

## EVALUATION AND ACCREDITATION DOCUMENTS

### M.Sc. Future Energies

Africa Centre of Excellence in Future Energies  
and Electrochemical Systems (ACE-FUELS)

Federal University of Technology Owerri (FUTO)

Owerri, Nigeria

**June 2024**

Rapport publié le 12/07/2024

# CONTENTS

Evaluation report	pages 1 to 14
Comments of the institution	pages 15 to 21
Accreditation decision	following pages

## EVALUATION REPORT

### M.Sc. Future Energies

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Federal University of Technology Owerri (FUTO)

Owerri, Nigeria

**May 2024**

The Federal University of Technology Owerri has mandated the Hcéres to perform the evaluation of its Future Energies M.Sc. programme. The evaluation is based on the “External Evaluation Standards” of foreign study programmes, adopted by the Hcéres Board on 31<sup>st</sup> January 2022. These standards are available on the Hcéres website ([hceres.fr](http://hceres.fr)).

On behalf of the experts committee<sup>1</sup> :

Olivier Boutin, President of the committee

In the name of Hcéres<sup>1</sup> :

Stéphane Le Boulter, Acting President

<sup>1</sup>In accordance with articles R. 114-15 and R. 114-10 of the Research Code, evaluation reports are signed by the chairman of the experts committee and countersigned by the President of Hcéres.

# CONTENTS

<b>I. STUDY PROGRAMME IDENTITY SHEET .....</b>	<b>2</b>
<b>II. PRESENTATION OF THE STUDY PROGRAMME.....</b>	<b>3</b>
1 – Presentation of the study programme .....	3
2 – Presentation of the programme's self-evaluation approach .....	3
<b>III. COMPOSITION OF THE EXPERTS PANEL .....</b>	<b>3</b>
<b>IV. VISIT DESCRIPTION .....</b>	<b>4</b>
<b>V. EVALUATION REPORT .....</b>	<b>5</b>
1 – Training policy and characterisation .....	5
2 – Pedagogical organisation of the study programme.....	7
3 – Attractiveness, performance and relevance of the study programme .....	8
4 – Academic programme management and continuous improvement .....	9
<b>VI. CONCLUSION.....</b>	<b>11</b>
Strengths.....	11
Weaknesses .....	11
Recommendations .....	12
<b>VII. COMMENTS OF THE INSTITUTION .....</b>	<b>13</b>

## I. STUDY PROGRAMME IDENTITY SHEET

- University: Federal University of Technology Owerri (FUTO), Owerri, Nigeria
- Department concerned: Department of Physics
- Title of the programme: M.Sc. Future Energies
- Year of creation and context: a Master in Renewable Energy has been created in 1997 in the Department of Physics. This programme has evolved in its content and objectives in order to be integrated into the ACE-FUELS in 2019, and has been named M.Sc. Future Energies.
- Site where the programme is taught (town and campus): Federal University of Technology Owerri (FUTO), Owerri, Nigeria

### PROGRAMME DIRECTOR

- Surname, first name: Opara, Alexander
- Profession and grade: Professor
- Main subject taught: Geophysics

### METHODS AND RESULTS OF THE PREVIOUS ACCREDITATION(S)

- In 2022, the programme was evaluated by the National Universities Commission (NUC). The programme received its full accreditation by the NUC for 5 years, from April 2022 to April 2027.
- No previous international accreditation.

### HUMAN AND MATERIAL RESOURCES DEDICATED TO THE PROGRAMME

- **Human resources**

<b>Academic staff</b>	Professors	Readers	Senior Lecturers	Lecturers	Total
	<b>22</b>	<b>2</b>	<b>19</b>	<b>4</b>	<b>47</b>
<b>Technical staff</b>	Deputy Chief Technologists	Assistant Chief Technologists	Senior Technologists	Technologists	Total
	<b>6</b>	<b>3</b>	<b>2</b>	<b>8</b>	<b>19</b>
<b>Administrative staff</b>	Administrative Team Leader	Deputy Registrar	Administrative Officer and Assistants	Others	Total
	<b>1</b>	<b>1</b>	<b>4</b>	<b>7</b>	<b>13</b>

- **Material resources:** Zoom Video Conferencing facility, Microsoft Teams Video Conferencing/LMS, Cloud-based LMS/Student Academic Records Management System, OYLEX Learning Management System (LMS), CCTV Facilities. Classroom, Physical library, online access to several scientific journals. Language Laboratory, Multimedia Conference Room. Fully Networked Computational Modelling Laboratory, Cluster Market Lab Management System, BIOVIA Materials Studio Software (Academic License), TRNSYS Software (Academic License). Laboratory at the level of the Centre with many equipment: FT-IR Microscope, UV/Visible Spectrometer, FT-IR Spectrometer, nGauge Atomic Force Microscope, Do-it-Yourself Atomic Force Microscope, Gas chromatograph with mass spec, Gas chromatograph-flame ionization detector 800, Plexiglass Glove Box (nitrogen environment), Plexiglass Glove Box (argon environment), Fume Cupboard, Planetary Ball Mill (BKBM Series, Conductivity meter, pH meter, Digital Colony Counter, Potentiostat/Galvanostat, Refrigerator, Digital Hot Air Oven, Digital Muffle Furnace, Lab Incubator, Thermostatic Water bath, Thermostatic Water bath with Shaker, Water Deionizer Unit, Precision Lapping/Polishing Machine, DigiPREP LS, solar panels, autoclaves, gasometric assembly, etc.

