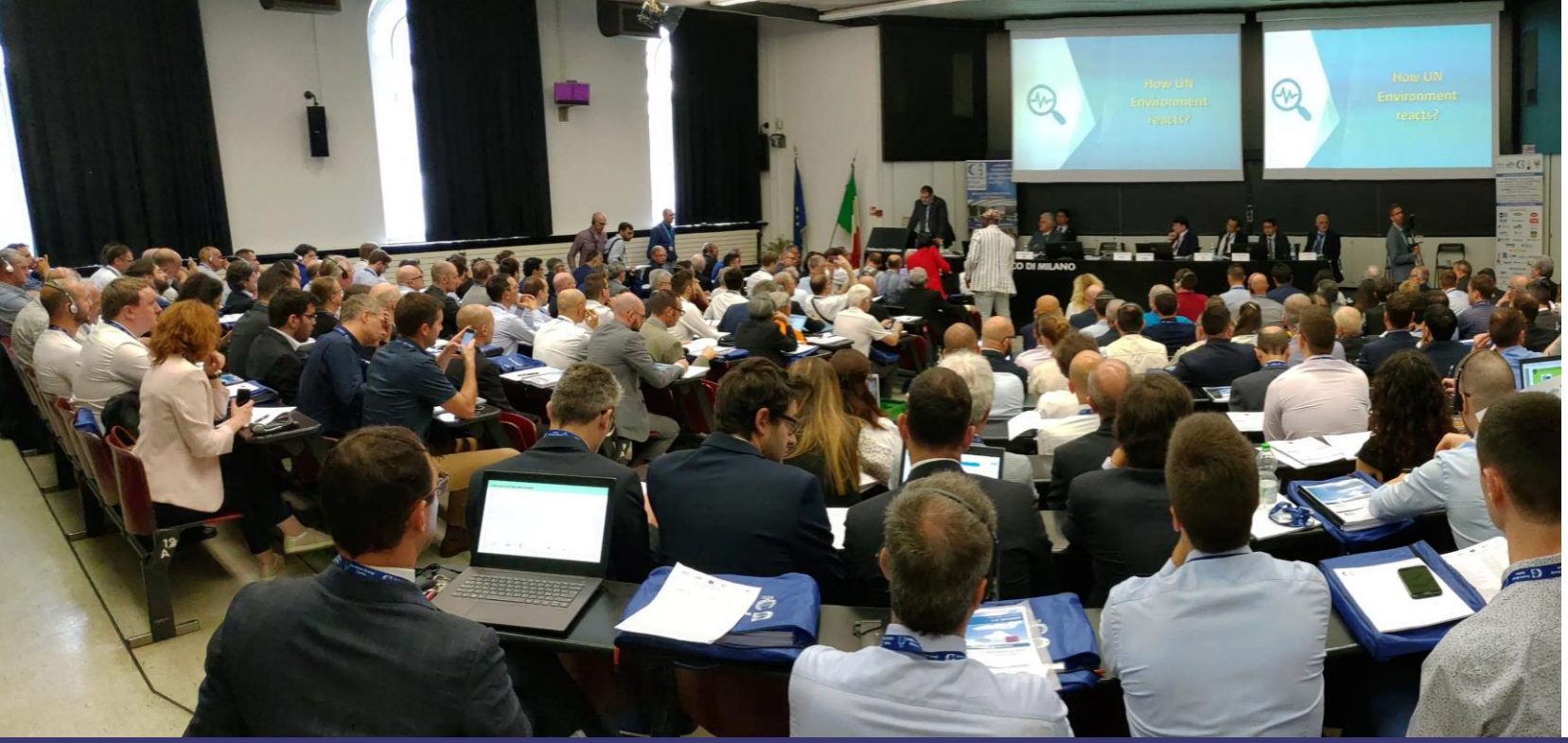


SQA Approved Centre

GMC

CPD The CPD Certification Service

ECT

Accredited Training Course Programmes

REI

Renewable Energy Institute

Professional Body for Education in Renewable Energy

https://www.renewableinstitute.org/

Hydrogen Energy

- 30 CPD Hours

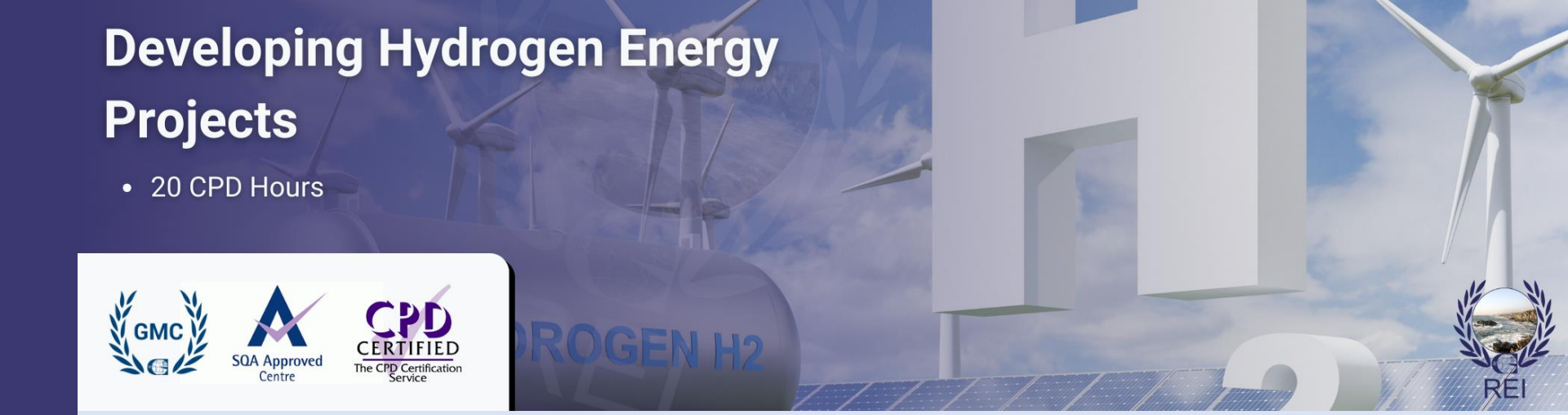
In this course, you will learn about **environmentally sustainable hydrogen** and its role in a **climate-neutral strategy**. You'll explore **hydrogen production** and **conversion**, **fuel cells**, and **hydrogen technologies** for mobility applications and vehicles. The course includes **modelling and simulation**, the **hydrogen economy** and **financial market opportunities**, as well as **storage** and **carbon capture**. You'll study **LCSA**, **recycling**, **eco-design** and the **distribution** and **grid infrastructure**. Additionally, the course covers **government legislation** and **policies** in the UK, EU (including the **European Green Deal**), and worldwide, illustrated with **case studies**.

Key Topics:

- Environmentally sustainable hydrogen
- Hydrogen as part of a climate neutral strategy
- Hydrogen production and conversion
- Fuel cells
- Hydrogen for mobility applications & vehicles
- Hydrogen technologies
- Modelling and simulation
- Hydrogen economy & financial market opportunities
- Storage & carbon capture
- LCSA, recycling and eco-design
- Distribution & grid infrastructure
- Government legislation & policies – UK, EU (including European Green Deal), worldwide
- Case studies

Developing Hydrogen Energy Projects

- 20 CPD Hours



In this course, you will learn the technical aspects of **developing a project**, including **designing a project**, understanding **design philosophies**, and **selecting technologies**. You'll explore **safety challenges**, **principles** and **design considerations for safety**, including **leak** and **flame detection**. The course covers **regulations, standards and codes**, with a focus on **key EU directives** and the process of **developing standards**. You'll also learn about **contracting strategies**, including **traditional contracting models**. On the commercial and economic side, the course covers **net present value calculations** and **internal rate of return** to evaluate project viability.

Key Topics:

- Developing your project – technical
- Designing a project
- Design philosophies
- Selecting a technology
- Safety challenges
- Safety principles
- Design considerations for safety
- Leak & flame detection
- Regulations, standards & codes
- Key EU directives
- Developing standards
- Contracting strategies
- Traditional contracting models
- Developing your project – commercial/economic
- Net present value calculation
- Internal rate of return

Please note: we recommend completing Hydrogen Energy before enrolling on this course.

