
S&P Global

Commodity Insights



Industry Fundamentals Training

Course Catalogue 2025

S&P Global Training

Over 20 years of experience delivering Learning & Development Solutions to the Industry

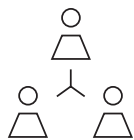
Backed by S&P Global's world-class data and insights, our training courses are developed by international experts, whose extensive knowledge and experience enable them to deliver optimal results regardless of scale, location or learning & development needs.

With a proven track record, S&P Global Learning offers tailored and cost-effective training solutions.



Expertise

Specialist knowledge of current training and development industry insights, understanding client needs and delivering the relevant professional skill sets.



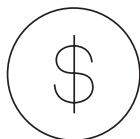
Consistency

Delivered through our robust and scalable, Training & Development professional resourcing process, ensuring you receive the same high-quality standard.



Reach

Global availability ensuring you have one point of contact to provide high caliber instructors for your worldwide training & development requirement.



Value

Cost-effective solutions using our contingent resourcing model or our specialist offshore capabilities with full vetting, validation and quality control standards applied to both.

20 Years of Satisfied Learners

“The course covered all aspects related to the Energy Transition, provided an understanding of the linkages between politics, markets and technologies.”

– **Executive Vice President, Manufacturing, Asian Oil Major | Energy Transition Fundamentals**

“Good, high-level summary of industry developments. The course instructors were very knowledgeable, and well prepared.”

Head of Basic Materials at European Banking Institution | Advances in Chemicals Sustainability

“The way the course tied various topics together was excellent. From refinery and petrochemical technology, and refinery optimization to GHG reduction initiatives, transportation industry response by sector, and OTC.”

– **President, Major Chemical Producer | Refineries of the Future**

“Very informative, broken down into easy-to-understand concepts; weaving stories into dense material is excellent. In retrospect, I would have enjoyed the three-day course.”

– **Director, Corporate Development, Major Chemical Producer | Understanding the Global Petrochemical Industry**

“The commercial strategies sessions were excellent”

Global Advisor from an energy major | Oil Markets, Price Forecasting and Commercial Strategies

“Good overview of biofuel markets. The course gave me more understanding of economic drivers for producers, especially credits and the volume targets that drive incentives.”

– **Director of Manufacturing | Bio-Feedstocks**

Our clients include most major energy and chemical companies



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Biographies of Selected S&P Global Energy & Chemical Experts

Oil Market Fundamentals, Price Forecasting & Commercial Strategies

Lead Instructor: Jim Burkhard, VP, Head of Research, Oil Markets, Energy & Mobility

Oil market experts teach this course, delivering a concise overview of the oil market, supply and demand, and energy transition to understand how the future may unfold. Further, the Commercial Strategies section delivers a comprehensive view of risk management concepts and introduces various commercial tools to mitigate market risks.

Course Outline

1. Oil Market Fundamentals

- Global energy supply & demand fundamentals
- Structure of the world oil industry
- Part 1: Market history; oil demand and supply; forces shaping future of world oil demand; history of oil supply regulation; US Shale; Emergence of OPEC+
- Part 2: Price history; factors shaping the oil price today; role of futures markets; price benchmarks
- Oil and the energy transition: How to think about the future

2. Market Outlook

- How to develop an oil price outlook, short and long term
- Value of scenario framework for forecasting
- Oil market outlook to 2024 and through 2050

3. Biofuels and Sustainable Aviation Fuel

4. Oil Price Discovery & Trading

- Oil pricing: How does the Brent Market work? Understanding what the physical trading data represents; Methodology: How do we arrive to the price?
- The mechanics of trading physical crude
- Oil price forecast

5. Benchmarks

- Overview of Platts assessment methodology: crude and refined products
- Update on Platts Benchmarks: Dated Brent

6. Carbon Capture Technologies & Trends

7. Emission Intensities

- Emissions, Carbon & Methane intensities
- Carbon price premium

8. Refining Economics and Future of Refining

- Global refined product demand outlook
- Refining and petrochemical integration
- Greener and sustainable refineries

9. Risk Management Concepts

- Approaches to risk management
- Risks with discretionary positioning; Long and short
- Basis and outright risk; Physical v. Financial exposure

10. Basic Futures

- Futures: ecosystem and settlement
- Margins, basis and spreads

11. Overview of Options

- Basics and definitions
- Variables to determine option prices
- Profit and Loss diagrams
- Basic option strategies

12. Introduction to Basis Trading

- Implications of basis
- Models for basis analysis

13. Introduction to Hedging

- Hedging strategies in trading
- Basic hedging instruments

Fundamentals of Refining Economics

Lead Instructor: Daniel Evans, VP, Global Head of Fuels & Refining Research

Gain an understanding of the fundamentals of refining operations and refining economics, how the industry adapts to a volatile near-term market, and the longer-term pressures of the energy transition.

Course Outline

1. Crude Oil Grades and Qualities

- Grades of crude oil – light, medium, or heavy; sweet or sour

2. Crude Oil Valuation

- Quality as a value determinant - light sweet vs heavy sour
- Selecting the most suitable crude oil

3. Refined Products and their Qualities

- Light Products – gasoline, jet fuel, diesel
- Intermediates
- Heavy "Bottom of the Barrel" Products – fuel oil, asphalt
- By-products – propane, butane, sulfur, petroleum coke

4. Refined Products Price Formation

5. Refining Configurations and "Complexity"

- Topping refineries – Separate crude oil into raw, unfinished products (no downstream conversion units)
- Hydro-skimming refineries – ability to make finished light products (gasoline, jet fuel, and diesel fuel)
- Cracking refineries – make additional light products by cracking Unfinished Gas Oils
- Coking refineries – most complex configuration, make almost no heavy products

- Exercise: Calculating Refinery Complexity

6. Market Setting Configurations

7. Refinery Margin Calculations

- Variable Margin
- Net Margin
- Exercise: Refinery Margins – Calculating gross, variable and net margins for Refinery A versus Refinery B

8. Market Outlook

- Short-term
- Responding to near-term changes
- Long-term

9. Refining and Petrochemical Integration

10. Refinery Flexibility

- To increase the percent of the barrel to chemical feedstocks (COTC)
- Bio-conversion is to include both co-processing of bio-feedstocks and full bio-conversion

The Refinery of the Future

Lead Instructor: Daniel Evans, VP, Global Head of Fuels & Refining Research

The Energy Transition is reshaping refining. As refinery margins are up, refiners are reviewing portfolios and reinventing what it means to be a refiner today. This live training course is designed to be both instructive and interactive, encouraging dialogue and feedback from participants.

