



QUALIFICATION FILE

Solar PV Module Manufacturing Technician

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

1.	Qualification Name	Solar PV Module Manufacturing Technician											
2.	Sector/s	Environment Science											
3.	Type of Qualification: <input type="checkbox"/> New <input checked="" type="checkbox"/> Revised <input type="checkbox"/> Has Electives/Options <input type="checkbox"/> OEM	NQR Code & version of existing/previous qualification: QG-04-ES-00525-2023-V1.1-SCGJ & Version 3.0	Qualification Name of existing/previous version: Solar PV Manufacturing Technician										
4.	a. OEM Name b. Qualification Name (Wherever applicable)												
5.	National Qualification Register (NQR) Code &Version	QG-04-ES-02633-2024-V2-SCGJ, Version 4.0	6. NCrf/NSQF Level: 4										
7.	Award (Certificate/Diploma/Advance Diploma/ Any Other	Certificate											
8.	Brief Description of the Qualification	Solar PV Module Manufacturing Technician cleans and checks the front glass cover for the PV module; monitors the process of soldering solar cells to the strings to make interconnect, lamination of modules, framing of solar PV module, module testing and packaging for transit.											
9.	Eligibility Criteria for Entry for Student/Trainee/Learner/Employee	a. Entry Qualification & Relevant Experience: <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>S. No.</th> <th>Academic/Skill Qualification (with Specialization - if applicable)</th> <th>Required Experience (with Specialization - if applicable)</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>12th (Science) or Equivalent</td> <td>1 year of relevant experience in renewable energy /power sector</td> </tr> <tr> <td>2.</td> <td>10th grade pass</td> <td>3 years of experience in renewable energy/ power sector</td> </tr> </tbody> </table>			S. No.	Academic/Skill Qualification (with Specialization - if applicable)	Required Experience (with Specialization - if applicable)	1.	12 th (Science) or Equivalent	1 year of relevant experience in renewable energy /power sector	2.	10th grade pass	3 years of experience in renewable energy/ power sector
S. No.	Academic/Skill Qualification (with Specialization - if applicable)	Required Experience (with Specialization - if applicable)											
1.	12 th (Science) or Equivalent	1 year of relevant experience in renewable energy /power sector											
2.	10th grade pass	3 years of experience in renewable energy/ power sector											

		b. Age: 18	3.	10th grade pass with two years of any combination of NTC/NAC/CITS or equivalent in relevant trade	NA																			
			4.	Previous relevant Qualification of NSQF Level 3.5	1.5 years of experience in renewable energy/ power sector																			
			5.	Previous relevant Qualification of NSQF Level 3.0 (Solar Manufacturing-Junior Technician)	3 years of experience in renewable energy/ power sector																			
10	Credits Assigned to this Qualification, Subject to Assessment (as per National Credit Framework (NCrF))	14	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)	<input checked="" type="checkbox"/> Offline <input type="checkbox"/> Online <input type="checkbox"/> Blended <table border="1"> <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>Total (Hours)</th> </tr> </thead> <tbody> <tr> <td>Classroom (offline)</td> <td>180</td> <td>120</td> <td>120</td> <td>0</td> <td>420</td> </tr> <tr> <td>Online</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)	Total (Hours)	Classroom (offline)	180	120	120	0	420	Online					
Training Delivery Modes	Theory (Hours)	Practical (Hours)	OJT Mandatory (Hours)	OJT Recommended (Hours)	Total (Hours)																			
Classroom (offline)	180	120	120	0	420																			
Online																								
13	Aligned to NCO/ISCO Code/s (if no code is available mention the same)	NCO-2015/7422.1901 Assembly Line Operator																						

