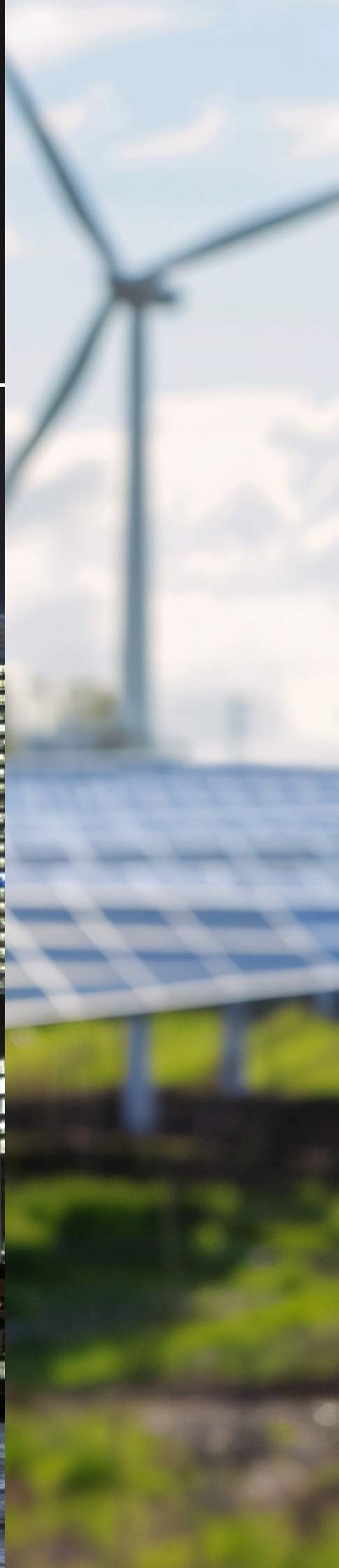




*Empowering the next generation of energy leaders*

# Executive Programmes

**Future Energy Leaders Executive Programme -  
*Renewables and Transition Metals Track***



# Message from the President

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## Dear Future Energy Leaders

Welcome to the London College of Energy Economics (LCEE), a pioneering learning affiliate of the Energy Institute founded in 2024, to address one of the most pressing challenges of our time: the transition to a sustainable energy future. Our mission is clear – to empower engineers in the energy industry to lead this transformation while equipping them with the economic tools to tackle the complexities of emerging technologies. As the world shifts toward a carbon-constrained economy, LCEE stands at the forefront, bridging technical expertise with economic insight to drive meaningful change. The term “Energy Economics” was coined following the oil crisis in 1973, and since then, it has been influencing global politics. For the past decades, the oil and gas sector has remained a cornerstone of global energy systems, but its future hinges on adaptation.

Engineers are uniquely positioned to innovate, whether through integrating renewables, scaling carbon capture and storage (CCS), or advancing hydrogen technologies. However, these innovations bring economic challenges – volatile markets, high capital costs, and evolving regulations. LCEE was established to support engineers in navigating these hurdles. Our cutting-edge programs blend energy economics, financial analysis, and policy evaluation, enabling professionals to assess the viability of new technologies and design

strategies that align profitability with sustainability.

Through practical training, real-life business case studies, and cost-benefit analyses, we ensure our graduates are not just technical experts but also strategic decision-makers shaping a resilient energy landscape.

Beyond education, the college is a hub for applied, policy-oriented research that empowers decision-makers to seize opportunities in a carbon-constrained world. Our world-class lecturers and industry partners produce actionable insights on critical issues, from the economics of decarbonising oil fields to the role of green subsidies in energy markets. Our research aims to inform policymakers, corporate leaders, and investors, helping them navigate regulatory shifts and capitalise on sustainable investments.

At LCEE, we believe the energy transition is not just a challenge but an opportunity to redefine the industry’s future. We invite engineers, researchers, and visionaries to join us in this mission. Together, we can build an energy ecosystem that is innovative, equitable, and sustainable. Explore our programs and research initiatives, and let’s shape the future of energy together.

Sincerely,

Dr. Yousef Alshammari, FEI CSci  
President, London College of Energy Economics



# Program Overview

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**The Future Energy Leaders Executive Programme (FELEP)** is an intensive ten-day executive development initiative designed for highly talented young professionals in energy, economics, sustainability, or related fields. Offered by the London College of Energy Economics (LCEE), a Learning Affiliate of the Energy Institute (EI), the course will engage participants in immersive modules on energy transition economics, policy innovation, sustainable finance, and leadership in decarbonization. Through four special tracks, the FELEP curriculum includes advanced lectures, executive workshops, case studies on real-world energy challenges, networking with C-suite leaders, and a capstone project addressing a pressing energy issue, including energy markets, net-zero strategies, AI, and renewable supply chains.

