Training - Financial Management in the Energy Business

AGFE-EN-P | Face-to-face only | 3 days

The energy sector is changing. The energy transition is increasing the pressure on traditional Oil & Gas activities' profitability. Renewable energy value levers are changing rapidly. In this context it is important for managers of these activities to understand the stakes of the firm's financial management and its key tools in order to better contribute to the performance of their organization

Level

Knowledge

Public

Technical, business development executives, economists and young high-potential executives of Oil & Gas and renewable energy companies, as well as public administration decision makers and staff (industry, finance, energy, environment)

Objectives

Attendees will be able to implement the following skills:

- Interpret the main financial indicators of their organization to better contribute to value creation,
- Evaluate the expected profitability of investment projects,
- Understand the criteria for selecting a company's financial structure

Pedagogical & technical resources

- Exercises.
- Case studies: financial analysis of a company, evaluation of an investment project (offshore Wind farm)

Assessment of achievements

- Trainees are assessed throughout the training through practical application phases and interactions with the trainer
- A final on-the-spot evaluation may also be carried out at the end of the course and/or at the end of each module using tests designed to verify the learners' understanding and assimilation of the knowledge linked to the training objectives

Prerequisites

No prerequisites are necessary to follow this course

Responsable

IFP Training instructors, with expertise in the field and trained in modern teaching methods adapted to the specific needs of learners from the professional world

Program

DEFINITIONS — 0.6 day

Financial management objectives. Key performance indicators in the energy sector.
Understanding financial statements. Fundamental accounting principles. Difference between income statement and cash flow.

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VALUE MANAGEMENT — 1.7 days

Analyzing and managing the financial performance of operations. Energy companies management targets/objectives: "Total Shareholder Return", ROCE, ROE). Cost of capital. Financial analysis ratios. Dashboards. Assessing the profitability of an investment project: discounting methodology and economic indicators (NPV, IRR, Payback time...), sensitivities.

OPTIMIZING THE FINANCIAL STRUCTURE OF THE FIRM — 0.7 day

Choosing the financial structure of the firm. Gearing.
Solvability, borrowing capacity.
Examples of typical energy financing methods: project financing, green bonds.

Sessions

Rueil-Malmaison - From 10/13/2026 to 10/15/2026 **2970 €/HT**

To French entities : IFP Training is referenced to DataDock ; you may contact your OPCO about potential funding.
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Training - Energy Transition: Positioning of the Key Players

DETE-EN-P | Face-to-face only | 2 days

As governments and public opinion debate the way forward on the energy transition, companies are trying to position themselves in consequence. The purpose of this course is to cut through the noise and sometime conflicting information to provide a summary of the pros and cons of various alternatives to fossils fuels, the challenges linked to development of these, and of the positioning of key stakeholders from Society to Governments and the incumbent Oil & Gas sector. This to help companies, and or public decision makers adopt the most appropriate strategy for their activities

Level

Awareness

Public

Strategic planning, Business development, Marketing staff, and other staff of various sectors wanting to understand better the potential impact of the energy transition on their business. Public decision makers having to make choices with regards to energy policy, subsidies, and/or promotion

Objectives

Attendees will be able to implement the following skills:

- Understand the impact of energy on greenhouse gas emissions, and analyze the challenges faced by decision-makers in choosing alternatives to fossil fuels
- Appreciate societal, political and individual trends and their ambivalence in the face of the challenge of the energy transition
- Have learned how some Oil & Gas companies are adjusting their activities facing the energy transition challenge

Pedagogical & technical resources

- Self-discovery based on real life documentation
- Exercises in small groups
- Quiz

Assessment of achievements

- Trainees are assessed throughout the training through practical application phases and interactions with the trainer
- A final on-the-spot evaluation may also be carried out at the end of the course and/or at the end of each module using tests designed to verify the learners' understanding and assimilation of the knowledge linked to the training objectives

Prerequisites

No prerequisites are necessary to follow this course

Responsable

IFP Training instructors, with expertise in the field and trained in modern teaching methods adapted to the specific needs of learners from the professional world

Program

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THE NEW ENERGY MIX — 1 day

The role of energy consumption in CO2 emissions.

- Fundamentals of climate change theory.
- Overview of greenhouse gases emissions.
- Energy mix and CO2 intensity.

Energy consumption and CO2 emissions trends:

- Key drivers underpinning energy consumption growth
- Geographic differences.
- Energy consumption growth and energy mix scenarios (IEA, Oil & Gas companies' scenarios): quiz; global energy consumption game (based on a few questions participants in small groups to assess energy demand annual growth % - to better understand key drivers underpinning energy growth).

The energy transition in the transport and power sector:

- Alternatives to fossil fuels in each of these sectors and pros and cons of these.
- What could accelerate the energy transition or slow it down?
- Self-discovery: participants in small groups to identify the pros and cons of various alternatives to fossil fuels in these sectors based on a dossier they will be given by the presenter during the session, containing relevant news articles, Oil & Gas companies' investor presentations and annual reports extracts. Each group to work on a separate theme and brief the others in plenary for debate (e.g. one group to focus on electricity for transport, one group on biofuels, one on Wind for power, one on solar...).

STAKEHOLDERS BEHAVIORS & STRATEGIES — 1 day

Government intervention policies:

- Dealing with a global challenge: regulation international cooperation.
- Status of progress vs. the Paris agreement.
- Positioning of the key players: US, Europe, China and India.

Societal trends and ambivalence:

- Social reactions to climate change.
- Compared analysis of various countries "climate plans" and/or climate initiatives.
- Advocacy against fossil fuels.
- Participants to compare in small groups different approaches to climate change policy from a social acceptability point of view e.g. Dutch climate change plan which strongly influenced subsequent election vs. the carbon dividend plan of the energy council.

Reaction of incumbent Oil & Gas companies:

- How have companies adjusted their strategy?
- Communication and advocacy with governments and society at large.
- Ability to compete with new clean energy small players.
- Participants to debate in small groups on strengths and weaknesses of Oil & Gas companies vs. news smaller players.

Sessions

Rueil-Malmaison - From 05/26/2026 to 06/27/2026 — **1920 €/HT**

Rueil-Malmaison - From 11/26/2026 to 11/27/2026 — **1920 €/HT**

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Training - Wind turbine operation

EECW-EN-P | Face-to-face only | 3 days

This course improves knowledge of industrial wind turbines operation

Level
Skilled

Public
Engineers, supervisors and technicians involved in wind turbine operation, maintenance or engineering

Objectives
Attendees will be able to implement the following skills:

- Explain wind condition impact on wind turbine operation and performance
- Explain the standard power control modes
- Explain typical incidents and key points for wind turbine operation

Pedagogical & technical resources

- Interactive course
- Use of drawings, datasheets, pictures and videos of actual equipment
- Wind farm visit (according to availabilities

Assessment of achievements

- Trainees are assessed throughout the training through practical application phases and interactions with the trainer
- A final on-the-spot evaluation may also be carried out at the end of the course and/or at the end of each module using tests designed to verify the learners' understanding and assimilation of the knowledge linked to the training objectives

Prerequisites
Provide evidence of minimum 1 month of experience within the relevant domain.

