



QUALIFICATION FILE

Agrivoltaics Installer Electrical

- 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 OEM

NCrF/NSQF Level: 4

Submitted By:

Skill Council for Green Jobs

Chief Executive Officer

CBIP Building, Malcha Marg,

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Section 1: Basic Details

1.	Qualification Name	Agrivoltaics Installer Electrical																
2.	Sector/s	Environmental Science																
3.	Type of Qualification: <input checked="" type="checkbox"/> New <input type="checkbox"/> Revised <input type="checkbox"/> Has Electives/Options <input type="checkbox"/> OEM	NQR Code & version of existing/previous qualification: Not Applicable	Qualification Name of existing/previous version: Not Applicable															
4.	a. OEM Name b. Qualification Name (Wherever applicable)																	
5.	National Qualification Register (NQR) Code &Version	QG-04-ES-02029-2024-V1-SCGJ	6. NCrF/NSQF Level: 4															
7.	Award (Certificate/Diploma/Advance Diploma/ Any Other	Certificate																
8.	Brief Description of the Qualification	Agrivoltaics Installer Electrical is responsible for installation, operation and maintenance of solar photovoltaic systems for producing power and suitable crops at the project site.																
9.	Eligibility Criteria for Entry for Student/Trainee/Learner/Employee	a. Entry Qualification & Relevant Experience: <table border="1"> <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 grade pass or equivalent</td> <td>NA</td> </tr> <tr> <td>2</td> <td>Pursuing 3rd year diploma (Electrical/ Mechanical) (after 10th)</td> <td>NA</td> </tr> <tr> <td>3</td> <td>10th grade pass</td> <td>With 2 years of relevant experience in renewable energy/ agriculture/ power/energy sector</td> </tr> <tr> <td>4.</td> <td>Previous relevant Qualification of NSQF Level 3.5 OR</td> <td>with 1.5 years of experience in renewable energy/power/energy/agriculture sector</td> </tr> </tbody> </table>		S. No.	Academic/Skill Qualification (with Specialization - if applicable)	Required Experience (with Specialization - if applicable)	1	12th grade pass or equivalent	NA	2	Pursuing 3rd year diploma (Electrical/ Mechanical) (after 10th)	NA	3	10th grade pass	With 2 years of relevant experience in renewable energy/ agriculture/ power/energy sector	4.	Previous relevant Qualification of NSQF Level 3.5 OR	with 1.5 years of experience in renewable energy/power/energy/agriculture sector
S. No.	Academic/Skill Qualification (with Specialization - if applicable)	Required Experience (with Specialization - if applicable)																
1	12th grade pass or equivalent	NA																
2	Pursuing 3rd year diploma (Electrical/ Mechanical) (after 10th)	NA																
3	10th grade pass	With 2 years of relevant experience in renewable energy/ agriculture/ power/energy sector																
4.	Previous relevant Qualification of NSQF Level 3.5 OR	with 1.5 years of experience in renewable energy/power/energy/agriculture sector																

	5. Previous relevant Qualification of NSQF Level 3.0	with 3 years of experience in renewable energy/power/energy/agriculture sector																		
b. Age: 16																				
10 Credits Assigned to this Qualification, Subject to Assessment (as per National Credit Framework (NCrF))	14	11. Common Cost Norm Category: I																		
12 Any Licensing requirements for Undertaking Training on This Qualification (wherever applicable)	NA																			
13 Training Duration by Modes of Training Delivery (Specify Total Duration as per selected training delivery modes and as per requirement of the qualification)	<input checked="" type="checkbox"/> Offline <input type="checkbox"/> Online <input type="checkbox"/> Blended <table border="1" data-bbox="786 727 1789 951"> <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>250</td> <td>170</td> <td>90</td> <td></td> <td>510</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)	250	170	90		510	Online					
Training Delivery Modes	Theory (Hours)	Practical (Hours)	OJT Mandatory (Hours)	OJT Recommended (Hours)	Total (Hours)															
Classroom (offline)	250	170	90		510															
Online																				
14 Aligned to NCO/ISCO Code/s (if no code is available mention the same)	NCO-2015/7421.1401																			
15 Progression path after attaining the qualification (Please show Professional and Academic progression)	Vertical Progression: Level -5 Solar PV Engineer (Water Pumping system) /Solar PV Entrepreneur																			
16 Other Indian languages in which the Qualification & Model Curriculum are being submitted	Nil																			