14	Progression path after attaining the qualification (Please show Professional and Academic progression)	Vertical Progression: Solar PV Module Production Supervisor (Level 5) Horizontal Progression:	
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	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
17	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	
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)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
20	Is Qualification Suitable to be Offered in Schools/Colleges	Schools <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Colleges <input checked="" type="checkbox"/> Yes <input type="checkbox"/> 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@sscgi.in Contact No.: 9871119101 Website: https://sscgi.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.	P r o j.	Vi va	Total	Weightage (%) (if applicable)
1.	SGJ/N0145: Carry out manufacturing of Solar PV Modules	SGJ/N0145 Version 4.0	Core	4	7	105:00	105:00			210	88	62			150	60
2.	SGJ/N0147: Maintain personal health & safety in a manufacturing facility	SGJ/N0147 Version 4.0	Core	4	1	15:00	15:00			30	25	25			50	20
3.	Employability Skills	DGT/VSQ/N0102 Version 1.0	Non Core	4	2	60				60	20	30			50	20
4.	On the Job Training				4					120						
Duration (in Hours) / Total Marks						14	180	120	120	420	133	117			250	100

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)	ITI /Diploma (Electrical, Electronics, Mechanical, Instrumentation or in a related trade) Minimum 4 years of relevant industry experience in solar manufacturing BTech/BE (Civil/Mechanical I /Electrical/ Instrumentation/ Electronics / Electrical and Electronics Eng.) or MSc Physics/relevant discipline with two years of industry experience in solar manufacturing or in solar PV sector with suitable training experience 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)	BTech/BE (Civil/Mechanical I /Electrical/ Instrumentation/ Electronics / Electrical and Electronics Eng.) or MSc Physics/relevant discipline with 5 years of industry experience in solar manufacturing or in solar PV sector with suitable training experience post their ToT Certification As per the Relevant Craft Instructor Training Scheme (CITS)
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) <i>(as per NCVET guidelines)</i>	ITI /Diploma (Electrical, Electronics, Mechanical, Instrumentation or in a related trade) Minimum 4 years of relevant industry experience OR BTech/BE (Civil/Mechanical I /Electrical/ Instrumentation/ Electronics / Electrical and Electronics Eng.) or MSc Physics/relevant discipline with Two years of industry experience in solar manufacturing or in solar PV sector with suitable training/assessment experience As per the Relevant Craft Instructor Training Scheme (CITS) * The education qualification can be relaxed in case of extraordinary relevant field experience.
2.	Proctor's Qualification and experience in relevant sector (in years) <i>(as per NCVET guidelines)</i>	BTech/BE (Civil/Mechanical I /Electrical/ Instrumentation/ Electronics / Electrical and Electronics Eng.) or MSc Physics/relevant discipline with three years of industry experience in solar manufacturing or in solar PV sector with suitable training/assessment experience * 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) <i>(as per NCVET guidelines)</i>	BTech/BE (Civil/Mechanical I /Electrical/ Instrumentation/ Electronics / Electrical and Electronics Eng.) or MSc Physics/relevant discipline with 10 years of industry experience in solar manufacturing or in solar PV sector with suitable training/assessment experience post their ToA Certification As per the Relevant Craft Instructor Training Scheme (CITS) * The education qualification can be relaxed in case of extraordinary relevant field experience.
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>
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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):
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 for performing various tasks related to manufacturing solar modules. It is expected that every year over 20,000 candidates shall be trained and certified on this through Short Term Training mode CEEW-NRDC- SCGJ research outlines that there is a huge shortage of workers trained in upstream manufacturing segments (poly-silicon, ingots, wafers, and cells). This segment is the focus of the recently launched INR 19,500 crore (USD 2.43 billion) tranche-II of production-linked incentive (PLI) scheme. This scheme targets 65 GW of domestic manufacturing capacity (29 GW fully integrated, 18 GW wafer to module integration and 18 GW cell to module integration). These facilities will be different from existing solar cell and module facilities which are largely assembling units of MW scale. Further, the key profiles in the new manufacturing lines can also include manufacturing specialists, and facility (manufacturing building) specialists. Industrial production and engineering, robotics and automation, modelling, and data analytics are some key skills needed in this new sector.
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 <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 (Mandatory)
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 PV Module Manufacturing Technician			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 individual is expected to check and rectify the front glass cover for the PV modules, solder the solar cell to the strings, carry out the lamination of solar PV modules, frame the solar PV modules, tests the modules and packs it for transit.	<p>The individual independently performs familiar, predictable, routine situation of clear choice such as sorting the solar cells using a cell sorters, assemble and carry out interconnection of cell using an assembler, carry out peel and gel test as per standard operating procedures, aligning and placing the cell strings on EVA, soldering the bus ribbons to connect the strings, visually and electrically inspecting the module laminate circuit by measuring its dark IV characteristics at the inspection station, completing the assembly of the laminated module using cutter, framing the module at a press station and carrying out the performance test of the module as per standard procedures like measuring performance under simulated sunlight, performing high voltage isolation test, etc. S/he also has to ensure proper packaging of modules for transportation.</p> <p>Hence, the role qualifies as a Level 4 role.</p> <p>The role requires working in familiar, predictable and routine situations of clear choice as the operating procedures are clearly established. For example, sorting of solar cells, carrying out assembling using an assembler, carrying out lamination of the module, conducting tests as per SOPs. In case of problems, the role holder is</p>	4