**The Renewables and Transition Metals Track** specifically examines the economics and geopolitics of scaling solar, wind, hydro,

geothermal, and emerging renewable technologies; the demand surge for transition metals driven by electrification, energy storage, and green hydrogen; supply chain vulnerabilities, ethical sourcing, recycling innovations, and geopolitical risks affecting critical mineral markets; sustainable finance mechanisms for renewable projects; and strategies to balance affordability, security, and sustainability in the energy trilemma.

Through a blend of expert-led lectures, interactive group case coursework, dynamic presentations, and rigorous exams, participants will gain actionable insights to lead in the accelerating renewables landscape and advise on policies that support equitable and resilient clean energy transitions. The programme will provide trainees with **68 CPD** credits through lectures, workshops, and exams on special topics in energy economics, aiming to prepare the next generation of energy leaders.

## Programme Leaders



### **John MacArthur, FEng FEI**

Former Vice President of Carbon Policy at Shell International, and a Visiting Professor at Imperial College London

Mr. MacArthur is a distinguished British engineer and energy executive renowned for his pivotal role in advancing sustainable practices within the global oil and gas industry. He undertook multiple roles within the oil and gas technology innovation, including VP of Integrated Gas Technology, where he spearheaded advancements in gas separation, gas-to-liquids processes, liquefied natural gas (LNG), and CO<sub>2</sub> abatement technologies. As Vice President of Shell's Carbon Policy, he pioneered the concept of the Circular Carbon Economy, and he oversaw Shell's climate ambition, including net-zero emissions targets by 2050. He chaired the Oil and Gas Climate Initiative (OGCI) Climate Investments, a \$1 billion+ fund deploying capital in methane reduction, carbon capture, and hydrogen technologies. MacArthur has addressed forums like TEDGlobal and Imperial College events, advocating for hydrocarbons' integration into a low-carbon future. He was elected a Fellow of the Royal Academy of Engineering in 2018, for his contributions to bridging fossil fuels with renewable innovation.



### **Dr. Yousef Alshammari, CSci FEI**

President of the London College of Energy Economics and Honorary Senior Lecturer at Imperial College London

Dr. Alshammari is a distinguished energy expert and one of the world's top global energy analysts. He is the winner of the OPEC Best Young Energy Professional Award, 2023, in recognition of his commitment to objective research and balanced analysis of the global energy sector while improving understanding of energy market stability. He is a TV speaker on multiple channels, including Bloomberg, Euronews, Reuters, and AlArabiya Business. As a member of the Group of Experts on Sustainable Energy at the United Nations, in Geneva, he has been advising countries on better strategies for decarbonisation of fossil fuels while maintaining energy security and affordability. He was elected a fellow of the Energy Institute in 2022, and he was awarded a Chartered Scientist membership by the Science Council in the UK in 2024. He spoke at multiple prestigious international energy events, including the International Energy Week and the MIT Energy Conference.

**Speakers will be announced soon!**

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# Who should attend?

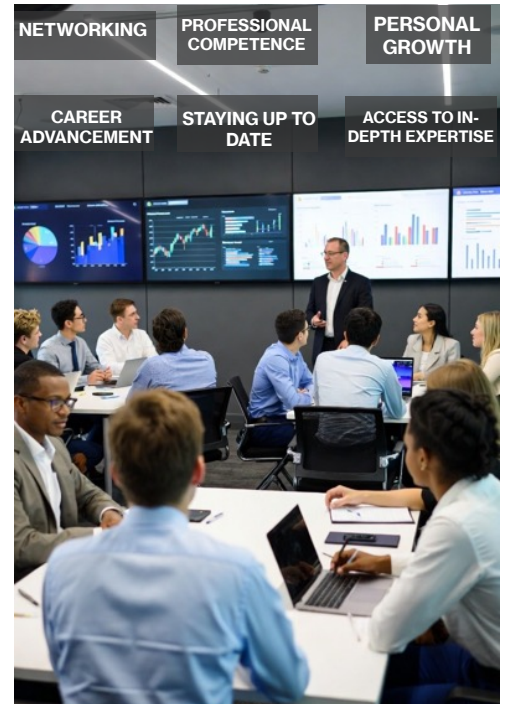
This program is designed mainly for **engineers, scientists, policy analysts, strategists, sustainability specialists, and economists** seeking to build advanced expertise in renewable energy technologies, critical minerals markets, and the materials-driven aspects of the global energy transition, while sharpening business analysis and strategic skills through real-world group case studies.