Renewable Energy Management and Finance

- 30 CPD Hours

The course covers various technologies like **wind**, **solar**, **biomass**, **heat pumps** and **wave/tidal power**. You'll explore the **fundamentals of renewable energy**, including **carbon budgeting** and the **energy trilemma**. You will also learn about the barriers and opportunities in the sector, **project development phases** and financial aspects such as **funding models** and **Net Present Value (NPV)**. **Risk management** and **safety** are examined through case studies, along with **lifecycle assessments**, recycling, critical raw materials and the role of **R&D**. The course also addresses **government and private support mechanisms**, **contracts for difference** and **future energy systems**, illustrated by real-world examples like the **Orkney renewable energy islands initiative**.

Key topics:

- Introduction to renewable energy finance and sustainable design
- Methods of financing: FiT / RHI / ROCs / CfD / PPA / ESCO / EPC
- Project risk and financial management
- Basic project finance & technical calculations – e.g., energy, economics, emissions, NPV, IRR
- Life Cycle Assessment (LCA) and approach
- Incentives and barriers to investment
- Government policy and support schemes – UN, EU, UK
- Project finance examples
- Practical international case studies

Carbon Finance

- 30 CPD Hours

In this course, you will learn about **corporate emissions** and decarbonisation strategies, including an **introduction to greenhouse gases (GHG)** and **climate change**. You'll explore **ESG corporate principles** and **reporting**, corporate carbon emissions accounting and various **emission-reduction commitments**. The course covers designing a **corporate decarbonisation strategy**, understanding carbon markets in Europe and the differences between compliance and voluntary carbon markets. Additionally, you will discover opportunities in **carbon trading** and effective **management strategies**.

Key topics:

- Corporate emissions and decarbonisation strategies
- Introduction to greenhouse gases (GHG) and climate change
- ESG corporate principles and reporting
- Corporate carbon emissions accounting
- Types of emission-reduction commitments
- Designing a corporate decarbonisation strategy
- Carbon markets in Europe
- Compliance carbon markets
- Voluntary carbon markets
- Opportunities in carbon trading and management strategies

Carbon Capture and Market Strategies

- 20 CPD Hours

In this course, you will learn about **carbon capture** and various types of projects, such as **avoidance** versus **removals**. You'll explore **carbon capture and storage technologies**, including **natural capital solutions** and **engineered removals** and their complementarity with other sectors. The course covers the integration of carbon capture with **carbon markets**, focusing on **voluntary** and **mandatory markets**. You'll also study the **scale** and **geographical distribution** of carbon markets, the **standardisation** and **quality of credits**, the **accreditation/verification process** and the **trading of carbon credits**.

Key Topics:

- Introduction to carbon capture and different types of projects (avoidance vs removals)
- Carbon capture and storage available technologies including natural capital solutions vs engineered removals
- Complementarity of carbon capture with other developments/sectors
- Integration with carbon markets, namely applicability in voluntary carbon markets vs mandatory carbon markets
- Carbon markets scale and geographical distribution
- Standardisation of carbon markets and relevance of credit quality
- Accreditation / verification process and key criteria considerations
- Carbon credits offtake and trade

Please note: we recommend completing Carbon Finance before enrolling on this course.

Artificial Intelligence for Renewable Energy

- 30 CPD Hours

This course covers the fundamentals of renewable energy and AI, focusing on **data collection and cleaning**, **predictive modeling for energy forecasting** and **optimisation techniques** for managing supply and demand. You will learn strategies for integrating storage solutions and smart grids, implementing **autonomous control systems** and using **AI for predictive maintenance**. Additionally, the course addresses **risk assessment**, including cybersecurity and explores **real-world AI applications in renewables** while considering **ethical implications** in the energy transition.

Key topics:

- Renewable Energy Basics & AI Fundamentals
- Data Collection & Cleaning Techniques
- Predictive Modelling for Energy Forecasting
- Optimisation for Energy Systems, including Supply/Demand Management
- Storage & Grid Integration Strategies, including Smart Grids
- Autonomous Control Systems in Renewables
- Predictive Maintenance with AI
- Risk Assessment & Mitigation, including Cybersecurity
- Real-world AI Applications in Renewables
- Ethical Considerations in AI for Energy Transition

Solar Photovoltaic

- 30 CPD Hours

In this course, you'll explore the fundamentals of photovoltaics, including the **composition of light**, the **photovoltaic effect** and different **photovoltaic cells**. You'll learn about the materials used, energy output analysis and optimal module positioning. The course covers **photovoltaic energy** and **illumination**, **planning** and **designing installations** and understanding the **electric load**. You'll evaluate costs, maintenance, and reliability while exploring practical solutions and installation types. The integration of photovoltaic modules in building structures, **payback time** and **economic perspectives** will also be addressed, providing a comprehensive understanding of this renewable energy technology.

