



QUALIFICATION FILE

Solar Photovoltaic Technician

Short Term Training (STT)

Future Skills

NCrF/NSQF Level: 4

Submitted By:

Skill Council for Green Jobs

Chief Executive Officer

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Section 1: Basic Details

1.	Qualification Name	Solar Photovoltaic Technician	
2.	Sector/s	Environmental Science	
3.	Type of Qualification: <input checked="" type="checkbox"/> New	NQR Code & version of existing/previous qualification: & version 1:	Qualification Name of existing/previous version:
4.	a. OEM Name b. Qualification Name (Wherever applicable)	Solar Photovoltaic Technician	
5.	National Qualification Register (NQR) Code &Version	QG-04-ES-00910-2023-V1-SCGJ & version 1	6. NCrf/NSQF Level: 4
7.	Award (Certificate/Diploma/Advance Diploma/ Any Other	Certificate	
8.	Brief Description of the Qualification	Solar PV Technician is responsible for installing small solar PV system including grid tied solar rooftop for domestic consumers, solar street light, Mini & Micro grid etc. The individual at work assesses the installation site, understands the system layout requirement, carry out required safety measures to install small solar projects while ensuring an effective functioning of the system post installation.	

9. Eligibility Criteria for Entry for Student/Trainee/Learner/Employee	a. Entry Qualification & Relevant Experience:	
	S. No.	Academic/Skill Qualification (with Specialization - if applicable)
	1	11th grade pass and pursuing continuous schooling
	2	Pursuing or Completed 2nd year of 3-year diploma (after 10th)
	3	10th grade pass with two years of any combination of NTC/NAC/CITS or equivalent
	4	11th Grade Pass with 1 year of relevant experience or
	5	10 th Grade Pass with 2 years of relevant experience
	6	Previous relevant Qualification of NSQF Level 3.5 with 3 years of relevant experience or Previous relevant Qualification of NSQF Level 3, with 3.5 years of relevant experience
b. Age: 16		
10 Credits Assigned to this Qualification, Subject to Assessment (as per National Credit Framework (NCrF))	14	11. Common Cost Norm Category: I
12 Any Licensing requirements for Undertaking Training on This Qualification (wherever applicable)	NA	

13 Training Duration by Modes of Training Delivery (Specify Total Duration as per selected training delivery modes and as per requirement of the qualification)	<input checked="" type="checkbox"/> Offline <input type="checkbox"/> Online <input type="checkbox"/> Blended <table border="1" data-bbox="685 344 1809 564"> <thead> <tr> <th>Training Delivery Modes</th> <th>Theory (Hours)</th> <th>Practical (Hours)</th> <th>OJT Mandatory (Hours)</th> <th>OJT Recommended (Hours)</th> <th>Employability (Hours)</th> <th>Total (Hours)</th> </tr> </thead> <tbody> <tr> <td>Classroom (offline)</td> <td>200</td> <td>130</td> <td>30</td> <td></td> <td>60</td> <td>420</td> </tr> <tr> <td>Online</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> (Refer Blended Learning Annexure for details)	Training Delivery Modes	Theory (Hours)	Practical (Hours)	OJT Mandatory (Hours)	OJT Recommended (Hours)	Employability (Hours)	Total (Hours)	Classroom (offline)	200	130	30		60	420	Online						
Training Delivery Modes	Theory (Hours)	Practical (Hours)	OJT Mandatory (Hours)	OJT Recommended (Hours)	Employability (Hours)	Total (Hours)																
Classroom (offline)	200	130	30		60	420																
Online																						
14 Aligned to NCO/ISCO Code/s (if no code is available mention the same)	NCO-2015/7421.1402																					
15 Progression path after attaining the qualification (Please show Professional and Academic progression)	Vertical Progression: Organizational Vertical- Solar PV Engineer (Level 5.0) Entrepreneurial Vertical- Solar Photovoltaic Entrepreneur (Level 5.0)																					
16 Other Indian languages in which the Qualification & Model Curriculum are being submitted	Nil																					
17 Is similar Qualification(s) available on NQR-if yes, justification for this qualification	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No This has been developed with a focus on introducing Vocationalisation in schools. This also covers installation of some other applications including solar mini grids which were not covered in other solar installation job roles																					
18 Is the Job Role Amenable to Persons with Disability	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If "Yes", specify applicable type of Disability: <input checked="" type="checkbox"/> Deaf <input checked="" type="checkbox"/> Hard of Hearing <input checked="" type="checkbox"/> Acid Attack Victims <input checked="" type="checkbox"/> Dwarfism																					
19 How Participation of Women will be Encouraged	The programme would be proposed to be incorporated in women ITIs and diploma colleges to train women candidates on the job role. TPs shall be encouraged to onboard at least a certain number of female candidates in each batch																					

