

Model Curriculum

Solar Off-Grid Entrepreneur

SECTOR: GREEN JOBS
SUB-SECTOR: RENEWABLE ENERGY
OCCUPATION: Entrepreneur
REF ID: SGJ/Q0118, V1.0
NSQF LEVEL: 5



Certificate

CURRICULUM COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

SKILL COUNCIL FOR GREEN JOBS

for the

MODEL CURRICULUM

Complying to National Occupational Standards of Job Role/
Qualification Pack: **'Solar Off grid Entrepreneur'** OP No. **'SGJ/Q 0118 NSQF Level 5'**

Date of Issuance: **October 16th, 2017**

Valid up to: **September 30th, 2019**

* Valid up to the next review date of the Qualification Pack



Authorised Signatory
(Skill Council for Green Jobs)

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Solar Off Grid Entrepreneur

CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a “Solar Off Grid Entrepreneur”, in the “Green Jobs” Sector/Industry and aims at building the following key competencies amongst the learner

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|--|--|----------------------------|---------------------------|
| Program Name | Solar Off-Grid Entrepreneur | | |
| Qualification Pack Name & Reference ID. | SGJ/Q0118, v1.0 | | |
| Version No. | 1.0 | Version Update Date | 01 th Aug 2017 |
| Pre-requisites to Training | 12 th Pass Preferably | | |
| Training Outcomes | After completing this programme, participants will be able to: <ul style="list-style-type: none"> • Develop Solar lighting solutions business • Develop solar PV pumping business • Develop Solar PV off-grid power plant business • Entrepreneurship Skills • Maintain personal health & safety at project site • Work effectively with others | | |

This course encompasses 6 out of 6 National Occupational Standards (NOS) of “Solar off-grid Entrepreneur” Qualification Pack issued by “Skill Council for Green Jobs”.

| S. No | Module | Key Learning Outcomes | Equipment Required |
|-------|---|--|---|
| 1 | <p>Introduction to Solar off-grid PV Sector in India</p> <p>Theory Duration (hh:mm) 12:00</p> <p>Practical Duration (hh:mm) 12:00</p> <p>Introduction Module</p> | <ul style="list-style-type: none"> overview of solar PV technology different types of Solar PV Off-grid products different applications of Solar PV Off-Grid appliances. Understand the market segments for different solar off-grid products. understand the various market research reports and industrial magazines present in the market. | |
| 2 | <p>Development solar lighting solutions business</p> <p>Theory Duration (hh:mm) 12:00</p> <p>Practical Duration (hh:mm) 24:00</p> <p>Corresponding NOS Code SGJ/N0142</p> | <ul style="list-style-type: none"> assess the market and evaluate the market trends to decide the strategy for sale analyze the economic profile and power consumption trends identify market opportunities and potential customers identify the customer requirements for solar home lightening systems, solar lanterns, solar street lights, etc. display and demonstrate these systems in your shop or at places of public gatherings identify manufacturers and suppliers in the nearby areas procure the required systems from the manufacturers or their dealers display and demonstrate the solar home lightening systems, solar lanterns, solar street lights, etc. in places of public gatherings Ensure the sales of the system check all components of solar lighting system including cables while selling register the product and handover warranty card to the customer demonstrate the safe operation and maintenance of solar home lighting demonstrate the safe operation and maintenance of solar lanterns demonstrate the safe operation and maintenance of solar street lights attend and resolve customer queries | Home-lighting system solar street light, and solar lantern with all accessories for demonstration |
| 3 | <p>Develop solar PV Pumping business</p> <p>Theory Duration (hh:mm) 12:00</p> | <ul style="list-style-type: none"> identify areas with no electric grid or with long power cuts study the drinking and irrigation water requirement of the user/s and it is being presently met | solar PV water pumping system with all accessories for demonstration, |