Course Outline

1. Fundamentals of Refining

- Refinery technical configuration and operations
- Refinery economics and margin optimization

2. Energy Transition

- Fundamentals
 - What is the definition and scope of Energy Transition?
 - What are the drivers (e.g. ESG)?
- Commercial Outlook
 - What is the industry response (e.g. electric vehicles, hydrogen economy, crude-oil-to-chemicals, etc.)?
 - What is the outlook, short, medium, and long term?

3. Refining petrochemical interface/integration

- Refined products as petrochemical feedstocks
 - Olefins and Aromatics
 - Regional balances and outlooks
- Process Technology as a function of the percent of chemical feedstocks (a.k.a. Crude-Oil-to-Chemicals)

4. Refinery Flexibility

- To increase the percent of the barrel to chemical feedstocks (COTC)
- Bio-conversion is to include both co-processing of bio-feedstocks and full bio-conversion

5. Greener Refineries Environmental Impact Overview

- Quantification of Greenhouse Gases (GHGs)
- Use Greener power and hydrogen

6. Refineries of the Future: Aspirational Design to Net Zero

- Profile of refiner's aspirational designs and technical approaches to net-zero designs
- Quantitative impact on a world-scale refinery carbon footprint of various technical configurations and product slate considerations (e.g. inclusion of the bio-diesel, chemical decarbonization, products, renewable power generation, and/or plastics recycling via chemical pyrolysis, etc.)

NGL/LPG Market Fundamentals

Lead Instructor: Darryl Rogers, VP, Midstream Oil & NGL

This course provides an in-depth study of the global markets and infrastructure for natural gas liquids (NGLs, including LPG), focusing on why the markets are structured and what pricing means.

Course Outline

1. Introduction to the Gas Industry

- Definitions & jargon
- Definitions & conventions
- Specifications and contaminants
- Health & safety issues

2. NGL Supply Sources

- Gas processing and LNG
- Refining
- Renewable LPG / bioLPG

3. Fuels– End Uses & Demand Drivers

- Residential/commercial and other premium fuel markets
- Premium vs. clearing markets.
- Competition and substitution

4. Petrochemicals–End Uses & Demand Drivers

- Ethylene, flexible crackers & feedstock competition
- PDH, BDH, and other chemical uses

5. NGL Regional Supply, Demand & Imbalances

- LPG supply and demand by region
- LPG regional imbalances and trade flows
- Ethane and natural gasoline

6. Global NGL Infrastructure

- Supply
 - Production and purification
 - Storage, Terminals
- Transportation
- Demand Related Assets
 - Residential, commercial, industrial, and agriculture
 - Autogas
 - Marine, agriculture, synthetic gas and chemicals

7. Pricing – Price Discovery & Benchmarks

- INCO Terms
- Price discovery and indexes
- Global and regional benchmarks

8. Pricing – Types of NGL Prices

- Exchanges and pricing hubs – transparency and liquidity
- Wholesale, distributor, and retail prices
- Role of subsidies and excise taxes
- Index vs. reported price

9. Transportation Costs

- Arbitrage, Waterborne, Overland, Demurrage, other

10. Trading & Contract Concepts

- Physical vs. paper
- Hedging and trading
- Term vs. spot contracts and pricing formulas
- NGL price forecasting

11. NGL Valuation Economics

- Netback & breakeven values
- Frac spreads and ethane recovery economics
- NGL valuation in refineries and competing fuel economics.
- Ethylene cash costs

12. Major Players in the NGL Value Chain

- Producers; Midstream and transportation; Commercial

13. Trends & Issues

- Energy Transition, decarbonization, and renewable / bio-LPG
- Chemicals sustainability and circularity
- Disruptive technologies and emerging markets

LNG Market, Pricing and Commercial Fundamentals

Lead Instructor: Zhi Xin Chong, Senior Director, Gas, Power & Climate Solutions

LNG Demand-supply dynamics are undergoing seismic changes in major markets - Asia, Europe and Americas. This course equips learners with a fundamental understanding of how the global LNG markets are structured, the setting of regional LNG prices and how low-carbon fuels will increasingly play an important role in decarbonizing part of the energy system transitioning away from fossil fuels.

Course Outline

1. History of LNG

- Properties, containment systems, and development

2. Current landscape of the LNG Chain

- Types of LNG buyers, sellers, and traders
- LNG project structures
- The capacity of new supply projects to meet future demand

3. LNG Value Chain

- Overview of the supply chain (liquefaction, shipping, regasification) and quality.
- Regasification market
- Carbon and methane emissions

4. LNG supply and demand fundamentals

- Key producing regions
- The global demand growth outlook, key markets

5. LNG Pricing

- Commercial contracts and pricing formula mechanisms –including oil linkage, hub linkage, Platts JKM, and hybrid formula.

- Contract vs. spot pricing

- LNG contracting trends include indexation type, length of contracts, and contract slope evolution.

