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COURSE BROCHURE

Advanced Hydrogen Industry Value Chain and Project Economics Training Course

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Registered in the United Kingdom and Saudi Arabia

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Hydrogen Industry Value Chain and Project Economics is a 2-week training course for energy engineers, project developers and commercial managers who are building or evaluating hydrogen production, ammonia export and industrial decarbonisation projects, and who leave with a Hydrogen Project Concept Assessment tracing one scheme from production to offtake. Large announced pipelines now meet the hard tests of cost, safety and buyer demand. Jupiter Prime Training delivers this course on the hydrogen industry value chain and project economics.

Why Hydrogen Industry Value Chain and Project Economics Matters Now

Three forces shape the hydrogen industry value chain and project economics today. Refiners, fertiliser producers and steelmakers face pressure to cut process emissions, and low-carbon hydrogen is one of few options for those heat and feedstock needs. Many announced electrolysis and reforming projects stall before final investment decision because offtake contracts, transport routes or electricity costs do not close. Buyers in importing markets demand traceable carbon intensity for every tonne of hydrogen or ammonia. A developer that tests each link of the chain early wins credible partners and financing; one that does not spends years on concepts that never reach construction. The course rests on established electrochemistry, gas processing, carbon capture and project appraisal methods.

Who Gains Most from Hydrogen Industry Value Chain and Project Economics

- Energy engineers responsible for electrolyser, reformer and carbon capture concept design
- Project developers who assemble sites, power supply, water and partners for hydrogen schemes
- Commercial managers who negotiate offtake, shipping and ammonia sales terms
- Process safety specialists who assess hydrogen and ammonia hazards at plants and terminals
- Strategy analysts in utilities, refineries and chemical groups who screen hydrogen opportunities

A new energy or decarbonisation business unit within an oil, gas, utility or chemicals group gains most when its engineers and commercial staff attend together.

Hydrogen Industry Value Chain and Project Economics Capabilities

Participants follow one molecule from power or gas input to the buyer's gate and price every step along the way.

- Compare alkaline, PEM and solid oxide electrolysis for duty, efficiency and flexibility — technology selection decisions
- Assess reforming with carbon capture against electrolytic routes on cost and carbon intensity — investment committees
- Specify storage and transport options including compression, liquefaction, pipelines and ammonia carriers — logistics planning
- Calculate levelised cost of hydrogen with electricity, capital and utilisation drivers — bid and pricing teams
- Apply hazard identification to hydrogen and ammonia facilities — safety and permitting reviewers
- Build offtake and risk allocation structures for a project concept — lenders and strategic partners

Key Hydrogen Industry Value Chain and Project Economics Terms

- Electrolyser — equipment that splits water into hydrogen and oxygen using electricity, sized in megawatts of power input.
- Steam methane reforming — a process reacting natural gas with steam to produce hydrogen and carbon dioxide.
- Carbon intensity — the greenhouse gas emitted per kilogram of hydrogen produced, used to classify and certify supply.
- Levelised cost of hydrogen — the constant price per kilogram that recovers all lifetime costs and the required return.
- Hydrogen carrier — a compound such as ammonia or a liquid organic carrier used to move hydrogen over long distances.
- Offtake agreement — a long-term contract in which a buyer commits to purchase hydrogen or derivatives on agreed terms.

Hydrogen Industry Value Chain and Project Economics Day by Day

Day 1: Hydrogen Markets and Demand

- Current Hydrogen Uses — Refining, Ammonia and Methanol Demand
- Emerging End Uses — Steel, Shipping Fuels and Power Generation
- Colour Labels and Carbon Intensity Classes — Buyer Requirements
- Exporting and Importing Market Roles — Trade Route Logic
- Project Pipeline Attrition — Why Announced Schemes Stall

Day 2: Electrolysis Technologies

- Alkaline Electrolysers — Maturity, Cost and Turndown Limits
- PEM Electrolysers — Dynamic Response and Material Constraints
- Solid Oxide Electrolysers — High-Temperature Efficiency and Heat Integration
- Stack Degradation and Replacement — Lifetime Cost Effects
- Water Treatment and Desalination Needs — Site Resource Planning

Day 3: Power Supply for Electrolysis

- Dedicated Solar and Wind Supply — Capacity Factor and Oversizing
- Grid Connection and Power Purchase Contracts — Additionality and Matching Rules
- Battery and Hydrogen Buffer Storage — Smoothing Variable Input
- Electrical Balance of Plant — Rectifiers, Transformers and Harmonics
- Utilisation Versus Cost Trade-Off — Electrolyser Sizing Decision

