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| DACUM Panel  **Engr. Safdar Qureshi**  Safroon Energy Services (Pvt.) Ltd.  **Malik Sameen Khan**  CEO Sky Green, Nowshera  **Engr, Asfandyaar Khan**  Sr. Engr. SPT (Solar Wing)  **Engr. Ashraf Khan**  GATTC Peshawar  **Mr. Muhammad Sadiq Orakzai**  Principal GATTC Peshawar  **Mr. Wisal Khan**  GATTC, Peshawar  **Mr. Muhammad Ayaz Khan**  GATTC, Peshawar  **Engr. Shahab**  Project Engineer renewable Power  **Mr. Muhammad Sohail**  Trade testing Board Peshawar  **Mr. Sajjad Ali**  Ali Hyder and Co.  **Mr. Sohaib Fida Khan Tanoli**  GIZ Pakistan  **Mr. Muhammad Naeem Akhtar**  GIZ Pakistan  DACUM Facilitator  **Engr. Abdul Maqsood**  Principal GPI, Mardan  **Co-Facilitators**  **Ms. Bisma Sahir**  Akhund Consultants, Faisalabad | Occupational Analysis  of  National Vocational Qualification for  Building Electrician “Solar PV system Technician level 4”  Image result for NAVTTC logo  November, 2017  Peshawar KPK  National Vocational & Technical Training Commission (NAVTTC)  Government of Pakistan |

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| **A1.** Carryout load assessment   1. **Conduct site assessment for Solar PV system installation** | **A2.** Perform shadow analysis | **A3**. Assess wiring requirements | **A4**. Identify the south direction for mounting structure |
| **A5.** Evaluate the site for Solar PV system installation |  |  |  |
| **B1.** Prepare checklist for job  **B. Interpret job document** | **B2.** Interpret schematic diagram | **B3.** Record the data | **B4**. Prepare log sheet for general maintenance |
| **C1.** Arrange required tools and eqipment  **C. Install solar PV system** | **C2.** Perform PV test | **C3.** Erect the mounting structure | **C4.** Fix PV modules |
| **C5.** Connect the PV modules as per circuit diagram |  |  |  |
| **D1.** Interpret wiring diagram  **D. Perform wiring for Solar PV system** | **D2.** Lay cables | **D3.** Perform continuity test | **D4**. Carryout battery test |
| **D5.** Connect PV system with battery and invertor | **D6.** Configure invertor | **D7.** Verify proper working of the system through load execution test |  |
| **E1.** Assess existing condition of unit  **E. Troubleshoot Solar PV system** | **E2.** Identify nature of the fault | **E3.** Perform diagnostic test | **E4**. Document the fault |
| **E5.** Identify solution of the faults | **E6**. Report the fault to the concerned persons | **E7**. Rectify the faults | **E8**. Carryout post rectification function test |
| **F1.** Prepare check list for maintenance  **F. Maintain PV solar system** | **F2.** Follow routine maintenance log sheet | **F3.** Maintain Solar PV modules | **F4.** Maintain invertor |
| **F5.** Maintain battery bank | **F6.** Maintain protective circuits | **F7.** Perform post verification function of the system |  |
| **G1**. Ensure Personal saftey  **G. Adopt safety precautions** | **G2.** Ensure workplace safety. | **G3**. Ensure saftey of tools and equipment | **G4**. Ensure PV system safety |
| **H1**. Calculate load  **H. Perform basic Design** | **H2.** Assess working schedule of load | **H3**. Determine backup time | **H4**. Workout size and configuration of PV panels, batteries, invertor, convertors cables and protection devices |
| **I1**. Develop basic computer operating skills  **I. Develop basic professional skills** | **I2.** Develop basic communication skills. | **I3**. Develop basic marketing skills | I4. Identify Need of the market |
| **I5.** Follow environmental health and saftey standards |  |  |  |

Additional Information for Building Electrician “Solar PV system Technician”

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| Worker traits   * Dedicated * Honest * Supportive * Physically fit * Weather adaptive * Committed * Decision maker | Entry Requirements  Literate and have working knowledge | Duration of Training Required  To be decided later | Career Paths  Entrepreneur  Trainer  Supervisor  Marketer / Merchandiser |
| **Related Knowledge**   * Basic measurements * Basic calculations * Uses of measuring tools and instruments * Use of shadow detector and PV Analyzer * Basic concepts of electricity and solar technology * Understand schematic symbols of components * Understanding of Electrical Drawings * Mechanical Aptitude and accessories * Sizes and capacities of wiring cables * Types of building wiring accessories and channel ducts, conduits etc. * Difference between AC and DC cables and appliances * Types of Jointing and insolation * Uses of MC4 connector * Concepts of parallel and series connections * Use of operational manuals * Data Sheets of equipment * Types of diagnostic tests * Use of Gravity meter and Battery tester * Cleaning materials and appropriate timings * Uses of personal protective equipment * Features and configuration of charge controller, invertors, converters * PWM and MPPT devices * Understanding of strings and Array of PV Panels * Types of Batteries and their configuration * Sequence of connecting power sources with invertor/charge controllers * How to deal with hazardous * Risk Management * Product knowledge * Importance of junctions box, breaker box * Earthling equipment including surge protector and light arrester * Technical drawings | | Combination plier  long nose Plier  Cable Cutter  Cable Cutter  Cable Cutter  Claw Hammer  Hammer  Screw Driver Set  mini Screw Driver Set  Screw Driver Set (metal head type)  Hammer  Cable Knife/paper cutter  Wire Striper/insulation remover  Soldering Iron with Stand  Sucker  Tool box  Bench vice  Angle Grinder  Mini Drill machine  Drill Machine Rotary Hammer  Drill Machine  Cordless Drill machine  Extension board  Chisel  Chisel  Torpedo level / spirit level  Compass  Adjustable Wrench  Adjustable Wrench  Richet Set  Spanner Set  Torque wrench with deep sockets  pipe wrench  welding plant With holder and lead  Thimble press  Electric blower  Heat gun  Measuring Tape  Measuring Tape  Measuring Tape  Hack Saw With blades  File Set  File Set  L-key Set  Fish Tape  wood Saw  Hole Saw For panel  Hole Saw For panel  Hole Saw For panel  Wooden Bit Set  twist Drill bit Set  Tap and Die Set  [Hand Tin Scissors](http://www.ebay.com/itm/Hand-Tin-Scissors-Sheet-metal-cutter-Nibbler-straight-/231840138781?hash=item35fabfc61d:g:3LAAAOSwMmBViblp)  pipe vice with Stands  Scissor  Tuser  Gas Cutting torch with Oxygen And LPG Cylinders  Magnetic wristband for holding bits and parts  Hot Melt Glue Gun 20W  Tool Belt | |