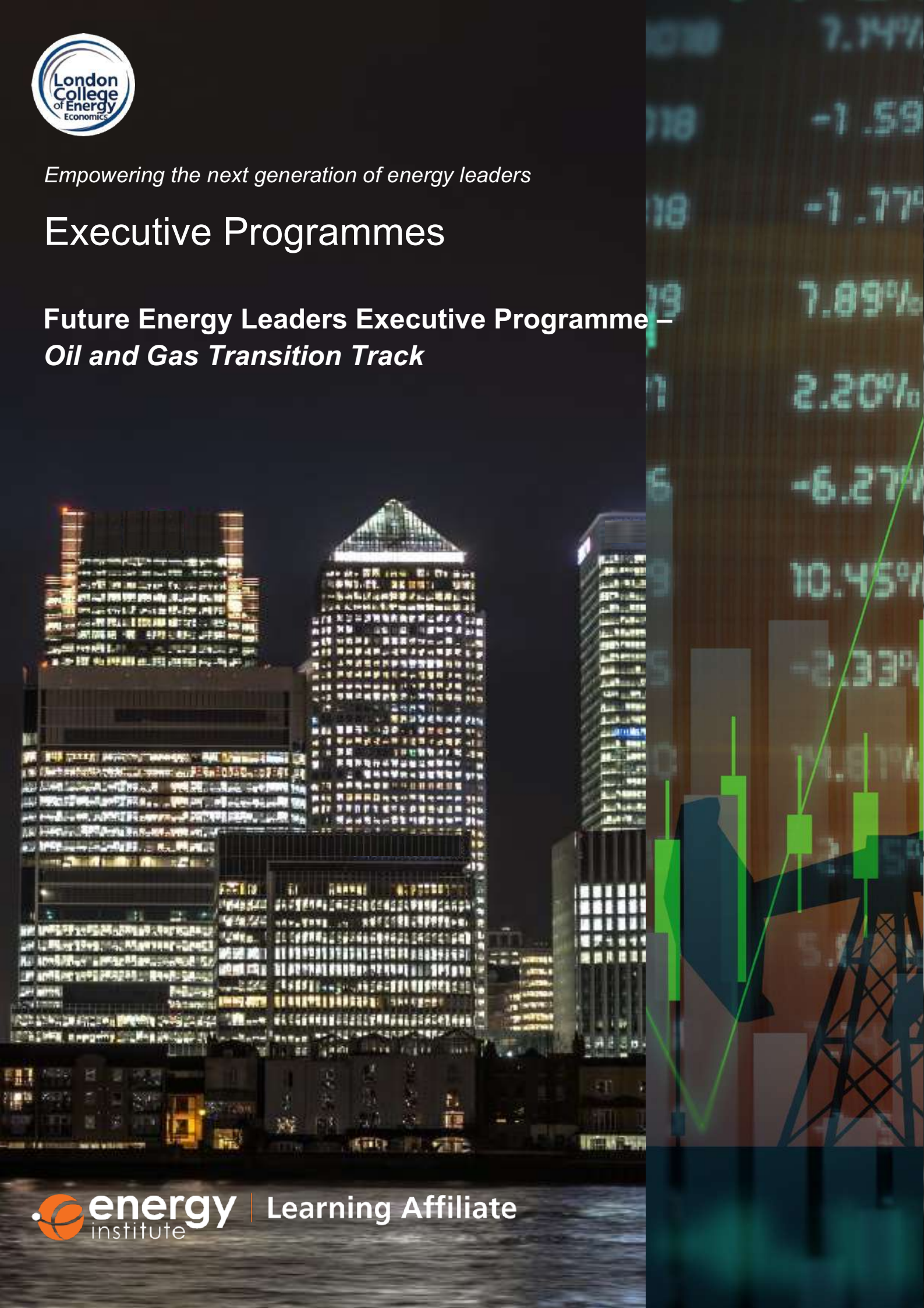
London College of Energy Economics

Empowering the next generation of energy leaders

Executive Programmes

Future Energy Leaders Executive Programme – *Oil and Gas Transition Track*



energy institute | Learning Affiliate

Message from the President

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.

