

Model Curriculum

Rooftop Solar Photovoltaic Entrepreneur

SECTOR: GREEN JOBS
SUB-SECTOR: RENEWABLE ENERGY
OCCUPATION: ENTREPRENEUR
REF ID: SGJ/Q0104, V1.0
NSQF LEVEL: 6



Certificate

CURRICULUM COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

SKILL COUNCIL FOR GREEN JOBS

for

MODEL CURRICULUM

Complying to National Occupational Standards of
Job Role/Qualification Pack: **'Rooftop Solar Photovoltaic Entrepreneur'** QP No. **'SGJ/ Qo104 NSQF Level 6'**

Date of Issuance: 15/02/2017
Valid up to*: 01/05/2019

*Valid up to the next review date of the Qualification Pack or the
'Valid up to' date mentioned above (whichever is earlier)



Dr. Praveen Saxena

Authorised Signatory
(Skill Council for Green Jobs)

TABLE OF CONTENTS

1. Curriculum	01
2. Trainer Prerequisites	05
3. Annexure: Assessment Criteria	06

Rooftop Solar Photovoltaic Entrepreneur

CURRICULUM / SYLLABUS

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

Program Name	Rooftop Solar Photovoltaic Entrepreneur		
Qualification Pack Name & Reference ID. ID	SGJ/Q0104, v1.0		
Version No.	1.0	Version Update Date	15 th February 2017
Pre-requisites to Training	B.E. / B. Tech. / Any Graduate with Science background, preferred		
Training Outcomes	<p>After completing this programme, participants will be able to:</p> <ul style="list-style-type: none"> • Carry out market research and prepare a cost estimate for a Rooftop Solar Photovoltaic plant • Prepare site feasibility report • Manage Solar PV project lifecycle • Entrepreneurship skills • Maintain Personal Health & Safety at project site 		

This course encompasses 5 out of 5 National Occupational Standards (NOS) of “Rooftop Solar Photovoltaic Entrepreneur” Qualification Pack issued by “Skill Council for Green Jobs”.

S. No	Module	Key Learning Outcomes	Equipment Required
1	Introduction to Solar PV Sector in India Theory Duration (hh:mm) 8:00 Practical Duration (hh:mm) 4:00 Corresponding NOS Code SGJ/No108	<ul style="list-style-type: none"> overview of Renewable Energy and Solar Sector in India overview of Rooftop Solar Sector in India overview of Solar PV Technology definitions of terms in Electricity type of Rooftop Solar PV Power Plants and working principles system components and operating principles metering arrangement for Rooftop Solar business Models for Rooftop Solar Deployment policy and regulatory framework 	Nil
2	Carry out market research and prepare a cost estimate for a Rooftop Solar Photovoltaic plant Theory Duration (hh:mm) 06:00 Practical Duration (hh:mm) 06:00 Corresponding NOS Code SGJ/No108	<ul style="list-style-type: none"> select the right quality of solar module by identifying the key technical parameters in data specification sheets select the right quality of inverter by identifying the key technical parameters in data specification sheets select the right quality of 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 select the balance of system by identifying the key technical parameters Identify market price of different components of solar PV system prepare a cost estimate for a solar project prepare a cost benefit analysis for a rooftop solar PV plant including LCOE, Payback, IRR etc. identify the policy, regulations and procedures for solar rooftop sector in the local market identify and select the appropriate business models in solar rooftop sector 	1 kWp Solar PV system components;
3	Prepare site feasibility report Theory Duration (hh:mm) 08:00 Practical Duration (hh:mm) 08:00	<ul style="list-style-type: none"> Identify optimum location of installations Assess the site level pre-requisites for solar panel installation Decide on the type of mounting to be constructed and place of mounting as per client requirement Check for any shading obstacles Prepare a site map of the location where installation has to be carried out 	Rooftop Solar PV design software with valid license;

	<p>Corresponding NOS Code SGJ/No109</p>	<ul style="list-style-type: none"> Assess the load to be run on solar PV power plant and prepare a load profile Estimate the capacity of solar PV power plant Decide on battery backup as per grid availability, loads and client expectation Assess or obtain the site specific major parameters of solar resource data like GHI, DNI, Temperature and Wind Perform shading analysis Estimate the energy generated from the rooftop solar PV power plant using solar design softwares like PV*SOL®, PVsyst, etc. Identify the risks associated with the specific solar project Prepare a site Feasibility Study Report using specialized software like PV*SOL®, PVsyst, etc. 	
4	<p>Manage Solar PV project lifecycle</p> <p>Theory Duration (hh:mm) 06:00</p> <p>Practical Duration (hh:mm) 06:00</p> <p>Corresponding NOS Code SGJ/No110</p>	<ul style="list-style-type: none"> Read and interpret the single line diagram, civil / mechanical drawings and electrical drawings Read and interpret the bill of material Calculate the lifecycle cost of a rooftop solar project Identify and mitigate various risks associated with the project Ensure the solar PV system and structure meets the local government and regulatory requirements Prepare action plan and coordinate the implementation of rooftop solar project Identify the maintenance activity required for a rooftop solar PV power plant components Prepare a preventive maintenance schedule Ensure proper cleaning of solar panels periodically Ensure regular inspection of the solar PV system to identify and rectify the faults 	