## STUDENT POPULATION: EVOLUTION AND TYPOLOGY OVER THE LAST 4 YEARS

		2018/2019	2019/2020	2020/2021	2021/2022	2022/2023
<b>Enrolment</b>	Male	-	-	5	10	7
	Female	-	-	1	2	6
	<b>Total</b>	-	-	<b>6</b>	<b>12</b>	<b>13</b>
	<i>including foreigners</i>	-	-	0	5	4
<b>Graduates</b>	Male	-	-	3	-	-
	Female	-	-	0	-	-
	<b>Total</b>	-	-	<b>3</b>	-	-
	<i>including foreigners</i>	-	-	0	-	-

## II. PRESENTATION OF THE STUDY PROGRAMME

### 1 – Presentation of the study programme

The Africa Centre of Excellence in Future Energies and Electrochemical Systems (ACE-FUELS) at the Federal University of Technology Owerri was established in 2019 to address a growing education, skills, and information gap in the field of renewable and other clean energy sources within the sub region. The Centre's objective is to cultivate a critical mass of well-trained researchers to meet of the demand for R&D professionals in Clean Energy and related high technology applications. It aims to initiate and support high-end research, expanding knowledge beyond existing industry practices. Additionally, the Centre seeks to promote local content in research and innovations by fostering industry-academia collaborations focused on value-driven initiatives. By partnering with local industry initiatives in the region, the Centre aims to develop competencies through tailored work-based learning events, activities, and tools in line with global best practices. The Centre offers eight M.Sc. and Ph.D. programmes across four fields: Future Energies, Nanotechnology, Electrochemical Technology, and Corrosion.

The M.Sc. Future Energies programme focuses on the developing novel, low-cost renewable energy technologies and devices to efficiently exploit the abundant energy resources in the region. The programme offers four paths: Solar energy, Bioenergy, Geothermal, and Clean Hydrocarbon. It employs an immersive approach to learning, incorporating principles and practices of clean energy through examples and practical exercises. Graduates of this course gain a firm, broad-based understanding of basic energy concepts, technologies, and contemporary energy challenges, equipping them with knowledge for potential solutions to sustainable clean energy usage. They also acquire expertise in renewable energy technologies, encompassing identification, design, fabrication, characterisation, and utilisation of clean energy technologies across diverse fields.

### 2 – Presentation of the programme's self-evaluation approach

Although the Department of Physics has a committee on quality assurance, no information was provided on the way self-evaluation was conducted. The submitted self-evaluation report was comprehensive, supplemented with appendices providing qualitative and quantitative data. A few additional documents were requested, all of which were promptly provided.

## III. COMPOSITION OF THE EXPERTS PANEL

- **Olivier BOUTIN**, Chair of the panel, Full professor, Aix-Marseille University, France
- **Renaud BOUCHET**, Full professor, INP Grenoble, France
- **Melika HINAJE**, Full professor, Lorraine University, France
- **Julie FINKEL**, Ph.D. candidate, University of Montpellier, France

Hcéres was represented by **Zakia MESTARI**, project manager, Europe and International Department.

## IV. VISIT DESCRIPTION

- **Date of the visit:** the visit took place on Monday 15<sup>th</sup> January 2024.
- **Summary of the proceedings:** prior to the visit, the experts received the self-evaluation report along with numerous appendices. Two preparatory meetings were conducted, one in Paris on 20<sup>th</sup> December and another online on 8<sup>th</sup> January, between the Director of the Hcéres Europe and International Department, the project manager, and the panel of experts.. The on-site visit lasted for one day, following a schedule agreed upon by ACE-FUELS, the National Universities Commission and the panel. During the visit, the experts requested additional documents to acquire quantitative data, all of which have been provided.
- **Organisation of the visit:** for safety reasons, the visit was organised in hybrid mode, with the panel unable to visit the Centre in Owerri. Instead, the Centre leaders, the programme director, and the postgraduate coordinator of the Federal University of Technology met the panel in Abuja, as along with some students and academics.
- **Cooperation of study programme and institution to be accredited:** ACE-FUELS has demonstrated cooperative throughout the process. The self-evaluation report was submitted according to the agreed schedule, and questions posed before and during the visit were answered clearly and precisely. The panel is satisfied that the conclusions reached are based on available and relevant information. Moreover, the involvement of the National Universities Commission has been very helpful throughout the process.
- **People met:** the committee had the opportunity to meet with 27 people from different panels:

	Session	Audience
8:00 – 9:30	Presentation of the programme and discussion with the top management	Centre Leaders, programmes directors and their teams
9:30 – 10:30	Academic staff	Representative panel of academics from both programmes
10:45 – 11:45	Quality assurance	Quality assurance representatives
11:45 – 12:45	Alumni	Representative panel of alumni
13:45 – 14:45	Socio-economic partners and employers	Representative panel of socio-economic partners and employers
14:45 – 15:45	Students	Representative panel of students from both programmes
16:30 – 17:00	Closing session	Centre Leaders, programmes directors and their teams



## V. EVALUATION REPORT

### 1 – Training policy and characterisation

**The M.Sc. Future Energies programme corresponds to one in the university's four key research priority areas, specifically focusing on Energy and Environment, particularly in the Renewable and alternative energy field. Moreover, the programme aligns with the Energy priorities outlined in the New Partnership for Africa's Development and the National Economic Empowerment and Development Strategies, particularly in the development of power generation infrastructure.** In 1997, the Department of Physics at the Federal University of Technology, Owerri, established a Master's programme in Renewable Energy, which later evolved and became integrated into the Africa Centre of Excellence in Future Energies and Electrochemical Systems (ACE-FUELS) in 2019, renamed as M.Sc. Future Energies. Alongside this programme, ACE-FUELS offers three other M.Sc., and Ph.D. programmes: Nanotechnology, Electrochemical Technology, and Corrosion Technology. The M.Sc. Future Energies programme is designed to train highly skilled individuals in the field of renewable and clean energy sources, aligning with the institution's ambitions and priorities. The programme has a clear positioning within the training landscape, aiming to have a national and regional outlook focused on West Africa. While other programmes in renewable energies exist in the region, the M.Sc. Future Energies stands out due to its multidisciplinary approach, which is a key strength. It is developed in a coherent and complementary manner alongside the other M.Sc. programmes within the ACE-FUELS. The Master's programme is opened to students with a Bachelor's degree in Engineering or Science, provided they meet the required scientific standards. Students from all M.Sc. programmes within the Centre have the opportunity to pursue a Ph.D. in the same field. At the national level, partnerships have been established with four universities (University of Nigeria Nsukka, University of Calabar, University of Uyo, and Abia State University Uturu) to facilitate students training, research collaboration, co-supervision, lecture delivery, and joint workshops. On a regional scale, ACE-FUELS is part of the West Africa Centres of Excellence on Energy Network (WACEENET), which includes ten universities, comprising the ACE-FUELS and the Africa Centre of Excellence for Oilfield Chemicals Research (ACE-CEFOR) at the University of Port-Harcourt in Nigeria; and partnerships have been established with other universities in the sub-region, located in Ghana (two), in South Africa (two), and one each in Togo, Senegal, Cameroon, and Ethiopia. This network aims to provide common short courses, research opportunities, entrepreneurship, and innovation initiatives. Collaboration with 12 existing departments within the University, ranging from Chemistry and Physics to Chemical Engineering and Environmental management, ensures a multidisciplinary approach to the programme. This multidisciplinary approach is reflected in the curriculum, which covers basic energy concepts, technologies, challenges, and solutions for sustainable clean energy, including design, fabrication, characterisation, and use of clean energy technologies. Interdisciplinary elements are embedded into several mandatory courses, addressing economics, financial aspects, and elective courses covering finance and management. The sustainable-development-related issues are incorporated in all courses. Moreover, specific courses such as Energy/Environmental Policy and Management focus on environmental impact assessment, monitoring, and a dedicated elective course on Climate change emphasises related topics.

**Apart from national agreements, the M.Sc. Future Energies programme develops partnerships at a broader international level that facilitate incoming and outgoing mobility.** ACE-FUELS has established six active academic partnerships in the field of Future Energies with institutions such as the Nuclear Energy and Research Institute, in São Paulo, Brazil; Federal University of Uberlândia, Brazil; Northeastern University in Shenyang, China; Norwegian University of Science and Technology in Trondheim, Norway; University of Bath, in the United Kingdom; and Robert Gordon University in Aberdeen, United Kingdom. These partnerships encompass various collaborative activities including research facilities and supervision, hosting students, training, delivering lectures, and conducting joint workshops. For instance, the partnership with Brazil focuses on research in solar energy and energy storage devices. Over the past four years, ACE-FUELS has hosted nine incoming students for mobility programmes from Senegal, Egypt, Tanzania, Ghana, and Liberia, all of whom received full scholarships for their studies. The programme also provides support services through its international office, assisting incoming regional students with visa and residency permit applications, insurance, transportation, and other logistics as needed. Outgoing mobility opportunities for students are primarily facilitated through the WACEENET network, with two students registering for M.Sc. courses and research in centres located in Ghana and Togo during the evaluated period. To further enhance the international standing of the programme, short courses on energy transition and renewable energy technologies were offered to individuals, organisations, and institutions both abroad (Gambia, Ghana) and within Nigeria.