20	Are Greening/ Environment Sustainability Aspects Covered (Specify the NOS/Module which covers it)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
21	Is Qualification Suitable to be Offered in Schools/Colleges	Schools <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Colleges <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
22	Name and Contact Details of Submitting / Awarding Body SPOC (In case of CS or MS, provide details of both Lead AB & Supporting ABs)	Name: Dr. Praveen Saxena Email: ceo@sscgi.in Contact No.: 9871119101 Website: https://sscgi.in/	
23	Final Approval Date by NSQC: 31.08.2023	24. Validity Duration: 3 years	25. Next Review Date: 30.08.2026

Section 2: Module Summary

NOS/s of Qualifications

(In exceptional cases these could be described as components)

Mandatory NOS/s:

Specify the training duration and assessment criteria at NOS/ Module level. For further details refer curriculum document.

Th.-Theory **Pr.**-Practical **OJT**-On the Job **Man.**-Mandatory Training **Rec.**-Recommended **Proj.**-Project

S. No	NOS/Module Name	NOS/Module Code & Version (if applicable)	Core/Non-Core	NCrF/NSQF Level	Credits as per NCrF	Training Duration (Hours)					Assessment Marks					
						Th.	Pr.	OJT	Emp.	Total	Th.	Pr.	Proj.	Viva	Total	Weightage (%) (if applicable)
1.	Introduce Solar PV Technology	SGJ/N4023	Core	4	1	20	10	30		30	26	24			50	10
2.	Perform DC electrical work of Solar Module components	SGJ/N4024	Core	4	1	20	10			30	30	20			50	10
3.	Identify and Explain Solar PV System Configuration and identify components	SGJ/N4025	Core	4	1	20	10			30	30	20			50	10
4.	Perform site assessment and interpret the layout	SGJ/N4026	Core	4	1	20	10			30	35	15			50	10
5.	Install Solar PV DC Standalone system (St. Light)	SGJ/N4027	Core	4	2	30	30			60	30	20			50	10

S. No	NOS/Module Name	NOS/Module Code & Version (if applicable)	Core/Non-Core	NCrF/NSQF Level	Credits as per NCrF	Training Duration (Hours)					Assessment Marks					
						Th.	Pr.	OJT	Emp.	Total	Th.	Pr.	Proj.	Viva	Total	Weightage (%) (if applicable)
6.	Install Solar Off Grid PV System	SGJ/N4028	Core	4	1	20	10			30	25	25			50	10
7.	Install Small solar rooftop grid tied plant for residential home	SGJ/N4029	Core	4	1	20	10			30	30	20			50	10
8.	Introduce tools and tackles used for Solar Installation	SGJ/N4030	Core	4	2	30	30			60	30	20			50	10
9.	Maintain Health and safety measures for installing and operating solar DC system.	SGJ/N4031	Core	4	1	20	10			30	29	21			50	10
10.	Employability Skills	DGT/VSQ/N0102	Non Core		2					60	20	30			50	10
11.	On the Job Training									30						
Duration (in Hours) / Total Marks						200	130	30	60	420	241	259			500	100

Assessment - Minimum Qualifying Percentage

Minimum Pass Percentage – Aggregate at qualification level: 70% (Every Trainee should score specified minimum aggregate passing percentage at qualification level to successfully clear the assessment.)