17 Is similar Qualification(s) available on NQR-if yes, justification for this qualification	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
18 Is the Job Role Amenable to Persons with Disability	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If "Yes", specify applicable type of Disability: <input checked="" type="checkbox"/> Deaf <input checked="" type="checkbox"/> Hard of Hearing <input checked="" type="checkbox"/> Acid Attack Victims <input checked="" type="checkbox"/> Dwarfism	
19 How Participation of Women will be Encouraged	The programme would be proposed to be incorporated in women ITIs and diploma colleges to train women candidates on the job role. TPs shall be encouraged to 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)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
21 Is Qualification Suitable to be Offered in Schools/Colleges	Schools <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Colleges <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
22 Name and Contact Details of Submitting / Awarding Body SPOC (In case of CS or MS, provide details of both Lead AB & Supporting ABs)	Name: Dr. Praveen Saxena Email: ceo@sscgj.in Contact No.: 9871119101 Website: https://sscgj.in/	
23 Final Approval Date by NSQC: 31.01.2024	24. Validity Duration: 3 years	25. Next Review Date: 31.01.2027

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 /NS QF Level	Credits as per NCrF	Training Duration (Hours)					Assessment Marks					
						Th.	Pr.	OJT - Man.	OJT-Recc	Total	Th.	Pr.	Proj.	Viva	Total	Weightage (%) (if applicable)
1.	Module 1: Site Survey for the installation of agrivoltaics system and access the customer’s requirement.	SGJ/N0164 Version 1	Core	4.0	1	25	35	90		60	30	20			50	18
2.	Module 2: Procure the agrivoltaics system components and prepare bill of material	SGJ/N0165 Version 1	Core	4.0	1	30	30			60	20	30			50	18
3.	Module 3: Introduce tools and Tackles used in Solar PV installation for Agrivoltaic system	SGJ/N0166 Version 1	Core	4.0	1	40	20			60	29	21			50	18
4.	Module 4: Install electrical components of agrivoltaic system	SGJ/N0167 Version 1	Core	4.0	2	35	25			60	25	25			50	18
5.	Module 5: Test and Commission Solar PV System and inspect Agrivoltaic System	SGJ/N0168 Version 1	Core	4.0	2	45	45			90	20	30			50	18

S. No	NOS/Module Name	NOS/Module Code & Version (if applicable)	Core / Non-Core	NCrF /NS QF Level	Credits as per NCrF	Training Duration (Hours)					Assessment Marks					
						Th.	Pr.	OJT - Man.	OJT-Recc	Total	Th.	Pr.	Proj.	Viva	Total	Weightage (%) (if applicable)
6.	Module 6: Maintain Personal Health & Safety at Agrivoltaic project site.	SGJ/N0106 Version 1	Core	4.0	1	15	15			30	21	29			50	10
7.	Module 7: Employability Skills (ES)	DGT/VSQ/N0101	Core	4.0	2	60				60						
Duration (in Hours) / Total Marks						250	170	90		510	145	155			300	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)	<p>ITI /Diploma Electrical, Electronics, Civil, Mechanical, Fitter, Instrumentation with 3 years of relevant industry//teaching/training experience in solar installation / renewable energy sector/ Agri PV/power or a related sector</p> <p>or</p> <p>B.Tech (Civil/Mechanical /Electrical/ Instrumentation / Electronics / Electrical and Electronics Eng.) or MSc Physics/other suitable discipline with 2 years of relevant industry/teaching/training experience in solar installation / renewable energy sector/ Agri PV/power or a related sector</p> <p>Or</p> <p>Certified under relevant Craft Instructor Training Scheme (CITS) course</p> <p>Relevant Experience includes work or training experience in Solar, Agri PV, power or a related sector The education qualification can be relaxed in case of extraordinary relevant field experience.</p>
2.	Master Trainer’s Qualification and experience in the relevant sector (in years) (as per NCVET guidelines)	<p>BE/B.Tech (Civil/Mechanical /Electrical/ Instrumentation / Electronics / Electrical and Electronics Eng.) or MSc Physics/other discipline with 4 years’ experience in Solar, Agri PV, power or a related sector</p>
3.	Tools and Equipment Required for Training	<p><input checked="" type="checkbox"/>Yes <input type="checkbox"/>No (If “Yes”, details to be provided in Annexure)</p>