- Key drivers behind the short, medium, and long-term regional LNG pricing outlook

6. LNG Shipping

- How global LNG trade works
- Shipping from a trade perspective: fleet size, development, shipping cost, charter rates

7. LNG & Competing Fuels

- Hydrogen
 - Production and use of hydrogen
 - Hydrogen derived low carbon fuels
- Biofuels
 - Supply, demand and outlook

8. Short- and long-term Market Outlook

- Outlook for global gas and LNG demand
- Outlook for LNG supply
- What's next for the energy transition

Understanding the Global Petrochemical Industry

Lead Instructor: Dr. Jeff Plotkin, VP Training, Energy & Chemicals

This course addresses industry profitability fundamentals, including chemical structures and properties, process technologies, cost of production methodologies, key producers, end-use applications, market sizes, and trade patterns across the petrochemical value chains.

Course Outline

- 1. Introduction to Petrochemicals**
- 2. Understanding Petrochemical Feedstocks**
- 3. Introduction to Synthesis Gas (Syngas)**
- 4. Introduction to the Olefins Business**
- 5. Ethylene:** The Largest of the Building Blocks
- 6. Ethylene Economics**
- 7. Propylene:** The Second Largest Building Block, but the Fastest Growing Olefin
- 8. The C4 Olefins:** Butadiene, Butene-1, Butene-2, and Isobutylene
- 9. Aromatic Business Benzene, Toluene, and the Xylenes:** Taking the Complexity out of Aromatics Complexes
- 10. Benzene:** The Most Versatile of the Aromatics
- 11. Toluene:** Transformations Fooling Mother Nature
- 12. Xylenes:** para-Xylene dominates for PTA/Polyester
- 13. Introduction to Polymers**
- 14. Exploring the Ethylene Value Chain:** Dominated by Four Very Commoditized Businesses: Polyethylenes, Chlor-Alkali/EDC/VCM/PVC, EO/MEG, EB/Styrene
- 15. Exploring the Propylene Value Chain:** Bringing Good Things to Life: PP, Cumene/Phenol/Acetone/BPA, PC, Epoxy resins, PF resins, MMA/PMMA, PO, Oxo alcohols, acrylic acid/SAP, Acrylonitrile
- 16. Exploring the C4 Olefins Value Chains:** Key to the Synthetic Rubber Industry: Synthetic rubber (SBR, PBR, Butyl, EPDM, Nitrile), MEK, Maleic anhydride, UPRs
- 17. Exploring the Aromatics Value Chain:** Styrene/GPPS/HIPS/EPS/ABS, Nylon 6 & 66, MDI/TDI/PU, PTA/Polyester/PET
- 18. Exploring the C1 Value Chain:** Ammonia, Methanol, Acetic Acid, VAM, Formaldehyde/UF/PF/MF resins, POM

Petrochemical Price Forecasting

Lead Instructor: Larry Tan, VP, Chemical Consulting

Explore the different considerations involved for short-, medium- and long-term price forecasting. Factors like feedstock cost, by-product values, variable & fixed costs elements will be discussed and considered. Concepts like industry cost curves will also be explained. Along with S&P detailed supply-demand methodology, these will all be brought together to assess historical margins, industry operating rates and return on investments – all to forecast petrochemical prices based on grounded fundamentals. This is a hands-on workshop as there will be case studies for attendees to work on for every aspect of the price forecasting process. **Bring your laptops.**

Course Outline

1. Introduction to Price Definitions & Forecasting Methodologies

- Short-term
- Medium-term
- Long-term

2. Short-term Forecasting Techniques

- Linear regression analysis method
- Other techniques (in brief)

Case Study #1: Forecasting the next five months' prices (*selected petrochemical product, polypropylene in this case)

3. Medium-Term Forecasting Techniques

- Integrated Case Study Introduction
- Production Cost Analysis
 - Underlying energy and feedstock values
 - Feedstock, variable, fixed costs, and co-product credits
 - Alternative values
 - Production cost models

Case Study #2: Cash Cost of Production (* selected petrochemical product)

- Historical Return on Investments

Case Study #3: Estimating Historical Return on Investments (ROI)

- Cost Curves Methodology
- Inherent Margin Analysis
 - Supply/demand balances

Case Study #4a: Demand forecast for Year Y

- Impact of operating rates
 - Market momentum & psychology

Case Study #4b: Global supply-demand-trade flow-operating rates planning for Year YY

4. Long-Term Forecasting Techniques

- Return on Investment

Case Study #4C: Forecast medium-long term ROI and prices.

- Diagnostic Checks
 - Price ratios and spreads
 - Regional relationships and arbitrage

Trading Strategies for the Petrochemical Industry

Lead Instructor: Garrie Li, VP, Business Development

The dynamics of the global petrochemical industry are changing rapidly and in profound ways. There is more volatility in the markets and many industry participants are adjusting towards just in time sales and purchase agreements. **Bring your laptop.**

Course Outline

1. Overview of Commercial Lexicon

–

2. Commercial Optimization along the Value Chain

Case Study #1: I smell an optimization opportunity

3. Pricing concepts

- Floor, Ceiling and Market concepts
- Netback Analysis

Case Study #2: Who should we sell the spot cargo to?

4. Marketing vs Trading

Case Study #3: Quality Gap risk management

5. Evolution of trading centers - Oil & Petrochemicals

6. Commercial Risk elements Market

Case Study #4: Sell at fix or formula prices?

- Counterparty
- Credit
- Operations

Case Study #5: Your vessel is going to miss the laycan!

- Regulatory
- Political

7. Hedging Strategies in Trading

Case Study #6: Taking advantage of market contango

Advances in Chemicals Sustainability

Lead Instructor: Dr. Mark Morgan, VP, Chemical Consulting

Advances in sustainable chemistry are essential to the environmental and climate challenges we face. The course offers participants an overview of advances in sustainable chemical production and an understanding of how the markets are reacting to these developments.