Key topics:

- Composition of light
- Photovoltaic effect
- Photovoltaic cells
- Materials
- Daily/annual energy
- Positioning of the modules
- Photovoltaic energy
- Photovoltaic illumination
- Planning and designing a photovoltaic installation
- The electric load
- Costs and evaluation of the economical solutions
- Maintenance and reliability
- Practical solutions
- Typologies and modality of installation
- Integration of the photovoltaic modules in the building structure
- Payback time
- Economical perspectives

Solar Water Heating

- 20 CPD Hours

This course covers **climatic data capture** and various **types of solar systems** with a focus on **energy storage**. It includes **calculating thermal requirements**, especially for occupancy and sanitary hot water, and understanding **passive components** in solar design. The course addresses the **designing surface required** for solar systems and the calculation of **accumulation volume** (ground storing). Practical aspects include **budgeting**, regulatory considerations and understanding **installation data** and costs. It also examines **savings achieved** through solar energy systems and details installation processes including components like tanks, solar regulating switchboards and hydronic circuits.

Key Topics:

- Climatic data capture
- Types of solar systems and storage of energy
- Calculation of the thermal requirements, occupancy, sanitary hot water
- Passive components
- Calculation of the designing surface required for the system
- Calculation of volume of accumulation (ground storing)
- Budgets
- Regulations
- Data and costs of installations
- Savings achieved
- Installation of the system, the tank, solar regulating switchboards, hydronic circuit of solar

Wind Power

- 20 CPD Hours

In the course you will gain comprehensive knowledge across various critical aspects of **wind energy**. This includes understanding the adaptation of **scenery** to accommodate wind turbines, assessing their **environmental impact** and exploring **hybrid systems** that integrate wind power with other energy sources. You will delve into **incentives** that drive wind power adoption, **economic considerations** and relevant **policies and procedures**. Practical skills will be developed in the **operation, maintenance, and design** of wind plants, with a focus on **tuning and optimising performance**. Additionally, you will explore the **technology** behind wind machines, the dynamics of the **wind market**, classifications of wind plants and foundational concepts in **aerodynamics** and **aeraulic machines**. By the end of the course, you will have a comprehensive understanding of **how wind power works** and its role in **sustainable energy solutions**.

Key Topics:

- Small and micro wind power plants
- Scenery adaptation
- The environmental impact
- Hybrid systems
- Incentives for wind power adoption
- Economical aspects
- Policies and procedures
- Running and maintenance of plants
- Design criteria
- Tuning the plants
- Technologies of machines
- The wind market
- Classification and types of plants
- Concepts of aerodynamics and aeraulic machines
- How wind power works

Renewable Energy Solutions

- 30 CPD Hours

In this course, you will receive an introduction and overview of various **renewable technologies**. You'll learn about **government incentives**, **climate change** and **energy assessments** like **LEED**, **BREEAM**, and **EPC**. The course will guide you in choosing the best renewable energy options and explore the **benefits, applications** and **case studies** for technologies such as **solar water heating**, **fuel cells** and **earth ducts**. You will review each technology, consider **payback time** and learn about **combining renewable energy technologies**. Additionally, the course will cover available **software** tools and conclude with a comprehensive summary.

