QUALIFICATION FILE

Solar Lighting Assembler

☒ Short Term Training (STT) ☐ Long Term Training (LTT) ☐ Apprenticeship

☐ Upskilling ☐ Dual/Flexi Qualification ☐ For ToT ☐ For ToA

☒ General ☐ Multi-skill (MS) ☐ Cross Sectoral (CS) ☐ Future Skills

NCrF/NSQF Level: 4

Submitted By:

Skill Council for Green Jobs

Chief Executive Officer
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Section 1: Basic Details

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<tr><td>1.</td><td>Qualification Name</td><td colspan="2">Solar Lighting Assembler</td></tr>
<tr><td>2.</td><td>Sector/s</td><td colspan="2">Environment Science</td></tr>
<tr><td>3.</td><td>Type of Qualification: ☐ New ☒ Revised ☐ Has Electives/Options ☐ OEM</td><td>NQR Code & version of existing/previous qualification:
QG-04-ES-00526-2023-V1.1-SCGJ & Version 3.0</td><td>Qualification Name of existing/previous version:
Solar Lighting Assembler (Elective: Home Lighting System/ Street Lights)</td></tr>
<tr><td>4.</td><td>a. OEM Name
b. Qualification Name (Wherever applicable)</td><td colspan="2"></td></tr>
<tr><td>5.</td><td>National Qualification Register (NQR) Code &Version</td><td>QG-04-ES-02630-2024-V2-SCGJ</td><td>6. NCrF/NSQF Level: 4</td></tr>
<tr><td>7.</td><td>Award (Certificate/Diploma/Advance Diploma/ Any Other</td><td colspan="2">Certificate</td></tr>
<tr><td>8.</td><td>Brief Description of the Qualification</td><td colspan="2">A Solar lighting Assembler assembles, tests and repairs different types of solar photovoltaic (SPV) lamps adhering to basic electrical standards.</td></tr>
<tr><td>9.</td><td>Eligibility Criteria for Entry for Student/Trainee/Learner/Employee</td><td colspan="2">a. Entry Qualification & Relevant Experience:
<table>
<tr><th>S. No.</th><th>Academic/Skill Qualification (with Specialization - if applicable)</th><th>Required Experience (with Specialization - if applicable)</th></tr>
<tr><td>1.</td><td>12th(Science) Grade Pass or equivalent</td><td>NA</td></tr>
<tr><td>2.</td><td>10th Grade Pass with 2 years of any combination of NTC/NAC/CITS or equivalent in relevant trade</td><td>NA</td></tr>
<tr><td>3.</td><td>10th Grade Pass</td><td>3 years of experience in Renewable energy/power sector/light assembling</td></tr>
<tr><td>4.</td><td>Previous relevant Qualification of NSQF Level 3.5</td><td>1.5 years of experience in Renewable energy/power sector/light assembling</td></tr>
</table></td></tr>
</table>

		5. Previous relevant Qualification of NSQF Level 3 — 3 years of experience in Renewable energy/power sector/light assembling **b. Age: 18**
10	**Credits Assigned to this Qualification, Subject to Assessment** (as per National Credit Framework (NCrF))	15 — **10. Common Cost Norm Category: I**
11	**Any Licensing requirements for Undertaking Training on This Qualification** (wherever applicable)	NA
12	**Training Duration by Modes of Training Delivery** (Specify **Total Duration** as per selected training delivery modes and as per requirement of the qualification)	☒**Offline** ☐**Online** ☐**Blended**

Training Delivery Modes	Theory (Hours)	Practical (Hours)	OJT Mandatory (Hours)	OJT Recommended (Hours)	Total (Hours)
Classroom (offline)	180	180	90	0	450
Online					

(Refer Blended Learning Annexure for details)

13	**Aligned to NCO/ISCO Code/s** (if no code is available mention the same)	NCO-2015/7411.0100 Electrician, General
14	**Progression path after attaining the qualification** (Please show Professional and Academic progression)	Vertical Progression: Solar photovoltaic Entrepreneur (Level5) Horizontal Progression: NA
15	**Other Indian languages in which the Qualification & Model Curriculum are being submitted**	**Nil**
16	**Is similar Qualification(s) available on NQR-if yes, justification for this qualification**	☐ **Yes** ☒ **No**