Responsable
IFP Training instructors, with expertise in the field and trained in modern teaching methods adapted to the specific needs of learners from the professional world

Program

WIND TURBINE AERODYNAMICS — 1 day

Wind turbines types, selection principles.
Site wind energy deposit assessement: principles.
Blade aerodynamics: lift, drag, resulting torque.
Wind turbine aerodynamics: output mechanical power, BETZ limit, power coefficient, wind turbine power curve.
Wake effect.
Exercises: wind turbine basic study.

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WIND TURBINE TECHNOLOGY — 1 day

Main parts of a wind turbine.
Mechanical parts: main technologies and components: hub and blades, nacelle, bearings, gearbox (if any), disc brake, pitch control, Yaw, generator flexible coupling, foundations (onshore).
Electrical parts: main generator arrangements and technologies, power management and conversion.
Instrumentation: vibrations, meteorological station, aviation lightening, oil circuit, electrical and mechanicalm data with associated alarms and safety thresholds.
Auxiliaries: lubrication and cooling.
Exercises: parts identification on machines views.

WIND TURBINE OPERATION — 1 day

Part and full load control. Overspeed.
Production vs demand adaptation: principles.
Routine maintenance. Key points to survey. Monitoring.
Service factor, annual production, yearly hours at normal power, availability. Overall efficiency.
Typical incidents.
Wind farm visit (according to availabilities).

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Training - Electrical Motors: Technology, Operation and Maintenance

EIMEA-EN-P | **Face-to-face only** | **5 days**

This course focuses on the technical development of industrial electrical motors

Level
Skilled

Public
Electrical and mechanical engineers, supervisors, technicians involved in electrical motors maintenance and operation

Objectives
Attendees will be able to implement the following skills:

- Explain how electric motors work
- List the main malfunctions
- Specify the diagnostic tools in use
- Explain repair and inspection techniques

Pedagogical & technical resources

- Visit of a motor repair workshop (when possible)
- Interactive course
- Motor disassembly and assembly in case of an available workshop

Assessment of achievements

- Trainees are assessed throughout the training through practical application phases and interactions with the trainer
- A final on-the-spot evaluation may also be carried out at the end of the course and/or at the end of each module using tests designed to verify the learners' understanding and assimilation of the knowledge linked to the training objectives

Prerequisites
No prerequisites are necessary to follow this course

Responsable
IFP Training instructors, with expertise in the field and trained in modern teaching methods adapted to the specific needs of learners from the professional world

Program

OPERATION PRINCIPLE & TECHNOLOGY — 2 days

Working principle of induction and synchronous motors.
Features: power, current, torque and power factors.
Technology and main parameters.

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Protective modes in regards with external environments: temperature classes, protection class index, hazardous area motors, ATEX protection.
Electrical and thermal protection of the motor as well as the use of temperature sensors.
API 541 asynchronous guidelines for refinery and petrochemical motors.
Efficiency motor's standards IEC 60 034-30/IEEE 112.

VARIABLE SPEED FEATURES — 1 day

Power and HV/LV range, fields of use and typical applications.
Speed and motor control as well as network consequences. Synchronous motor: torque control and various technologies.
Induction motor: standard starting methods depending on mechanical load, motor power and network capacity; limiting conditions due to the grid; number of start constraints. Electronic starting method (soft starter).

INSTALLATION — 0.5 day

Main characteristics and constraints for a motor installation.
Skid and shim. Shaft alignment. Comparison to reference datasheets. Vibration footprint.

FAILURE DIAGNOSIS IN OPERATION — 0.5 day

Bearings: temperature, vibration, lubrication monitoring.
Mechanical failures.

CONTROL & REPAIR TECHNIQUES - PRACTICAL WORK — 1 day

Part identification in workshop.
Bearings assembly, housing repair, clearance and run-out checks.
Electrical insulation and phases balancing checks.
Impact of frequency inverters and harmonics on electrical coils insulation and the bearings.
Coil insulation repairs: vacuum coils impregnation, technology and quality. Rewinding and coils positioning according to magnetic circuit's notches. Electrical checks (electrical resistance, insulation, polarization...).
Balancing: quality standards, unload and load tests. Repair specification: specification content as well as work acceptance.
Visit of a motor repair workshop (when possible).

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Training - Energy Efficiency and Low Carbon Strategy, Industrial Solutions

ELCS-EN-P | **Face-to-face only** | **5 days**

As part of adapting their activities to the energy transition, industrial companies, particularly oil and gas firms, will need to manage CO_2 emissions and actively participate in the energy transition. This training focuses on the main challenges industries will face, both in transitioning to low-carbon energy consumption and in increasing energy efficiency. These companies will need to integrate new energies (renewables, hydrogen, etc.) into their energy mix. Furthermore, CO_2 economics must be considered when implementing their low-carbon plans

Level

Knowledge

Public

Industrial operators and national (NOC) or international (IOC) oil and gas companies. It is suitable for technical managers as well as executives and managers at all levels.

Objectives

Attendees will be able to implement the following skills:

- Integrate the new energy landscape with strategies to reduce carbon footprint
- Understand the evolution of the renewable energy sector and opportunities in this field
- Assess energy efficiency and manage its improvement potential
- Develop CCS and CCUS opportunities in future or existing projects
- Implement a roadmap for decarbonizing industrial facilities considering CO2 economics

Pedagogical & technical resources

- Questionnaires
- Team games
- Case studies
- Calculations using economics and KPIs

Assessment of achievements

- Trainees are assessed throughout the training through practical application phases and interactions with the trainer
- A final on-the-spot evaluation may also be carried out at the end of the course and/or at the end of each module using tests designed to verify the learners' understanding and assimilation of the knowledge linked to the training objectives

Prerequisites

No prerequisites are necessary to follow this course

Responsable

IFP Training instructors, with expertise in the field and trained in modern teaching methods adapted to the specific needs of learners from the professional world

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Program

GLOBAL ENERGY LANDSCAPE — 0.5 day

Energy basics: definitions, characteristics, units, conversion factors, orders of magnitude.
Oil chain: technologies, supply and demand, prices, reserves, transition scenarios.
Gas chain: technologies, market players, producing and consuming countries, economic issues.
Case study: crude oil price.