**Most of the teaching staff in the programme are affiliated with various research units within the University, including the Centre for Energy & Power Systems Research, Centre for Nuclear Energy Studies & Training, and Centre for Industrial Studies.** A large laboratory has been established to cater to the needs of students and researchers from ACE-FUELS, equipped with facilities aligned with the programme's objectives. Moreover, students have convenient access to laboratories in all departments of the university. Additionally, a specific

mandatory course, "Research Method and Innovation", is dedicated to research training. ACE-FUELS also offers a Webinar Series featuring online presentation from international professors on subjects relevant to the Centre's focus areas. The centre organised an international e-symposium on Hydrogen energy in June 2023. The team of 12 professors and 21 lecturers collectively covered all the fields necessary to the programme, facilitating efficient research in various aspects of future energies. A portion of the course curriculum is dedicated to research methods, including information literacy and search techniques, plagiarism prevention, ethics and legal consideration, and research integrity. Moreover, students have access to both physical library and online libraries, ensuring comprehensive resource availability. Additional resources would yet be beneficial.

**Extensive partnerships with the socio-economic sector, both nationally and internationally, contribute to programme development and offers opportunities for involvement in courses for professional seminars; industrial partners and sectoral stakeholders have been engaged in the evaluation process of the Centre to strengthen connections with socio-economic needs.** Regular discussions and workshops on the curriculum are conducted to align with these needs and define job opportunities accordingly. Work-linked training and continuing education opportunities are provided, supported by ACE-FUELS's policy for professional training and career development. Professional courses in renewable energy are offered, and the Centre provides hands-on training for young professionals without academic qualifications, such as solar installation and maintenance programmes. The ACE-FUELS Leadership Academy offers training for emerging leaders on communication and resource acquisition skills. Additionally, a programme called "Research opportunities for undergraduates: training in new energies" aims to provide research experience in clean energy to female students. Partnership agreements have been established between the programme and various companies at both national and international levels. At national level, it concerns GVE Projects Limited Port Harcourt (on Renewable Energy solutions set up by university alumni), Soul Mate Industries Limited Lagos (also set up by a university alumnus, collaborating with the programme in training and research on new functional materials, for internships, training materials, and use of the facilities), Electronics Development Institute Awka (electronics development on energy storage), and Hydraulic Solutions Energy Services Limited Port Harcourt (fellowships, student internships, study materials and new product development). At the international level, an agreement has been signed with Him in Solar Company Limited De Zhou City, China (solar products company, training, R&D, and internships), International Energy Agency Photovoltaic Power Systems Programme. The Centre aims to contribute to the development of new technologies and transfer research activities to start-ups. To facilitate this, ACE-FUELS Innovations Ltd, a company registered by the Centre, supports entrepreneurship training through dedicated courses and promotes Innovation through various initiatives. The "Innovation Series" offers online presentations from socio-economic partners discussing job market integration possibilities and fostering collaboration between academia and industry.

**In conclusion, the M.Sc. Future Energies programme aligns perfectly with one of the four strategic areas defined by the Federal University of Technology Owerri, focusing on Energy and Environment. It also supports national plans for the development of renewable energies in Nigeria. The programme adopts a well-constructed multidisciplinary and interdisciplinary approach, leveraging the University's Departments and their research laboratories. As a key component of the Africa Centre of Excellence in Future Energies and Electrochemical Systems (ACE-FUELS), established in 2019, it operates alongside with its own research laboratory. Building upon various science Bachelor's degrees (chemistry, physics, etc.), the programme serves as a pathway to a Ph.D. within the ACE-FUELS.**

**Academic partnerships extend from the national level (laboratories within the same university but also other universities in Nigeria), to the international level, including collaborations with universities in the East Africa sub-region (in particular a network bringing together several West Africa Centres of Excellence on Energy Network WACEENET), and other continents. These partnerships have facilitated outgoing exchanges and attracted nine foreign students from the sub-region during the evaluated period. The programme is encouraged to further enhance and sustain these international links, particularly in terms of outgoing mobility opportunities.**

**Students engage in well-structured and supervised research projects over two years, with the requirement of an accepted article before graduation. Students benefit from various communication tools and have access to extensive documentary resources, both physical and online. While the existing research facilities are varied, additional resources would be beneficial. Extensive partnerships with the socio-economic sector, both nationally and internationally, contribute to programme development and offers opportunities for involvement in courses for professional seminars. The programme also delivers several structured professional courses tailored to various external audiences. The programme has established its own entrepreneurial structure in renewable energies, providing students with exposure to real-world industrial contexts and dedicated entrepreneurship courses.**

