

# Economics of energy and climate policies (ECON752\_SOLEM )



## En bref

- **Langues d'enseignement:** Anglais
- **Méthodes d'enseignement:** Hybride
- **Forme d'enseignement :** Cours magistral
- **Ouvert aux étudiants en échange:** Oui

## Présentation

### Description

- Mandatory - 1st semester - 2 Ects
- **Student workload :** Lecture (CM): 21, 40 hours of self-study
- **Module examination :** 1 written exam (50%), 1 individual oral presentation (30%), Readings (20%)
- **Teaching and learning method:** seminar, case studies, discussion
- **Applicability:** Solem course only

**Responsible person for the module :** Tunç Durmaz

### Objectifs

Major intended learning outcomes

Students will use insights and tools from economics to understand and evaluate energy issues and climate change problems, associated developments, and policies upon completing the module. In particular, the students will:

- Identify the policy instruments for a future with decarbonized energy generation and understand how energy policy can steer the economy towards this goal;

- Learn Levelized cost of energy, which is a widely used as a comparative measure between alternative sources of energy for evaluating policy decisions;
- Identify renewable support policies, including price- and quantity-based policies, and how they can affect LCOEs of different energy generating technologies;
- Identify which environmental policy (e.g., price-based or quantity-based policy) instrument to use under uncertainty;
- Understand the possible impacts of climate change and energy policies on the economy, including but not limited to electricity prices, energy transition, and baseload power generators;
- Apprehend that the world's major environmental and natural resource management problems arise from interactions between economic agents, resulting, for example, in highly challenging negotiations about decreasing carbon dioxide emissions;
- Apply game theory to understand the governments' interactions when forging self-enforcing treaties affecting their economic welfare and environment.

#### Correspondence between major intended learning outcomes and assessment:

| Assessment<br>Tasks/<br>Activities      | CILO No. |   |   |   |     |   | Weighting* | Remarks |
|-----------------------------------------|----------|---|---|---|-----|---|------------|---------|
|                                         | 1        | 2 | 3 | 4 | ... | 8 |            |         |
| Continuous Assessment: 40%              |          |   |   |   |     |   |            |         |
| Homework<br>problems                    | ü        | ü | ü | ü | ü   | ü | 20%        |         |
| Readings                                | ü        | ü | ü | ü | ü   | ü | 20%        |         |
| Examination: 60%                        |          |   |   |   |     |   |            |         |
| * The weightings should add up to 100%. |          |   |   |   |     |   | 100%       |         |

## Heures d'enseignement

Economics of energy and climate policies - CM

Cours Magistral

21h

## Pré-requis obligatoires

The student is referred to the "Content of the module" section below

## Plan du cours

1. Energy and the Environment (HSW: Chapter 15; Tol: Chapter 2 – 1/2 Lecture)
  1. a. Energy demand/production and greenhouse gas emissions
  - b. Energy transition from fossil fuels to renewable energy sources (RES): an overview
  - c. Trends in CO2 emissions and the KAYA identity
  - d. Options for emissions reductions

## 2. The Decarbonization Challenge (1 Lecture)

a. Policy instruments to address decarbonization of energy (Léautier: Chapter 8.1-8.3; HOR: 13-14)

b. 1. i. Carbon pricing

ii. Research and Development Policies

iii. Policies to support near-future technologies

3. Renewable Energy Sources (RES) and Electricity Production (CF: Chapter 25; Léautier: Chapter 8.1-8.3 – 1 Lecture)

1. a. Levelized cost of electricity

b. RES support policies

i. Price-based support policies Feed-in tariffs, feed-in premiums, net metering, fiscal, and investment incentives

ii. Quantity-based support policies : Renewable portfolio standards / (Competitive) Auctions

iii. Complementary power sector policies (HOR: Chapter 4-5) : grid flexibility, performance-based regulation, competitive power markets, orderly retirements of power plants, de-risking renewable projects

c. Other) impacts of RES support policies (Léautier: Chapter 8.3.3; CF: Chapter 24.5)

4. Climate Policy: Conflict and cooperation (HSW: Chapter 8 – 3/2 Lecture)

a. Introduction to game theory

b. The challenge of coordination: a simple model of common grazing

c. Self-governance: escaping the tragedy of the commons

d. Co-operative games: Effective international environmental agreements

e. Transboundary pollution control (Kolstad: Chapter 19-III)

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## Bibliographie

- Kolstad, C. (2011). Intermediate environmental economics: International edition. #OUP Catalogue.
- (CF) Creti and Fontini, 2019: Economics of electricity - Markets, competition and rules, Cambridge University Press
- Léautier, T. O. (2019). #Imperfect markets and imperfect regulation: An introduction to the microeconomics and political economy of power markets. MIT Press.
- (HOR) Harvey, H., Orvis, R., & Rissman, J. (2018). Designing climate solutions: a policy guide for low-carbon energy. Island Press.
- Tol, R. S. (2019). Climate economics: economic analysis of climate, climate change and climate policy. Edward Elgar Publishing.

**Libellé court :** ECON752\_SOLEM

**Nature :** EC

## Infos pratiques

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### Lieux

➤ Le Bourget-du-Lac (73)

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## Campus

➤ Le Bourget-du-Lac / campus Savoie Technolac

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## Contacts

Responsable du cours

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