<p>5</p>	<p>Entrepreneurship skills</p> <p>Theory Duration (hh:mm) 06:00</p> <p>Practical Duration (hh:mm) 10:00</p> <p>Corresponding NOS Code SGJ/No111</p>	<ul style="list-style-type: none"> Describe the process for setting up a new venture Identify the key ingredients of a business plan Distinguish between fixed and working capital requirements Describe the components of a loan application for fund raising Demonstrate good Etiquettes and manners while communicating with the client Demonstrate the importance of time management Demonstrate leadership skills and effective resource management techniques Demonstrate the use of MS word and MS excel for preparing a proposal Prepare a workable presentation for marketing and business development Choose the right buyer in a given situation of market parameters Identify the challenges and risks for new entrepreneurs and the possible mitigation measures 	
<p>6</p>	<p>Maintain Personal Health & Safety at project site</p> <p>Theory Duration (hh:mm) 06:00</p> <p>Practical Duration (hh:mm) 06:00</p> <p>Corresponding NOS Code SGJ/No106</p>	<ul style="list-style-type: none"> Identify the requirements for safe work area; Administer first aid; Identify the personal protective equipment used for the specific purpose; Identify the hazards associated with photovoltaic installations; Identify work safety procedures and instructions for working at height; Understand Occupational health & Safety standards and regulations for installation of Solar PV system 	<p>Health and Safety kit for Installation, Operation & Maintenance of Rooftop Solar PV Power Plant;</p>
	<p>Theory Duration (hh:mm) 40:00</p> <p>Practical Duration (hh:mm) 40:00</p> <p>On the Job Training / Practical Project Duration (hh:mm) 40:00</p>	<p>1 kWp Solar PV system components; Rooftop Solar PV design software with valid license; Health and Safety kit for Installation, Operation & Maintenance of Rooftop Solar PV Power Plant.</p>	



SKILL COUNCIL FOR
GREEN JOBS



Grand Total Course Duration: 120 **Hours**, 0 **Minutes**

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

Trainer Prerequisites for Job role: “Rooftop Solar Photovoltaic Entrepreneur” mapped to Qualification Pack: “SGJ/Qo104, 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/Qo104, 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	B.E. / B.Tech / MSc Physics or B.Tech + MBA Or B.Tech + M.Tech.
4a	Domain Certification	Certified for Job Role: “Rooftop Solar Photovoltaic Entrepreneur” mapped to QP: “SGJ/Qo104, 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/Qo102” or equivalent. Minimum accepted score as per SCGJ is 80%.
5	Experience	<ul style="list-style-type: none"> Minimum 5 years of relevant industry experience for B.E./B.Tech / MSc Physics graduates Or Minimum 3 years of relevant industry experience for (B.Tech. + M.Tech.) or (B.Tech + MBA) graduates

Annexure: Assessment Criteria

Assessment Criteria for Rooftop Solar Photovoltaic Entrepreneur	
Job Role	Rooftop Solar Photovoltaic Entrepreneur
Qualification Pack	SGJ/Qo104, Version 1.0
Sector Skill Council	Green Jobs

Sr. No.	Guidelines for Assessment
1	Criteria for assessment for Qualification Pack has been created based on the NOSs and performance criteria by SCGJ. Each Performance Criteria (PC) has been assigned marks proportional to its importance within NOS and weightages have also been given among the NOSs accordingly. SCGJ has laid down the proportion of marks for Skills, Theory/Knowledge and Behaviour / Attitudes for each PC.
2	The assessment of the theory/knowledge will be based on written test/viva-voce or both while skill test shall be hands on practical. Behaviour and attitude will be assessed while performing the task.
3	The assessment shall be done as per the assessment sheets devised by SCGJ and accordingly the assessment agencies in consultation with SCGJ will create unique question papers for theory/knowledge and attitude for each candidate at each SCGJ accredited testing centres (as per assessment criteria below)
4	The assessment agencies will conduct the assessment as per the guidelines given by SCGJ having unique evaluations for skill practical for every student at each SCGJ accredited testing centre based on this criteria
5	To pass the Qualification Pack, every trainee should score a minimum of 70% in the overall assessment.
6	The marks are allocated PC wise; however, every NOS will carry a weight age in the total marks allocated to the specific QP

