

Energy policy and management

Lecturers

Pierre HENNEAUX (Coordinator), Adel EL Gammal and Benjamin GENET

Course mnemonic

GEST-H506

ECTS credits

5 credits

Language(s) of instruction

English

Course period

First and second terms

Campus

Solbosch

Course content

This course includes two parts: the part "Geopolitics of Energy" taught by Prof. El Gammal with the participation of 3 other lecturers, and the part "Electricity Markets", taught by Prof. Genêt and Prof. Henneaux (also with the participation of 3 other lecturers).

The course presents the basis of energy related politics and how geopolitics of energy constitute the cornerstone of understanding international developments and news.

The part "Geopolitics of Energy" illustrates the central role of energy resources in the development of relations between nations. It presents a historical analysis illustrating how "security of supply" has conditioned international relations to date. It will then describe how, global warming, and the subsequent required energy transition, and its implications on the projected gradual decay of fossil resources, fundamentally reshuffles the maps of energy and the stakes conditioning relations between nations at the global level. It concludes by introducing the main socio-economic reference scenarios (IPCC, IEA, etc.) and their respective projected implications over the coming decades.

The part "Electricity Markets" provides basic notions about power system economics, fundamentals about electricity market arrangements (mainly the energy market but also some considerations on ancillary services), and a description of the current European electricity market.

Objectives (and/or specific learning outcomes)

Part 1: Geopolitics of Energy

Understand how geopolitics of energy constitute an essential key to understanding international political and economic news, while assimilating the fundamental elements of the energy debate in

the context of sustainable development, and in particular of global warming and the energy transition.

Part 2: Electricity markets

Understand the specificities of the electric power market, what part is a natural monopoly, what part is a market, how is it regulated, what are the interaction with the security of operation, how to manage the network in this context.

Pre-requisites and co-requisites

Pre-requisites courses

ELEC-H413 | Electric Power Systems I | 5 crédits

Teaching method and learning activities

Part 1: Geopolitics of Energy

Ex cathedra course (24h)

Part 2: Electricity markets

Ex cathedra course (12h) - Seminars (2 x 3h) - Report on a subject linked to the course by group of 2 students (20 pages max + appendix)

Contribution to the teaching profile

- > Develop sense of critical and independent analysis of news, based on a holistic assessment of multiple and diverse sources of information
- > Initiation to « complex thinking » and in particular development of multi-disciplinary and multi-criteria analysis capabilities.
- > Raise awareness about the entanglement of technical, economical, legal, regulatory and political aspects (including politics!)

References, bibliography and recommended reading

- > IPCC AR5 (2014) & AR6 (2021-2022)
- > IEA, Special Flagship Report, Net Zero by 2050 (2021)
- > "Fundamentals of power System Economics", Daniel Kirschen et Goran Strbac, Wiley, (2004), 284 p.
- > "Power System Economics - Designing Markets for Electricity", Steven Stoft, IEEE/ Wiley & Sons (2002), 468 p.

Course notes

Université virtuelle

Other information

Place(s) of teaching

Solbosch

Contact(s)

M. Pierre HENNEAUX pierre.henneaux@ulb.be

M. Adel EL GAMMAL

M. Benjamin GENÉT, benjamin.genet@ulb.be

Evaluation method(s)

Oral examination and Project

Evaluation method(s) (additional information)

Part1 "Geopolitics of Energy" : Evaluation of a report related to a predefined question related to the course (50%) and oral exam (50%) or oral exam (100%)

Part 2 "Electricity Markets": Report on a topic linked to the course (50%) and oral exam (50%).

Determination of the mark (including the weighting of partial marks)

50% for Part 1 "Geopolitics of Energy"

50% for Part 2 "Electricity Markets"

Main language(s) of evaluation

English

Programmes

Programmes proposing this course at the Brussels School of Engineering

MA-IREM | **Master of science in Electromechanical Engineering** | finalité Professional/unit 2 and finalité Operations engineering and management/unit 2