| | | | |
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| | <p>Practical Duration (hh:mm) 24:00</p> <p>Corresponding NOS Code SGJ/N0143</p> | <ul style="list-style-type: none"> • study the depth of the water/ ground water source and the quantity/recharge period • study the solar irradiance at the site • create relevant solar pumping model of appropriate capacity and specifications • prepare cost benefit analysis of the solar pump and make a presentation to the customer • arrange for display and demonstration of solar pump from MNRE approved solar pump manufacturer • identify manufacturers and suppliers through various sources who can meet the requirements • procure the products/ systems from the approved manufacturers and their dealers • check that all the components of the solar pumping systems ; solar modules, MPPT & control electronics, inverter, pump, motor mounting structures, cables, switches etc. are in proper condition • ensure drilling of bore of appropriate diameter and depth and fixing of pipe of appropriate diameter fixed in the bore • construct foundation for holding the module mounting structures • ensure the solar modules are mounted onto the structures • ensure the interconnection of the modules as per the pump literature • ensure the output of modules are connected to the electronic box containing MPPT, Inverter (for AC pump), controls and on off switches • ensure the proper placement of the pump into the bore • test if actual performance (discharge) is as per the specifications provided by manufacturer • record component serial number and complete equipment warranty registrations • deliver operation and maintenance documents with customer operation manual • demonstrate start up and shut down procedures • demonstrate the safe operation and maintenance of solar PV pumping system and provide basic training to user for maintaining the system • attend and resolve customer queries | |
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|----------|--|--|---|
| <p>4</p> | <p>Develop solar PV off-grid power plant business</p> <p>Theory Duration (hh:mm) 12:00</p> <p>Practical Duration (hh:mm) 24:00</p> <p>Corresponding NOS Code SGJ/N0144</p> | <ul style="list-style-type: none"> • assess the market and evaluate the market trends to decide the strategy for sale • study the economic profile and power consumption trends • identify market opportunities and potential customers • identify the customer requirements for solar PV off-grid power plants • identify market price of different components of solar PV system • prepare a cost estimate for a solar project • select the right quality of solar module, mounting structure by identifying the key technical parameters in data specification sheets • select the right quality of battery by identifying the key technical parameters in data specification sheets • prepare the cost benefit analysis for setting up of rooftop solar PV power plant prepare a pitch for the customer and close the sale • check all components of solar PV off-grid power plants including cables while selling • check the status of battery charging. If required , fully charge the battery before installation • get the solar modules installed in open at shadow free sites on rooftop or on mounting structures facing south and inclined at local latitude • ensure the interconnection of the modules as per design & and connect the output to the battery bank through charge controller, inverter and preventive electronics • get the lights, fans, etc. installed at appropriate places, as per requirement, and do the wiring with switches up to the board up to the charge controller • compare the voltage of the batteries before switching on the loads as per design and ensure corrective action is taken • record component serial number and complete equipment warranty registrations • deliver operation and maintenance documents with customer operation manual • demonstrate start up and shut down procedures | <p>500Wp Solar PV off-grid system with all accessories for demonstration purposes</p> |
|----------|--|--|---|

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| | Corresponding NOS Code SGJ/N0120 | <ul style="list-style-type: none"> display appropriate communication etiquette while working display active listening skills while interacting with others at work demonstrate responsible and disciplined behaviour at the workplace escalate grievances and problems to appropriate authority as per procedure to resolve them and avoid conflict identify the need for common grounds with clients, team members, etc. and negotiate in an effective manner to achieve the same consider and respect the opinions, creativity, values, beliefs and perspectives of others ensure collaboration and group participation to achieve common goals promote a friendly, co-operative environment that is conducive to employee's sense of belonging facilitate an understanding and appreciation of the differences among team members | |
| | Theory Duration (hh:mm) 80:00 Practical Duration (hh:mm) 120:00 | Home-lighting system, solar street light and solar lantern with all accessories for demonstration, solar PV water pumping system with all accessories for demonstration, 500Wp Solar PV off-grid system with all accessories for demonstration purposes, Safety helmet, Safety souse, Safety belt, Ear plug, PVC hand glove, Cotton hand glove, Reflective jacket, Safety Gloves | |

Grand Total Course Duration: 200 Hours, 0 Minutes

(This syllabus/ curriculum has been approved by [Skill Council for Green Jobs](#))

Trainer Prerequisites for Job role: “Solar off-grid Entrepreneur” mapped to Qualification Pack: “SGJ/Q0118, v1.0”

| Sr. No. | Area | Details |
|---------|---|--|
| 1 | Description | To deliver accredited training service, mapping to the curriculum detailed above, in accordance with the Qualification Pack “SGJ/Q0118, Version 1.0”. |
| 2 | Personal Attributes | Aptitude for conducting training, and pre/ post work to ensure competent, employable candidates at the end of the training. Strong communication skills, interpersonal skills, ability to work as part of a team; a passion for quality and for developing others; well-organised and focused, eager to learn and keep oneself updated with the latest in the mentioned field. |
| 3 | Minimum Educational Qualifications | Any Graduate. |
| 4a | Domain Certification | Certified for Job Role: “Solar off-Grid Entrepreneur” mapped to QP: “SGJ/Q0118, Version 1.0”. Minimum accepted score as per respective as per SCGJ guidelines is 80%. |
| 4b | Platform Certification | Recommended that the Trainer is certified for the Job Role: “Trainer”, mapped to the Qualification Pack: “MEP/Q0102” or equivalent. Minimum accepted score as per SSC is 80%. |
| 5 | Experience | Two years of working experience in the solar off-grid sector |

