QUALIFICATION FILE

Solar Manufacturing – Junior Technician

☒ Short Term Training (STT)

☒ Future Skills

NCrF/NSQF Level: 3

Submitted By:

Skill Council for Green Jobs

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Section 1: Basic Details

1.	**Qualification Name**	**Solar Manufacturing – Junior Technician**	
2.	**Sector/s**	Environmental Science	
3.	**Type of Qualification:** ☐ **New**	**NQR Code & version of existing/previous qualification:**	**Qualification Name of existing/previous version:**
4.	**a. OEM Name** **b. Qualification Name** (Wherever applicable)	**Solar Manufacturing – Junior Technician**	
5.	**National Qualification Register (NQR) Code &Version**	QG-03-ES-00908-2023-V1-SCGJ & version 1	**6. NCrF/NSQF Level:** 3
7.	**Award (Certificate/Diploma/Advance Diploma/ Any Other**	Certificate	
8.	**Brief Description of the Qualification**	Solar Manufacturing Junior Technician is responsible for basic preparation, handling and supply of materials for solar manufacturing. The job holder must adhere to all safety procedures and practice good housekeeping, safe operation of specific equipment, material or processes. This is an entry level position for solar manufacturing.	
9.	**Eligibility Criteria for Entry for Student/Trainee/Learner/Employee**	**a. Entry Qualification & Relevant Experience:**	

b. Age: 16

S. No.	Academic/Skill Qualification (with Specialization - if applicable)	Required Experience (with Specialization - if applicable)
1	9th Grade pass and pass and pursuing continuous schooling in regular school.	NA
2	Grade 8 pass with two year of (NTC/ NAC) after 8th Grade Pass with 2 years relevant experience.	NA
3	Qualification of NSQF Level 2.5 with 1.5 years of relevant experience	NA
4	Previous relevant Qualification of NSQF Level 2 with 3 years of relevant experience	NA

10	**Credits Assigned to this Qualification, Subject to Assessment** (as per National Credit Framework (NCrF))	10	**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)	☒**Offline** ☐**Online** ☐**Blended**	

Training Delivery Modes	Theory (Hours)	Practical (Hours)	OJT Mandatory (Hours)	OJT Recommended (Hours)	Employability (Hours)	Total (Hours)
Classroom (offline)	140	100	30		30	300
Online						

(Refer Blended Learning Annexure for details)

14	**Aligned to NCO/ISCO Code/s** (if no code is available mention the same)	NCO-2015/8212.0400
15	**Progression path after attaining the qualification** (Please show Professional and Academic progression)	Vertical Progression: Solar PV Site Survey Assistant (Level 3.5)
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**	**☐ Yes ☒ No**
18	**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**
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 on-board 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)	**☒ Yes ☐ No**
21	**Is Qualification Suitable to be Offered in Schools/Colleges**	**Schools ☒ Yes ☐ No Colleges ☒ Yes ☐ 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@sscgj.in **Contact No.:** 9871119101 **Website: https://sscgj.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.	Explain and identify key components of Solar PV system	SGJ/N4019	Core	3	3	50	40	30		90	27	23			50	20
2.	Identify Different semi-conductor materials and types of solar cell	SGJ/N4020	Core	3	3	50	40			90	26	24			50	20
3.	Describe the basics functions of Solar rooftop plant	SGJ/N4021	Core	3	1	20	10			30	30	20			50	20
4.	Maintain Personal Health & Safety for solar manufacturing	SGJ/N4022	Core	3	1	20	10			30	35	15			50	20
5.	Employability Skills	DGT/VSQ/N0101			1					30	20	30			50	20

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.	On the Job Training									30						
Duration (in Hours) / Total Marks					10	140	100	30	30	**300**	138	112			250	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)*	ITI /Diploma Electrical, Electronics, Civil, Mechanical, Fitter, Instrumentation or B.Tech (Civil/Mechanical /Electrical/ Instrumentation / Electronics / Electrical and Electronics Eng.) or MSc Physics or The education qualification can be relaxed in case of extraordinary relevant field experience. Or Certified under relevant Craft Instructor Training Scheme (CITS) course Minimum 3 years of relevant industry/teaching experience for ITI /Diploma (Electrical, Electronics, Civil, Mechanical, Fitter, Instrumentation) Or 2. Minimum 2 years of relevant industry/teaching experience for B.Tech (Civil/Mechanical /Electrical/ Instrumentation / Electronics / MSc Physics
2.	**Master Trainer's Qualification and experience in the relevant sector (in years)** *(as per NCVET guidelines)*	B.Tech (Civil/Mechanical /Electrical/ Instrumentation / Electronics / Electrical and Electronics Eng.) or MSc Physics with 4 years' experience in Solar product Manufacturing
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)*	ITI /Diploma Electrical, Electronics, Civil, Mechanical, Fitter, Instrumentation or B.Tech (Civil/Mechanical /Electrical/ Instrumentation / Electronics / Electrical and Electronics Eng.) or MSc Physics or The education qualification can be relaxed in case of extraordinary relevant field experience.