Section 3: Training Related

1.	Trainer's Qualification and experience in the relevant sector (in years) (as per NCVET guidelines)	Graduate/Diploma(Technical) with Two years of experience in a petrochemical industries/Gasification processes/relevant experience Or Certified under relevant Craft Instructor Training Scheme (CITS) course
2.	Master Trainer's Qualification and experience in the relevant sector (in years) (as per NCVET guidelines)	Engineering Graduate with 5 years of Solar PV Rooftop Technician experience
3.	Tools and Equipment Required for Training	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (If "Yes", details to be provided in Annexure)
4.	In Case of Revised Qualification, Details of Any Upskilling Required for Trainer	Not Applicable

Section 4: Assessment Related

1.	Assessor's Qualification and experience in relevant sector (in years) (as per NCVET guidelines)	Graduate/Diploma(Technical) with Three years of experience in Solar PV Rooftop Technician relevant experience Or Certified under relevant Craft Instructor Training Scheme (CITS) course
2.	Proctor's Qualification and experience in relevant sector (in years) (as per NCVET guidelines)	Engineering Graduate with 6 years of experience in Solar PV Rooftop Technician
3.	Lead Assessor's/Proctor's Qualification and experience in relevant sector (in years) (as per NCVET guidelines)	Engineering Graduate with 7 years of experience in Solar PV Rooftop Technician

4.	Assessment Mode (<i>Specify the assessment mode</i>)	Online and offline both
5.	Tools and Equipment Required for Assessment	<input checked="" type="checkbox"/> Same as for training <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (<i>details to be provided in Annexure-if it is different for Assessment</i>)

Section 5: Evidence of the need for the Qualification

Provide Annexure/Supporting documents name.

1.	Latest Skill Gap Study (not older than 2 years) (Yes/No): Yes available at https://sscgi.in/wp-content/uploads/2022/03/Green-Jobs-Report-Jan27.pdf
2.	<p>Latest Market Research Reports or any other source (not older than 2 years) (Yes/No): Yes following key documents are available in the public domain</p> <p>a. https://sscgi.in/wp-content/uploads/2022/03/Green-Jobs-Report-Jan27.pdf</p> <p>b. https://solarrooftop.gov.in/knowledge/file-44.pdf</p> <p>c. https://imkresearch.com/wp-content/uploads/2022/02/Photovoltaic-Manufacturing-Outlook-in-India_February-2022_JMK.pdf</p>
3.	<p>Government /Industry initiatives/ requirement (Yes/No): The Government of India has set the target to expand India's non fossil fuel based installed capacity to 500 GW by 2030. Out of this target over 300 GW is expected to be achieved exclusively through solar. India has promised to source nearly half its energy from non-fossil fuel sources by 2030 and, in the shorter term, source at least 60% of its renewable energy from solar power.</p> <p>National Solar Mission: It is a major initiative of the Government of India to promote ecologically sustainable growth while addressing India's energy security challenge.</p> <p>Key schemes of the Government on Solar energy</p>

	<ul style="list-style-type: none"> • Solar Park Scheme: This plans to build a number of solar parks, each with a capacity of nearly 500 MW, across several states. • Rooftop Solar Scheme: The Rooftop Solar Scheme aims to harness solar power by installing solar panels on the roof of various consumers including residential, commercial and industrial. • SRISTI Scheme: Sustainable rooftop implementation of Solar transfiguration of India (SRISTI) scheme to promote rooftop solar power projects across residential consumers in India. • International Solar Alliance: International Solar Alliance is an action-oriented, member-driven, collaborative platform for increased deployment of solar energy technologies. • Kisan Urja Suraksha evam Utthaan Mahabhiyan (PM-KUSUM): Launched by the Ministry of New and Renewable Energy (MNRE), it aims to support deployment of solar pumps in rural areas. <p>This qualification aims to prepare the candidates on the knowledge and competencies required for performing the role of technicians for installing small grid interactive and off grid solar projects. This qualification also complements Solar PV Installer (Suryamitra) qualification which is being successfully utilized for delivering short term trainings across the country.</p> <p>It is proposed to introduce this qualification for vocationalisation in schools (in Grade XII) along with short term training to ensure a large number of learners/trainees are trained and certified in the concerned job role.</p>
4.	<p>Number of Industry validation provided: Up to 10 companies are expected to provide validations on the same.</p>
5.	<p>Estimated nos. of persons to be trained and employed A large number of workforce shall be employed primarily at small solar project sites for performing various tasks related to installation of small solar projects. It is expected that every year over 20,000 candidates shall be trained and certified on this through Short Term Training mode. Further, thousands of Secondary school students shall also be certified on this if it is successfully introduced in schools.</p>
6.	<p>Evidence of Concurrence/Consultation with Line Ministry/State Departments: Concurrence has been requested from the Ministry of New and Renewable Energy</p>