17	**Is the Job Role Amenable to Persons with Disability**	☒ **Yes** ☐ **No** **If "Yes", specify applicable type of Disability:** ☒ **Deaf** ☒ **Hard of Hearing** ☒ **Acid Attack Victims** ☒ **Dwarfism**	
18	**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	
19	**Are Greening/ Environment Sustainability Aspects Covered** (Specify the NOS/Module which covers it)	☒ **Yes** ☐ **No**	
20	**Is Qualification Suitable to be Offered in Schools/Colleges**	**Schools** ☒ **Yes** ☐ **No** **Colleges** ☒ **Yes** ☐ **No**	
21	**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@sscgj.in **Contact No.:** 9871119101 **Website: https://sscgj.in/**	
22	**Final Approval Date by NSQC: 30/05/2024**	**23. Validity Duration:** 3 years	**24. Next Review Date: 29/05/2027**

Section 2: Module Summary

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-Man.	OJT Recommended	Total	Th.	Pr.	Proj.	Viva	Total	Weightage (%) *(if applicable)*
1.	SGJ/N0201: Assembly of different types of solar lamp	SGJ/N0201 Version 4.0	Core	4	4	60:00	60:00			120	68	82			150	30
2.	SGJ/N0202: repair solar lamps	SGJ/N0202 Version 4.0	Core	4	4	45:00	75:00			120	24	26			50	10
3.	SGJ/N0106: Maintain personal health & safety at project site	SGJ/N0106 Version 4.0	Core	4	1	15:00	15:00			30	21	29			50	10
4.	Employability Skills	DGT/VSQ/ N0101 Version 1.0	Non Core	4	1	30				30	20	30			50	10
5.	On the Job Training				3					90						
6.	SGJ/N0203: Assemble and repair solar home lighting	SGJ/N0203 Version 4.0	Core	4	1	15:00	15:00			30	49	51			100	20
7.	SGJ/N0204: Assemble and repair solar street lights	SGJ/N0204 Version 4.0	Core	4	1	15:00	15:00			30	52	48			100	20
Duration (in Hours)					15	180	180	90	0	450	234	266			500	100

Note: Total 450 notional hours ((including Theory : 180 +Practical: 180+OJT: 90)

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*

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)*	10th Pass+ ITI Or Diploma in Technical Education with 1 year of experience in manufacturing of solar lighting devices or 2 years of experience in operation and maintenance of solar lighting devices or in renewable energy As per the Relevant Craft Instructor Training Scheme (CITS)
2.	**Master Trainer's Qualification and experience in the relevant sector (in years)** *(as per NCVET guidelines)*	10th Pass+ ITI Or Diploma in Technical Education with 2 years of experience in manufacturing of solar lighting devices or 5 years of experience in operation and maintenance of solar lighting devices or in renewable energy post their ToT Certification.
3.	**Tools and Equipment Required for Training**	☒Yes ☐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)*	10th Pass+ ITI Or Diploma in Technical Education with 2 year of experience in manufacturing of solar lighting devices or 10 years of experience in operation and maintenance of solar lighting devices *** The education qualification can be relaxed in case of extraordinary relevant field experience.**
2.	**Proctor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)*	10th Pass+ ITI Or Diploma in Technical Education with 2 year of experience in manufacturing of solar lighting devices or 3 years of experience in operation and maintenance of solar lighting devices *** The education qualification can be relaxed in case of extraordinary relevant field experience.**
3.	**Lead Assessor's/Proctor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)*	10th Pass+ ITI Or Diploma in Technical Education with 3 year of experience in manufacturing of solar lighting devices or 10 years of experience in operation and maintenance of solar lighting devices post their ToA Certification. *** The education qualification can be relaxed in case of extraordinary relevant field experience.**
4.	**Assessment Mode** *(Specify the assessment mode)*	Online and offline both
5.	**Tools and Equipment Required for Assessment**	☒ Same as for training ☒ Yes ☐ No *(details to be provided in Annexure-if it is different for Assessment)*

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://sscgj.in/wp-content/uploads/2022/03/Green-Jobs-Report-Jan27.pdf
2.	**Latest Market Research Reports or any other source (not older than 2 years) (Yes/No):** yes Yes following key documents are available in the public domain a. https://sscgj.in/wp-content/uploads/2022/03/Green-Jobs-Report-Jan27.pdf b. https://solarrooftop.gov.in/knowledge/file-44.pdf c. https://jmkresearch.com/wp-content/uploads/2022/02/Photovoltaic-Manufacturing-Outlook-in-India_February-2022_JMK.pdf
3.	**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. 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. Key schemes of the Government on Solar energy • 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. 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.