CARBON, CLIMATE AND ENERGY STRATEGY — 0.5 day

Current scientific observations. Evolution of greenhouse gas emissions.
Other planetary environmental limits. Energy mix and CO_2 intensity of energy sources.
Case study: European energy mix. Energy trilemma concept.
Emission distribution by economic and geographic sectors. Oil & gas sector outlook in the energy transition: IEA scenarios, societal pressure, stranded asset risks.
Case study: production decline and oil investment pace.
Public actor mobilization, North-South debate, just transition concept.
Consumer mobilization. Global strategy for decoupling economic growth and carbon emissions. Debate and case study on transition scenarios.

DECARBONIZED INDUSTRIAL SOLUTIONS — 1 day

Global statistics review. Massive rise of renewables. Collapse of solar, wind, and battery costs. Shortened investment cycles, societal barriers, grid transmission impacts. Cross-over of global investment curves: green vs fossil energy.
Mixed results of a two-speed transition versus technologies and geographic sectors.
Overview of solar and wind energy. Presentation of main low-carbon sources: solar, wind, bioenergy, etc.
Case study: comparison of economic models for different electricity sources (solar, wind, gas). Economic concepts: capital cost, key performance criteria : net present value (NPV), internal rate of return (IRR), levelized cost of electricity (LCOE). Growth of competitive renewables without subsidies in the economic landscape. Practical examples.
Intermittency and energy storage: grid balancing constraints, technical and commercial challenges. Emerging solutions: hybrid projects, pumped hydro storage, utility-scale batteries. Emerging economic trends : new business models, emerging technologies, innovations.

CO2 ECONOMICS AND EMISSIVE INDUSTRIES — 1 day

State mobilization, carbon pricing markets (national/regional), European example. International economic implications, carbon market trends.
Industrial and economic actors mobilization. Corporate low-carbon strategies: role of carbon accounting (GHG Protocol). Case study for a SME, utilisation of ADEME database on emission factors in French economy. Key steps after carbon footprint assessment (emission reduction targets, action plan, integration into low-carbon strategy).
Target sectors, “hard-to-abate” industries, persistent supply-demand challenges. CCUS value chain: examples of CCS projects in Europe and the USA, costs trends, sectors applicability, impact of carbon footprint.
Technological and economic barriers to CCUS deployment, industry deployment status in France.
Hydrogen value chain: current supply and demand, hydrogen “colors” (grey, green, blue, etc.), technological and economic barriers to hydrogen economy.

LOW CARBON STRATEGY AND ENERGY EFFICIENCY — 1 day

Electrification of demand. Growth of low-carbon energy supply and electrification of demand across various sectors Case example of Global South and Sun Belt countries. Technological levers for global energy efficiency.
Gas vs renewables: competition and complementarity. Critical minerals challenge for energy transition. Environmental, economic, and geopolitical barriers.
Efficiency levers for residential, commercial, and industrial heat. Heat pump technology: residential, urban, industrial applications, technical limits. Regulatory and economic barriers.
Thermal storage technologies: practical examples and applications.

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LOW CARBON STRATEGY FOR THE OIL & GAS INDUSTRY — 1 day

Energy independence goals of importing countries as a transition driver. Impact of China's electric mobility revolution on fuel demand reduction. Oil & gas sector adaptation: examples from major companies, diverse strategic approaches.
The challenge of methane emissions and flaring reduction: differentiation by actors (majors, independents, NOCs, mining companies, utilities) and countries in their power to influence the outcome.
Emission management systems: typical emission reduction plan format for oil & gas companies.
Technological levers for operational optimization and facility design, flaring reduction, methane elimination, CCUS projects, energy efficiency, renewable energy use.
Examples and case studies with economic calculations.

Sessions

Rueil-Malmaison - From 12/07/2026 to 12/11/2026 — **4470 €/HT**

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Training - Introduction to Industrial Electricity

ELECBAS-EN-P | Face-to-face only | 5 days

This course provides an overview on industrial electricity; how it is generated and distributed in petrochemical plants

Level
Awareness

Public
Operators, supervisors and engineers from any department

Objectives
Attendees will be able to implement the following skills:
- List the fundamentals of electricity
- Identify equipment used for the grid
- Recognize electric motors and generators technologies
- List the electrical safety rules

Pedagogical & technical resources
- Numerous drawings and datasheets used in the industrial plants
- Daily quiz to reactivate the key points
- Practical exercises and case studies

Assessment of achievements
- Trainees are assessed throughout the training through practical application phases and interactions with the trainer
- A final on-the-spot evaluation may also be carried out at the end of the course and/or at the end of each module using tests designed to verify the learners' understanding and assimilation of the knowledge linked to the training objectives

Prerequisites
No prerequisites are necessary to follow this course

Responsable
IFP Training instructors, with expertise in the field and trained in modern teaching methods adapted to the specific needs of learners from the professional world

Program

FUNDAMENTALS IN INDUSTRIAL ELECTRICITY — 1 day

Characteristics of electrical power supply for industrial plants.
Principles of electrical distribution:
- Main technical characteristics of the electrical distribution and the grid. One line electric distribution diagram.
- Application: overall online diagram.

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SUBSTATION EQUIPMENT & SWITCHGEAR — 2 days

Purposes and use of these types of equipment.
Transformers: overall technology and troubleshooting.
Circuit breakers: technology and switchboard.
Operation and maintenance of main electrical equipment.
Electricity control system. Failures monitoring and corrective actions.
Electrical protections.

ELECTRICAL HAZARDS — 1 day

Electrical shocks. Direct and indirect contacts.
Collective and personal protective equipment. Hazardous areas. Basics in safety.
Prevention against electrical shocks, Lock-Out Tag-Out procedure (LOTO).

INTRODUCTION TO MOTORS — 0.5 day

Different type of motors. Operation and technology. Working principle of induction and synchronous motors.
LV & HV motors. Troubleshooting.

DESCRIPTION OF STEAM TURBINES GENERATORS — 0.5 day

Electrical power generating set. Technology. Coupling.
Main technical characteristics of these types of equipment.

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Training - Electrical Maintenance for Industrial Plants

ELECMAI-EN-P | **Face-to-face only** | **5 days**

This course provides a better understanding of electrical equipment such as generators, motors and power grids. It includes performances, operation, maintenance, hazards and safety

Level
Skilled

Public
Electrical technicians, supervisors and inspectors, operation and maintenance staff as well as reliability engineers

Objectives
Attendees will be able to implement the following skills:

- Understand a plant grid and its structure
- Master electrical equipment including motor operating principles
- Detect the main disturbances and failures related to electrical motors
- List the main maintenance procedures on these types of equipment
- Understand the roles of the safety parts

Pedagogical & technical resources

- Drawings and datasheets used in the industrial plants
- Practical exercises and case studies

Assessment of achievements

- Trainees are assessed throughout the training through practical application phases and interactions with the trainer
- A final on-the-spot evaluation may also be carried out at the end of the course and/or at the end of each module using tests designed to verify the learners' understanding and assimilation of the knowledge linked to the training objectives

Prerequisites
No prerequisites are necessary to follow this course

Responsable
IFP Training instructors, with expertise in the field and trained in modern teaching methods adapted to the specific needs of learners from the professional world

Program

CHARACTERISTICS OF PLANT ELECTRICAL DISTRIBUTION — 0.5 day

Purpose of electrical distribution, characteristics of the grid. One line electrical diagram.
Main grid, auxiliary grid, safety grid. Application to a typical grid.