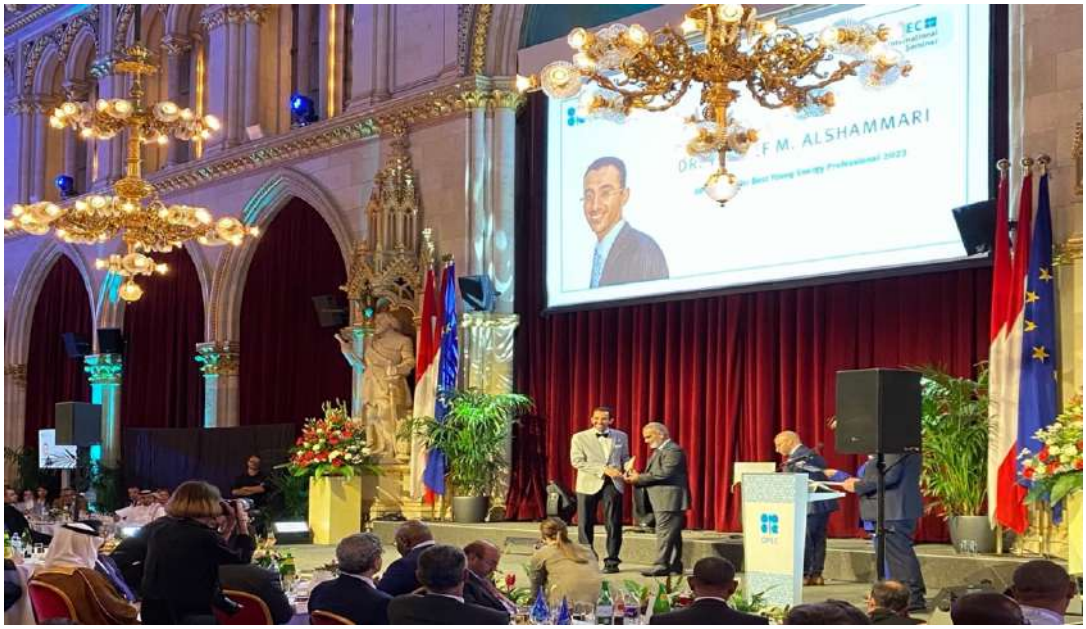
Through practical training, real-life business case studies, and cost-benefit analyses, we ensure our graduates are not just technical experts but also strategic decision-makers shaping a resilient energy landscape.

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

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 Oil and Gas Transition Track focuses specifically on the evolving role of oil and gas in a net-zero future. It equips young energy professionals with strategic tools to navigate decarbonization, regulatory changes, and technological disruptions while maximising value from legacy assets. Participants explore how oil and gas can pivot toward low-carbon solutions, such as carbon capture, hydrogen integration, and renewable synergies, ensuring resilience in volatile markets. This track aligns with LCEE's mission to advance energy economics and policy innovation, drawing on interdisciplinary insights from economics, engineering, and geopolitics.

Through a blend of expert-led lectures, interactive group case coursework, dynamic presentations, and rigorous exams, participants will gain actionable insights to lead in an evolving energy landscape and be able to advise on the role of oil and gas in the global transition towards sustainable energy systems. The programme will provide trainees with **76 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, FREng 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_2 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 include

Brian M. Peers
Global Head of Sustainable Transport & Fuels
HSBC

Dr. David Hart
Global Hydrogen Lead
ERM

Dr. Jorge León
SVP & Head of Geopolitical Analysis
Rystad Energy

Dr. Christopher Banks
Principal New Energy & Geoscience Consultant
SLB

Dr. Bas van den Heuvel
CEO at innoXL
Former Head of Mobility Ecosystems Innovation
Ford Motor Company

