QUALIFICATION FILE

Supervisor - Operations & Maintenance Compressed Biogas/Waste to Energy

☒ 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: 5

Submitted By:

Skill Council for Green Jobs

Chief Executive Officer
CBIP Building, Malcha Marg,
Chanakyapuri, New Delhi – 110021
Contact no. and mail: 9871119101, ceo@sscgj.in

Contents

Section 1: Basic Details

<table>
<tr><td>1.</td><td>Qualification Name</td><td colspan="2">Supervisor - Operations & Maintenance Compressed Biogas/Waste to Energy</td></tr>
<tr><td>2.</td><td>Sector/s</td><td colspan="2">Environmental Science</td></tr>
<tr><td>3.</td><td>Type of Qualification: ☐ New ☒ Revised ☐ Has Electives/Options</td><td>NQR Code & version of existing/previous qualification:
2022/WSSWM/SCGJ/05147 & version 1</td><td>Qualification Name of existing/previous version:
Supervisor - Operations & Maintenance Compressed Biogas/Waste to Energy</td></tr>
<tr><td>4.</td><td>a. OEM Name
b. Qualification Name (Wherever applicable)</td><td colspan="2"></td></tr>
<tr><td>5.</td><td>National Qualification Register (NQR) Code &Version</td><td>QG-05-ES-01349-2023-V1.1-SCGJ</td><td>6. NCrF/NSQF Level: 5</td></tr>
<tr><td>7.</td><td>Award (Certificate/Diploma/Advance Diploma/ Any Other</td><td colspan="2">Certificate</td></tr>
<tr><td>8.</td><td>Brief Description of the Qualification</td><td colspan="2">The individual at work supervises the team of Operations and Maintenance (O&M) technicians and maintains the operations of plant systems and equipment of a Compressed Biogas (CBG) plant to ensure smooth and profitable functioning of the business and streamlining the workflow.</td></tr>
<tr><td>9.</td><td>Eligibility Criteria for Entry for Student/Trainee/Learner/Employee</td><td colspan="2">a. Entry Qualification & Relevant Experience:
<table>
<tr><th>S. No.</th><th>Academic/Skill Qualification (with Specialization - if applicable)</th><th>Required Experience (with Specialization - if applicable)</th></tr>
<tr><td>1.</td><td>Completed 2nd year of UG</td><td>NA</td></tr>
<tr><td>2.</td><td>Completed 2nd year of diploma (after 12th)</td><td>NA</td></tr>
<tr><td>3.</td><td>Pursuing 2nd year of 2-year diploma after 12th</td><td>NA</td></tr>
<tr><td>4.</td><td>12th pass with 1-year Vocational Education & training (NTC or NAC or CITS)</td><td>NA</td></tr>
<tr><td>5.</td><td>Completed 3-year diploma after 10th</td><td>1-year relevant experience (e.g. in bioenergy)</td></tr>
</table></td></tr>
</table>

<table>
<tr><td></td><td></td><td>b. Age: 19</td><td colspan="3"><table>
<tr><td>6.</td><td>12th grade pass</td><td>2 years relevant experience. (e.g. in bioenergy, etc)</td></tr>
<tr><td>7</td><td>10th Grade pass</td><td>4-year relevant experience. (e.g. in bioenergy, etc)</td></tr>
<tr><td>7.</td><td>Previous relevant Qualification of NSQF Level 4 and with minimum education as 8th Grade pass</td><td>3 years of relevant experience (e.g. in bioenergy/ waste to energy sector, etc)</td></tr>
</table></td></tr>
<tr><td>10</td><td>Credits Assigned to this Qualification, Subject to Assessment (as per National Credit Framework (NCrF))</td><td colspan="2">17</td><td colspan="2">10. Common Cost Norm Category:
I</td></tr>
<tr><td>11</td><td>Any Licensing requirements for Undertaking Training on This Qualification (wherever applicable)</td><td colspan="4">NA</td></tr>
<tr><td>12</td><td>Training Duration by Modes of Training Delivery (Specify Total Duration as per selected training delivery modes and as per requirement of the qualification)</td><td colspan="4">☒Offline ☐Online ☐Blended
<table>
<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>
<tr><td>Classroom (offline)</td><td>240</td><td>210</td><td>60</td><td>0</td><td>510</td></tr>
<tr><td>Online</td><td></td><td></td><td></td><td></td><td></td></tr>
</table>
(Refer Blended Learning Annexure for details)</td></tr>
<tr><td>13</td><td>Aligned to NCO/ISCO Code/s (if no code is available mention the same)</td><td colspan="4">NCO-2015/3122.9900
Operation and Maintenance</td></tr>
<tr><td>14</td><td>Progression path after attaining the qualification (Please show Professional and Academic progression)</td><td colspan="4">Vertical Progression: Plant Head-Operations(Compressed Biogas/Waste to Energy) (Level 7)
Horizontal Progression: NA</td></tr>
<tr><td>15</td><td>Other Indian languages in which the Qualification & Model Curriculum are being submitted</td><td colspan="4">Nil</td></tr>
<tr><td>16</td><td>Is similar Qualification(s) available on NQR-if yes, justification for this qualification</td><td colspan="4">☐ Yes ☒ No</td></tr>
</table>