4.	**Number of Industry validation provided:** Up to 10 industry validations are expected to be received for the qualification.
5.	**Estimated nos. of persons to be trained and employed:** The increase in workforce requirements (as per projections) from 2024 to 2027 & 2030 is significant for this role. A minimum of 5000 of Solar lighting technicians are estimated to be needed annually by 2027
6.	**Evidence of Concurrence/Consultation with Line Ministry/State Departments:** Concurrence has been requested from the Ministry of New and Renewable Energy

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 *(Mandatory)*	Annexure: Evidence of Level
2.	**Annexure:** List of tools and equipment relevant for qualification *(Mandatory, except in case of online course)*	Annexure: Tools and Equipment (Lab Set-Up)
3.	**Annexure:** Detailed Assessment Criteria *(Mandatory)*	Annexure: Detailed Assessment Criteria (Mandatory)
4.	**Annexure:** Assessment Strategy *(Mandatory)*	Annexure: Assessment Strategy
5.	**Annexure:** Acronym and Glossary *(Optional)*	Annexure: Acronym and Glossary
6.	**Supporting Document:** Model Curriculum *(Mandatory – Public view)*	Attached

7.	**Supporting Document:** Career Progression *(Mandatory - Public view)*	Annexure: Career progression and OM
8.	**Supporting Document:** Occupational Map *(Mandatory)*	Annexure: Career progression and OM
9.	**Supporting Document:** Assessment SOP *(Mandatory)*	Annexure: Assessment Strategy

Annexure: Evidence of Level

Title/Name of qualification/component: Solar Lighting Assembler			**Level:4**
NSQF Domain	**Outcomes of the Qualification/Component**	**How the outcomes relate to the NSQF level descriptors**	**NSQF Level**
Professional Theoretical Knowledge/ Process	The Solar Lighting Assembler performs the following activities: • Assembly of different types of solar lamps • Repair solar lamp • Assembly of Solar home lighting systems • Repair Solar home lighting systems • Assembly of Solar Street Lights • Repair Solar Street Lights	The activities performed by Solar lighting Technician in limited range which they are very familiar with and they have very predictable, routine situation where they can make clear choices.	4
Professional and Technical	The Solar lighting Assembler is required to possesses the knowledge of: • Natural resources of energy	The Assembler has a factual knowledge of the solar field and understand the basic knowledge of electricity and electrical system.	4

Title/Name of qualification/component: Solar Lighting Assembler			**Level:4**
NSQF Domain	**Outcomes of the Qualification/Component**	**How the outcomes relate to the NSQF level descriptors**	**NSQF Level**
Skills/ Expertise/ Professional Knowledge	• Voltage, Current and resistance. • Characteristics & specifications of battery, solar module, PCB (Printed Circuit Board), LED (light- Emitting-Diode) load wire and other components of a solar home lighting systems as per the manufacturer. • Operating and working of a Multimeter soldering iron and other tools present in a tool kit. • Preliminary concepts of solar PV system • Complete assembly of a solar home lighting systems as per manufacturer • Warranties of different components of solar home lighting systems. • Ability to shape and direct working/process methods according to self-defined criteria and effective management techniques • Standard operating procedures for carrying out visual inspection of solar home lighting systems. • Testing procedure for verifying the performance of all the components of a solar home lighting systems. • Structure of a basic repair and maintenance report. • Knowledge of electrical hazards		
Employment Readiness & Entrepreneurship	The Solar Lighting Assembler has the following professional skills: • Follow organization based decision making process • Plan and organise work schedule to meet deadlines • Work constructively with others. • Adhere to organisation code of conduct • Recognise problems and search for solutions. • Choose the best methods to complete assigned tasks	A Solar Lighting Assembler recalls and demonstrate practical skills, routine and repetitive in narrow range of application, using appropriate rule and tools.	4

Title/Name of qualification/component: Solar Lighting Assembler			**Level:4**
NSQF Domain	**Outcomes of the Qualification/Component**	**How the outcomes relate to the NSQF level descriptors**	**NSQF Level**
Skills & Mind-set/Professional Skill	• Reduce repetition of errors		
Broad Learning Outcomes/ Core Skill	The Solar Lighting Assembler possess the following Core Skills • Prepare and maintain documentation • Read and Understand "assembly and distribution training manuals" in English / Hindi / vernacular language. • Basic understanding of vernacular/local language • Read user manuals and safety instructions • Express statements or information clearly so that others can hear and understand • Participate in and understand general discussions • Respond appropriately to any queries • Communicate with other employees in the organization	A Solar Lighting Assembler communicates with required clarity. They also report their day to day activity and have a fairly good understanding of social political and natural environment.	4
Responsibility	A solar lighting assembler performs the following : • Identify different types of solar lamps • Verify physical properties of all the lamp components. • Measure basic electrical parameters like resistance, current and voltage of different solar lamp electrical components. • Test the solar panel to check if the Voltage at open circuit (VoC) and current at open circuit (IoC) are according to the specifications mentioned by the manufacturer • Test the battery to check if it's voltage is within the range specified by the manufacturer	Solar Lighting Assembler is responsible for own work and learning.	4

