National Occupational Standards

Fundamentals of Biomass Processing for Energy

Unit Code: AGR/N6706

Version: 1.0

NSQF Level: 4

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Description

This OS unit is about understanding the use and benefits of biomass energy in agriculture and biomass processing for meeting the energy needs of rural economies by farmers/ SHGs/ FPOs/ rural community.

Scope

The scope covers the following :

- Plan for the production of biomass energy
- Carry out biomass processing
- Sell and record the output

Elements and Performance Criteria

Plan for the production of biomass energy

To be competent, the user/individual on the job must be able to:

PC1. Analyse the different applications of biomass energy in agriculture

PC2. Identify the common biomass materials used for energy

PC3. Comprehend the process of transforming the biomass into usable energy through direct and indirect means

PC4. Select the purpose of processing the biomass- heat generation/electricity generation/biofuel production

PC5. Determine the eligibility for any subsidies or concessional financing available under any Government scheme

PC6. Select the sustainable partnership model for biomass processing

PC7. Choose the right partner for setting the biomass processing unit

PC8. Arrange for finances for the production of bioenergy

Carry out biomass processing

To be competent, the user/individual on the job must be able to:

PC9. Collect/source biomass feedstocks for use as raw material in the biomass processing plant

PC10. assess the feedstock for the required quality and quantity

PC11. transport the feedstock to the processing plant

PC12. ensure proper storage and handling of the feedstocks

PC13. manage the inventory for timely feeding the processing plant

PC14. process the feedstock for feeding into the processing plant

PC15. operate the processing plant safely

PC16. monitor the processing plant for operational efficiency and any faults

PC17. clean and maintain the processing plant in good condition

PC18. co-manage the resources in the integrated farming and bioenergy production system

PC19. use the generated bioenergy for heating, cooking/processing/cooling/electricity production/as transport fuel

Sell and record the output

To be competent, the user/individual on the job must be able to:

PC20. Sell the energy/output and by-products to buyers at a profitable price
PC21. Calculate the Benefit: Cost ratio for biomass processing
PC22. Maintain proper record of the cost and revenue generated
PC23. ensure a balance between agricultural and bioenergy production imperatives

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. Definition of biomass and bioenergy
KU2. Role of biomass energy in revolutionizing agricultural practices
KU3. Applications of biomass energy in agriculture
KU4. Economic benefits of biomass energy in agriculture
KU5. Examples of leading biomass feedstocks
KU6. Direct and indirect means for processing biomass into usable energy- heat/electricity/biofuel
KU7. Different types of energy created through direct firing, co-firing, pyrolysis, gasification, and anaerobic decomposition.
KU8. Torrefaction process
KU9. Briquette formation process
KU10. Thermal conversion process
KU11. Anaerobic decomposition and fermentation process
KU12. Government schemes promoting biomass processing
KU13. Potential business models for setting up and operating a small biomass processing unit
KU14. Technical and operational challenges in biomass processing
KU15. Book-keeping method

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. maintain work-related notes and records
GS2. read the relevant literature to get the latest updates about the field of work
GS3. listen attentively to understand the information being shared
GS4. communicate politely and professionally
GS5. plan and prioritize tasks to ensure timely completion
GS6. take quick decisions to deal with workplace emergencies/ accidents
GS7. identify possible disruptions to work and take appropriate preventive measures

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Plan for the production of biomass energy	**10**	**10**	**-**	**10**
PC1. Analyse the different applications of biomass energy in agriculture	-	-	-	-
PC2. Identify the common biomass materials used for energy	-	-	-	-
PC3. Comprehend the process of transforming the biomass into usable energy through direct and indirect means	-	-	-	-
PC4. Select the purpose of processing the biomass-heat generation/electricity generation/biofuel production	-	-	-	-
PC5. Determine the eligibility for any subsidies or concessional financing available under any Government scheme	-	-	-	-
PC6. Select the sustainable partnership model for biomass processing	-	-	-	-
PC7. Choose the right partner for setting the biomass processing unit	-	-	-	-
PC8. Arrange for finances for the production of bioenergy	-	-	-	-
Carry out biomass processing	**15**	**30**	**-**	**10**
PC9. Collect/source biomass feedstocks for use as raw material in the biomass processing plant	-	-	-	-
PC10. assess the feedstock for the required quality and quantity	-	-	-	-
PC11. transport the feedstock to the processing plant	-	-	-	-
PC12. ensure proper storage and handling of the feedstocks	-	-	-	-
PC13. manage the inventory for timely feeding the processing plant	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC14. process the feedstock for feeding into the processing plant	-	-	-	-
PC15. operate the processing plant safely	-	-	-	-
PC16. monitor the processing plant for operational efficiency and any faults	-	-	-	-
PC17. clean and maintain the processing plant in good condition	-	-	-	-
PC18. co-manage the resources in the integrated farming and bioenergy production system	-	-	-	-
PC19. use the generated bioenergy for heating, cooking/processing/cooling/electricity production/as transport fuel	-	-	-	-
Sell and record the output	**5**	**5**	**-**	**5**
PC20. Sell the energy/output and by-products to buyers at a profitable price	-	-	-	-
PC21. Calculate the Benefit: Cost ratio for biomass processing	-	-	-	-
PC22. Maintain proper record of the cost and revenue generated	-	-	-	-
PC23. ensure a balance between agricultural and bioenergy production imperatives	-	-	-	-
NOS Total	**30**	**45**	**-**	**25**

National Occupational Standards (NOS) Parameters

NOS Code	AGR/N6706
NOS Name	Fundamentals of Biomass Processing for Energy
Sector	Agriculture
Sub-Sector	
Occupation	Renewable Energy Management
NSQF Level	4
Credits	1.25
Minimum Educational Qualification & Experience	12th grade Pass (or equivalent) with 1 Year of experience relevant experience in Agriculture and Allied sectors OR 10th grade pass with 2 Years of experience relevant experience in Agriculture and Allied sectors OR 10th grade pass and pursuing continuous schooling (for 2-year program) OR Previous relevant Qualification of NSQF Level (3.5) with 1.5 years of experience relevant experience in Agriculture and Allied sectors OR Previous relevant Qualification of NSQF Level (3) with 3 Years of experience relevant experience in Agriculture and Allied sectors
Version	1.0
Last Reviewed Date	30/05/2024
Next Review Date	30/05/2027
NSQC Clearance Date	30/05/2024
Reference code on NQR	NG-04-AG-02651-2024-V1-ASCI
NQR Version	1.0
CCN Category	1