

EFS9AE STRATEGIC ANALYSIS OF ENERGY INDUSTRIES AND ENVIRONMENT

EFS9AE Strategic Analysis of Energy Industries and Environment		ECTS Credits : 2 Duration : 21 hours	Semester : S9
Person(s) in charge : Dr. Philippe SESSIECQ, associate professor , philippe.sessiecq@mines-nancy.univ-lorraine.fr ,			
Keywords : Life cycle analysis, environmental impacts, optimization			
Prerequisites : second year courses of the department			
Objective : Comparative analysis of the energy industries : costs, impacts, optimization			
<p>The goal of this module is to present the current energy debate by a multidisciplinary approach. A comparative analysis of energy systems will take into account technical and environmental aspects. Viewed from various angles, this module aims to give some elements about the following issues : What types of energies for now and the future, which ones are sustainable? How and in what conditions can we define the optimal choices? By studying these questions we will have the opportunity to examine or re-examine the technology of the different systems concerned. These being coal, oil, gas, biomass, nuclear, solar, hydroelectric, wind and hydrogen (with fuel cell applications).</p> <p>Content</p> <ul style="list-style-type: none"> Life Cycle Analysis : <ul style="list-style-type: none"> Moving from Carbon Footprint methodology to "Life Cycle Assessment" Introduction to Carbon Footprint and ACV (GaBi4 software) Description of energy systems and evaluation of their impact using ACV (using GaBi4 software) <p>application to different energy systems : coal, oil, gas, biomass, nuclear, solar, hydroelectric, wind and hydrogen.</p> <p>This course is complemented by lectures at Mines ParisTech (Sophia Antipolis) on Energetic strategies</p> <p>Forecasting and context</p> <p>History of the contribution of long-term forecasting models in the climate debate.</p> <p>The MARKAL-TIMES model, developed with the IEA as a prototype forecasting and modeling tool which follows the principle of optimality.</p> <p>Application : energy and climate strategies, consequences of the Kyoto Protocol, CO2 quotas.</p>			
Abilities :			
Levels		Description and operational vocabulary	
Know		The sector of primary energy production and conversion. The prospective approach and the global context of the energy field. The principles of prospective modelling	
Understand		The principle of Life Cycle Analysis and the link with prospective modelling	
Apply		the methods to build energy and climate strategies	
Analyse		Compare various energy sectors considering technical and environmental aspects	
Summarise		Choose mid-term and long-term prospective approaches for energetic scenarii	
Assess			

Evaluation :

☐ Written test

☒ Continuous Control

☒ Oral report

☒ Project

☒ Written report