FIELD OF STUDY

AGRICULTURE - ENVIRONMENT

RÉPUBLIQUE FRANÇAISE
Liberté
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CAMPUS FRANCE

Renewable Energy

- **72%** increase of primary production of renewable energies since 2005 in France (2021)
- **19.3%** share of renewable energies in France's total energy consumption (2021)
- **500 million** euros of investment in renewable energies, in particular to improve current technology in on- and offshore wind, and photovoltaic

Sources :
www.statistiques.developpement-durable.gouv.fr
www.ecologique-solidaire.gouv.fr

Renewable forms of energy, already a major research focus in France, include bioenergy, geothermal energy, thermodynamic heating, solar energy (thermal, photovoltaic, concentration), wind energy, hydroelectric and marine energy, and hydrogen-based generation.

Beneficial to the environment, renewable energy comes from a variety of sources: the sun, wind, water and geothermal energy, as well as wood, crop residues, biogas, biofuels, urban and industrial waste, and heat pumps. In order to protect the environment and to mitigate climate change, carbon-free sources of energy and sustainable development are now priority research areas.

The goal is to ensure greater energy efficiency by developing clean technologies and alternatives to technologies that depend on fossil fuels. Renewable energy development seeks to ensure high output and low emissions.

Students may begin studying some aspects of renewable energy in their first years of higher education. However, at the Master level, students decide to specialize in engineering (systems, energy efficiency, etc.), physics (electricity, materials, etc.), or chemistry. Sustainable development is a component of programs in management and the environment.

International

France is rich in renewable energy sources. It has Europe's fourth largest forest area after Sweden, Finland, and Spain (source: Food and Agricultural Organization of the United Nations). In terms of absolute levels of production, France ranks second in solid biomass, hydropower, biofuels, renewable wastes, and geothermal power.

From 1990 to 2020, renewable energy grew by 84% in mainland France. The share of renewable energy in total final energy consumption was 19.1% in 2020.

In accordance with the 'France 2030' Investment Plan, €500 million will be invested in renewable energy, particularly to improve on- and offshore wind, solar photovoltaic, and other current technologies.

RELATED FIELDS

• Earth and space sciences • Ecology • Energy • Environmental science • Life Sciences and Health • Marine Science • Physics • Public health • Transportation • Urban Planning

SUBFIELDS

• Bioenergy • Biomass
• Carbon-free energy
• Energy efficiency
• Energy transition
• Geothermal energy
• Hydraulics
• Marine energy
• Photovoltaic energy
• Solar energy
• Wind energy • Wood

Useful links

- Agence de l'environnement et de la maîtrise de l'énergie (ADEME): **www.ademe.fr**
- Alliance nationale de coordination de la recherche pour l'énergie (ANCRE): **www.allianceenergie.fr**
- Association savoyarde pour le Développement des énergies renouvelables (ASDER): **www.asder.asso.fr**
- Réseau pour la transition énergétique (CLER): **www.cler.org**
- Commissariat à l'énergie atomique et aux énergies alternatives (CEA): **www.cea.fr**
- Écosources, a portal with data on renewable energies: **www.ecosources.org**
- EDF renewables: **www.edf-renouvelables.com/en/**
- FRANCE, Key figures on renewable energy: **www.statistiques.developpement-durable.gouv.fr**
- FRANCE, Ministry for Ecological Transition: **www.ecologie.gouv.fr**
- Grenelle de l'environnement: **https://grenelleenvironnement.fr**
- Groupe Énergies Renouvelables, Environnement et Solidarités (GERES): **www.geres.eu**
- Observatoire des énergies renouvelables (Observ'ER): **www.energies-renouvelables.org**
- Planète énergies, an online encyclopedia: **www.planete-energies.com**
- Syndicat des Énergies Renouvelables (SER): **www.enr.fr**

LEVEL Licence

BREVET DE TECHNICIEN SUPÉRIEUR (BTS)

NATIONAL DIPLOMA – 2 YEARS OF HIGHER EDUCATION – L2
120 ECTS credits

The **BTS in fluid, energy, and household automation** is offered with three options:
> climate and fluid engineering
> cooling and air conditioning
> household automation and adjoining buildings

www.campusfrance.org >Resources center >Panorama of Higher Education and Research in France >Degrees >The *Brevet de Technicien Supérieur* (BTS)

PROFESSIONAL LICENCE

NATIONAL DIPLOMA – 3 YEARS OF HIGHER EDUCATION – L3
180 ECTS credits

Several available concentrations are relevant to renewable energy:

- Management and maintenance of energy facilities, track in Maintenance and operation of renewable energy equipment
- Control of energy, electricity, and sustainable development, with the following tracks: Renewable and electrical energy control; Renewable energy and energy control; Renewable and alternative energy systems; Management of projects in electrical and renewable energy, Technical coordination for the optimization of renewable energy; Renewable energy and electricity management; Sciences and technologies of renewable sources of energy; Control of energy and renewable energy; Renewable energy and energy efficiency
- Control of electricity and energy, with tracks as Assistant and Technical Adviser for Renewable Electrical Energy
- Occupations in Energy, environment, and climate engineering, with the following tracks: Eco-management of renewable energy; Electrical energy and the environment; Renewable energy; Energy efficiency and renewable energy for sustainable buildings; Climate engineering, renewable energy, and energy efficiency; Energy control and renewable energy; Occupations in Renewable energy (production, exploitation, maintenance); Heat systems, energy efficiency and renewable energy; Cooling technologies and renewable energy; Exploitation of renewable energy and the energy transition.

