



SPONSORED BY THE



Federal Ministry
of Education
and Research

CALL FOR APPLICATIONS (FULL SCHOLARSHIP AVAILABLE)

2023 ADMISSION IN THE INTERNATIONAL MASTER'S PROGRAMME IN ENERGY AND GREEN HYDROGEN TECHNOLOGY (IMP-EGH): OPTION: **PHOTOVOLTAICS FOR GREEN HYDROGEN TECHNOLOGIES**

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 Interdisciplinary Master Program in Energy and green hydrogen (IMP-EGH) in all fifteen (15) ECOWAS countries partners namely: Benin, Burkina Faso, Cabo Verde, Cote d'Ivoire, The 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 strengths and weaknesses, energy policies, practices in a changing climate context and the search for sustainable solutions.



SPONSORED BY THE



Federal Ministry
of Education
and Research

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 Program in Energy and Green Hydrogen (IMP-EGH) option **PHOTOVOLTAICS FOR GREEN HYDROGEN TECHNOLOGIES** led by Abdou Moumouni University (UAM) of Niamey in Niger and implemented in collaboration with Julich 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, UAM is launching the second call for Application of the International Master's Program in Energy and Green Hydrogen Technologies (IMP-EGH): Option: **Photovoltaics for Green Hydrogen technologies** for the academic year 2023-2024. The program 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.



SPONSORED BY THE



Federal Ministry
of Education
and Research

2. Missions

The IMP-EGH Option **Photovoltaics for Green Hydrogen technologies** is designed to prepare the next generation of specialists to address the energy challenges through hydrogen production using renewable energy technology (i.e., Photovoltaics). The program interdisciplinary approach allows a better understanding of the green hydrogen technologies with a strong background on the West Africa energy infrastructures, their strength and weaknesses, energy policies, practices in a changing climate context and the search for sustainable solutions from renewable energy integration.

3. Objective

The main objective of this IMP-EGH is to prepare and train a new generation of interdisciplinary researchers capable of proposing adapted solutions to face the above-mentioned climate change and energy crisis. Upon completion of their study, graduates are expected to be able 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 deep comprehension of hydrogen production through renewable energy (Photovoltaics Solar Energy), hydrogen storage and consumption, environment safety with special emphasis on energy efficiency, energy management and local available renewable energy.

4. Job opportunities

For students who are not willing to pursue a PhD Program, expected employment opportunities after this formation are national and international government agencies, research institutions, extractive industries and energy processing companies, such as oil companies, the mining industry, power producers, and equipment builders. Employment will also be found in environmental consulting companies, with local and international NGOs interested in environmental and energy issues.



SPONSORED BY THE



5. Eligibility criteria

The IMP-EGH Option **Photovoltaics for Green Hydrogen technologies** 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 program, 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’s Program in Energy and Green Hydrogen is a well-structured program consisting of three (3) semesters of taught courses, laboratory activities, field visits



SPONSORED BY THE



Federal Ministry of Education and Research

and interaction with stakeholders. The semester four (4) is intended for student field work, thesis research, final write up and defense.

6.1 Training

The training includes courses divided into semesters as follows:

Semesters	Courses	Credits
Semester 1	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
Total credits S1		30
Semester 2	Conventional energy and Energy security	3
	Renewable Energy	6
	Green Hydrogen	6
	Renewable energy (RE) Technologies and Applications (Photovoltaics)	6
	Energy systems and infrastructure	6
	Energy Policy and Market	3
Total credits S2		30
Semester3: (Specialization) Photovoltaics for Green Hydrogen technologies	Cells and Materials	5
	Photovoltaic Systems	4
	Stand Alone Systems	3
	Hydrogen production by Electrolysis	3
	Hydrogen storage technology	3
	Fuel cell technology	3



SPONSORED BY THE

Federal Ministry
of Education
and Research

	PV4H2 (Hands-on activity)	4
	Research methodology	5
Total credits S3		30
Semester 4 :	<ul style="list-style-type: none"> • Internship in Germany (4-6 months) • Master thesis defense in Niger 	30
Total credits S4		30
Total credits (S1+S2+S3+S4)		120

6.2 Research activities

Phase 1: Writing and validation of the research project

Phase II: Field study

Phase III: Internship in Germany – students will be hosted by Julich and University of Aachen

Phase IV: Final writing of the Master Thesis

Phase V: Master Thesis defense and graduation at UAM

7. Language requirement

The Master Research Program on Energy and Green Hydrogen will be conducted in English.

Please note that a 4-month English proficiency course will be provided to selected francophone students at the University of Cape Coast, in Ghana, to help meet entry requirements.

8. Application procedures

- Form duly filled, scanned, and sent to required addresses
- Curriculum Vitae signed with information about relevant experience and professional training
- Cover letter
- 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 with precise availability of the candidate for the period of the master program (if Applicable). Reference letters must be written in English or French and must be signed / stamped
- Passport copy or national identification card
- Provide two recent passport-sized photographs
- Certified copies of diplomas and transcripts (Baccalaureate to Bachelor)



SPONSORED BY THE



Federal Ministry
of Education
and Research

9. Selection procedures

- Only short-listed candidates will be notified for interviews
- Interviews will be done in English by an international committee

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

APPLICATION PROCEDURE AND CONTACT

Candidates may apply directly to the Master Research Program by sending all required information to: drp-cce@wascal-ne.org

Please copy to:

- ✉ rabadamou@wascal-ne.org , maman_maarouhi@yahoo.fr ;
- ✉ cbd.hydrogen@wascal.org

The application form can be obtained via <http://www.wascal-ne.org> or at www.wascal.org

Start date for application: February 16th, 2023

Deadline for application: April 16th, 2023.