Dr. Cornelia Meyer
Former Special Advisor for Europe
IEF

Paul Hickin
Editor in Chief and Chief Economist
Petroleum Economist

Dr. Chin Kin Ong
Senior Energy Consultant
Worley Consulting

Pietro Mezzano
Director of the Oil and Gas Decarbonisation Charter
OGCI

Asma Muttawa
Energy Counsel
White & Case LLP

Speakers' affiliations include

HSBC

slb

OGCI
OIL AND GAS CLIMATE INITIATIVE

Imperial College London

RystadEnergy

ERM

Petroleum Economist

WHITE & CASE

Worley
energy | chemicals | resources

Who should attend?

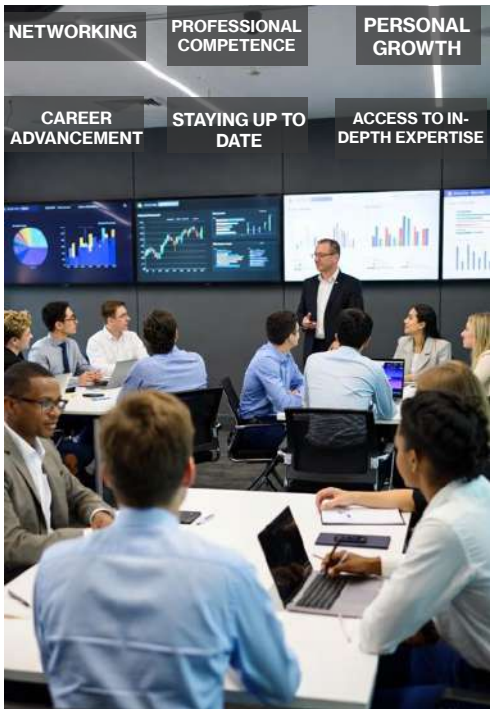
This program is designed mainly for **engineers, scientists and economists,** seeking to enhance their expertise in oil and gas supply chain, refining economics, circular carbon economy, and hydrogen technologies and economics, while gaining business analysis skills through real-life group case studies.

By the end, participants will be prepared to advise on the role of oil and gas in the global transition towards sustainable energy systems, while earning accredited 76 CPD points 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 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 key components of the oil and gas value chain – upstream exploration, midstream transportation, and downstream refining and distribution – to understand their roles in shaping global energy markets.
2. Evaluate the hydrogen supply chain, including IEA's Net Zero demand forecasts and production routes, applying the Hydrogen Ladder to prioritise applications.
3. Assess CO_2 storage in saline formations and enhanced oil recovery, identifying risks like seismicity and leakage through major projects' pricing models to understand their dynamics.
4. Analyse cost structures, storage site potential, and opportunities in DAC and BECCS, developing strategies for cost-saving hubs to support net-zero goals.
5. Analyse the fuel cell market, focusing on PEMFC/SOFC technologies, global policies, and infrastructure, using Japan and China's FCEV growth as case studies.
6. Compare EV types (BEVs, PHEVs) and battery characteristics, analysing lithium-ion advancements, charging innovations, and sustainability challenges in global markets while evaluating fuel cells versus batteries, focusing on efficiency, cost, and infrastructure.
7. Tackling real-world energy challenges in teams, applying critical thinking to propose solutions, delivering evidence-based presentations, synthesising data for actionable stakeholder recommendations, and fostering leadership skills.

Programme Details

Day 1: Introduction to Crude Oil Value Chain

Morning: Participants will explore the crude oil value chain, covering both upstream and downstream sectors. The upstream segment introduces the fundamentals of crude oil and gas production, processing, and shipping, alongside key concepts like international pricing benchmarks, API classification, OPEC crudes, and the price basket. It also examines global oil resources, production costs, and carbon intensity.