## 2 – Pedagogical organisation of the study programme

**The M.Sc. in Future Energies programme is meticulously structured, featuring compulsory and elective aligned with one of the five possible pathways: Solar Energy, Bioenergy, Clean Hydrocarbon, Geothermal Energy, and Hydrogen Energy. In addition, students engage in well-structured and supervised research projects, with the requirement of an accepted article before graduation.** It is an 18-month full-time programme, comprising a 12-month period of learning, instruction, and research on campus, followed by an internship. Upon completion of the internship, students undergo oral examination of their thesis. Academic sessions begin each year in October, with the Harmattan Semester (October – February), and conclude in August with the Rain Semester (April – August). The Academic calendar for each new session is approved by the University Senate before the end of the preceding session. The M.Sc. programme is structured around three main parts: mandatory modules (seven courses on different basic knowledge on energy systems), specialisation modules (M.Sc. programme in Future Energies proposes five pathways of specialisation: Solar Energy, Bioenergy, Clean Hydrocarbon, Geothermal Energy and Hydrogen Energy), and project modules (research project). The programme's objectives regarding the acquisition of knowledge and skills in the field of New Energy are outlined in the curriculum and skill approaches. These objectives are well-documented and accessible to students and other stakeholders through a comprehensive handbook of studies available online on the Centre's and the University's websites. Moreover, each student undertakes a six-month research project involving experimental, theoretical, or computational studies, under the guidance of a principal supervisor and a co-supervisor, who are academics, sometimes along with an industry-based supervisor. The project consists of three seminar sessions: research proposal, progress report, and final report (research thesis). For most courses, students are required to write a "monoreview" based on several research articles provided by the teaching staff. They also have the opportunity to visit laboratories for demonstration on targeted equipment related to the course. Moreover, each student is expected to co-author and publish at least one article from their research work in a relevant peer-reviewed journal, present papers (oral or poster) at national/regional professional conferences, and participate in all workshops, seminars, guest lectures, and other activities organised by the Centre. Each student is assigned at least one research supervisor who provide guidance throughout the duration of the programme. A dedicated officer within the Centre offers further support as needed. During the Covid-19 pandemic, courses were transitioned to online delivery. While the number of online courses has decreased over time, the majority are now conducted in person on the University's campus. Communication and information technology aspects are embedded in several courses, and ACE-FUELS offers assistance for using various tools such as Zoom, Google Meet, MS PowerPoint, Word, and Excel. The programme offers a diverse teaching environment with a range of digital resources available including Zoom video conferencing facility, a cloud-based academic records management system, the OYLEX learning management system, and a language lab. Regarding scientific and technological equipment, the programme benefits from the development of ACE-FUELS, providing student with a wide array of materials conducive to research, such as spectroscopy apparatuses, SEM, X-ray diffractometer, and more.

**A diverse array of teaching methods is employed, ranging from online courses to flipped classroom approaches, facilitated by an online learning platform and industry contributions.** Each course includes lectures, tutorials, seminars, hands-on sessions, and guest lectures delivered by industry subject-matter experts. Course delivery incorporate both physical and online components, with course materials provided to students in advance. This enables students to prepare the content beforehand, aligning with the flipped classroom approach. ACE-FUELS uses OYLEX online learning management system, developed at FUTO University, as a tool for delivering online courses and providing learner-centred instructions and access to resources. The platform serves as a support system for delivering lessons, conducting assessments, and tracking/analysing performance. Students can access lesson contents anytime and anywhere for personalised learning and standardisation of materials.

**Although support is provided to non-English-speaking students, no specific preparation is offered for incoming and outgoing mobility, which could be an area for further development and enhancement.** International students who do not speak English fluently can benefit from the English Language Support Programme offered at the University Language Laboratory. This programme provides lessons, tutorials, and interactive sessions aimed at improving academic English language skills.

**The programme proposes numerous and varied opportunities for students' further training through collaborations with socio-economic partners; in particular they are offered to study entrepreneurship through a dedicated mandatory course.** Industrial experts are involved in teaching courses related to entrepreneurship, banking, and investment. As part of the programme, students are required to complete a mandatory internship with an industry partner. Final oral examination of the thesis shall take place after successful completion of the internship programme. A list of internship opportunities is provided by the programme's socio-economic partners, and if the internship is located outside Owerri, the programme can cover the intern's living expenses. ACE-FUELS proposes professional training and career development courses designed to enhance the practical skills, expertise, and credentials of science and technology professionals. They also provide a Training and Skills

Support Programme aimed at offering hands-on training for young professionals without academic qualifications. Additionally, ACE-FUELS offers open specific training sessions, either onsite or in a hybrid mode, to develop knowledge and skills in Energy Transition and Renewable Energy. These training sessions can last for one or several weeks, and participants receive a certification upon completion.

