

Renewable Energies



Component

École Nationale
Supérieure
d'Électrotechnique
d'Électronique
d'Informatique
d'Hydraulique
et des
Télécommunications

In brief

- **Ametys Code:** N8AE15B
- **Open to exchange students:** No

Presentation

Objectives

- Discover the two renewable electricity generation technologies, photovoltaic and wind. Learn to size various photovoltaic plants (self-consumption, carport, ground-mounted plants). Equipment selection. Cost evaluation, profitability, IRR.
- Introduce the first elements of wind turbine chain design based on their size and technology

Description

- This course presents the techno-economic aspects of photovoltaics and wind energy.
- Photovoltaics: from the photovoltaic cell to the system, solar radiation, photovoltaic conversion, photovoltaic panels, power plants, cost, environmental impact.
- Wind energy: Characterization of the wind resource, altitude and wake effects, theoretical elements (Betz limit) on wind power output and the energy efficiency of wind turbines; from mechanical control through blade adjustment to operating zones from start-up to safe shutdown.
- Construction of electrical wind turbines: nacelles with and without gearboxes.

Pre-requisites

None