Day 4: Reforming and Carbon Capture

- Steam Methane and Autothermal Reforming — Process Routes Compared
- Carbon Capture Rates and Technologies — Pre and Post-Combustion Options
- CO2 Transport and Storage Chain — Pipelines, Ships and Reservoirs
- Upstream Methane Emissions — Effect on Carbon Intensity
- Retrofitting Existing Hydrogen Plants — Brownfield Decarbonisation Case

Day 5: Storage and Transport

- Compressed Gas Storage — Tubes, Vessels and Salt Caverns
- Liquefied Hydrogen — Energy Penalty and Boil-Off Management
- Pipeline Repurposing and New Build — Material Embrittlement Concerns
- Trucking and Tube Trailer Logistics — Small-Scale Distribution
- Transport Cost Comparison by Distance — Route Selection Method

Day 6: Ammonia and Other Derivatives

- Haber-Bosch Synthesis Integration — Flexible Operation with Variable Supply
- Ammonia as Carrier and Fuel — Cracking Back to Hydrogen
- Methanol and Synthetic Fuels — Carbon Source Requirements
- Export Terminal Design — Storage Tanks, Jetties and Loading
- Derivative Market Pricing — Linking Product to Feedstock Value

Day 7: Safety and Risk Engineering

- Hydrogen Properties and Hazards — Flammability, Leakage and Embrittlement
- Hazard Identification Studies — HAZID and HAZOP for Hydrogen Units
- Ammonia Toxicity and Release Scenarios — Emergency Planning Zones
- Separation Distances and Layout — Siting Plants and Terminals
- Detection, Ventilation and Ignition Control — Protective Measures Design

Day 8: Project Economics

- Levelised Cost of Hydrogen Model — Capital, Power and Operating Drivers
- Sensitivity to Electricity Price and Utilisation — Cost Curve Analysis
- Carbon Price and Incentive Effects — Competitiveness Against Grey Supply
- Delivered Cost Build-Up — Production, Conversion and Shipping Stack
- Scale and Learning Effects — Future Cost Trajectory Scenarios

Day 9: Commercial Structuring and Offtake

- Offtake Agreement Terms — Volume, Price and Carbon Specification
- Contract for Difference and Subsidy Mechanisms — Bridging Cost Gaps
- Certification and Guarantees of Origin — Traceability for Buyers
- Project Finance Bankability Tests — Risk Allocation Across Partners
- Partnership and Joint Venture Models — Equity, Technology and Offtake Roles

Day 10: Practising the Hydrogen Project Concept Assessment

- Applying Production Route Selection — Electrolytic or Reformed Supply for the Case
- Applying Storage and Transport Choice — Delivery Chain to the Buyer
- Applying Safety Screening — Key Hazards and Layout Constraints
- Applying Cost and Offtake Tests — Delivered Cost Against Buyer Price
- Hydrogen Project Concept Assessment — Production-to-Offtake Case for Peer Review

Applying Hydrogen Industry Value Chain and Project Economics After the Course

- Build a delivered cost stack for one hydrogen or ammonia opportunity your organisation is screening and identify the largest cost driver.
- Run a hazard identification session on one proposed hydrogen unit layout and record separation distance and detection gaps.

Hydrogen Industry Value Chain and Project Economics Questions FAQ

What is the hydrogen industry value chain and project economics, and why does it matter now?

The hydrogen industry value chain and project economics covers how hydrogen is produced, stored, moved, converted and sold, and what each step costs. It matters now because many announced projects stall when costs, safety or offtake fail to close.

Which roles gain most from hydrogen industry value chain and project economics training?

Energy engineers, project developers, commercial managers, safety specialists and strategy analysts gain most. You benefit if you design electrolysis or reforming units, negotiate offtake, plan ammonia logistics or screen hydrogen investments.

How does hydrogen industry value chain and project economics differ from a renewable energy grid course?

A renewable grid course focuses on connecting solar and wind to electricity networks. This course follows power and gas beyond the grid into electrolysis, reforming, carbon capture, storage, ammonia conversion, shipping, safety and offtake contracts for hydrogen products.

What do you bring back from hydrogen industry value chain and project economics training?

You bring back a structured assessment of one hydrogen project concept, covering production route, logistics, safety, delivered cost and offtake terms. It gives your business unit a repeatable screen for the next opportunity.

Hydrogen Industry Value Chain and Project Economics: The Way Forward

The Hydrogen Project Concept Assessment first informs whether a scheme proceeds to feasibility study or is reshaped around a different route or buyer. Developers and commercial managers use it to brief partners and lenders. After its first use, revisit electricity price, electrolyser cost and certification assumptions, since policy support and technology learning move quickly across hydrogen markets.