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SUBSTATION EQUIPMENT & WORKING PRINCIPLE OF SWITCHGEAR - MAINTENANCE — 2 days

Purposes and uses of equipment, as well as its first level maintenance.
Operation and technical characteristics.
Transformers: purpose of transformer on a power grid; operating principle, single phase to tri phases; windings connection and protections. Preventive maintenance.
Circuit breakers: operating principle, technologies, main failures.
Cables, switchboards, equipment, relays, diesel generators, batteries, chargers and UPS. Equipment monitoring.
Gas insulated substation: principle and technology.

SAFETY EQUIPMENT & RELIABILITY — 1 day

Main types of protections. Earthing system choice LV&HV: advantages and drawbacks.
Selectivity of protections: mains techniques. Protection relays. Insulation monitoring.
Hazardous area (ATEX) equipment: standards and maintenance rules.
LockOut - Tag-Out procedures (LOTO).

INDUCTION & SYNCHRONOUS MOTORS — 1 day

Operation and technical characteristics (intensity, efficiency, power factor and torque).
Field of use of power and voltage range HV & LV. Technology and hazardous area (ATEX).
Variable speed drive, type of drives; consequences on the grid. Electrical protection of motors.
Synchronous motors: torque control, excitation, different technologies.
Induction motors: various types of starting according to the mechanical load and power of the motor.
Constraints from the grid; maximal numbers of launches. Applications and case studies.

STEAM TURBINES GENERATORS — 0.5 day

Main parameters of the steam turbine generator. Technology and operation of the electrical generator.
Isolated mode and coupling of the generator: impact on the grid.
Application: maintenance case studies.

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Training - Rotating machinery electrification

ELECMT-EN-P | Face-to-face only | 2 days

This course explains how to assess the efficiency of a rotating machinery (pump, compressor) electrification project, in order to achieve savings in fuel consumption and as a result equivalent CO2 emissions to atmosphere

Level
Skilled

Public
Engineers and technicians involved in rotating machinery electrification projects

Objectives
Attendees will be able to implement the following skills:

- Explain how to calculate the work and the power of a rotating machine
- Explain how to select an electrical motor
- Explain how to assess the benefits of such an electrification project

Pedagogical & technical resources

- Interactive course
- Case studies coming from actual situations.

Assessment of achievements
Quiz

Prerequisites
No prerequisites are necessary to follow this course

Responsable
IFP Training instructors, with expertise in the field and trained in modern teaching methods adapted to the specific needs of learners from the professional world

Program

ROTATING MACHINERY WORK AND POWER — 1 day

Pumps and compressors

- Basics of construction.
- Hydraulics and gas compression basics
- Application: work and power calculations/on-site checks

Drivers: electrical motors, diesel engines, gas turbines, steam turbines, expanders

- Basics of construction.
- Combustion and gas expansion basics
- Application: work and power calculations/on-site checks

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ROTATING MACHINERY ELECTRIFICATION 1 day

Pumps and compressors of various sizes electrification case studies, allowing:

- The calculation/check of the required works and powers
- The assessment of the project benefits, in terms of: fuel consumption savings, CO2 emissions to atmosphere savings, footprint savings...

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This training course is offered under the **Alliance4Training** brand

Training - Electrical Technicians

ELECTEC-EN-P | **Face-to-face only** | **35 days**

Improve electrical technicians performance in safety, quality and work efficiency. This course will provide an IFP Training Certificate according to the IFP Training procedures

IFP Training Certificate

Advanced Certificate

Level

Skilled

Public

Electrical technicians from refineries and petrochemical plants

Objectives

Attendees will be able to implement the following skills:

- Apply electrical safety rules
- Identify equipment used for the grid
- Perform checks in workshop and on the plant
- Explain electric motors and generators technology
- Write/validate electrical maintenance procedures

Pedagogical & technical resources

- Training split into thematic modules and "On The Job Training" (OJT). To give participants the opportunity to better assimilate the content of the previous course modules, and apply the studied subjects to the facilities
- Workshop practice
- Exercises on site
- Intermediate and final tests to evaluate trainee according to IFP Training certificate procedure

Assessment of achievements

- Trainees are assessed throughout the training through practical application phases and interactions with the trainer
- A final on-the-spot evaluation may also be carried out at the end of the course and/or at the end of each module using tests designed to verify the learners' understanding and assimilation of the knowledge linked to the training objectives

Prerequisites

No prerequisites are necessary to follow this course

Responsable

IFP Training instructors, with expertise in the field and trained in modern teaching methods adapted to the specific needs of learners from the professional world

Program

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MODULE 1: ELECTRICITY FUNDAMENTALS, PROCESS & SAFETY — 5 days

Electricity fundamentals. Voltage. Intensity. Power. Ohm law. Main characteristics of cables and wirings.
Process and electrical equipment: process constraints due to electrical power supply; introduction to electrical drawings.
Physics: pressure, force, temperature and electrical units used in Oil & Gas processes. Main physical parameters of high voltage cells.
Safety at work: general hazards and electrical risks in a petrochemical plant; electrical hazardous area; protections layers concept; work permit and prevention. Application on an electrical equipment maintenance.

MODULE 2: INDUSTRIAL ELECTRICITY BASIS - PLANT ELECTRICAL NETWORK & GRID — 5 days

Main parameters of an industrial electrical power supply. Electrical distribution drawings. Existing electric distribution diagram and grid. Wiring and connecting switchgear inside electrical cabinets. Replace/repair an equipment in a cabinet. Checks and inspection.
Practical works in a workshop according to available equipment.
Hazards: electrical shocks, direct and indirect contact, collective and personal protective equipment, hazardous areas.
Mini-study (1 day team work) for an assigned electrical system: detail specific hazards and barriers, critical process variables, critical pieces of equipment and critical operations.

