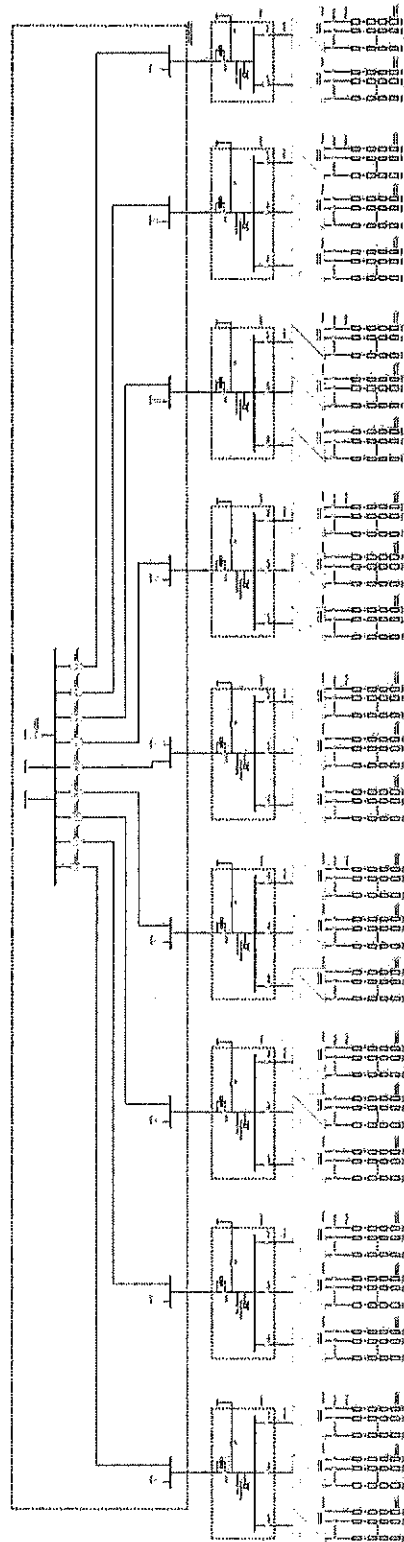
Process Flow Diagram of the Proposed Generation Facility/Solar Farm/Solar Power Plant of the Licensee/SPPL



**Location Coordinates of the Generation Facility/Solar Farm/Power
Plant of the Licensee/SPPL**

Latitude (North)	Longitude (East)
31°28'16.37"	74°21'21.45"

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



Single Line Diagram of
1.897 MW Grid Tied PV Power Plant for Packages Mall, Lahore

Interconnection

Arrangement for Dispersal of Power from the Generation Facility/Solar Power Plant of Shams Power (Private) Limited

The power generated from the Generation Facility/Power Plant of Shams Power (Private) Limited, installed at roof top of Packages Mall, Walton Road, Nishter Town Lahore, will be dispersed for in-house utilization.

(2). The proposed Interconnection Arrangement for dispersal of electric power for the Generation Facility/Solar Power Plant will be as under:-

(a). 230V/400V nine single circuits individually on nine separate bus bars of existing LT distribution panel of Packages Mall/Consumer.

(3). Any change in the above Interconnection Arrangement duly agreed by Shams Power (Private) Limited and Packages Mall shall be communicated to the Authority in due course of time.

Detail of Generation Facility/Solar Power Plant

(A). General Information

(i).	Name of the Company/ Licensee	Shams Power (Private) Limited
(ii).	Registered/Business Office of the Company	2 nd Floor, Al-Maalik Building 19-Davis Road Lahore
(iii).	Principal Office	2 nd Floor, Al-Maalik Building 19-Davis Road Lahore
(iv).	Plants Location	Packages Mall, Walton Road, Nishter Town Lahore, Punjab
(v).	Field Type	Fixed Tilted Plane
(vi).	Field Parameters	Tilt 3° & Azimuth 0° 150° -56° -66° 22° -30° 130°
(vii).	Type of Generation Facility	Solar Photovoltaic (PV)

(B). Solar Power Generation Technology & Capacity

(i).	Type of Technology	Photovoltaic (PV) Cell
(ii).	Type of Cell	Polycrystalline
(ii).	Type of System	Grid Tied
(iii).	Installed Capacity of the Generation Facility (MW)	1.897 MW _p DC

(C). **Technical Details of Equipment**

(a).	Solar Panels-PV Modules		
(i).	Type of Module	Polycrystalline PV Type Module CS6U-330P	
(ii).	Surface Area of Module	1.94432 m ²	
(iii).	Dimension of each Module	1960 mm x 992 mm x 35mm	
(iv).	Total area of roof top for Solar Panels-PV Modules	36,892 m ²	
(v).	No. of Modules	5,748	
(vi).	Frame of Module	Anodised Aluminium Alloy	
(vii).	Weight of one Module	22.4 kg	
(viii).	Module Output Warranty	For 1 st Year	For 2 nd Year to 25 th Year
		97.5% or above	Not more than 0.7% output reduction each year
(ix).	Number of Solar Cells in each Module	72 Cells	
(x).	Efficiency of Module	16.97 %	
(xi).	Environment Protection System	Encapsulation and sealing arrangements for protection from environment.	
(xii).	Maximum Power (P _{max})	330 W _P	
(xiii).	Power Tolerance at STC	0 ~ +5W	
(xiv).	Operating Voltage @ (P _{max})	37.2 V	
(xv).	Operating Current @ (P _{max})	8.88 A	
(xvi).	Open circuit voltage (V _{oc})	45.6 V	
(xvii).	Short circuit current (I _{sc})	9.45 A	

(xviii).	Optimum Operating Voltage at NOCT	34.2 V
(xix).	Optimum Operating Current at NOCT	7.10 A
(xx).	Open circuit voltage (Voc) at NOCT	42.5 V
(xxi).	Maximum system open Circuit Voltage	1000V(IEC) or 1000V (UL) or 600V(UL)
(b).	PV Array	
(i).	No. of Arrays	26
(ii).	Modules in a String	Three Arrangements 18, 19, 20
(iii).	Total No. of Strings	310
(iv).	Modules in Array	Four arrangements 198, 216, 228, 198; 240 Modules
(v).	Total Modules	5,748
(c).	PV Capacity	
(i).	Total Capacity	1.897 MW _p DC
(ii).	Net Capacity Factor	13.9 % 16.9% (w.r.t AC)
(d).	Inverters	
(i).	Maximum DC Power Input	1.746 MW (@50°C)
(ii).	Inverter Model	SUN2000-60KTL-M0
(iii).	Manufacturer	Huawei
(iv).	Maximum DC Input Voltage	DC 1100 V
(v).	Start Voltage	DC 200 V
(vi).	Number of Inverters	26
(vii).	Efficiency	98.7%
(viii).	Max. Input Current	DC 132 A
(ix).	MPP Voltage Range	200 V- 1000 V DC

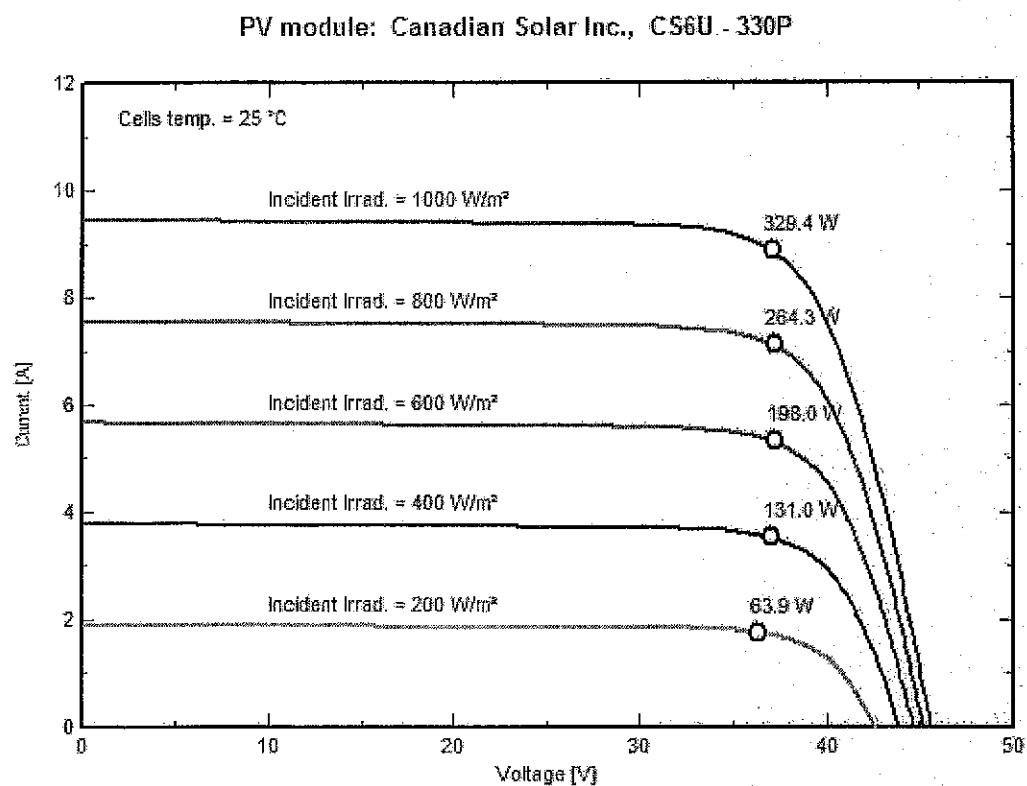
(x).	Output electrical system	3-Phase, 4-Wire	
(xi).	Rated Output Voltage	AC 230/400 V	
(xii).	Rated Frequency	50 Hz	
(xiii).	Power Factor	Adjustable – 0.8 lag to 0.8 lead	
(xiv).	Power Control	MPP Tracker (6 MPPT/Inverter)	
(xv).	Environmental Enclosures	Operating Temperature Range	-25° C to 60° C
		Relative Humidity	100% non-condensing
		Protection Class	IP65
		Audible Noise	
		Operating Elevation	<4000m
(xvi)	Protection Devices	(a).	DC Disconnect Switch
		(b).	Anti-Islanding
		(c).	DC SPD
		(d).	DC Reverse Polarity Protection
		(e).	AC SPD
		(f).	Residual Current Monitoring Unit
(e).	Junction Boxes		
	N/A	Strings directly connected to Inverters	
(f).	Data Collecting System		
(i).	Weather Data	(a).	Meteo Control WS501-UMB Irradiation, Temperature, Air pressure, Wind speed, Rel. Humidity
(ii).	System Data	(a).	DC input voltage (V) & current (A) of each Inverter (Phase, Line)

		(b).	Total DC power (kW) generated by PV array.
		(c).	AC output voltage(V) and current (A) of each Inverter (Phase, Total)
		(d).	AC output power (kW) and energy (kWh) of each Inverter
		(e).	Frequency (Hz)
		(f).	Power Factor (PF)

(D). Other Details

(i).	COD of the Project	August 22, 2019
(ii).	Expected Life of the Project from the COD	25 Years

VI Curve of Solar Panel at STC for the Generation Facility/Solar Farm/Solar Power Plant of the Licensee/SPPL



SECTION 4: SCHEDULE II

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.

SCHEDULE-II

Packages Mall Lahore Generation Facilities/Solar Farms/Solar Power Plants

(1).	Total PV Installed Capacity of Generation Facility	1.897 MWp DC 1.560 MWp (Inverter Output)
(2).	Average Sun Hour Availability/Day (Irradiation on Inclined Surface)	5.18 Hrs
(3).	Days per Year	365
(4).	PV Plant Generating Capacity Annually (As Per Simulation)	2,310 MWh
(5).	Expected Total Generation in 25 years Life Span	52,775 MWh
(6).	Generation per Year from plant keeping 24 Hours Working	$1.56 \times 24 \times 365 = 13,665.6$ MWh
(7).	Net Capacity Factor (4/6)	16.9%

Note

All the above figures are indicative as provided by the Licensee. The Net energy available to the Power Purchaser for dispatch will be determined through procedures contained in the Energy Purchase Agreement.