17	**Is the Job Role Amenable to Persons with Disability**	☒ **Yes** ☐ **No** **If "Yes", specify applicable type of Disability:** ☒ **Deaf** ☒ **Hard of Hearing** ☒ **Acid Attack Victims** ☒ **Dwarfism**	
18	**How Participation of Women will be Encouraged**	The programme would be proposed to be incorporated in women ITIs and diploma colleges to train women candidates on the job role. TPs shall be encouraged to onboard at least a certain number of female candidates in each batch	
19	**Are Greening/ Environment Sustainability Aspects Covered** (Specify the NOS/Module which covers it)	☒ **Yes** ☐ **No**	
20	**Is Qualification Suitable to be Offered in Schools/Colleges**	**Schools** ☒ **Yes** ☐ **No** **Colleges** ☒ **Yes** ☐ **No**	
21	**Name and Contact Details of Submitting / Awarding Body SPOC** (In case of CS or MS, provide details of both Lead AB & Supporting ABs)	**Name:** Dr. Praveen Saxena **Email:** ceo@sscgj.in **Contact No.:** 9871119101 **Website: https://sscgj.in/**	
22	**Final Approval Date by NSQC: 27/01/2022**	**23. Validity Duration:** 3 years	**24. Next Review Date: 26/01/2025**

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 Rec.	Total	Th.	Pr.	Proj.	Viva	Total	Weightage (%) *(if applicable)*
1.	Supervise Plant Operations, Functioning of Team and Budget Compliance	SGJ/N0617 Version 3	Core	5	7	120	90			210						
2.	Supervise the Plant Maintenance	SGJ/N0618 Version 3	Core	5	4	30	90			120						
3.	Ensure Health and Safety at Workplace	SGJ/N6504 Version 4	Core	5	2	30	30			60						
4.	Employability Skills	DGT/VSQ/N0102 Version 1	Non-Core		2	60				60						
5.	On the Job Training				2					60						
Duration (in Hours) / Total Marks					17	240	210	60	0	**510**						

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)*	Graduate/Diploma (Technical) with Two years of experience in Bio Energy processes/relevant experience Or Certified under relevant Craft Instructor Training Scheme (CITS) course. * Relevant experience includes Suitable work experience in Bio Energy
2.	**Master Trainer's Qualification and experience in the relevant sector (in years)** *(as per NCVET guidelines)*	Engineering Graduate with 5 years of experience in Bio Energy
3.	**Tools and Equipment Required for Training**	☒Yes ☐No (*If "Yes", details to be provided in Annexure)*
4.	**In Case of Revised Qualification, Details of Any Upskilling Required for Trainer**	Not Applicable

Section 4: Assessment Related

1.	**Assessor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)*	Graduate/Diploma (Technical) with Three years of experience in Bio Energy Or Certified under relevant Craft Instructor Training Scheme (CITS) course. *** Relevant experience includes Suitable work experience in Bio Energy**
2.	**Proctor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)*	Engineering Graduate with 6 years of **experience in Bio Energy**
3.	**Lead Assessor's/Proctor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)*	Engineering Graduate with 10 years of **experience in Bio Energy.**
4.	**Assessment Mode** *(Specify the assessment mode)*	Online and offline both
5.	**Tools and Equipment Required for Assessment**	☒ Same as for training ☒ Yes ☐ No *(details to be provided in Annexure-if it is different for Assessment)*

Section 5: Evidence of the need for the Qualification

Provide Annexure/Supporting documents name.

1.	**Latest Skill Gap Study (not older than 2 years) (Yes/No):** yes. Modern Bioenergy has been identified by Skill Council for Green Jobs as one alternative to contribute in this transition to self-reliance in the energy sector. Biomass as renewable resource for India can play important role to achieve a net-zero carbon emissions economy by 2070. We have a large surplus of biomass (230 million Metric tonne per year) which provides social and environmental benefits apart from clean fuels. Bioenergy applications can also reduce pollution create local jobs and business opportunities. It also overcomes the main problems of use of traditional biomass like inefficient combustion technologies, environmental hazards due to indoor pollution and unsustainable harvesting practices. Government of India has initiated many schemes for increased use of biomass for various end use applications. However it is necessary to ensure biomass resource availability and its demand through a proper supply chain management. Availability of skilled human resources is critical to achieve the goals. The current capacity and skills are not adequate and there is a gap in terms of knowledge and application which are critical to conceptualize, implement, regulate and monitor. It is necessary to create a cadre of local entrepreneurs who not only manage the surplus Agri residue of farm but also developed avenue for livelihood generation in villages. Skilling in this sector will not only organize it but also improve the service quality, its efficiency, livelihood of the farmers/labour's and to create a job opportunity in the existing and as well as upcoming CBG plants. As a part of its objectives for capacity building for green businesses and cutting-edge climate friendly technologies, Skill Council for Green Jobs along with KPMG, India has carried out sector analysis, skill gap studies, occupational mapping and process flow along with identification of job roles for the biomass sector with focus on biomass Supply chain and its utilization. As per the study, a part of agricultural residues generated in the country are consumed in traditional uses such as construction material for rural housing, domestic fuel for cooking etc. The surplus that is generated is burned by farmers in open fields in the absence of affordable disposal alternatives. The crop residue generated in the field has to be made available to the user facilities. The supply chain involves collection, storage and transportation of residue from field to site for end-use. Biomass also needs to be stored to ensure long term biomass availability for implementation of economically viable bio-based energy projects. Biomass can be stored in Biomass storage depot which need to be built and maintained for comprehensive inventories of biomass preferably in States which have high biomass availability per unit area which in turn is linked to the number of jobs in the region. Job related to agri-residue supply chain include jobs related to field collection of agri residues, biomass densification and aggregation in biomass depots. Harvesting Raking Primary Baling Transport Debaling Secondary Baling Storage at Depot In order to plan for creating trained manpower for providing a sustained supply of feedstock for the CBG plants, it is necessary to develop a sustainable biomass supply chain and set up storage depots. As per the study conducted by SCGJ, 200 tons of paddy can be handled by each workforce annually and a