Section 6: Annexure & Supporting Documents Check List

Specify Annexure Name / Supporting document file name

1.	Annexure: NCrf/NSQF level justification based on NCrf level/NSQF descriptors (<i>Mandatory</i>)	Annexure: Evidence of Level
2.	Annexure: List of tools and equipment relevant for qualification (<i>Mandatory, except in case of online course</i>)	Annexure: Tools and Equipment (Lab Set-Up)
3.	Annexure: Detailed Assessment Criteria (<i>Mandatory</i>)	Annexure: Detailed Assessment Criteria (<i>Mandatory</i>)
4.	Annexure: Assessment Strategy (<i>Mandatory</i>)	Annexure: Assessment Strategy
5.	Annexure: Acronym and Glossary (<i>Optional</i>)	Annexure: Acronym and Glossary
6.	Supporting Document: Model Curriculum (<i>Mandatory – Public view</i>)	Attached
7.	Supporting Document: Career Progression (<i>Mandatory - Public view</i>)	Annexure: Career progression and OM
8.	Supporting Document: Occupational Map (<i>Mandatory</i>)	Annexure: Career progression and OM
9.	Supporting Document: Assessment SOP (<i>Mandatory</i>)	Annexure: Assessment Strategy

Annexure: Evidence of Level

Title/Name of qualification/component: Solar Photovoltaic technician		Level: 4	
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relate to the NSQF level descriptors	NS QF Level
Professional Theoretical Knowledge/Process	<p>The individual is expected to perform testing, installation and facility integration of Solar Pv system, repairs, troubleshooting, upkeep and maintenance of electrical control systems, protection systems, and other auxiliary equipment and associated tools in Solar Pv Projects facilities.</p> <p>He/she is expected to have Basic knowledge of electrical systems.</p> <p>Has knowledge of collecting and interpreting the available information, drawing conclusions & communicating the same to the concerned people.</p>	<p>The Solar Pv system technician needs to know various sub sections of the small solar pv power plant and their operation and maintenance.</p> <p>The Technician is expected to exhibit knowledge of facts such as type of material, functioning of devices, storage etc. He/she should have general concepts of physical and chemical composition of cells of Solar Pv Project and how to safely handle the plant.</p> <p>He/she should possess the ability to speak, read and write in the local vernacular language and English which is always preferred.</p> <p>Thus considering the professional knowledge, s/he can be placed at level 4.</p>	4
Professional and Technical Skills/ Expertise/ Professional Knowledge	<p>The individual is expected to exhibit the basic knowledge of producing Solar power including operation and maintenance of various sub components. He/She needs to have skills to set up multiple Pv system.</p> <p>He/She has the knowledge and ability to use hand-held tools.</p>	<p>The Solar Photovoltaic technician will install, and maintain solar photovoltaic (PV) systems.</p> <p>The Solar Photovoltaic technician connect the panel to the electrical system.</p> <p>The Solar Photovoltaic technician must assemble and install the racking, panels and the electrical system.</p>	4

