Carbon Capture and Renewable Integration 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

Carbon Capture and Renewable Integration Training Course is designed to build advanced expertise in decarbonization technologies, carbon management strategies, clean energy transition, and renewable energy integration. With industries worldwide accelerating toward Net Zero Emissions, climate resilience, and sustainable development, this course provides participants with practical knowledge of Carbon Capture, Utilization and Storage (CCUS), renewable power systems, energy transition pathways, carbon neutrality strategies, and low-carbon industrial solutions. The program addresses the growing demand for professionals capable of implementing green technologies, climate innovation, and sustainable energy solutions across industrial, energy, and environmental sectors.

This comprehensive training combines technical concepts, strategic frameworks, industry best practices, and real-world case studies to help participants understand the integration of carbon capture systems with renewable energy infrastructure. Learners will explore direct air capture (DAC), carbon storage technologies, hydrogen integration, renewable grid optimization, energy efficiency, carbon accounting, ESG compliance, and climate policy frameworks. Through practical exercises and global examples, participants will gain the skills required to support organizations in achieving carbon reduction targets, energy transformation goals, and long-term sustainability objectives.

Programme Curriculum

Carbon Capture and Renewable Integration Training Course

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5 days

Course Objectives

By completing this course, participants will be able to:

1. Understand the fundamentals of Carbon Capture, Utilization and Storage (CCUS) and its role in global decarbonization.
2. Develop knowledge of Net Zero strategies, carbon neutrality pathways, and climate action frameworks.
3. Analyze different carbon capture technologies including post-combustion, pre-combustion, and direct air capture.
4. Evaluate opportunities for integrating renewable energy systems with carbon capture infrastructure.
5. Apply principles of clean energy transition and sustainable industrial transformation.
6. Understand carbon accounting, greenhouse gas (GHG) measurement, and emissions reduction strategies.
7. Explore the role of green hydrogen and renewable power in carbon management solutions.
8. Assess energy systems using smart grid, energy storage, and renewable optimization approaches.
9. Identify investment opportunities in low-carbon technologies and climate finance initiatives.
10. Implement ESG, sustainability reporting, and environmental compliance frameworks.
11. Evaluate global CCUS projects and renewable integration case studies.
12. Develop strategies for industrial decarbonization and climate risk management.
13. Prepare organizations for future carbon markets, clean technology innovation, and Net Zero transformation.

Target Audience

1. Energy professionals involved in renewable energy, power generation, and sustainability projects.
2. Engineers and technical specialists working in carbon capture, process industries, and environmental management.
3. Sustainability managers developing ESG and Net Zero implementation strategies.
4. Oil & gas professionals transitioning toward low-carbon energy solutions.
5. Environmental consultants supporting climate change mitigation projects.
6. Government officials and policymakers involved in energy transition and climate policy.
7. Researchers and academics specializing in clean technology and renewable innovation.
8. Business leaders investing in sustainable development and green transformation.

Course Modules

Module 1: Fundamentals of Carbon Capture and Climate Technology

- Introduction to **carbon capture technologies and global decarbonization trends**.
- Overview of **Carbon Capture, Utilization and Storage (CCUS)** value chains.
- Understanding **CO? emissions sources and industrial carbon challenges**.
- Role of carbon capture in achieving **Net Zero 2050 targets**.
- Global carbon reduction initiatives and policy drivers.
- **Case Study: Norway's Northern Lights CCS Project**

Module 2: Carbon Capture Technologies and Engineering Applications

- Post-combustion, pre-combustion, and oxy-fuel capture technologies.
- Direct Air Capture (**DAC**) systems and emerging innovations.
- Carbon separation processes and capture efficiency improvement.
- CO? compression, transportation, and storage infrastructure.
- Technology selection for industrial applications.
- **Case Study: Climeworks Direct Air Capture Facilities, Iceland**

Module 3: Carbon Utilization and Storage Solutions

- Carbon utilization pathways and circular carbon economy concepts.
- CO? conversion into fuels, chemicals, and construction materials.
- Geological storage principles and monitoring systems.
- Carbon leakage prevention and storage security.
- Future trends in carbon removal technologies.
- **Case Study: Carbfix Mineral Storage Technology, Iceland**

Module 4: Renewable Energy Integration Strategies

- Renewable energy systems and carbon-free power generation.
- Solar, wind, and hybrid renewable integration concepts.
- Renewable electricity supply for carbon capture operations.
- Grid flexibility, smart grids, and energy management.
- Renewable energy forecasting and optimization.
- **Case Study: Hybrid Renewable Energy Systems Supporting Industrial Decarbonization**

Module 5: Green Hydrogen and Carbon Capture Integration

- Fundamentals of green hydrogen production.
- Electrolysis powered by renewable energy.
- Hydrogen applications in hard-to-abate industries.
- Hydrogen-based carbon reduction pathways.
- Future hydrogen economy opportunities.
- **Case Study: HYBRIT Steel Project, Sweden**

Module 6: Industrial Decarbonization and Net Zero Strategies

- Decarbonization approaches for heavy industries.
- Cement, steel, chemicals, and energy sector transformation.
- Carbon reduction roadmaps and implementation planning.

- Energy efficiency and emissions optimization.
- Net Zero transition management.
- **Case Study: Heidelberg Materials Carbon Capture Project**

Module 7: Carbon Markets, ESG, and Climate Finance

- Carbon credits and global carbon trading mechanisms.
- ESG reporting and sustainability disclosures.
- Climate finance models for clean technology projects.
- Carbon pricing and regulatory frameworks.
- Investment trends in green technologies.
- **Case Study: EU Emissions Trading System (EU ETS)**

Module 8: Future Trends, Innovation, and Project Implementation

- Artificial intelligence in carbon management.
- Digital twins for renewable and CCUS optimization.
- Emerging carbon removal technologies.
- Developing CCUS and renewable integration projects.
- Future opportunities in climate technology careers.
- **Case Study: Microsoft Carbon Removal Initiatives**

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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