	biomass storage depot could house 10000 tonnes capacity/annum (280 days storage) in a radius of 25-30 km of the plant. Skill Council for Green Jobs (SCGJ) has developed Qualifications Packs of Agri-residue Aggregator, Animal Waste Manure Aggregator and Biomass Depot Operator and Manager to skill local youth in collection, aggregation and storage of farm waste and also be trained for developing business in supply chain management of agri-residues/cattle manure. Keeping in view the focus of the Government to promote a Bio-CNG for automotive industrial and commercial usages, Skill Council for Green Jobs (SCGJ) in collaboration with Foreign Commonwealth Development Office (FCDO) India, Govt of UK (Formally DFID) has conducted another study with the objective to identify new and emerging Job Roles in the Bio-CNG sector for development of National Occupational Standards. The study has taken in to account global best practices to identify areas of potential growth in future and various government initiatives in the sector. SCGJ has also developed four training modules on the new and emerging job roles in the Bio-CNG/CBG sector for the job roles of Plant Head, Feedstock Manager (Procurement & Composition), Supervisor-CBG/WtE and Technician-CBG/WtE. Recently SCGJ has completed an in-depth study for assessments of biomass demand-supply value chain and entrepreneurship development for pellet production and identification for job roles. Skill council has developed qualification modules for Bioenergy Entrepreneur and Biomass Pellet Manufacturing Junior Technician.
2.	**Latest Market Research Reports or any other source (not older than 2 years) (Yes/No):** Yes 1. https://www.ieabioenergy.com/wp-content/uploads/2021/11/CountryReport2021_India_final.pdf 2. https://www.transparencymarketresearch.com/india-biomass-market.html
3.	**Government /Industry initiatives/ requirement (Yes/No):** • This Qualification Pack will be used across industry which is organised. • It would be used by the training institute for new trainings/For employers to conduct RPL and for annual Appraisal • The SSC would submit details of the employment generated (wherever applicable) and realised.
4.	**Number of Industry validation provided:** 5
5.	**Estimated nos. of persons to be trained and employed:** Bioenergy has started to provide promising results in India's decarbonization efforts. It is no more the 'sleeping giant' of renewables in the country and has a significant role to play in India achieving its 2030 Conference of Parties 26 (COP26) target of achieving a cumulative non-fossil fuel-based energy capacity of 500 GW and reduction of total projected carbon emissions by 1 billion tonnes. It can also help to achieve the low-carbon transition pathway by focusing on rational utilisation of national resources as committed by India in COP27.

	In terms of its socioeconomic impact, bioenergy also bodes well for the Government of India's push for home-grown initiatives – underlined in programmes and campaigns such as Make in India, Aatmanirbhar Bharat Abhiyaan and Swachh Bharat Abhiyan. It also offers opportunities for augmenting farmers' income, easing the pressure on India's exchequer, and generating employment and waste-to-wealth creation. As of August 2022, based on the total installed capacity of bioenergy projects in India, an estimated 0.43 million direct jobs and 0.66 million indirect jobs had been created in the economy. Of these, approximately 0.25 million jobs across the value chain of bioenergy projects are for women.
6.	**Evidence of Concurrence/Consultation with Line Ministry/State Departments:** Concurrence has been requested from the Ministry of New and Renewable Energy

