Training Course on Renewable Energy Solutions for Agricultural Operations (Solar, Biogas)

Professional Development Training Course Outline

Category	Agriculture	**Duration**	10 Days
Base Fee	$3,000 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

In today’s world, sustainable agriculture is no longer a choice—it is a necessity. With rising fuel prices, environmental concerns, and increasing demand for green farming practices, agricultural professionals must shift toward renewable energy technologies. Training Course on Renewable Energy Solutions for Agricultural Operations (Solar, Biogas) offers comprehensive insights into solar energy systems and biogas solutions, tailored for agricultural operations. Learners will explore cost-saving techniques, environmental benefits, and energy optimization strategies critical for transforming traditional farming into a clean energy-powered agricultural enterprise.

By implementing solar panels, biogas digesters, and hybrid power systems, farmers can reduce operational costs, enhance productivity, and contribute to environmental conservation. This course empowers participants to harness eco-innovative technologies and position their farms as models of climate-smart agriculture and resilient agri-businesses.

Programme Curriculum

Training Course on Renewable Energy Solutions for Agricultural Operations (Solar, Biogas)

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technologies and position their farms as models of climate-smart agriculture and resilient agri-businesses.

Course Objectives

1. Understand the fundamentals of renewable energy for agriculture.
2. Identify benefits of solar power systems in farming.
3. Analyze the working of biogas digesters for livestock and crop waste.
4. Learn how to reduce carbon footprint through sustainable farming energy solutions.
5. Develop energy-efficient farm designs using off-grid solar applications.
6. Optimize agricultural operations with smart energy monitoring.
7. Understand government incentives and financing options for renewable projects.
8. Apply green energy ROI calculations for farm businesses.
9. Explore climate-resilient farming through energy independence.
10. Design integrated systems combining solar irrigation and biogas cooking.
11. Enhance post-harvest systems using solar dryers and cold storage.
12. Learn community-level applications like solar-powered cooperative models.
13. Gain practical exposure through case studies in renewable-powered farms.

Target Audience

1. Smallholder and commercial farmers
2. Agricultural extension officers
3. Renewable energy engineers and technicians
4. Agri-business investors
5. Government officials in agriculture and energy sectors
6. Rural development NGOs and CBOs
7. Students in agriculture and environmental sciences
8. Cooperatives and farming associations

Course Duration: 10 days

Course Modules

Module 1: Introduction to Renewable Energy in Agriculture

- Definition and importance of renewable energy
- Global and local trends in green agriculture
- Environmental and economic benefits
- Energy challenges in traditional farming
- Overview of solar and biogas applications
- **Case Study:** Kenya’s Solar-Powered Greenhouse Farmers

Module 2: Fundamentals of Solar Energy

- How solar energy works
- Components of a solar system (PV panels, batteries, inverters)
- Types of solar panels and efficiency
- Grid-tied vs. off-grid systems
- Solar power sizing for farm use
- **Case Study:** Uganda’s Off-Grid Dairy Farms

Module 3: Solar Water Pumping and Irrigation

- Basics of solar pumps
- Solar drip vs. sprinkler systems

- Pump sizing and water needs
- Seasonal water planning
- Maintenance and troubleshooting
- **Case Study:** Solar Irrigation in Tanzania's Rice Fields

Module 4: Solar-Powered Post-Harvest Solutions

- Solar drying technology
- Solar-powered cold rooms and storage
- Benefits for value addition
- Reduction in post-harvest losses
- Economic viability
- **Case Study:** Mango Farmers in India Using Solar Dryers

Module 5: Introduction to Biogas Technology

- What is biogas?
- Sources of feedstock (manure, crop residue)
- Anaerobic digestion explained
- Components of a biogas system
- Energy output and usage
- **Case Study:** Biogas from Cow Dung in Ethiopia

Module 6: Biogas Plant Design & Installation

- Sizing the plant
- Types of digesters (fixed dome, floating drum)
- Cost analysis
- Safety and operational protocols
- Maintenance schedules
- **Case Study:** Nepal’s National Domestic Biogas Program

Module 7: Integrated Solar & Biogas Systems

- Designing hybrid systems
- Load sharing and energy balancing
- Use in farms with livestock and crops
- Benefits of system integration
- Hybrid cost-efficiency
- **Case Study:** Kenyan Poultry Farm with Biogas & Solar Combo

Module 8: Financing Renewable Energy Projects

- Government grants and subsidies
- Loans and microfinancing options
- Carbon credit opportunities
- ROI and break-even analysis
- Proposal writing for funding
- **Case Study:** World Bank Solar Grant for Small Farmers

Module 9: Environmental Impact & Climate Change

- Reduction of GHG emissions
- Carbon sequestration benefits
- Renewable energy and SDGs
- Climate adaptation strategies

- Regulatory frameworks
- **Case Study:** Solar Farms in Sahel Region for Climate Action

Module 10: Smart Monitoring and Automation

- IoT and remote monitoring for solar systems
- Sensors for water and temperature control
- Smart metering for biogas output
- Data-driven farm energy optimization
- Mobile apps for monitoring
- **Case Study:** IoT-Based Energy Monitoring in Ghanaian Farms

Module 11: Solar Greenhouses and Controlled Environments

- Energy-efficient greenhouse design
- Heating and lighting with solar
- CO? management
- Hydroponic and aquaponic integrations
- Yield optimization
- **Case Study:** Solar Greenhouses in South Africa

Module 12: Maintenance and Troubleshooting

- Preventive maintenance practices
- Identifying common faults
- Emergency responses
- Spare parts management
- Technician support systems
- **Case Study:** Solar Panel Failures and Fixes in Malawi

Module 13: Community Renewable Energy Projects

- Cooperative solar farms
- Shared biogas units
- Energy as a service models
- Social impact measurement
- Community training initiatives
- **Case Study:** Women-Led Solar Farming Co-ops in Rwanda

Module 14: Policies and Regulatory Landscape

- Renewable energy policies in agriculture
- Licensing and permits
- Feed-in tariffs and incentives
- Compliance with environmental law
- Navigating bureaucracy
- **Case Study:** Ghana’s Renewable Energy Law for Farmers

Module 15: Final Project and Presentation

- Farm energy audit
- Renewable energy proposal development
- Presentation skills
- Peer review
- Feedback and improvement
- **Case Study:** Participants' Renewable Energy Pitch Day

Training Methodology:

- Interactive presentations and expert-led lectures
- Hands-on field demonstrations
- Group activities and collaborative problem-solving
- Real-world case study analysis and simulation
- Quizzes and evaluation after each module
- Capstone project to apply all course learning

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	04 Dec 2026	Online	$2,000
23 Nov 2026	04 Dec 2026	Physical	$3,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$12,000

Start Date	End Date	Location	Price
23 Nov 2026	04 Dec 2026	Physical	$9,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$12,000

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

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