4.	In Case of Revised Qualification, Details of Any Upskilling Required for Trainer	Not Applicable
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Section 4: Assessment Related

1.	Assessor's Qualification and experience in relevant sector (in years) (as per NCVET guidelines)	<p>ITI /Diploma Electrical, Electronics, Civil, Mechanical, Fitter, Instrumentation with minimum 4 years of relevant industry/teaching /assessment experience in solar or related sector</p> <p>OR</p> <p>BTech/BE or MSc with a Minimum 3 years of relevant industry/teaching/assessment experience in solar or related sector</p> <p>Or</p> <p>Certified under relevant Craft Instructor Training Scheme (CITS) course</p> <p>The education qualification can be relaxed in case of extraordinary relevant field experience.</p>
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 with 5 years' experience in in Solar, Agri PV, power or a related sector
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 with 10 years' experience in Solar, Agri PV, power or a related sector
4.	Assessment Mode (Specify the assessment mode)	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 checked="" type="checkbox"/> 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.	<p>Latest Market Research Reports or any other source (not older than 2 years) (Yes/No):</p> <p>Yes following key documents are available in the public domain</p> <p>a. https://sscgj.in/wp-content/uploads/2022/03/Green-Jobs-Report-Jan27.pdf</p> <p>b. https://solarrooftop.gov.in/knowledge/file-44.pdf</p> <p>c. https://www.mdpi.com/2227-9717/11/3/948</p>
3.	<p>Government /Industry initiatives/ requirement (Yes/No): Yes,</p> <p>Government /Industry initiatives/ requirement (Yes/No):</p> <p>The Government of India has set the target to expand India’s non fossil fuel based installed capacity to 500 GW by 2030. Out of this target over 300 GW is expected to be achieved exclusively through solar. India has promised to source nearly half its energy from non-fossil fuel sources by 2030 and, in the shorter term, source at least 60% of its renewable energy from solar power.</p> <p>National Solar Mission: It is a major initiative of the Government of India to promote ecologically sustainable growth while addressing India's energy security challenge.</p> <p>Key schemes of the Government on Solar energy</p> <ul style="list-style-type: none"> • Solar Park Scheme: This plans to build a number of solar parks, each with a capacity of nearly 500 MW, across several states. • Rooftop Solar Scheme: The Rooftop Solar Scheme aims to harness solar power by installing solar panels on the roof of various consumers including residential, commercial and industrial. • SRISTI Scheme: Sustainable rooftop implementation of Solar transfiguration of India (SRISTI) scheme to promote rooftop solar power projects across residential consumers in India.