Title/Name of qualification/component: Solar Lighting Assembler			Level:4
NSQF Domain	**Outcomes of the Qualification/Component**	**How the outcomes relate to the NSQF level descriptors**	**NSQF Level**
	• Perform a continuity check of the load wire to check for any internal breakage • Verify the PCB and LED as per technical specifications mentioned by the manufacturer. • Perform step by step procedure to assemble a solar lamp		

Annexure: Tools and Equipment (Lab Set-Up)

List of Tools and Equipment

Batch Size: 30

S. No.	Tool / Equipment Name	Specification	Quantity for specified Batch size
1	Solar Panel for assembly	Number	6

2	Multimeter	Number	6
3	Clamp meter	Number	1
4	Circuit	Number	6
5	wire	Meter	As per length required
6	Functional Demo Model	Number	1
7	Semiconductors	Number	6
8	LED bulbs	Number	6
9	Resistor	Number	6
10	Battery	Number	4
11	Capacitor	Number	6
12	Tweezers	Number	6
13	Solder iron	Number	2
14	Solder wire and flux	Set	6
15	M-seal	Number	2
16	Adhesive	Number	2
17	Wire Crimping, Stripping and Cutting Tool (s)	Number	4
18	Screwdriver	Number	6
19	Safety Helmet	Number	30
20	Safety Shoes	Number	30
21	Safety Belt	Number	30
22	First Aid kit	Number	1
23	Safety gloves	Number	30
24	Reflective Jacket	Number	30

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 Compressed biogas waste to energy 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.	Ashlyn Solar Infra Private Limited	Arun Kumar	Director	C-44, Mansa Ram Park, Uttam Nagar, New Delhi - 110059	8130841685	arun@greenaffiliates.in	NA
2.	Danao Green Tech Private Limited	Dr. Sanjay Danao	Director	203, Sai Avenue, D-7, CIDCO Meghdoot, Butibori MIDC, Nagpur - 441122	9545648496	Danaogreentech@gmail.com	NA
3.	M/s Oriana Power Limited	Parveen	CEO	C-103, 1st Floor, Sec-2, Noida, U.P-201301	0120-4114695	Rupal.gupta@orianapower.com	NA
4.	PowerXP Consultants Private Limited	Puneet Sharma	GM	86, Marudhara Nagar, Bikaner, Rajasthan - 334003	7726884770	pxpsolar@gmail.com	NA

5.	Innodust Marketing Private Limited	Sunil Kumar Sahoo	Director	Plot No. A/63/1, Saheed Nagar, Bhubaneshwar, Odisha - 751007	7894412585	Sunil.innodust@gmail.com	NA
6.	Vacen Engineering and Solutions Private Limited	Vibhutinath Pandey	Director	H-72-A, Second Floor, Kh No. 80/14, Mahavir Enclave, Palam, New Delhi - 110045	7503208625	Vibhuti.vacen@gmail.com	NA
7.	Ayodhyawasi Corporation (OPC) Private Limited	Anurag Srivastava	CEO	D-2/101, Vibhuti Khand, Gomti Nagar, Lucknow - 226010	8887521559	ayodhyawasigroup@gmail.com	NA
8.	Gujarat Institute of Solar Energy	Dipti Shah	Principal Director	620, Sharan Circle Business Hub, Opp. Zundal BRTS, Zundal Cross Road, Gandhinagar - 382421	9898167732	director@gise.in	NA
9.	GORenewable Technology	Japen Gor	Managing Partner	214, Devpath Complex, B/H Lal Bungalow, Off C.G Road, Navrangpura, Ahmedabad-380009	9099064348	japen@gorenewtech.com	NA
10.	SolarTech Saarthi Pvt. Ltd.	Lucky Agarwal	Managing Director	A-6/49, Sector 17, Rohini, Delhi - 110089	9711851306	solarsaarthi@gmail.com	NA
11.	Global Sustainable Energy Solutions India Pvt. Ltd.	Dwipen Boruah	Managing Director	FIEE Complex, A-46, Upper Ground Floor,	9560550075	Dwipen.boruah@gses.in	NA

