Sustainable Energy Economics 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

Sustainable Energy Economics Training Course provides a practical, decision-focused understanding of the economic, financial, technological, and policy forces shaping the global energy transition. As governments, investors, utilities, and businesses move from climate commitments toward implementation, professionals increasingly need to understand renewable energy economics, energy markets, decarbonization, net-zero strategies, carbon pricing, energy security, sustainable finance, and climate policy. Current energy-economics programs emphasize electricity-market design, renewable integration, storage, hydrogen, carbon pricing, investment, and techno-economic analysis, reflecting the growing complexity of low-carbon energy systems.

The course connects economic theory with real-world energy investment and policy decisions, enabling participants to evaluate the commercial and societal implications of emerging energy technologies. Particular attention is given to solar and wind power, battery storage, smart grids, green hydrogen, energy efficiency, carbon markets, sustainable infrastructure, project finance, PPAs, and energy-system resilience. Case-based learning helps participants understand how changing technology costs, regulation, market structures, financing conditions, and climate objectives influence investment decisions. This approach reflects current professional training models that combine theory, quantitative analysis, practical exercises, policy discussions, and industry cases.

Programme Curriculum

Sustainable Energy Economics Training Course

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Course Duration

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Course Objectives

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

1. Analyze energy markets and explain the economic drivers of the global energy transition.
2. Evaluate the levelized cost of energy (LCOE), lifecycle costs, and competitiveness of renewable technologies.
3. Assess renewable energy investment using techno-economic and financial-analysis techniques.
4. Understand electricity-market design, pricing mechanisms, market power, and system reliability.
5. Evaluate carbon pricing, emissions trading, and climate-policy instruments for decarbonization.
6. Develop strategies for net-zero transition and low-carbon economic development.
7. Assess the economics of energy storage, battery systems, and flexible power resources.
8. Examine green hydrogen economics, value chains, infrastructure requirements, and investment opportunities.
9. Apply project finance, PPAs, risk allocation, and sustainable-finance principles to clean-energy projects.
10. Evaluate the economic impact of energy efficiency, electrification, and demand-side management.
11. Analyze smart grids, distributed energy resources, microgrids, and grid modernization.
12. Assess energy security, climate resilience, energy-access, and just-transition considerations.
13. Formulate evidence-based recommendations for sustainable energy policy, investment, and strategic decision-making.

Target Audience

1. Energy economists and analysts
2. Government officials and energy policymakers
3. Utility and power-sector professionals
4. Renewable-energy project developers
5. Investment, banking, and sustainable-finance professionals
6. Engineers and technical energy specialists
7. Corporate sustainability, ESG, and climate professionals
8. Consultants, researchers, academics, and development-sector professionals

Course Modules

Module 1: Foundations of Sustainable Energy Economics

- Energy economics fundamentals
- Energy transition dynamics
- Energy security and resilience
- Economic indicators
- **Case Study:** Comparing the economics of a fossil-fuel power system with a renewable-heavy electricity system.

Module 2: Renewable Energy Economics and Technology

- Economics of **solar PV, wind, hydropower, geothermal, and sustainable bioenergy**.
- Technology learning curves, economies of scale, and declining clean-energy costs.
- **Techno-economic assessment** and lifecycle-cost analysis.
- Capacity factors, intermittency, curtailment, and renewable-resource economics.
- **Case Study:** Evaluating the investment economics of a utility-scale solar or wind project.

Module 3: Electricity Markets, Pricing and Grid Economics

- Wholesale and retail **electricity-market structures**.
- Market competition, market power, marginal pricing, and congestion.
- **Capacity markets, balancing markets, ancillary services**, and resource adequacy.
- Renewable integration and the economics of transmission and grid modernization.
- **Case Study:** Assessing how high renewable penetration and battery storage can influence electricity prices and market behavior. Current research highlights the importance of storage design and market rules in high-renewable systems.

Module 4: Energy Policy, Regulation and Carbon Economics

- **Carbon pricing**, carbon taxes, emissions trading, and environmental externalities.
- Renewable-energy incentives, auctions, subsidies, and regulatory mechanisms.
- Energy-efficiency standards and demand-side policy.
- **Net-zero policy**, climate commitments, and transition pathways.
- **Case Study:** Comparing alternative policy instruments for accelerating renewable-energy investment.

Module 5: Clean Energy Finance and Investment

- **Project finance** fundamentals for renewable and sustainable-energy projects.
- Investment appraisal: NPV, IRR, payback period, sensitivity, and scenario analysis.
- **Power Purchase Agreements (PPAs)**, revenue structures, and risk allocation.
- Sustainable finance, green bonds, blended finance, and climate investment.
- **Case Study:** Building an investment decision framework for a renewable-energy project under changing interest rates, power prices, and policy incentives.

Module 6: Energy Storage, Hydrogen and Emerging Energy Markets

- Economics of **battery energy storage**, pumped hydro, thermal storage, and other flexibility solutions.
- Storage valuation through arbitrage, capacity, ancillary services, and grid support.
- **Green hydrogen** production economics, infrastructure, demand, and emerging markets.
- Sector coupling, industrial decarbonization, and electrification.
- **Case Study:** Comparing the economics of a solar-plus-storage project with a renewable hydrogen pathway. Storage is increasingly treated as a cornerstone of flexible renewable-energy systems.

Module 7: Energy Efficiency, Sustainable Infrastructure and Just Transition

- **Energy efficiency economics** across buildings, industry, transport, and infrastructure.
- Demand-side management, electrification, and energy productivity.
- Sustainable infrastructure investment and lifecycle economics.
- **Just transition**, energy affordability, employment, and inclusive development.
- **Case Study:** Developing an economic strategy for reducing industrial energy consumption while maintaining competitiveness.

Module 8: Integrated Energy-System Modelling and Strategic Decision-Making

- **Energy-system modelling** and scenario analysis for long-term planning.
- Integrated electricity, transport, heating, hydrogen, storage, and industrial systems.
- **AI, digitalization, smart grids, and data-driven energy decisions**.
- Climate-risk, uncertainty, resilience, and investment stress testing.
- **Case Study:** Designing a **2050 net-zero energy strategy** balancing affordability, energy security, emissions reduction, investment requirements, and economic development.

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
21 Sep 2026	25 Sep 2026	Online	$1,000
21 Sep 2026	25 Sep 2026	Physical	$1,500
21 Sep 2026	25 Sep 2026	Physical	$0
21 Sep 2026	25 Sep 2026	Physical	$0
21 Sep 2026	25 Sep 2026	Physical	$0
21 Sep 2026	25 Sep 2026	Physical	$0
21 Sep 2026	25 Sep 2026	Physical	$0
21 Sep 2026	25 Sep 2026	Physical	$0

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