Downstream Economics
Downstream Economics and Management

AGENDA

Trading
- Oil supply and demand fundamentals
- Petroleum physical trading
- Financial trading (futures), markets place, derivatives
- Hedging and strategies

2 d

Refining and petrochemicals economics
- Brief technical overview of the main refining and petrochemical processes
- World refining and petrochemicals demand
- Evolution of the downstream supply: refining overcapacities, production nature and quantity
- Main challenges for the refining sector: deep conversion, new product specifications, petrochemical integration, environment, etc.
- Refining margins and costs
- Case study: valuation of intermediate products of a FCC (Fluid Catalytic Cracking) unit
- Case study: refinery blending simulation
- Main characteristics of the petrochemical business: economic drivers, cyclic behavior, etc.
- Case study: steam cracker economics

3 d

Optimization of refining operation - Linear programming
- Linear programming (LP) principles: linear equation, objective function, profit maximization or cost minimization, Simplex method, graphic interpretation, etc.
- Analysis of the LP results: optimum properties, marginal costs, domain of validity of the results, etc.
- Case study on Excel: introduction to the preparation of a refinery model matrix (material balances, products specifications, utilities consumption, objective function, etc.); team work on the optimization of a cracking refinery

2.5 d

Refining operations planning - Scheduling
- Principles of refining management: constraints, operations organization
- Monthly program to daily operations
- Optimization of margins from different process units
- Case study: management of typical sequential constraints (delays, processing problems, etc.)

1.5 d

Investment profitability studies
- Value creation and capital cost, cash flows, discounting principle and inflation impact
- Standard global profitability analysis: cash flow schedule, economic criteria
- Introduction to risk analysis
- Exercises on various investment profitability studies for refineries and petrochemical plants

1 d

Strategic marketing
- Marketing role in a firm and in the economy, marketing organization
- Measuring the firm’s competitiveness
- Designing a development strategy

2 d

Supply chain management
- Supply chain principles: definitions, review of activities, interactions with consumers
- Storage management: «pull» and «push» modes, basic tools for stock management, technical and economic aspects
- Supply chain design and methodological approaches: analysis of the industry (organization, process, location)
- Benchmarking context

3 d

In-house training

Level: Foundation

Purpose
To allow the participants to acquire a complete view of the economic principles of the downstream sector as well as the methods necessary for the decision-making processes

Audience
Professionals from the refining, the petrochemicals and the distribution sectors in a management position where they need to deepen their understanding of all the essential economic aspects as well as the management tools used in the oil downstream sector

Learning Objectives
Upon completion of the course, participants will be able:
- to analyze the economic fundamentals of the energy scene, with a particular attention to the importance of markets dynamics and its impact on the economics of refining, petrochemicals and distribution
- to evaluate the economic values of various intermediate or semi-finished products
- to use linear programming models and management tools in order to optimize refining and petrochemical operations
- to do project profitability evaluation
- to take part in the development of a marketing strategy
- to analyze the supply chain of an industry

Coordinator: Sylvie Saulnier
Planning and Economics of Refinery Operations
In collaboration with the Energy Institute, London

AGENDA

**PURPOSE**
To enable delegates to understand the essential elements of refinery operations and investment economics, to review the various parameters which affect refinery profitability and to develop a working knowledge of the management tools used in the refinery industry.

**AUDIENCE**
Technical, operating and engineering personnel working in the refining industry, trading and commercial specialists, independent consultants, process licensors, catalyst manufacturers and refining subcontractors.

**LEARNING OBJECTIVES**
Upon completion of the course, participants will be able:
- To assess the latest trends in product specifications and refining schemes
- To calculate product value, refinery margins and process unit margins
- To simulate and to optimize refinery operations, crude oil selection and product manufacturing
- To analyze the results of an linear programming model optimization
- To evaluate the profitability of a new process unit

**WAYS AND MEANS**
Case studies and exercises derived from present refinery situations
Economic optimization using Excel

**Coordinator:** Mélissa Clodic

---

**Technical overview**
Brief technical presentation of the main refining units: distillation, conversion, etc.
Refinery scheme evolution

**Refining industry**
World petroleum product demand and evolution of the crude oil supply
Refining supply: overcapacity, types and quantity
Main challenges: deep conversion, new product specifications, petrochemical integration, environment, etc.
Projects and perspectives