Key Topics:

- Introduction of the module and overview of the different renewable technologies
- Government incentive, climate change, energy, assessment (LEED, BREEAM, EPC)
- Choosing the best renewable energy options
- Benefits, applications and case studies for each technology
- Solar water heating
- Fuel cell, earth duct: Canadian/Provencal wheel, light pipe
- Review of each technology
- Payback time considerations
- Combining renewable energy technologies
- Software available
- Conclusion

Biomass

- 20 CPD Hours

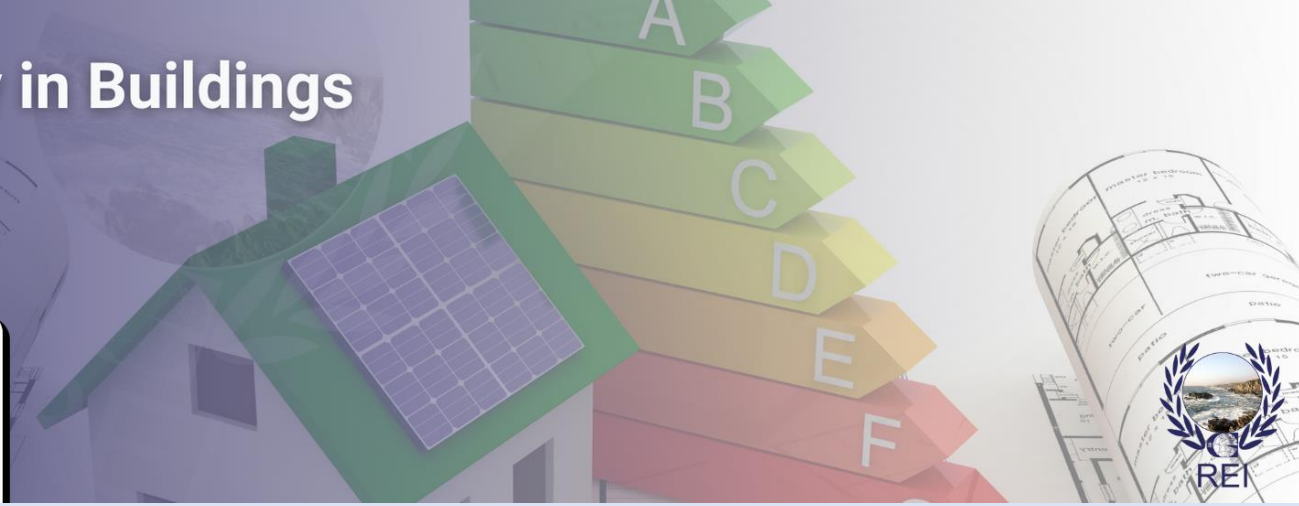
This course covers fundamental aspects such as **biomass definition**, **market overview** and **resource targets**. It explores the **physics principles** of biomass energy, including **energy content**, technology types like **anaerobic digestion** and **gasification** and design considerations such as **sizing**, **selection**, **autonomy** and **storage**. The course addresses **environmental impact**, financial considerations including incentives like **RHI** and **ROCs** and **regulatory frameworks**. It includes **case studies**, **best practices**, simulation tools, **standards** and resources for further reading, as well as support from **trade bodies** in the biomass sector.

Key Topics:

- What is biomass?
- Market, resources and targets overview
- The physics principles
- How biomass works (energy content, types of technologies, PCI, humidity content)
- Design guidance (sizing, selecting, autonomy, storage, manufacturers)
- Types of technologies: anaerobic digestion (bio-methane), gasification
- Environmental impact and analysis
- Finance, regulation and incentives (RHI, MCS, ROCs, DECC)
- Case studies, best practice analysis, manufacturers
- Simulation tools
- Standards
- References and further reading
- Trade bodies and support

Energy Efficiency in Buildings

- 30 CPD Hours



In this course, you will study global and UK **energy demand**, policy drivers, and **energy conservation** techniques. Topics include **energy audits**, **thermal comfort**, and strategies to manage **heat loss** and condensation risks. You'll explore **building heat loss** calculations, model **thermal performance** and examine **combined heat and power** systems. Technologies covered include **boilers**, **heat pumps**, and **solar water heating**, with a focus on optimising **heating controls** and **artificial lighting**. The course also addresses **solar resources**, building design for **ventilation** and **cooling** and the concept of **embodied energy** in construction.

