Power Generation Development & Energy Management

Overview

LEVEL
Knowledge

PURPOSE
This training provides an understanding of the chronology of the development and the management of a power generation fleet of assets, based on the energy strategy of the country, its economic environment and the technical and financial criterion of the power plants installed.

LEARNING OBJECTIVES
Upon completion of the course, participants will be able to:
- identify the needs of an energy producing country,
- define and compare energy resources,
- evaluate and arbitrate the technological choices of electricity production,
- explain energy supply and electricity sales contracts,
- explain the EPC and operation & maintenance contracts for the means of energy production,
- structure the development and management of a portfolio of electrical generation assets.

WAYS AND MEANS
- Quiz about the different resources and means of energy production.
- Case study on the optimal choice of the electricity production technology.
- Case study on the structuring of a power generation project proposal
- Case study on a power plant portfolio management

LEARNING ASSESSMENT
Participants will be evaluated during the training through quizzes and case studies.

PREREQUISITES
Basic notions of Microsoft Excel.

Agenda

OVERVIEW OF ENERGY RESOURCES
Fossils and renewable primary energy resources: definitions, characteristics and prices.
Global electricity resources: definitions, origins.

ELECTRICITY PRODUCTION
Power generation: principle, pros & cons.
Electricity network: interconnection and electricity market.
Power plant technologies: description and benchmark of the different technologies of nuclear, thermal, combined cycle, renewables & hydro, hybrids and gas to power solutions (FSRP, network extension).
Technical presentations: fuel supply, advantages/drawbacks/risks, CAPEX, OPEX and project overview.
Impact of the CO2: regulations, quota systems, prices.
ECONOMICS CRITERIA: LCOE
Reminder of economic criterion.
Levelized Cost Of Energy (LCOE): definition and mechanism.
Example and benchmark of different projects.

PROJECT DEVELOPMENT STRATEGY: DECISION CRITERION
Needs of an industrial company.
Needs of an electricity supplier.
Decision criterion.
Case study: a case study on the optimal choice of the electricity production technology according to the political, technical and financial environment considered.

PROJECT DEVELOPMENT
Project management and organization: invitation to tender, organization and planning, selection of suppliers, chronology of the development and construction phases, cost structuring and financing.
Contractual structuring: fuel supply contract, electricity sales contract, operating and maintenance structure.
Case study: exercise on the structuring of a power generation project proposal.

POWER GENERATION & ASSET MANAGEMENT
Introduction to energy portfolio management and price risk.
Operational excellence: asset management, operation and maintenance optimization, local and corporate management.
Case study: exercise and simulation of power generation portfolio management.