Course Outline

1. Agricultural Background & Biofuels

- Legislation overview; agri-feedstocks overview and carbon intensity including new fuels.
- Routes to gasoline blending components.
- Routes to diesel/aviation fuel blending components
- Biogas developments, Bio-methanol
- RFNBOs – eFuels, hydrogen, etc.
- Market overview, Manufacturing costs
- Carbon footprint and availability of petrochemical feedstocks

2. Plastics Recycling

- Scoping the challenge, legislation overview
- Market overview and development
- Petrochemical value chain Integration
- Technology Solutions
 - Mechanical; Pyrolysis; Depolymerization; Dissolution; Gasification; New developments, hydrothermal liquefaction, etc.
 - Production economics; carbon footprint implications

3. Biodegradable Polymers

- Definitions, legislation overview
- Market overview and development
- Polymer Families and Building Blocks
- Technology Solutions
- Lactic acid/PLA, Glycolic Acid/PGA, polyhydroxyalkanoates (PHA, PHB, etc.), polybutylene succinate/adipate (PBS, PBSA), gasification, new developments
- Production economics; carbon footprint implications.

4. Bio-based Plastics & Intermediates

- Definitions, legislation overview as appropriate
- Market overview and development
- Polymer Families and Building Blocks

Technology Solutions

- Bio-based Polyolefins, Bio-based Polyesters, Bio-based Nylons; novel bio-based polymers (bio-PBT, bio-PC, etc.)
- Comparative production economics, carbon footprint implications.

5. Carbon Dioxide

- Market overview and development, major sources
- Technology solutions for CCS/CCSU and re-use
 - Air capture, Amine systems, colored methanol
- Screening emerging applications
- Comparative production economics
- Introduce impact on biofuel/chemical operations.

6. More Sustainable Petrochemical Building Blocks

- Definitions, Legislation overview as appropriate
- Market overview and development – focus on production.
- A reminder of feedstocks, from biofuels, circular plastics, etc.
- Low carbon building blocks and footprint
 - Ethylene (conventional, bio-naphtha/propylene/MTO, circular naphtha/propylene/FCC),
 - Propylene (conventional, bio-naphtha/propylene/MTO, circular naphtha/propylene/FCC/PDH)
 - Benzene (conventional, bio-naphtha, reforming, unconventional)
 - Methanol
- Alternative approaches to reduction in scopes 1, 2, and 3.
 - Cracker electrification,
 - PDH electrification
 - Hydrogen-fired furnaces in steam cracking.
- Comparative production economics
- Impact of developments in CO2 pricing on competitiveness

Hydrogen Market Fundamentals

Lead Instructor: Zhi Xin Chong, Senior Director, Gas, Power & Climate Solutions

Hydrogen markets are evolving in line with the global transition towards cleaner energy sources, and there is growing interest in hydrogen as a potential alternative to traditional fossil fuels. However, challenges and uncertainties exist related to its role in the energy mix and its potential to contribute to decarbonization efforts.

Course Outline

1. The Hydrogen Economy

- Different types of hydrogen
- Hydrogen production pathways
- Hydrogen's complementary role in the energy transition
- Advantages & limitations of the hydrogen economy

2. Hydrogen Market & Demand

- Supply / Demand
- Critical points
- Required infrastructure and its effect on market and demand
- Requirements and barriers

3. Effect of the Hydrogen Market on Other Industry

- The big-three-W on the hydrogen market
- Hydrogen market and other industries
- Hydrogen and manufacturing

4. Technology Status & Costs

- Relevance of projects
- Moving from hydrogen colors to carbon intensity

5. Ammonia

6. Policy Drivers

7. Outlook: How will Hydrogen Markets Evolve?

- Trends
- Major How fast can hydrogen scale?
- Hydrogen shift: Essential Considerations
- Leveraging opportunities
- How will hydrogen change the market?

Biofuels: An Alternative Fuel for Transportation Decarbonization

Lead Instructor: Dr. Umesh Patil, Director, Energy Training

The course covers current and emerging process technologies, energy transition issues, and decarbonization developments. It provides the learner with a complete understanding of the biofuels value chain from agriculture, biofuel manufacturing, and downstream into retail transportation fuels and the impact on chemicals markets.

Course Outline

1. Introduction to Biofuels

- Introduction to and Historical Development of Biofuels
- Introduction to Biofuel Policies and Regulations

2. Introduction to Biofuel Markets

3. The Role of Agriculture

- Agricultural Feedstocks
- Technology and Agricultural Feedstocks

4. Fundamental Biofuel Technologies

- 1st Generation Bioethanol
- 1st Generation Biodiesel
- Introducing Alternative Feedstocks for Biofuel Production

5. Advanced Biofuels Technologies

- Advanced Bioethanol
- 2nd Generation/Advanced Biodiesel and Jet Fuel

6. Biofuel Demand & Outlook

7. Decarbonization: Role of Biofuels in Refinery & Chemicals Production

- The Changing Nature of Refining and its Impact on Biofuels
- Adding Value to Biofuels and Selected Biofuel Byproducts

8. e-Fuels: Power-to-Liquid (PtL)

- Technology maturity assessment, scale-up risks
- Basic economic assessments, including projections on expected costs and their evolution
- Projected market potential of products in e-fuels

Carbon Markets Fundamentals

Lead Instructor: Roman Kramarchuk, Head Energy Scenarios, Policy & Technology Analytics

The actions to meet net zero targets has increased globally, creating new opportunities for those who understand the fundamentals of carbon markets and how they support the wider energy transition. Our future-focused curriculum will equip you with the tools and skills to tap into these nascent opportunities.