NOS	Performance Criteria	Marks Allocation			
		Total Mark	Out Of	Theory	Skills Practical
SGJ/No108 Carry out Market Research and prepare a cost estimate for a Rooftop Solar Photovoltaic Plant	PC1. Select the right quality of solar module by identifying the key technical parameters in data Specification Sheets.	55	5	2	3
	PC2. Select the right quality of Inverter by identifying the key technical parameters in data Specification Sheets.		5	2	3
	PC3. Select the right quality of Mounting Structure by identifying the key technical parameters in data Specification Sheets.		5	2	3
	PC4. Select the right quality of battery by identifying the key technical parameters in data Specification Sheets.		5	2	3
	PC5. Select the balance of system by identifying the key technical parameters in data Specification Sheets.		5	2	3
	PC6. Identify market price of different components of Solar PV system.		3	1	2
	PC7. Prepare an estimate for a solar project		3	1	2
	PC8. Prepare a cost benefit analysis for a rooftop solar PV plant.		7	3	4
	PC9. Identify different business models in solar rooftop Sector		7	3	4

	PC10. Identify the policy, regulations and procedures for solar rooftop sector in the local market.		10	4	6
		TOTAL	55	22	33
SGJ/No109 Prepare a site feasibility study report.	PC1. Identify optimum location of Installations	65	3	1	2
	PC2. Assess the site level pre-requisites for solar panel installation		10	4	6
	PC3. Decide on the type of mounting to be constructed and place of mounting as per client requirement.		4	2	2
	PC4. Check for any shading obstacles		3	1	2
	PC5. Prepare a site map of the location where installation has to be carried out.		3	1	2
	PC6. Assess the load to be run on Solar PV power plant and prepare a load profile.		3	1	2
	PC7. Estimate the capacity of Solar PV power plant		5	2	3
	PC8. Decide on battery backup as per grid availability, loads and client expectation		5	2	3
	PC9. Assess or Obtain the site specific major parameters of solar resource data like GHI, DNI, Temperature and Wind.		3	1	2
	PC10. Perform shading analysis		5	2	3
	PC11. Estimate the energy generated from the rooftop solar PV power plant using software like PV*SOL®, PVSYST, ETC.		10	3	7
	PC12. Identify the risks associated with the specific solar project.		5	2	3
	PC13. Prepare a site feasibility study report.		6	3	3
		TOTAL	65	25	40
SGJ/No110 Manage Solar PV Project lifecycle	PC1. Read and interpret the single line diagram, Civil / Mechanical drawings and Electrical drawings.	100	7	3	4
	PC2. Read and interpret the bill of material.		5	2	3
	PC3. Calculate the lifecycle cost of a rooftop solar project using softwares like Excel, PV*SOL®, PVsyst, etc.		10	4	6
	PC4. Identify and mitigate various risks associated with project.		15	5	10
	PC5. Ensure the solar PV system and structure meets the local government and regulatory requirements.		5	2	3
	PC6. Coordinate with Design team to get the bill of materials and drawings.		2	1	1
	PC7. Coordinate with the supplier for timely delivery of components.		3	1	2

	PC8. Ensure arrangement of skilled technicians and engineers for installation.		10	4	6
	PC9. Prepare a draft project activity implementation plan.		10	4	6
	PC10. Coordinate with supervisor at client's side to ensure timely implementation of project to avoid any cost overrun.		3	1	2
	PC11. Identify the maintenance activity required for a rooftop solar PV power plant components.		10	4	6
	PC12. Prepare a preventive maintenance schedule		3	3	5
	PC13. Ensure Proper Cleaning of Solar Panels		10	2	3
	PC14. Ensure Regular inspection of the solar PV system and rectify the faults.		8	3	4
			100	39	61
SGJ/No111 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/No106 Maintain Personal Health	PC1. Identify corporate policies required for workplace safety.	50	2	1	1
	PC2. Identify requirements for safe work area and create a safe work environment.		3	2	1

& Safety at project site	PC3. Identify contact person when workplace safety policies are violated.	1	1	0	
	PC4. Provide information about incident/violation.	1	1		
	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		
	PC20. Dismantle Plant safely in accordance with sequence and remove from worksite to clear work area.	2	1	1	
		Total	50	29	21