By the end of the programme, participants will be prepared to navigate scenarios involving supply-demand imbalances in critical materials, policy incentives for renewables, energy trilemma trade-offs (security, affordability, sustainability), and equitable transitions in electrification and decarbonization, while earning accredited **68** CPD credits linking course insights to career progression.

## Programme Benefits

The programme learning outcomes ensure the programme contributes meaningfully to your CPD, emphasising skills to support your professional progression towards full professional membership (MEI) as well as professional registration (e.g., Chartered Energy Manager).

The programme is designed to meet the Energy Institute's output-based CPD framework and is aligned with UK CPD standards. This ensures supporting membership progression with leading institutions and enhancing their professional credentials for leadership roles in the energy sector. The programme benefits from a diverse international cohort, which will include participants from a range of countries, job functions and industries, while hosting international experts and energy leaders necessary to enhance young professional experience.



## Programme Learning Outcomes

Aligned with the Energy Institute output-based CPD framework for clear, measurable objectives linking course insights to career progression, participants will be able to:

1. Evaluate the core components of renewable energy systems – including solar PV, wind, energy storage, green hydrogen, geothermal, and emerging technologies – and their integration into global energy markets.
2. Apply principles of energy economics, including supply-demand dynamics, LCOE, pricing mechanisms, and market structures, to analyse trends, investment opportunities, and economic viability in renewables deployment and transition metals markets.
3. Assess the surging demand for transition metals and critical minerals, while analysing supply chain structures, processing concentration, and projected shortages or surpluses.
4. Analyse the geopolitics, trade flows, pricing models, and vulnerabilities of global transition metals and critical minerals markets, including concentration risks, export controls, and supply security.
5. Examine the interplay of energy security, affordability, and sustainability within the global energy trilemma, developing risk mitigation strategies for renewables scaling and mineral sourcing approaches (recycling, substitution, efficiency).
6. Tackle real-world challenges in the renewables and transition metals ecosystem through collaborative team projects.

# Programme Details

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## Day 1: Intermittent Renewables

**Morning:** On day one, participants will go through a comprehensive solar overview, starting with photovoltaic (PV) advancements, global deployment trends, performance metrics, land-use/environmental considerations, and efficiency in diverse conditions. Participants will also explore Concentrated Solar Power (CSP), global growth trends, and comparative advantages over PV. This includes discussions on hybridisation (CSP+PV) for complementary roles in net-zero systems.

**Afternoon:** Participants will go through the fundamentals and latest developments in onshore/offshore wind turbines, including configuration, capacity factors, and wake effects, and international markets. Discussions on intermittency drivers and the role in meeting >90% of recent global electricity demand growth. Participants will go through real-world case studies on major solar/wind farms and CSP plants.

## Day 2: Baseload Renewables

**Morning:** Participants will go through the fundamentals of geothermal technologies, focusing on enhanced geothermal systems, and advanced drilling for reliable baseload power in new regions; hydro systems, including large-scale dams, pumped storage for grid flexibility, environmental/social impacts, and stability role amid data centre/AI-driven demand surges.

**Afternoon:** Participants will explore bioenergy pathways: sustainable biomass feedstocks, first- to advanced-generation biofuels (ethanol, renewable diesel, sustainable aviation fuel/SAF, biogas/biomethane), production processes, and contributions to hard-to-electrify sectors (transport, aviation, industry, heating). Group case studies will include biofuel blending mandates, hydro/geothermal project viability in specific geographies, and hybrid systems (e.g., hydro-pumped storage with wind/solar).

## Day 3: Electric Vehicles and Battery Technologies

**Morning:** Participants will examine EV types (BEVs, PHEVs), advantages over ICE vehicles, and global market position with sales share, boosted by subsidies like China's trade-in extensions and EU CO<sub>2</sub> targets. They will study battery characteristics, focusing on lithium-ion evolution, capacities, mileage, and charging times. Improvements in universal connectors, AI algorithms, eco-charge sustainability, and research challenges like cycle life will be covered alongside communications integration for smart EVs.

**Afternoon:** Participants will delve into EV development challenges, including infrastructure gaps and material sustainability, and compare fuel cells versus batteries. Hybrid systems bridging both will be analysed, emphasising batteries' dominance for passenger EVs and fuel cells' promise for trucks/buses in net-zero pathways.