Afternoon: Exploring the downstream segment, providing an overview of refinery products, refining processes, and major global refineries, including the Nielson Index (NCI) for sizing refineries. Participants will delve into crude oil feedstock selection, refinery configurations, major petrochemical processes, and alternative energy systems, concluding with practical case study exercises to reinforce learning.

Day 2: Liquid to Chemicals and the Future of Refining

Morning: Special topics in downstream processing of hydrocarbons, including Liquid to Chemicals technologies, the Future of Refining, Biofuels blending and Sustainable Aviation Fuels (SAF).

Afternoon: Participants will analyse business case studies on future trends of the refining industry, including Lube Oils, integration of refineries and petrochemical plants, and plastic recycling and circular economy.

Day 3: Hydrogen Value Chain

Morning: Participants will study the hydrogen supply chain, markets, supply and demand, and the Hydrogen Ladder, focusing on the IEA's Net Zero Scenario. They will explore hydrogen technologies and the economics of the production routes – grey, blue, green, and the downhole gasification concept.

Afternoon: Participants will continue to explore and analyse hydrogen conversion pathways to methanol, ammonia, and e-fuels will be analysed, considering Qatar's Ras Laffan GTL as a case study. Hydrogen storage in caverns and the Circular Carbon Economy concept, recycling will be discussed.

Day 4: CCUS: Technologies and Value Chain

Morning: Participants will be introduced to the Carbon Capture, Utilisation, and Storage (CCUS), learning capture methods – post-combustion (amine scrubbing), pre-combustion (IGCC), and oxy-fuel – and technologies including absorption, adsorption, membranes, chemical looping, and direct air capture.

Afternoon: Participants will analyse the CCUS value chain: capture, transport, and storage in geological formations, as well as the concept of Circular Carbon Economy. The course covers case studies from the UK, including the North Sea's storage potential, strategic retrofit versus new plant choices, and CCUS's role in achieving net-zero emissions.

Day 5: CO_2 Storage: Risks, and Net-Zero Integration

Morning: On day five, participants will explore CCUS storage in saline formations and CO_2 injection for enhanced oil recovery, assessing risks including seismicity and leakage. They will review major projects: Boundary Dam, Petra Nova, and Jilin. Cost structures – capture, transport, storage and retrofit challenges will be analysed.

Afternoon: Participants will continue to study and analyse major potential sites for CO_2 storage, cost-saving hubs, and opportunities in DAC and BECCS for net-zero integration.

Day 6: Fuel Cells for Transportation

Morning: Participants will study the fuel cell market in the automobile industry, driven by the Asia-Pacific leaders, Japan and China. They will explore timelines, state-of-the-art PEMFC and SOFC technologies, global policies, and infrastructure worldwide.

Afternoon: China's subsidies per vehicle and hybrid systems will be analysed, alongside examples like Toyota, Honda Clarity, GM prototypes, and public transport applications. Commercialisation challenges and promising outlooks for FCEVs will be discussed through practical case studies.

Day 7: 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_2 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 8-9: Business Case Grand Challenge

Each student 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 10. 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 10: Group Presentations, Best Strategy Prize, and Certificates

On Day 10, students 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

- Lectures blended with real-life group case studies (60: 40)
- In-Person Capstone Modules
- Enriched classes through insight from experts and energy leaders
- International peer interaction
- Accredited CPD credits for professional growth
- Career-long mentoring opportunities
- International professional recognition through Energy Institute membership

Duration	10 days	**Date**	Please check our website for the latest available dates
Location	Canary Wharf, London, UK	**Programme Fees**	£4000 + VAT
Scholarships	A limited number of tuition-fee scholarships exist on a merit basis	**Application**	**Apply**

