Hydrogen Economy and Fuel Technologies 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 global energy landscape is rapidly shifting toward decarbonization, net-zero emissions, and clean energy transition, positioning the Hydrogen Economy as a cornerstone of future sustainable development. Hydrogen is emerging as a critical energy carrier due to its high efficiency, zero-carbon combustion, and versatility across transportation, industrial processes, power generation, and energy storage systems. Governments, industries, and research institutions are investing heavily in green hydrogen, blue hydrogen, fuel cells, and renewable energy integration, making hydrogen technologies one of the fastest-growing sectors in the global energy market.

Hydrogen Economy and Fuel Technologies Training Course provides a comprehensive, industry-focused understanding of hydrogen production, storage, distribution, and application technologies. It integrates real-world case studies, emerging innovations such as electrolysis, carbon capture utilization and storage (CCUS), hydrogen fuel cells, and synthetic fuels, and prepares learners for careers in the evolving clean energy ecosystem. Participants will gain practical insights into global hydrogen infrastructure development, policy frameworks, and commercial deployment strategies aligned with ESG goals, climate action targets, and sustainable energy transition policies.

Programme Curriculum

Hydrogen Economy and Fuel Technologies Training Course

Introduction

The global energy landscape is rapidly shifting toward decarbonization, net-zero emissions, and clean energy transition, positioning the Hydrogen Economy as a cornerstone of future sustainable development. Hydrogen is emerging as a critical energy carrier due to its high efficiency, zero-carbon combustion, and versatility across transportation, industrial processes, power generation, and energy storage systems. Governments, industries,

and research institutions are investing heavily in green hydrogen, blue hydrogen, fuel cells, and renewable energy integration, making hydrogen technologies one of the fastest-growing sectors in the global energy market.

Hydrogen Economy and Fuel Technologies Training Course provides a comprehensive, industry-focused understanding of hydrogen production, storage, distribution, and application technologies. It integrates real-world case studies, emerging innovations such as electrolysis, carbon capture utilization and storage (CCUS), hydrogen fuel cells, and synthetic fuels, and prepares learners for careers in the evolving clean energy ecosystem. Participants will gain practical insights into global hydrogen infrastructure development, policy frameworks, and commercial deployment strategies aligned with ESG goals, climate action targets, and sustainable energy transition policies.

Course Duration

5 days

Course Objectives

1. Understand the fundamentals of the Hydrogen Economy and clean energy transition
2. Analyze green hydrogen production technologies and electrolysis systems
3. Evaluate blue hydrogen and carbon capture utilization (CCUS) integration
4. Explore hydrogen fuel cell technology and applications in mobility
5. Assess hydrogen storage methods including compressed, liquid, and solid-state storage
6. Understand hydrogen transportation and global supply chain infrastructure
7. Study renewable energy integration with hydrogen production systems
8. Examine decarbonization strategies in industrial hydrogen usage
9. Analyze hydrogen refueling station design and deployment
10. Evaluate synthetic fuels and Power-to-X (P2X) technologies
11. Understand hydrogen safety standards and risk management frameworks
12. Review global hydrogen policies, regulations, and market trends
13. Develop skills for hydrogen project development and investment feasibility analysis

Target Audience

1. Energy engineers and petroleum professionals
2. Renewable energy consultants and analysts
3. Government energy policy makers and regulators
4. Automotive and EV industry professionals
5. Chemical and process engineers
6. Sustainability and ESG officers
7. Researchers and university students in clean energy fields
8. Investors and project developers in green energy infrastructure

Course Modules

Module 1: Hydrogen Economy Fundamentals

- Evolution of global hydrogen markets
- Hydrogen as an energy carrier
- Types-grey, blue, green hydrogen
- Role in net-zero emissions

- Global hydrogen demand trends
- **Case Study:** Germany’s National Hydrogen Strategy and industrial decarbonization roadmap

Module 2: Hydrogen Production Technologies

- Steam methane reforming (SMR)
- Electrolysis
- Biomass gasification
- Blue hydrogen with CCUS
- Efficiency optimization techniques
- **Case Study:** Australia’s green hydrogen export projects

Module 3: Hydrogen Storage & Transport

- Compressed gas storage systems
- Liquid hydrogen cryogenic storage
- Metal hydrides and solid storage
- Pipelines and shipping logistics
- Hydrogen leakage and safety controls
- **Case Study:** Japan’s liquid hydrogen supply chain development

Module 4: Fuel Cell Technologies

- PEM fuel cells
- Solid oxide fuel cells (SOFC)
- Alkaline fuel cells
- Efficiency and performance metrics
- Applications in transport and power
- **Case Study:** Toyota Mirai fuel cell vehicle deployment

Module 5: Hydrogen in Transportation

- Fuel cell electric vehicles (FCEVs)
- Hydrogen buses and trucks
- Aviation and maritime applications
- Refueling infrastructure design
- Comparative analysis with battery EVs
- **Case Study:** Hyundai hydrogen truck fleet in Europe

Module 6: Industrial Applications

- Steel and cement decarbonization
- Refining and ammonia production
- Power generation blending
- Hydrogen in chemical industries
- Energy-intensive industry transformation
- **Case Study:** SSAB fossil-free steel project in Sweden

Module 7: Hydrogen Infrastructure & Policy

- Hydrogen refueling stations (HRS)
- Pipeline infrastructure development

- Global hydrogen policies and subsidies
- Carbon pricing impact
- Investment frameworks and PPP models
- **Case Study:** California hydrogen highway network

Module 8: Power-to-X and Future Energy Systems

- Power-to-gas and Power-to-liquid
- Synthetic fuels (e-fuels)
- Renewable energy coupling
- Grid balancing using hydrogen
- Future hydrogen ecosystems
- **Case Study:** Siemens Energy Power-to-X plant in Germany

Training Methodology

This course employs a participatory and hands-on approach to ensure practical learning, including:

- 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:

Register Online Now

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