SQA Approved Centre

GMC

CPD The CPD Certification Service

ECT

Accredited Master in Renewable Energy Award

REI

Renewable Energy Institute

Professional Body for Education in Renewable Energy

https://www.renewableinstitute.org/

CASE STUDY

The skills and knowledge obtained through attending the courses offered by the REI are crucial for my current role and future career.”

Nar Bahadur Khatiwora

United Nations UNDP

1. Why did you choose to attend a course at the Renewable Energy Institute?

In addition to my qualifications, experience and background in **leading successful projects for top clients at the United Nations Development Programme**, I am also passionate about learning new things and continuously increasing my knowledge. I see training courses as an opportunity to continue to develop both professionally and personally. I am driven to deliver high-quality work and therefore, **internationally recognised courses are appropriate and helpful for me to keep abreast of new innovations and adapt to the changing dynamics** and new developments in the areas of Climate Change, Renewable Energy and Energy Efficiency, the core area of my work. **The courses offered by the Renewable Energy Institute at world-class Universities in the United Kingdom are appropriately delivered with practical case studies to demonstrate the latest developments** in the growing field of climate change, renewable energy and energy efficiency.

I can hardly describe the rewarding feeling that one gets when obtaining the **internationally recognised Galileo Master Certificate (GMC)**, which takes the level of your competency to a greater height and gives you more confidence to work much harder independently, in improving the health of our planet and the livelihood of the world’s population.

To read the full article with Nar visit: https://www.renewableinstitute.org/eec-alumnus-spotlight-united-nations-undp-nar-bahadur-khatiwora/

Master in Renewable Energy Award

Access to 15 renewable energy and energy efficiency courses

- 270+ CPD Hours

Study a minimum of 12 courses to become a Master in Renewable Energy:
Study up to 3 courses in the Live Virtual Classroom

- Renewable Energy Market Trends & Finance (US Specific)
- Solar Photovoltaic
- Carbon Finance
- Renewable Energy Solutions
- Hydrogen Energy
- Wind Power
- Energy Efficiency in Buildings
- Electrics for Renewables
- Biomass
- Wave & Hydro Power
- Solar Water Heating
- Combined Heat & Power
- Energy Storage
- Electric Vehicles (US Specific)
- Heat Pumps

Price per Participant: **$5190**

This includes access to 15 accredited courses; opportunity to study up to 3 courses in the Live Virtual Classroom; remote exams for the Galileo Master Certificates; video lessons based on the live classroom training; course materials; 1-year complimentary REI Professional Membership and is inclusive of tax.

For more information visit our website, here.

"I would like to underline the REI instructors' high level of preparation, alongside their good spirit of collaboration, dedication, flexibility and professionalism."

- Lorenza Vecchio, North Atlantic Treaty Organization (NATO-OTAN)

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

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)

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

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

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

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

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

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

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

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

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

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

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

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

CASE STUDY

The course provided me with information that I'll be able to apply to the decisions I make with regard to the procurement of renewable energy."

Nancy Jones

BNY Mellon | Sustainability Research Analyst

1. What is your current expertise and how does this relate to the renewable energy field?

I work as the Sustainability Research Analyst at BNY Mellon, a global investment company, where I manage the sustainable operations of the firm with the goal of reducing the company's impact on the environment in terms of its real estate, supply chain, and services provided to employees. This directly relates to renewable energy as the sustainable management of our energy portfolio is critical to our success in this space. As a carbon neutral company, BNY Mellon procures renewable energy credits and carbon offset projects for its energy portfolio.

2. Why did you choose to train with the Renewable Energy Institute at The George Washington University in order to take the exam for the internationally recognised Galileo Master Certificate?

I chose this course in order to augment my understanding of the dynamic and fluctuating energy markets. I wanted to gain a more thorough understanding of the factors that impact energy prices so that I can make more informed decisions. Furthermore, I signed up for this course with the intent to meet and network with other professionals in the field.

To read more from Nancy, visit: https://www.renewableinstitute.org/eec-alumnus-spotlight-bny-mellon-nancy-jones/

CASE STUDY

The knowledge I have gained from this course will help identify opportunities for my company to engage our clients on new points in project life cycles."

Marc David

The MET Office | Energy Account Manager

1. What is your current expertise at the MET Office and how does this relate to the renewable energy field?

My work currently involves managing a cross Energy portfolio of accounts who utilise **Met Office's commercial products** and data sets. This typically will includes companies focused on larger generation type construction projects or O&M activities in the UK and Internationally. Specifically for Renewables, **the Met Office** looks to maximise the use of our world leading weather forecasting and climate science to better manage resource, mitigate health and safety risk and maximise economic recovery.

2. Why did you choose to train with the Renewable Energy Institute in order to take the exam for the internationally recognised Galileo Master Certificate?

Having the course delivered by industry professionals with a record of accomplishment in the renewable and low-carbon industries was something that was particularly important for me. Allowing the opportunity to question the course contents and get anecdotal evidence from those working directly in the industry was beneficial.

Read the full article from Marc here: https://www.renewableinstitute.org/eec-alumnus-spotlight-the-met-office-marc-david/

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