**Refinery margins and costs**
Refinery margins and costs: definitions and evolution worldwide
Unit margins and intermediate product valuation
Case studies: crude oil arbitrage, Fluid Catalytic Cracking (FCC) unit margin

**Refinery blending simulation**
Case study: managing the blending operation of a refinery taking into account the economic and technical (product specifications, capacities, etc.) constraints

**Optimization of refining operations – Linear programming**
Linear programming (LP) principles: linear equation, objective function, profit maximization or cost minimization, Simplex method, graphic interpretation, etc.
Analysis of the LP results: optimum properties, marginal costs, domain of validity of the results, etc.
Case study on Excel: explanation of a refinery model matrix (material balances, product specifications, utilities consumption, objective function, etc.); team work on the optimization of a cracking refinery and on the result analysis

**Investment profitability studies**
Value creation and capital cost, cash flows, discounting principle and inflation impact
Standard global profitability analysis: cash flow schedule, economic criteria (net present value, internal rate of return, etc.)
Introduction to risk analysis
Exercises on various investment profitability studies for refineries and petrochemical plants

**LANGUAGE**
EN

**DATES**
Oct 20 - 23

**LOCATION**
London

**FEES**
3,200 £

**REGISTRATION CONTACT**
eco.rueil@ifptraining.com

**4 Days**

**Level:** Proficiency

---

**PUROSITY**

**AGENDA**

---

**Planner and Economics of Refinery Operations**

In collaboration with the Energy Institute, London

AGENDA

**PURPOSE**

---

**AUDIENCE**

---

**LEARNING OBJECTIVES**

---

**WAYS AND MEANS**

---

**Coordinator:** Mélissa Clodic

---

**LANGUAGE**

---

**DATES**

---

**LOCATION**

---

**FEES**

---

**REGISTRATION CONTACT**

---
Refinery Operation Management and Linear Programming

Level: Proficiency

AGENDA

Oil markets and trading

0.25 d

- Oil supply and demand fundamentals and evolution
- Petroleum physical trading (spot, forward)
- Crude oil and petroleum product pricing: benchmark, quality differential, etc.
- Financial trading (futures) and hedging strategies for a refiner

Refining context

0.5 d

- World petroleum product demand
- Refining supply: overcapacity, types and quantity
- Main challenges: deep conversion, new product specifications, petrochemical integration, environment, etc.
- Projects and perspectives

Refining margins and costs

0.75 d

- Refinery margins and costs: definitions and evolution worldwide
- Unit margins and intermediate product valuation
- Case studies: crude oil arbitrage, Fluid Catalytic Cracking (FCC) unit margin

Optimization of refining operations – Linear programming

2.5 d

- Linear programming (LP) principles: linear equation, objective function, profit maximization or cost minimization, Simplex method, graphic interpretation, etc.
- Analysis of the LP results: optimum properties, marginal costs, domain of validity of the results, etc.
- Case study on Excel: parametrization and preparation of a refinery model matrix (material balances, product specifications, utilities consumption, objective function, etc.); team work on the optimization of a cracking refinery and on the result analysis

Optimization of refinery operations – Scheduling

1 d

- Principles of refining management: constraints, operations organization
- Monthly program to daily operations
- Optimization of margins from different process units
- Case study: management of typical sequential constraints (delays, processing problems, etc.)

Ways and means

Case studies and exercises derived from present refinery situations
Economic optimization using Excel software and the solver Quiz

LEARNING OBJECTIVES

Upon completion of the course, participants will be able:

- to optimize refinery operations, crude oil selection and crude oil selection
- to analyze the results of a linear programming model optimization
- to help optimizing a planning, from preparation of optimal monthly programs up to daily operation scheduling

AUDIENCE

Managerial staff, supply planners, oil economists and personnel in charge of supply, planning, programs and product blending

PurPOSE

To provide an in-depth understanding of the techniques used for decision making operations concerning supply and refining

Coordinator: Mélissa Clodic

May be organized for a single company
Economic Framework of Refining

AGENDA

Technical overview
Brief technical presentation of the main refining units: distillation, conversion, blending, etc.
Refinery scheme evolution

Oil markets and trading
Oil supply and demand fundamentals and evolution
Petroleum physical trading (spot, forward)
Crude oil and petroleum product pricing: benchmark, quality differential, etc.
Financial trading (futures) and hedging strategies for a refiner