Title/Name of qualification/component: Solar PV Module Manufacturing Technician			Level:4
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relate to the NSQF level descriptors	NSQF Level
		<p>expected to escalate the issue to the production engineer. Hence, the role cannot be placed at level 5.</p> <p>This role requires the job holder to carry out work of a predictable and routine nature where the range of activities is not limited. The role holder is responsible for end to end assembling, testing as well as packing of a solar PV module. For example, s/he is expected to sort the solar cells using a cell sorters, carry out assembly of solar cells, carry out peel and gel test, soldering the bus ribbons to connect the strings, lamination of solar module, carrying out testing of solar modules and packing the same for transportation. Hence, s/he cannot be placed at level 3.</p>	
Professional and Technical Skills/ Expertise/ Professional Knowledge	The individual is expected to be exhibit the knowledge of basic electrical concepts, basics of solar energy systems, raw material, shelf life and storage specifications of various equipment, cutting procedures of EVA and back sheet, soldering techniques, various types of tools, measuring equipment used for the manufacturing of solar PV modules, operation of various equipment such as laminators, framing machines, etc., typical faults and their rectification, etc.	The job holder is expected to exhibit an understanding factual knowledge of the field of solar module manufacturing. For example, s/he is expected to have knowledge of the various raw materials used in the production of solar PV modules, their shelf life and storage specifications, basics of function of solar PV modules, usage of various measuring equipments such as multi-meter, solar array tester, meggar, etc., cutting procedures of EVA and back sheet, soldering techniques, various types of tools used for the manufacturing and their usage, operation of machines used for solar module manufacturing such as laminators, framing machines, etc., performance characteristics of solar cells and modules, etc., various faults which can occur in the	4

Title/Name of qualification/component: Solar PV Module Manufacturing Technician			Level:4
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relate to the NSQF level descriptors	NSQF Level
		<p>machines and their troubleshooting, etc. S/he is also supposed to have the knowledge about the relevant occupational health and safety standards and various personal protective equipment to be used for carrying out manufacturing process. S/he should also have the ability to speak read and write in the local vernacular language and English.</p> <p>Since all the above mentioned areas are related to factual knowledge in the field of solar PV module manufacturing, the role qualifies for Level 4.</p> <p>The job holder is expected to know more than basic facts and principles applied in his/her trade. For example, s/he is expected to have detailed knowledge of the various raw materials used in the production of solar PV modules, their shelf life and storage specifications, detailed knowledge of the usage of various measuring equipments such as multi-meter, solar array tester, meggar, etc., soldering techniques, various types of tools used for the manufacturing and their usage, operation of machines used for solar module manufacturing such as laminators, framing machines, etc., performance characteristics of solar cells and modules, etc., various faults which can occur in the machines and their troubleshooting, etc. S/he is also supposed to have the knowledge about the relevant occupational health and safety standards and various personal protective</p>	