**In conclusion, the programme is meticulously structured, featuring compulsory and elective courses aligned with one of the five possible pathways: Solar Energy, Bioenergy, Clean Hydrocarbon, Geothermal Energy, and Hydrogen Energy. It encompasses a research project and a one-to-six-month internship, both culminating in written and oral reports. The programme's content, objectives, and desired skills are clearly defined and accessible to all.**

**A diverse array of teaching methods is employed, ranging from online courses to flipped classroom approaches, facilitated by an online learning platform and industry contributions. Throughout their academic journey, students receive guidance from both a supervisor and a dedicated person at the Centre. Foreign students are provided with an English language refresher course to support their integration. The programme offers numerous and varied opportunities for further training through collaborations with socio-economic partners.**

### 3 – Attractiveness, performance and relevance of the study programme

**Even though the programme employs a variety of channels to disseminate information and attract students, including social media platforms, flyers, posters, industry contacts, and physical outreach efforts, overall student enrolment remains low.** Admission criteria and programme details are efficiently communicated on the programme's website, and comprehensive guidance is provided in the Student's Handbook, which is accessible to a wide audience through the Centre's website. To increase awareness, the programme participates in regional workshops and utilises advertising materials. Non-discriminatory clauses are established, and full scholarships and accommodation are offered to regional students, fostering inclusivity. Despite efforts to attract students from both Nigeria and the region (Senegal, Egypt, Tanzania, Sierra Leone, Liberia, and Ghana), student enrolment should be increased. Since the establishment of the ACE-FUELS in 2019, the numbers have remained stable, with 15 students in 2019 and 16 in 2021. All students recruited in 2019 successfully graduated, and approximately 100 applications are received annually.

**The study programme employs a comprehensive assessment protocol to monitor students' success rates, which includes review exercises focused on research publications, tests, and quizzes.** Students are required to co-author and publish at least one article from their research work in a relevant peer-reviewed journal, actively participate in workshops, seminars, and guest lectures, and present papers at national/regional conferences to fulfil graduation requirements. The programme places a strong emphasis on students' academic and research success, and scholarship holders are expected to maintain high levels of achievement to retain their scholarships. To customise teaching plans and enhance student engagement, the programme utilises feedback from lecture evaluation surveys completed by students. The students' success rates are not publicly disclosed. Upon admission, newly admitted students participate in an orientation session within the first week to familiarise themselves with the Centre and its resources. Students are assigned programme advisors to provide personalised academic guidance and support, as along with research supervisors based on their research interests. New students are also paired with more experienced peers to facilitate mentorship and integration into the programme.

**The programme has implemented the graduate tracer mechanism developed by the Association of African Universities (AAU) to monitor and track the progress of its graduates.** Moreover, ACE-FUELS engages with various sectors to provide students with practical experience, networking opportunities, research prospects, and access to workshops and webinars. The programme aims to produce graduates who are well-prepared for careers in academia, industry, and other relevant fields. However, the obligation to publish in a peer-reviewed journal as part of the graduation process has slowed down the progression of graduates. Hence, the programme has observed a low number of graduate students, with only three graduates since 2020. Despite this, the data about the programme's graduate students are made public on the Centre's website.

**In conclusion, the programme employs a variety of virtual and physical channels to enhance its attractiveness. Its robust policy to attract regional students, including full scholarships, accommodation, and language support programme, has led to enrolment of nine students from multiple countries (Senegal, Egypt, Tanzania, Sierra Leone, Liberia, and Ghana). However, there is room for improvement in overall student enrolment and access to full scholarships for Nigerian students. The programme diligently monitors student progress through a structured assessment protocol, which informs ongoing improvements to teaching plans and support measures. Additionally, the programme has implemented the graduate tracer mechanism developed by the AAU to track the progress of alumni, with this data publicly available on the Centre's website. Nonetheless, the requirement to publish in peer-reviewed journal has hindered the graduation process, resulting in only three graduates since 2020.**



## 4 – Academic programme management and continuous improvement

**The ACE-FUELS centre operates under the leadership of a well-known management team led by a Centre Director and a Deputy Director.** The team also includes roles such as Monitoring & Evaluation Officer, Finance Officer, Project Manager, Communications Officer, and Training and Education Coordinator. There is a dedicated coordinator for the Future Energies programme, along with academic coordinators responsible for content delivery and research coordinators overseeing research-related activities such as seminars and laboratory work. This structured management team ensures effective administration, planning, coordination, and promotion of the training programme. Each course within the programme has a designated coordinator who defines the content and schedule, with regular seminar held between teaching staff and management to address recommendations and improvements. The contributors to the programme and their status are known to the students and more generally to the audience concerned. They all have a very high scientific level. Six of them are experts coming from different sectors of the industry and economics. Moreover, a significant contribution of the training is given by nine visiting teaching staffs in related scientific fields coming from several foreign universities (Universities of Bath, Bristol and Cambridge, United Kingdom; Monash University, Australia, etc.).

