

Gas Valorization

Production & Utilization of Syngas

3 days

SYNGASE-EN-P

Overview

LEVEL

Awareness

PURPOSE

This course provides a technical and economic information regarding the various options for valorizing gas.

LEARNING OBJECTIVES

Upon completion of the course, participants will be able to:
grasp the essence of gas markets, including natural gas and syngas (CO + H₂),
understand the importance of syngas: production modes and valorization channels,
learn about the various technologies and their conditions of implementation,
learn about the latest projects under consideration.

WAYS AND MEANS

Industry experts share their views of current developments.

LEARNING ASSESSMENT

Quiz.

PREREQUISITES

No prerequisites for this course.

Agenda

NATURAL GAS

1 d

Natural gas reserves, conventional or non-conventional.
Production, consumption and trade, utilization of natural gas worldwide.
Field treatment, production and by-products (ethane, LPG's, condensates).
Different ways for gas transportation: pipelines, LNG shipping...
Quality specifications for commercial natural gas.
Valorization of natural gas: as fuel (domestic or industrial uses), generation of other energy types (electrical, cogeneration), car-fuel (CNG, GTL), chemical valorization.

SYNGAS PRODUCTION

1 d

Composition and feedstocks (natural gas, hydrocarbons, coal).
Different modes of syngas production: steam reforming, partial oxidation (POx), autothermal reforming.
Gas production from biomass: advantages, yields, constraints. Example of a biorefinery.

SYNGAS VALORIZATION

0.5 d

Maximization of hydrogen production in the refineries through the shift reaction.
Chemical synthesis: production of alcohol like Methanol, Ammonia and other chemical compounds.

GTL Complex (Gas-To-Liquid): production of liquid hydrocarbons from gas through Fischer Tropsch reaction.

Coal gasification.

Electrical energy production, steam and hydrogen for refining industry: IGCC (Integrated Gasification Combined Cycle).

ECONOMIC ASPECTS OF GAS VALORIZATION

0.5 d

Investment (Capex), operating costs (Opex), costs for raw materials.

Marketing advantages, environment issues.

Example: comparison of GTL with LNG.

Strategies of different actors: production countries of natural gas, licensors, oil or gas trusts, engineering companies.