
CALL FOR APPLICATIONS (2nd BATCH)
WITH
(FULL SCHOLARSHIP AVAILABLE)

2023 Admissions into International Master's Programme in Energy and Green Hydrogen Technology (IMP-EGH)
Major: Bioenergy/Biofuels and Green Hydrogen Technology

1. Background

The West African Science Service Centre on Climate Change and Adapted Land Use (WASCAL) under the sponsorship of the German Federal Ministry of Education and Research (BMBF) is pleased to announce application for its **International Master Program in Energy and Green Hydrogen (IMP-EGH)** in all fifteen (15) ECOWAS countries partners namely: Benin, Burkina Faso, Cabo-Verde, Côte d'Ivoire, Gambia, Ghana, Guinea Conakry, Guinea Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo.

WASCAL is a wholly West African international organization with focus on academic and transdisciplinary research, building graduate-level scientific capacity and serving policy makers in West Africa with science-based advice on adaptation to climate change impacts and land use management. It cooperates with many agencies and universities in the region, providing a knowledge platform of excellence for its partners. WASCAL is funded by BMBF, multilateral and bilateral partners and its West African member countries.

The Interdisciplinary Master Program in Energy and Green Hydrogen (IMP-EGH) is innovative for the West African region, and it is designed to prepare the next generation to address the energy challenges of adaptation and resilience to climate change in West Africa. The program interdisciplinary approach will allow a better understanding of present-day energy infrastructures in West Africa, their strength and weaknesses, energy policies, practices in a changing climate context and the search for sustainable solutions.

Energy is a major issue in the world. More than 80% of the energy comes from fossil fuels, a finite resource unevenly distributed beneath the Earth's surface. Thus, reserves of fossil fuels are progressively decreasing, and their continued usage produce harmful pollutants and greenhouse gases (GHGs) associated with global warming and climate change. Furthermore, energy is a basic necessity for human activity, economy and social development.

In its Fourth Assessment Report, the Intergovernmental Panel for Climate Change (IPCC, 2014) has confirmed that climate change is real, and Africa is "one of the most vulnerable continents to climate change and climate variability". The continent's vulnerability is exacerbated, by endemic poverty, economical and institutional weakness, and limited access of technological and energy infrastructures. Thus, Africa needs more energy for its ongoing development despite the vulnerability to climate change.

Moreover, the region continues to face several critical challenges related to its energy sector such as energy access, energy security and unsustainable use of wood resources. The main challenge remains how to satisfy the increasing energy demand without exacerbating observed social, economic, and environmental problems caused by climate change. This international Master's Programme in Energy and Green Hydrogen (IMP-EGH) Major: **Bioenergy/Biofuels and Green Hydrogen Technology** led by Université de Lomé (UL) in Togo and implemented in collaboration with Juelich and Aachen and other renowned African, German, and other international universities and institutions, aims at offering top-ranking students an integrated learning environment to develop skills to be qualified as Renewable Energy and Green Hydrogen specialists.

Therefore, UL is launching the second call for Application of the International Master's Programme in **Energy and Green Hydrogen** (IMP-EGH): Major: **Bioenergy/Biofuels and Green Hydrogen Technology** for the academic year 2023-2024. The programme of the IMP-EGH provides full scholarship to successful candidates from ECOWAS member countries: Benin, Burkina Faso, Cabo Verde, Cote d'Ivoire, the Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo. Potential candidates from these countries are invited to submit their applications for selection.

2. Mission

The mission of this programme is to provide training on state-of-the-art tools used in renewable energy, **Bioenergy/Biofuels and Green Hydrogen Technology** with the view of forming adequate human resources to boost the sector of energy technology and guide policy formulation across the West African region.

3. Objectives

a) General objective

The main objective of this Master's Programme is to prepare and train a new generation of interdisciplinary professionals capable of proposing adapted solutions to ongoing energy crisis and appropriate solutions to climate change.

b) Learning outcomes

Upon completion of their studies, graduates are expected to:

- demonstrate an understanding of the science related to a changing climate and global warming, knowledge of the impacts of climate change, vulnerability of natural systems and the built environment, and methods for adaptation;
- develop a comprehension of energy production, delivery, and consumption for both traditional systems and sustainable energy alternatives with special emphasis on energy efficiency, energy management and local available renewable energy;
- and particularly apply bioenergy and Hydrogen technologies in sustainable renewable energy sector.

4. Job opportunities

Graduates of the International Program Master in Energy and Green Hydrogen will be able to work in the following sectors:

1. national and international government agencies, research institutions, extractives and mining industries, energy intensive industries, transport companies, production, storage and distribution of biofuels and hydrogen or alternative energy of the future
2. environmental consulting companies, national and international NGOs interested in environmental and energy issues.
3. sizing, installation and maintenance companies for photovoltaic systems associated with hydrogen storage and hydrogen fuel companies
4. adaptation to climate change in Africa in relation to the exploitation and consumption of energy resources
5. planning and management of energy and renewable energy policies in the context of climate change
6. entrepreneurship by creating its own business in the renewable energy sectors, self-employment through bioenergy production startup

Graduates with high research capacities will also be able to integrate into a relevant PhD program.

5. Eligibility criteria

The IMP-EGH Major **Bioenergy/Biofuels and Green Hydrogen Technology** is opened to excellent students with a bachelor (Licence in French) in scientific or engineering disciplines with at least a Mention “Assez-bien” or Second Class Upper or equivalent. Candidates with strong technical and theoretical background in Chemistry, Physics, Mechanical/Electrical/Electrical Engineering are preferred.