Refining context
World petroleum product demand
Refining supply: overcapacity, types and quantity
Main challenges: deep conversion, new product specifications, petrochemical integration, environment, etc.
Projects and perspectives

Refining margins and costs
Refinery margins and costs: definitions and evolution worldwide
Unit margins and intermediate product valuation
Case studies: crude oil arbitrage, Fluid Catalytic Cracking (FCC) unit margin

Refinery blending simulation
Case study: managing the blending operation of a refinery taking into account the economic and technical (product specifications, capacities, etc.) constraints

Optimization of refining operations – Linear programming
Linear programming (LP) principles: linear equation, objective function, profit maximization or cost minimization, Simplex method, graphic interpretation, etc.
Analysis of the LP results: optimum properties, marginal costs, domain of validity of the results, etc.
Case study on Excel: explanation of a refinery model matrix (material balances, product specifications, utilities consumption, objective function, etc.); team work on the optimization of a cracking refinery and on the result analysis

Optimization of refinery operations – Scheduling
Principles of refining management: constraints, operational organization
Monthly program to daily operations
Optimization of margins from different process units
Case study: management of typical sequential constraints (delays, processing problems, etc.)

Investment profitability studies
Value creation and capital cost, cash flows, discounting principle and inflation impact
Standard global profitability analysis: cash flow schedule, economic criteria (net present value, internal rate of return, etc.)
Introduction to risk analysis
Exercises on various investment profitability studies for refineries and petrochemical plants

LEVEL: Foundation

PURPOSE
To enable delegates to get a grasp of all the fundamental aspects and challenges of the economic framework in which the refining industry is evolving

AUDIENCE
Technical, operating and engineering personnel working in the refining industry, trading and commercial specialists, independent consultants, process licensors, catalyst manufacturers and refining subcontractors

LEARNING OBJECTIVES
Upon completion of the course, participants will be able:
- to calculate product marginal value, refinery margins and process unit margins
- to identify cost savings in order to improve margins
- to simulate refinery operations and product blending
- to simulate and to optimize refinery operations, crude oil selection and product manufacturing
- to analyze the result of an linear programming model optimization
- to do project profitability evaluation

WAYS AND MEANS
Case studies and exercises derived from present refinery situations
Economic optimization using Excel Quiz

Coordinator: Mélissa Clodic

LANGUAGE DATES LOCATION FEES REGISTRATION CONTACT
EN May 18 - 22 Rueil 2,910 € EM eco.rueil@ifptraining.com

May be organized for a single company
Process Units Margin Calculations
(Intermediate products valuation)

Level: Proficiency

PURPOSE
To provide an in-depth understanding of the unit margin calculation, through the valuation of the intermediate products which feed or are produced by the unit.

AUDIENCE
Managerial staff involved in technical operation, process, R&D or economic matters.

LEARNING OBJECTIVES
On completion of the course, the participants will be able:
- to estimate the economic value of different intermediate products
- to manage the linear programming models as a user: result analysis, limits
- to analyze refining margins
- to use the refining margin indexes as main indicators of the refining margin trends in a dedicated region.

PREREQUISITE
Basic knowledge on refining units and petroleum products.

WAYS AND MEANS
Case studies and exercises derived from present refinery situations Quiz.

AGENDA

Technical overview
Brief technical presentation of the main refining units: distillation, conversion, etc.
Refinery scheme evolution

0.25 d

Refining margin and costs
Refinery margins and costs: definition and evolution
Break-even point
Case study: crude oil arbitrage

0.25 d

Intermediate product valuation
Intermediate product valuation methods for unit margin calculation
Introduction of the notion of constraint cost
Valuation of a product: linked to its usage and to the economic context
Added-value or penalty linked to different manufacturing processes
Various exercises and case studies: butane valuation in the gasoline pool, light cycle oil (LCO) valuation in different diluents, vacuum residue valuation in different diluents and economic context, visbreaking unit margin, etc.