LIST OF ANNEXURES

ANNEXURE I

PV MODULE SPEC SHEET

ANNEXURE II

INVERTER SPEC SHEET

ANNEXURE III

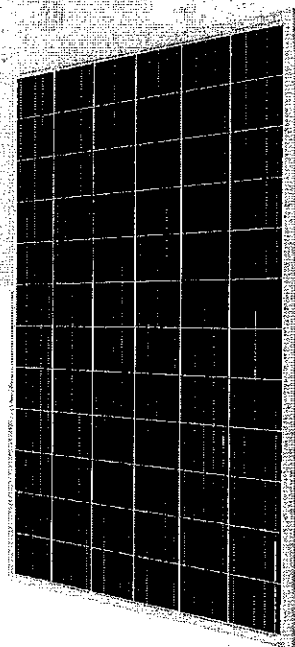
SINGLE LINE DIAGRAM

ANNEXURE IV

PV SYST REPORT

ANNEXURE I

PV MODULE SPEC SHEET



MAXPOWER CS6U-325 | 330 | 335P

Canadian Solar's modules use the latest innovative cell technology, increasing module power output and system reliability, ensured by 17 years of experience in module manufacturing, well-engineered module design, stringent BOM quality testing, an automated manufacturing process and 100% EL testing.

KEY FEATURES



Excellent module efficiency of up to: 17.23 %



High PTC rating of up to: 92.18 %



IP68 junction box for long-term weather endurance



Heavy snow load up to 5400 Pa, wind load up to 3600 Pa*

25
years

linear power output warranty

10
years

product warranty on materials and workmanship

MANAGEMENT SYSTEM CERTIFICATES*

ISO 9001:2015 / Quality management system

ISO 14001:2015 / Standards for environmental management system

OHSAS 18001:2007 / International standards for occupational health & safety

PRODUCT CERTIFICATES*

IEC 61215 / IEC 61730: VDE / CE / MCS / INMETRO / CEC AU / KEMCO / SII

UL 1703 / IEC 61215 performance: CEC listed (US) / FSEC (US Florida)

UL 1703: CSA / IEC 61701 ED2: VDE / IEC 62716: VDE

UNI 9177 Reaction to Fire: Class 1 / IEC 60068-2-68: SGS

Take-e-way



* We can provide this product with special BOM specifically certified with salt mist, ammonia and sand blowing tests. Please talk to our local technical sales representatives to get your customized solutions.

CANADIAN SOLAR INC. is committed to providing high quality solar products, solar system solutions and services to customers around the world. No. 1 module supplier for quality and performance/price ratio in IHS Module Customer Insight Survey. As a leading PV project developer and manufacturer of solar modules with over 30 GW deployed around the world since 2001.

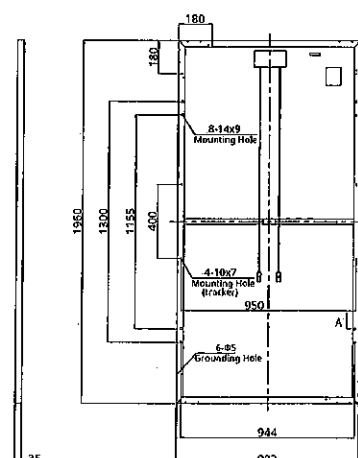
*For detail information, please refer to Installation Manual.

CANADIAN SOLAR INC.

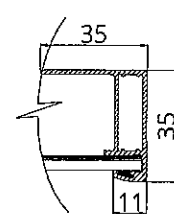
545 Speedvale Avenue West, Guelph, Ontario N1K 1E6, Canada, www.canadiansolar.com, support@canadiansolar.com

ENGINEERING DRAWING (mm)

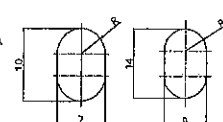
Rear View



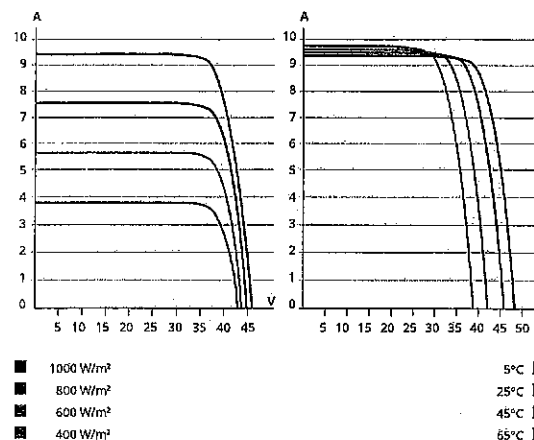
Frame Cross Section A-A



Mounting Hole



CS6U-330P / I-V CURVES



ELECTRICAL DATA | STC*

CS6U	325P	330P	335P
Nominal Max. Power (Pmax)	325 W	330 W	335 W
Opt. Operating Voltage (Vmp)	37.0 V	37.2 V	37.4 V
Opt. Operating Current (Imp)	8.78 A	8.88 A	8.96 A
Open Circuit Voltage (Voc)	45.5 V	45.6 V	45.8 V
Short Circuit Current (Isc)	9.34 A	9.45 A	9.54 A
Module Efficiency	16.72%	16.97%	17.23%
Operating Temperature	-40°C ~ +85°C		
Max. System Voltage	1000 V (IEC/UL) or 1500 V (IEC/UL)		
Module Fire Performance	TYPE 1 (UL 1703) or CLASS C (IEC 61730)		
Max. Series Fuse Rating	15 A		
Application Classification	Class A		
Power Tolerance	0 ~ + 5 W		

* Under Standard Test Conditions (STC) of irradiance of 1000 W/m², spectrum AM 1.5 and cell temperature of 25°C.

ELECTRICAL DATA | NMOT*

CS6U	325P	330P	335P
Nominal Max. Power (Pmax)	239 W	243 W	247 W
Opt. Operating Voltage (Vmp)	34.0 V	34.2 V	34.4 V
Opt. Operating Current (Imp)	7.03 A	7.10 A	7.17 A
Open Circuit Voltage (Voc)	42.4 V	42.5 V	42.6 V
Short Circuit Current (Isc)	7.54 A	7.63 A	7.70 A

* Under Nominal Module Operating Temperature (NMOT), irradiance of 800 W/m², spectrum AM 1.5, ambient temperature 20°C, wind speed 1 m/s.

PERFORMANCE AT LOW IRRADIANCE

Outstanding performance at low irradiance, with an average relative efficiency of 96.0 % for irradiances between 200 W/m² and 1000 W/m² (AM 1.5, 25°C).

* The specifications and key features contained in this datasheet may deviate slightly from our actual products due to the on-going innovation and product enhancement. Canadian Solar Inc. reserves the right to make necessary adjustment to the information described herein at any time without further notice.

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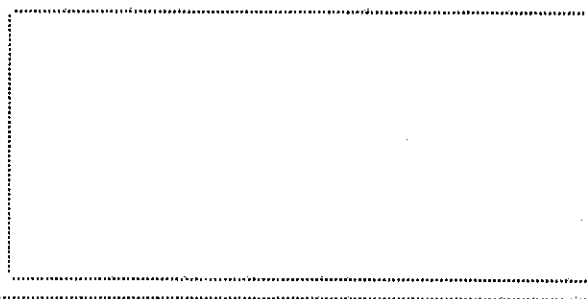
MECHANICAL DATA

Specification	Data
Cell Type	Poly-crystalline, 6 inch
Cell Arrangement	72 (6 × 12)
Dimensions	1960 × 992 × 35 mm (77.2 × 39.1 × 1.38 in)
Weight	22.4 kg (49.4 lbs)
Front Cover	3.2 mm tempered glass
Frame Material	Anodized aluminium alloy
J-Box	IP68, 3 bypass diodes
Cable	4.0 mm² (IEC), 12 AWG (UL), 1160 mm (45.7 in)
Connector	T4 series
Per Pallet	30 pieces
Per Container (40' HQ)	720 pieces

TEMPERATURE CHARACTERISTICS

Specification	Data
Temperature Coefficient (Pmax)	-0.40 % / °C
Temperature Coefficient (Voc)	-0.31 % / °C
Temperature Coefficient (Isc)	0.05 % / °C
Nominal Module Operating Temperature (NMOT)	43 ± 3 °C

PARTNER SECTION

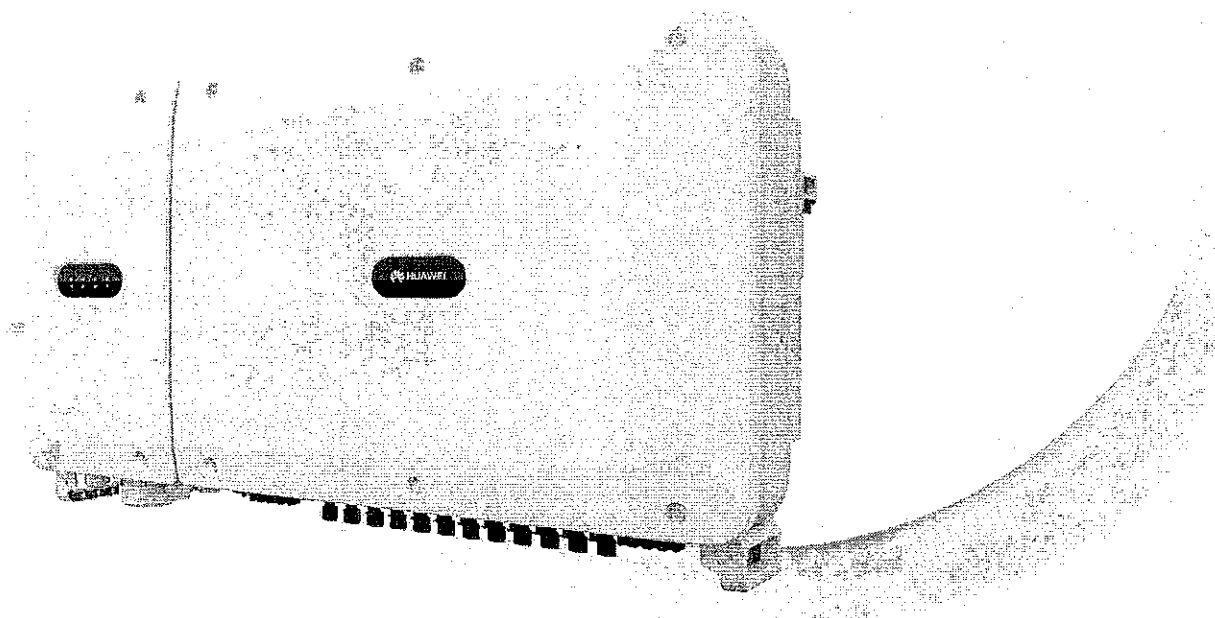


ANNEXURE II

INVERTER SPEC SHEET

Smart String Inverter

SUN2000-60KTL-M0



Smart

- 12 strings intelligent monitoring and fast trouble-shooting
- Power Line Communication (PLC) supported
- Smart I-V Curve Diagnosis supported

Efficient

- Max. efficiency 98.9%, European efficiency 98.7% (@480 V)
- Max. efficiency 98.7%, European efficiency 98.5% (@380 V / 400 V)
- 6 MPPT per unit, effectively reducing string mismatch

Safe

- DC switch integrated, safe and convenient for maintenance
- Residual Current Monitoring Unit (RCMU) integrated
- Fuse free design