	<ul style="list-style-type: none"> • International Solar Alliance: International Solar Alliance is an action-oriented, member-driven, collaborative platform for increased deployment of solar energy technologies. • Kisan Urja Suraksha evam Utthaan Mahabhiyan (PM-KUSUM): Launched by the Ministry of New and Renewable Energy (MNRE), it aims to support deployment of solar pumps in rural areas. <p>This qualification aims to prepare the candidates on the knowledge and competencies required for performing sites survey on small solar projects. Not all aspects of site survey shall be covered in details, considering it is proposed as a 4-level job role, which could also be gradually utilized for introducing Vocationalisation in schools.</p>
4.	<p>Number of Industry validation provided: 5 validations as this is an innovative application of solar PV thus it resembles new age job</p> <p>Agri PV the integration of solar panels into agricultural settings, holds significant promise and should be regarded as a crucial skill for the future for several compelling reasons including Optimized Land Use, Sustainable Energy Production, technological Integration with evolving farming system etc.</p> <p>Agri PV projects can significantly stimulate economic growth in rural areas by creating job opportunities, fostering local manufacturing of solar components, and attracting investments in clean energy infrastructure. Recognizing Agri PV as a future skill is crucial due to its potential to address multiple challenges faced by the agriculture sector while contributing to sustainable energy production.</p>
5.	<p>Estimated nos. of persons to be trained and employed A large number of workforce shall be employed primarily at small solar project sites for performing various tasks related to site survey to installation & O&M of Agri PV system It is expected that every year over 20,000 candidates shall be trained and certified on this through Short Term Training mode.</p>
6.	<p>Evidence of Concurrence/Consultation with Line Ministry/State Departments:</p> <p>Concurrence has been requested from the Ministry of New and Renewable Energy</p>

Section 6: Annexure & Supporting Documents Check List

Specify Annexure Name / Supporting document file name

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

Annexure: Evidence of Level

Title/Name of qualification/component: Agrivoltaic Installer Electrical		Level: 4.0	
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relate to the NSQF level descriptors	NSQF Level
<p>Professional Theoretical Knowledge/ Process</p>	<p>The Agrivoltaic Installer Electrical is responsible for assessing the feasibility of installing solar photovoltaic systems on agricultural land and performing the basic installation tasks. They should possess a fundamental understanding of electrical and structural systems necessary for installing Agrivoltaic systems, as well as a strong grasp of solar photovoltaic equipment and installation standards.</p> <p>Their duties include conducting physical site surveys using electrical tools specific to agrivoltaics system requirements, ensuring compliance with state, national, and industry regulations, guidelines, and safety standards for solar photovoltaic installations on agricultural land. This role requires a blend of technical knowledge, regulatory awareness, and practical skills to perform installations effectively and safely.</p>	<p>The individual should have a comprehensive understanding of the entire process involved in surveying sites for solar projects on agricultural land. They must possess basic knowledge of solar installations and adhere to various guidelines, industry standards, and safety protocols specific to Agrivoltaic installations. The job requires multidisciplinary skills and expertise in surveying solar photovoltaic installations. The individual should demonstrate proficiency in executing tasks within familiar contexts, understanding technical aspects related to electrical components, and conducting testing and commissioning procedures for solar PV systems in agrivoltaics setups. Coordination with the installation team is essential, indicating a level of teamwork and collaboration. The job holder is expected to operate at Level 4.0, indicating a high level of competency in their role.</p> <p>Furthermore, the individual should be knowledgeable about site conditions, weather patterns, and geographical locations, along with general surveying concepts. They must also be proficient in safely handling of installation work. Language proficiency in both the local vernacular and English is necessary for effective communication.</p>	<p>4.0</p>

