CAREER PROSPECTS

All sectors must consider the developments related to the energy transition as well as environmental restrictions. Companies of every size are concerned, from major industrial groups to SMEs/ SMIs, SOHOs and Start-ups and offer positions dedicated to energy efficiency and Sustainable Development issues.

There are many opportunities in the Energy and Environment fields: the positions are more conceptual in applied research or in an engineering office and more "field oriented" in systems maintenance and operation and are sometimes economy or strategy minded.

TARGETED POSITIONS

- Design engineer
- Research engineer
- Project Manager
- Business engineer
- Project lead
- Consultant
- Operations and maintenance Manager

FIELDS

- Nuclear industry
- Energy conversion
- Waste (collection, sorting, burning, recycling)
- Various industrial sectors
- Land use Planning
- Corporate social responsibility
- Rehabilitation of industrial sites
- Wastewater and sewage treatment, clean-up, decontamination
- Renewable energy
- Energy management

PROJECTS

A project is carried out each academic semester, in collaboration with a company. **It is used as a guideline for the whole semester, enables the implementation of many courses** and is chosen in line with the selected CUs.

A few examples of projects carried out:

- **Kynarou**: proposal for a drinking water supply chain in India (water hardness treatment);
- **GREnADE**: development of an intelligent tool for controlling the remote irrigation;
- **GENSUN**: comparative analysis of the performance of photovoltaic fields between the design and operation phases
- **FARMEX**: design of a positive energy water treatment plant in order to facilitate access to drinking water in sub-Saharan Africa
- **SEGULA TECHNOLOGIES**: Study on potential environmental impacts following the installation and operation of floating photovoltaic power plants (FPV) on impoudment lakes upstream of a hydroelectric dam in France.
- **VH93**: Development of a Savonius rotor tidal turbine for electricity production in small streams (finite element modeling and 3D printing).

ANY **QUESTIONS**?

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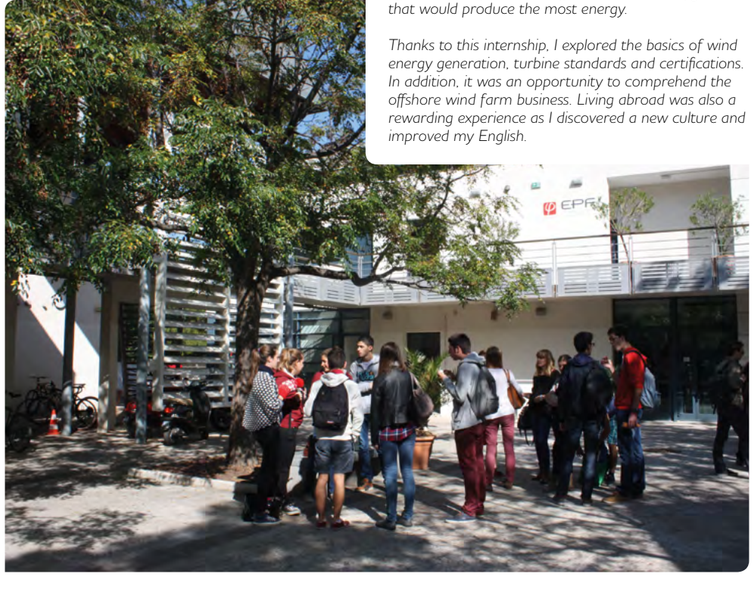
For further information please check the "Application process for international students" section on our website www.epf.fr/en



Lara MOUHADJER
Wind & Site Assessment Engineer
Senvion France (Class of 2016)

I was convinced by the general nature of this major. It's still very much a technical and engineering major as it includes environmental diagnosis, pollution modelling in rivers and soil and decontamination solutions. But is also covers legal aspects (environmental law) and management (risk management and local management).

***I carried out my student engineer internship at Areva Wind in Bremen, Germany**. Our team work was to provide technical support to sales offers. I had to assess the annual energy output of future European offshore wind farms and offer the turbine configuration that would produce the most energy.*

Thanks to this internship, I explored the basics of wind energy generation, turbine standards and certifications. In addition, it was an opportunity to comprehend the offshore wind farm business. Living abroad was also a rewarding experience as I discovered a new culture and improved my English.