CRITERIA FOR ASSESSMENT OF TRAINEES

Job Role Solar Off - Grid Entrepreneur

Qualification Pack SGJ/ Q0118

Sector Skill Council Green Jobs

Guidelines for Assessment

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC
3. Assessments will be conducted for all compulsory NOS, and where applicable, on the selected elective/option NOS/set of NOS.
4. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training centre (as per assessment criteria below)
5. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training centre based on this criterion
6. To pass the Qualification Pack, every trainee should score a minimum of 70% of aggregate marks to successfully clear the assessment.
6. In case of *unsuccessful completion*, the trainee may seek reassessment on the Qualification Pack.

| Compulsory NOS | | | Marks allocation | | |
|---|--|-------------|------------------|--------|------------------|
| Total Marks: 500 | | | Out of | Theory | Skills Practical |
| Assessment Outcomes | Assessment Criteria for outcomes | Total Marks | | | |
| SGJ/ N0142 Develop solar lighting solutions business | PC1. assess the market and evaluate the market trends to decide the strategy for sale | 100 | 8 | 3 | 5 |
| | PC2. analyze the economic profile and power consumption trends | | 10 | 4 | 6 |
| | PC3. identify market opportunities and potential customers | | 8 | 4 | 4 |
| | PC4. identify the customer requirements for solar home lightening systems, solar lanterns, solar street lights, etc. | | 8 | 2 | 6 |
| | PC5. display and demonstrate these systems in your shop or at places of public gatherings | | 10 | 4 | 6 |
| | PC6. identify manufacturers and suppliers in the nearby areas | | 8 | 2 | 6 |
| | PC7. procure the required systems from the manufacturers or their dealers | | 8 | 2 | 4 |
| | PC8. display and demonstrate the solar home lightening systems, solar lanterns, solar street lights, etc. in places of public gatherings | | 6 | 2 | 6 |
| | PC9. ensure the sales of the system | | 6 | 2 | 6 |
| | PC10. check all components of solar lighting system including cables while selling | | 6 | 3 | 5 |
| | PC11. register the product and handover warranty card to the customer | | 4 | 1 | 3 |

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| | PC12. demonstrate the safe operation and maintenance of solar home lighting | | 6 | 2 | 4 |
| | PC13. demonstrate the safe operation and maintenance of solar lanterns | | 4 | 1 | 3 |
| | PC14. demonstrate the safe operation and maintenance of solar street lights | | 4 | 2 | 2 |
| | PC15. attend and resolve customer queries | | 4 | 2 | 2 |
| | | TOTAL | 100 | 36 | 64 |
| SGJ/ N0143 Develop solar PV pumping business | PC1. identify areas with no electric grid or with long power cuts | 100 | 5 | 2 | 3 |
| | PC2. study the drinking and irrigation water requirement of the user/s and it is being presently met | | 8 | 3 | 5 |
| | PC3. study the depth of the water/ ground water source and the quantity/recharge period | | 5 | 2 | 3 |
| | PC4. study the solar irradiance at the site | | 6 | 4 | 2 |
| | PC5. create relevant solar pumping model of appropriate capacity and specifications | | 8 | 5 | 3 |
| | PC6. prepare cost benefit analysis of the solar pump and make a presentation to the customer | | 6 | 4 | 2 |
| | PC7. arrange for display and demonstration of solar pump from MNRE approved solar pump manufacturer | | 3 | 1 | 2 |
| | PC8. identify manufacturers and suppliers through various sources who can meet the requirements | | 8 | 2 | 6 |
| | PC9. procure the products/ systems from the approved manufacturers and their dealers | | 4 | 1 | 3 |
| | PC10. check that all the components of the solar pumping systems ; solar modules, MPPT & control electronics, inverter, pump, motor mounting structures, cables, switches etc. are in proper condition | | 6 | 3 | 3 |
| | PC11. ensure the drilling of bore of appropriate diameter and depth drilled and fixing of pipe of appropriate diameter in the bore | | 4 | 1 | 3 |
| | PC12. construct foundation for holding the module mounting structures | | 4 | 1 | 3 |
| | PC13. ensure the solar modules are mounted onto the structures | | 4 | 1 | 3 |
| | PC14. ensure the interconnection of the modules as per the pump literature | | 5 | 2 | 3 |
| | PC15. ensure the output of modules are connected to the electronic box containing MPPT, Inverter (for AC pump), controls and on off switches | | 6 | 2 | 4 |
| | PC16. ensure the proper placement of the pump into the bore | | 4 | 2 | 2 |