		Or Certified under relevant Craft Instructor Training Scheme (CITS) course Minimum 4 years of relevant industry/teaching experience for ITI /Diploma (Electrical, Electronics, Civil, Mechanical, Fitter, Instrumentation) Or 2. Minimum 3 years of relevant industry/teaching experience for B.Tech (Civil/Mechanical /Electrical/ Instrumentation / Electronics / MSc Physics
2.	**Proctor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)*	B.Tech (Civil/Mechanical /Electrical/ Instrumentation / Electronics / Electrical and Electronics Eng.) or MSc Physics with 5 years' experience in Solar product Manufacturing
3.	**Lead Assessor's/Proctor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)*	B.Tech (Civil/Mechanical /Electrical/ Instrumentation / Electronics / Electrical and Electronics Eng.) or MSc Physics with 5 years' experience in Solar product Manufacturing
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 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://jmkresearch.com/wp-content/uploads/2022/02/Photovoltaic-Manufacturing-Outlook-in-India_February-2022_JMK.pdf
3.	**Government /Industry initiatives/ requirement (Yes/No):** The term solar manufacturing largely refers to the production and assembly of the entire components of solar value chain with solar cells and modules being some key examples. Polysilicon is the building block for solar PV manufacturing from which ingots are cast. Wafers cut from ingots are then used to make solar cells, after which modules are assembled. Globally, the manufacturing of polysilicon, ingot and wafer is dominated by China but to ensure energy security and the viability of solar power projects in the country, Government of India has taken a range of steps for boosting domestic solar manufacturing. In order to boost demand for locally manufactured solar cell and modules, the government schemes including central public sector undertaking (CPSU) scheme, phase 2 of grid connected rooftop solar program and PM–KUSUM scheme mandate domestic content requirement for sourcing solar PV modules. The government has also issued amendments to ALMM order, 2019 clarifying that only the models and manufacturers enlisted under ALMM will be eligible for use in a range of Government supported solar projects. Government plans to create an additional domestic solar equipment manufacturing capacity of 25 GW each of solar cells and modules, and 10 GW of wafers in 2023. Considering the strategic importance of augmenting the capability for domestic manufacturing, the plan follows an additional allocation of Rs 19,500 crore[1] for the production-linked incentive (PLI) scheme for high-efficiency solar modules in the FY22-23 Union budget. This is in addition to the Rs 4,500 crore already allocated to the scheme for manufacturing solar photovoltaic modules. The manufacturing push comes as India's plan to impose a basic customs duty of 40% on modules and 25% on solar cell imports from 1 April 2022. The PLI scheme supported with a range of other measures will incentivize domestic and foreign manufacturers to build gigawatt scale, vertically integrated solar manufacturing facilities in India. The government aims at achieving 10 GW capacity of integrated solar PV manufacturing plants in India within two years through the PLI scheme which is expected to drive a direct investment of around INR14,000 crore and thereby creating many jobs in the sector. Rapid solar deployment is the backbone of India's climate ambitions and energy security and a thriving domestic manufacturing industry would also generate new jobs along with delivering on growth and sustainability. During the extensive industry interactions carried out with solar industry while creating occupational maps and prioritization of job roles for Qualifications development, manufacturing focussed job roles was indicated as a key requirement by the solar manufacturing industry.