				Okhla Industrial Area, Phase II, New Delhi - 110020			
12.	ASW Projects Pvt. Ltd.	Uzma Ali	Assistant Manager	38 A,1st Floor, Surya Kiran Complex, Opposite Khureji Petrol Pump, West Laxmi Market, Delhi - 110051.	7011485393	aswprojects@gmail.com	NA
13.	Friends Power Solution	Hiren Thakkar	Partner	25/c Mahakant Complex, Opp. v.s. hospital Ellisbridge, Ahmedabad	9825431155	Friendspowersolution1121@gmail.com	NA
14.	Grun Green Power Private Ltd	Ramesh Shivanna	Director	99, 2nd Cross, 2nd Main, MLA Layout, R T Nagar, Bangalore	9845010306	ramesh@prideworld.in	NA
15.	Heemsol Energy System Pvt Ltd	Dipti Shah	Director	620, Sharan Circle Hub, Near Zundal BRTS Bus Stand, Zundal, Gandhinagar-382421, Gujarat	9898167732	dipti@heemenergy.com	NA
16.	MS Enterprises	Nitin Verma	Director	248-A, Veer Sawarkar Nagar, Kota (Raj.) - 324005	9001860235	Rajsingh.necessary@gmail.com	NA
17.	OM SAI SOLAR POWER SYSTEM	Rajendra Singh	Director	Plot No. C-183, Noida, Sector 63	9999596127	Omsaisolarpowersystem12@gmail.com	NA

18.	SAURGURU GREEN ENERGY SOLUTIONS	Manisha Anand Barbind	Proprietor	Plot No. 03, Peshwe Nagar, Satara Parisar, Aurangabad (M.S)	9422108057	mabarbind@gmail.com	NA
19.	Shri Rang Aditya Solar Power EPC Pvt Ltd	Atul Jani	Director	A-413, Fourth Floor, Maradia Plaza, Near Panchvati 5 Cross Road, C. G. Road, Ahmedabad	76328 50466	rangadityaaspepc@gmail.com	NA

Annexure: Training & Employment Details

Training and Employment Projections:

Year	Total Candidates		Women		People with Disability	
	Estimated Training #	Estimated Employment Opportunities	Estimated Training #	Estimated Employment Opportunities	Estimated Training #	Estimated Employment Opportunities
2024-25	250		30		Nil	
2025-26	250		30			
2026-27	500		60			

Data to be provided year-wise for next 3 years

Training, Assessment, Certification, and Placement Data for previous versions of qualifications:

Qualification Version	Year	Total Candidates				Women				People with Disability			
		Trained	Assessed	Certified	Placed	Trained	Assessed	Certified	Placed	Trained	Assessed	Certified	Placed

1	2021-22	0	0	0									
2	2022-23	354	338	338									
3	2023-24	411	407	407									

Applicable for revised qualifications only, data to be provided year-wise for past 3 years.

List Schemes in which the previous version of Qualification was implemented:

1. NA

Content availability for previous versions of qualifications:

☒ **Participant Handbook** ☒ **Facilitator Guide** ☐ Digital Content ☐ Qualification Handbook ☐ Any Other:

Languages in which Content is available: Available in Englis

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	☒Theory/ Lectures - Imparting theoretical and conceptual knowledge	Not Applicable	Not Applicable
2	☒Imparting Soft Skills, Life Skills, and Employability Skills /Mentorship to Learners		
3	☒Showing Practical Demonstrations to the learners		
4	☒Imparting Practical Hands-on Skills/ Lab Work/ workshop/ shop floor training		

5	☒Tutorials/ Assignments/ Drill/ Practice		
6	☒Proctored Monitoring/ Assessment/ Evaluation/ Examinations		
7	☒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 Marks	Practical Marks	Project Marks	Viva Marks
SGJ/N0201: Assembly of different types of solar lamp	*need of clean energy*	9	7	-	-
	PC1. Provide introduction to the Programme anddiscuss the job profile	1	-	-	-
	PC2. Identify the importance and the need ofClean Energy for Lighting	2	1	-	-
	PC3. Illustrate the importance of the job role andoutline future career options	1	1	-	-
	PC4. Discuss and Show how small solar lightingsystem are useful for the overall health and development of communities	1	1	-	-
	PC5. Discuss and Illustrate key components of asmall solar lighting system and outline their functions	2	2	-	-

	PC6. Demonstrate the working of a solar DC system through various charts, model, video etc.	-	1	-	-
	PC7. Explain and show how to acquire basic skillsof communication; along with skills for working effectively with others while respecting gender and disability concerns	1	1	-	-
	PC8. Discuss and show how to promote a safeand interactive environment	1	-	-	-
	basics of solar energy	**11**	**12**	-	-
	PC9. Explain the basics of electricity	2	-	-	-
	PC10. Identify basics of electrical circuit	1	1	-	-
	PC11. Perform simple calculations to illustrate the fundamental concepts of power and energy.	1	2	-	-
	PC12. Explain the importance of Measurement ofSolar irradiation.	-	-	-	-
	PC13. Analyze the use and importance of sunlight	2	2	-	-
	PC14. Show and Identify uses of Sunlight invarious solar applications	1	3	-	-
	PC15. Provide Introduction to luminance meter and Identify the importance of luminous intensity.	*2*	**2**	-	-
	PC16. Identify the importance of Measurement of Solar irradiation	*2*	**2**	-	-
	tools and tackles	*9*	**9**	-	-