1.5 d

Coordinator: Mélissa Clodic

LANGUAGE | DATES | LOCATION | FEES | REGISTRATION CONTACT
---|---|---|---|---
EN | Jun 01 - 02 | Rueil | 1,580 € | eco.rueil@ifptraining.com

May be organized for a single company
Linear Programming Practice for Refinery Optimization

Level: Proficiency

AGENDA

- **Linear programming principle**
  - Linear equations, matrix preparation
  - Objective function, profit maximization or cost minimization
  - Optimization of refinery operations: Simplex method, graphic interpretation
  - 0.5 d

- **Linear programming result analysis**
  - Optimum properties, domain of validity of the results, marginal costs
  - Sensitivity analysis
  - 0.5 d

- **Introduction to linear programming practice**
  - Case study: parametrization and preparation of a refinery model matrix (material balances, product specifications, utilities consumption, objective function, etc.); team work on the optimization of a cracking refinery and on the result analysis (unit debottlenecking option, etc.)
  - 1 d

P R O J E C T

- **Linear Programming Practice for Refinery Optimization**
- Downstream Economics
- Coordinator: Mélissa Clodic

A U N D I E N C E

Managerial staff, supply planners, oil economists and personnel in charge of supply, planning, programs and product blending

L E A R N I N G  O B J E C T I V E S

On completion of the course, the participants will be able:
- to acquire a working knowledge of refinery economic optimization; operating conditions, feedstock and be able to evaluate the extent of the validity and limits of the different approaches
- to analyze all results interpretation and what benefit they can obtain for the economic optimization of their refinery
- to understand the principles of refining management: constraints and operations organization

P R E Q U I S I T E

Basic knowledge on refining units and petroleum products

W A Y S  A N D  M E A N S

Case study derived from present refinery situations
Economic optimization using Excel Quiz


<table>
<thead>
<tr>
<th>LANGUAGE</th>
<th>DATES</th>
<th>LOCATION</th>
<th>FEES</th>
<th>REGISTRATION CONTACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN</td>
<td>Dec 03 - 04</td>
<td>Ruell</td>
<td>1,310 €</td>
<td><a href="mailto:eco.ruell@ifptraining.com">eco.ruell@ifptraining.com</a></td>
</tr>
</tbody>
</table>

May be organized for a single company
Economic Optimization of Refining Operations

Level: Proficiency

AGENDA

PUPROSE
To allow the participants to acquire the main economic challenges of the running of a refinery and to understand the oil markets (crude oil and petroleum products) in order to optimize refining operations

AUDIENCE
Engineers, independent consultants, subcontractors or managers from refining who need a better understanding of operation optimization

LEARNING OBJECTIVES
Upon completion of the course, participants will be able:
- to understand the economic issues and the main parameters influencing refining profitability
- to develop a working knowledge of management tools and models used in the industry
- to get a grasp of the input/output balances of the refining industry
- to calculate product value (intermediate, semi-finished or finished products), refinery margins and process unit margins; how cost and margins compare; how to simulate refinery operations and product blending
- to understand and analyze the refining margin from an operational point of view, considering the contribution of each unit operation
- to understand the notion of break-even point (as an evaluation tool for assessing the resilience of a refinery to economic changes)
- to comprehend ways to optimize refinery operations, crude oil selection and product manufacturing, in order to improve profitability
- to gain a working knowledge in decision-making regarding future investments
- to better understand and use the various elements that contribute to refining margin improvement, such that: blending optimization, energy optimization, maintenance management, inventory management, analysis, performance monitoring,...

WAYS AND MEANS
Case studies
Example cost of give-away
Calculation of a working inventory

Coordinator: Lucien Guez

Technical overview
Petroleum demand
Crude oils - Qualities and characteristics
Petroleum products - Characteristics and specifications
Refining schemes and processes

Price constitution of crude oils and petroleum products
The different types of crude oils and their interactions
Notions of incoterms (FOB, CIF...)
Price determination from reporting agencies (e.g.: Platts and Argus)

Refining margins and costs
Definitions
Different types of margins and indicators
Principle of estimation of the real margin in a refinery from the reference indicator
Refining variable and fixed costs
Definitions and principle of a refinery break-even point

Value and simulation of intermediate and semi-finished products
Value of a product depending on its use and the economic context
Notion of marginal cost, netback value
Capital gain or loss of separation, product blending or transformation operations; examples
Case study of the premium “straight-run” for atmospheric residues

How to improve the refining margin daily?
Blending optimization
Energy integration, maintenance management
Monitoring and control of consumption (energy, chemicals, catalysts) and losses
Inventory management, working inventory
Organization, reactivity, employees training
Implementation analysis and performance monitoring tools (KPI: Key Performance Indicators), ...

