Floating Renewable 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

Floating Renewable Energy Systems Training Course provides a practical and future-focused understanding of how renewable energy technologies can be deployed on water bodies to accelerate the global clean energy transition. The course explores floating solar photovoltaic (FPV), floating wind power, hybrid renewable systems, energy storage, offshore engineering, marine infrastructure, mooring and anchoring technologies, grid integration, and digital monitoring. Participants examine how floating renewable projects can unlock new generation capacity where land availability is constrained while supporting decarbonization, energy security, net-zero targets, and climate-resilient energy development. Through industry-oriented learning, learners gain insight into the complete project lifecycle—from resource assessment, feasibility studies, technology selection, design, and financing through construction, commissioning, operations, maintenance, and decommissioning. The course also highlights emerging innovations such as AI-enabled predictive maintenance, digital twins, smart grids, battery energy storage, green hydrogen integration, and hybrid offshore energy systems.

The program combines technical concepts with real-world case studies from floating solar reservoirs, offshore floating wind farms, and integrated renewable-energy projects. Participants evaluate project economics, environmental considerations, marine risks, electrical systems, structural stability, permitting, health and safety, and ESG performance while learning how to identify opportunities and manage challenges in rapidly expanding floating renewable markets. Case-based exercises encourage learners to compare technologies, assess project risks, develop implementation strategies, and make informed investment and engineering decisions. By the end of the training, participants will be better prepared to contribute to utility-scale renewable energy projects, sustainable infrastructure development, climate innovation, and the next generation of floating clean-energy solutions.

Programme Curriculum

Floating Renewable Energy Systems Training Course

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Course Duration

5 days

Course Objectives

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

1. Explain the principles, technologies, and applications of Floating Renewable Energy Systems and their role in the energy transition.
2. Evaluate floating solar PV technologies, system configurations, performance factors, and deployment opportunities.
3. Understand floating offshore wind technologies, platforms, turbines, mooring systems, and marine operating conditions.
4. Conduct preliminary site assessment and resource evaluation for floating renewable energy projects.
5. Apply concepts of hydrodynamics, structural stability, anchoring, and mooring design to floating energy systems.
6. Assess grid integration, energy storage, smart-grid technologies, and power management requirements.
7. Evaluate the role of AI, IoT, digital twins, remote sensing, and predictive maintenance in project optimization.
8. Analyze CAPEX, OPEX, LCOE, project finance, bankability, and investment risks for floating renewable projects.
9. Identify environmental, social, and marine impacts using modern ESG, sustainability, and climate-risk frameworks.

10. Develop strategies for operations and maintenance (O&M), asset management, reliability, and lifecycle optimization.
11. Assess hybrid renewable systems, including floating solar-wind-storage and renewable-to-hydrogen applications.
12. Examine regulatory, permitting, health and safety, and marine spatial planning requirements.
13. Apply lessons from international industry case studies to develop scalable, resilient, and commercially viable floating renewable energy projects.

Target Audience

1. Renewable Energy Engineers and technical specialists
2. Solar PV and Offshore Wind Professionals
3. Project Developers and EPC Professionals
4. Energy Consultants and Sustainability Specialists
5. Utility, Grid, and Power-System Professionals
6. Government, Regulatory, and Energy-Policy Officials
7. Investors, Project-Finance, ESG, and Infrastructure Professionals
8. Researchers, Academics, and Clean-Tech Entrepreneurs

Course Modules

Module 1: Fundamentals of Floating Renewable Energy Systems

- Global trends in floating solar, floating wind, and offshore renewable energy
- Technology architectures and key system components
- Advantages, limitations, and scalability of floating energy
- Case Study: Utility-scale floating solar deployment on a large reservoir
- Emerging opportunities in net-zero energy infrastructure

Module 2: Floating Solar Photovoltaic Systems

- FPV platforms, pontoons, PV modules, inverters, and electrical systems
- Mooring and anchoring configurations for reservoirs and offshore environments
- Solar resource assessment, energy yield, and performance optimization
- Case Study: Large-scale FPV project and lessons in reservoir integration
- Innovations in bifacial modules, tracking, AI monitoring, and floating PV design

Module 3: Floating Offshore Wind Energy

- Floating wind turbine concepts and platform technologies
- Spar, semi-submersible, and tension-leg platform fundamentals
- Wind resource assessment and offshore energy yield
- Case Study: Commercial-scale floating offshore wind farm development
- Future trends in deep-water wind, larger turbines, and industrial-scale deployment

Module 4: Marine Engineering, Mooring, and Structural Design

- Hydrodynamics, wave loading, wind loading, and platform stability
- Mooring lines, anchors, cables, and dynamic response
- Corrosion protection, materials selection, and marine durability
- Case Study: Mooring and structural-risk assessment for an offshore floating system
- Digital engineering and simulation for reliability and resilience

Module 5: Electrical Systems, Storage, and Grid Integration

- Electrical collection, transformers, subsea cables, and grid connection
- Power quality, grid stability, forecasting, and energy management
- Battery Energy Storage Systems (BESS) and hybrid renewable configurations
- Case Study: Floating solar plus battery storage for grid flexibility
- Smart grids, microgrids, and AI-enabled energy optimization

Module 6: Project Development, Economics, and Financing

- Feasibility studies, site selection, technology selection, and project planning
- CAPEX, OPEX, LCOE, IRR, NPV, and bankability fundamentals
- Procurement, EPC contracting, insurance, and supply-chain considerations
- Case Study: Financial assessment of a utility-scale floating renewable project
- Green finance, blended finance, ESG investment, and carbon-reduction value

Module 7: Environmental, Regulatory, Safety, and Sustainability Management

- Environmental and social impact assessment for aquatic and offshore projects
- Marine ecology, water-use conflicts, biodiversity, and stakeholder engagement
- Permitting, marine spatial planning, compliance, and regulatory frameworks
- Case Study: Environmental assessment and stakeholder management for FPV
- ESG, climate resilience, circular economy, and responsible decommissioning

Module 8: Operations, Digitalization, and Future Innovations

- Asset management, inspection, maintenance, reliability, and lifecycle management
- IoT sensors, drones, AI analytics, digital twins, and predictive maintenance
- Performance monitoring, fault detection, and remote operations
- Case Study: Digital O&M strategy for a floating renewable energy portfolio
- Future pathways: floating solar-wind hybrids, green hydrogen, offshore energy hubs, and autonomous systems

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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