Section 6: Annexure & Supporting Documents Check List

Specify Annexure Name / Supporting document file name

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

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

Annexure: Evidence of Level

Title/Name of qualification/component: Supervisor - Operations and Maintenance Compressed Biogas/Waste to Energy			**Level:5**
NSQF Domain	**Outcomes of the Qualification/Component**	**How the outcomes relate to the NSQF level descriptors**	**NSQF Level**
Professional Theoretical Knowledge/ Process	Knowledge of facts, principles, processes and general concepts, in a field of work or study. • Procedure to prepare work schedules and duty rosters • Team management procedures • Human resource management process • Conflict management techniques • How to prepare KRA/KPI for team members • Performance management/review techniques • Organizational documentation and reporting procedures • Processes involved in the manufacturing of CBG • Inspection procedure for various processes inside a CBG plant • Inspection methods of various machinery and equipment • Performance parameters of the operational activities in a CBG plant • Plant optimization techniques • Budget management and cost control methods • Waste management procedures • Methods of effective utilization of resources • Preventive and corrective maintenance procedures • Inspection procedure for maintenance activities in a CBG plant • Methods to develop preventive maintenance plans • How to handle emergency failures of the machine or equipment • Causes of various issues/faults in the machine or equipment and their solutions • Inventory management procedures • Inspection procedure for various supplies, material, spare parts etc. • Procedure to follow up on the maintenance of machinery and equipment • Calibration procedure of the machines and equipment • Organizational document and reporting SOP • Procedure to handle major breakdowns	A Supervisor - Operations and Maintenance Compressed Biogas/Waste to Energy should have knowledge of facts, principles, processes and general concepts such as preparing work schedules and duty rosters, team management, conflict management, processes involved in the manufacturing of CBG plant, etc. Hence Level 5	5

Title/Name of qualification/component: Supervisor - Operations and Maintenance Compressed Biogas/Waste to Energy			**Level:5**
NSQF Domain	**Outcomes of the Qualification/Component**	**How the outcomes relate to the NSQF level descriptors**	**NSQF Level**
	• importance of effective communication and establishing good working relationships with team members, customers, superiors and other stakeholders • Gender based concepts, issues and legislations • Organizational standards and guidelines on respecting gender and disabilities • Organizational policies and procedures pertaining to written and verbal communication • Escalation matrix and procedures for reporting work • Various categories of people that one is required to communicate and co-ordinate within the organization • Importance of effective communication in the at project site • Importance of teamwork in organizational and individual success • Organizational health and safety related practices applicable at the workplace • SOP to demonstrate safe and accepted practices for personal protection to the team, ensure compliance to emergency, rescue and first-aid procedures, organize and attend fire drills and workplace safety workshops, clean and disinfect of all material, tools and supplies • Safety signs, labels and charts are displayed at appropriate places • PPE and how to use them • Organizational procedures for safe handling of equipment and machine operations • Proper disposal system for waste and by-products • Basic first aid procedures • Methods to minimize accidental risks • Emergency procedures to be followed in case of a mishappening		
Professional and Technical Skills/ Expertise/	A range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying basic methods, tools, materials and information. • Write information documents to internal departments/ internal teams, operational reports, work schedules and duty rosters • Make timely decisions for efficient utilization of resources	The jobholder will apply professional skills to supervise operations of the CBG plant and solve work related day-to-day problems, etc. as per the organizational standards. Hence Level 5	5

Title/Name of qualification/component: Supervisor - Operations and Maintenance Compressed Biogas/Waste to Energy			**Level:5**
NSQF Domain	**Outcomes of the Qualification/Component**	**How the outcomes relate to the NSQF level descriptors**	**NSQF Level**
Professional Knowledge	• Modify work practices to improve them • Work with supervisors/team members to carry out work related tasks • Complete tasks efficiently and accurately within stipulated time • Approach relevant authority when required • Apply domain knowledge, observations and data to select course of action to perform tasks • Evaluate information and feedback obtained from customers, superiors and teams to perform day to day activities • Read statutory documents relevant to health and safety • Communicate effectively with team regarding the significance of health and safety at the workplace • Fill in relevant forms, formats and checklist accurately • Analyze the impact of not adhering to the health and safety procedures • Analyze, review and decide on approval / rejection based on quality standards of the organization		
Employment Readiness & Entrepreneurship Skills & Mind-set/Professional Skill	**Desired mathematical skill; understanding of social, political; and some skill of collecting and organising information, communication.** • Note the information communicated, observations related to the activity • Read and interpret instructions, procedures, and information at the workplace • Communicate effectively with supervisor, peers and subordinates • Communicate effectively with supervisor, peers, subordinates, management, and vendors Read instructions/guidelines/procedures	Supervisor - Operations and Maintenance Compressed Biogas/Waste to Energy applies to understand of social, and communication along with organizational skills to deal with plant staff. Hence Level 5	5
Broad Learning Outcomes/ Core Skill	Job that requires well developed skill, with clear choice of procedures in familiar context. • Supervise plant operations, functioning of team and budget compliance • Supervise the plant maintenance	A Supervisor - Operations and Maintenance Compressed Biogas/Waste to Energy is responsible for supervising plant operations, functioning of team and budget compliance, plant maintenance, etc. The person requires	5

Title/Name of qualification/component: Supervisor - Operations and Maintenance Compressed Biogas/Waste to Energy			**Level:5**
NSQF Domain	**Outcomes of the Qualification/Component**	**How the outcomes relate to the NSQF level descriptors**	**NSQF Level**
	• Work effectively with team, customers and others Ensure health and safety at workplace	well developed skills to supervise operations of the CBG/WTE plant activates. Hence Level 5	
Responsibility	• Responsibility for own work and learning and some responsibility for others' works and learning. • Ensure functioning of technical team • Supervise plant operations • Promote greening practices at workplace • Ensure rectification of major breakdowns • Supervise maintenance of machinery and equipment • Supervise major breakdowns • Communicate effectively with team members, customers and others • Interact with superiors • Work in collaborative manner • Respect gender and disabilities • Monitor safe work practices at the workplace • Ensure compliance to emergency, rescue and first-aid procedures • Ensure good housekeeping practices and infection control guidelines	A Supervisor - Operations and Maintenance Compressed Biogas/Waste to Energy is responsible to ensure functioning of technical team and supervise plant operations, etc. This person is responsible for own work and have some responsibility for others' works. Hence Level 5	5