Title/Name of qualification/component: Solar Photovoltaic technician		Level: 4	
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relate to the NSQF level descriptors	NS QF Level
	<p>He/she is expected to have good understanding of solar PV module and its components like cell, module, and array. Glass, insulating film, EVA sheet.</p> <p>The individual is expected to exhibit the knowledge of collecting and interpreting the available information, drawing conclusions & communicating the same to the concerned team members.</p>	<p>The Solar Photovoltaic technician must activate and test the solar panel system.</p> <p>The Job holder is expected to possess a range of practical and cognitive skills required to accomplish tasks and solve problems by selecting and applying basic methods and tools and install systems and provide post installation support. The job holder also has to ensure preparation of effective installation plan for setting up Solar pv project. Thus, considering the professional skills the job holder can be placed at Level 4.</p>	
Employment Readiness & Entrepreneurship Skills & Mind-set/Professional Skill	<p>The individual is expected to plan & organize the schedule for all installations and related activities to be undertaken by self or by the team. Further He/she must be able to take decisions on a regular basis, manage relationship with colleagues and apply domain knowledge to perform tasks related to Solar Pv Technician.</p> <p>Requires good understanding Equipment installation and problems, Site Topology and equipment location, knowledge of unpacking and positioning the equipment in professional way, and methodically routing the interconnecting cables, power cables and wires.</p>	<p>The job holder is expected to represent and demonstrate practical skills, which are routine and repetitive in a narrow range of application such as checking the mechanical and electrical equipment's using standard protocols.</p> <p>Since all the above-mentioned professional skill are related to demonstrating practical skills, which are routine and repetitive in a narrow range and using appropriate rule and tool, the role qualifies for Level 3.</p>	4

Title/Name of qualification/component: Solar Photovoltaic technician		Level: 4	
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relate to the NSQF level descriptors	NS QF Level
		<p>The Job holder expected to possess professional skills more than just demonstrating practical skills, which are routine and repetitive in a narrow range but also using appropriate rules & tools to identify and communicate to the Supervisor. Example, He/she is expected to use practical skills and basic fundamental principles of Solar pv set up. He should have knowledge pertaining to operate different tools and equipment required for production of Solar power. Hence, the role can't be placed at Level 3.</p>	
Broad Learning Outcomes/Core Skill	The individual is expected to exhibit fluent communications skills, with fellow Technician & is capable of understanding the need of fellow Technician.	<p>The Job holder is expected to be possess the technical capabilities for preparing the installation plan and its execution for Solar PV Project etc., interact effectively with Technician, skill of collecting and organizing information for them, understanding requirements of the local site to prepare solutions, etc. and communication skill for so as to interact effectively with fellow technician.</p> <p>Thus, considering the core skills, s/he can be placed at Level 4.</p> <p>The Job holder is expected to exhibit core skills more than language to communicate with required clarity, basic algebraic and arithmetic skill. For example, s/he is supposed to organize and collect information regarding the local energy usage practices through discussions, etc., And since the job holder requires only some skill of collecting and organizing</p>	4

Title/Name of qualification/component: Solar Photovoltaic technician		Level: 4	
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relate to the NSQF level descriptors	NS QF Level
		information but doesn't need to be reasonably good and only the desired mathematical skill restricted to the production plant, s/he can't be placed at Level 5.	
Responsibility	The individual is primarily responsible for installation of Solar Pv project setup along with thorough monitoring of the project performance and ensuring proper maintenance of each and every equipment to ensure optimum service delivery. Responsibility of completing the work assigned and reporting the same as per standards.	Solar Pv Technician is responsible for his/ her own work as He/she has to ensure installation of Solar Pv Project. The individual is primarily responsible for updating self with industry trends to an extent influence subordinate's works and learning as He/she is responsible for passing knowledge and skills to his/ her team of Junior technicians and helpers. Considering the responsibilities, the individual can be placed at level 4. Since the Job holder responsibility is not limited till his/her own work & learning but also encompasses some responsibilities for others learnings as He/she is expected to ensure knowledge transfer to team members He/she can't be placed at 3.	4

Annexure: Tools and Equipment (Lab Set-Up)

List of Tools and Equipment

Batch Size:

S. No.	Tool / Equipment Name	Specification	Quantity for specified Batch size
1	Small size/demonstration of solar power Production Units and small solar power plant	Standard Make	
2	Personnel Protective Equipment, First aid kit, Material Safety Data Sheet, Gas leakage detector	Standard Make	
3	Tool kit, IR Thermometer ,Barometer, Double ended flat spanner, Double ended ring spanner, Wrenches, Combination pliers, Side cutting pliers, Nose pliers, Screw driver, Vanier caliper, hammer, Cutters, Tweezers, Stripping & Crimping Tools, Safety helmet, electronic pressure gauge, clamp meter, multimeter, KOH concentration measuring tools, gas leakage detector, Nose mask, Safety goggles, Ear plug, PVC hand glove, Cotton hand glove, Reflective jacket, Safety Gloves ,Chemical Mask, Leather gloves, flame proof aprons, Flame proof overalls buttoned to	Standard Make	

	neck, Helmets/hard hats, Full body harness, Hand shields, , fire extinguishers, First aid equipment, Safety instruments		
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Classroom Aids

The aids required to conduct sessions in the classroom are:

Marker, chart and visual aid, Pellet production flowchart, raw material supply chain flow chart, Schematics of Solar Domestic Product production plant;

Annexure: Industry Validations Summary

Provide the summary information of all the industry validations in table. This is not required for OEM qualifications.

S. No	Organization Name	Representative Name	Designation	Contact Address	Contact Phone No	E-mail ID	LinkedIn Profile (if available)
1.	Bugalia International Pvt. Ltd.	Preeti	Director	47, Ashok Vihar, Jodhpur	9353000097	info@bugaliainternational.com	NA
2.	Gujaraj Institute of Solar Energy	Japen Gor	Project Director	620 Sharan Circle Hub, Opp. BRTS Bus Stop, Zundal, Gandhi Nagar-382421	7201922622	j.gor@gise.in	NA
3.	Greenery Solar Solutions	S. Kannan	Chief Executive Officer	No.234, 1 st Floor, Lawspet Main Road, Pakkamudayanpet, Lawspet, Puducherry-605008	9943256109	greenergypdy@gmail.com	NA

4.	SolarTech Saarthi Pvt. Ltd.	Lucky Aggarwal	Managing Director	17, Amar Colony, Main Rohtak Road, Nangloi, Delhi-110041	9711851306	Lucky.solarsaarthi@gmail.com	NA
5.	Innodust Marketing Private Limited	Sunil Kumar Sahoo	Director	A/63/1, Sahidnagar, Bhubaneswar, Odisha	7894412585	Sunil.innodust@gmail.com	NA
6.	M/s Oriana Power Limited	Parveen Kumar	Director	C-103, 1 st Floor, Sec-2, Noida, U.P-201301	+91-120-4114695	Parveen.jangra@orianapower.com	NA
7.	Saitech Energy Space Systems Pvt. Ltd.	Sanyam Indurkhya	Director	Hall No. 1A, Ground Floor, Chittod Complex, Zone 1, M.P Nagar, Bhopal - 462011	9685580822	Saitechsystem471@gmail.com	NA
8.	Shigoto International Pvt. Ltd.	Sunil Kumar	Director	6-B-12, Mahaveer Nagar 3, Kota, Rajasthan	9829707243	shigotointernational@gmail.com	NA
9.	OM Sai Solar Power System	Rajendra Singh	General Manager	Plot No. C 183, Noida, Sector -63, U.P- 201301	9999596127	Omsaisolarpowersystem12@gmail.com	NA

Annexure: Blended Learning

Blended Learning Estimated Ratio & Recommended Tools:

Refer NCVET “Guidelines for Blended Learning for Vocational Education, Training & Skilling” available on:

<https://ncvet.gov.in/sites/default/files/Guidelines%20for%20Blended%20Learning%20for%20Vocational%20Education,%20Training%20&%20Skilling.pdf>

