

# Model Curriculum

## Solar PV Project Manager (E&C)

SECTOR: GREEN JOBS  
SUB-SECTOR: RENEWABLE ENERGY  
OCCUPATION: Project Management  
REF ID: SGJ/Q0114, V1.0  
NSQF LEVEL: 7



## 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 PV Project Manger (E&C)**' OP No. '**SGJ/Q 0114, NSQF Level 7**'

Date of Issuance: **October 16<sup>th</sup>, 2017**

Valid up to: **September 30<sup>th</sup>, 2019**

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



Authorised Signatory  
(Skill Council for Green Jobs)

## TABLE OF CONTENTS

<b>1. Curriculum</b>	<b>01</b>
<b>2. Trainer Prerequisites</b>	<b>06</b>
<b>3. Annexure: Assessment Criteria</b>	<b>07</b>

# Solar PV Project Manager (E&C)

## CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a “Solar PV Project Manager (E&C)”, in the “Green Jobs” Sector/Industry and aims at building the following key competencies amongst the learner

<b>Program Name</b>	<b>Solar PV Project Manager (E&amp;C)</b>		
<b>Qualification Pack Name &amp; Reference ID.</b>	SGJ/Q0114, v1.0		
<b>Version No.</b>	1.0	<b>Version Update Date</b>	01 <sup>th</sup> Aug 2017
<b>Pre-requisites to Training</b>	B.E./ B.Tech. in Engineering and Technology with 6 years’ of experience in renewable energy/power sector utilities/consulting firms/solar PV power plant installation and commissioning or M.Sc. / M.Tech. / MBA with 3 years of experience in renewable energy/power sector utilities/consulting firms/solar PV power plant installation and commissioning		
<b>Training Outcomes</b>	<b>After completing this programme, participants will be able to:</b> <ul style="list-style-type: none"> <li>• <b>Manage installation of solar PV power plant</b></li> <li>• <b>Maintain personal health &amp; safety at project site</b></li> <li>• <b>Work effectively with others</b></li> </ul>		

This course encompasses 3 out of 3 National Occupational Standards (NOS) of “Solar PV Project Manager (E&C)” Qualification Pack issued by “Skill Council for Green Jobs”.

S. No	Module	Key Learning Outcomes	Equipment Required
1	<p><b>Introduction to Solar PV Sector in India</b></p> <p><b>Theory Duration</b> (hh:mm) 03:00</p> <p><b>Practical Duration</b> (hh:mm) 00:00</p> <p><b>Introduction Module</b></p>	<ul style="list-style-type: none"> <li>overview of solar PV technology</li> <li>overview of ground mount solar sector in India</li> <li>understand the various market research reports and industrial magazines present in the market</li> <li>type of ground mount PV Power Plants and working principles</li> <li>overview of Rooftop Solar Sector in India</li> <li>type of Rooftop Solar PV Power Plants and working principles</li> <li>power scenario of the country</li> <li>solar energy and its landscape in the country</li> <li>solar PV power generation technology and fundamentals of solar resource assessment like DHI, DNI, GHI, etc.</li> <li>broad design of the solar PV power plant</li> <li>cost of solar power plant</li> </ul>	
2	<p><b>Support and assist in project development, pre-construction and designing phase</b></p> <p><b>Theory Duration</b> (hh:mm) 03:00</p> <p><b>Practical Duration</b> (hh:mm) 03:00</p> <p><b>Corresponding NOS Code</b> SGJ/N0136</p>	<ul style="list-style-type: none"> <li>develop the overall project constructability approach for cost effective implementation</li> <li>assist the project design team in developing sequencing, logistics and mobilization plan</li> <li>manage and obtain all required permits /approvals for construction including permission for grid connectivity</li> <li>manage project bill of materials and ensure timely ordering of all major materials</li> <li>manage and run all preconstruction meetings for internal and external parties</li> </ul>	
3.	<p><b>Develop and Manage schedule for installation, overall project safety and crisis management plan</b></p> <p><b>Theory Duration</b> (hh:mm) 06:00</p> <p><b>Practical Duration</b> (hh:mm) 18:00</p>	<ul style="list-style-type: none"> <li>manage schedule for each of the construction activity i.e. construction of internal roads, construction of foundations for mounting module support structures, combiner boxes, inverters, transformers, and substation etc.</li> <li>supervise and manage schedule for installation of module structures and modules, installation of inverters, transformers, earthing piles, DC/ AC power protection devices, lightning arresters, substation as per the grid codes and regulatory provisions</li> </ul>	Licensed project management software