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	Relevant Standard Operating Procedures, and Sample reports	Each	1
2	First aid kit	Nos	3
3	Fire extinguisher	Nos	5
4	Warning signs and tapes	Nos	5
5	Safety footwear	Each	1
6	Rubber gloves	Each	1
7	Head protection	Each	1
8	Safety glasses	Each	1
9	Personal Protection Equipment	Each	1
10	Participant Handbook and Related Standard Operating Procedures	Each	1
11	Training kit (Trainer guide, Presentations	Each	1
12	2.1 Laptop External Speakers.	No	1
13	Projector screen	No	1
14	Laptop with charger	Nos	3
15	Projector	No	1
16	Duster	No	1
17	Markers	Nos	5
18	Flip Chart	Nos	3
19	Whiteboard	No	1

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	Cyra Engines Pvt. Ltd	Dr. Rajesh C. Iyar	Founder	Surat	7203847496	rajesh_c_iyer@yahoo.com	NA
2	Enprotech Solution	Mr. Sanjay Nandre	Managing Partner	Pune	9890044785	enprotech@gmail.com	NA
3	REVY Environmental Solutions Pvt. Ltd	Dr. Vanita Prasad	CT0	Vadodara, Gujarat	8156006652	vanita.prasad@revy.co.in	NA
4	MSA Bio-Energy Pvt Ltd	Mr Deepak Gadhia	Director	Valsad, Gujarat	9825117353	Deepak.gadhia@greenashram.org	NA
5	United Nations Development Program	Srikrishna Balachandran	Project Manager	Lodhi Estate, New Delhi	7406133000	Srikrishna.balachandran@undp.org	N/A

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	100	10	30	30	10	10
2025-26	500	50	50	60	20	20
2026-27	300	30	60	60	20	20

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		0											

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: Planned for future development, will be available by September 2024

Languages in which Content is available:

Annexure: Blended Learning

Blended Learning Estimated Ratio & Recommended Tools:

Refer NCVET "Guidelines for Blended Learning for Vocational Education, Training & Skilling" available on:
https://ncvet.gov.in/sites/default/files/Guidelines%20for%20Blended%20Learning%20for%20Vocational%20Education,%20Training%20&%20Skilling.pdf

S. No.	Select the Components of the Qualification	List Recommended Tools – for all Selected Components	Offline : Online Ratio
1	☒Theory/ Lectures - Imparting theoretical and conceptual knowledge	Not Applicable	Not Applicable
2	☒Imparting Soft Skills, Life Skills, and Employability Skills /Mentorship to Learners		

3	☒Showing Practical Demonstrations to the learners		
4	☒Imparting Practical Hands-on Skills/ Lab Work/ workshop/ shop floor training		
5	☒Tutorials/ Assignments/ Drill/ Practice		
6	☒Proctored Monitoring/ Assessment/ Evaluation/ Examinations		
7	☒On the Job Training (OJT)/ Project Work Internship/ Apprenticeship Training		

Annexure: Detailed Assessment Criteria

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

NOS/Module Name	Assessment Criteria for Performance Criteria/Learning Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
SGJ/N0617*: Supervise plant operations, functioning of team and budget compliance	*Ensure functioning of technical team*	**10**	**10**	-	-
	PC1. prepare weekly maintenance schedules and allocate work as per duty roster	1	1	-	-

	PC2. plan and organize task for the technicians before the start of the shift	1	1	-	-
	PC3. manage and control the daily activities of operation and maintenance technicians	1	1	-	-
	PC4. support the management in recruitment, supervision and training of operations and maintenance technicians	1	1	-	-
	PC5. oversee, motivates, and reviews operations and maintenance staff	1	1	-	-
	PC6. resolve conflict among team members, if any	1	1	-	-
	PC7. assist the manager in setting up of performance parameters like KRA/KPI, etc.	1	1	-	-
	PC8. manage and lead the team of O&M technicians, ensuring adequate staffing levels	1	1	-	-
	PC9. review, implement and update organization's record e.g., training matrices, performance reviews, risk assessments	1	1	-	-
	PC10. prepare training and workshop reports and various other reports, as required by the management	1	1	-	-
	Supervise plant operations	**28**	**26**	-	-
	PC11. ensure proper starting and shutting down of the plant equipment	1	1	-	-
	PC12. coordinate daily cleaning and maintenance activities at the CBG plant as per standards	1	1	-	-