Course Outline

1. Carbon Markets Fundamentals

- Compliance Carbon Markets & Pricing
 - Carbon trading (ETS) versus carbon tax
 - Global compliance markets and pricing schemes
 - Regional specifics and development in key economies (G20)
- The voluntary Carbon Markets
 - What is the VCM and how does it work?
 - Key VCM bodies, stakeholders and participants
 - Demand-side: buyers' perspective, preferences and making claims
 - Trading: ratings, exchanges, and barriers
 - Global & regional trends
- Article 6 & Global Carbon Linkages
 - What is Article 6 and what does it do?
 - Progress of 6.2 and 6.4 mechanisms
 - EU Carbon Border Adjustment Mechanism (CBAM)
 - Carbon clubs

2. Carbon Pricing

- Carbon Markets and Pricing Overview
 - Why do we need a carbon price?
 - What are carbon pricing tools and how do they work?
 - Different types and purposes of carbon markets and pricing
 - Overview of different features and dynamics
- How do Carbon Markets and Pricing fit within Global Climate Policy?
 - A global challenge: politics & economics of climate change
 - Comparison of climate policy instruments
 - UN frameworks: the Paris Agreement,

UNFCCC, COP process and the Sustainable Development Goals (SDGs)

- Key global institutions on carbon markets

3. Carbon scenarios

- Fundamentals of net-zero
 - Understand net-zero cases and how they translate into potential GHG emissions outcomes that could arise in uncertain markets.

4. Carbon Accounting

- Cross-cutting view of carbon intensity for different commodities.
- Different frameworks, use cases and how industries can apply carbon accounting

5. Carbon Registries

- Overview of the critical infrastructure required to manage all your global carbon, water, and biodiversity credits in a centralized, financial markets-based registry system.
- Nature-based solutions (NBS) and natural climate solutions (NCS)?
 - Linkages between NBS, land-use and agriculture
 - Biodiversity as a metric and crediting
 - Reporting requirements relating to climate and nature-based risks

6. Opportunities for Industry

- Overview of sustainability products, insights & solutions
- Corporate strategies for carbon management
- Carbon investments
- NBS & Biodiversity: The size of the prize and its potential
 - Opportunities and challenges for scaling, implications

CCUS Market Fundamentals

Lead Instructor: Paola Perez, Principal Research Analyst, Gas, Power & Climate Solutions

Carbon capture, utilization, and storage (CCUS) is a key technology that can contribute to reducing emissions in key emitting sectors and to remove CO₂ from the atmosphere while also supporting the development of CO₂-based products. This course provides an overview of market and technology trends, offering key insights into the challenges and opportunities that different sectors face in implementing CCUS.

Course Outline

1. Status of CCUS Market

- The potential role of CCUS in the energy transition
- Overview of current market conditions
- Summary of global policy

2. The CCUS Value Chain

- Overview of the value chain
- Global CCUS project pipeline progress by segment
- Cost analysis of CO₂ capture, transportation, and storage.
- Overview of CO₂ utilization

3. CCUS Trends in Chemicals and Fuels Applications

- Overview of the market dynamics between low-carbon fuels and CO₂ use
- Supply and demand balance for CO₂ utilization by 2030

4. Engineered Carbon Dioxide Removal

- Overview of technologies and market trends

5. Long-term Global Outlook for CO₂ Capture Installation

- S&P Global Commodity Insights' base case outlook for both near-term (2030) and long-term (2050) CO₂ capture installations

Renewables Market Fundamentals

Lead Instructor: Jenny Yang, Senior Director, Asia Gas & LNG

Recent policy decisions worldwide have increased investment in renewable energy technologies causing new challenges and opportunities for market players. The rise in wind and solar deployment in power systems originally built for firm generation creates potential complications, while a localized approach to analyzing power market regulatory frameworks is necessary due to regional differences.

Course Outline

1. Industry Structure & Regulation

- Current structure of the US electricity industry
 - Industry evolution
 - Restructuring and the formation of ISO/RTOs
 - Retail competition
- Hybrid regulatory structure

2. Drivers of Electricity Demand

- Evolution of the drivers of electricity demand
- Relative stagnation over the past decades
- Current changes

3. Electricity Supply Trends

- Historical trends and current state
- Drivers shaping the US supply portfolio
- Transformation of the power supply mix

4. Prices and Revenue

- Drivers and variations of wholesale and retail electricity prices in the US
- Captured revenue by technology type
- Missing Money dilemma - concept and implications

5. Key Trends and Issues for Coming Decades

- How power markets may evolve
- Scenarios and a range of potential market outcomes

Clean Energy Technology Fundamentals

Lead Instructor: Eduard Sala de Vedruna, VP, Clean Energy Technology lead

The shift to affordable, clean energy is rapidly changing power systems worldwide. Increasing shares of variable renewables are pushing regulators and companies alike to adopt a multi-technology strategy. At the same time, growing geopolitical fractures are reshaping cleantech supply chains and cost structures. In this dynamic setting, innovation remains key with existing technologies becoming cheaper and more performant, with new innovations on the horizon that could potentially transform the cleantech landscape.