	<p><b>Corresponding NOS Code</b> SGJ/N0136</p>	<ul style="list-style-type: none"> <li>• prepare all schedule updates weekly and be ready with contingency plan</li> <li>• plan, schedule, and monitor all material deliveries to avoid project delays</li> <li>• develop and manage safety and crisis management plan for the site</li> <li>• implement the crisis management plan internally and monitor that it is being implemented by the subcontractor and all the visitors to the site</li> </ul>	
4.	<p><b>Manage the Project Financing</b></p> <p><b>Theory Duration</b> (hh:mm) 06:00</p> <p><b>Practical Duration</b> (hh:mm) 10:00</p> <p><b>Corresponding NOS Code</b> SGJ/N0136</p>	<ul style="list-style-type: none"> <li>• ensure the successful completion of the projects by identifying innovative ways to maximize profit</li> <li>• manage internal and external change order process through discussion with subcontractors/ vendors and approval of superiors</li> <li>• manage project billing cycle to ensure timely submission and payment of invoices</li> <li>• maintain positive cash flow by developing project revenues and forecast</li> <li>• review and approve all capital expenditures of subcontractors/suppliers in a timely manner</li> <li>• ensure the costs are as per cost models and within project budget</li> </ul>	Microsoft Excel, Licensed project management software
5.	<p><b>Manage subcontractors, vendors and overall customer relationship</b></p> <p><b>Theory Duration</b> (hh:mm) 05:00</p> <p><b>Practical Duration</b> (hh:mm) 03:00</p> <p><b>Corresponding NOS Code</b> SGJ/N0136</p>	<ul style="list-style-type: none"> <li>• develop subcontractor and vendors database based on references and work experience</li> <li>• analyze the bids to ensure complete and accurate quotes for scopes of work</li> <li>• prepare and negotiate with subcontractors</li> <li>• resolve conflicts with subcontractors and vendors</li> <li>• perform project coordination and ensure overall compliance with the project documents</li> <li>• coordinate with the customers on a regular basis and provide them with the updates (if any)</li> <li>• ensure that the customer satisfaction and expectations are achieved</li> <li>• communicate to the customer and other key team members the contractual, financial, cost accounting, scheduling, technical and other matters related to the project</li> </ul>	
6.	<p><b>Provide and manage project document controls and post</b></p>	<ul style="list-style-type: none"> <li>• ensure development and maintenance of all logs for drawings, submittal, etc.</li> <li>• prepare and manage all meeting minutes</li> </ul>	