Title/Name of qualification/component: Solar PV Module Manufacturing Technician			Level:4
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relate to the NSQF level descriptors	NSQF Level
		<p>equipment to be used for carrying out manufacturing process. Hence the role cannot be pegged at level 3.</p> <p>Further, since the job holder is not expected to be aware of principles/ process & general concepts in the field of manufacturing as a whole, it can't be pegged at level 5. For example, this role is not expected to possess knowledge about the fault rectification of various machines apart from simple troubleshooting procedures. Further the role incumbent is not expected to possess the knowledge about the quality control procedures of solar PV modules, maintenance procedures of the various machines and equipment.</p>	
Employment Readiness & Entrepreneurship Skills & Mind-set/Professional Skill	<p>The job holder is expected to operate/ use screw driver, inspection fixtures, wire cutter, pliers, testers, spanner, etc., plan and organize the regular activities to be conducted at the solar module manufacturing facility.</p> <p>Further, the job holder must be able to take the day to day decisions and solve problem/s at work. The job holder should also be able to critically analyse the information gathered from different channels like current, voltage readings etc. to identify the possible faults and escalate to the production engineer</p>	<p>The job holder is expected to carry out routine and repetitive activities in a narrow range of application, using appropriate rule and tool. For instance, the job holder has to sort the solar cells using a cell sorters, assemble and carry out interconnection of cell using an assembler, carry out peel and gel test as per standard operating procedures, align and place the cell strings on EVA, solder the bus ribbons to connect the strings, visually and electrically inspect the</p> <p>module laminate circuit by measuring its dark IV characteristics at the inspection station, complete the assembly of the laminated module using cutter, frame the module at a press station and carry out the performance test of the module as per standard procedures like measuring performance under simulated sunlight, perform high voltage</p>	4

Title/Name of qualification/component: Solar PV Module Manufacturing Technician			Level:4
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relate to the NSQF level descriptors	NSQF Level
		<p>isolation test, etc. S/he also has to ensure proper packaging of modules for transportation.</p> <p>All these activities are repetitive as they relate to following already established SOPs. Hence this role qualifies for level 4.</p> <p>As this job requires a lot of experience and observation skills, for example, the job holder is expected for analyse critical points in day to day tasks through experience for example the operation of different machines, etc. and escalate the same to the production engineer, arrange for the tools, etc. required for the production of solar modules, organize raw materials and packaging materials required for all products, plan to utilise time and equipment's effectively, etc. Therefore, it cannot be pegged at level 3.</p> <p>Further the job holder doesn't require to solve problems by selection and applying methods, tools, materials and information, but rather follow standard operating procedures established at the manufacturing plant. Hence, s/he can't be placed at level 5.</p>	
Broad Learning Outcomes/ Core Skill	The job holder is required to have core skills for performing the job which includes: writing skills, reading skills, and oral and communication skills (listening ad speaking skills). For example the job holder is expected to note the information communicated by the supervisor, read and interpret the process required for producing	The job holder is expected to exhibit effective oral communication skills (including awareness of vernacular language) so as to understand the instructions of the supervisor as well as clearly communicate with team members. The job holder is also expected to possess	4

Title/Name of qualification/component: Solar PV Module Manufacturing Technician			Level:4
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relate to the NSQF level descriptors	NSQF Level
	<p>various types of products, discuss task lists, schedules, and activities with the supervisor, effectively communicate with team members, read equipment manuals and process documents to understand the equipments operation and process requirement</p>	<p>reading and writing skills so as to read and understand equipment manuals, health and safety instructions, various signage and standard code and concepts well as well as maintain daily records as per organisation policies for work like details about defects, breakdowns, etc. and write information documents to other teams. The job holder is also expected to display basic arithmetic/ algebraic awareness to analyse and interpret the evaluation parameters of equipment such as the standard current, voltage level, the accepted resistance levels for different components, etc. The incumbent must understand the social, political of the local environment so as to communicate effectively with helpers, etc. who primarily belong to the surrounding regions.</p> <p>Since all the above mentioned core skills are related to exhibiting effective oral, written communication skills along with basic understanding of the arithmetic principles as well as some basic understanding of the social, political environment, the role qualifies for Level 4.</p>	

