

Biomass and Biofuels Conversion and Project Training Course

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Overview

Biomass and Biofuels Conversion and Project Training Course is a one-week foundation course for energy, sustainability, engineering, resource, development, and investment functions who leave with a Biomass and Biofuels Project Concept. Participants connect biomass resource types and feedstock characterization with supply chains, pretreatment, conversion pathways, product quality, lifecycle emissions, safety, economics, and project screening. The course turns site and feedstock evidence into a structured technology choice. Agile Leaders Training Center develops biomass and biofuels project capability.

Who Should Attend

- Energy functions responsible for evaluating heat, power, gas, and liquid-fuel pathways
- Sustainability functions responsible for lifecycle emissions, land use, and resource safeguards
- Engineering and operations functions responsible for process selection, balances, safety, and operability
- Project development functions responsible for site screening, infrastructure, economics, and risk
- Agricultural and waste-resource functions responsible for feedstock supply, storage, and handling
- Investment functions responsible for comparing project assumptions and decision evidence

The course assumes participants contribute to energy, resource, process, sustainability, or investment decisions and leaves out detailed plant design, laboratory certification, fuel trading, and renewable-energy portfolio finance.

Departments and Industries

The course supports departments and industries that evaluate biological resources and conversion projects.

- Energy, sustainability, engineering, operations, and project development departments
- Agriculture, forestry, food processing, and municipal resource management
- Utilities, power generation, district energy, and renewable fuels
- Manufacturing, pulp and paper, chemicals, and process industries
- Transport fuels, infrastructure, investment, and advisory services

Learning Objectives

By the end of this course, participants will be able to:

- Analyze biomass resources, properties, availability, and supply constraints
- Build feedstock storage, handling, and pretreatment flows
- Compare thermal, biological, and liquid biofuel conversion pathways
- Apply mass and energy balances to preliminary process screening
- Evaluate sustainability, emissions, safety, quality, and economic evidence
- Prioritize technology and project options using a structured selection matrix

Course Agenda

Day 1: Biomass Resources and Feedstock Supply

- Biomass Resource Classification and Sampling Plan
- Feedstock Moisture, Ash, Density, and Energy-Value Record
- Seasonal Availability and Supply-Radius Map
- Storage, Handling, and Pretreatment Flow Diagram
- Feedstock Sustainability and Land-Use Screen

Day 2: Thermal Conversion Pathways

- Mass and Energy Balance Worksheet
- Combustion and Cogeneration Configuration Map
- Gasification and Syngas Process Flow
- Pyrolysis Product-Yield Comparison
- Thermal Conversion Safety and Emissions Checklist

Day 3: Biological Conversion and Liquid Biofuels

- Anaerobic Digestion Feedstock and Process Map
- Biogas Cleaning and Biomethane Upgrading Options Grid
- Fermentation and Bioethanol Conversion Flow
- Biodiesel Feedstock and Transesterification Map
- Biofuel Quality and Product Specification Record

Day 4: Project Screening and Selection

- Conversion Technology Selection Matrix
- Lifecycle Emissions and Carbon-Intensity Screen
- Site Utilities and Infrastructure Requirement Map
- Capital, Operating, and Feedstock Cost Model
- Project Risk and Sensitivity Register

Day 5: Biomass and Biofuels Project Practice

- Exercise: Characterize Biomass and Map Feedstock Supply
- Exercise: Build a Conversion Mass and Energy Balance
- Exercise: Compare Sustainability, Emissions, and Safety Evidence
- Exercise: Test Project Economics and Risk Sensitivities
- Capstone Exercise: Biomass and Biofuels Project Concept

Practical Exercises

The course uses suggested activities to connect feedstock evidence with conversion and project decisions.

- Suggested activity: characterize agricultural residues and food-processing by-products in a feedstock record.
- Suggested activity: compare combustion, gasification, pyrolysis, digestion, and fermentation for a site case.
- Suggested activity: screen lifecycle emissions, land use, storage hazards, product quality, and operability.
- Suggested activity: assemble supply, process, infrastructure, cost, risk, and decision evidence in a project concept.

FAQs

Who suits biomass and biofuels project training, and what does it assume?

Energy, sustainability, engineering, operations, resource, development, and investment functions suit the training. It assumes involvement in resource, process, project, or investment decisions.

How does biomass and biofuels training differ from general energy transition training?

Biomass and biofuels training focuses on feedstock properties, logistics, conversion processes, product quality, and site-level project screening, while general energy transition training compares broader system pathways, technologies, policies, and organizational actions.

How are biomass conversion technologies selected?

Biomass conversion technologies are selected by comparing feedstock composition, moisture, scale, product needs, utilities, logistics, emissions, safety, costs, and operating constraints.

What does a biomass feedstock assessment examine?

A biomass feedstock assessment examines resource type, quantity, seasonality, composition, moisture, ash, energy value, collection radius, storage behavior, pretreatment needs, competing uses, and sustainability considerations.

How are biofuel project economics screened?

Biofuel project economics are screened through feedstock, capital, operating, logistics, utility, product, and risk assumptions, followed by sensitivity tests on the variables that most affect feasibility.

Conclusion

Participants take a Biomass and Biofuels Project Concept back to work. It connects feedstock evidence, conversion selection, balances, infrastructure, sustainability, emissions, safety, quality, costs, and risks. It changes an early bioenergy idea into a structured basis for screening, comparison, and further technical investigation.

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