	<p><b>construction requirement</b></p> <p><b>Theory Duration</b> (hh:mm) 03:00</p> <p><b>Practical Duration</b> (hh:mm) 04:00</p> <p><b>Corresponding NOS Code</b> SGJ/N0136</p>	<ul style="list-style-type: none"> <li>• develop and manage overall project quality control program</li> <li>• ensure the preparation of detailed status reports</li> <li>• ensure the organization and maintenance of all commercial project folders</li> <li>• manage project commissioning process</li> <li>• develop and manage project punch list and close out</li> <li>• manage closeout documentation such as O&amp;M manuals, owners training, close out all permits</li> <li>• manage all warranty claims and follow ups</li> <li>• ensure both internal and external close out meetings and minutes documented</li> <li>• organize project handover meetings between customer, asset management department and operation and maintenance department/ company</li> <li>• conduct periodic visits to the site(s) to review the progress at the ground</li> <li>• supervise and coordinate the installation and commissioning activities at the site</li> </ul>	
7.	<p><b>Maintain Personal Health &amp; Safety at project site</b></p> <p><b>Theory Duration</b> (hh:mm) 03:00</p> <p><b>Practical Duration</b> (hh:mm) 01:00</p> <p><b>Corresponding NOS Code</b> SGJ/N0106</p>	<ul style="list-style-type: none"> <li>• Identify the requirements for safe work area;</li> <li>• Administer first aid;</li> <li>• Identify the personal protective equipment used for the specific purpose;</li> <li>• Identify the hazards associated with photovoltaic installations;</li> <li>• Identify work safety procedures and instructions for working at height;</li> <li>• Understand Occupational health &amp; Safety standards and regulations for installation of Solar PV system</li> </ul>	<p>Safety helmet, Safety souse, Safety belt, , Ear plug, PVC hand glove, Cotton hand glove, Reflective jacket, Safety Gloves</p>
8.	<p><b>Work effectively with others</b></p> <p><b>Theory Duration</b> (hh:mm) 06:00</p> <p><b>Practical Duration</b> (hh:mm) 06:00</p> <p><b>Corresponding NOS Code</b> SGJ/N0120</p>	<ul style="list-style-type: none"> <li>• accurately pass on information to the authorized persons who require it and within agreed timescale and confirm its receipt</li> <li>• assist others in performing tasks in a positive manner where required and possible</li> <li>• consult and assist others to maximize effectiveness and efficiency in carrying out tasks</li> <li>• display appropriate communication etiquette while working</li> <li>• display active listening skills while interacting with others at work</li> </ul>	

		<ul style="list-style-type: none"> <li>• demonstrate responsible and disciplined behaviors at the workplace</li> <li>• escalate grievances and problems to appropriate authority as per procedure to resolve them and avoid conflict</li> <li>• identify the need for common grounds with clients, team members, etc. and negotiate in an effective manner to achieve the same</li> <li>• consider and respect the opinions, creativity, values, beliefs and perspectives of others</li> <li>• ensure collaboration and group participation to achieve common goals</li> <li>• promote a friendly, co-operative environment that is conducive to employee's sense of belonging</li> <li>• facilitate an understanding and appreciation of the differences among team members</li> </ul>	
	<p><b>Theory Duration</b> (hh:mm) 35:00</p> <p><b>Practical Duration</b> (hh:mm) 45:00</p>	<p>Microsoft Excel, Licensed project management software; Computer Lab, Safety helmet, Safety souse, Safety belt, Ear plug, PVC hand glove, Cotton hand glove, Reflective jacket, Safety Gloves</p>	

Grand Total Course Duration: 80 **Hours, 0 Minutes**

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



## Trainer Prerequisites for Job role: “Solar PV Project Manager (E&C)” mapped to Qualification Pack: “SGJ/Q0114, v1.0”

Sr. No.	Area	Details
1	<b>Description</b>	To deliver accredited training service, mapping to the curriculum detailed above, in accordance with the Qualification Pack “SGJ/Q0114, Version 1.0”.
2	<b>Personal Attributes</b>	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	<b>Minimum Educational Qualifications</b>	B.E./ B.Tech. in Engineering and Technology or M.Sc. / M.Tech. / MBA
4a	<b>Domain Certification</b>	Certified for Job Role: “Solar PV Project Manager (E&C)” mapped to QP: “SGJ/Q0114, Version 1.0”. Minimum accepted score as per respective as per SCGJ guidelines is 80%.
4b	<b>Platform Certification</b>	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	<b>Experience</b>	7 years of experience in managing installation & commissioning of Solar PV projects for B.E./ B.Tech. in Engineering and Technology Or 5 years of experience in managing installation & commissioning of Solar PV projects for M.Sc. / M.Tech. / MBA

## CRITERIA FOR ASSESSMENT OF TRAINEES

**Job Role** Solar PV Project Manager (E&C)

**Qualification Pack** SGJ/Q0114

**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. Assessment 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 center (as per assessment criteria below).
5. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center 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.
7. In case of *unsuccessful completion*, the trainee may seek reassessment on the Qualification Pack.