## Day 4: Economics of Renewables and Transition Metals

**Morning:** Participants will study the principles of energy economics applied to renewables – supply-demand dynamics, cost curves, levelized cost of energy (LCOE), pricing mechanisms, and investment viability for solar, wind, and storage projects.

**Afternoon:** Participants will analyse demand surge for transition metals and critical minerals (lithium, cobalt, nickel, copper, graphite, rare earth elements). This includes analysing market structures, economic drivers from electrification and clean tech manufacturing, and projections for shortages/surpluses.

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## Day 5: Critical Minerals: Supply Chains, Sustainability and Geopolitics

**Morning:** Participants will be introduced to the structure and trade flows of transition metals markets – mining, refining, and processing concentration by key countries, pricing models, and global supply chain mapping. They will explore the global energy trilemma (security, affordability, sustainability) in the context of renewables scaling and mineral sourcing. Frameworks for policy evaluation (e.g., World Energy Council Index) and responsible mining standards.

**Afternoon:** Participants will analyse geopolitical risks and vulnerabilities – export controls, sanctions, international alliances, supply security disruptions, and case studies of real-world market shocks affecting critical minerals for renewables. Participants will discuss circular economy approaches – recycling innovations, material substitution, efficiency improvements, ethical sourcing strategies, and group exercises on developing risk mitigation plans for sustainable supply chains.

## Day 6: Sustainable Finance and Policy Innovation in Energy Transitions

**Morning:** Participants will study sustainable finance mechanisms – green bonds, project financing, blended finance, and investment models for renewable projects and critical mineral infrastructure. This includes analysing Policy incentives and regulatory shifts supporting clean energy scale-up.

**Afternoon:** Participants will analyse equitable transition models, innovation in balancing the energy trilemma, capstone-style leadership discussions, and collaborative work on real-world challenges – culminating in evidence-based presentations, stakeholder recommendations, and strategies for resilient clean energy futures.

## Day 7-8: Business Case Grand Challenge

Each group will be presented with a business case to analyse and propose a strategy. The college will provide support and mentoring for students to prepare their presentation on Day 9. Students will also have the opportunity to attend a keynote speech of an energy leader, which will support them in obtaining real-life exposure to develop business strategies and policy design.

## Day 9: Group Presentations, Best Strategy Prize, and Certificates

On Day 9, participants will need to complete a presentation highlighting their approach to solving an energy business challenge. Each group will be given a 30-minute presentation assessed by an expert panel. Presentations will be followed by announcing the best business strategy and awarding the programme certificates.



# Programme Highlights

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Lectures blended with real-life group case studies (60: 40)



Accredited CPD credits for professional growth



In-Person Capstone Modules



Career-long mentoring opportunities



Enriched classes through insight from experts and energy leaders



International professional recognition through Energy Institute membership



International peer interaction

## Duration

9 days

## Date

Please check our [website](#) for the latest available dates

## Location

Canary Wharf, London, UK

## Programme Fees

£3750 + VAT

## Scholarships

A limited number of tuition-fee scholarships exist on a merit basis

## Application

[Apply](#)

## Admission Criteria

- A good degree in engineering, economics or a related field
  - Prior industrial experience
  - Proficiency in English (TOEFL iBT score of 100 or IELTS of 6.5 or equivalent for non-native speakers)
  - Demonstrated leadership potential through roles involving team management and project leadership is highly desirable
  - One reference letter
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# About the College

The London College of Energy Economics (LCEE), is a training and research institution and a Learning Affiliate of the Energy Institute, UK, which bridges the gap between economic principles and rapid technological advancements in the energy sector. Its mission is to empower the energy industry – particularly oil and gas – to navigate the complexities of the global energy transition while preparing the next generation of energy leaders.

The college was officially announced at the International Energy Week 2025 in London, aiming to be a hub where energy leaders meet future energy leaders to address one of the most pressing challenges of our time: the transition to a sustainable energy future. We empower engineers in the oil and gas industry to lead this transformation while equipping them with the economic tools to tackle the complexities of emerging technologies. As the world shifts toward a carbon-constrained economy, LCEE stands at the forefront, bridging technical expertise with economic insight to drive meaningful change. LCEE supports the energy sector by delivering targeted insights and thought leadership on achieving net-zero goals, including the role of emerging technologies, the Middle East's transition progress, and the competition for critical minerals essential for renewables. Through cutting-edge research, moderated

discussions, podcasts, and student-led interviews, it fosters consumer-producer dialogue on balancing fossil fuels with clean energy, promoting inclusive strategies for decarbonisation and long-term industry resilience





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