Reliable

- Natural cooling technology
- Protection degree of IP65
- Type II surge arresters for both DC and AC

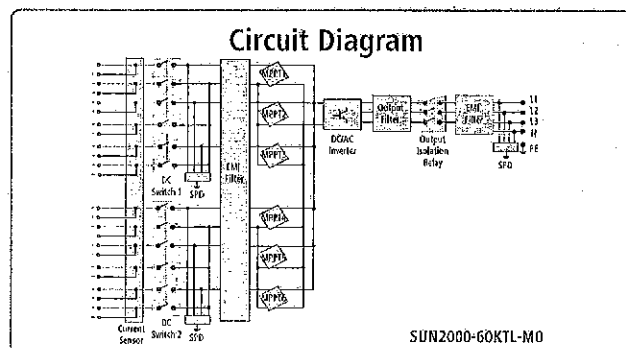
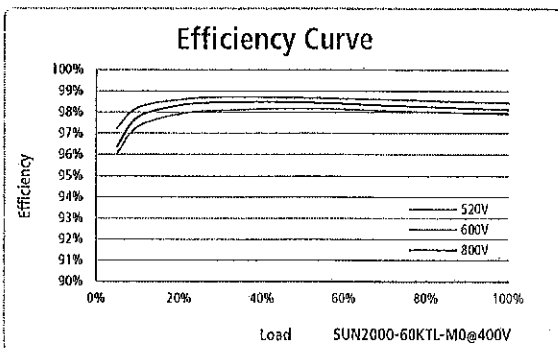
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Smart String Inverter (SUN2000-60KTL-M0)



Technical Specifications		SUN2000-60KTL-M0
		Efficiency
Max. Efficiency		98.9% @480 V; 98.7% @380 V / 400 V
European Efficiency		98.7% @480 V; 98.5% @380 V / 400 V
		Input
Max. Input Voltage		1,100 V
Max. Current per MPPT		22 A
Max. Short Circuit Current per MPPT		30 A
Start Voltage		200 V
MPPT Operating Voltage Range		200 V ~ 1,000 V
Rated Input Voltage		600 V @380 Vac / 400 Vac; 720 V @480 Vac
Number of Inputs		12
Number of MPP Trackers		6
		Output
Rated AC Active Power		60,000 W
Max. AC Apparent Power		66,000 VA
Max. AC Active Power (cosφ=1)		66,000 W
Rated Output Voltage		220 V / 380 V, 230 V / 400 V, default 3W + N + PE; 3W + PE optional in settings; 277 V / 480 V, 3W + PE
Rated AC Grid Frequency		50 Hz / 60 Hz
Rated Output Current		91.2 A @380 V, 86.7 A @400 V, 72.2 A @480 V
Max. Output Current		100 A @380 V, 95.3 A @400 V, 79.4 A @480 V
Adjustable Power Factor Range		0.8 LG ... 0.8 LD
Max. Total Harmonic Distortion		< 3%
		Protection
Input-side Disconnection Device		Yes
Anti-Islanding Protection		Yes
AC Overcurrent Protection		Yes
DC Reverse-Polarity Protection		Yes
PV-array String Fault Monitoring		Yes
DC Surge Arrester		Type II
AC Surge Arrester		Type II
DC Insulation Resistance Detection		Yes
Residual-Current Monitoring Unit		Yes
		Communication
Display		LED Indicators, Bluetooth + APP
RS485		Yes
USB		Yes
Power Line Communication (PLC)		Yes
		General
Dimensions (W x H x D)		1,075 x 555 x 300 mm (42.3 x 21.9 x 11.8 inch)
Weight (with mounting plate)		74 kg (163.1 lb.)
Operating Temperature Range		-25°C ~ 60°C (-13°F ~ 140°F)
Cooling Method		Natural Convection
Max. Operating Altitude		4,000 m (13,123 ft.)
Relative Humidity		0 ~ 100%
DC Connector		Amphenol Helios H4
AC Connector		Waterproof PG Terminal + Terminal Clamp
Protection Degree		IP65
Topology		Transformerless
		Standard Compliance (more available upon request)
Certificate		EN 62109-1/-2, IEC 62109-1/-2, EN 50530, IEC 62116, IEC 60068, IEC 61683
Grid Code		IEC 61727, VDE-AR-N4105, VDE 0126-1-1, BDEW, VDE 4120, UTE C 15-712-1, CEI 0-16, CEI 0-21, RD 661, RD 1699, P.O. 12.3, RD 413, EN-50438-Turkey, EN-50438-Ireland, C10/11



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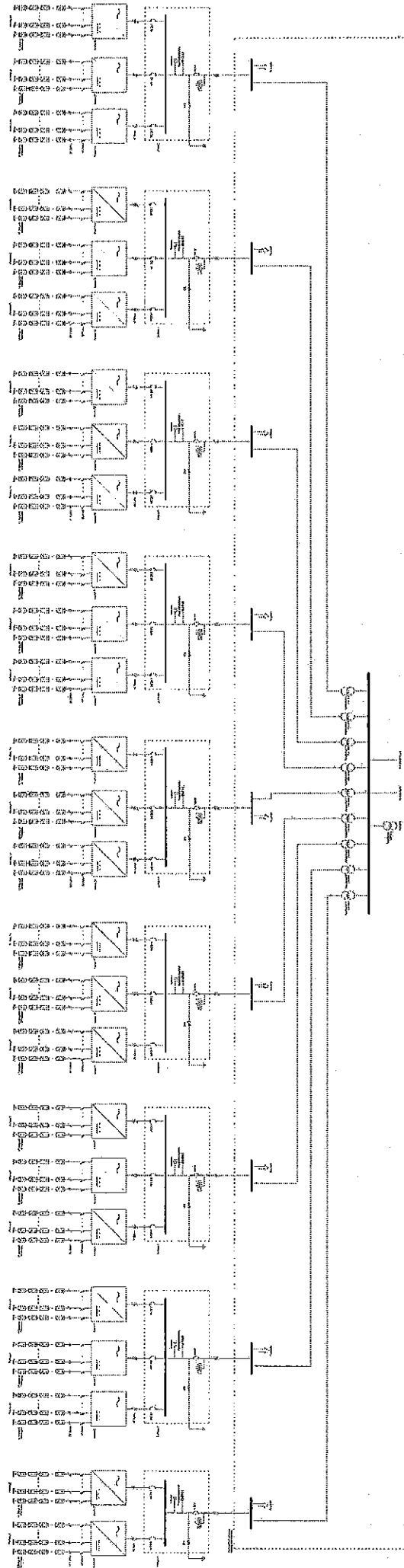
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ANNEXURE III

SINGLE LINE DIAGRAM

Single Line Diagram of
1.897 MW Grid Tied PV Power Plant for Packages Mall, Lahore



ANNEXURE IV

PV SYST REPORT

PVSYST V6.78				22/02/19		Page 1/7	
Grid-Connected System: Simulation parameters							
Project :		Packages Mall					
Geographical Site		Lahore			Country	Pakistan	
Situation		Latitude	31.55° N		Longitude	74.33° E	
Time defined as		Legal Time	Time zone UT+5		Altitude	219 m	
		Albedo	0.20				
Meteo data:		Beacon House DHA Lahore		Meteonorm 7.1 (1981-1990) - Synthetic			
Simulation variant :		Packages Poly 1.9					
		Simulation date	22/02/19 17h05				
Simulation parameters		System type		Tables on a building			
6 orientations		tilts/azimuths		3°/0°, 3°/150°, 3°/-58°, 3°/22°, 3°/-30°, 3°/130°			
Sheds configuration		Nb. of sheds		3910			
		Sheds spacing		2.58 m		Collector width	1.99 m
Shading limit angle		Limit profile angle		10.0°		Ground cov. Ratio (GCR)	77.1 %
Models used		Transposition		Perez		Diffuse	Perez, Meteonorm
Horizon		Free Horizon					
Near Shadings		Linear shadings					
User's needs :		Unlimited load (grid)					
PV Arrays Characteristics (7 kinds of array defined)							
PV module		Si-poly	Model	CS6U - 330P 1000V			
Custom parameters definition		Manufacturer		Canadian Solar Inc.			
Sub-array "Sub-array #1"		Orientation		#1	Tilt/Azimuth	3°/0°	
Number of PV modules		In series		18 modules	In parallel	23 strings	
Total number of PV modules		Nb. modules		414	Unit Nom. Power	330 Wp	
Array global power		Nominal (STC)		137 kWp	At operating cond.	123 kWp (50°C)	
Array operating characteristics (50°C)		U mpp		598 V	I mpp	205 A	
Sub-array "Sub-array #2"		Orientation		#2	Tilt/Azimuth	3°/150°	
Number of PV modules		In series		18 modules	In parallel	35 strings	
Total number of PV modules		Nb. modules		630	Unit Nom. Power	330 Wp	
Array global power		Nominal (STC)		208 kWp	At operating cond.	187 kWp (50°C)	
Array operating characteristics (50°C)		U mpp		598 V	I mpp	312 A	
Sub-array "Sub-array #3"		Orientation		#3	Tilt/Azimuth	3°/-58°	
Number of PV modules		In series		18 modules	In parallel	60 strings	
Total number of PV modules		Nb. modules		1080	Unit Nom. Power	330 Wp	
Array global power		Nominal (STC)		356 kWp	At operating cond.	320 kWp (50°C)	
Array operating characteristics (50°C)		U mpp		598 V	I mpp	536 A	
Sub-array "Sub-array #4"		Orientation		#3	Tilt/Azimuth	3°/-58°	
Number of PV modules		In series		20 modules	In parallel	10 strings	
Total number of PV modules		Nb. modules		200	Unit Nom. Power	330 Wp	
Array global power		Nominal (STC)		66.0 kWp	At operating cond.	59.3 kWp (50°C)	
Array operating characteristics (50°C)		U mpp		664 V	I mpp	89 A	
Sub-array "Sub-array #5"		Orientation		#4	Tilt/Azimuth	3°/22°	
Number of PV modules		In series		18 modules	In parallel	48 strings	
Total number of PV modules		Nb. modules		864	Unit Nom. Power	330 Wp	
Array global power		Nominal (STC)		285 kWp	At operating cond.	256 kWp (50°C)	
Array operating characteristics (50°C)		U mpp		598 V	I mpp	429 A	

Grid-Connected System: Simulation parameters

Sub-array "Sub-array #6"			
Number of PV modules	Orientation #5	Tilt/Azimuth	3°/-30°
Total number of PV modules	In series 20 modules	In parallel	12 strings
Array global power	Nb. modules 240	Unit Nom. Power	330 Wp
Array operating characteristics (50°C)	Nominal (STC) 79.2 kWp	At operating cond.	71.1 kWp (50°C)
	U mpp 664 V	I mpp	107 A
Sub-array "Sub-array #7"			
Number of PV modules	Orientation #6	Tilt/Azimuth	3°/130°
Total number of PV modules	In series 19 modules	In parallel	120 strings
Array global power	Nb. modules 2280	Unit Nom. Power	330 Wp
Array operating characteristics (50°C)	Nominal (STC) 752 kWp	At operating cond.	676 kWp (50°C)
	U mpp 631 V	I mpp	1071 A
Total Arrays global power	Nominal (STC) 1884 kWp	Total	5708 modules
	Module area 11098 m²	Cell area	10003 m²
Inverter			
Custom parameters definition	Model	SUN2000-60KTL-M0_400Vac	
Characteristics	Manufacturer	Huawei Technologies	
	Operating Voltage	200-1000 V	Unit Nom. Power 60.0 kWac
			Max. power (=>30°C) 66.0 kWac
Sub-array "Sub-array #1"	Nb. of inverters	12 * MPPT 17 %	Total Power 120 kWac
			Pnom ratio 1.14
Sub-array "Sub-array #2"	Nb. of inverters	18 * MPPT 17 %	Total Power 180 kWac
			Pnom ratio 1.16
Sub-array "Sub-array #3"	Nb. of inverters	30 * MPPT 17 %	Total Power 300 kWac
			Pnom ratio 1.19
Sub-array "Sub-array #4"	Nb. of inverters	5 * MPPT 17 %	Total Power 50 kWac
			Pnom ratio 1.32
Sub-array "Sub-array #5"	Nb. of inverters	24 * MPPT 17 %	Total Power 240 kWac
			Pnom ratio 1.19
Sub-array "Sub-array #6"	Nb. of inverters	6 * MPPT 17 %	Total Power 60 kWac
			Pnom ratio 1.32
Sub-array "Sub-array #7"	Nb. of inverters	60 * MPPT 17 %	Total Power 600 kWac
			Pnom ratio 1.25
Total	Nb. of inverters	26 (0.2 unused)	Total Power 1550 kWac

