



## Call for candidates for a Ph.D. Student position at GEP

REF. G2308

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**Reference:** G2308

**Research Activities:** Electrical Engineering – Smart Grids/Microgrids

**Department:** Electrical and PV Systems Department/Smart Grids Group

**Candidate:** Ph.D. Student

**Topic:** Application of Artificial Intelligence for the planning and optimization of water-energy-food (WEF) microgrids.

**Location:** Green Energy Park, Benguerir

**Duration:** 24 months

**Eligibility:** Enrolled in the first or second year of a doctoral thesis at a National University

### DESCRIPTION

As part of the Long-term Europe-Africa Partnership on Renewable Energy (LEAP-RE) programme co-funded by the European Union (EU) under Horizon 2020, and under the project named “**Optimizing Integrated mini grids for water-energy-food (OPTiMG)**”, 1 funded Ph.D. position in the Smart Grids Group is open.

The project OPTiMG aims at promoting the use of decentralized renewable energy and storage technologies for sustainable development via understanding the Water-Energy-Food (WEF) Systems in the African context.

The proposed solution combines different **Renewable Energy** technologies, such as photovoltaics, wind turbines, hydropower, and biogas plants, **Storage Systems** such as batteries, hydrogen, or water tanks, and **Productive Uses** such as water pumping, water treatment, irrigation, cold storage, and agricultural processing. All this, via developing smart control systems in order to promote and to facilitate the demand assessment and design optimization for WEF microgrids on the local level.

The outcomes of the project will be reached via the following innovations:

- Technologies and use cases for integrated microgrids (iMGs) and WEF systems.
- Development of demand modeling tools and capacities for iMGs and WEF systems.
- Development of optimization tools for WEF supply.
- Application of the tools and demonstration along with different use cases.

### ROLE OF Ph.D. STUDENT

During her/his journey in GEP, the PhD student will have to perform the following tasks:

- **Literature review and problem identification:** this task involves a comprehensive literature review to understand the existing research on AI applications for WEF microgrids.
- **Data collection and analysis:** In this task, the Ph.D. Student is responsible for collecting relevant data related to iMGs and WEF systems. These data will provide



insights into the dynamics and interdependencies within the microgrid systems, forming the bases for AI modeling and optimization.

- **AI Model Development:** This task involves the development of an AI model and algorithms to address specific challenges in planning and optimizing WEF microgrids.
- **Model Implementation and validation:** the model developed will be tested and validated in a software platform and simulations to simulate the behavior of the WEF microgrid system.
- **Optimization and Decision Support:** this task introduces the application of the developed AI model to optimize the planning and decision-making processes within the WEF microgrid system.
- **Deliverables, monitoring, and progress report:** The Ph.D. Student is required to document the research findings, methodologies, and analysis in the form of technical reports, research papers.

## REQUIREMENTS

The candidate must have an **Engineering** or **Master degree** in **Electrical Engineering**, with advanced skills in **Electrical Grids**, and extensive knowledge in **Smart Grids, Microgrids, and Artificial intelligence**. We are looking for an autonomous student capable of innovation and initiative, wishing to work on a multidisciplinary research project:

- Consciousness of the new challenges in Electrical Grids and excellent knowledge in recent advances in Smart & Microgrids fields.
- Strong background in Artificial Intelligence and Machine Learning.
- Knowledge of WEF systems and microgrid.
- Mathematical and Optimization skills.
- Strong problem-solving abilities.
- Passion for Sustainable Development.
- Good level in English and French, creative spirit, and autonomy.
- Strong interest in interdisciplinary research.

The candidate should send the following documents to [laamim@greenenergypark.ma](mailto:laamim@greenenergypark.ma) or [contact@greenenergypark.ma](mailto:contact@greenenergypark.ma)

- A curriculum vitae
- Copies of university degrees
- doctorate registration certificate
- A research proposal linked to the project description and to one of the issue areas of the call (2000 words, containing an explanation of topic, Scientific background of candidate, Methodology for completion of research proposal)
- Letter of recommendation by the PhD supervisor professor.