MODULE 3: ELECTRICAL HAZARDS - ATEX - LOCKOUT/TAG-OUT PROCEDURES — 5 days

Electrical protection: electrical hazards for human body and material; equipotential connections, grounding protection. Fuses - Circuit breakers - Selectivity of protections: main techniques. Protection relays. LV & HV earthing system: protections and preventive measures. Reliability and safety.
Different voltage magnitude. Hazardous area and different electrical equipment installed in ATEX zones; maintenance constraints.
Electrical authorizations - Role and commitments related to work permits.
Lock Out & Tag Out rules before and after maintenance works. Case study and practical works on a switchgear.
Mini-study (1 day) for an assigned electrical substation: identify the grounding system & the possible existing defaults.

MODULE 4: ON THE JOB TRAINING 1 (ELECTRICAL NETWORK) — 5 days

OJT:

- Application of the previous module(s) content to the actual plant.
- According to a subject submitted by the lecturer, the trainees will be requested to prepare a written report and 20 minutes presentation about “Electrical Network”: safety (work permit, risk analysis, safeguards...); detailed network and grid; results analysis (accuracy, acceptance criteria...).
- The trainee will present its work to other trainees and lecturer during other modules.

MODULE 5: ELECTRICAL MAINTENANCE — 5 days

Electrical distribution monitoring: main, auxiliary and safety grid; inspection and failure detection systems; LV & HV cells (standards and technology); maintenance procedures.
Transformers: overall technology, troubleshooting, operating and maintenance procedures; winding connections.
Circuit breakers: technology and switchboard; maintenance, replacement and settings.
Practical works: racking-in/out procedures; main parameters of cables, switchboards, relays, diesel generators, batteries, chargers, UPS.
Steam/gas turbines generators: voltage control and excitation systems; impact of the generator coupling on the grid.
Application: electrical parts replacement and malfunction consequences.
Practical works: applications are performed on representative operating technical substation.

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MODULE 6: ELECTRICAL MOTORS (MAINTENANCE & INSPECTION) 5 days

Technology: working principle of an induction and synchronous motors; features (power, current, torque and power factors); protective modes vs. external environment (temperature classes, protection class index, hazardous area motors, main “EEx” protection); electrical and thermal protection.
Variable speed technology: motor power and network capacity, limiting conditions due to the grid; number of starts.
Control and repair techniques: bearings, lubrication control; main mechanical failures.
Coil insulation repairs: technology and quality; electrical tests (electrical resistance, insulation, polarization...).
Practical work: dismantling of a LV motor; inspection, electrical insulation checks; reassembly the motor.
Visit of a motor repair workshop (if possible): identification of main components on existing motor equipment.

MODULE 7: ON THE JOB TRAINING 2 & FINAL TEST (ELECTRICAL MAINTENANCE) 5 days

OJT (3 days)

- Application of the previous module(s) content to the actual plant. The subject is submitted by the lecturer.
- At the end of the OJT period, the trainees will be requested to prepare a written report and 20 minutes presentation about “Electrical Maintenance”: safety (work permit, risk analysis, safeguards...); topics studied during the previous modules; results analysis (accuracy, acceptance criteria...).

Final test (2 days)

- Presentation of OJTs to the classroom.
- Written test about all the training contents according to the IFP Training Certification procedure.

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Training - M&A in the Energy World

FAE-EN-P | Face-to-face only | 2 days

Current developments in the energy sector are expected to lead to a new wave of mergers and acquisitions (M&A). Traditional Oil & Gas players will have to adapt (or continue to adapt for the most advanced) their business portfolio to the energy transition, and also to meet the challenges of the recent health crisis. The growth of Renewable Energy could also lead to consolidation amongst the first entrants as the sector matures. The objective of this training is to enable participants to successfully manage their acquisition operations and/or asset sales so that they can best position themselves for the future

Level

Knowledge

Public

Oil & Gas, Renewables companies' commercial, technical, financial managers and support functions staff involved in external growth operations. Public administration decision makers and personnel (industry, finance, energy, environment)

Objectives

Attendees will be able to implement the following skills:

- Lead/contribute to an M&A project through a structured process
- Evaluate assets to buy or sell using different methods (e.g.: multiples, discounted cash flows)

Pedagogical & technical resources

- Exercises
- Analysis of recent transactions
- Case studies: setting the maximum purchase price
- Case study: Critical review of a sale and purchase contract clauses
- Quiz

Assessment of achievements

- Trainees are assessed throughout the training through practical application phases and interactions with the trainer
- A final on-the-spot evaluation may also be carried out at the end of the course and/or at the end of each module using tests designed to verify the learners' understanding and assimilation of the knowledge linked to the training objectives

Prerequisites

No prerequisites are necessary to follow this course

Responsable

IFP Training instructors, with expertise in the field and trained in modern teaching methods adapted to the specific needs of learners from the professional world

Program

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KEY STEPS & RISKS OF M&A TRANSACTIONS — 0.2 day

The various types of transactions: assets/equity.
The main stages of an acquisition/divestment project.
M&A transactions risks: key success factors.
Key participants in the process.

DETERMINING THE PURCHASE/SALE PRICE — 1 day

The different valuation methods: multiples (comparable transactions, EBITDA, PER), discounted cash flows.
Discounted cash flow method and analysis criteria refresher (NPV, IRR, Payback time). Calculating the residual value/terminal value.
Defining the maximum purchase price (or minimum sale price) taking into account synergies/di-synergies and risks.
Price adjustment options to manage uncertainties/close valuation gaps between buyer and seller.
Taking into account debt.

DUE DILIGENCE & DEAL STRUCTURING — 0.4 day

Preparing an information memorandum.
Risk management. The due diligence process and datarooms.
Choosing the legal and tax structure of the transaction.
Assessing the impact of competition laws.

NEGOTIATIONS & KEY CLAUSES OF SALE & PURCHASE AGREEMENTS — 0.4 day

Pros and cons of the various sale methods: auctions, negotiations.
Counterparties' assessment.
Conditions/ precedents.
Commitments and guarantees.
Completion adjustments.