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| | PC17.test if actual performance (discharge) is as per the specifications provided by manufacturer | | 3 | 1 | 2 |
| | PC18.record component serial number and complete equipment warranty registrations | | 2 | 0 | 2 |
| | PC19.deliver operation and maintenance documents with customer operation manual | | 2 | 0 | 2 |
| | PC20.demonstrate start up and shut down procedures | | 4 | 1 | 3 |
| | PC21.demonstrate the safe operation and maintenance of solar PV pumping system and provide basic training to user for maintaining the system | | 4 | 1 | 3 |
| | PC22.attend and resolve customer queries | | 4 | 2 | 2 |
| | | TOTAL | 100 | 39 | 61 |
| SGJ/ N0144 Develop solar PV off-grid power plant business | PC1. assess the market and evaluate the market trends to decide the strategy for sale | 100 | 8 | 3 | 5 |
| | PC2. study the economic profile and power consumption trends | | 6 | 2 | 4 |
| | PC3. identify market opportunities and potential customers | | 6 | 2 | 4 |
| | PC4. identify the customer requirements for solar PV off-grid power plants | | 6 | 2 | 4 |
| | PC5. identify market price of different components of solar PV system | | 4 | 1 | 3 |
| | PC6. prepare a cost estimate for a solar project | | 6 | 1 | 5 |
| | PC7. select the right quality of solar module, mounting structure by identifying the key technical parameters in data specification sheets | | 6 | 1 | 5 |
| | PC8. select the right quality of battery by identifying the key technical parameters in data specification sheets | | 6 | 2 | 4 |
| | PC9. prepare the cost benefit analysis for setting up of rooftop solar PV power plant prepare a pitch for the customer and close the sale | | 6 | 2 | 4 |
| | PC10.check all components of solar PV off-grid power plants including cables while selling | | 4 | 1 | 3 |
| | PC11.check the status of battery charging and if required, fully charge the battery before installation | | 2 | 1 | 1 |
| | PC12.get the solar modules installed in open at shadow free sites on rooftop or on mounting structures facing south and inclined at local latitude | | 6 | 2 | 4 |
| | PC13.ensure the interconnection of the modules as per design & and | | 6 | 2 | 4 |

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|---|--|--------------|------------|-----------|-----------|
| | connect the output to the battery bank through charge controller, inverter and preventive electronics | | | | |
| | PC14.get the lights, fans, etc. installed at appropriate places, as per requirement, and do the wiring with switches up to the board up to the charge controller | | 4 | 1 | 3 |
| | PC15.compare the voltage of the batteries before switching on the loads as per design and ensure corrective action is taken | | 4 | 2 | 2 |
| | PC16. record component serial number and complete equipment warranty registrations | | 4 | 2 | 2 |
| | PC17. deliver operation and maintenance documents with customer operation manual | | 4 | 1 | 3 |
| | PC18. demonstrate start up and shut down procedures | | 4 | 2 | 2 |
| | PC19. demonstrate the safe operation and maintenance of solar off- grid power plants and provide basic training to the user for maintaining the system | | 4 | 2 | 2 |
| | PC20. attend and resolve customer queries | | 4 | 2 | 2 |
| | | TOTAL | 100 | 34 | 66 |
| SGJ/ N0111 Entrepreneurship Skills | PC1. describe the process for setting up a new venture | 100 | 8 | 4 | 4 |
| | PC2. identify the key ingredients of a business plan | | 12 | 5 | 7 |
| | PC3. distinguish between fixed and working capital requirements | | 8 | 3 | 5 |
| | PC4. describe the components of a loan application for fund raising | | 8 | 4 | 4 |
| | PC5. demonstrate good etiquettes and manners while communicating with the client | | 8 | 4 | 4 |
| | PC6. demonstrate the importance of time management | | 8 | 4 | 4 |
| | PC7. demonstrate leadership skills and effective resource management techniques | | 8 | 4 | 4 |
| | PC8. demonstrate the use of MS word and MS excel for preparing a proposal | | 10 | 4 | 6 |
| | PC9. prepare a workable presentation for marketing and business development | | 10 | 4 | 6 |
| | PC10.choose the right buyer in a given situation of market parameters | | 10 | 4 | 6 |
| | PC11.identify the challenges and risks for new entrepreneurs and the possible mitigation measures | | 10 | 5 | 5 |
| | TOTAL | 100 | 45 | 55 | |
| SGJ/ N0106 Maintain personal | PC1. identify corporate policies required for workplace safety | 50 | 2 | 1 | 1 |