	PC17. Identify an electric tool kit and Demonstrate how to work with an electric tool kit	*2*	**2**	-	-
	PC18. Discuss the key tools and tackles required for assembly and repair of concerned system.	*2*	-	-	-
	PC19. Show the use of all tools and tackles required for assembly and repair of concerned system.	-	**2**	-	-
	PC20. Discuss the use and Perform working with a Screw Driver	*1*	**1**	-	-
	PC21. Demonstrate how to use soldering Iron and how to do proper soldering	*2*	**2**	-	-
	PC22. Perform Cable/wire cutting practices/explain and demonstrate about lugs crimping tool.	*2*	**2**	-	-
	components of a Solar PV home lighting system	*10*	**11**	-	-
	PC23. Explain and Identify the components of a Solar PV home lighting system	*2*	**2**	-	-
	PC24. Discuss and show how to use a multimeter	*1*	**1**	-	-
	PC25. Explain and Show how to perform technical testing of solar home lighting system components	*2*	**2**	-	-
	PC26. Explain how a solar panel operates and show how to measure basic parameters like current and voltage	*2*	**2**	-	-
	PC27. Explain and show the effect of shadow on solar module	*2*	**2**	-	-

	PC28. Explain and Show the working of LED bulbs	*1*	**2**	-	-
	assembly of different types of solar lamp	*10*	**12**	-	-
	PC29. Identify various types of solar lamps	*1*	**2**	-	-
	PC30. Explain and show how to verify physical properties of all the lamp components.	*1*	**1**	-	-
	PC31. Explain and show how to measure basic electrical parameters like resistance, current and voltage of different solar lamp, electrical components	*2*	**2**	-	-
	PC32. Discuss and Show how to test the battery voltage.	*2*	**2**	-	-
	PC33. Discuss and Perform step by step procedure to assemble a solar lamp	*2*	**2**	-	-
	PC34. Discuss and Show how to perform a continuity check of the load wire to check short circuit for any internal breakage	*1*	**2**	-	-
	PC35. Discuss to verify the PCB and LED as per technical specifications mentioned by the manufacturer.	*1*	**1**	-	-
NOS Total		**49**	**51**	-	-

NOS/Module Name	Assessment Criteria for Performance Criteria/Learning Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
SGJ/N0202 : Repair Solar Lamps	*visual inspection and repair*	**6**	**6**	-	-

	PC1. Discuss and Show how to perform visual inspection and repair solar lamps .	3	3	-	-
	PC2. Explain and show the key steps inrepairing solar lamps.	3	3	-	-
	measure voltage	**18**	**20**	**-**	**-**
	PC3. Explain and show how to Measure and verify the terminal voltage of the battery as per manufacturer's specification.	3	3	-	-
	PC4. Explain and show how to measure andverify the voltage and current of solar PV modules with technical specifications	3	3	-	-
	PC5. Examine and show hpw to replace thefaulty switches and DC sockets	3	4	-	-
	PC6. Discuss and verify the connector pin andother components of a solar lamp	3	3	-	-
	PC7. Explain and show the working of a PCB/LED drivers	3	3	-	-
	PC8. Discuss and Show how to Prepare a basicrepair and maintenance report	3	4	-	-
NOS Total		**24**	**26**	**-**	**-**

NOS/Module Name	Assessment Criteria for Performance Criteria/Learning Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
DGT/VSQ/N0101:Employability Skills (30 Hours)	*Introduction to Employability Skills*	**1**	**1**	**-**	**-**

	PC1. understand the significance of employability skills in meeting the job requirements	-	-	-	-
	Constitutional values – Citizenship	**1**	**1**	-	-
	PC2. identify constitutional values, civic rights, duties, personal values and ethics and environmentally sustainable practices	-	-	-	-
	Becoming a Professional in the 21st Century	**1**	**3**	-	-
	PC3. explain 21st Century Skills such as Self-Awareness, Behavior Skills, Positive attitude, self-motivation, problem-solving, creative thinking, time management, social and culturalawareness, emotional awareness, continuous learning mindset etc.	-	-	-	-
	Basic English Skills	**2**	**3**	-	-
	PC4. speak with others using some basicEnglish phrases or sentences	-	-	-	-
	Communication Skills	**1**	**1**	-	-
	PC5. follow good manners while communicatingwith others	-	-	-	-
	PC6. work with others in a team	-	-	-	-
	Diversity & Inclusion	**1**	**1**	-	-
	PC7. communicate and behave appropriatelywith all genders and PwD	-	-	-	-