Sessions

Rueil-Malmaison - From 09/08/2026 to 09/09/2026 — **1980 €/HT**

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Training - Economic and Financial Modelling of Renewable Energy Projects

MPER-EN-P | Face-to-face only | 3 days

This course provides a better understanding of the use of decision-making tools in the field of renewable energy projects and incorporate risk analysis in the economic & financial evaluation

Level

Skilled

Public

Economists, engineers and financial analysts concerned with decisions affecting medium and long-term cash flows, such as investment, disinvestment, acquisitions, who need to improve their understanding of the theory and practice of investment analysis in the renewable energy sector

Objectives

Attendees will be able to implement the following skills:

- To carry out investment profitability studies in renewable energy projects including all aspects of fiscal incentives, inflation, and financing up to the Levelized Cost Of Electricity (LCOE) evaluation
- To analyze the deterministic economic results and carry out sensitivity analysis
- To incorporate the risk and uncertainties in the economic evaluation of renewable projects

Pedagogical & technical resources

Case studies simulated on computers

Assessment of achievements

- Trainees are assessed throughout the training through practical application phases and interactions with the trainer
- A final on-the-spot evaluation may also be carried out at the end of the course and/or at the end of each module using tests designed to verify the learners' understanding and assimilation of the knowledge linked to the training objectives

Prerequisites

No prerequisites are necessary to follow this course

Responsable

IFP Training instructors, with expertise in the field and trained in modern teaching methods adapted to the specific needs of learners from the professional world

Program

ECONOMIC CRITERIA FOR DECISION MAKING — 1.5 days

Cost of capital and discount rate, value creation.
Economic criteria for project evaluation: net present value (NPV), internal rate of return (IRR), payback period, etc.
Methodology for assessing the global profitability of capital invested.
Impact of taxation and inflation on economic indicators.

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Choosing an investment program with a limited budget, scarcity cost of capital.
Case studies: solar photovoltaic & wind power plant projects

ECONOMIC COST ANALYSIS — 0.5 day

Accounting cost vs. economic cost. Total discounted cost, annual economic cost.
Unit economic cost analysis vs. Levelized cost of electricity (LCOE).
Optimal economic lifetime (average cost & marginal cost).
Cases studies: LCOE of power plants, definition of an optimal economic lifetime.

IMPACT OF FINANCING ON PROJECT ECONOMICS — 0.5 day

Financing of renewable energy projects (ring-fencing and SPV concept).
Project finance valuation for renewable energy projects.
Different financing plans and debt repayment.
Return on equity (IRR and NPV of equity) and financial leverage.
Determination of the optimal electricity tariff leading to project economics balance.
Case studies: Solar photovoltaic and wind farm projects with specific financing.

RISK ANALYSIS OF RENEWABLE ENERGY PROJECTS — 0.5 day

Overview of resource assessment in renewable projects (wind & solar).
Probabilistic distribution approach (statistical & seasonal analysis of production, P99, P90 & P50 statics).
Risk matrix, risk classification and strategies for risk mitigation.
Risk evaluation using break-even price and sensitivity analysis.
Risk analysis using spider and tornado diagram.

CASE STUDIES

Solar photovoltaic project.
Wind power plant project.
Equipment optimal economic lifetime.
Power plant project.

Sessions

Rueil-Malmaison - From 12/09/2026 to 12/11/2026 — **3380 €/HT**

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Training - Overview and Challenges of the Energy Mix

MXE-EN-P | Face-to-face only | 4 days

This course aims to provide an updated overview of the energy sector and the upcoming economic, political and environmental challenges (Covid-19, climate change, supply and demand crisis, unconventional Oil & Gas...). Participants will get a complete overview of both fossil fuels and renewable energy sources, with their respective benefits and burdens

Level

Knowledge

Public

Engineers from the energy sectors (oil, gas, renewables, power), industrial partners, executives (banking, insurance, consulting), public administration staff, PhD and postgraduate students

Objectives

Attendees will be able to implement the following skills:

- Describe the main stages (upstream, downstream, trading) of the oil and gas sectors and understand the technical and economic characteristics of hydrocarbons (production, outlets, availability, market)
- Analyze the advantages and disadvantages of each energy and interpret the evolution of factors affecting the supply and demand of the energy mix
- Identify the actors of the energy scene and their strategic lines (states, international organizations, public and private companies in the sector)
- Understand the role of renewable energies in the energy mix (maturity, intermittency, carbon footprint)

Pedagogical & technical resources

- Quiz and videos on the fundamentals of the energy sector
- Board game about the different steps of an oil or gas project
- Team game on the composition of the energy mix and the role of renewables
- Team game on factors affecting crude prices, the upstream sector and trading

Assessment of achievements

- Trainees are assessed throughout the training through practical application phases and interactions with the trainer
- A final on-the-spot evaluation may also be carried out at the end of the course and/or at the end of each module using tests designed to verify the learners' understanding and assimilation of the knowledge linked to the training objectives

Prerequisites

No prerequisites are necessary to follow this course

Responsable

IFP Training instructors, with expertise in the field and trained in modern teaching methods adapted to the specific needs of learners from the professional world

Program

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INTERNATIONAL ENERGY SCENE — 0.5 day

Energy resources: definition, characteristics, conversion factor.
Climate change & energy transition: supply/demand asymmetry, Kaya's identity analysis.
Short and long-term forecasts (Covid-19 crisis, supply situation, climate change) and IEA scenarios.

OIL SECTOR ISSUES — 1 day

Stakeholder's strategy: NOC, IOC, majors, international organizations.
Upstream: stages and technical-economic aspects of the Exploration-Production.
Oil contracts and principles of oil rent sharing.
Downstream: refining economics and margins, capacity and new projects.

GAS SECTOR ISSUES — 1 day

Structure of the gas value chain: production, treatment, transportation, storage.
Pros and cons: natural gas and LNG in the energy transition.
Markets & grids, introduction to gas contracts.
Focus on current trends: crisis, market, evolutions, technological breaks...

RENEWABLES ISSUES & ENERGY TRANSITION — 1 day

Overview of the main renewables: solar, wind, hydro, bio, geothermal.
Comparison and competition: outputs, costs, availability, pros, limits.
CCUS technology and use of renewables in the Oil & Gas sector.
Stakeholders' strategy and supply chain presentation.

CASE STUDIES — 0.5 day

Economic calculations on Oil & Gas and renewables projects.
Opex, capex, revenues, assumptions, taxable income, cash flows, IRR.

Sessions

Rueil-Malmaison - From 09/29/2026 to 10/02/2026 — **3360 €/HT**

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Training - Overview and challenges of renewable energies

PANENR-EN-P | Face-to-face only | 3 days

This training provides a global vision of renewable energies, their share in the European and global energy mix, as well as a technical and economic overview of the available solutions

Level

Awareness

Public

People interested in the energy transition, renewable energies and decarbonation issues

Objectives

Attendees will be able to implement the following skills:

- Briefly describe the techniques used in the different renewable energy production sectors
- List the main advantages and disadvantages of these production chains

Pedagogical & technical resources

- Provision of introductory material prior to the training course
- Sub-groups activities, business cases, educational games
- Illustration by concrete industrial cases and current events

Assessment of achievements

- Trainees are assessed throughout the training through practical application phases and interactions with the trainer
- A final on-the-spot evaluation may also be carried out at the end of the course and/or at the end of each module using tests designed to verify the learners' understanding and assimilation of the knowledge linked to the training objectives

Prerequisites

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Responsable

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Program

ENERGY TRANSITION AND CURRENT CONTEXT — 0.5 day

World energy scene: supply & demand, actors, findings and perspectives.
The place of renewable energy in the French, European and global energy mix.
Neutrality, budget and carbon bubble: commitments, constraints, risks and opportunities.
Energy & Climate: decarbonation and electrification.