Key Topics:

- Energy and power
- World & UK demand / energy consumption
- Policy and drivers
- Energy conservation & Energy auditing
- Thermal comfort
- Heat loss and condensation
- Calculating heat loss and condensation risk
- Building heat loss
- Modelling the thermal performance of buildings
- Combined heat and power
- Boilers
- Heat pumps
- Solar water heating
- Heating controls
- Artificial lighting
- Solar resource & geometry
- Building design strategies – ventilation and cooling of buildings
- Embodied energy
- Site visits

Electrics for Renewables

- 20 CPD Hours

In this course you will review essential concepts such as **voltage** and **current measurement**, distinguishing between **AC** and **DC** systems and understanding **resistance**, **inductance** and **capacitance** in circuits. Topics include the **impact and calculation** of voltage drops, particularly in **DC-based renewable systems** (off-grid), covering aspects like **earthing** and **overcurrent protection**. For **grid-connected systems**, emphasis is placed on **safety considerations** and the **impact of power factor**, alongside guidelines for **PV installations** and adherence to **installation standards** and **connection wiring standards**. The course also addresses **AC safety**, focusing on **earthing arrangements** and their implications in ensuring electrical safety.

Key Topics:

- Review of electrical fundamentals including
- Voltage, current and how they are measured
- AC and DC
- Resistance
- Inductance and capacitance in AC and DC circuits
- Impact and calculation of voltage drops
- DC-based renewable systems (off-grid)
- Earthing and over current protection
- Grid-connected systems
- Safety considerations
- The impact of power factor
- PV installation guidelines and installation standards
- Connection and wiring standards
- AC safety
- Earthing arrangements and their implications

Energy Storage

- 30 CPD Hours

This course offers a comprehensive overview of modern **energy storage technologies**. Participants explore various **types of electrical energy storage**, examining their **operational characteristics**, **parameters** and **cost considerations**. The course covers **integration into electrical grids**, **off-grid system design** and **small-scale battery applications**. Additionally, it discusses **types and applications of thermal energy storage**, alongside insights into **future developments** in the field, preparing participants for the evolving landscape of sustainable energy solutions.

Key Topics:

- Types of electrical energy storage and key characteristics
- Parameters for electrical energy storage
- Operational characteristics of electrical storage
- Costs and pricing
- Integration of energy storage into electrical grids
- Off-grid systems, architecture and sizing
- Small scale battery storage systems
- Types and applications of thermal energy storage
- Future developments in energy storage

Wave and Hydro Power

- 20 CPD Hours

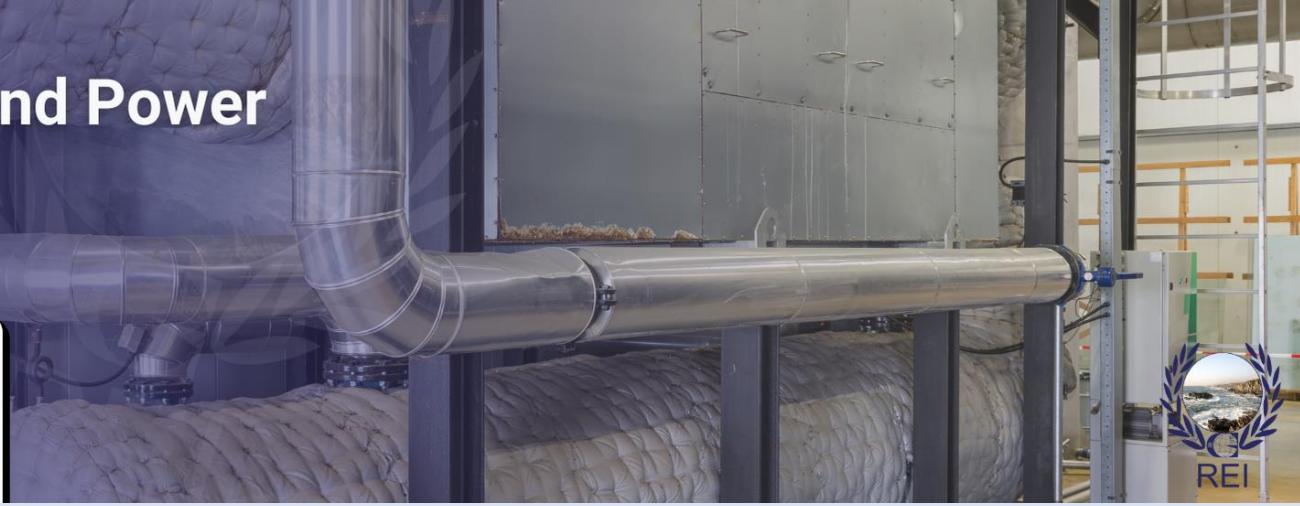
This course explores **wave and tidal power** and **hydro power**, providing an overview of their markets, resources and targets. It delves into the **physics principles** including energy content and various technologies involved. The course offers **design guidance** covering types, sizing, selection, and manufacturers. Environmental impact and analysis are discussed, alongside financial considerations such as **MCS**, **RHI**, **CCL**, and **ECA**, along with relevant regulations and incentives. **Case studies** and best practices are examined to illustrate real-world applications, supported by simulation tools, standards and references for further reading.

