Renewable Energy in Mining Training Course

Professional Development Training Course Outline

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

Course Introduction

The Renewable Energy in Mining Training Course is designed to equip professionals with the skills required to transition mining operations toward low-carbon, net-zero emissions, and ESG-compliant energy systems. As the global mining sector faces increasing pressure from climate regulations, carbon taxation, and investor ESG mandates, the integration of solar power, wind energy, hybrid microgrids, hydrogen systems, and battery storage solutions has become a strategic priority. This training provides a comprehensive understanding of how renewable energy can be deployed in both surface and underground mining environments to reduce operational costs, improve energy resilience, and enhance sustainability performance.

This course combines technical knowledge with practical applications, focusing on decarbonization strategies, energy transition frameworks, smart mining technologies, digital energy monitoring systems, and carbon footprint optimization. Participants will explore real-world mining case studies where renewable energy systems have successfully replaced diesel dependency, improved energy efficiency, and enhanced production reliability. The program is aligned with global trends such as ESG reporting standards, renewable integration in heavy industry, circular economy practices, and climate-smart mining operations, making it essential for organizations seeking future-ready energy transformation strategies.

Programme Curriculum

Renewable Energy in Mining Training Course

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Course Duration

5 days

Course Objectives

1. Understand renewable energy integration in mining operations
2. Apply decarbonization strategies for heavy industry
3. Evaluate solar PV systems for off-grid mining sites
4. Assess wind energy potential in mining regions
5. Design hybrid microgrid energy systems
6. Implement battery energy storage systems (BESS) in mining
7. Analyze diesel displacement strategies using renewables
8. Develop ESG-compliant mining energy frameworks
9. Conduct carbon footprint measurement and reduction planning
10. Explore hydrogen fuel applications in mining fleets
11. Optimize energy efficiency in mineral extraction processes
12. Integrate smart grid and IoT energy monitoring systems
13. Prepare net-zero mining transition roadmaps

Target Audience

1. Mining Engineers and Operations Managers
2. Energy and Sustainability Managers
3. Environmental, Social & Governance (ESG) Officers
4. Renewable Energy Engineers and Consultants
5. Mining Project Developers and Planners
6. Government Energy and Mining Regulators
7. Corporate Strategy and Innovation Teams
8. Technical Trainers and Vocational Educators

Course Modules

Module 1: Global Energy Transition in Mining

- Overview of energy transition trends in mining
- Climate change impact on extractive industries
- Regulatory frameworks
- Role of renewable energy in mining sustainability

- Future of net-zero mining operations
- **Case Study:** Anglo American’s renewable energy transition strategy in South African mining operations

Module 2: Solar Energy Systems for Mining

- Design of solar PV systems for remote mines
- Off-grid solar applications in mining camps
- Solar-diesel hybrid systems
- Maintenance and performance optimization
- Cost-benefit analysis of solar deployment
- **Case Study:** Pilbara solar hybrid mining project (Australia)

Module 3: Wind Energy Integration

- Wind resource assessment in mining regions
- Turbine selection and installation
- Hybrid wind-diesel systems
- Grid stabilization techniques
- Operational challenges in mining environments
- **Case Study:** Wind integration in Chilean copper mining operations

Module 4: Battery Storage and Energy Management

- Battery Energy Storage Systems (BESS) fundamentals
- Load balancing in mining operations
- Peak shaving and energy optimization
- Safety and lifecycle management
- Integration with renewable sources
- **Case Study:** Gold Fields battery storage system in South Africa

Module 5: Hydrogen and Alternative Fuels

- Green hydrogen production basics
- Hydrogen-powered mining fleets
- Fuel cell technologies
- Infrastructure requirements
- Safety and storage considerations
- **Case Study:** Hydrogen haul truck pilot projects in Canada mining sector

Module 6: Smart Microgrids in Mining

- Microgrid architecture design
- Energy control systems and automation
- IoT-enabled energy monitoring
- Grid independence strategies
- Fault detection and resilience planning
- **Case Study:** Rio Tinto autonomous microgrid mining site

Module 7: ESG, Carbon Accounting & Compliance

- ESG reporting frameworks in mining
- Carbon emissions measurement techniques

- Life cycle assessment (LCA)
- Sustainability KPIs and reporting tools
- Compliance with global climate standards
- **Case Study:** BHP carbon neutrality roadmap implementation

Module 8: Digital Transformation in Energy Mining Systems

- AI and predictive analytics in energy management
- Digital twins for mining energy systems
- Real-time energy optimization tools
- Remote monitoring and automation
- Cybersecurity in energy infrastructure
- **Case Study:** Smart mining energy control system in Nordic mining operations

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

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

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Email: info@fineskilltrainingcenter.com | Website: www.fineskilltrainingcenter.com