PV Array loss factors

Array Soiling Losses		Loss Fraction	3.0 %
Thermal Loss factor	Uc (const) 15.5 W/m²K	Uv (wind)	0.0 W/m²K / m/s
Wiring Ohmic Loss	Array#1 65 mOhm	Loss Fraction	2.0 % at STC
	Array#2 43 mOhm	Loss Fraction	2.0 % at STC
	Array#3 25 mOhm	Loss Fraction	2.0 % at STC
	Array#4 167 mOhm	Loss Fraction	2.0 % at STC
	Array#5 31 mOhm	Loss Fraction	2.0 % at STC
	Array#6 139 mOhm	Loss Fraction	2.0 % at STC
	Array#7 13 mOhm	Loss Fraction	2.0 % at STC
	Global	Loss Fraction	2.0 % at STC
Series Diode Loss	Voltage Drop 0.7 V	Loss Fraction	0.1 % at STC
LID - Light Induced Degradation		Loss Fraction	2.0 %
Module Quality Loss		Loss Fraction	1.0 %
Module Mismatch Losses		Loss Fraction	1.0 % at MPP
Strings Mismatch loss		Loss Fraction	0.10 %
Incidence effect (IAM): User defined profile			

10°	20°	30°	40°	50°	60°	70°	80°	90°
0.998	0.998	0.995	0.992	0.986	0.970	0.917	0.763	0.000

Grid-Connected System: Near shading definition

Project : Packages Mall
Simulation variant : Packages Poly 1.9

Main system parameters

Near Shadings

6 orientations

PV modules

PV Array

Inverter

Inverter pack

User's needs

System type Tables on a building

Linear shadings

Tilt/Azimuth 3°/0°, 3°/150°, 3°/-58°, 3°/22°, 3°/-30°, 3°/130°

Model CS6U - 330P 1000V Pnom 330 Wp

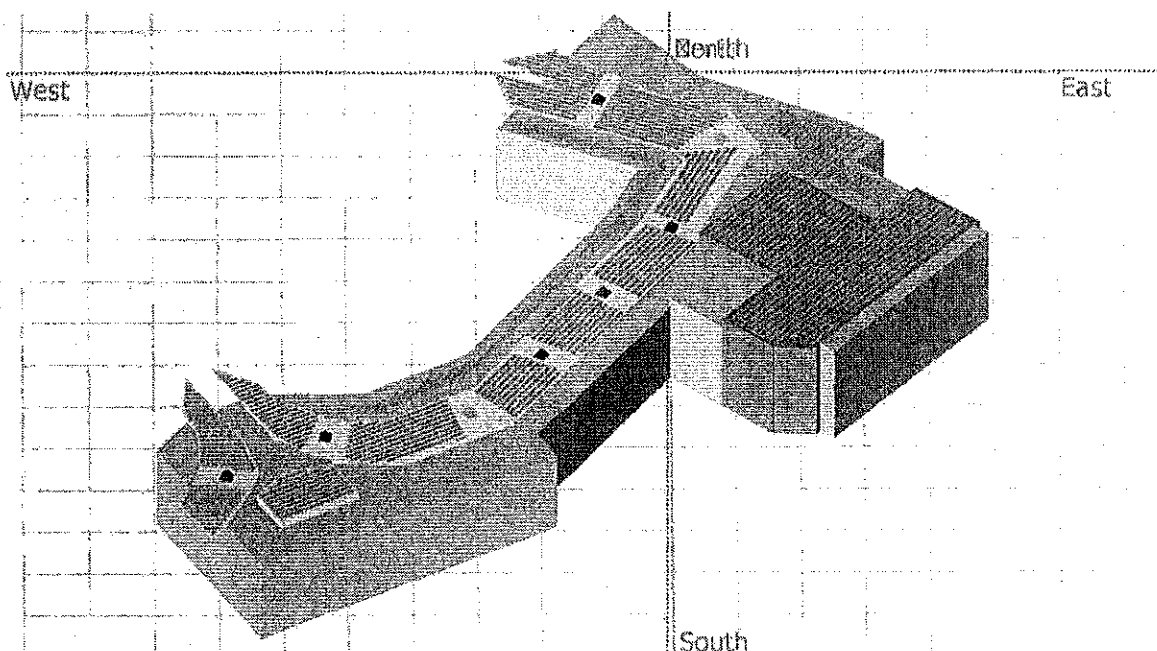
Nb. of modules 5708 Pnom total 1884 kWp

Model SUN2000-60KTL-M0_400Vac 60.0 kW ac

Nb. of units 25.8 Pnom total 1550 kW ac

Unlimited load (grid)

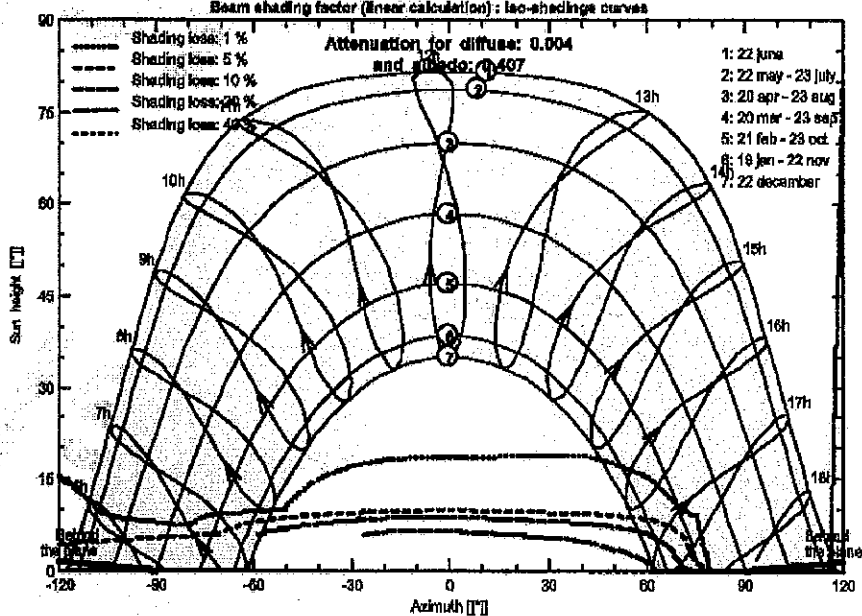
Perspective of the PV-field and surrounding shading scene



Iso-shadings diagram

Packages Mall

Beam shading factor (linear calculation): iso-shadings curves



Grid-Connected System: Main results

Project : Packages Mall
Simulation variant : Packages Poly 1.9

Main system parameters

Near Shadings

6 orientations

PV modules

PV Array

Inverter

Inverter pack

User's needs

System type Tables on a building

Linear shadings

Tilt/Azimuth 3°/0°, 3°/150°, 3°/-58°, 3°/22°, 3°/-30°, 3°/130°

Model CS6U - 330P 1000V

Pnom 330 Wp

Nb. of modules 5708

Pnom total 1884 kWp

Model SUN2000-60KTL-M0_400Vac

60.0 kW ac

Nb. of units 25.8

Pnom total 1550 kW ac

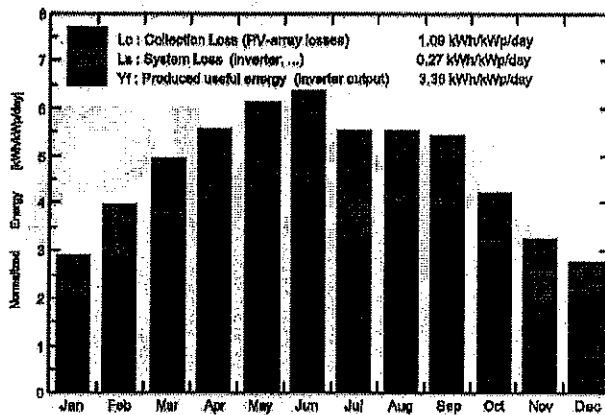
Unlimited load (grid)

Main simulation results

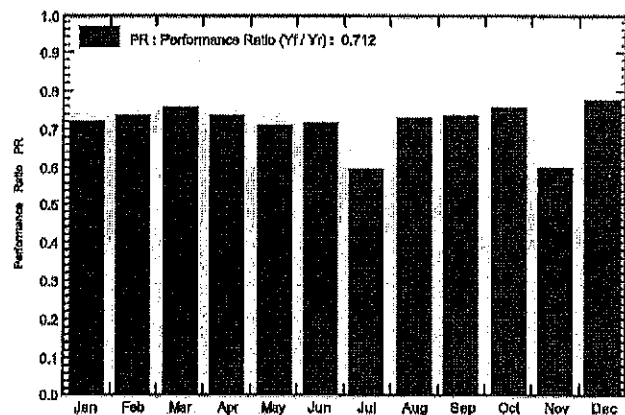
System Production

Produced Energy 2310 MWh/year **Specific prod.** 1226 kWh/kWp/year
Performance Ratio PR 71.22 %

Normalized productions (per installed kWp): Nominal power 1884 kWp



Performance Ratio PR



Packages Poly 1.9 Balances and main results

	GlobHor kWh/m²	DiffHor kWh/m²	T_Amb °C	GlobInc kWh/m²	GlobEff kWh/m²	EArray MWh	E_Grid MWh	PR
January	89.3	44.7	11.38	89.4	82.8	140.8	120.9	0.718
February	111.0	44.9	15.72	111.1	103.6	169.6	153.6	0.734
March	153.4	64.7	21.49	153.7	144.0	226.4	218.7	0.755
April	167.1	86.4	26.70	167.1	156.5	238.6	231.4	0.735
May	169.7	97.4	32.34	169.7	178.2	281.3	253.1	0.708
June	190.4	98.9	32.14	190.5	179.0	284.0	255.7	0.713
July	170.8	103.4	30.80	170.7	169.8	241.7	191.4	0.695
August	171.5	99.2	30.32	171.5	160.8	243.5	236.2	0.731
September	163.5	75.2	28.12	163.6	153.4	233.5	226.4	0.734
October	130.3	64.1	24.87	130.5	121.8	191.0	185.8	0.756
November	97.1	48.2	17.89	97.3	90.1	148.2	110.1	0.601
December	86.1	40.8	13.28	86.3	79.4	134.5	126.4	0.777
Year	1720.2	867.8	23.78	1721.6	1608.8	2492.1	2309.6	0.712

Legends: GlobHor Horizontal global irradiation GlobEff Effective Global, corr. for IAM and shadings
DiffHor Horizontal diffuse irradiation EArray Effective energy at the output of the array
T_Amb Ambient Temperature E_Grid Energy injected into grid
GlobInc Global incident in coll. plane PR Performance Ratio