Key Topics:

- What is wave / tidal power?
- What is hydro power
- Market, resources and targets overview
- The physics principles (energy content, types of technologies)
- Design guidance (types, sizing, selecting, manufacturers)
- Environmental impact and analysis
- Finance, regulation and incentives (MCS, RHI, CCL, ECA)
- Case studies, best practice analysis
- Simulation tools
- Standards, references and further reading

Combined Heat and Power

- 20 CPD Hours



This course covers essential topics such as defining **CHP**, providing an overview of its **market, resources and targets**. It explores the **physics principles** underlying CHP, including **energy content** and various **technologies** involved. **Design guidance** includes considerations for types, sizing, selection, and manufacturers. The course addresses **environmental impact and analysis**, along with financial aspects such as **MCS, RHI, CCL, and ECA** incentives and regulatory frameworks. **Case studies** and **best practices** are highlighted to illustrate effective implementation strategies. The course also introduces **simulation tools**, discusses **standards** and provides **references** for further reading on CHP systems.

Key Topics:

- What is CHP?
- Market, resources and targets overview
- The physics principles (energy content, types of technologies)
- Design guidance (types, sizing, selecting, manufacturers)
- Environmental impact and analysis
- Finance, regulation and incentives (MCS, RHI, CCL, ECA)
- Case studies, best practice analysis
- Simulation tools
- Standards, references and further reading

Heat Pumps

- 30 CPD Hours

This course provides a comprehensive overview across several key sessions. Participants will explore the nature of **heat energy** and its applications, alongside an analysis of **market dynamics** and **resource targets**. The course covers the **physics principles** underlying heat technologies, offering **design guidance** for sizing, selection, and storage, with insights into manufacturers. Topics include **environmental impact assessment**, **financial considerations** such as MCS and RHI incentives, and **case studies** illustrating best practices. Additionally, participants will engage with **simulation tools**, learn about industry **standards** and access valuable **references** and support from trade bodies in the heat energy sector.

Key Topics:

- What is heat
- Market, resources and targets overview
- The physics principles (components, types of technologies)
- Design guidance (sizing, selecting, autonomy, storage, manufacturers)
- Other types: Underground thermal energy storage (UTES), earth ducts, solar assisted ground source heat pump
- Environmental impact and analysis
- Finance, regulation and incentives (MCS, RHI)
- Case studies, best practice analysis
- Simulation tools
- Standards
- References and further reading
- Trade bodies and support

Global Energy Transition

- 30 CPD Hours

In this course, you will learn about the shift from **fossil fuels** to **alternative energy sources**, covering key concepts, technologies and the role of **policies and governance**. The course explores **decarbonisation challenges**, **sustainability goals** and the **geopolitical implications** of the energy transition. You will also delve into **Environmental, Social and Corporate Governance (ESG)** and examine **case studies** to understand practical applications and solutions.

Key Topics:

Global Energy Transition

- Terminology and concepts
- Misconceptions and lessons from history
- The energy trilemma and climate change

Energy Transition From the Bottom Up

- Technologies and building blocks for the transition
- Electrons and molecules
- Supply chain decarbonisation

Energy Transition From the Top Down

- COP, commitments, and the role of the UN
- Global challenges and geopolitics
- Policies and the role of governments

Decarbonisation - Challenges and Solutions

- International / national / industrial

Sustainability and the Energy Transition

- Sustainable development goals and their current and future impact
- ESG – Environmental social and corporate governance

Project Management

- 30 CPD Hours

This course covers the core components of project management and the benefits of **effective project management**, providing insights into the **project environment and PESTLE analysis**. You will learn about roles and responsibilities within a project, the importance of a purpose and business case and how to produce an **efficient project management plan**. The course emphasises **stakeholder management and analysis**, successful leadership and teamwork and **configuration management and change control**. Additionally, it addresses **procurement**, the **project risk management** process, the communication plan and project **reporting**.