Title/Name of qualification/component: Solar PV Module Manufacturing Technician			Level:4
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relate to the NSQF level descriptors	NSQF Level
		<p>As this job requires having direct communication with the supervisor for the discussion about the tasks and schedules, For Example, the job holder is expected to discuss task lists, schedules and activities with the supervisor , read and interpret the process required for producing various types of products, effectively communicate with team members , communicate clearly with the supervisor and cross department teams on the issues faced during the process , question the supervisor in order to understand the nature of the problem and to clarify queries. Therefore, it cannot be pegged at level 3.</p> <p>Further since the job holder doesn't require to use detailed mathematical skill or skill of collecting & organizing information such as collecting information regarding plant operation, efficiency, etc. to anticipate faults and taking corrective actions, etc. s/he can't be placed at level 5</p>	
Responsibility	The individual is primarily responsible to gain knowledge about standard protocols and SOPs regarding the solar module manufacturing and update self, regarding the operation and basic troubleshooting of various machines through on-the job learning, manuals, etc.	The Solar PV Module Manufacturing Technician is responsible for his/ her own work and learning. S/he is expected to update self with the standard protocols and SOPs using the available equipment manuals, etc. S/he is also expected to have significant on the job learning	4

Title/Name of qualification/component: Solar PV Module Manufacturing Technician			Level:4
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relate to the NSQF level descriptors	NSQF Level
		<p>about the machines, their operations and basic troubleshooting procedures S/he works under some supervision but primarily carries out his/her day to day activities independently. Only in cases where a problem arises s/he takes the support of the production engineer. Thus s/he can be placed at level 4.</p> <p>Since s/he is neither expected to be responsible of other's work and learning by hence s/he can't be placed at level 5.</p> <p>Also as the role incumbent does not work under close supervision and has full responsibility for own learning, s/he can't even be placed at Level 3.</p>	

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 Module manufacturing flow chart, Solar Module, Hand held solar irradiation meter, Clamp meter and Multi meter, Sample signs, notice, cautions used at plant.	Standard Make	
	Site Visit for Practical Learning.		

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, 1 st 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,	9099064348	japen@gorennewtech.com	NA

				Ahmedabad-380009			
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, Okhla Industrial Area, Phase II, New Delhi - 110020	9560550075	Dwipen.boruah@gses.in	NA
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	9898167732	dipti@heemenergy.com	NA

				Stand, Zundal, Gandhinagar- 382421, Gujarat			
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	500		100		NA	
2025-26	500		100		NA	
2026-27	500		100		NA	

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	569	547	547									
3	2023-24	627	614	614									

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 English

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	Not Applicable	Not Applicable
2	<input checked="" type="checkbox"/> Imparting Soft Skills, Life Skills, and Employability Skills /Mentorship to Learners		
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 Outcomes	Theory	Practical	Project	Viva
<i>SGJ/N0145: Carry out manufacturing of Solar PV Modules</i>	<i>Introduction to Solar PV Technology</i>	14	8	-	-
	PC1. identify the role of Solar Photovoltaic (PV) Manufacturing technician, its importance in the sector and the advantages of doing the course.	2	-	-	-
	PC2. show how irradiation influence performance of solar module.	-	2	-	-
	PC3. show how to the use of Hand-held irradiation meter.	-	2	-	-
	PC4. show Solar Module Construction & Manufacturing Process flow Chart.	-	2	-	-
	PC5. identify mono and poly crystalline silicon solar cell technology and recent trends.	2	-	-	-
	PC6. identify the concept of solar energy, working of solar cell, Electrical Properties of Solar Cell, Solar	2	-	-	-
	PC7. identify the property of semiconductor material and P-N Junction.	2	-	-	-
	PC8. discuss the basic aspects of solar energy and power generation.	2	-	-	-

PC9. definition of properties of light, global horizontal Irradiation (GHI) and Direct Normal irradiance.	2	-	-	-
PC10. discuss the various configurations of Solar PV Power plants. (Grid connected, Off grid etc).	2	-	-	-
PC11. show how to interpret signs, notices and/or cautions at project site.	-	2	-	-
<i>Prepare and identify the BOM and its specification for solar module</i>	4	6	-	-
PC12. show each component and explain their application in Solar module	-	2	-	-
PC13. show how to prepare the BOM of Solar	-	2	-	-