**The human resources allocated to the programme are deemed satisfactory and well-organised to effectively manage its operations.** With a total of 13 administrative staff members at the Centre level, the administrative support appears adequate. The equipment inventory indicates that most necessary facilities are available, with provisions for acquiring additional equipment as needed for device fabrication and prototyping. Students have access to library resources, computer classrooms equipped with essential software such as Matlab. However, there is room for improvement in the training and sharing of teaching practices among the academic staff. While the opportunities for staff participation in conferences and workshops exist, particularly through networks like WACEENET and TEA-LP, these avenues could be further optimised. Non-teaching staff members also engage in workshops covering financial and administrative topics, both locally and internationally through ACE workshops. The programme demonstrates a commitment to sustainability through the use of tools and indicators to monitor the programme's costs, alongside with financial audits and reports from internal and external sources.

**The evaluation processes are clearly outlined, with students invited by e-mail to participate biannually in an anonymous online questionnaire covering course modules and programmes.** All student communications directed to the Centre's management shall be routed through the Programme Advisor, while communications intended for the University's management shall be directed through both the Programme Advisor and the Centre Director. Students also participate in evaluating lecture performance through a structured evaluation form aimed at assessing the quality of lecturers' performance for potential improvements. The results of these evaluations are communicated to both staff and students, and students are encouraged to provide improvement suggestions through an online form. Lecturers are required to submit evaluation reports on their courses, ensuring a comprehensive feedback loop. The Quality Assurance document of the ACE-FUELS outlines the use of a Plan-Do-Check-Act cycle to ensure the Centre's quality and identify areas for improvement. Various boards and committees, including a Board of Studies for proposing new courses or modifications, exist to address specific tasks, with defined meeting frequencies provided. While there is a student representative within the Centre's organisation, there is room for further inclusion of student representatives in various Centre bodies. Regular statutory monthly meetings are conducted within the management team to review programme progress and devise strategies for continuous enhancement. The ACE-FUELS, along with four M.Sc. and Ph.D. programmes, has received national accreditation from the National Universities Commission (NUC). Notably, the Future Energies programme received accreditation in 2022 for five years, accompanied with recommendations aimed at further enhancing the Centre's development.

**The student recruitment procedures are meticulously outlined, requiring applicants to hold a good second-class honours degree in a relevant science or engineering programme as the minimum admission requirement.** The selection process involves the submission of necessary application documents, followed by a computer-based aptitude test and interviews conducted either face-to-face or via video conference. To be considered for admissions, applicants must score above 60 out of 100 in the assessments. The evaluation procedures for assessing students' knowledge are clearly explained and widely understood, adhering to common rules at the University level. A distinctive approach to evaluating knowledge and skills is implemented, whereby students are tasked with writing a short review based on suggested articles for each mandatory course, contributing 20% to the total score. Moreover, the programme has instituted anti-plagiarism and anti-fraud measures, including the use of software such as "Tuintin", to maintain academic integrity.

**In conclusion, the programme's organisation and management are transparent and cohesive, with collaborative management at the ACE-FUELS level, a dedicated programme coordinator, and clear allocation of responsibilities for courses and content at the lecturer level. The lecturers, sourced from FUTO University,**

possess diverse expertise required for interdisciplinary approaches, supplemented by professionals from the socio-economic world and from foreign universities. Sufficient teaching and technical/administrative staff ensure the smooth operation of the programme, with opportunities for further training, particularly on an international scale, which could be expanded upon.

Course evaluations by students and lecturers contribute to ongoing improvements, supported by a comprehensive plan at the Centre level. Various bodies oversee different aspects of the programme, including a student representative, although increased student representation in management bodies could be beneficial. Recruitment, assessment, and graduation procedures are well-defined and accessible, meeting the University's standards.

## VI. CONCLUSION

The M.Sc. in Future Energies offers advanced training to equip students with the skills necessary to address the challenges associated with renewable energy development, making it a crucial response to contemporary concerns surrounding climate change. Aligned with the research and educational priorities of FUTO University and national agendas in Nigeria, the programme adopts a robust multidisciplinary and interdisciplinary approach, drawing support from several departments and research laboratories. Established in 2019 under the Africa Centre of Excellence in Future Energies and Electrochemical Systems (ACE-FUELS), alongside three other master's programmes, its organisational structure is clear and relevant, with transparent procedures from student recruitment to graduation. Continuous evaluation by both students and faculty ensures ongoing improvement, reflecting the Centre's commitment to excellence.