<p>Professional and Technical Skills/ Expertise/ Professional Knowledge</p>	<p>The individual is expected to exhibit and requires good understanding of Solar PV installation and problems, Site Topology and equipment location, knowledge of positioning the equipment in professional way. He/She exhibits the knowledge of performing solar site surveying including operations of various tools required to do site survey. He/She needs to have skills to set up various instruments required to do Solar Photovoltaic site surveying. He/she must possess knowledge of operating the drone.</p>	<p>The job requires the ability to measure land size, identify property lines, and assess potential obstructions for photovoltaic panel placement. Duties involve traveling to sites, utilizing specialized equipment to measure mounting boundaries, and creating maps or charts for plan designers.</p> <p>The job holder should possess a variety of practical and cognitive skills necessary for completing tasks, solving problems, and selecting appropriate methods and tools. They are responsible for installing systems and providing post-installation support for site surveying. Additionally, they must prepare effective installation plans for setting up solar photovoltaic site surveying.</p> <p>Considering the required professional skills, the job holder can be classified at Level 4, indicating a high level of competency.</p> <p>As the Agrivoltaics Installer Electrical is expected to demonstrate both practical and cognitive skills, solve problems, and identify needs and solutions, it is pegged within Level 4.</p>	<p>4.0</p>
<p>Employment Readiness & Entrepreneurship Skills & Mind-</p>	<p>The individual is tasked with planning and organizing schedules for all activities, whether undertaken independently or by the team. They must possess decision-making skills, manage relationships with colleagues effectively, and apply domain knowledge to tasks related to solar photovoltaic installation. Additionally, they are expected to critically evaluate information from vendors and teams to devise relevant solutions. The job holder must demonstrate a high level of attention to detail and possess strong written and verbal communication skills to effectively</p>	<p>The job requires the individual to contribute to creating a safe, positive, and efficient work environment. They must possess professional skills that go beyond demonstrating routine practical abilities, particularly in situations involving live lines or active power equipment, where they should apply appropriate rules and tools and communicate effectively with supervisors.</p>	<p>4.0</p>

set/Professional Skill	communicate with supervisors, solar consumers, and fellow team members..	The individual is expected to utilize practical skills and basic principles of solar photovoltaic installation, including operating various tools and equipment necessary for the job. Given that these professional skills involve demonstrating routine and repetitive practical abilities while adhering to specific rules and using appropriate tools, so the role is pegged for Level 4.0.	
Broad Learning Outcomes/ Core Skill	The individual is expected to exhibit fluent communications skills, networking skills with fellow Assistant & is capable of understanding the need of fellow Assistant.	<p>The Job holder is expected to be possess the technical capabilities like reading and interpreting technical documents and drawings and skill of collecting and organizing information to handle the conditions accurately.</p> <p>The Job holder is expected to have good communication skill to interact effectively with fellow Assistant.</p> <p>The Job holder is expected to exhibit core skills more than language to communicate with required clarity, basic algebraic and arithmetic skill and basic understanding of socio- political environment</p> <p>Needs proficiency for collecting information, filling up the forms, issuing Bills, collecting payments and getting endorsement</p> <p>Thus, considering the core skills, s/he can be placed at Level 4.0.</p>	4.0
Responsibility	The individual is responsible for Effectively managing his/her schedule to complete several time sensitive tasks on a daily basis.	The Agrivoltaic Installer Electrical is accountable for their own work and staying updated on industry trends and skills, and they may also influence the work and learning of subordinates. Additionally, they are responsible for imparting knowledge and skills to their team of	4.0

	<p>The individual is primarily responsible for surveying of Solar Photovoltaic installation at site along with thorough monitoring of the site conditions and to ensure optimum service delivery.</p> <p>The individual must be able to effectively communicate with customers during the initial face to face greeting and/or on the phone.</p>	<p>junior technicians and helpers. The job holder must ensure timely and accurate completion of all Projects.</p> <p>Considering the responsibilities, the individual can be placed at level 4.0.</p>	
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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	Small size/solar PV system	1 kwp	1
2	Personnel Protective Equipment	Standard Make	30

3	Tool kit, IR Thermometer , , 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, Pyranometer, clamp meter, multimeter, Nose mask, Safety goggles, Ear plug, PVC hand glove, Cotton hand glove, Reflective jacket, Safety Gloves , Leather gloves, Arc Flash Suit, Helmets/hard hats, Full body harness, Hand shields, , fire extinguishers, First aid equipment, Safety instruments	Standard Make	2
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Classroom Aids

The aids required to conduct sessions in the classroom are:

Marker, chart and visual aid, Schematics of Solar Power 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)
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1.	Centurion University	Nimay Chandra Giri	Asst. Professor	Bhubaneswar, Odisha	6371211594	girinimayc@gmail.com	
2.	Gram Tarang Inclusive Development Services Pvt. Ltd.	Vishal Kr. Singh	Project Manager	Bhubaneswar, Odisha	9502353944	vishu@cutm.ac.in	
3.	Amity University	Dr. Subhra Das	Professor	Noida	9910444524	sdas@ggn.amity.edu	
4.	Vaidic Jaivik Agricultural Industries	SHIV KUMAR	Director	Meerut	9410039186	rana_shiv15@rediffmail.com	
5	Innodust Marketing Pvt. Ltd.	Gourab	CEO	Bhubaneswar	7894412588	Gourab.innodust@gmail.com	

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 Performance criteria/Outcomes	Theory	Practical	Project	Viva
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SGJ/N0164: Perform Site Survey for installation of Solar PV System for Agrovoltaic system	<i>Site Survey for the installation of agrivoltaic system and access the customer's requirement.</i>	30	20	-	-
	PC1. understand the concept and requirements of agrivoltaic system.	2	-	-	-
	PC2. discuss how to Understand the location of installations.	4	-	-	-
	PC3. explain how to Select a shadow-free location for agrivoltaic system.	3	-	-	-
	PC4. assess the site level pre-requisites for solar PV installation and prepare a site map of the location where installation and cultivation has to be carried out	3	5	-	-
	PC5. identify and list the load to be connected to the Solar PV system and show how to assess the load to be run on agrivoltaic system.	3	5	-	-
	PC6. explain how to Check for any shading obstacles to the solar panels.	3	-	-	-
	PC7. discuss about ON Grid and Off Grid Solar PV	3	-	-	-
	PC8. explain and perform Soil test, Earth Resistance test, Pull-out test and contoured Survey.	3	5	-	-

	PC9. decide on the type of mounting and spacing of panels to be developed.	3	-	-	-
	PC10. inform the customer of any civil construction to be undertaken for installing the panels and document the site survey variables and complete the checklist/site survey form	3	-	-	-
	PC11. prepare a load profile.	-	5	-	-
NOS Total		30	20	-	-

NOS/Module Name	Assessment Criteria for Performance criteria/Outcomes	Theory	Practical	Project	Viva
SGJ/N0165: Procure Solar PV system components according to Agrovoltaic Installation	<i>Procure the agrivoltaic system components and prepare bill of material</i>	20	30	-	-
	PC1. determine size of solar panel, Controller/Inverter, Transformer, Cable, Breaker, SCADA system, etc.	4	-	-	-
	PC2. discuss procedure of Design finalization and drawings release	4	-	-	-
	PC3. prepare Bill of Materials (BoM) from single line diagram, civil/mechanical and electrical/agriculture drawings and show how to check materials received as per final BOM and ensure that the correct material for the job arrives on site and is damage free	2	5	-	-
	PC4. explain how to Approach stores of the company or the market to place the requirement for components as per BOM.	2	-	-	-
	PC5. ensure that the quantity of panels, controller/inverter and batteries match the voltage requirement of the system.	2	-	-	-

PC6. document variation and submit to design team (if required) and obtain approval or revised drawings.	2	-	-	-
PC7. ensure that only company recommended quality materials are used unless specified by customer.	2	-	-	-
PC8. ensure that all materials are Quality control passed.	2	-	-	-
PC9. ensure that all the components are handled and stored properly as per standard operating procedures and show how to report and document the status of material received at site and take appropriate action for replacements, if any.	-	5	-	-
PC10. show the connection practice of on-grid/off-grid/hybrid system.	-	5	-	-
PC11. show how to identify and verify the equipment specifications.	-	5	-	-

	PC12. show how to arrange for tools and consumables required for mounting the solar panels over crops.	-	5	-	-
	PC13. show how to complete all documentation w.r.t. procurement	-	5	-	-
NOS Total		20	30	-	-