Optimization of the feedstocks – Key criteria
Crude oil case study: tools and models used, basic knowledge of linear programming
Case study

LANGUAGE | DATES | LOCATION | FEES | REGISTRATION CONTACT
--- | --- | --- | --- | ---
EN | Dec 14 - 18 | Rueil | 2,970 € | EM eco.rueil@ifptraining.com

May be organized for a single company
Economic Framework of Petrochemicals

AGENDA

Introduction to the petrochemical industry
- World context of the petrochemicals sector
- Main characteristics of petrochemical businesses
- Petrochemical chains and economic perspectives
- Economic impact of refining integration
- Steam cracker economics
- Case studies: effect of feedstock on olefins manufacturing costs, economic impact of refinery-petrochemical manufacturing complex integration

0.5 d

Olefins and derivatives market
- Technical review, main actors and markets
- Capacities and new investments in Asia or for Asia
- Main challenges: increase of the world ethylene production, new technologies of propylene production, etc.

0.25 d

C4 cut and aromatics markets
- Technical review, main actors and markets
- Capacities and new investments
- Markets: benzene, toluene, xylenes, derivatives
- Economic aspects of benzene-styrene-polystyrene trends

0.25 d

Main polymers
- Technical review, main actors and markets
- Capacities and new investments
- Main markets trends

Optimization of refining operations – Linear programming
- Linear programming (LP) principles: linear equation, objective function, profit maximization or cost minimization, Simplex method, graphic interpretation, etc.
- Analysis of the LP results: optimum properties, marginal costs, domain of validity of the results, etc.
- Case study on Excel: explanation of a petrochemical model matrix (material balances, utilities consumption, objective function, etc.); team work on the optimization of a petrochemical complex

1 d

Investment profitability studies
- Value creation and capital cost, cash flows, discounting principle and inflation impact
- Standard global profitability analysis: cash flow schedule, economic criteria (net present value, internal rate of return, etc.)
- Introduction to risk analysis
- Case study: investment profitability of petrochemical plants

1 d

Purcussion
To provide an in-depth understanding of the fundamental aspects and challenges of the petrochemicals industry

Audience
Professionals in petrochemicals who want to develop a better understanding of the petrochemical industry and its economic aspects
Managerial staff involved in manufacturing, marketing, logistics, business development in the petrochemical industry

Learning Objectives
- Upon completion of the course, participants will be able:
  - to evaluate the petrochemical environment, and the different interfaces between petrochemicals and refining
  - to get a grasp of the fundamental market trends of the industry
  - to simulate and to optimize petrochemical operations
  - to analyze the result of an linear programming model optimization
  - to do project profitability evaluation

Ways and Means
Case studies and exercises derived from present refinery situations
Economic optimization using Excel
Quiz

Coordinator: Mélissa Clodic

Level: Foundation

4 Days

Ways and Means
Case studies and exercises derived from present refinery situations
Economic optimization using Excel
Quiz

Coordinator: Mélissa Clodic

May be organized for a single company

Language | Dates | Location | Fees | Registration Contact
--- | --- | --- | --- | ---
EN | Oct 13 - 16 | Rueil | 2,330 € | EM eco.rueil@ifptraining.com
Refining-Petrochemicals Synergies

Level: Proficiency

AGENDA

POURS
Review of the pain refining and petrochemical specificities, identification of the possible synergies and highlight the economic gains achievable from refining-petrochemicals integration

AUDIENCE
Staff from refining and petrochemistry involved in production, planning, procurement, marketing, management control and investment

LEARNING OBJECTIVES
Upon completion of the course, the participants will be able:
- to describe the main specificities of the refining and petrochemical sectors
- to identify the possible synergies between refining and petrochemistry
- to explain the economic challenges and the main factors of these sectors’ profitability
- to analyze the effects of these synergies

WAYS AND MEANS
Quiz, examples
Case studies and exercises in team work

Technical review of refining and petrochemistry
Main petroleum and petrochemical products: key product specifications review
Refining and petrochemical schemes
HSE specifications: refining (H2S, etc.), petrochemicals (product instability, etc.)