Grid-Connected System: Loss diagram

Project : Packages Mall

Simulation variant : Packages Poly 1.9

Main system parameters

Near Shadings

6 orientations

PV modules

PV Array

Inverter

Inverter pack

User's needs

System type Tables on a building

Linear shadings

Tilt/Azimuth 3°/0°, 3°/150°, 3°/-58°, 3°/22°, 3°/-30°, 3°/130°

Model CS6U - 330P 1000V Pnom 330 Wp

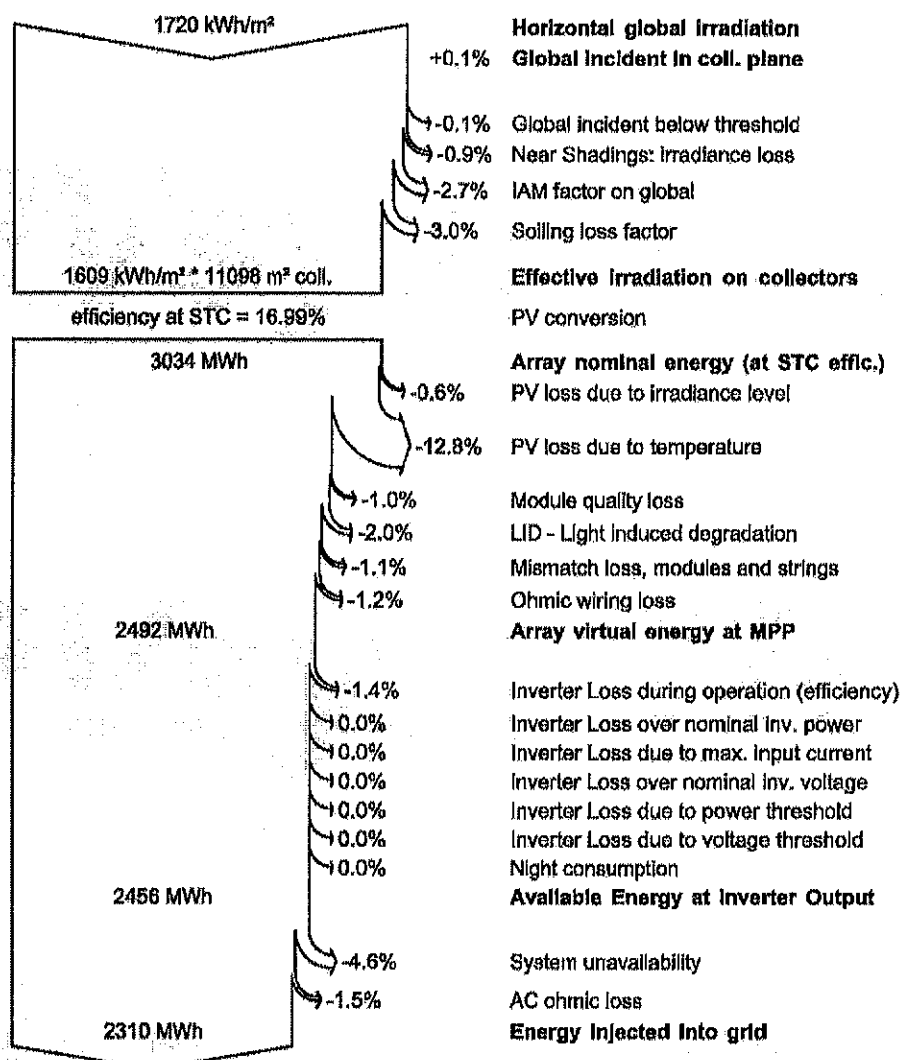
Nb. of modules 5708 Pnom total 1884 kWp

Model SUN2000-60KTL-M0_400Vac 60.0 kW ac

Nb. of units 25.8 Pnom total 1550 kW ac

Unlimited load (grid)

Loss diagram over the whole year



Grid-Connected System: CO2 Balance

Project : Packages Mall

Simulation variant : Packages Poly 1.9

Main system parameters

System type Tables on a building

Near Shadings

Linear shadings

6 orientations

Tilt/Azimuth 3°/0°, 3°/150°, 3°/-58°, 3°/22°, 3°/-30°, 3°/130°

PV modules

Model CS6U - 330P 1000V Pnom 330 Wp

PV Array

Nb. of modules 5708 Pnom total 1884 kWp

Inverter

Model SUN2000-60KTL-M0_400Vac 60.0 kW ac

Inverter pack

Nb. of units 25.8 Pnom total 1550 kW ac

User's needs

Unlimited load (grid)

Produced Emissions

Total: 2976.78 tCO2

Source: Detailed calculation from table below

Replaced Emissions

Total: 30832.7 tCO2

System production: 2309.56 MWh/yr Lifetime: 30 years

Annual Degradation: 1.0 %

Grid Lifecycle Emissions: 445 gCO2/kWh

Source: IEA List

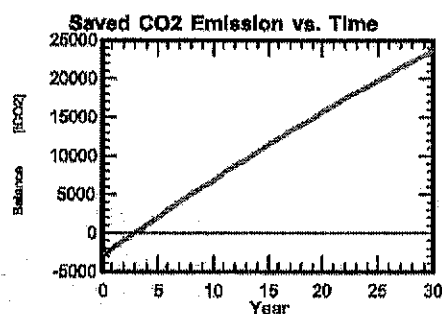
Country: Pakistan

CO2 Emission Balance

Total: 23775.7 tCO2

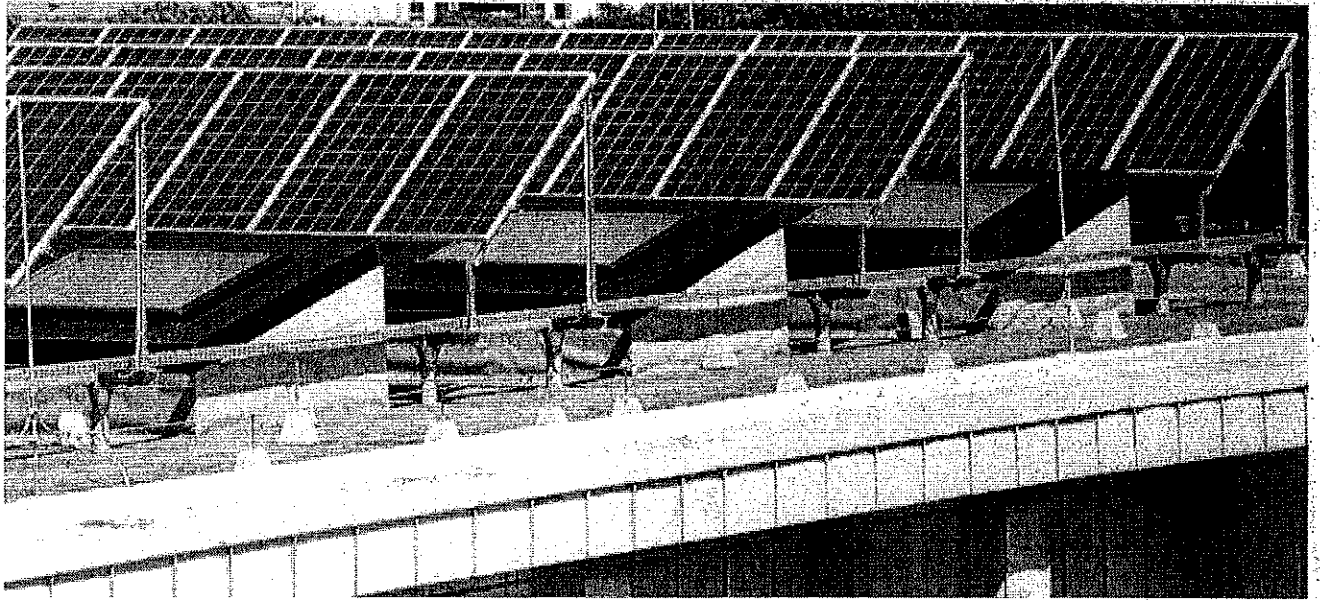
System Lifecycle Emissions Details:

Item	Modules	Supports
LCE	1713 kgCO2/kWp	2.97 kgCO2/kg
Quantity	1651 kWp	50040 kg
Subtotal [kgCO2]	2828249	148526



SECTION 5:

Feasibility Study



**FEASIBILITY STUDY FOR ROOFTOP SOLAR
INSTALLATION AT PACKAGES MALL, WALTON
ROAD, LAHORE**

SHAMS POWER (PVT) LIMITED

Contents

EXECUTIVE SUMMARY	3
Introduction	4
Technical Analysis	5
Site Conditions	5
Technology Review and Selection	5
Technology Selection	5
Plant Characteristics	7
Design Parameters	7
Layout	7
Electrical Design	8
Energy Yield Estimation	9
Simulation Parameters	10
Near Shading Definition	12
Losses	13
Simulation Results	14
Financial Analysis	15
Safety and Emergency Plans	16
Training and Capacity Development	16
Environmental Aspects	17
Socio-Economic Aspects	17
Conclusion	18

EXECUTIVE SUMMARY

The feasibility study examines the costs, practicality, and likely outcome of a solar photovoltaic (PV) installation on the rooftop of Packages Mall, Lahore.

The main outcomes of the feasibility report are given below:

Technical Site Analysis: The project site is suitable for a solar PV energy system. For the purpose of estimation of power generation potential, solar insolation is assumed to be "good" (1,719 kWh/ square meter/ year). Panel azimuths (0, 150, -58, 22, -30, 130 degrees), panel tilt (3 degrees) and satisfactory roof condition and structure are also assumed.

Anticipated System Information: The project will accommodate a 1,897 kWp (DC) solar PV system with a projected annual production of 2,310 MWh/ year. Use of a Canadian Solar Inc. CS6U – 330P (330 watt) PV panel as a basis for design will result in an acceptable system weight density of 2.5 lbs/SF. The system will offset approximately 1,014 tons of carbon dioxide annually.

Financial Analysis: Whilst the parent companies of Shams Power have very strong balance sheets and can finance the project on 100% equity, nevertheless, this project will be financed on a 25% equity and 75% debt model. The total estimated project cost is USD 1,261,505

Based on the technical and financial analysis, the installation of a 1,897kWp Solar PV System on the rooftop of Packages Mall, Lahore is deemed to be feasible.