NOS/Module Name	Assessment Criteria for Performance criteria/Outcomes	Theory	Practical	Project	Viva
SGJ/N0166: Introduce tools and Tackles used in Solar PV installation for Agrovoltaic system installation	<i>Introduce tools and Tackles used in Solar PV installation for Agrovoltaic system installation</i>	29	21	-	-
	PC1. discuss and demonstrate the role and requirement of tools in solar PV installation.	5	7	-	-
	PC2. discuss the various tools types.	5	-	-	-
	PC3. discuss and demonstrate the specific function, working and application of various tools and the working of tools	4	7	-	-
	PC4. describe the tools used for Electric wiring, Solar Panel Installation. load analysis.	5	-	-	-
	PC5. discuss about checking and detection of damaged Tools and demonstrate the risk associated with tools.	5	7	-	-
	PC6. discuss about all measuring instruments, multimeter. megger. clampmeter. etc.	5	-	-	-
NOS Total		29	21	-	-

NOS/Module Name	Assessment Criteria for Performance criteria/Outcomes	Theory	Practical	Project	Viva
SGJ/N0167: Install Electrical components of Solar PV System for Agrovoltaic system installation	<i>Install Electrical components of Solar PV System for Agrovoltaic system installation</i>	25	25	-	-
	PC1. discuss how to use the site safety plan and maintain clean work place.	1	-	-	-
	PC2. explain how to clarify the maximum working voltage.	2	-	-	-
	PC3. explain how to measure current and voltage on equipment before proceeding with work.	1	-	-	-
	PC4. inspect and demonstrate the use of electrical installation toolkit.	1	1	-	-
	PC5. inspect and maintain safety equipment.	1	-	-	-
	PC6. inspect and maintain testing equipment.	2	-	-	-
	PC7. inspect the civil and mechanical installation for agrivoltaic system.	1	-	-	-
	PC8. install solar panels on the mounting structure with appropriate configuration and show how to install mounting structure on foundation.	1	2	-	-

<p>PC9. maintain proper space between the rows for Solar PV installation and show how to install multiple panels on structure.</p>	<p>1</p>	<p>2</p>	<p>-</p>	<p>-</p>
<p>PC10. select the location for the energy meter, DC combiner box, controller/inverter, battery bank, and earthing point as per the drawing and show how to install panels, controller/inverter and other components.</p>	<p>2</p>	<p>2</p>	<p>-</p>	<p>-</p>
<p>PC11. confirm battery bank location and Install batteries (if required) and show how to confirm and install battery bank racks.</p>	<p>1</p>	<p>2</p>	<p>-</p>	<p>-</p>
<p>PC12. prepare battery terminals and Install battery interconnection cables and show how to Install batteries and prepare battery terminals (e.g., clean).</p>	<p>1</p>	<p>2</p>	<p>-</p>	<p>-</p>
<p>PC13. install DC combiner box and show how to connect cables in the agrivoltaic system.</p>	<p>1</p>	<p>1</p>	<p>-</p>	<p>-</p>

	PC14. prepare conduit and cable routing plan.	-	2	-	-
	PC15. install controller/inverter (as per requirement)	1	1	-	-
	PC16. install all cables in the agrivoltaic system as per approved drawing and Show how to select the correct cable type, color, and gauge. Show how to support and secure conduit. Show how to terminate cables.	1	2	-	-
	PC17. test final assembled of panels, controller/inverter. battery. and transformer.	1	1	-	-
	PC18. install AC combiner box (if required)	1	1	-	-
	PC19. install utility required disconnects	1	1	-	-
	PC20. connect all accessories with an earthing system at least more than 2 points.	1	1	-	-
	PC21. get the grounding system installed for panels/mounting system, and controller/inverters and show how to check cables for continuity. Show how to locate underground hazards, if any. Show how to determine grounding conductor size.	1	2	-	-
	PC22. get the Bonding done for all electrical equipment's and apply anti-oxidant material.	2	-	-	-
	PC23. show how to terminate fine stranded cables.	-	2	-	-