The **Bachelor Universitaire de Technologie (B.U.T.)** offers the following specializations: civil engineering and sustainable construction; occupations in the energy transition and energy efficiency.

www.campusfrance.org > Students > Studying in France > Find your program

LEVEL Master

Renewable Energy

MASTER

NATIONAL DIPLOMA – 5 YEARS OF HIGHER EDUCATION – M2
120 ECTS credits

Master's level concentrations and tracks related to renewable energy include the following:

- Automation and electrical systems, track in Electrical energy and sustainable development
- Chemistry and materials sciences, track in Materials for new energy technologies
- Law-related tracks: Law and the management of energy and sustainable development; Natural resources and renewable energy law
- Economics of the environment, energy, and transportation, tracks in Management of sustainable development projects in ocean energy settings; Economics of energy and sustainable development
- Electronics, electrical energy, and automated systems, tracks in Coastal eco-engineering; intelligence and energy measures for new forms of energy
- Energy and heat, track in Renewable energy strategy and operations
- Energy tracks: Energy choices for a decarbonized future; Energy, ecology, and society; Fluids for sustainable energy; Heat engineering and energy; Thermal engineering; Sustainable energy engineering; Energy management in tropical island settings; Management of renewable energy networks; Energy management, sources, storage and conversion; Solar energy materials and processes; Energy physics and the energy transition; Processes, renewable energy, and geosciences; Heat sciences
- Civil engineering, track in Construction engineering (Management and integration of energy efficiency and renewable energy)
- Process and bioprocess engineering, track in Energy process engineering
- Geoenergy, track in Geosciences
- Environmental management, renewable energy track
- Physics, tracks in Applied physics of renewable energy; New energy technologies; Basic and applied physics (energy physics and the energy transition)
- Environmental risk (environmental engineering and new forms of energy; Energy transition (integrating renewable energy in island settings)
- Materials sciences, tracks in Advanced energy materials; New and renewable energy
- Earth and planetary sciences, tracks in energy geosciences; eco-construction
- Materials sciences and engineering, track in Materials for renewable sources of energy

Programs Taught in English: Clean and Renewable Energy; Electrical Energy for Sustainable Development; Renewable Energy; Renewable Energy & Civil Engineering
https://taughtie.campusfrance.org

Engineering schools also propose Master's programs with various concentrations and tracks:

- Chemistry, tracks in Chemistry and materials sciences for energy and sustainable development; Green chemistry
- Electronics, electrical energy, and automation, track in Electrical energy (conversion, materials, sustainable development)
- Energy, track in Durability of energy materials and structures

Programs Taught in English: Biomass and Waste for Energy and Materials; Electrical Energy for Sustainable Development; Energy for Solar Buildings and Cities; Energy & Sustainable Cities; Hydraulic and Civil Engineering; Smart Energy; Solar Energy
https://taughtie.campusfrance.org

TITRE D'INGÉNIEUR DIPLÔMÉ (ENGINEERING DEGREE)

MASTER LEVEL – 5 YEARS OF HIGHER EDUCATION – M2
120 ECTS credits

French engineering schools offer Engineering and Master's degrees accredited by the CTI (*Commission des Titres d'Ingénieur*). Several specializations are available: Construction and energy; Energy Engineering and Environment; Urban Engineering; Energy; Energy and Environment; Geosciences and Environment; Heat Energy.

List of accredited engineering programs:
www.cti-commission.fr/accreditation

LEVEL

Beyond the Master level

DIPLÔME PROPRE AUX ÉCOLES D'ARCHITECTURE (DPEA)

INSTITUTION DIPLOMA – 1 OR 2 YEARS OF HIGHER EDUCATION

DPEA Architecture Post-Carbone:
https://paris-est.archi.fr/formations/post-master/dpea-post-carbone

MASTÈRE SPÉCIALISÉ®(MS)

INSTITUTION DIPLOMA - 1 YEAR OF HIGHER EDUCATION

Labeled by the *Conférence des Grandes Écoles* (CGE), the *Mastère Spécialisé* enables students to earn an institutional credential attesting to dual competence in various specializations:
Energy transition professional; energy efficiency and the environment; renewable energy; renewable energy technologies and entrepreneurship; renewable energy production systems; energy management; expert in sea-based renewable energy; international energy management (energy alternatives of the future); management of the energy transition; new energy management; new energy technologies; regional energy and environmental transitions.

www.campusfrance.org > Resource center > Panorama of Higher Education and Research in France > Degrees > Mastère spécialisé® programs

List of MS programs:
www.cge.asso.fr/formations-labellisees/liste-formation-ms

ECTS: European Credit Transfer System