Introduction

The project site is the rooftop of Packages Mall, Walton Road, Lahore Pakistan. Packages Mall is a double storied commercial building/retail store. The exact coordinates of the project site are:

Latitude: 31°28'16.37" North

Longitude: 74°21'21.45" East

A bird's eye view of the project site is given in the figure below:

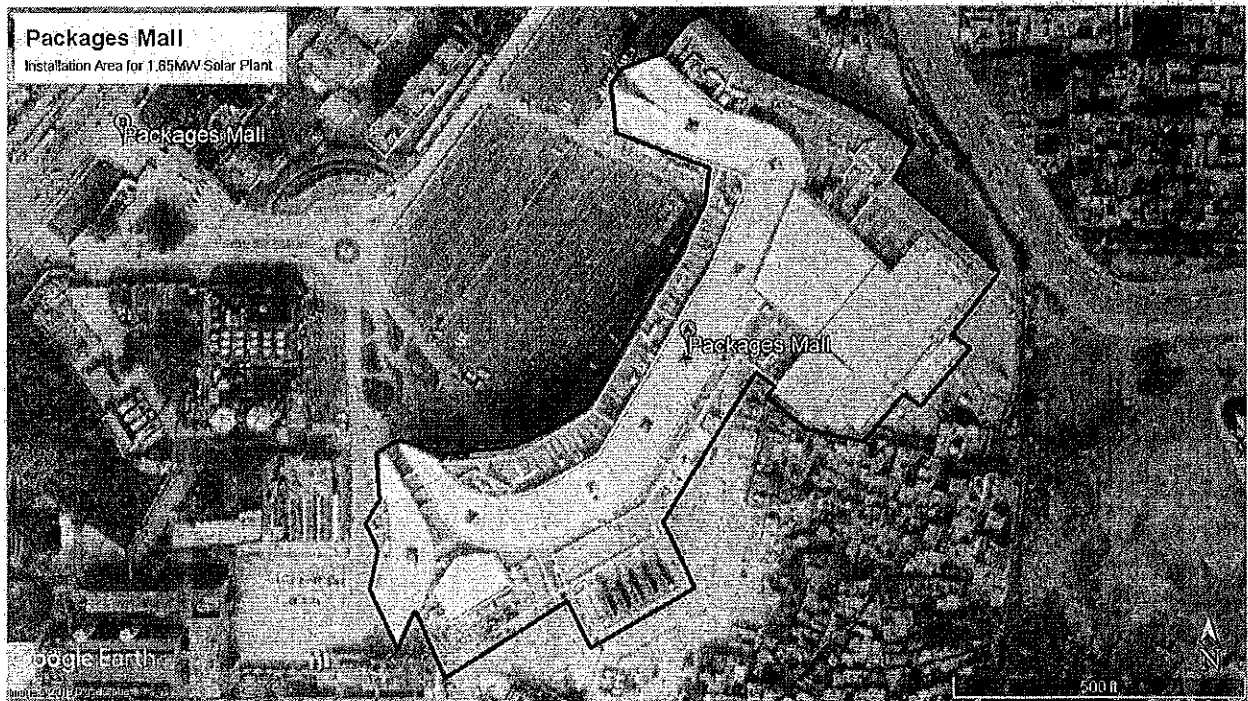


Figure 1: Overview of Project Site

Technical Analysis

Site Conditions

The following tasks were carried out:

- Global Horizontal Irradiation, annual and inter-annual variation was assessed.
- Near shading objects were taken into account for placement of PV modules.
- Area required for selected module technology was calculated. Keeping in view available area and minimum inter row shading, tilt angle and appropriate spacing was calculated from near shading objects.

Details of the finalized parameters are given under section 3.5.1

Technology Review and Selection

Technology Selection

PV Modules:

S. No	Specification	Data
1	Type of Module	CS6U-330P
2	Type of Cell	Polycrystalline
3	Dimensions of each module	1960*992*35 mm
4	Weight	22.4 Kg
5	No of Modules	5,748
6	Module Area	1.94432 m ²
7	Total Land Area Used	Roof Top
8	Module Frame	Anodized aluminum alloy
9	Nominal Max. Power (Pmax)	330 W
10	Opt. Operating Voltage (Vmp)	37.2 V
11	Opt. Operating Current (Imp)	8.88 A
12	Open Circuit Voltage (Voc)	45.6 V
13	Short Circuit Current (Isc)	9.45 A
14	Module Efficiency	16.97%
15	Operating Temperature	-40°C ~ +85°C
16	Max. System Voltage	1000 V (IEC) or 1000 V (UL) or 600 V (UL)
17	Module Fire Performance	TYPE 1 (UL 1703) or CLASS C (IEC 61730)

PV Array

S. No	Specification	Data
1	No of Strings	310
2	Modules in String	Three Arrangements 18, 19, 20

PV Capacity

S. No	Specification	Data
1	Total Site	1,897 KW Peak
2	Net Capacity Factor	16.9 %

Inverters

S. No	Specification	
1	Manufacturer	Huawei
2	Capacity of each Unit	60 KW
3	No of Inverters	26
4	MPP Input Voltage Range	200 V to 1000 V
5	Rated Input Voltage	600 V
6	Max Input Voltage	1100 V
7	Total Power (AC)	1,560 KW
8	Max Input Current Input per MPPT	22A
9	Max Output Current	95.3 A
10	Output Electrical System	3 Phase AC (4 Wire)
11	AC Nominal Voltage	230/400 V
12	Rated Power Frequency	50 Hz
13	Efficiency	98.7%
14	Relative Humidity (Non-Condensing)	100%
15	Degree of Protection	IP65

PV Mounting Structure

S. No	Specification	Data
1	Structure	Aluminum rails and clamps
2	Tilt of Array Frame	3°

Data Collecting System

S. No	Specification	Data
1	System Data	Continuous on-line logging and monitoring over web portal

Solar PV Yield Estimation and Simulation

The aim of yield estimation is to predict the average annual energy output of the site. PvSyst software is used for simulation and near shading analysis.

Working Conditions

The solar system will have automatic mechanism to ensure that PV power currently generated by the inverters always matches the current power consumption of the site

load. A closed loop control system of inverter AC output is implemented in reference to energy flow at grid connection point which will reduce inverter AC output of the inverter if site load will be less than the solar production in case of Load shedding.

Plant Characteristics

Generation Voltage: 230/400 V three phase four wire system

Power Factor at rated power: 1

Frequency: 50 Hz

Generation characteristic: Inverter has built-in features of controllable active power ramp following grid disturbance or normal connection, voltage regulation and frequency response. There are no additional control metering and instrumentations.

Design Parameters

The following tasks were carried out for PV layout and shading.

- Assessment of shading (horizon and nearby building)
- Outline layout of area suitable for PV development
- Designing row spacing to reduce inter-row shading and associated shading losses.
- Designing the layout to minimize cable runs and associated electrical losses
- Creating access routes and sufficient space to allow movement for maintenance purposes
- Choosing a tilt angle that optimizes the annual energy yield according to the latitude of the site and the annual distribution of solar resource
- Module cleaning strategy
- Simulating the annual energy losses associated with various configurations of tilt angle, orientation and row spacing. The optimized configuration and simulation results are given in section "Energy Yield Prediction"
- PV layouts of the site are given in 3D and 2D view in the following section.

Layout

The detailed layout (2D and 3D) of the solar panels is given below; PV layout may change depending upon site constraints before or during installation. PvSyst simulation is also performed as per following layout:

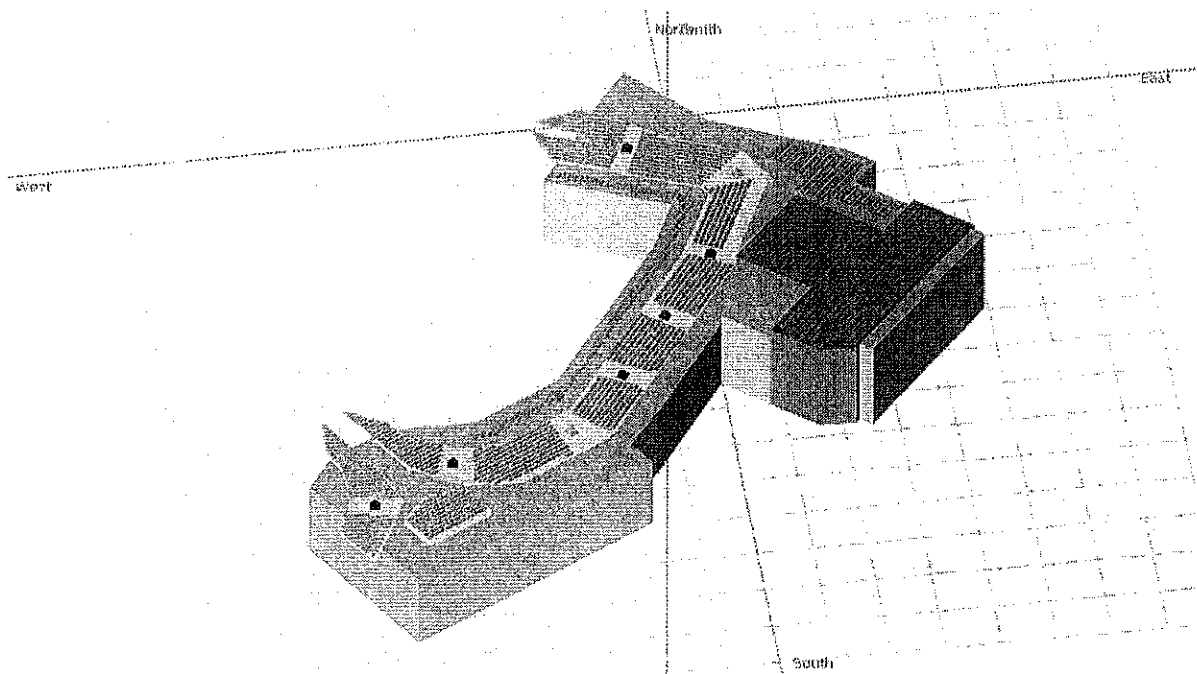


Figure 2: 3D Layout of rooftop of Packages Mall, Lahore

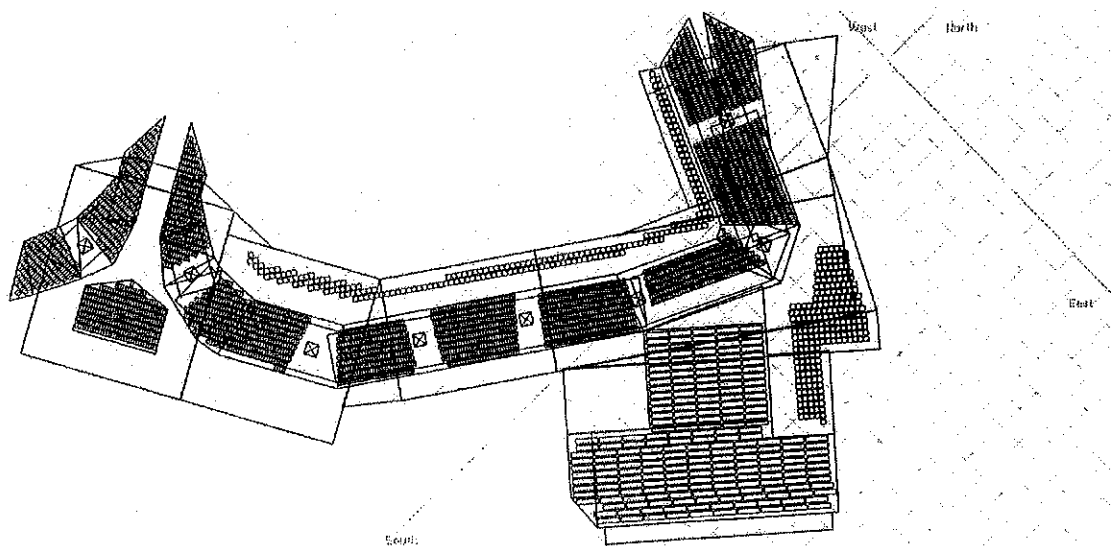


Figure 3: 2D Layout of rooftop of Packages Mall Lahore, showing solar panel locations

Electrical Design

The electrical system comprises the following components:

- Array(s) of PV modules
- DC/AC cabling (module, string and main cable)
- DC connectors (plugs and sockets)
- Disconnects/switches

- Protection devices e.g. fuses, surge protective devices, breakers
- Energy Meters
- Earthing

The single line diagram is given below. The single line diagram includes the protection devices that will be used for safe and smooth operation of the system.

