

Number of ECTS credits : 2
Course language : Anglais
Course leader : GUYOT ALEXIS

≡ COURSE DESCRIPTION

The course focuses on economics and management signposts of the energy industry to explore and understand possible trajectories and the key drivers of the current transformation.

The course encompasses analysis of: supply and demand global balances and outlooks, energy value chains, price discovery mechanisms, main players actions, renewable energy evolution/disruption, electricity industry digitalization, environmental/climate policies and carbon markets.

Every energy segments (oil, natural gas, coal, nuclear, electricity and renewables) are reviewed under the lenses of energy transition.

≡ COURSE OBJECTIVES

Students will be able to:

- Find, identify and prioritize noteworthy information on energy and climate change issues
- Recognize the main factors affecting the global climate system and their interactions with the energy sector
- Assess the techno-economic issues of energy production and consumption.

≡ LEARNING OBJECTIVES

C4B learning goal	LG4 - CSR			
C4B learning objective	LO10 - Identify and understand stakeholder interests			
Outcomes	Lev. 2 - Categorize the relevant stakeholders and explain their interests			
Details	• Recognize the main factors affecting the global climate system and their interactions with the energy sector • Assess the techno-economic issues of energy production and consumption.			
Non-acquired (< 50% of total score)	Developing (50% ≥ 60% of total score)	Acquired (60% ≥ 70% of total score)	Advanced (70% ≥ 80% of total score)	Expertise (80% ≥ 100% of total score)
Final quizz				

≡ TACKLED CONCEPTS

The course will give students an understanding of:

- Global energy outlooks assumptions, usages and limits
- Oil and natural gas value chains, market structures and its fundamental characteristics, costs, contracts and pricing, both upstream and downstream.
- Fundamentals of power generation and recent transformation trends
- Environment issues economic treatment, climate governance, carbon emission management and related energy policies
- Energy transition challenges and key drivers: evolution or disruption?

≡ LEARNING METHODS

The methodologies used in the course will include PPT lectures and exercises.

≡ EXPECTED WORK AND EVALUATION

In class exercises and case studies

≡ BIBLIOGRAPHY

v IEA World Energy Outlook and various outlooks

BP Statistical Review of World Energy

Various websites on energy and climate

Clean disruption of Energy and Transportation, Tony Seba, 2014

Rothwell G. and T. Gomez, 2002. Electricity Economics: Regulation and Deregulation

Stoft S, 2002. Power System Economics. Wiley-IEEE press.

IPCC Assessment Report

≡ EVALUATION METHODS

≡ SESSIONS

1 Oil and gas fundamentals

LECTURE : 03h00

- Oil value chain (production, refining, distribution), price discovery, main players strategy, geopolitics, ...)
- Natural gas value chain (production, refining, distribution), price discovery, main players strategy, geopolitics, ...)
- Transformative features

2 Electricity fundamentals & Markets

LECTURE : 03h00

- Power generation means
- Electricity chain structure
- Electricity market organization

3 Electricity industry digitalization and renewables

LECTURE : 03h00

- Digitalization & smart grids
- Renewable sources & technologies
- Costs analysis & projects evaluation

4 Environment, climate and energy

LECTURE : 03h00

- Fundamentals of climate science
- Climate negotiations and policy analysis
- Introduction to carbon pricing