Course Outline

1. Overview of clean power technologies

- Available renewable power technologies
- Drivers and inhibitors to deployment
- Current installation levelsThe voluntary Carbon Markets

2. Technology 101

- Solar PV
 - Solar PV system breakdown
 - End-use areas
 - PV technology and supplier overview
- Wind (onshore and offshore)
 - Onshore and offshore wind farm layout
 - Turbine technology and supplier overview
 - Fixed versus floating offshore winds)
- Energy storage
 - Battery and non-battery storage
 - Application areas
 - Battery technology and supplier overview
 - Business models

- Non-mainstream technologies
- Clean and firm technologies
- Introduction to heat electrification

3. Costs

- Evolution of technology and supplier landscape climate and nature-based risks
- Innovations and disruptions
- Emergence of hybrids/colocation
- Cost evolution and drivers

4. Supply chain

- Current supply demand balanceions
- Component manufacturing footprint
- Raw material dependencies
- Emerging localization trendsl

5. Outlooks

- Capacity outlooks
- Investment outlooks

Biographies

Selected S&P Global Experts Energy and Chemicals

Oil Markets Fundamentals/ Energy Transition

Lead Instructor: Kaushik Burman Roy, Global Director,
Energy Training



Kaushik Burman Roy

Global Director, Energy Training

Kaushik leads our Energy Training, globally. He leads training efforts in Energy Transition (covering Carbon, Renewables, Nuclear, Electricity, Methane, Hydrogen, Ammonia, Energy Attribute Certificates) as well as Energy and Generating Fuels (LNG, gas, oil, coal, lubricants, petrochemicals)."

Prior to joining S&P Global, he worked for 30 years in the Energy Industry, having worked for some of the world's largest energy companies, including ExxonMobil and Shell in upstream, downstream and petrochemicals.

He is a Chemical Engineer (IIT-Kharagpur, India), MBA (IIM-Ahmedabad, India) and Masters in Education (US).

Oil Markets Fundamentals/ Energy Transition/ Biofuels: An Alternative Fuel for Transportation Decarbonization

Lead Instructor: Umesh Patil, Director, Energy Training



Dr Umesh Patil

Director, Energy Training

Umesh Patil is the Director of Energy Training in the Middle East. Previously he was Director of Consulting at S&P Global Commodity Insights in Dubai.

He has over 11 years of experience in R&D, technology, and business development. In his current role, Umesh focuses on the future of energy, specializing in low-carbon solutions like Biofuels, SAF, eFuels, hydrogen and ammonia economies, carbon capture and utilization, and Power-to-X technologies.

Umesh has a diverse background, having worked on projects of all sizes, from the molecular level to large-scale megawatt projects. He has deep experience in the unique energy ecosystems of both Saudi Arabia and the UAE.

Oil Market Fundamentals, Price Forecasting & Commercial Strategies

Lead Instructor: Jim Burkhard, VP, Head of Research,
Oil Markets, Energy & Mobility



Jim Burkhard

Vice President, Head of Research, Oil Markets, Energy & Mobility

Jim Burkhard is a vice president and heads S&P Global Commodity Insights crude oil research and energy & mobility research on how the automotive ecosystem impacts demand and influences the energy and automotive industries. Jim is vice president and head of crude oil market and energy and mobility research.

Jim is responsible for the development and coordination of Insights and messages for global and regional oil markets and scenarios. His expertise covers geopolitics, industry dynamics, and global oil demand and supply trends. He has more than 20 years of experience in energy markets. He also leads research into how changes in the automotive ecosystem are impacting the future of the energy and automotive industries. He led the ground-breaking S&P Global study, *Reinventing the Wheel (RTW): The future of cars, oil, chemicals, and electric power*. RTW has been cited by numerous press outlets around the world including the Wall Street Journal, the Financial Times, CNBC, Bloomberg, and media outlets in China, Europe, and India.

Jim has led the development of each generation of S&P Global scenarios that bring together the entirety of energy research to form an integrated global outlook for the future of energy. The 2006 scenarios pointed to a major debt-induced global crisis two years before the 2008 recession; and in 2011, identified the roadmap to \$50 oil by 2014/15. Also, in early 2020, his team was the first to identify the scale of production cuts that would materialize in the US and OPEC+ members in the second quarter of the year.

Jim has testified before the US Congress on energy issues and is frequently sought for comment by global media. He has participated in several US National Petroleum Council (NPC) studies that provide policy recommendations to the US Secretary of Energy on oil and gas issues. Prior to joining Cambridge Energy Research Associates before its acquisition by S&P Global, he was a member of the US Peace Corps in Niger, West Africa, where he directed infrastructure projects to improve water availability and credit facilities.

Jim holds a BA from Hamline University and an MS from the school of Foreign Service at Georgetown University.

Fundamentals of Refining Economics / The Refinery of the Future

Lead Instructor: Daniel Evans, VP, Global Head of Fuels & Refining Research



Daniel Evans

Vice President, Head of Global Refining & Marketing research

Daniel Evans, S&P Global Vice President, leads our Fuels & Refining research. The team Daniel leads is responsible for our global and regional short-term refined product supply, demand, price and margin outlooks, and detailed downstream market research. Daniel's team also contributes to the long-term forecasting efforts and delivers global base oil, lubricants, and fuel retail research.

Daniel has been involved in developing our work on the future of energy and mobility and lead studies focused on decarbonization pathways for trucking, aviation and shipping.

Prior to joining S&P Global, Daniel worked for Statoil in corporate strategy where he was responsible for analyzing global business opportunities and framing the strategic investment context for senior management.

Daniel holds a Masters degree in Civil Engineering from Leeds University, and studied jointly at the University of California, Berkeley.

NGL/LPG Market Fundamentals

Lead Instructor: Darryl Rogers, VP, Midstream Oil & NGL



Darryl Rogers

Vice President, Midstream Oil & NGL

Darryl is responsible and accountable for company's flagship NGL markets subscription product, Waterborne LIVE LPG subscription product, and the US NGL Markets Weekly subscription product.

Along with leading these subscription based offerings, he serves as a focal point for consulting projects, integrating the unmatched technical/market expertise and resources from our upstream, natural gas, NGL, downstream, and chemicals teams to provide client-focused solutions.

Darryl has 17+ years of industry experience and expertise in natural gas, LNG, power and cogeneration, ethylene manufacturing, petroleum coke, hydrogen and other industrial gases. Darryl has 10+ years of consulting and research and analysis experience including his employment at Purvin & Gertz. Before joining S&P Global (Now part of S&P Global) through the acquisition of Purvin & Gertz, he was at The Dow Chemical Company.