NOS Total	25	25	-	-
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NOS/Module Name	Assessment Criteria for Performance criteria/Outcomes	Theory	Practical	Project	Viva
SGJ/N0168: Test and Commission Solar PV System and inspect Agrovoltaic System.	<i>Test and Commission Solar PV System and inspect Agrovoltaic System</i>	20	30	-	-
	PC1. discuss about the team mobilize to site with proper PPE.	2	-	-	-
	PC2. Perform visual inspection of the installed components and show how to check All disconnects are in (OFF) position during the final checkout.	2	3	-	-
	PC3. inspect civil, mechanical, electrical installation at agrovoltaic site	2	-	-	-
	PC4. verify the configuration of the panels for crop development and show how to verify Installations are matched to the manufacturer's specifications and recommendations	2	3	-	-
	PC5. verify system grounding and measure insulation resistance.	2	-	-	-

PC6. check continuity of the system and verify polarity and Show how to find fault in the system at site.	2	3	-	-
PC7. explain how to measure DC voltages and currents for each string and array for proper operation of the system and Show how to Test AC voltage at inverter end and Show how to Test Line to Line and Line to Neutral	2	3	-	-
PC8. verify inverter operation including anti-islanding performance and measure AC system values.	2	-	-	-
PC9. verify calibration of data acquisition System.	2	-	-	-
PC10. preparation of the Inspection report of	2	-	-	-
PC11. show how to check Terminals connections and screws are securely tightened.	-	3	-	-
PC12. show how to check Applicable warning signs and labels are posted appropriately.	-	2	-	-

	PC13. show how to verify the job site is clean and orderlv.	-	3	-	-
	PC14. show how to Connect power source to system., all disconnect or and fuse must be open.	-	3	-	-
	PC15. show how to test DC Voltage and Polarity	-	3	-	-
	PC16. Show how to Lift AC disconnect lever (inverter to grid) and Show how to Lift DC disconnect lever (PV to inverter)	-	2	-	-
	PC17. Show how to Check normal operation status of each components.	-	2	-	-
NOS Total		20	30	-	-

NOS/Module Name	Assessment Criteria for Performance criteria/Outcomes	Theory	Practical	Project	Viva
SGJ/N0106: Maintain Personal Health & Safety at project site	<i>Adopt safe practices at workplace</i>	13	19	-	-
	PC1. explain the requirements for safe work area	2	-	-	-
	PC2. identify and report any hazards, risks or breaches in site safety to the appropriate authority	2	3	-	-
	PC3. follow recommended safe practices in handling physical, chemical, electrical and fire hazards 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 height and in confined space	1	1	-	-
	PC6. handle all required tools, tackles, materials and equipment safely	1	2	-	-
	PC7. identify expiry dates, wear and tear issues of specified equipment and accordingly inform supervisor and undertake corrective measures	1	2	-	-

PC8. apply ergonomic principles wherever required	1	2	-	-
PC9. use safety signs, labels, charts and notices at workolace	1	1	-	-
PC10. identify work safety procedures and instructions for handling heavv components	1	2	-	-
<i>Follow emergencies, rescue and first aid procedures</i>	4	4	-	-
PC11. follow emergency and evacuation procedures in case of accidents, fires and natural calamities	1	1	-	-
PC12. use appropriate fire extinguishers for different tvpes 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	-	-
	<i>Follow good housekeeping practices and infection control guidelines</i>	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/Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
DGT/VSQ/N0102: Employability Skills (60 Hours)	<i>Introduction to Employability Skills</i>	1	1	-	-
	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	-	-	-	-

	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-mails etc. 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 safely and securely	-	-	-	-

	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	-	-	-	-
	PC30. search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and	-	-	-	-
	PC31. apply to identified job openings using offline	-	-	-	-
	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 learner 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

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

