

Job offer :

## Postdoctoral Fellowship:

# Resilient Energy Management Systems for PV-based Agrivoltaic Microgrids



### PRESENTATION OF THE INSTITUTION

**Position:** Post-Doctoral  
Position on Electrical  
Engineering and Control

**Location:** ESTIA Campus,  
Technopole Izarbel,  
Bidart

**Remuneration:** set  
according to the  
candidate's experience

**Expected start date:**  
January 2026

**Contract duration:** 24  
month fixed-term  
research

ESTIA (<http://www.estia.fr>) is built around three core missions: education, research and technology transfer, and entrepreneurship, supported by its incubator and technology park.

The school trains versatile, trilingual engineers in fields such as energy, embedded systems, mechanics, information technology, organizational management, and industrial engineering. Affiliated with the University of Bordeaux, ESTIA is a member of the Conférence des Grandes Écoles and accredited by the Commission des Titres de l'Ingénieur (CTI). Its academic programs include a CTI-accredited Bachelor of Technology, an Engineering Preparatory Cycle, and a range of specialized Master's degrees.

Beyond its educational programs, ESTIA drives innovation through its multidisciplinary research laboratory, ESTIA-Recherche, coordinating national and European projects in collaboration with industrial partners. It leads fundamental and applied research initiatives, as well as expertise and consulting services. Its research chairs help sustain strong, lasting partnerships between industry and academia.

To support and expand its collaborative activities, ESTIA relies on ESTIA-Tech and the specialized technology platforms: COMPOSITADOUR, ENERGEA, PEPSS, ADDIMADOUR, TURBOLAB, DATALAB, and CETIA.

**As part of developing its research and training activities, ESTIA Institute of Technology is looking for a Postdoctoral Fellowship: Resilient Energy Management Systems for PV-based Agrivoltaic Microgrids**

**Keywords:** Agrivoltaic Microgrids, Renewable energies, Optimization, Supervision, Flexibility, Resilience.

### CONTEXT

This postdoctoral position is part of the Interreg Sudoe-funded AgroSQL project, which unites partners from Spain, France, and Portugal. Its core mission is to develop and implement innovative agrivoltaic production models that enhance the sustainability and economic viability of small and medium-sized farms, while strengthening the resilience of rural areas in Southern Europe.

The successful candidate will focus on designing smart agrivoltaic production models and advanced Energy Management Systems tailored for small and medium-sized farms. She/he will join the Renewable Energy Integration (IEnR) team at ESTIA-Research and may also contribute to teaching activities within the engineering program.

## RESEARCH OBJECTIVES

This postdoctoral project aims to develop and deploy intelligent agrivoltaic production models, enhancing the sustainability and resilience of small and medium-sized farms amid energy and climate challenges. A central focus will be the integration of renewable energy from agrivoltaic systems into a hybrid microgrid, optimized in real time by an advanced Energy Management System (EMS). The EMS will dynamically balance key parameters—photovoltaic output, farm energy demand, meteorological conditions (solar irradiance, temperature, humidity), soil moisture, and crop-specific energy requirements—using ESTIA’s ENERGEA platform for both simulation and experimental validation. Additionally, the project will explore hydrogen-based energy storage through ESTIA’s French pilot site, evaluating the technical and economic feasibility of local energy autonomy. This includes assessing electrolyzer performance, hydrogen compression and storage, and conversion efficiency for diverse applications, from farm electricity needs to shared uses like powering agricultural machinery and integrating hydrogen into local value chains. Ultimately, this research seeks to validate flexible, resilient, and scalable solutions—designed for agricultural settings but adaptable to broader contexts.

## Key Responsibilities

- Collecting baseline data from agrivoltaic and renewable sources and defining technical requirements for microgrid EMS and hydrogen storage.
- Developing AI-based predictive models (energy, weather, crop growth) and designing an optimized EMS architecture, including hydrogen storage scenarios.
- Simulating renewable integration and hydrogen storage performance using the ENERGEA platform.
- Testing the EMS at a French pilot site and assessing its technical, economic, and environmental impacts.

The selected candidate will work at **ESTIA-Recherche** and have access to the **EneR-GEA platform**, a cutting-edge **modular electrical micro-grid** that integrates diverse energy sources, storage systems, and power converters. This setup, including a building micro-grid demonstrator, enables realistic, lab-scale experimentation for advanced research.

## REQUIRED SKILLS:

Candidates must have completed a PhD in in Control/Electric Engineering, Energy Systems, or a related field, with a focus on renewable energy, hydrogen technologies, or smart grids.

The following skills will be highly appreciated:

- Linear and nonlinear control & Modelling and simulation of dynamic systems.
- Renewable energy, electrical networks, energy management optimization and flexibility.
- Artificial Intelligence knowledge.
- Matlab/Simulink and real-time simulation tools.
- Good English level.

## Application procedures:

Recruitment will begin on 1 November 2025 and continue until the position is filled. Interested candidates should submit a detailed CV, a cover letter, and the names and email addresses of three referees who can provide letters of recommendation. Any supporting evidence of skills or experience gained in previous roles should also be included. Applications should be sent to Isabelle ERRECARRET, [i.errecarret@estia.fr](mailto:i.errecarret@estia.fr), +33 559.43.84.14.

**Administrative contact :** Isabelle ERRECARRET, [i.errecarret@estia.fr](mailto:i.errecarret@estia.fr)

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General presentation of the ESTIA 2024-2025: <https://www.youtube.com/watch?v=C9ahm5mKwmw>