Protections DC Side: String Fuses, Surge Protective Device and DC Disconnect Switches

Protections AC Side: MCBs, Main Breaker and Surge Protective Device

Single Line Diagram of
1.897 MW Grid Tied PV Power Plant for Packages Mall, Lahore

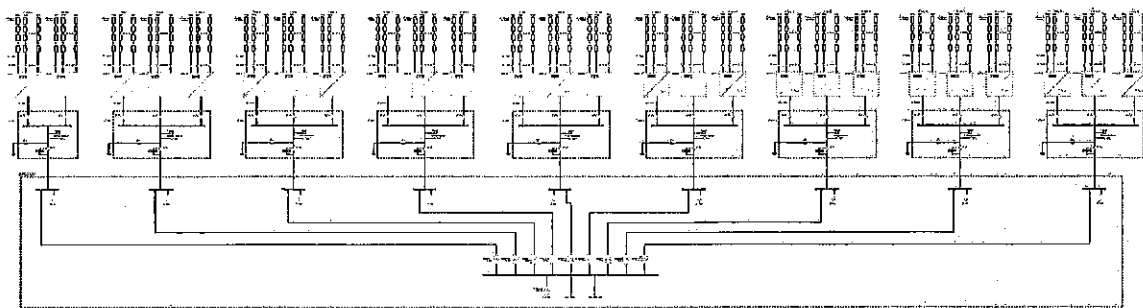


Figure 4: Single Line Diagram of PV Plant

Energy Yield Estimation

The energy yield prediction provides the basis for calculating project revenues. The aim is to predict the average annual energy output for the lifetime of the proposed power plant.

To estimate accurately the energy produced from a PV power plant, information is needed on the solar resource and temperature conditions of the site. Also required are the layout and technical specifications of the plant components.

A number of solar energy yield prediction software packages are available in the market. These packages use time step simulation to model the performance of a project over the course of a year. PvSyst software has been used for energy yield prediction for this site and its results are given below.

Details of the simulation steps are presented in the following sections:

Simulation Parameters

PVSYST V6.78		22/02/19		Page 1/7	
Grid-Connected System: Simulation parameters					
Project :		Packages Mall			
Geographical Site		Lahore		Country	Pakistan
Situation		Latitude	31.55° N	Longitude	74.33° E
Time defined as		Legal Time	Time zone UT+5	Altitude	219 m
		Albedo	0.20		
Meteo data:		Beacon House DHA Lahore Meteonorm 7.1 (1981-1990) - Synthetic			
Simulation variant :		Packages Poly 1.9			
		Simulation date	22/02/19 17h05		
Simulation parameters		System type		Tables on a building	
6 orientations		tilts/azimuths		3°/0°, 3°/150°, 3°/-58°, 3°/22°, 3°/-30°, 3°/130°	
Sheds configuration		Nb. of sheds		3910	
		Sheds spacing		Collector width	1.99 m
Shading limit angle		Limit profile angle	10.0°	Ground cov. Ratio (GCR)	77.1 %
Models used		Transposition	Pérez	Diffuse	Pérez, Meteonorm
Horizon		Free Horizon			
Near Shadings		Linear shadings			
User's needs :		Unlimited load (grid)			
PV Arrays Characteristics (7 kinds of array defined)					
PV module		Si-poly	Model	CS6U - 330P 1000V	
Custom parameters definition		Manufacturer	Canadian Solar Inc.		
Sub-array "Sub-array #1"		Orientation	#1	Tilt/Azimuth	3°/0°
Number of PV modules		In series	18 modules	In parallel	23 strings
Total number of PV modules		Nb. modules	414	Unit Nom. Power	330 Wp
Array global power		Nominal (STC)	137 kWp	At operating cond.	123 kWp (50°C)
Array operating characteristics (50°C)		U mpp	598 V	I mpp	205 A
Sub-array "Sub-array #2"		Orientation	#2	Tilt/Azimuth	3°/150°
Number of PV modules		In series	18 modules	In parallel	35 strings
Total number of PV modules		Nb. modules	630	Unit Nom. Power	330 Wp
Array global power		Nominal (STC)	208 kWp	At operating cond.	187 kWp (50°C)
Array operating characteristics (50°C)		U mpp	598 V	I mpp	312 A
Sub-array "Sub-array #3"		Orientation	#3	Tilt/Azimuth	3°/-58°
Number of PV modules		In series	18 modules	In parallel	80 strings
Total number of PV modules		Nb. modules	1080	Unit Nom. Power	330 Wp
Array global power		Nominal (STC)	356 kWp	At operating cond.	320 kWp (50°C)
Array operating characteristics (50°C)		U mpp	598 V	I mpp	536 A
Sub-array "Sub-array #4"		Orientation	#3	Tilt/Azimuth	3°/-58°
Number of PV modules		In series	20 modules	In parallel	10 strings
Total number of PV modules		Nb. modules	200	Unit Nom. Power	330 Wp
Array global power		Nominal (STC)	66.0 kWp	At operating cond.	59.3 kWp (50°C)
Array operating characteristics (50°C)		U mpp	664 V	I mpp	89 A
Sub-array "Sub-array #5"		Orientation	#4	Tilt/Azimuth	3°/22°
Number of PV modules		In series	18 modules	In parallel	48 strings
Total number of PV modules		Nb. modules	864	Unit Nom. Power	330 Wp
Array global power		Nominal (STC)	285 kWp	At operating cond.	256 kWp (50°C)
Array operating characteristics (50°C)		U mpp	598 V	I mpp	429 A

PVSYST V6.78

22/02/19

Page 2/7

Grid-Connected System: Simulation parameters

Sub-array "Sub-array #6"

Number of PV modules

Total number of PV modules

Array global power

Array operating characteristics (50°C)

Orientation

In series

Nb. modules

Nominal (STC)

U mpp

#5

20 modules

240

79.2 kWp

684 V

Tilt/Azimuth

In parallel

Unit Nom. Power

At operating cond.

I mpp

3°/30°

12 strings

330 Wp

71.1 kWp (50°C)

107 A

Sub-array "Sub-array #7"

Number of PV modules

Total number of PV modules

Array global power

Array operating characteristics (50°C)

Orientation

In series

Nb. modules

Nominal (STC)

U mpp

#6

19 modules

2280

752 kWp

631 V

Tilt/Azimuth

In parallel

Unit Nom. Power

At operating cond.

I mpp

3°/130°

120 strings

330 Wp

678 kWp (50°C)

1071 A

Total

Arrays global power

Nominal (STC)

Module area

1884 kWp

11098 m²

Total

Cell area

5708 modules

10003 m²

Inverter

Custom parameters definition

Characteristics

Model

Manufacturer

Operating Voltage

SUN2000-60KTL-M0_400Vac

Huawei Technologies

200-1000 V

Unit Nom. Power

Max. power (≥30°C)

60.0 kWac

66.0 kWac

Sub-array "Sub-array #1"

Sub-array "Sub-array #2"

Sub-array "Sub-array #3"

Sub-array "Sub-array #4"

Sub-array "Sub-array #5"

Sub-array "Sub-array #6"

Sub-array "Sub-array #7"

Total

Nb. of inverters

Nb. of inverters

Nb. of inverters

Nb. of inverters

Nb. of inverters

Nb. of inverters

Nb. of inverters

Nb. of inverters

12 * MPPT 17 %

18 * MPPT 17 %

30 * MPPT 17 %

5 * MPPT 17 %

24 * MPPT 17 %

6 * MPPT 17 %

60 * MPPT 17 %

26 (0.2 unused)

Total Power

Total Power

Total Power

Total Power

Total Power

Total Power

Total Power

Total Power

120 kWac

180 kWac

300 kWac

50 kWac

240 kWac

60 kWac

600 kWac

1550 kWac

Prdm ratio

Prdm ratio

Prdm ratio

Prdm ratio

Prdm ratio

Prdm ratio

Prdm ratio

Prdm ratio

1.14

1.16

1.19

1.32

1.19

1.32

1.25

PV Array loss factors

Array Soiling Losses

Thermal Loss factor

Wiring Ohmic Loss

Series Diode Loss

LID - Light Induced Degradation

Module Quality Loss

Module Mismatch Losses

Strings Mismatch loss

Incidence effect (IAM): User defined profile

Uc (const)

Array#1

Array#2

Array#3

Array#4

Array#5

Array#6

Array#7

Global

Voltage Drop

15.5 W/m²K

65 mOhm

43 mOhm

25 mOhm

167 mOhm

31 mOhm

139 mOhm

13 mOhm

0.7 V

Loss Fraction

Loss Fraction

Loss Fraction

Loss Fraction

Loss Fraction

Loss Fraction

Loss Fraction

Loss Fraction

Loss Fraction

Loss Fraction

3.0 %

2.0 % at STC

2.0 % at STC

2.0 % at STC

2.0 % at STC

2.0 % at STC

2.0 % at STC

2.0 % at STC

0.1 % at STC

2.0 %

1.0 %

1.0 % at MPP

0.10 %

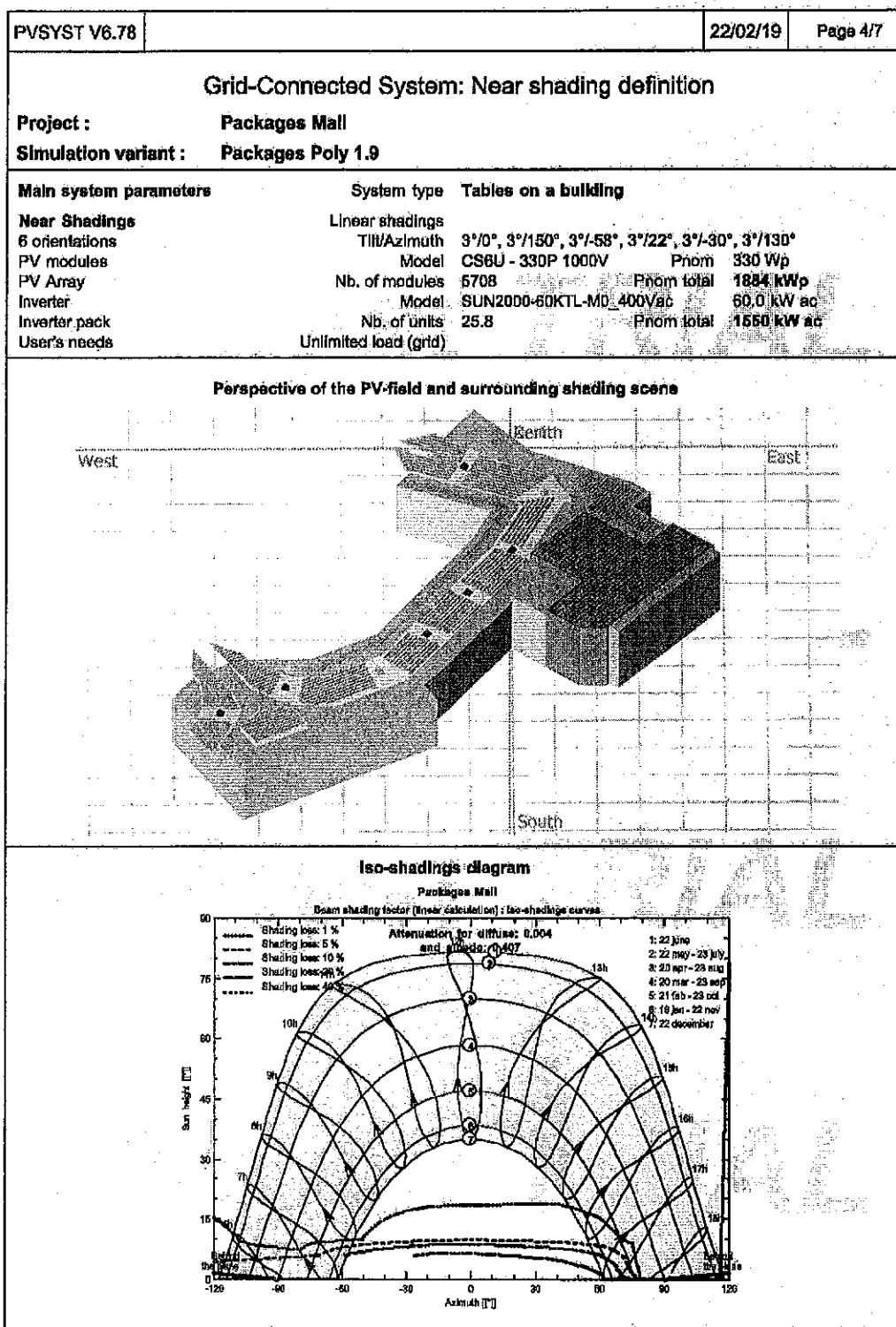
Uv (wind)