PC14. Identify various Materials used in solar module manufacturing as Solar Glass, Cell, EVA Back sheet, Aluminium Frame, Junction Box, Interconnect Ribbon, Silicon Sealant	2	-	-	-
PC15. show how to use AI based tool to analyse performance of module.	-	2	-	-
PC16. discuss technical specifications and their role	2	-	-	-
<i>Use of soldering technology in module manufacturing test</i>	16	9	-	-

PC17. discuss soldering process general requirement.	2	-	-	-
PC18. discuss tools used for Soldering process.	2	-	-	-
PC19. discuss Soldering Tests & Defect	2	-	-	-
PC20. discuss how to identification of defects (Dry soldering, Poor Soldering) & their criticality in PV module Reliability.	2	-	-	-
PC21. discuss how to Avoid wrong practices during	2	-	-	-
PC22. discuss soldering process of Solar Cell String	2	-	-	-
PC23. discuss the Junction Box Soldering techniques & desoldering process,	2	-	-	-
PC24. discuss how to perform cell soldering and soldering of cell strings by string.	2	-	-	-
PC25. show how to perform soldering.	-	2	-	-
PC26. show how to the Junction box soldering techniques with hands on experience.	-	2	-	-
PC27. show how to use of soldering tools during soldering of solar cell.	-	2	-	-
PC28. show how to do plain soldering, soldering in junction boxes, soldering on cells to achieve interconnection.	-	3	-	-

	<i>Solar Module Manufacturing process (Solar Cell</i>	25	24	-	-
	PC29. identify the flow chart of Solar module manufacturing processes	2	-	-	-
	PC30. discuss use of laser cutting machine, for cells cutting.	2	-	-	-
	PC31. discuss the functioning of Solar cell Tabber Stringer machine for tabbing and interconnection	3	-	-	-
	PC32. discuss tabbing of cells interconnect ribbon on solar cells.	2	-	-	-
	PC33. discuss how to removal of defective broken cells from string.	2	-	-	-
	PC34. discuss solar cells string bussing interconnect of copper ribbon.	2	-	-	-
	PC35. discuss the process of bussing and bus bar welding.	2	-	-	-
	PC36. discuss how to monitor the assembly and interconnection of cells with metal ribbons to make a module.	2	-	-	-
	PC37. discuss the process of EVA and back sheet layup.	2	-	-	-

	PC38. discuss the process of lamination and its importance solar module performance.	2	-	-	-
	PC39. discuss how to ensure there should not be voids, bubbles, back sheet wrinkles, and other defects during the visual inspections after the lamination process.	2	-	-	-
	PC40. discuss the process of aluminium gluing	2	-	-	-
	PC41. show how to solar cell tabbing technique.	-	3	-	-
	PC42. show how to functioning of Solar cell Tabber Stringer machine for tabbing and interconnection of solar cell in to string.	-	3	-	-
	PC43. show how to perform Sorting of the solar cells using a cell sorter and put use the cells with same specifications for making a cell string.	-	3	-	-
	PC44. show how to cut EVA using a cutter and place it on the glass substrate.	-	3	-	-
	PC45. show how to perform monitoring the process of aligning and placing cell strings on EVA sheet at assembler module layup station.	-	3	-	-
	PC46. show how to monitor the process of completing the module laminate circuit at the busing station and provide output leads.	-	3	-	-

