

**3 ECTS****Course language: English****≡ DESCRIPTION**

Almost every day, you hear that climate is changing due to huge CO2 emissions resulting from human industrial activities, and that is absolutely necessary to switch rapidly to decarbonized energies. That's what we call Energy Transition. But at the same time, other people say that solar energy is too expensive, that wind turbines are destroying landscapes and killing birds and bats, that nuclear energy is dangerous... If you want to understand the current debate on energy transition, how to choose the best technologies, how the main actors of the energy sectors are preparing new and innovative solutions, this elective is for you.

Furthermore, it will show you that whatever your future specialization will be (physics, engineering, finance, project management, human sciences, lawyer...), it will be possible for you to play a part in preparing this energy transition since all the problems to solve are requiring a multidisciplinary approach.

**≡ COURSE OBJECTIVES**

- Understand fundamentals of climate change and its main contributors
- Understand the influence of energy sector in the Green-House Gases (GHG) emissions
- Acquire a 360-degree view of the possible solutions for the Energy Transition, adapted to the various geopolitical backgrounds
- Understand who decides and who influences the choices for the Energy Transition
- Identify the key success factors to develop and implement the required solutions
- Imagine what could be your own contribution to the Energy Transition whatever your specialty is.

**≡ LEARNING OBJECTIVES**

<b>Learning goals C4B</b>	LG1 - Analyse
<b>Learning objectives C4B</b>	LO3 - Adopter des approches transversales
<b>Outcomes</b>	Niv. 1 - Identifier et interpréter des savoirs issus de divers champs disciplinaires
<b>Learning goals C4B</b>	LG4 - RSO
<b>Learning objectives C4B</b>	LO12 - Arbitrer en fonction des considérations économiques, sociétales et environnementales
<b>Outcomes</b>	Niv. 1 - Identifier et interpréter les lois, réglementations et normes internationales s'appliquant à son activité en matière de RSO et développement durable

**≡ CONCEPTS**

- Green House Gases: what is it ? why they change the climate
- Geopolitical landscape of energy
- Decarbonized energy technologies
- The actors of the Energy Transition
- How to change behaviors to accelerate the Energy Transition?
- Financing the Energy Transition

**≡ PEDAGOGICAL APPROACH**

Lectures, videos, business case studies, personal and group research, role play

## EVALUATION

Participation in working groups and case studies  
Personal participation, working groups deliverables

## SESSIONS

### 1 Lectures COURS : 04h00

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The impacts on the planet of human activities; Green House Gases (GES): what is it ? where they come from ; why they change the climate. How to decrease these emissions; the importance of the Energy Transition to decrease GES emissions. The 17 sustainable development Goals (SDG) of the United Nations. The roles of the different stakeholders to reach the goals. The Paris agreement on climate.

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### 2 Lectures & working groups COURS + TP : 04h00

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Geopolitical landscape of energy: presentation of the energy mix on the 5 continents; example of several countries: energy strategies, decarbonization goals, will they be sufficient to reach Paris agreement objectives?

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### 3 Lectures COURS + TP : 04h00

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Panorama of the main technologies for the Energy Transition. Advantages and limits of each technology. Why innovation is still necessary. Examples

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### 4 Working groups TRAVAIL INDIVIDUEL OU EN GROUPE : 04h00

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The actor of the Energy Transition: energy companies, GAFA, automotive companies, manufacturers, start-ups, governments, supra-national organizations, finance, public and private research center. Role and limits of each type of actor. Why subsidies are necessary, what are their limit ?

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### 5 Quiz & roleplay SIMULATION / JEUX DE RÔLES : 04h00

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How to change behaviors to accelerate the Energy Transition? The eco-gestures and their impacts; how to decrease energy needs? Towards a more frugal economy?

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### 6 Press review & working groups COURS + TP : 04h00

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Financing the Energy Transition: the development of green finance, the role of shareholders, the opportunity of the European Green Deal, the role of lobbies (consumers, NGO, politicians...).

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