Renewable Energy Risk Assessment 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

Renewable Energy Risk Assessment Training Course is designed to equip professionals with practical frameworks for identifying, analyzing, evaluating, mitigating, and monitoring risks across modern renewable energy projects. As solar PV, wind, battery energy storage systems (BESS), distributed energy resources, smart grids, and hybrid power projects expand, risk management increasingly needs to address technical reliability, climate resilience, cybersecurity, operational safety, financial exposure, supply-chain disruption, regulatory uncertainty, and grid-integration challenges. Recent industry and research developments highlight growing attention to climate-driven hazards, cyber-physical vulnerabilities, storage risks, digitalization, and resilient grid planning. The course therefore combines conventional risk assessment with emerging approaches such as AI-enabled analytics, scenario analysis, digital twins, resilience planning, stochastic modeling, and cyber-physical risk assessment.

Participants will develop the ability to translate complex renewable-energy uncertainties into structured risk registers, risk matrices, bow-tie analyses, quantitative assessments, mitigation plans, business-continuity strategies, and investment decisions. Particular emphasis is placed on real-world project conditions, including extreme weather, resource variability, equipment failure, grid instability, battery-storage hazards, cybersecurity, supply-chain exposure, and financial uncertainty. These capabilities are increasingly important as renewable-rich power systems become more decentralized, digital, interconnected, and exposed to climate and cyber risks. The course uses practical case studies covering solar, wind, BESS, microgrids, smart grids, and emerging-market energy projects, enabling participants to apply risk-based thinking from project development through construction, commissioning, operations, asset management, and decommissioning.

Programme Curriculum

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Course Duration

5 days

Course Objectives

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

1. Apply enterprise risk management (ERM) principles to renewable energy projects.
2. Identify technical, operational, financial, environmental, regulatory, and strategic risks.
3. Perform structured renewable energy risk identification and risk profiling.
4. Develop qualitative and quantitative risk assessments using appropriate analytical techniques.
5. Assess solar PV, wind, BESS, hybrid, and distributed energy resource risks.
6. Evaluate climate risk, extreme-weather exposure, and climate resilience.
7. Assess grid-integration, resource adequacy, reliability, and power-system stability risks.
8. Identify cybersecurity and cyber-physical vulnerabilities in digitally enabled energy systems.
9. Analyze supply-chain, procurement, geopolitical, and critical-component risks.
10. Apply scenario analysis, sensitivity analysis, Monte Carlo simulation, and risk-based decision-making.
11. Develop effective risk mitigation, contingency, business continuity, and resilience strategies.
12. Integrate risk assessment into project finance, insurance, investment, EPC, O&M, and asset-management decisions.
13. Build actionable risk registers, dashboards, response plans, and risk-monitoring frameworks for renewable energy portfolios.

Target Audience

1. Renewable energy project managers and developers
2. Solar PV and wind energy engineers

3. BESS and energy-storage professionals
4. Risk managers and enterprise risk professionals
5. HSE, EHS, and operational safety professionals
6. Energy consultants, auditors, and technical advisors
7. Investors, lenders, insurers, and project-finance professionals
8. Utility, grid, government, and energy-policy professionals

Course Modules

Module 1: Renewable Energy Risk Management Fundamentals

- Renewable energy risk landscape and **risk taxonomy**
- Risk identification, classification, ownership, and governance
- **Risk matrix, risk appetite, risk tolerance, and risk registers**
- Risk assessment lifecycle from development to decommissioning
- **Case Study:** Risk register development for a utility-scale solar PV project

Module 2: Solar PV, Wind, and Renewable Asset Risk Assessment

- Solar PV **technical performance and equipment failure risks**
- Wind turbine reliability, availability, and weather exposure
- Resource uncertainty and **energy-yield risk**
- Component degradation, condition monitoring, and O&M risks
- **Case Study:** Comparative risk assessment of solar PV and wind projects

Module 3: Battery Energy Storage and Hybrid-System Risks

- **BESS safety, reliability, thermal, and operational risks**
- Battery degradation, availability, and performance uncertainty
- Hybrid solar-plus-storage risk interactions
- Storage sizing, siting, and grid-integration risk
- **Case Study:** Risk-informed solar-plus-BESS investment and operating strategy, reflecting current research on storage and voltage-risk assessment.

Module 4: Climate, Environmental, and Physical Risk

- **Climate-risk assessment** for renewable energy assets
- Extreme heat, flooding, drought, storms, wildfire, and other hazards
- Site-specific vulnerability and resilience assessment
- Environmental and social risk considerations
- **Case Study:** Climate-resilience assessment for a renewable energy portfolio

Module 5: Grid Integration, Reliability, and Resilience

- Renewable intermittency and **resource adequacy**
- Voltage, frequency, stability, and grid-congestion risks
- Distributed energy resources, microgrids, and flexible resources
- Reliability, resilience, and contingency planning
- **Case Study:** Risk-informed renewable integration using scenario-based grid analysis

Module 6: Cybersecurity and Cyber-Physical Risk

- Renewable-energy **cybersecurity risk assessment**
- SCADA, IoT, smart-inverter, cloud, and communication vulnerabilities
- Threat identification, vulnerability assessment, and risk prioritization
- **Cyber resilience, zero-trust, incident response, and recovery**
- **Case Study:** Cyber-physical risk assessment for an IoT-enabled smart-grid environment.

Module 7: Financial, Commercial, Supply-Chain, and Regulatory Risk

- **Project-finance and investment risk** in renewable energy
- PPA, revenue, market-price, currency, and interest-rate exposure
- EPC, contractor, procurement, and supply-chain risks
- Policy, regulatory, permitting, and geopolitical uncertainty
- **Case Study:** Supply-chain and financial risk assessment for a solar-plus-storage investment portfolio, reflecting current industry emphasis on supply-chain agility and resilience.

Module 8: Advanced Risk Analytics, Mitigation, and Resilience

- **Quantitative risk assessment, Monte Carlo simulation, and sensitivity analysis**
- Scenario planning, stress testing, and **tail-risk analysis**
- AI, predictive analytics, and **digital twins for risk monitoring**
- Risk mitigation, insurance, contingency planning, and business continuity
- **Case Study:** Digital-twin-enabled resilience planning for a renewable-rich power network.

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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