	PC13. monitor equipment and systems to ensure that the required performance is maintained	1	1	-	-
	PC14. ensure the plant, processes and equipment are functioning efficiently	*1*	**1**	-	-
	PC15. supervise, coordinate, and monitor utility plant activities	*1*	**1**	-	-
	PC16. supervise the parameters that characterize the processes like feedstock type and quantity, biogas production amount, dry matter concentration, pH, etc.	*1*	**1**	-	-
	PC17. ensure the stability of the anaerobic digestion	*1*	**1**	-	-
	PC18. monitor the parameters supplying early detection of instability like VFA (Volatile fatty acids), alkalinity, hydrogen concentration, etc.	*2*	**1**	-	-
	PC19. oversee the variable process parameters defined by the plant operators like OLR (Organic loading rate) and HRT (Hydraulic retention time)	*1*	**1**	-	-
	PC20. monitor the CBG plant's operational parameters on-line, at-line, and off-line analyzers, as applicable	*1*	**1**	-	-
	PC21. make sure the sample analysis reports for gas, slurry and compost meet the specified standards	*1*	**1**	-	-
	PC22. ensure efficient and safe operation management of technical facilities requiring complex maintenance	*1*	**1**	-	-
	PC23. ensure plant optimization and flexibilization	*1*	**1**	-	-

	PC24. assess the condition of the plant through energy audits, performance testing and RLA/CA, etc.	1	1	-	-
	PC25. ensure that the equipment required for operations is regularly checked for faults	1	1	-	-
	PC26. report any breaches of safety procedures to the management, if any	1	1	-	-
	PC27. ensure adherence to quality standards and health and safety regulations	1	1	-	-
	PC28. inspect completed jobs for quality assurance	1	1	-	-
	PC29. respond to unplanned operational or maintenance events	1	1	-	-
	PC30. compile data for daily operational reports, inventory control, payrolls, and other day-to-day reporting activity	1	1	-	-
	PC31. diagnoses operational problems and recommend corrective actions to the technicians	1	1	-	-
	PC32. analyze operational data and reconfigure operating units as necessary to provide adequate, and economical service	1	1	-	-
	PC33. oversee the overall safety of any personnel working at the plant	1	1	-	-
	PC34. analyze operational data such as readings on meters, instruments, and gauges prepared by the O&M technicians	1	1	-	-

	PC35. optimize equipment according to standard procedure, enhancing performance and product quality, ensuring the achievement of all key performance indicators	*1*	**1**	-	-
	PC36. conduct risk assessments of processes and tasks in the plant	*2*	**1**	-	-
	Promote greening practices at workplace	*7*	**7**	-	-
	PC37. make sure effective utilization of available resources	*1*	**1**	-	-
	PC38. identify ways to optimize usage of material	*1*	**1**	-	-
	PC39. identify materials which can be replaced by environment friendly substitutes	*1*	**1**	-	-
	PC40. ensure machinery and equipment are switched off when not in use	*1*	**1**	-	-
	PC41. identify recyclable and non-recyclable, and hazardous waste generated	*2*	**1**	-	-
	PC42. dispose of hazardous waste appropriately as per SOP	*1*	**2**	-	-
	Ensure budget compliance	*5*	**7**	-	-
	PC43. assist the management in the development of operations and maintenance budget and ensure compliance	*1*	**1**	-	-

	PC44. prepare operational reports for regulatory and budgetary purposes	*1*	**2**	-	-
	PC45. ensure operation and maintenance of all equipment and assets to achieve performance and production objectives while reducing operating expense and maximizing equipment service life	*1*	**1**	-	-
	PC46. develop clear accountability for operation and maintenance material spend combined with a strategy to manage expenditure	*1*	**2**	-	-
	PC47. monitor overall maintenance expenses, variances, and implement corrective actions necessary as per norms	*1*	**1**	-	-
NOS Total		**50**	**50**	-	-

NOS/Module Name	Assessment Criteria for Performance Criteria/Learning Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
SGJ/N0618*: Supervise plant maintenance	*Supervise maintenance of machinery and equipment*	**22**	**50**	-	-
	PC1. delegate any maintenance issues to be resolved on each shift effectively to the right skills in the team	1	2	-	-
	PC2. adhere to daily and weekly checks to ensure smooth operation of the plant	1	2	-	-

	PC3. support the management in development of a Planned Preventative Maintenance (PPM) schedule	1	2	-	-
	PC4. ensure full preventative maintenance is carried out, plan in missed maintenance activities, and lead the team to deliver effectively	1	2	-	-
	PC5. make sure routine maintenance tasks are performed, and the repairs are scheduled and performed in the case of damage or flaws	1	2	-	-
	PC6. ensure all maintenance work is carried out in a safe manner	1	2	-	-
	PC7. inspect facilities periodically to determine problems and necessary maintenance required	1	2	-	-
	PC8. manage maintenance backlogs, if any	1	2	-	-
	PC9. support the maintenance technicians in achieving timely and efficient maintenance schedules	1	2	-	-
	PC10. investigate abnormal operating events or equipment failures to determine cause	1	2	-	-
	PC11. ensure adjustments, repairs, and/or modifications are done promptly as needed	1	2	-	-
	PC12. organize and maintain an inventory of tools, equipment, and supplies	1	2	-	-
	PC13. ensure supplies, spare parts or items received from vendors are as per scheduled time frame	1	2	-	-