Requirements of candidates to the program:

- i. Completed application form;
- ii. Be citizen of one of the ECOWAS member countries: Benin, Burkina Faso, Cabo Verde, Cote d’Ivoire, the Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo;
- iii. Submit a letter of motivation (2 pages maximum: Why you want to study Climate Change and Energy, Why you are well-suited for this programme, How this program will fit into your professional vision, How your home country and west-Africa stand to benefit after your training, any other relevant information and/or experience);
- iv. Provide all certified transcripts and certified copies of all diplomas (from baccalaureate to bachelor), and others relevant documents
- v. Provide two (2) letters of recommendation from references,
- vi. Provide a detailed Curriculum Vitae,
- vii. Provide Two recent passport-sized photographs
- viii. Provide the fee-paying proof (scholarship award, etc.),
- ix. Evidence of current and previous employments (if applicable)
- x. Francophone candidates must have an intermediate level of English (see Language section below).
- xi. Selected candidates are required to have a valid passport for travelling in the ECOWAS member countries and abroad.

6. Outline of the program

The International Master Programme in Energy and Green Hydrogen is a well-structured programme consisting of three (3) semesters of taught courses, laboratory activities, field visits and interactive activities with stakeholders and one (1) semester intended to the student field work, thesis research, final write up and defense.

6.1. Training

The training includes modules divided into semesters and specified in the following way:

Semesters	Courses	Credits
Semester 1 in Niger	Physics of solids and fluids	5
	Semiconductor, electrical and electronic engineering	6
	Thermodynamics	6
	Electrochemistry	6
	Atmospheric Sciences	4
	Climate Change and sustainable development	3
Semester 2 in Niger	Conventional energy and Energy security	3
	Renewable Energy	6
	Green Hydrogen	6
	Renewable energy (RE) Technologies and Applications	6
	Energy systems and infrastructure	6
	Energy Policy and Market	3
Semester 3 (Specialization) in Togo Bioenergy/Biofuels and Green Hydrogen Technology	Biomass to Energy	5
	Green H ₂ production technologies from wastes/biofuels	6
	System engineering for H ₂ production from biomass - management and optimization of H ₂ production systems	4
	H ₂ utilization, storage and transport	3
	Safety and security of H ₂ production systems and utilization	3
	Economic of H ₂ production technologies from wastes/biofuel Techno-economic and life cycle analysis of biomass to Hydrogen- Case studies	3
	Fundamental of scientific and research methodology	6

Semesters	Courses	Credits
Semester 4	Internship in Germany (4-6 months) Master thesis defense in Lomé	

6.2. Research Activities

Phase I: Writing and validation of the research project

Phase II: Field study

Phase III: Internship in Germany

Phase IV: Final writing of the Master Thesis

Phase V: Master Thesis defense and graduation in Université de Lomé.

7. Working Language

The International Master Programme in Green Hydrogen is a structured Master with English as language of instruction. Candidate must have a background in English which could allow them to follow the programmed classes. To improve language skills: English language courses will be offered by WASCAL to selected Francophone students at the University of Cape Coast (Ghana), to help them meet entry requirement. Anglophone students will also be given the opportunity to take French language courses at Université de Lomé (Togo). The Language Course is geared towards fostering future professional communication, collaboration, negotiations and friendships between the French and English-speaking students.

8. Application procedures

- a) Application Form duly filled, scanned, and sent to required address (see section 13);
- b) Curriculum Vitae signed with information about relevant experience and professional training;
- c) Cover letter;
- d) Two (2) reference letters, one of whom should preferably be from the undergraduate lecturer in the equivalent science discipline or in engineering; preferably one letter from an academic, and one from a former employer to precise the availability of the candidate for the all period of the master programme. Reference letters must be written in English or French and must be signed / stamped;
- e) Passport copy or national identification card and;
- f) Certified copies of diplomas and all the academic transcripts (Baccalaureate or Senior High School Diploma to Bachelor's Degree).

9. Selection procedures

- Only short-listed candidates will be notified for interviews.

- Interviews will be done in English by a committee.
- Final selection: one student per country will be selected for **Bioenergy/biofuels and Green Hydrogen Technology**.
- A scholarship letter will be sent to the selected candidate by WASCAL Headquarters.

10. Duration

- Duration of the IMP-EGH is up to 28 months including 4 months' language training in English proficiency for Francophones and French proficiency for Anglophones. During the course work phase, students will be required to develop a detailed research program (proposal) (including budget). The proposal plan should be completed and validated by the student's principal advisor and the MRP Director.

11. Scholarship and research support

- Stipend: 350 Euros per month
- Accommodation supported up to 100 Euros.
- Research Budget
- Travel ticket for language courses in Cape Coast or Lomé
- Round trip Travel ticket (Niger –home country)
- Travel Ticket to Germany
- Tuition

12. Self-funding

The German Ministry of Education and Research (BMBF) will grant support to selected candidates. Self-financed candidates or candidates with other sponsorships can, however, register for the programme.

13. Application address

Candidates may apply directly to the GRP CC&DRM at Université de Lomé. All requested documents should be sent via e-mail to Professor Komi AGBOKA's secretariat: wascal@wascal-togo.org and copy cbd.hydrogen@wascal.org and kagboka@gmail.com.

Start date of Call for application: February 16, 2023.

Deadline for applications: April 16, 2023.