	PC8. report any issues related to sexual harassment	-	-	-	-
	Financial and Legal Literacy	**3**	**4**	-	-
	PC9. use various financial products and servicessafely and securely	-	-	-	-
	PC10. calculate income, expenses, savings etc.	-	-	-	-
	PC11. approach the concerned authorities for any exploitation as per legal rights and laws	-	-	-	-
	Essential Digital Skills	*4*	**6**	-	-
	PC12. operate digital devices and use its features and applications securely and safely	-	-	-	-
	PC13. use internet and social media platforms securely and safely	-	-	-	-
	Entrepreneurship	*3*	**5**	-	-
	PC14. identify and assess opportunities for potential business	-	-	-	-
	PC15. identify sources for arranging money and associated financial and legal challenges	-	-	-	-
	Customer Service	*2*	**2**	-	-

	PC16. identify different types of customers	-	-	-	-
	PC17. identify customer needs and address them appropriately	-	-	-	-
	PC18. follow appropriate hygiene and grooming standards	-	-	-	-
	Getting ready for apprenticeship & Jobs	*1*	**3**	-	-
	PC19. create a basic biodata	-	-	-	-
	PC20. search for suitable jobs and apply	-	-	-	-
	PC21. identify and register apprenticeship opportunities as per requirement	-	-	-	-
NOS Total		**20**	**30**	-	-

NOS/Module Name	Assessment Criteria for Performance Criteria/Learning Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
SGJ/N0106*:* Maintain Personal Health & Safety at project site	*Adopt safe practices at workplace*	**13**	**19**	-	-
	PC1. explain the requirements for safe work area	2	-	-	-
	PC2. identify and report any hazards, risks orbreaches in site safety to the appropriate authority	2	3	-	-

	PC3. follow recommended safe practices in handling physical, chemical, electrical and firehazards and risk	1	2	-	-
	PC4. use appropriate Personal Protective Equipment(PPE) for head, eye, hand, ear, face, body and fall protection specific to work condition	2	4	-	-
	PC5. follow safe practices when working at heightand in confined space	1	1	-	-
	PC6. handle all required tools, tackles, materialsand equipment safely	1	2	-	-
	PC7. identify expiry dates, wear and tear issuesof specified equipment and accordingly inform supervisor and undertake corrective measures	1	2	-	-
	PC8. apply ergonomic principles whereverrequired	1	2	-	-
	PC9. use safety signs, labels, charts and noticesat workplace	1	1	-	-
	PC10. identify work safety procedures and instructions for handling heavy components	1	2	-	-
	Follow emergencies, rescue and first aid procedures	**4**	**4**	-	-
	PC11. follow emergency and evacuation procedures in case of accidents, fires and naturalcalamities	1	1	-	-
	PC12. use appropriate fire extinguishers fordifferent types of fire	1	1	-	-

	PC13. administer first aid to victim in case of various medical emergencies including bleeding, burns, choking, electric shock, cardiac arrest, etc.	*1*	**1**	-	-
	PC14. use correct method to move injured person during an emergency	*1*	**1**	-	-
	Follow good housekeeping practices and infection control guidelines	*4*	**6**	-	-
	PC15. follow recommended personal hygiene, workplace hygiene and sanitation practices	*1*	**1**	-	-
	PC16. clean and disinfect all material, tools and supplies before and after use	*1*	**1**	-	-
	PC17. report immediately to concerned authorities regarding sign and symptoms of illness of self and other colleagues	*1*	**2**	-	-
	PC18. follow processes specified for disposal of hazardous waste	*1*	**2**	-	-
NOS Total		**21**	**29**	-	-

NOS/Module Name	Assessment Criteria for Performance Criteria/Learning Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
SGJ/N0203*:* Assemble and repair solar home lighting	*Assembly of solar home lighting systems*	**12**	**40**	-	-
	PC1. verify physical properties of all the solarhome lighting systems components.	4	4	-	-