	PC14. inspect the quality of the received items, and inform the purchase department in case of any discrepancy	*1*	**2**	-	-
	PC15. oversee all repairs and ensure that work is completed on time	*1*	**2**	-	-
	PC16. manage and maintain the preventive maintenance system to keep all day-to-day operations running smoothly	*1*	**2**	-	-
	PC17. conduct follow-ups on all maintenance and repair work	*1*	**3**	-	-
	PC18. co-ordinate the planning and implementation of maintenance work ensuring adequate spares are maintained	*1*	**3**	-	-
	PC19. ensure routine calibration and maintenance requirements of the machinery and equipment in the CBG plant	*1*	**3**	-	-
	PC20. make sure all the maintenance related bills are recorded as per specified format in manually or in the software, as applicable	*1*	**3**	-	-
	PC21. monitor daily, weekly and monthly reports and discuss with the management on standard Vs actual plant parameters to ensure the maintenance equality	*1*	**3**	-	-
	PC22. support technical audit team by providing all technical & relevant information along with the relevant document	*1*	**3**	-	-

	Supervise major breakdowns	*8*	**20**	-	-
	PC23. inform the management promptly in case of major breakdown	*1*	**2**	-	-
	PC24. seek prior approval of the management on plant shut down for maintenance	*1*	**2**	-	-
	PC25. perform root cause analysis in coordination with the experts for major repair or breakdown in the plant	*1*	**3**	-	-
	PC26. coordinate with the engineering team or external vendor for fault rectification, as applicable	*1*	**3**	-	-
	PC27. resolve the issue in a timely manner to decrease the down-time	*1*	**2**	-	-
	PC28. record the issue/fault and resolution time in the log as per SOP	*1*	**3**	-	-
	PC29. support the management in creation of reference manuals for major breakdowns	*1*	**2**	-	-
	PC30. execute the guidelines provided by the management in case of major breakdowns	*1*	**3**	-	-

NOS Total	30	70	-	-

NOS/Module Name	Assessment Criteria for Performance Criteria/Learning Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
SGJ/N6504*: Ensure health and safety at workplace	*Monitor safe work practices at the workplace*	15	15	-	-
	PC1. monitor the workplace and work processes for potential risks and threats	2	2	-	-
	PC2. ensure recommended safe practices in handling physical, chemical, electrical and fire hazards and risk are followed	2	2	-	-
	PC3. demonstrate safe and accepted practices for personal protection	2	2	-	-
	PC4. make sure usage of PPE by self and the team members	2	2	-	-
	PC5. ascertain the team follows safe working practices when working at height and in confined space	2	1	-	-
	PC6. monitor safe handling and usage of appropriate tools, materials and equipment during the work processes	2	2	-	-
	PC7. make sure ergonomic principles are followed, wherever required	2	2	-	-

	PC8. ensure safety signs, labels and charts are displayed at appropriate places	1	2	-	-
	Ensure compliance to emergency, rescue and first- aid procedures	**15**	**15**	-	-
	PC9. recognize emergency and potential emergency situations	2	2	-	-
	PC10. ensure no accidents and damages take place at the workplace	2	2	-	-
	PC11. organize and attend fire drills and workplace safety workshops	3	2	-	-
	PC12. ensure proper emergency and evacuation procedures are followed in case of accidents, fires and natural calamities	2	2	-	-
	PC13. make sure appropriate fire extinguishers are used for different types of fire	*2*	**3**	-	-
	PC14. administer first aid to victim in case of various medical emergencies including bleeding, burns, choking, electric shock, cardiac arrest, etc.	*2*	**2**	-	-
	PC15. ensure usage of correct and specified method to move injured person during an emergency	*2*	**2**	-	-
	Ensure good housekeeping practices and infection control guidelines	*20*	**20**	-	-

	PC16. ensure recommended personal hygiene, workplace hygiene and sanitation practices are followed at all times	*3*	**2**	-	-
	PC17. monitor cleaning and disinfecting procedures for all material, tools and supplies	*2*	**3**	-	-
	PC18. carry out periodic walk-through inspections to keep work area free from hazards and obstructions	*3*	**3**	-	-
	PC19. make sure any case report regarding sign and symptoms of illness of self and other colleagues are reported immediately to concerned authorities	*3*	**3**	-	-
	PC20. identify corrective actions for hazards such as illness, accidents, fires or any other natural calamity	*3*	**3**	-	-
	PC21. identify and recommend suggestions for improving health and safety at the workplace	*3*	**3**	-	-
	PC22. ensure proper processes are followed for disposal of hazardous waste as per standards	*3*	**3**	-	-
NOS Total		**50**	**50**	-	-

