Clean Fuel Technology and Standards

Specifications, Emissions, Quality Monitoring, and the Future of Low-Carbon Fuels in Europe and the Americas

Focus on: The Manager ☐ The Specialist ☐ Spotlight Programme ☑ Hands-on Skills ☑

This course offers a comprehensive and up-to-date review of clean fuel technologies, emissions standards, and future fuel pathways with a strong focus on Europe and the Americas. Participants will gain deep insights into fuel properties, refining processes, environmental standards, and renewable fuel integration. Special focus is given to:

- Euro 6/7, Fit-for-55, and RED II/III in Europe.
- EPA Tier 3, RFS, LCFS, and CARB regulations in the U.S.
- Biofuels leadership in Brazil (RenovaBio) and Latin America.
- SAF mandates for aviation and IMO sulfur reduction for marine fuels.

By blending technical knowledge, regulatory updates, and case studies, this course prepares participants for the challenges of clean fuel supply, compliance, and innovation in transatlantic markets.

Course Objectives		This Course is Ideal For:	
1	Understand the chemistry and specifications of clean fuels (gasoline, diesel, jet, marine).	✓	Refinery technologists & process engineers
2	Apply Euro 6/7 and EPA Tier 3 standards to refining and blending strategies.	✓	Fuel quality managers & laboratory specialists
3	Evaluate pathways for producing ultra-low sulfur fuels and their impact on refinery margins.	✓	HSE & compliance officers (EPA, EU ETS, IMO)
4	Examine biofuels, renewable diesel, and SAF as key compliance tools.	✓	Government regulators & policy advisors
5	Compare market mechanisms: EU ETS, U.S. RFS, LCFS, Brazil's RenovaBio.	✓	Corporate planning & sustainability professionals
6	Develop skills for fuel quality monitoring and emissions control.	✓	Logistics & trading professionals in downstream markets
7	Explore future fuels: hydrogen, LNG/CNG, synthetic fuels, and e-fuels.		

Course Content

Day	Theme	Coverage
1	Fundamentals of Clean Fuels & Regulations	• Clean fuel definitions and drivers (climate, air quality, regulation) • Gasoline, diesel, jet, and marine fuel specifications • EU regulations: Euro 6/7, Fit-for-55, RED II/III mandates • U.S. regulations: EPA Tier 3, CARB, LCFS, RFS

		• Latin America: Brazil's RenovaBio, Mexico's clean fuels policy • Case Study: Euro 6/7 vs EPA Tier 3 compliance challenges
2	Gasoline Standards & Blending	• Refining processes: reforming, isomerization, alkylation • Gasoline parameters: octane, aromatics, volatility, benzene, sulfur • U.S. ethanol blending (E10, E15, E85) vs EU ethanol mandates • Renewable gasoline pathways (biomass-to-liquids, synthetic e-fuels) • Exercise: Design a RON 95 gasoline blend compliant with Euro 6 and EPA Tier 3
3	Diesel & Renewable Diesel	• Diesel fuel properties: cetane, lubricity, cold flow, sulfur • ULSD (10–15 ppm sulfur) technologies • Biodiesel (FAME) vs renewable diesel (HVO) – pros & cons • U.S. LCFS credits and EU RED II compliance through renewable diesel • Case Study: California LCFS vs EU Fit-for-55 – renewable diesel economics
4	Jet Fuel, Marine Fuels & SAF	• Jet A-1 vs SAF: key properties (freezing point, flash point, stability) • SAF pathways: HEFA, FT-SPK, ATJ, PtL (Power-to-Liquids) • IATA/ICAO goals and EU/U.S. SAF blending mandates • Marine fuels: IMO 2020 sulfur cap, VLSFO, LNG bunkering • Case Study: SAF deployment – EU mandate vs U.S. SAF Grand Challenge
5	Future Fuels & Monitoring Systems	• Hydrogen blending in refining and mobility • Synthetic fuels (PtL/e-fuels) and carbon capture integration • LNG/CNG adoption in heavy transport & shipping • Digitalization: IoT, blockchain, and real-time compliance monitoring • Roadmap: The future of clean fuels in EU & Americas (to 2035/2050)

Course Assessment	Certification
Participants will be assessed on:	Upon successful completion of the course, participants will receive a **Certificate of Successful Completion**, along with a **Transcript of Marks**
Participation in sessions	
Completion of exercises & case studies	

Performance in assessments	showing the performance by grade in each element of assessment and overall.

Course Instructor
With BSc and PhD degrees from the UK, and with over 30 years of refinery technology, operations, and management expertise for several famous-name oil companies, this speaker is now an internationally-famous chemical engineering consultant. As a Chartered Chemist, a Member of the Royal Society of Chemistry and a Member of the American Institute of Chemical Engineers, he holds honorary appointments at a number of European universities and conducts cutting-edge research into vacuum distillation, gas recovery, absorption and pyrolysis.