SOLAR ENERGY — 0.5 day

Different production methods: thermodynamic, photovoltaic, thermal, passive.

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Technology and state of the art - Main production sites and current projects.
Main applications.
Cost of electricity production and GHG emissions during the life cycle.
Application: Sizing of a production plant.

WIND ENERGY — 0.5 day

Different production methods: Onshore – Offshore – Floating. Advantages and disadvantages.
Different types of wind turbines. Principle of operation.
Technology and state of the art - Distribution of production in the world.
Cost of electricity production and GHG emissions during the life cycle.
Application: Analysis of a production site.

BIOENERGIES — 0.5 day

Biomass, Biogas and Biofuels - Associated technologies and end uses.
Place of bioenergy in France and in Europe.
State of the art and main projects in progress.
Cost of electricity production.
Application : Production of biogas by methanization.

MARINES ENERGIES — 0.25 day

Main production methods: hydroelectricity, tidal, current, wave, osmotic.
Current state of art and main projects underway.
Cost of electricity production and life cycle GHG emissions.

GEOTHERMAL ENERGY — 0.25 day

Geothermal energy for power and heat production - Main technologies.
Advantages and disadvantages - Impact on the environment.
Integration with existing production sites.
Cost of electricity production and life cycle GHG emissions.

HYDROGEN INDUSTRY — 0.5 day

Hydrogen: an energy carrier.
The different colors of hydrogen depending on the production method.
End use of hydrogen. Constraints of use.
State of the art and main projects in progress.

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Training - Successfully Developing Renewable Projects

RPER-EN-P | Face-to-face only | 3 days

Limiting climate change requires a strong acceleration of the introduction of new Renewable energy production facilities. This training provides participants with a structured methodology to assess and develop renewables projects. The toolkit they will be given will enable them to overcome the potential difficulties of these to ensure their success, be it, for example, in terms of community engagement or financing

Level

Knowledge

Public

Business development staff & supporting functional staff, technical managers, new economists and finance staff of energy companies, investors, bankers, public decision makers promoting new energies (industry, finance, energy, environment)

Objectives

Attendees will be able to implement the following skills:

- set the different stages of the societal, commercial, economic and financial development of a renewable electricity wind, solar or battery project and list key contracts
- build an economic model of a wind or solar project and identify the risks
- manage stakeholders and evaluate possible financing options

Pedagogical & technical resources

- Exercises
- Case study: economic evaluation and financing of a renewables project
- Focus on solar, wind and batteries projects
- Examples from various countries

Assessment of achievements

- Trainees are assessed throughout the training through practical application phases and interactions with the trainer
- A final on-the-spot evaluation may also be carried out at the end of the course and/or at the end of each module using tests designed to verify the learners' understanding and assimilation of the knowledge linked to the training objectives

Prerequisites

No prerequisites are necessary to follow this course

Responsable

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Program

GOVERNANCE/PROJECT MANAGEMENT — 0.25 day

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Introduction. Summary review of electricity market supply and demand and the competitive environment.
Key players and key steps of a renewables project.

MARKET ACCESS — 1 day

Route to market : auctions, Purchasing Power Agreements, the various typical contracts required in a renewables project.
Optimization, intermittency of variable renewables, batteries, hybrid projects.
Partnering.
Risk management: Pestel analysis, sensitivities, scenarios.
Stakeholder management.

BUSINESS CASE ASSESSMENT — 1 day

Cost of capital and discounted cash flow methodology.
Assessing revenues, costs and investments.
Building up future cash flows taking into account taxes and inflation.
Economic indicators calculation (NPV, IRR, Payback Time, economic cost).

FINANCING — 0.75 day

The various sources of financing (in particular Project Financing, Green Bonds).
Prerequisites: “bankability”.
Shareholder profitability analysis (geared economics).

Sessions

Rueil-Malmaison -	From 04/21/2026 to 04/23/2026	**2970 €/HT**
Rueil-Malmaison -	From 10/06/2026 to 10/08/2026	**2970 €/HT**

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Training - Developing a low Carbon Strategy: From Carbon Footprint Measurement to transition Plan

SBC-EN-P | Face-to-face only | 3 days

Since the Paris Agreement, countries have agreed on a global warming threshold that should not exceed 2°C above 1850 levels by 2100. This implies, first and foremost, reducing anthropogenic GHG emissions, which governments are translating into their own legislation. Companies must therefore transform and act to measure their carbon footprint and build a robust climate strategy

Level

Knowledge

Public

Anyone wishing to discover and/or deepen their knowledge of GHG emissions quantification and reporting methods (GHG Protocol, Bilan Carbone®, ISO 14064/69).
This course is aimed at: company and engineering office staff working as HSE or CSR coordinators, project managers & consultants on sustainability

Objectives

Attendees will be able to implement the following skills:

- Master the main principles of a carbon footprint assessment.
- Differentiate between the different available national & international standards for carrying out your company's carbon footprint (GHG Protocol, Bilan Carbone®, ISO 14064/69).
- Identify the key stages following the completion of a carbon footprint (emissions reduction target, action plan, integration into low-carbon strategy .... etc.).

Pedagogical & technical resources

- Quiz.
- Case studies.

Assessment of achievements

- Trainees are assessed throughout the training through practical application phases and interactions with the trainer
- A final on-the-spot evaluation may also be carried out at the end of the course and/or at the end of each module using tests designed to verify the learners' understanding and assimilation of the knowledge linked to the training objectives

Prerequisites

Basic knowledge on climate change and MS Office Excel.

Responsable

IFP Training instructors, with expertise in the field and trained in modern teaching methods adapted to the specific needs of learners from the professional world

Program

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WHY TAKE THE DECARBONIZATION ROUTE — 0.5 day

Identify the causes and consequences of climate change.
Understand the nature of climate change.
Climate change and its impact on business.
Identify the challenges raised by the energy transition.

KEY STEPS IN A CARBON FOOTPRINT ASSESSMENT — 1 day

Identify regulatory requirements for carbon footprint.
Carbon accounting standards (GHG Protocol, Bilan Carbone®, ISO 14064/69).
Describe the objectives of a carbon footprint.
Identify the scope of the carbon footprint (organizational, operational and temporal).
Drawing up flow maps.
Data collection and processing.
Handling carbon footprint measurement units.
Interpreting the results of a simple carbon footprint case study.
List existing reporting formats for publishing carbon inventory.
Case study: Evaluating a company's GHG emissions according to carbon accounting standards.