NOS/Module Name	Assessment Criteria for Performance criteria/Outcomes	Theory	Practical	Project	Viva
DGT/VSQ/N0102.Employability Skills (60 Hours)	*Introduction to Employability Skills*	**1**	**1**	-	-
	PC1. identify employability skills required for jobs in various industries	-	-	-	-
	PC2. identify and explore learning and employability portals	-	-	-	-
	Constitutional values – Citizenship	**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	-	-	-	-
	Becoming a Professional in the 21st Century	**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	-	-	-	-
	Basic English Skills	**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	-	-	-	-
	Career Development & Goal Setting	**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	-	-	-	-
	Communication Skills	**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	-	-	-	-
	Diversity & Inclusion	**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	-	-	-	-
	Financial and Legal Literacy	**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	-	-	-	-
	Essential Digital Skills	**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	-	-	-	-
	Entrepreneurship	**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	-	-	-	-

	Customer Service	**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	-	-	-	-
	Getting ready for apprenticeship & Jobs	**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 SID
- 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

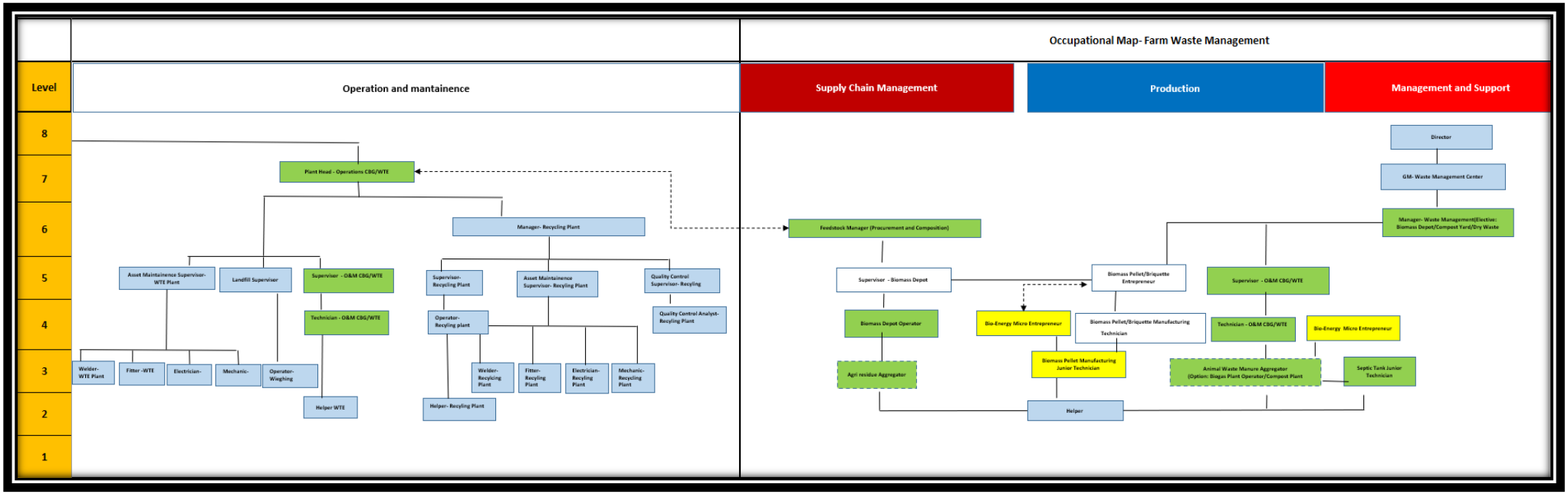
Acronym	Description
AA	Assessment Agency
AB	Awarding Body
ISCO	International Standard Classification of Occupations
NCO	National Classification of Occupations
NCrF	National Credit Framework
NOS	National Occupational Standard(s)
NQR	National Qualification Register
NSQF	National Skills Qualifications Framework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


Occupational Map- Farm Waste Management
Level
Operation and mantainence
Supply Chain Management
Production
Management and Support
8
7
6
5
4
3
2
1
Plant Head - Operations CBG/WTE
Manager- Recycling Plant
Asset Maintainence Supervisor- WTE Plant
Landfill Supervisor
Supervisor - O&M CBG/WTE
Technician - O&M CBG/WTE
Welder- WTE Plant
Fitter -WTE
Electrician-
Mechanic-
Operator- Weighing
Helper WTE
Supervisor- Recycling Plant
Asset Maintainence Supervisor- Recyling Plant
Quality Control Supervisor- Recyling
Quality Control Analyst- Recyling Plant
Operator- Recyling plant
Welder- Recycling Plant
Fitter- Recyling Plant
Electrician- Recyling Plant
Mechanic- Recycling Plant
Helper- Recyling Plant
Feedstock Manager (Procurement and Composition)
Supervisor - Biomass Depot
Biomass Depot Operator
Agri residue Aggregator
Bio-Energy Micro Entrepreneur
Biomass Pellet/Briquette Entrepreneur
Biomass Pellet/Briquette Manufacturing Technician
Biomass Pellet Manufacturing Junior Technician
Helper
Director
GM- Waste Management Center
Manager- Waste Management(Elective: Biomass Depot/Compost Yard/Dry Waste
Supervisor - O&M CBG/WTE
Technician - O&M CBG/WTE
Animal Waste Manure Aggregator (Option: Biogas Plant Operator/Compost Plant
Bio-Energy Micro Entrepreneur
Septic Tank Junior Technician