S. No.	Select the Components of the Qualification	List Recommended Tools – for all Selected Components	Offline : Online Ratio
1	<input checked="" type="checkbox"/> Theory/ Lectures - Imparting theoretical and conceptual knowledge	Color code nomenclature chart of Solar PV equipment's and, Various tools and devices used for installing solar pv project.	60:40
2	<input checked="" type="checkbox"/> Imparting Soft Skills, Life Skills, and Employability Skills /Mentorship to Learners	Small size/demonstration units of transformer, rectifier, and solar power plant, Visit to a Solar Pv Project unit site; Tool kit, IR Thermometer ,Barometer, Double ended flat spanner, Double ended ring spanner, Wrenches, Combination pliers, Side cutting pliers, Nose pliers, Screw driver, Vanier calliper, hammer, Cutters, Tweezers, Stripping & Crimping Tools, Safety helmet, electronic pressure gauge, clamp meter, multimeter, KOH concentration measuring tools, gas leakage detector, Nose mask, Safety goggles, Ear plug, PVC hand glove, Cotton hand glove, Reflective jacket, Safety Gloves ,Chemical Mask, Leather gloves, flame proof aprons, Flame proof overalls buttoned to neck, Helmets/hard hats, Full body harness, Hand shields, , fire extinguishers, First aid equipment, Safety instruments	
3	<input checked="" type="checkbox"/> Showing Practical Demonstrations to the learners		
4	<input checked="" type="checkbox"/> Imparting Practical Hands-on Skills/ Lab Work/ workshop/ shop floor training		
5	<input checked="" type="checkbox"/> Tutorials/ Assignments/ Drill/ Practice		
6	<input checked="" type="checkbox"/> Proctored Monitoring/ Assessment/ Evaluation/ Examinations		
7	<input checked="" type="checkbox"/> On the Job Training (OJT)/ Project Work Internship/ Apprenticeship Training		

Annexure: Detailed Assessment Criteria

Detailed assessment criteria for each NOS/Module are as follows:

NOS/Module Name	Assessment Criteria for Performance Criteria/Learning Outcomes			
	Theory	Practical	Project Marks	Viva Marks
Introduce Solar PV Technology	26	24		
Perform DC electrical work of Solar Module components	30	20		

Identify and Explain Solar PV System Configuration and identify components	30	20		
Perform site assessment and interpret the layout	35	15		
Install Solar PV DC Standalone system (St. Light)	30	20		
Install Solar Off Grid PV System	25	25		
Install Small solar rooftop grid tied plant for residential home	30	20		
Introduce tools and tackles used for Solar Installation	30	20		
Maintain Health and safety measures for installing and operating solar DC system.	29	21		
Employability Skills	20	30		
Grand Total	241	259		

Annexure: Assessment Strategy

This section includes the processes involved in identifying, gathering, and interpreting information to evaluate the Candidate on the required competencies of the program.

1. Assessment System Overview:

- Batches assigned to the assessment agencies for conducting the assessment on SDSM/SIP or email
- Assessment agencies send the assessment confirmation to VTP/TC looping SSC
- Assessment agency deploys the ToA certified Assessor for executing the assessment
- SSC monitors the assessment process & records

2. Testing Environment:

- Confirm that the centre is available at the same address as mentioned on SDMS or SIP
- Check the duration of the training.
- Check the Assessment Start and End time to be as 10 a.m. and 5 p.m.
- Check that the allotted time to the candidates to complete Theory & Practical Assessment is correct.
- Check the mode of assessment—Online (TAB/Computer) or Offline (OMR/PP).
- Confirm the number of TABs on the ground are correct to execute the Assessment smoothly.
- Check the availability of the Lab Equipment for the particular Job Role.

3. Assessment Quality Assurance levels / Framework:

- Question papers created by the Subject Matter Experts (SME)
- Question papers created by the SME verified by the other subject Matter Experts
- Questions are mapped with NOS and PC
- Question papers are prepared considering that level 1 to 3 are for the unskilled & semi-skilled individuals, and level 4 and above are for the skilled, supervisor & higher management
- Assessor must be ToA certified & trainer must be ToT Certified
- Assessment agency must follow the assessment guidelines to conduct the assessment

4. Types of evidence or evidence-gathering protocol:

- Time-stamped & geotagged reporting of the assessor from assessment location
- Center photographs with signboards and scheme specific branding
- Biometric or manual attendance sheet (stamped by TP) of the trainees during the training period
- Time-stamped & geotagged assessment (Theory + Viva + Practical) photographs & videos

5. Method of verification or validation:

- Surprise visit to the assessment location
- Random audit of the batch

- Random audit of any candidate

6. Method for assessment documentation, archiving, and access

- Hard copies of the documents are stored
- Soft copies of the documents & photographs of the assessment are uploaded / accessed from Cloud Storage
- Soft copies of the documents & photographs of the assessment are stored in the Hard Drives

