Climate-Resilient Energy Systems 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

Climate change, extreme weather events, energy insecurity, and the accelerating transition toward low-carbon development are transforming the global energy landscape. Climate-resilient energy systems are becoming essential for governments, utilities, businesses, communities, and development organisations seeking to maintain reliable energy services while reducing greenhouse gas emissions, climate vulnerability, energy poverty, and infrastructure risks. Climate-Resilient Energy Systems Training Course provides a practical and strategic understanding of how to design, assess, finance, implement, and manage resilient, low-carbon, decentralized, and future-ready energy systems. Participants will explore renewable energy integration, energy storage, smart grids, distributed energy resources, climate risk assessment, energy efficiency, disaster preparedness, and nature-based solutions for energy infrastructure.

The course combines climate adaptation, energy transition, resilience planning, clean energy innovation, digitalisation, and sustainable infrastructure development to equip participants with actionable skills for real-world applications. Through practical exercises, scenario analysis, group discussions, and case studies from climate-vulnerable regions, participants will learn how to strengthen energy reliability and affordability while supporting net-zero pathways, energy security, just transition, climate finance, and the Sustainable Development Goals (SDGs). By the end of the programme, participants will be able to develop integrated strategies for energy systems capable of anticipating, absorbing, recovering from, and adapting to climate-related disruptions.

Programme Curriculum

Climate-Resilient Energy Systems Training Course

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Course Duration

5 days

Course Objectives

By the end of the training, participants will be able to:

1. Understand the principles of climate-resilient and low-carbon energy systems.
2. Assess climate risks, hazards, vulnerabilities, and exposure affecting energy infrastructure.
3. Develop strategies for energy system resilience and climate adaptation.
4. Apply renewable energy integration approaches for resilient power systems.
5. Evaluate the role of solar, wind, hydropower, bioenergy, and geothermal energy in climate resilience.
6. Design strategies for battery energy storage and distributed energy resources.
7. Understand smart grids, microgrids, digital energy systems, and grid flexibility.
8. Apply energy efficiency and demand-side management for improved system resilience.
9. Develop disaster risk reduction and business continuity strategies for energy infrastructure.
10. Identify opportunities for climate finance, green investment, and sustainable infrastructure funding.
11. Integrate nature-based solutions and ecosystem-based adaptation into energy planning.
12. Develop practical pathways for net-zero, just energy transition, and energy security.
13. Formulate an actionable climate-resilient energy strategy and implementation roadmap.

Target Audience

1. Energy sector professionals and utility managers
2. Renewable energy developers and engineers
3. Government and energy-policy officials
4. Climate change and sustainability professionals
5. Infrastructure and urban-development planners
6. NGOs, development agencies, and humanitarian organisations
7. Corporate sustainability and ESG professionals
8. Researchers, consultants, academics, and project managers

Course Modules

Module 1: Foundations of Climate-Resilient Energy Systems

- Climate change impacts on global and regional energy systems
- Principles of **energy resilience, adaptation, mitigation, and sustainability**
- Energy security, energy access, affordability, and reliability
- Climate-resilient infrastructure and systems thinking
- **Case Study:** Energy resilience planning for a climate-vulnerable coastal community

Module 2: Climate Risk and Energy Infrastructure Vulnerability

- Identifying climate hazards affecting energy assets
- **Climate risk assessment, vulnerability mapping, and scenario planning**
- Flood, drought, heatwave, cyclone, wildfire, and sea-level-rise risks
- Critical infrastructure interdependencies and cascading failures
- **Case Study:** Climate vulnerability assessment of a regional electricity network

Module 3: Renewable Energy for Climate Resilience

- Solar PV, wind, hydropower, geothermal, and sustainable bioenergy
- Distributed renewable energy and decentralized power generation
- Renewable energy diversification and energy security
- Hybrid renewable energy systems for vulnerable communities
- **Case Study:** Solar-plus-storage microgrids improving energy access after extreme weather events

Module 4: Energy Storage, Microgrids and Smart Grids

- Battery storage and emerging **long-duration energy storage** technologies
- Microgrids and distributed energy resources
- Smart grids, grid automation, and digital energy management
- Grid flexibility, demand response, and system balancing
- **Case Study:** Community microgrid deployment for critical services during grid outages

Module 5: Energy Efficiency and Demand-Side Resilience

- Energy efficiency as a climate mitigation and resilience strategy
- Efficient buildings, industries, transport, and public infrastructure
- **Demand-side management and demand response**
- Energy audits, efficiency indicators, and performance optimisation
- **Case Study:** Energy-efficiency upgrades reducing operating costs and climate vulnerability in public facilities

Module 6: Disaster Preparedness and Resilient Energy Infrastructure

- Disaster risk reduction and emergency energy planning
- Business continuity and **critical energy infrastructure protection**
- Emergency power systems for hospitals, water systems, shelters, and communications
- Rapid recovery, redundancy, and contingency planning
- **Case Study:** Maintaining essential electricity services during a major cyclone or flood

Module 7: Climate Finance, Policy and Just Energy Transition

- **Climate finance, green bonds, blended finance, and sustainable investment**

- National climate policies and energy-transition frameworks
- Carbon markets, ESG, and sustainable infrastructure investment
- Just transition, energy equity, and inclusive climate action
- **Case Study:** Financing a renewable energy resilience programme in a developing economy

Module 8: Designing a Climate-Resilient Energy Strategy

- Developing integrated climate-resilient energy action plans
- Resilience indicators, monitoring, evaluation, and adaptive management
- **Net-zero pathways and long-term energy transition planning**
- Stakeholder engagement, governance, and implementation frameworks
- **Case Study:** Developing a 2030–2050 climate-resilient energy roadmap for a city or region

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
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

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