Synergies between refining and petrochemistry
Utility exchanges: H2, gas, fuel
Supply: ethane, LPG, naphtha, atmospheric gasoil, vacuum distillate
Product exchanges: pyrolysis gasoline, olefins
Common treatment of the C4 cuts: BTX (Benzene-Toluene-Xylene) extraction
Pooling services

Refining and petrochemicals economics
Refining and petrochemical margins and costs
Location and unit severities effects
Gains due to synergies
Case study: economics of a refinery, of a steam cracker and of the integration of both (with some synergies)

Quiz, examples
Case studies and exercises in team work

Language: EN
Dates: Nov 26 - 27
Location: Rueil
Fees: 1,380 €
Coordinator: Mélissa Clodic

May be organized for a single company
Profitability Analysis of Downstream Investment Projects

AGENDA

Economic criteria
- Value creation, capital cost and discount rate of a company
- Equity and debt, Corporate finance and return on capital, ROCE and ROE
- Cash flows and discounting principle
- Net Present Value (NPV), Internal Rate of Return (IRR), Pay-Out Time (POT), financial exposure, profitability index

Global profitability analysis
- Analysis of operating cash flows and economic criteria
- Return on capital employed
- Profit and Loss accounts and associated project income taxes
- Impact of taxation and inflation in profitability investment studies
- Choice of an investment program with a limited budget, scarcity cost of capital

Risk analysis
- Risk analysis methodology
- Sensitivity analysis in investment decision, Spider and Tornado charts
- Limits of sensitivity analysis

Case studies on investment profitability
- Octane improvement: implementation of isomerization and/or alkylation process units
- Hydrocracker project
- Refinery project
- Steam cracker project

PREREQUISITE
- Basic notions of Microsoft Excel

WAYS AND MEANS
- Case studies and exercises derived from actual refinery situations

Coordinator: Mélissa Clodic
Downstream Module

PURPOSE
To gain an understanding of the downstream petroleum sector in its technical, economic, commercial and environmental dimensions (main refining units, key economic data and characteristics, management tools...)

AUDIENCE
Recently hired professionals, preferably with an engineering background, about to take up a position in downstream petroleum activities.
Staff from other petroleum sectors (upstream, chemicals, etc.) taking up a downstream managerial position or from government agencies with responsibilities for petroleum matters will also benefit from this course.

AGENDA

<table>
<thead>
<tr>
<th>Topic</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Refining</strong></td>
<td>6 d</td>
</tr>
<tr>
<td>Crude oils and finished products</td>
<td></td>
</tr>
<tr>
<td>Refining processes</td>
<td></td>
</tr>
<tr>
<td>Deep upgrading</td>
<td></td>
</tr>
<tr>
<td>Environmental constraints</td>
<td></td>
</tr>
<tr>
<td>Consequences of the reduction of heavy fuel oil outlets</td>
<td></td>
</tr>
<tr>
<td>Short-term refinery management</td>
<td></td>
</tr>
<tr>
<td>Unit margins</td>
<td></td>
</tr>
<tr>
<td><strong>Decision sciences</strong></td>
<td>4 d</td>
</tr>
<tr>
<td>Linear programming: simplex, duality, economic interpretation, etc.</td>
<td></td>
</tr>
<tr>
<td>Refining supply and demand</td>
<td></td>
</tr>
<tr>
<td>Refinery investments, costs and margins</td>
<td></td>
</tr>
<tr>
<td>Dynamic programming, non-linear programming, MCP problems in their applications in Energy industries (Gas and Electricity)</td>
<td></td>
</tr>
<tr>
<td><strong>Downstream management &amp; sustainable development (refining, gas &amp; power)</strong></td>
<td>22 d</td>
</tr>
<tr>
<td>Mid and downstream business: oil refining, petrochemicals and products</td>
<td></td>
</tr>
<tr>
<td>Utility management: coal, gas and power</td>
<td></td>
</tr>
<tr>
<td>Renewables and Environmental Management</td>
<td></td>
</tr>
<tr>
<td><strong>Commodities markets &amp; trading</strong></td>
<td>5 d</td>
</tr>
<tr>
<td>Introduction to commodities markets (energy, soft, tropical &amp; non-ferrous)</td>
<td></td>
</tr>
<tr>
<td>Physical oil markets</td>
<td></td>
</tr>
<tr>
<td>OTC products</td>
<td></td>
</tr>
<tr>
<td>Future markets, Options</td>
<td></td>
</tr>
<tr>
<td>Risk management and hedging</td>
<td></td>
</tr>
<tr>
<td><strong>Strategic marketing and management</strong></td>
<td>8 d</td>
</tr>
<tr>
<td>Role of marketing in the firm and in the economy</td>
<td></td>
</tr>
<tr>
<td>Marketing organization</td>
<td></td>
</tr>
<tr>
<td>Measuring the firm’s competitiveness</td>
<td></td>
</tr>
<tr>
<td>Designing a development strategy</td>
<td></td>
</tr>
<tr>
<td><strong>Advanced econometrics</strong></td>
<td>5 d</td>
</tr>
<tr>
<td>Applied probability and statistics</td>
<td></td>
</tr>
<tr>
<td>Applications of statistical and probabilistic concepts</td>
<td></td>
</tr>
<tr>
<td><strong>Independent study</strong></td>
<td>10 d</td>
</tr>
<tr>
<td>Personal research work</td>
<td></td>
</tr>
</tbody>
</table>