Darryl holds a Bachelor of Science from Western Carolina University, a Bachelor of Science from North Carolina State University and an MBA from Louisiana State University, United States.

LNG Market Fundamentals/ Hydrogen Market Fundamentals

Lead Instructor: Zhi Xin Chong,
Senior Director, Gas, Power & Climate Solutions



Zhi Xin Chong

Senior Director, Gas, Power & Climate Solutions

Zhi Xin is a highly regarded expert in the energy sector, currently serving as the Head of the S&P Global Emerging Asia gas team, with operational bases in Singapore and India. His core area of expertise lies in liquefied natural gas (LNG), where he conducts in-depth analysis of supply, demand, and pricing dynamics within emerging Asian markets, while closely monitoring the influence of governmental policies on the industry.

Noteworthy accomplishments in his career include spearheading a variety of consulting projects for a multitude of LNG stakeholders, focusing on optimizing portfolios, providing transactional advisory services, and setting contractual pricing benchmarks.

Zhi Xin's professional standing extends to his role as a distinguished speaker at global forums, encompassing moderation and presentation at prestigious events like CERAWEEK, World Gas Conference and Gastech. His expertise was featured in a documentary produced by CNBC dedicated to sustainable energy and broadcast to audiences across North America, Europe, the Middle East and Asia.

Prior to his tenure at S&P Global, he accrued valuable experience at Wood Mackenzie and the Energy Market Authority of Singapore. Zhi Xin's academic foundation is a Bachelor of Business Management (cum laude) awarded by the Singapore Management University.

Understanding the Global Petrochemical Industry

Lead Instructor: Dr. Jeff Plotkin, Vice President, Chemical & Energy Training



Dr Jeff Plotkin

Vice President, Chemical & Energy Training

Dr. Plotkin brings over three decades of experience working for operating companies and consulting firms in the petrochemical industry to his position as head of S&P Global Chemical and Energy Training for the Oil, Midstream, Downstream, and Chemical (OMDC) markets. He is internationally recognized as a gifted educator on the subjects of the technology and business of petrochemicals.

Dr. Plotkin is co-author of a popular chemical textbook entitled "Industrial Organic Chemicals, third edition" (Wiley Interscience, 2012) and a contributing editor of the American Chemical Society's Patent Watch online.

Dr. Plotkin holds 30 U.S. patents and has authored more than 25 publications in peer-reviewed journals. Before joining S&P Global, Dr. Plotkin served as Nexant/Chem System's training programs vice president. Dr. Plotkin's industrial experience includes working in research for Exxon Chemical and in marketing and product management for ISP.

Dr. Plotkin holds a Doctor of Philosophy in Organometallic Chemistry from the University of Pennsylvania, US., and a Master of Business Administration from PACE University, New York City, US. He also served as a post-doctoral research fellow at the Ohio State University, Columbus, Ohio, US with a minor in psychology.

Petrochemical Price Forecasting

Lead Instructor: Larry Tan, VP, Chemical Consulting for Oil Markets, Midstream, Downstream & Chemicals



Larry Tan

Vice President, Chemical Industry Consulting for Oil Markets, Midstream, Downstream & Chemicals

Larry Tan has more than three decades of experience in the oil refining and petrochemical sectors within Asia and the United States. He is frequently invited to share his market views at petrochemical industry conferences and conduct bespoke in-house training for petrochemical industry subjects. In addition to prior work as a consultant,

Larry spent the bulk of his career with ExxonMobil Oil and Chemicals in various functional areas of increasing responsibility, including process engineering, technical, refinery operations, catalytic research, and development (in the U.S.), supply operations, vessel chartering, manufacturing planning, joint venture commercial oversight (aromatics) and sales and marketing (aromatics and olefins). After he left ExxonMobil, he traded olefins and aromatics for European firms covering the Asian markets.

At S&P Global, Larry has been in Chemical Consulting and Training since 2013. His project focus has been commercial and technical due diligence, market entry and strategy-related studies, project feasibility studies, commercial advisory, transfer pricing, pricing strategy, trading support, competency skills training workshops, and litigation support.

Trading Strategies for the Petrochemical Industry

Lead Instructor: Garrie Li, VP,
Business Development, Asia, OMDC



Garrie Lin

Vice President, Business Development, Asia, OMDC

Garrie joined S&P Global Commodity Insights as Vice President Business Development, Asia, Oil Markets/Midstream/Downstream/Chemicals in Hong Kong in 2020.

Prior to S&P Global, Garrie spent 11 years with BASF, holding various management positions in Singapore and Hong Kong, before retiring as Vice President, Polyamides & Precursors in 2018.

Garrie joined CMAI in Singapore as Director - Asia Olefins Studies in 2005 and was Managing Director of CMAI Asia when he left in 2007.

Before CMAI, Garrie undertook a 6-month project for Methanex Corporation in China.

Garrie began his industry career with Dow in 1983 and progressed through various marketing and business positions in Hong Kong, Canada, Singapore and Thailand. He was Commercial Director, Hydrocarbons & Energy, Asia Pacific when he left the company in 2004.

Garrie received an MBA and a Bachelor of Science degree in chemical engineering, both from Queen's University, in 1982 and 1980, respectively.

Advances in Sustainable Chemicals

Lead Instructor: Mark Morgan, VP, Chemical Consulting



Dr Mark Morgan

Vice President, Chemicals Consulting

Mark Morgan leads business development activities in chemical consulting focused on specialty chemicals, renewables and advanced materials.