	PC2. measure basic electrical parameters like resistance, current and voltage of different solarhome lighting electrical components.	2	6	-	-
	PC3. test the solar panel to check if the Voltageat open circuit (VoC) and current at open circuit(IoC) are according to the specifications mentioned by the manufacturer	1	5	-	-
	PC4. test the battery to check if its voltage is within the range specified by the manufacturer	1	5	-	-
	PC5. perform a continuity check of the load wireto check for any internal breakage	1	5	-	-
	PC6. verify the PCB and LED as per technical specifications mentioned by the manufacturer.	1	5	-	-
	PC7. perform step by step procedure to assemble a solar home lighting systems	2	10	-	-
	Repair Solar home lighting systems	**13**	**33**	**-**	**-**
	PC8. perform visual inspection of the solar homelighting systems.	2	4	-	-
	PC9. measure and verify the terminal voltage ofthe battery as per manufacturers specification.	1	5	-	-
	PC10. measure and verify the voltage and current of solar PV modules with technical specifications	2	4	-	-
	PC11. verify and replace the faulty switches andDC sockets	1	5	-	-

	PC12. verify the connector pin and other components of a solar home lighting systems	2	4	-	-
	PC13. verify the working of a PCB/ LED drivers	1	5	-	-
	PC14. verify the working of the charge controller	2	4	-	-
	PC15. prepare a basic repair and maintenance report.	2	2	-	-
	Communicate and work effectively with others while respecting diversity	1	1	-	-
	PC16. promote a safe and interactive environment at work and use inclusive language (verbal, non-verbal and written) that is gender, disability and culturally sensitive	1	1	-	-
NOS Total		**26**	**74**	**-**	**-**

NOS/Module Name	Assessment Criteria for Performance Criteria/Learning Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
SGJ/N0204: Assemble and repair solar street lights	*Assembly of solar street lights*	**14**	**40**	**-**	**-**
	PC1. verify physical properties of all the streetlights components.	4	4	-	-
	PC2. measure basic electrical parameters like resistance, current and voltage of different solarstreet lights electrical components.	2	6	-	-
	PC3. test the solar panel to check if the Voltageat open circuit (VoC) and current at open circuit(IoC) are according to the specifications mentioned by the manufacturer	2	5	-	-

	PC4. test the battery to check if its voltage is within the range specified by the manufacturer	2	5	-	-
	PC5. perform a continuity check of the load wireto check for any internal breakage	1	5	-	-
	PC6. verify the PCB and LED as per technical specifications mentioned by the manufacturer.	1	5	-	-
	PC7. perform step by step procedure toassemble a solar street lights	2	10	-	-
	Repair Solar Street lights	**13**	**33**	**-**	**-**
	PC8. perform visual inspection of a solar streetlight system.	2	4	-	-
	PC9. measure and verify the terminal voltage ofthe battery as per manufacturers specification.	1	5	-	-
	PC10. measure and verify the voltage and current of solar PV modules with technical specifications	2	4	-	-
	PC11. verify and replace the faulty switches anddc sockets	1	5	-	-
	PC12. verify the connector pin and othercomponents of a solar street light	2	4	-	-
	PC13. verify the working of a PCB/ LED drivers	1	5	-	-
	PC14. verify the working of the charge controller	2	4	-	-

	PC15. prepare a basic repair and maintenancereport	2	2	-	-
NOS Total		**27**	**73**	**-**	**-**

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/SID or email
   - Assessment agencies send the assessment confirmation to VTP/TC looping SCGJ
   - Assessment agency deploys the ToA certified Assessor for executing the assessment
   - SCGJ 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 Level/domain	Solar PV - Off Grid							
8	MD/Director							
6.5-7			Category Head (Solar PV Pumps)	Category Head (Solar Street Lighting)		Category Head (Solar Lantern and Solar Home lighting)		
5.5-6	Solar Off-Grid Sales Manager		Solar PV Pump Installation and Maintenance Manager /Solar Pump Entrepreneur	Site Supervisor	Civil Subcontractor		Solar Off Grid Production Manager (Solar Lantern and Solar Home lighting)	
4.5-5		Solar Cold Storage Dealership or Channel Partner	Solar Water Pumping Junior Engineer	Solar Off Grid Street Lighting Installation and Maintenance Supervisor	Mechanical / Civil Supervisors	Solar Off-Grid Entrepreneur	Solar Off Grid Production Supervisor (Solar Lantern and Solar Home lighting)	
3.5-4	Solar Off – Grid Sales Executive	Solar Cold Storage Entrepreneur	Agrivoltaic Installer/ Solar Pump Technician	Solar Lighting Assembler	Mason	Solar Off Grid Installation and repair Technician (Solar Lantern and Solar Home lighting)		Solar Off Grid Manufacturing Technician (Solar Lantern and Solar Home lighting)
2.5-3		Junior Technician-Solar Cold Storage		Solar Domestic Product Assembler				
2			Solar PV Project Helper	Solar PV Installation Helper	Solar PV Project Helper	Solar PV Project Helper		Solar PV Project Helper
1								

Solar Lighting Assembler