HOW TO SET A GHG REDUCTION TARGETS — 0.5 day

Identify the steps that follow a carbon footprint (emission reduction target, action plan, contribution to carbon sequestration, etc.).
Define the notion of carbon neutrality within the SBTi framework (Science Based Target Initiative).
Setting a science-based GHG reduction targets (commitment timeframe and scope).
Examples of targets setting according to SBTi standards (Absolute Approach ACA and Sector Approach SDA).

HOW TO BUILD A LOW CARBON ROADMAP — 0.5 day

Diagnose the risks and opportunities of the ecological transition.
Diagnose physical risks.
Define a strategy and an ecological transition project.

SETTING A TRANSITION PLAN — 0.5 day

Identification of potential actions to implement the strategic plan.
Selection of the most relevant set of actions for implementation.
Identify the levers for actions within the company, depending on its structure and sector.
Monitoring and guiding the implementation of the action plan.
Case studies: Building a company's transition plan according to international standards.

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Training - Electricity Trading

TDE-EN-P | Face-to-face only | 1 day

This course provides an understanding of risk management in the various electricity trading activities

Level
Skilled

Public
Executives, engineers and managers concerned with risk management tools in electricity markets

Objectives
Attendees will be able to implement the following skills:

- Assess the threats associated with each phase of electricity marketing and implement control measures.

Pedagogical & technical resources
Case studies.

Assessment of achievements

- Trainees are assessed throughout the training through practical application phases and interactions with the trainer
- A final on-the-spot evaluation may also be carried out at the end of the course and/or at the end of each module using tests designed to verify the learners' understanding and assimilation of the knowledge linked to the training objectives

Prerequisites
No prerequisites are necessary to follow this course

Responsable
IFP Training instructors, with expertise in the field and trained in modern teaching methods adapted to the specific needs of learners from the professional world

Program

ELECTRICITY MARKETS — 0.5 day

Production methods.
Players in the sector.
Products and markets.
Characteristics of the physical market.

RISK MANAGEMENT IN ELECTRICITY MARKETS — 0.5 day

The basics of risk management.
Risk typologies.
Value at Risk (VaR).
Hedging and modelling.
Calculating sensitivities on the electricity market.
Calculating V@R on the contract using Monte Carlo and parametric methods.

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Sessions

Rueil-Malmaison - 04/24/2026 **1680 €/HT**

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Training - Natural Gas and Electricity Trading

TEG-EN-P | Face-to-face only | 2 days

This training provides participants a global and synthetic view on the risk management of the various trading activities of gas and electricity

Level
Skilled

Public
All managers who need to learn the ways of managing risk in the market of natural gas and electricity

Objectives
Attendees will be able to implement the following skills:

- Understand gas and electricity trading operations and effectively use the various hedging tools in the face of financial risks
- Implement control measures, including market risk and credit risk

Pedagogical & technical resources
Case studies and examples

Assessment of achievements

- Trainees are assessed throughout the training through practical application phases and interactions with the trainer
- A final on-the-spot evaluation may also be carried out at the end of the course and/or at the end of each module using tests designed to verify the learners' understanding and assimilation of the knowledge linked to the training objectives

Prerequisites
No prerequisites are necessary to follow this course

Responsable
IFP Training instructors, with expertise in the field and trained in modern teaching methods adapted to the specific needs of learners from the professional world

Program

MARKETS — 0.5 day

Main features of gas and electricity markets.

RISK MANAGEMENT — 0.5 day

Basic statistics.
Risk typologies:

- Credit risk.
- Market risk.
- Operational risk.

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Value at risk.

HEDGING & MODELING — 0.5 day

Nature.
Products:

- Futures, forwards, swaps, options.

CASE STUDIES — 0.5 day

Compute sensitivities on a gas procurement contract.
Compute the V@R of the contract using Monte Carlo and parametric methods.

Sessions

Rueil-Malmaison - From 09/22/2026 to 09/23/2026 — **2560 €/HT**

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Training - Industrial wind turbines

WT-EN-P

Face-to-face only

4 days

This course improves knowledge of industrial wind turbines operation, maintenance, engineering and installation

Level

Skilled

Public

Engineers, supervisors and technicians involved in wind turbine operation, maintenance or engineering.

Objectives

Attendees will be able to implement the following skills:

- Explain wind condition impact on wind turbine operation and performance
- Explain the standard power control modes
- Explain typical incidents and key points for wind turbine operation
- Explain critical maintenance tasks
- Explain how to install a wind turbine

Pedagogical & technical resources

- Interactive course
- Use of drawings, datasheets, pictures and videos of actual equipment
- Wind farm visit (according to availabilitie

Assessment of achievements

- Trainees are assessed throughout the training through practical application phases and interactions with the trainer
- A final on-the-spot evaluation may also be carried out at the end of the course and/or at the end of each module using tests designed to verify the learners' understanding and assimilation of the knowledge linked to the training objectives

Prerequisites

Provide evidence of minimum 1 month of experience within the relevant domain.

Responsable

IFP Training instructors, with expertise in the field and trained in modern teaching methods adapted to the specific needs of learners from the professional world

Program

WIND TURBINE AERODYNAMICS — 1 day

Wind turbines types, selection principles.
Site wind energy deposit assessement: principles.
Blade aerodynamics: lift, drag, resulting torque.

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Wind turbine aerodynamics: output mechanical power, BETZ limit, power coefficient, wind turbine power curve. Wake effect.
Exercises: wind turbine installation study.

WIND TURBINE TECHNOLOGY — 1 day

Main parts of a wind turbine.
Mechanical parts: main technologies and components: hub and blades, nacelle, bearings, gearbox (if any), disc brake, pitch control, Yaw, generator flexible coupling, foundations (onshore).
Electrical parts: main generator arrangements and technologies, power management and conversion.
Instrumentation: vibrations, meteorological station, aviation lightening, oil circuit, electrical and mechanicalm data with associated alarms and safety thresholds.
Auxiliaries: lubrication and cooling.
Exercises: parts identification on machines views.

WIND TURBINE OPERATION — 1 day

Part and full load control. Overspeed.
Production vs demand adaptation: principles.
Routine maintenance. Key points to survey. Monitoring.
Service factor, annual production, yearly hours at normal power, availability. Overall efficiency.
Typical incidents.
Wind farm visit (according to availabilities).

WIND TURBINE MAINTENANCE — 0.5 day

Convenient maintenance policies.
Incident statistics.
Specific tools – spare parts management.
Main site maintenance tasks.

WIND TURBINE INSTALLATION — 0.5 day

Onshore wind turbines: construction allowance: typical procedure. Technical studies to achieve (noise, shadowing...).
Wind farm arrangement key points. Wind turbine construction key points.
Offshore wind turbines: main construction and installation schemes.

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