Admission Criteria

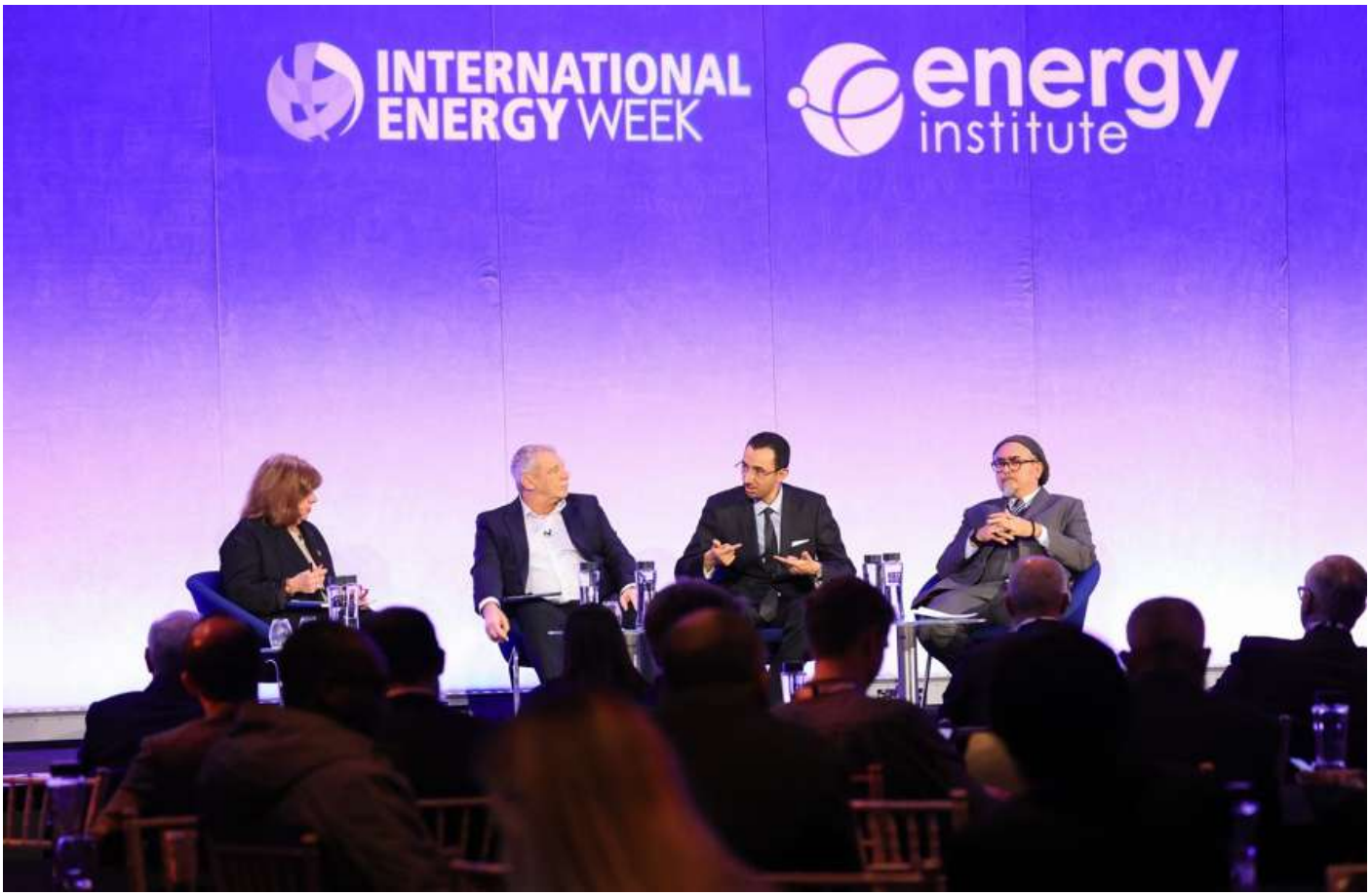
- A good degree in engineering, economics or a related field
- Prior industrial experience
- Proficiency in English (TOEFL iBT score of 100 or IELTS of 6.5 or equivalent for non-native speakers)
- Demonstrated leadership potential through roles involving team management and project leadership is highly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

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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