On the Job:

OJT Monitoring Report

- As in Green Jobs Sector, reproducing the evidence for assessment is not feasible due to constraints like cost, confidentiality and controlled environment, every
- Apprentice is required to record the evidences performed during the OJT and the same gets authorized by his/her supervisor.
- The evidence recording is done in a structured monitoring report, termed as OJT Monitoring report.
- During the OJT, every trainee is required to fill the OJT monitoring report which is required to be signed by his/her supervisor.
- Towards the end of OJT period these reports are submitted with the HR department of company
- These duly submitted reports are then verified by an Industry nominated assessor for verification of evidence.

Theory, Practical & Viva:

- Scope – Is used to test the knowledge and understanding and skills acquired during the OJT as well as to conform the OJT monitoring report.
- Some personality traits and generic skills (such as – promptness, sharpness, communication skills, depth of knowledge, comprehension, presentation, patience
- etc.) can also be tested, which is also required for the QP.
- Tools – The assessment's questions should be aligned with the Qualification Pack, covering the PCs. There will be summative assessment at the end of the OJT.
- Method – Direct questions open and close ended questions, situation-based questions, analytical questions, and decision-making based questions for Viva,
- MCQ for the theory and performing QP related operations for practical. Different questions in theory, practical and viva are included to test relevant PCs from
- the QP
- Analysis – Assessor draws a spectrum of ready answers to be expected from trainee for Viva. This reduces effect of subjectivity of the assessor.

Comparative

- Quality of trainees within a batch or different institutes can be gauged. The skill is gauged by observing the practical work.

Execution of OJT Assessment:

- HR department hands over the individual OJT monitoring report with Industry nominated assessor and schedules an assessment meeting for each trainee.
- Industry nominated assessor assesses each trainee based on OJT monitoring report, viva on each PC and also takes into account attendance of each trainee towards the end of the OJT period.
- The OJT marks are compiled for each NOS by the Industry nominated assessor and submitted with HR department of company.
- The OJT assessment results are then sent to SCGJ by HR department of company in a sealed envelope for compiling the assessment results in case of offline assessment.

Annexure: Acronym and Glossary

Acronym

Acronym	Description
AA	Assessment Agency
AB	Awarding Body
ISCO	International Standard Classification of Occupations
NCO	National Classification of Occupations
NCrF	National Credit Framework
NOS	National Occupational Standard(s)
NQR	National Qualification Register
NSQF	National Skills Qualifications Framework
OJT	On the Job Training

Glossary

Term	Description
National Occupational Standards (NOS)	NOS define the measurable performance outcomes required from an individual engaged in a particular task. They list down what an individual performing that task should know and also do.
Qualification	A formal outcome of an assessment and validation process which is obtained when a competent body determines that an individual has achieved learning outcomes to given standards
Qualification File	A Qualification File is a template designed to capture necessary information of a Qualification from the perspective of NSQF compliance. The Qualification File will be normally submitted by the awarding body for the qualification.
Sector	A grouping of professional activities on the basis of their main economic function, product, service or technology.
Long Term Training	Long-term skilling means any vocational training program undertaken for a year and above. https://ncvet.gov.in/sites/default/files/NCVET.pdf

Annexure: Annexure: Career Progression and OM

NSQF	Entrepreneurial value chain	Organizational verticals
LEVEL 5	Solar Photovoltaic Entrepreneur	Solar PV Engineer
LEVEL 4	Solar Photovoltaic Technician/Solar Lightning Assembler/Solar PV Module Manufacturing Technician/Solar PV Installer	Solar Photovoltaic Technician/Solar Lightning Assembler/Solar PV Module Manufacturing Technician/Solar PV Installer
LEVEL 3.5	Solar PV Site Survey Assistant	Solar PV Site Survey Assistant
LEVEL 3.0	Junior Technician- Solar Manufacturing	Junior Technician- Solar Manufacturing
LEVEL 2.5	Solar Domestic Product Assembler	Solar Domestic Product Assembler

LEVEL 2.0	Solar PV Project Helper	Solar PV Project Helper
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