Compulsory NOS			Marks allocation		
Total Marks: 200			Out of	Theory	Skills Practical
Assessment Outcomes	Assessment Criteria for outcomes	Total Marks			
<b>SGJ/N0136 Manage installation of solar PV power plant</b>	PC1. Develop the overall project constructability approach for cost effective implementation	<b>100</b>	7	2	5
	PC2. assist the project design team in developing sequencing , logistics and mobilization plan		4	3	1
	PC3. manage and obtain all required permits /approvals for construction including permission for grid connectivity		4	1	3
	PC4. manage project bill of materials and ensure timely ordering of all major materials		2	1	1
	PC5. manage and run all preconstruction meetings for internal and external parties		4	2	2
	PC6. develop and manage schedule for each of the construction activity i.e. construction of internal roads, construction of foundations for mounting module support structures, combiner boxes, inverters, transformers, and substation etc.		<b>8</b>	<b>2</b>	<b>6</b>

	PC7. supervise and manage schedule for installation of module structures and modules, installation of inverters, transformers, earthing piles, dc / ac power protection devices, lightning arresters, substation as per the grid codes and regulatory provisions		8	1	7
	PC8. prepare all schedule updates weekly and be ready with contingency plan		4	1	3
	PC9. plan, schedule, and monitor all material deliveries to avoid project delays		4	1	3
	PC10. ensure the successful completion of the projects by identifying innovative ways to maximize profit		4	1	3
	PC11. manage internal and external change order process through discussion with subcontractors/ vendors and approval of superiors		4	1	3
	PC12. manage project billing cycle to ensure timely submission and payment of invoices		2	1	1
	PC13. maintain positive cash flow by developing project revenues and forecast		2	1	1
	PC14. review and approve all capital expenditures of subcontractors/suppliers in a timely manner		2	1	1
	PC15. ensure the costs are as per cost models and within project budget		2	1	1
	PC16. develop and manage safety and crisis management plan for the site		2	0	2
	PC17. implement the crisis management plan internally and monitor that it is being implemented by the subcontractor and all the visitors to the site		2	1	1
	PC18. develop subcontractor and vendors database based on references and work experience		2	0	2
	PC19. analyze the bids to ensure complete and accurate quotes for scopes of work		1	0	1
	PC20. prepare and negotiate with subcontractors		1	0	1
	PC21. resolve conflicts with		2	0	2

	subcontractors and vendors				
	PC22.perform project coordination and ensure overall compliance with the project documents	1	0	1	
	PC23.coordinate with the customers on a regular basis and provide them with the updates (if any)	1	0	1	
	PC24.ensure that the customer satisfaction and expectations are achieved	1	0	1	
	PC25.communicate to the customer and other key team members the contractual, financial, cost accounting, scheduling, technical and other matters related to the project	2	1	1	
	PC26.ensure development and maintenance of all logs for drawings , submittals etc.	2	1	1	
	PC27.ensure management of all meeting minutes	1	0	1	
	PC28.develop and manage overall project quality control program	4	1	3	
	PC29.ensure the preparation of detailed status reports	2	1	1	
	PC30.ensure the organization and maintenance of all commercial project folders	2	1	1	
	PC31.manage project commissioning process	1	0	1	
	PC32.develop and manage project punch list and close out	1	0	1	
	PC33.manage all closeout documentation such as O&M manuals, owners training, close out all permits	2	1	1	
	PC34.manage all warranty claims and follow ups	2	1	1	
	PC35.ensure all internal and external close out meetings are conducted and minutes documented	1	1	0	
	PC36.organize project handover meetings between customer, asset management department and operation and maintenance department/ company	2	0	2	
	PC37.conduct periodic visits to the site(s) to review the progress at the ground	2	1	1	
	PC38.supervise and coordinate the installation and commissioning activities at the site	2	1	1	
	<b>TOTAL</b>	<b>100</b>	<b>31</b>	<b>69</b>	

<b>SGJ/N0106 Maintain personal health &amp; safety at project site</b>	PC1. identify corporate policies required for workplace safety	<b>50</b>	2	1	1
	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
			<b>TOTAL</b>	<b>50</b>	<b>29</b>	<b>21</b>
<b>SGJ/N0120</b>	<b>Work with others</b>	PC1. accurately pass on information to the authorized persons who require it and within agreed timescale and confirm its receipt	<b>50</b>	4	2	2
		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
			<b>TOTAL</b>	<b>50</b>	<b>24</b>	<b>26</b>