Waste Valorization Technologies Training Course

Professional Development Training Course Outline

Category	Renewable Energy	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Waste Valorization Technologies Training Course provides a practical and forward-looking foundation in circular economy, resource recovery, waste-to-value, sustainable waste management, clean technology, and green innovation. The course explores how municipal, industrial, agricultural, food, and organic waste streams can be transformed into valuable materials, energy, fuels, chemicals, and other marketable products. Participants examine modern approaches including recycling, anaerobic digestion, composting, pyrolysis, gasification, refuse-derived fuel, biorefineries, nutrient recovery, and industrial symbiosis, with emphasis on environmental performance, economic feasibility, and scalable implementation.

Through applied learning and real-world case studies, participants develop the ability to assess waste streams, select appropriate valorization technologies, design integrated resource-recovery systems, and evaluate technical, economic, environmental, and social impacts. The training connects technology with ESG, climate action, decarbonization, net-zero strategies, extended producer responsibility, sustainable production, green jobs, and circular business models, enabling organizations to convert waste-management challenges into opportunities for resource efficiency, revenue generation, emissions reduction, and sustainable development.

Programme Curriculum

Waste Valorization Technologies Training Course

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Course Duration

5 days

Course Objectives

1. Understand waste valorization, circular economy, and resource recovery principles.
2. Identify opportunities for waste-to-value across major waste streams.
3. Evaluate advanced recycling and material recovery technologies.
4. Apply anaerobic digestion and biogas-to-energy solutions.
5. Explore pyrolysis, gasification, and thermochemical conversion.
6. Assess waste-to-energy and refuse-derived fuel systems.
7. Examine organic waste, composting, and nutrient recovery technologies.
8. Understand biorefineries and bio-based product development.
9. Conduct technology selection, feasibility, and techno-economic assessment.
10. Integrate life-cycle assessment, carbon accounting, and environmental performance.
11. Develop circular business models and waste valorization value chains.
12. Apply ESG, climate resilience, net-zero, and sustainable development principles.
13. Develop actionable waste valorization strategies, investment concepts, and implementation roadmaps.

Target Audience

1. Waste management professionals and environmental practitioners.
2. Municipal authorities and local government officials.
3. Environmental engineers and sustainability specialists.
4. Recycling and resource-recovery companies.
5. Energy and renewable-energy professionals.
6. Manufacturing and industrial sustainability managers.
7. Researchers, consultants, academics, and development practitioners.
8. Entrepreneurs, investors, and policymakers working in the circular economy.

Training Modules

Module 1: Foundations of Waste Valorization & Circular Economy

- Waste hierarchy, **circular economy**, and resource efficiency.
- Waste characterization and **resource mapping**.
- From waste disposal to **waste-to-value** models.
- Circular supply chains and **industrial symbiosis**.
- **Case study:** Circular transformation of a municipal waste-management system.

Module 2: Recycling & Material Recovery Technologies

- Mechanical and automated **material recovery systems**.
- Plastics, metals, paper, glass, and textile recovery.
- **AI-enabled sorting**, sensors, robotics, and smart recycling.
- Advanced recycling and **chemical recycling** concepts.
- **Case study:** Integrated recycling facility using automated sorting technologies.

Module 3: Organic Waste Valorization & Anaerobic Digestion

- Organic waste collection and preprocessing.
- **Anaerobic digestion, biogas, and biomethane** production.
- Digestate management and **nutrient recovery**.
- Food waste and agricultural residue valorization.
- **Case study:** Food-waste-to-biogas project for renewable energy generation.

Module 4: Thermochemical Waste Conversion

- Principles of **pyrolysis and gasification**.
- Production of syngas, biochar, and recovered fuels.
- Feedstock preparation and process optimization.
- Emissions control and environmental considerations.
- **Case study:** Agricultural-residue pyrolysis for **biochar and carbon management**.

Module 5: Waste-to-Energy & Alternative Fuels

- **Waste-to-energy** technologies and energy recovery.
- Refuse-derived fuel and solid recovered fuel.
- Energy efficiency and heat recovery.
- Renewable fuel integration and **decarbonization**.
- **Case study:** Municipal solid waste-to-energy facility and its resource-recovery strategy.

Module 6: Biorefineries & High-Value Waste Products

- **Biorefinery** concepts and integrated conversion pathways.
- Recovery of bio-based chemicals and materials.
- Industrial by-products as alternative feedstocks.
- Biofuels, bioplastics, and other **value-added products**.
- **Case study:** Agricultural by-products converted into bio-based commercial products.

Module 7: Technology Assessment, LCA & Business Models

- **Techno-economic assessment** and investment evaluation.
- **Life-cycle assessment (LCA)** and carbon-footprint analysis.
- CAPEX, OPEX, revenue streams, and financial viability.
- Circular business models and **ESG performance**.
- **Case study:** Comparative assessment of recycling, composting, and energy-recovery options.

Module 8: Implementation, Policy & Future Trends

- Waste valorization policies and **extended producer responsibility**.
- Regulation, standards, environmental compliance, and governance.
- **Digital waste management**, data analytics, and smart infrastructure.
- Climate finance, green investment, and **net-zero pathways**.

- **Case study:** Developing an integrated circular-economy roadmap for a growing city.

Training Methodology

- Interactive lectures and presentations.
- Group discussions and brainstorming sessions.
- Hands-on exercises using real-world datasets.
- Role-playing and scenario-based simulations.
- Analysis of case studies to bridge theory and practice.
- Peer-to-peer learning and networking.
- Expert-led Q&A sessions.
- Continuous feedback and personalized guidance.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Online	$1,000
23 Nov 2026	27 Nov 2026	Physical	$1,500
23 Nov 2026	27 Nov 2026	Physical	$3,000

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$4,500
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

Ready to enroll or request a customized program? Book online or contact us:

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