PC47. show how to Monitor the process to laminate the assembly and cure the EVA with the laminator.	-	3	-	-
PC48. show how to Trim the edges of the laminated module panel using cutter.	-	3	-	-
<i>Visual inspection and electroluminescence (EL) test</i>	17	11	-	-
PC49. discuss how to perform EL test of solar module and identify any dead and low power cells, short circuit cells, cracks, etc. If any such error is spotted, the module is sent back for fixing the error.	3	-	-	-
PC50. discuss visual inspection to identify defects, consequences of Soldering Process & It's Severity.	2	-	-	-
PC51. discuss the important checkpoints of string &	2	-	-	-
PC52. discuss how to check its output current, voltage and power of solar module.	2	-	-	-
PC53. discuss use of sun simulator for performing	2	-	-	-
PC54. discuss the flash test and measures the open-circuit voltage (VOC), voltage at maximum power point (VMP), short-circuit current (ISC), current at maximum power point (Imp), maximum power (Pm (W)) and the fill factor (FF). The parameters of the modules are measured at standard test conditions (STC).	2	-	-	-

	PC55. discuss how to generate a Flash test report	2	-	-	-
	PC56. discuss the module is connected to check its output current, voltage, power, etc	2	-	-	-
	PC57. show how to solar cell tabbing technique.	-	3	-	-
	PC58. show how to operate sun simulator and perform the various test.	-	2	-	-
	PC59. show how to perform IV/ EL/Insulation test.	-	2	-	-
	PC60. show how to perform the visual Inspection.	-	2	-	-
	PC61. show how to generate flash test report.	-	2	-	-
	<i>Packing of Solar PV modules</i>	12	4	-	-
	PC62. discuss how to visually inspect the completed module for quality of materials and workmanship.	2	-	-	-
	PC63. discuss how to check proper packaging material for module.	2	-	-	-
	PC64. discuss how to pack modules in properly designed cartons for transportation.	2	-	-	-
	PC65. discuss how to keep module in to stacked in a box.	2	-	-	-
	PC66. discuss the use of carton separators and also many available plastic separators.	2	-	-	-

	PC67. identify processes where material and resources utilization can be optimized.	2	-	-	-
	PC68. show how to the Automatic Packing process and handling of Solar Module.	-	2	-	-
	PC69. show how to use of fork lift machine for moving of solar module pallet from one place to other.	-	2	-	-
	NOS Total	88	62	-	-

SGJ/N0147: Maintain personal health & safety in a manufacturing facility	Maintain personal health & safety in a manufacturing facility	25	25	-	-
	PC1. identify the requirements for safe work area.	3	-	-	-
	PC2. discuss how to Administer first aid.	4	-	-	-
	PC3. discuss how to identify the personal protective equipment used for the specific purpose.	4	-	-	-
	PC4. discuss how to identify the electrical and chemical hazards associated with photovoltaic installations.	4	-	-	-
	PC5. discuss how to identify work safety procedures and instructions to Handle Sharp and heavy component in a solar PV manufacturing.	5	-	-	-

	PC6. discuss occupational health & safety standards and regulations for installation of Solar PV system.	5	-	-	-
	PC7. show how to Administer first aid.	-	5	-	-
	PC8. show how to Identify the electrical and chemical hazards associated with photovoltaic installations.	-	5	-	-
	PC9. show how to Identify and perform work safety procedures and instructions to handle sharp and heavy component in a solar PV Manufacturing.	-	5	-	-
	PC10. show how to good housekeeping practices and infection control guidelines.	-	5	-	-
	PC11. show how to Dispose- off any waste materials in accordance with safe working practices and procedures.	-	5	-	-
	NOS Total	25	25	-	-

NOS/ Module Name	Assessment Criteria for Performance Criteria/Learning Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>DGT/VSQ/N0102:</i>	<i>Introduction to Employability Skills</i>	1	1	-	-

<i>Employability Skills</i>	PC1. identify employability skills required for jobs in various industries	-	-	-	-
	PC2. identify and explore learning and employability portals	-	-	-	-
	<i>Constitutional values – Citizenship</i>	1	1	-	-
	PC3. recognize the significance of constitutional values, including civic rights and duties, citizenship, responsibility towards society etc. and personal values and ethics such as honesty, integrity, caring and respecting others, etc.	-	-	-	-
	PC4. follow environmentally sustainable practices	-	-	-	-
	<i>Becoming a Professional in the 21st Century</i>	2	4	-	-
	PC5. recognize the significance of 21st Century Skills for employment	-	-	-	-
	PC6. practice the 21st Century Skills such as Self-Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn for continuous learning etc. in personal and professional life	-	-	-	-
<i>Basic English Skills</i>	2	3	-	-	
PC7. use basic English for everyday conversation in different contexts, in person and over the telephone	-	-	-	-	