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SMART SYSTEMS

CIRCULAR ECONOMY
ENERGY EFFICIENCY

RENEWABLE ENERGY
DIGITAL

ENERGY & ENVIRONMENT MAJOR

SENSOR

ENVIRONMENTAL TRANSITION
ENERGY AND MATERIALS RECOVERY

PROGRAM **AIMS**

The aim of this major is **to train flexible and adaptable engineers**, able to solve new industrial issues relating to the ecological transition.

An emphasis is placed on the importance of digital transformation in this ecological transition.

At the end of this major, graduates acquire a set of scientific, technical and management skills based on:

- **An industrial approach** to production processes and energy systems
- The issues relating to electricity, hydraulic and gas transport and distribution networks
- **Political, economic, geopolitical and regulatory aspects** in the energy and environment fields
- **Mineral and energy resource management issues including extraction**, operation, industrial production, industrial ecology, life-cycle analysis and recovery techniques for energy and materials.

PROGRAM **STRUCTURE**

The major extends over two academic years and is organised around **two in-class semesters**, alternating with **two internship semesters**. Year 4 includes 4 compulsory course units (CUs) and 2 elective CUs to be chosen among 4, and Year 5 includes 3 compulsory CUs and 3electives CUs among 5.

The fact that a CUs is elective means that students can chose according to their preferences and career path and thus:

- **Orient their program** towards the energy, environment and/or digital fields by choosing specific CUs;
- **Maintain a very broad view of these interconnected fields by choosing CUs from all three fields**.

Some elective CUs are offered in English, in French or in both. Some CUs are offered over two semesters in identical forms and cannot be chosen twice.

The maximum capacity of a CU is 36 students. In the event of more, CUs will be duplicated. Under 12 students, the elective CUs will not be opened.

COMPULSORY CUs – **YEAR 4**

COURSE UNIT	
Land management I 63 h I 5 ECTS	
Sustainable development and lands Hydraulic, electric and thermal grid Geopolitics	Understanding and knowledge of land and environmental flows.
Digital I 63 h I 5 ECTS	
Geographic information modeling Data science and smart systems English	Managing, processing and modeling data.
Renewable energy I 63 h I 5 ECTS	
Electricty production Heat and cold production	Developing and implementing systems based on renewable energy for energy and power production ...
Project I 63 h I 5 ECTS	

ELECTIVE CUs – **YEAR 4** - 2 to be chosen

COURSE UNIT	
Environmental science I 63 h I 5 ECTS	
Rehabilitation of industrial sites Soil science Climate science	Distribution of the impacts of human activities on the environment.
Nuclear Energy I 63 h I 5 ECTS	
Basic element of nuclear Safety & dismantling Radioactive waste management	Understanding the specificities of nuclear energy.
Sustainable building I 63 h I 5 ECTS	
LCA Dynamic thermal simulation Exploitation	Mixed approach (environment and energy) around the new buildings.
Water management I 66 h I 5 ECTS	
Water science Water quality and treatment Water reuse	Management of water resources.

COMPULSORY CUs – **YEAR 5**

COURSE UNIT	
Circular economy I 63 h I 5 ECTS	
Materials, eco-design, life cycle analysis New business models Waste management and recycling	Understanding the components of the circular economy.
Corporate relations I 63 h I 5 ECTS	
Professional communication Labour law and industrial security Tendering Technical visits	Preparing for working in a professional environment.
Project I 45 h I 5 ECTS	

ELECTIVE CUs – **YEAR 5** - 2 to be chosen

COURSE UNIT	
Innovation & ecological transition I 63 h I 5 ECTS	
Mineral resources and material recovery Bioprocesses	Understanding ecological transition and associated innovation needs.
Energy* I 63 h I 5 ECTS	
Energy Energy efficiency Energy storage	Design, develop and optimize energy installations.
Smart Systems I 60 h I 5 ECTS	
Smartcity & Mobility Smartgrid et Blockchain Smartwater	Understand the major issues related to smart systems and related services.
Complex thermal models** I 68 h I 5 ECTS	
Heat Transfers and Digital Tools Inverse Methods and Mathematical Tools for the Engineer	R & D, the CU aims to deepen knowledge in Engineering Sciences.
Water management I 66 h I 5 ECTS	
Water science Water quality and treatment Water reuse	Management of water resources.

* Smartsystems course is the logical following of the energy course and is only accessible to students who have followed this course unit.
** Complex thermal models is a research-oriented course, accessible to students also following the energy course.