Mark has dedicated more than two decades to consulting in specialty chemicals, process technology and industrial biotechnology. In addition, to chemicals consulting, he supports work in other S&P Global business units where chemicals and materials are involved, in particular Aerospace, Defence and Security (AD&S). In 2011, he joined Chemical Market Associates, Inc. (CMAI) to lead its global activities in renewables.

Previously, he was with Chem Systems, a leading boutique consulting firm serving chemicals and allied industries. His work covered lenders advisory work, M&A due diligence, project feasibility, technology validation and valuation, legal work and more. Following service in the army, he began his chemicals career with BP undertaking blue sky research as well as plant support, together with taking new ideas from concept to commercialization.

Mark earned his doctorate in chemical physics at the University of Bristol, United Kingdom.

He leads consulting projects in all regions in specialty chemicals, biotechnology, renewables and advanced materials. He has strong experience across multiple specialty chemical value chains; linear alpha olefins, detergent alcohols, surfactants, nutraceuticals, the C4 chain, the C5 chain, specialty aromatics, biodegradable polymers, bio-based building blocks, engineering polymers, higher performance materials, carbon fiber, construction chemicals, food/feed additives, valorizing cracker by-product streams, etc. Mark has also undertaken lenders advisory work - commercial and technical for small and large capital projects, as well as supporting due diligence processes in M&A transactions, venture capital, etc.

Carbon Markets Fundamentals

Lead Instructor: Roman Kramarchuk, Head Energy Scenarios,
Policy & Technology Analytics



Roman Kramarchuk

Head Energy Scenarios, Policy & Technology Analytics

Roman leads efforts to analyze the impacts of the energy transition – driven by policy changes and technology advancements – on the energy sector, with special focus on clean energy technologies (i.e., hydrogen, stationary storage, electric vehicles/ alternative transport, renewables, etc.). He oversees Future Energy Outlooks content, advising clients on medium- and long-term energy market views (including reference case and 2-degree scenarios). Roman launched and continues to oversee the Greenhouse Gas and North American Environmental Markets – content areas - covering analytics and outlooks around carbon/environmental markets & policies.

Prior to joining PIRA, now part of S&P Global Commodity Insights, he was at the U.S. EPA, developing key power plant and industrial emissions regulations at the Clean Air Markets Division. With PG&E and before that at PA Consulting / PHB Hagler Bailly, he evaluated strategies regarding power sector fuel choice, capital investments and trading. Roman also worked on international projects to develop power markets and regulatory capacity in Ukraine, Armenia and India. At the Federal Reserve Board, Roman analyzed trends in industrial production.

He has an M.P.P. from the Harvard Kennedy School and a B.A. in economics and B.S.E. in systems engineering from the University of Pennsylvania.

CCUS Market Fundamentals

Lead Instructor: Paola Perez,
Principal Research Analyst, Gas Power and Climate Solutions



Paola Perez

Senior Director, North American Power Markets Analytics

Paola Perez is a principal research analyst in the Clean Energy Technology group, focusing on carbon sequestration research, analytics and insights.

Paola has multiple years of consulting and research experience in the energy sector focusing on emerging technologies and strategy development for utility and oil and gas companies.

Prior to joining S&P Global, Paola was a management consultant with the Americas consulting unit of Arthur D. Little, providing asset evaluation -technical and economic analysis- exploration strategy, and energy transition strategies for E&P companies and governments. She has published and presented several SPE papers. Paola Perez Pena holds a Bachelor of Science in Mechanical Engineering from Universidad de los Andes - Colombia, and a Master of Science in Petroleum Engineering from Texas A&M University, United States.

Renewables Market Fundamentals

Lead Instructor: Jenny Yang, Senior Director, Asia Gas & LNG



Jenny Yang Senior Director, Asia Gas & LNG

Jenny Yang, Senior Director, leads market analysis on Greater China natural and low-carbon gases and a member of the global gas leadership team at S&P Global Commodity Insights.

Based in Singapore, Jenny's recent research includes China's energy market reforms, Chinese companies' LNG procurement strategies, the impacts of China's gas demand and related policies on the global gas and LNG market, and the potential role of hydrogen in China's energy mix under the government's carbon ambitions. She regularly presents and moderates C-level executive dialogs at industry conferences including CERAWEEK, LNG and Hydrogen Gas Market Forum, International Energy Executive Forum, and Asia Gas Forum.

Jenny also has extensive knowledge of electricity load forecast and peak demand management, pricing and structuring of electricity products, power retail operations, and electricity market deregulation. Prior to joining S&P Global, she was vice president of pricing, products, and markets at Constellation NewEnergy in Houston, Texas. Earlier, she was a quantitative analyst at Williams Companies, where she produced forward-looking price and volatility curves for energy-related trading commodities.

Clean Energy Technology Fundamentals

Lead Instructor:

Eduard Sala de Vedruna, VP, Clean Energy Technology lead



Eduard Sala de Vedruna

Executive Director, Clean Energy Technology lead

Eduard Sala de Vedruna is a vice president within the Gas, Power and Climate Solutions (GPCS) group and leads the Clean Energy Technology team. Eduard and his team deliver competitive strategy and market analysis to developers, utilities, and renewables equipment manufacturers on key trends and market opportunities. He is the author of numerous S&P Global reports, including analyses of business models and competitive strategies employed by key market players in the global renewables sector.

Eduard has more than 20 years of consulting and research experience in the energy sector with a focus on market analysis and competitive strategy, particularly with the global renewables market. He has worked on numerous tailored consulting assignments, providing strategic advice and recommendations. Prior to joining S&P Global, he was responsible for market research and management consulting at International Venture Consultants, where he contributed to a variety of projects for major oil and gas companies.

Eduard holds a degree in economics from the University of Barcelona, Spain. He is fluent in English, Spanish, Catalan and French.

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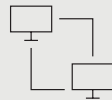
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