NOTE
This module is a part of a 16-month master degree program, Petroleum Economics and Management, run by IFP School.

Coordinator: Sylvie Saulnier

LANGUAGE | DATES        | LOCATION | FEES  | REGISTRATION CONTACT
---------|--------------|----------|-------|-----------------------
EN        | Apr 13 - Jul 10 | Rueil    | 12,240 € | eco.rueil@ifptraining.com

May be organized for a single company.
Refining Processes and Petroleum Products

AGENDA

Petroleum products
Energy and non-energy products and their main uses, CO₂ emissions and main regulated pollutants in the end use
Principal components of petroleum products: general hydrocarbon classification and main impurities (sulfur, nitrogen, metals and asphaltenes, etc.)
Quality requirements imposed on petroleum products in view of their utilization: quality specifications measured by standard tests, characteristics related to the product composition, origin and processing routes
New trends in market structure and product characteristics to European and worldwide scale, post-combustion depollution systems, biofuels (nature, alternative fuel pathways for transport, strengths and weaknesses)

Refining processes
Crude oil fractionation
- origin, overall characteristics and classification of crude oils
- yields and properties of straight-run cuts obtained by distillation, potential destinations
- industrial units: atmospheric distillation, vacuum distillation, light-ends fractionation
- typical process scheme, operating conditions, energy consumption
Catalytic reforming and isomerization
- octane improvement of virgin naphthas
- basics of processes, types of catalyst, product yields and hydrogen production
- industrial units: process flowsheets, operating conditions, equipment, low pressure processes
Hydrotreating processes
- main features of impurities removal by catalytic hydrogen treatment
- main refining applications
- example of ULSD hydrotreatment unit: operating principles, operating conditions
- scrubbing treatments: amine washing, sulfur production, treatment of residual gases from Claus units
Conversion units
- outline of conversion and various cracking processes
- characteristics and origin of feeds for cracking
- conversion by means of thermal cracking: visbreaker, various cokers
- conversion by means of catalytic cracking: FCC and related units, gasoline sweetening and desulfurization, alkylation, production of MTBE, ETBE and propylene, hydrocracker and related units, hydrogen production (SMR, POX)
- recent developments in hydrotreatment and hydroconversion of heavy residues
- hydrogen balance in the refinery, energy consumption per unit, CO₂ emissions at the outlet of the refinery
Other processes for production of petroleum products: GTL, synthetic crude oils

Manufacturing flowsheets
Main routes to major products
Up to date refining schemes including the production of petrochemical intermediate products
Impacts of the evolution of market demand and the quality of the products on manufacturing patterns
Base lube oil manufacturing

Main economic features of refinery operation
Prices of crude oils and products, operating costs, economic margin of a refinery
Examples of flexibility in operation and its economic consequences


cordinator: Carole Le Mirronet

Level: Discovery

PURPOSE
To provide broad technical information on refining processes and petroleum products, enabling a rapid immersion in the refining industry

AUDIENCE
Professionals in the oil and gas industry or related sectors (in the technical, commercial, legal, finance, or HR departments) interested in oil refining

LEARNING OBJECTIVES
- To learn about the composition, main characteristics and new trends of petroleum products
- To understand the role of various processing units in a refinery
- To describe the main manufacturing schemes encountered in oil refining
- To assess the economic environment of this industry