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| health & safety at project site | PC2. identify requirements for safe work area and create a safe work environment | | 3 | 2 | 1 |
| | PC3. identify contact person when workplace safety policies are violated | | 1 | 1 | 0 |
| | PC4. provide information about incident/violation | | 1 | 1 | 0 |
| | PC5. identify the location of first aid materials and administer first aid | | 2 | 1 | 1 |
| | PC6. identify the personal protection equipment required for specific locations on-site | | 3 | 2 | 1 |
| | PC7. identify expiry dates and wear & tear issues of specified equipment | | 2 | 1 | 1 |
| | PC8. demonstrate safe and accepted practices for personal protection | | 3 | 2 | 1 |
| | PC9. identify environmental hazards associated with the project site | | 2 | 1 | 1 |
| | PC10. identify electrical hazards | | 4 | 2 | 2 |
| | PC11. identify personal safety hazards or work site hazards and mitigate hazards | | 4 | 2 | 2 |
| | PC12. select tools, equipment and testing devices needed to carry out the work | | 4 | 2 | 2 |
| | PC13. demonstrate safe and proper use of required tools and equipment | | 4 | 2 | 2 |
| | PC14. check access from ground to work area to ensure it is safe and in accordance with requirements | | 2 | 1 | 1 |
| | PC15. reassess risk control measures, as required, in accordance with changed work practices and/or site conditions and undertake alterations | | 2 | 2 | 0 |
| | PC16. inspect/install fall protection and perimeter protection equipment ensuring adequacy for work and conformance to regulatory requirements | | 4 | 2 | 2 |
| | PC17. identify approved methods of moving tools and equipment to work area and minimize potential hazards associated with tools at heights | | 2 | 1 | 1 |
| | PC18. select and install appropriate signs and barricades | | 2 | 1 | 1 |
| | PC19. place tools and materials to eliminate or minimize the risk of items being knocked down | | 1 | 1 | 0 |
| | PC20. dismantle plant safely in accordance with sequence and remove from worksite to clear work area | | 2 | 1 | 1 |
| | | TOTAL | | 50 | 29 |
| SGJ/ N0120 Work effectively with others | PC1. accurately pass on information to the authorized persons who require it and within agreed timescale and confirm its receipt | 50 | 4 | 2 | 2 |

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| PC2. assist others in performing tasks in a positive manner where required and possible | 4 | 2 | 2 |
| PC3. consult and assist others to maximize effectiveness and efficiency in carrying out tasks | 4 | 2 | 2 |
| PC4. display appropriate communication etiquette while working | 6 | 3 | 3 |
| PC5. display active listening skills while interacting with others at work | 4 | 2 | 2 |
| PC6. demonstrate responsible and disciplined behaviours at the workplace | 4 | 2 | 2 |
| PC7. escalate grievances and problems to appropriate authority as per procedure to resolve them and avoid conflict | 3 | 1 | 2 |
| PC8. identify the need for common grounds with clients, team members, etc. and negotiate in an effective manner to achieve the same | 3 | 1 | 2 |
| PC9. consider and respect the opinions, creativity, values, beliefs and perspectives of others | 4 | 2 | 2 |
| PC10. ensure collaboration and group participation to achieve common goals | 6 | 3 | 3 |
| PC11. promote a friendly, co-operative environment that is conducive to employee's sense of belonging | 4 | 2 | 2 |
| PC12. facilitate an understanding and appreciation of the differences among team members | 4 | 2 | 2 |
| TOTAL | 50 | 24 | 26 |