	It is important to note that SCGJ already has a level 4 qualification on Solar Cell and Module Manufacturing and the concerned qualification which is also proposed to be introduced in schools for Vocationalisation, further complements those to ensure that skilled and certified candidates are readily available to meet the growing requirements of the solar manufacturing companies. It is proposed to introduce this qualification for vocationalisation in schools (in Grade X) along with short term training to ensure a large number of learners/trainees are trained and certified in the concerned job role.
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** A large number of workforce shall be employed primarily at Solar PV cells and module manufacturing sites as Indi embarks on boosting its domestic solar manufacturing capacity. There is a significant increase in manpower requirements which is driven by government policies and initiatives like "Make in India", FDI, production-linked incentive (PLI) scheme etc. It is estimated that domestic manufacturing of solar cells and modules will increase significantly and new jobs opportunities shall be created. Most of these will be created in the private sector but in some cases, PSUs shall also set up/expand into solar manufacturing. With so much focus on promoting domestic manufacturing, Industry shall require trained and skilled manpower to perform a range of functions in solar manufacturing facilities. It is estimated that at least 10,000 trained junior technicians shall be required every year till 2025 and further doubling to 20,000 every year till 2030. This job role aims to introduce the basics of solar manufacturing in the schools curriculum to make this sector aspirational for the students.
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 Manufacturing – Junior Technician		Level: 3	
NSQF Domain	**Outcomes of the Qualification/Component**	**How the outcomes relate to the NSQF level descriptors**	**NSQF Level**
Professional Theoretical Knowledge/Process	The individual is expected to identify, handle and supply materials for solar Module manufacturing. The job holder must have knowledge to identify various parts like frame, glass, encapsulant agent, insulating film EVA sheets etc. The job holder must adhere to all safety procedures and practice good housekeeping, safe operation of specific equipment, material or processes. This is an entry level position for solar Module manufacturing.	The individual would have a basic knowledge of the process in identifying the materials required for solar Module manufacturing. He needs to know various sub sections of the manufacturing of solar module. He/She has to be specific knowledge and skills of identification and supply of material at site. The Job holder is expected to have follow defined procedures in familiar context. Thus, considering the scope of work the job holder can be placed at Level 3.	3
Professional and Technical Skills/ Expertise/ Professional Knowledge	The individual is expected to good knowledge of electrical system, good Mathematical skills. He/She needs to have skills to provide good service and good communication too. He/She has the ability to use hand-held and power tools.	He/She is expected to exhibit practical skills required to accomplish the tasks and solve problems by operational knowledge and understanding of the work so placed at Level 3. He/She can Identify the relevant tools and materials as per job requirement.	3
Employment Readiness & Entrepreneurship **Skills & Mind-set/Professional Skill**	The individual is expected to plan & organize the schedule for all installations and related activities to be undertaken by self. The individual is expected to Display Personal Motivation. Positive Attitude & Passion for Work.	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. He/She must possess Skills for workshop calculations and basic of arithmetic and algebraic principles	3

Title/Name of qualification/component: Solar Manufacturing – Junior Technician		Level: 3	
NSQF Domain	**Outcomes of the Qualification/Component**	**How the outcomes relate to the NSQF level descriptors**	**NSQF Level**
		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.	
Broad Learning Outcomes/Core Skill	The individual is expected to have good communications skills with fellow Technician & is capable of understanding the need of fellow Technician.	The Job holder is expected to be possess the technical capabilities and interact effectively with Technician, skill of collecting and organizing information for them, understanding requirements of the local site to suggest for improvement, etc. and communication skill for so as to interact effectively with fellow technician. Thus, considering the core skills, s/he can be placed at Level 3.	3
Responsibility	The individual is primarily responsible for own work in define context	Individual must take responsibility for delivery and quality of own work and tangible output as He/she has to ensure Solar Module manufacturing Considering the responsibilities, the individual can be placed at level 3. Takes responsibility for delivery and quality of own work and tangible output. .	3

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 Production Units and 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		

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.	Gujarat 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.	Greenergy Solar Solutions	S. Kannan	Chief Executive Officer	No.234, 1st 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, 1st 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	☒Theory/ Lectures - Imparting theoretical and conceptual knowledge	Colour code nomenclature chart of Solar Products, Solar Production unit, flowchart, Solar Product supply chain flow chart.	60:40
2	☒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 Domestic Product Production 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, clampmeter, 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	
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	aprons, Flame proof overalls buttoned to neck, Helmets/hard hats, Full body harness, Hand shields, , fire extinguishers, First aid equipment, Safety instruments	

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**
Explain and identify key components of Solar PV system	27	23		
Identify Different semi-conductor materials and types of solar cell	26	24		
Describe the basics functions of Solar rooftop plant	30	20		
Maintain Personal Health & Safety for solar manufacturing	35	15		
Employability Skills	20	30		
Grand Total	**138**	**112**		

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
    - Centred 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 fromthe 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 Lighting Assembler/Solar PV Module Manufacturing Technician/Solar PV Installer	Solar Photovoltaic Technician/Solar Lighting 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	Solar Manufacturing – Junior Technician	Solar Manufacturing – Junior Technician
LEVEL 2.5	Solar Domestic Product Assembler	Solar Domestic Product Assembler
LEVEL 2.0	Solar PV Project Helper	Solar PV Project Helper