WAYS AND MEANS
Detailed course material with a glossary of the main technical terms used in the refining industry
Active participation of trainees through interactive games and quizzes to grasp the key points of the course

May be organized for a single company
Marketing and Sales of Lubricants

AGENDA

Lubricants market
- Overview of the lubricants market
- Evolution of demand and general characteristics
- Oil industry and the lubricants
- Added value chain
- Business models

Lubricants performance
- Performance standard
- Environmental issues
- Automotive lubricants
- Transmission oils
- Industrial lubricants
- Metal working fluids
- Greases

Base oils
- Group classification and technical aspects
- Worldwide capacity breakdown by quality: mineral, synthetic
- Worldwide capacity breakdown by operator
- Base oils re-refining
- Capacity and demand trend outlook: 5 years’ time horizon
- Financial structure: profitability, pricing, contract terms

Additives
- Role and functions of the additives
- Respective role and responsibilities in technology developments and ownership: OEMs, additives vendors, lubricants marketers
- Market structure and players
- Future trends outlook

Operations
- Lubricants manufacturing and distributions: main steps, strategic options
- Manufacturing optimization: procurement, blending, filling
- Typical cost structure
- Managing performance

Lubricants marketing
- General consumer marketing
- General lubricants market segmentation: factors of impact
- Implementing appropriate marketing tools
- Developing a strategic marketing plan
- Added value opportunities: total fluid management
- Practical case exercise

Marine lubricants
- Marine lubricants market specific requirements
- Operational constraints and consequences on products technologies and logistics
- Market organization and players
- Financial structure and contractual terms

In-house training

Level: Proficiency

PURPOSE
To identify the specificities of lubricants market and to improve performances during production processes and sales development

AUDIENCE
Managers in a new position in lubricants business. Commercial staff moving into the lubricants area or with responsibilities, e.g., in refining, research, planning etc., related to lubricants. Staff who already have lubricants experience but who require to extend their general, marketing and strategic knowledge

LEARNING OBJECTIVES
Upon completion of the course, participants will be able:
- to understand the commercial and marketing environment, covering base oils, additives, blending plants, automotive and industrial sectors, and consumer requirements
- to know the marketing and strategic options available

WAYS AND MEANS
Industrial experience of the lecturer
Interactive lecture
Real case studies

Coordinator: Sylvie Saulnier
# Marketing and Sales of Bitumen

**Level:** Proficiency

## PURPOSE
As a result of the course, participants will obtain a better understanding of the bitumen binders industry, for roads, highways, airports, roofing, with special attention for two products having a world-wide development, namely polymer modified bitumen and bitumen emulsions.

Objectives of this seminar are to present European and international commercial aspects of bitumen, and to improve the technical knowledge of participants.

## AUDIENCE
Professionals taking up new positions in the manufacturing, marketing, utilization and technical assistance of bitumen and other bituminous binders, as well as those involved in road repairs, new roads, and industrial bitumen uses.

## WAYS AND MEANS
- Industrial experience of the lecturer
- Interactive lecture

## AGENDA

### 1.5 d

**Bitumen marketing**
Relevant technical properties of bitumen

Commercial aspects of paving bitumen, polymer modified bitumen, bitumen emulsions:
- market characteristics, consumption of various products, market trends
- different types of customers, impact of technology development on the business
- competition law: risks and compliance

Commercial aspects of industrial bitumen

Major European, American, African and Asian markets

International bitumen trading

Production and consumption areas, distribution

### 1.5 d

**Technical & HSE aspects**
Properties and main uses of bitumen, polymer modified bitumen, bitumen emulsions

Manufacturing: importance and constraints linked to bitumen production
- tests, specifications, quality control
- road building with hot, warm and cold mixes

Polymer modified paving bitumen and other modified bitumen

Road repairs and road maintenance techniques

Bitumen emulsions and polymer modified bitumen emulsions

Roof waterproofing techniques

Bitumen, polymer modified bitumen, oxidized bitumen, for waterproofing techniques: recent specifications in Europe, USA, and other countries

Health, safety, environment:
- safety during transportation, storage, application of bitumen binders
- health classification of bitumen
- environmental aspect: recycling, LCI, authorities view

---

Coordinator: Sylvie Saulnier

In-house training