PC8. read and understand routine information, notes, instructions, mails, letters etc. written in English	-	-	-	-
PC9. write short messages, notes, letters, e-mailsetc. in English	-	-	-	-
<i>Career Development & Goal Setting</i>	1	2	-	-
PC10. understand the difference between job and career	-	-	-	-
PC11. prepare a career development plan with short- and long-term goals, based on aptitude	-	-	-	-
<i>Communication Skills</i>	2	2	-	-
PC12. follow verbal and non-verbal communication etiquette and active listening techniques in various settings	-	-	-	-
PC13. work collaboratively with others in a team	-	-	-	-
<i>Diversity & Inclusion</i>	1	2	-	-
PC14. communicate and behave appropriately with all genders and PwD	-	-	-	-
PC15. escalate any issues related to sexual harassment at workplace according to POSH Act	-	-	-	-
<i>Financial and Legal Literacy</i>	2	3	-	-
PC16. select financial institutions, products and services as per requirement	-	-	-	-

	PC17. carry out offline and online financial transactions, safely and securely	-	-	-	-
	PC18. identify common components of salary and compute income, expenses, taxes, investments etc.	-	-	-	-
	PC19. identify relevant rights and laws and use legal aids to fight against legal exploitation	-	-	-	-
	<i>Essential Digital Skills</i>	3	4	-	-
	PC20. operate digital devices and carry out basic internet operations securely and safely	-	-	-	-
	PC21. use e- mail and social media platforms and virtual collaboration tools to work effectively	-	-	-	-
	PC22. use basic features of word processor, spreadsheets, and presentations	-	-	-	-
	<i>Entrepreneurship</i>	2	3	-	-
	PC23. identify different types of Entrepreneurship and Enterprises and assess opportunities for potential business through research	-	-	-	-
	PC24. develop a business plan and a work model, considering the 4Ps of Marketing Product, Price, Place and Promotion	-	-	-	-
	PC25. identify sources of funding, anticipate, and mitigate any financial/ legal hurdles for the potential business opportunity	-	-	-	-
	<i>Customer Service</i>	1	2	-	-

	PC26. identify different types of customers	-	-	-	-
	PC27. identify and respond to customer requests and needs in a professional manner.	-	-	-	-
	PC28. follow appropriate hygiene and grooming standards	-	-	-	-
	<i>Getting ready for apprenticeship & Jobs</i>	2	3	-	-
	PC29. create a professional Curriculum vitae (Résumé)	-	-	-	-
	PC30. search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and job portals, respectively	-	-	-	-
	PC31. apply to identified job openings using offline/online methods as per requirement	-	-	-	-
	PC32. answer questions politely, with clarity and confidence, during recruitment and selection	-	-	-	-
	PC33. identify apprenticeship opportunities and register for it as per guidelines and requirements	-	-	-	-
NOS Total		20	30	-	-

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- Manufacturing									
8	MD/Director									
6.5-7	Production Head									
5.5-6	Quality Assurance Manager	Production Manager/Solar Manufacturing Entrepreneur								
4.5-5	Quality Assurance Engineer	Production Supervisor								
3.5-4	Quality Assurance Assistant	Solar PV Module Manufacturing Technician/Operator	CNC Technician	Solar PV Electrical Maintenance Technician-	Solar PV Mechanical Maintenance Technician	Solar soldering technician	Solar PV Cell Manufacturing Technician	Solar lamination technician	Solar cell tester	Solar packer
2.5-3		Solar Manufacturing - Junior Technician		Instrumentation Assistant					Testing technical assistant	
2	Solar PV Project Helper				Solar PV Project Helper	Solar PV Project Helper	Solar PV Project Helper	Solar PV Project Helper		Solar PV Project Helper
1										