Key Topics:

- Core components of project management
- The benefits of effective project management
- Project environment and PESTLE analysis
- Roles and responsibilities within a project
- Purpose and the business case
- Production of an efficient project management plan
- Stakeholder management and analysis
- Successful leadership and teamwork
- Configuration management and change control
- Procurement
- Project risk management process
- The communication plan
- Project reporting

Electric Vehicles

- 30 CPD Hours

In this course, you'll explore key topics across four sessions. Session 1 covers **motivations** for EV adoption, including **air quality** and **climate change** and examines **carbon foot printing**. Session 2 details vehicle and battery categories, market trends, **EV policies**, and technological advancements. Session 3 focuses on **EV charging infrastructure** with insights into policy specifics, **emerging technologies** and **social attitudes**. Session 4 analyses the **evolution** of the **automotive** and **energy sectors**, including growth areas like **e-bikes**, **startup trends** and future **EV market developments**.

Key Topics:

Session 1: Why electric vehicles?
- Air quality versus climate change drivers
- Deep dive on carbon foot printing
- Policy: historic interventions to cut transport emissions
- Technology: options to cut emissions
- Social: perceptions around the solutions

Session 2: What is an EV?
- A breakdown of the vehicle categories and battery categories
- Market adoption trends and predictions
- Policy: EV specific policy evolution
- Technology: new tech trends
- Social: public attitudes as we enter the early majority

Session 3: How do we recharge the EV?
- A breakdown of the four categories of EV charging
- Policy: charging specific policies
- Technology: emerging trends in smart, public, home and fleet
- Social: attitudes towards charging

Session 4: How is the market responding?
- How the automotive and energy sectors are colliding and evolving
- The growth into new sectors: e.g., e-bike is the biggest growth sector
- Start-up evolution and trends
- What to watch over the next 2, 5 and 10 years of EV

Electric Vehicles (US Specific)

- 30 CPD Hours

This course provides a comprehensive exploration of key topics crucial to understanding the electric vehicle (EV) landscape. Participants delve into the **sustainability implications** of EVs, advancements in **EV and battery technologies** and the infrastructure supporting **EV charging**. The course addresses strategies and challenges in deploying **charging stations**, particularly focusing on the **U.S. landscape**. It also examines barriers limiting widespread EV adoption, **financial models** for EV **financing and development**, and the diverse **governmental policies** at local, state, national and international levels that promote and regulate **EV deployment**.

Key Topics:

- EVs and sustainability
- EV technology
- Battery technology
- Overview of charging infrastructure/electric vehicle supply equipment
- Charging station deployment
- U.S. charging station deployment
- Issues limiting adoption of EVs
- EV financing and development
- Government policies promoting EV deployment (local, state, national, and international)

Renewable Energy Market Trends and Finance (US Specific)

- 30 CPD Hours

Participants begin with a **Course Introduction** followed by an exploration of **Renewable Energy** fundamentals and current **Market Trends**. They gain insights into **Renewable Energy Finance**, including an introduction to financial principles and various financing tools such as **PACE, CREBs, QZEBs** and others. The course covers **Government Policy** and support schemes, highlighting their impact on renewable energy projects. Participants delve into **Developing Country Financing** options, including microlending and crowdfunding and gain an understanding of **Project Finance** through case studies and deal structuring exercises. Practical case studies and examples illustrate the application of boutique financing and project finance principles in real-world scenarios.

Key Topics:

- Course introduction
- Introduction to renewable energy
- Market trends renewable energy
- Introduction to renewable energy finance
- Government policy and support schemes
- Developing country financing: microlending, multilateral
- Banks, crowdfunding
- Project finance (overview)
- Project finance (basic financial and economic principles)
- Project case studies
- Deal structuring
- Financing tools - PACE, CREBs, QZEBs and other
- Boutique financing
- Project finance examples
- Practical case studies

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