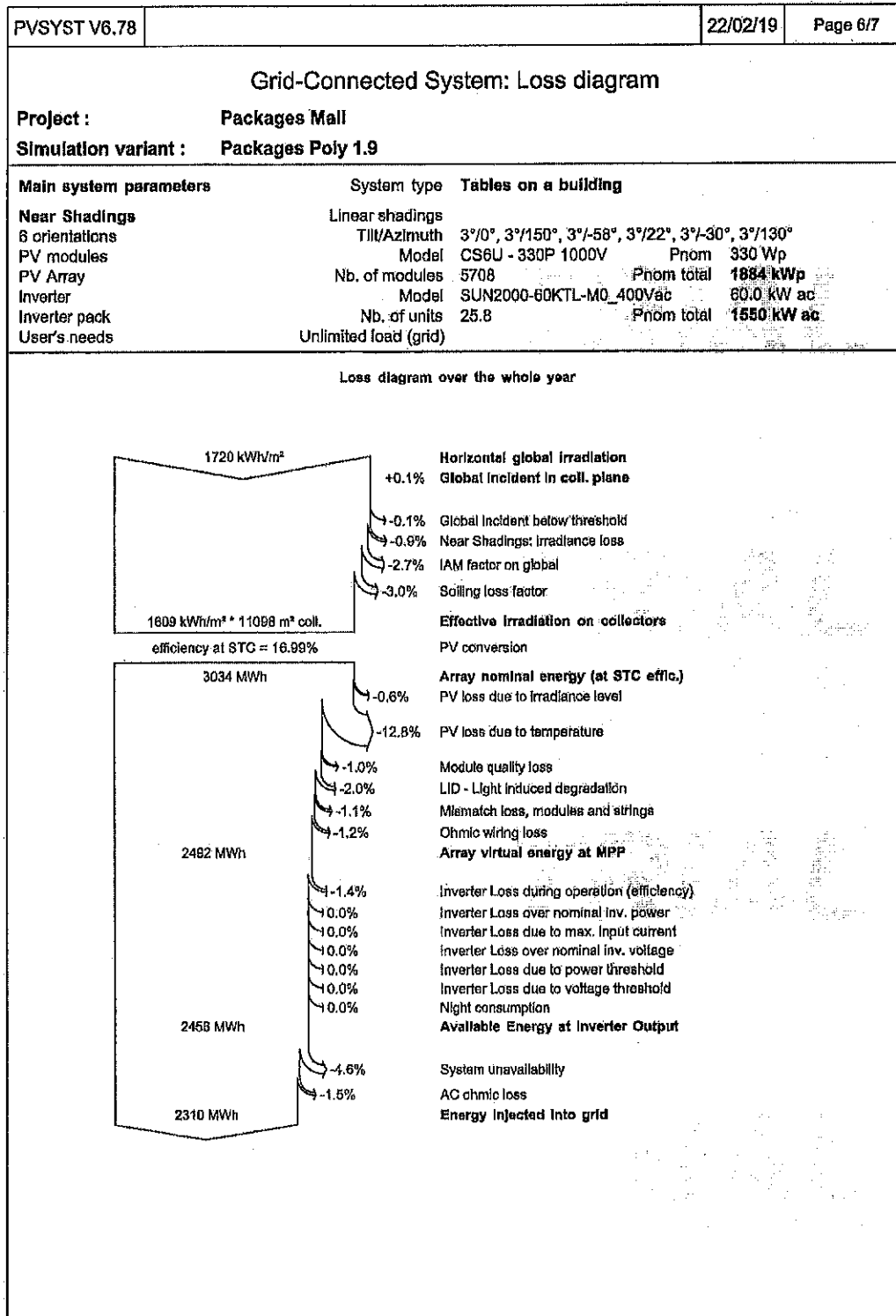
Uv (wind)

0.0 W/m²K / m/s

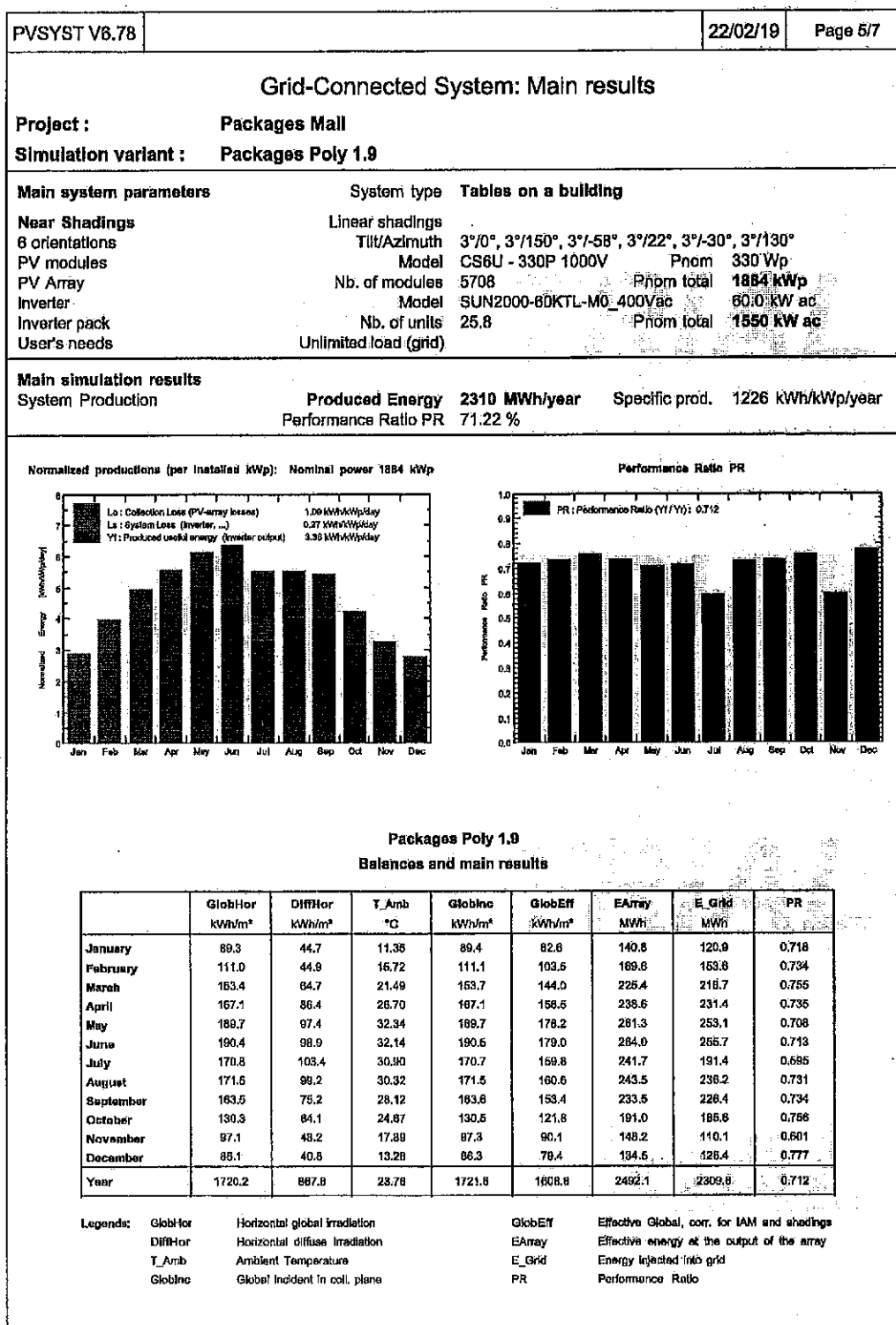
0.0 W/m²K / m/s

10°	20°	30°	40°	50°	60°	70°	80°	90°
0.998	0.998	0.995	0.992	0.986	0.970	0.917	0.763	0.000





Simulation Results



Financial Analysis

Cost/watt: USD 0.665

Total Project Cost for 1,897 KWp (DC) Solar PV System: **USD 1,261,505**

Equity: 25%

Debt: 75%

Safety and Emergency Plans

- Only qualified and authorized electricians will be allowed to undertake servicing or maintenance tasks.
- The authorized personnel will wear appropriate equipment, including a safety harness to restrain from falling off the roof, sturdy shoes that will have thick rubber soles to provide electrical insulation and good grip and appropriate clothing for personal protection, including a hat, sunglasses, gloves and long pants and sleeves
- Lock out and tag out procedures will be used before commencement of maintenance tasks.
- On-going operation and maintenance concerns for solar power systems will be addressed properly. These systems are exposed to outdoor weather conditions that enhance the aging process, and the infrastructure needs to be in place for the on-going maintenance of these systems to assure their safe operation.
- Properly grounded or double insulated power tools will be used for maintenance tasks. Tools will be maintained in good condition.
- Working on electrical equipment and circuits will be carried out in de energized state.
- Proper pathways will be available for operation, maintenance and firefighting.
- Fire protection and suppression will be placed at site

Training and Capacity Development

Trained and qualified personnel will be available at site 24/7 with proper safety and firefighting training. Training program will focus on but not limited to Solar Resource Assessment, Site Survey, Technology, Engineering Design, Regulation, Policy, Metering & Billing, and Project Management of Rooftop Solar System. The following components will include in training and development program.

- a. Collection of Resource Data
- b. Variability and uncertainty of resource data
- c. Site evaluation
- d. Crystalline and Thin film technology comparison
- e. Rooftop solar system components
- f. Module mounting structure selection
- g. Inverter selection
- h. Design of PV Array
- i. Shadow Analysis
- j. DC cable sizing
- k. DC cable layout
- l. Protection and Metering
- m. Installation and testing standards for solar PV plants
- n. Solar Module testing standards
- o. Economy of Roof top Solar System
- p. Detailed Project Report
- q. Operation and maintenance of rooftop solar system
- r. Safety and firefighting training

Environmental Aspects

Every energy generation and transmission method affects the environment. Conventional generating options can damage air, climate, water, land and wildlife, landscape as well as raise the levels of harmful radiation. PV technology is substantially safer offering a solution to many environmental and social problems associated with fossil and nuclear fuels. Solar PV energy technology provides obvious environmental advantages in comparison to the conventional energy sources thus contributing to the sustainable development of human activities. Not counting the depletion of the exhausted natural resources, their main advantage is related to the reduced CO₂ emissions and normally absence of any air emissions or waste products during their operation.

The use of solar power has additional positive implications such as:

- Reduction of the emissions of the greenhouse gases (mainly CO₂, NO_x) and prevention of toxic gas emissions (SO₂, particulates)
- Reduction of the required transmission lines of the electricity grids

Socio-Economic Aspects

In regard to the socio-economic viewpoint, the benefits of exploitation of solar PV system comprise of:

- Increase of the regional/national energy independency
- Provision of significant work opportunities
- Diversification and security of energy supply
- Support of the deregulation of energy markets

Conclusion

This feasibility study is conducted to ascertain the technical feasibility and commercial viability of installation of 1,897 kW rooftop PV system installations at Packages Mall, Lahore.

Installation of the PV system will result in annual power generation of 2,310 MWh.

The results of the financial analysis indicate that the project is feasible.

Based on the outcomes of both the technical and financial analysis, the project is deemed to be viable.