To enhance multidisciplinary and interdisciplinary engagement, the programme has fostered numerous partnerships within both academic and socio-economic spheres. Collaborations extend to research laboratories within FUTO University, other Nigerian universities, and international networks like the West Africa Centres of Excellence on Energy Network WACEENET, facilitating student and staff mobility and joint initiatives. Socio-economic partners contribute to curriculum development, participate in courses and seminars, and offers internship opportunities for students. In addition, the programme's initiatives in professional training, offering diverse certification programmes to various stakeholders, are commendable.

Therefore, students receive comprehensive knowledge in Renewable Energies, encompassing both technical expertise and soft skills essential for entrepreneurship and job market readiness. Through dedicated courses and research projects, students engage in academic research and gain access to research facilities, although the graduation process may be prolonged due to publication requirements. To expedite graduation, allowing graduation upon initial submission could be considered. Additionally, for the programme ensures exposure to industrial contexts through partnerships and internships, facilitating students' integration in to the job market. In this context, it is recommended that the programme continue to prepare its students more thoroughly to job market integration. Efforts to attract regional students with scholarships and support programs are commendable, though overall enrolment could be further enhanced.

To conclude, the programme equips students with valuable skills and experiences, positioning them well for success in both academic and professional realms within the field of Renewable Energy.

### Strengths

- The programme is well-structured, organised, with the different processes and contents available to all audiences
- The programme effectively addresses pressing issues related to Sustainable Development, Climate Change, and Renewable Energy, providing students with knowledge and skills to contribute meaningfully to these areas
- Partnerships with Universities and academic institutions as well as socio-economic world are diverse and efficient, offering students exposure to a wide range of perspectives
- The programme proposes valuable training for professionals, at different levels, with some certifications
- Few trainings are offered to the programme's teaching, technical, and administrative staff

### Weaknesses

- The number of students per year, and therefore the overall attractiveness of the programme, is still quite low
- There is no student representative in the different bodies, both at the programme and the Centre levels
- The continuous training programmes for teaching, administrative and technical staff exists but are not sufficiently developed
- Although students have access to several laboratories and to the Centre's equipment for their research activities, the level and number of accessible equipment is still limited
- The outgoing international mobility for students is still limited

## Recommendations

- In order to increase the attractiveness and number of students, it is suggested to multiply interventions in forums, congresses, publications on social networks and websites, as well as mobilising the alumni network and the socio-economic partners.
- Define the role of the student's representatives in the different bodies at least within the programme and Centre, and organise an elective process to involve students in these bodies.
- Teaching, administrative and technical staff could be trained inside the FUTO University, but also through training sessions centralised in Abuja for all universities. More staff members could also benefit from the two international networks WACEENET and TEA-LP.
- Pursue the policy of renewing and purchasing research equipment in the programme's research themes such as solar panels or wind energy.
- Use and develop the international networks in order to give students more opportunities for international outgoing mobility.



## VII. COMMENTS OF THE INSTITUTION



May 30, 2024

### Federal University of Technology Owerri

Office of the Deputy Vice Chancellor  
Research, Development & Innovation

**Prof. Emeka E. Oguzie**

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Tel: +234 803 7026581

Olivier Boutin  
President,  
International Evaluation and Accreditation Committee,  
Higher Education Evaluation Research (HCERES)

#### HCÉRES EVALUATION FOLLOW UP REPORT FOR ACE-FUELS MSc PROGRAMME in FUTURE ENERGIES

I write to acknowledge the evaluation report for the MSc Future Energies Programme.

This Follow-up Report is submitted to the Higher Education Evaluation Research (HCÉRES) for the purpose of determining the resolution of recommendations identified during the January 2024 site visit.

I certify that there was broad participation and review by the Centre Management and university community and believe this report accurately reflects the nature and substance of the University and the ACE-FUELS MSc programme in Future Energies.

Please accept the assurances of my highest regards.



**Prof. Emeka Oguzie**  
Deputy Vice-Chancellor  
(Research, Development & Innovation)  
*Centre Leader, Africa Centre of Excellence in Future Energies  
and Electrochemical Systems (ACE-FUELS)*



Vice Chancellor: Prof. Nnenna N. Oti, B. Agric, MSc (Nigeria), PGD (Belgium), PhD (FUTO)

## PREAMBLE

The Africa Centre of Excellence in Future Energies and Electrochemical Systems (ACE-FUELS) at the Federal University of Technology Owerri has mandated the Higher Education Evaluation Research (HCÉRES) to perform the evaluation of its Future Energies M.Sc. programme, submitted a Self-Evaluation Report in December 2023 and received a visit from HCÉRES external evaluation team on January 15, 2024. The evaluation team submitted their report in May 2024, that detailed five recommendations as follows:

1. In order to increase the attractiveness and number of students, it is suggested to multiply interventions in forums, congresses, publications on social networks and websites, as well as mobilising the alumni network and the socio-economic partners.
2. Define the role of the student's representatives in the different bodies at least within the programme and Centre and organise an elective process to involve students in these bodies.
3. Teaching, administrative and technical staff could be trained inside the FUTO University, but also through training sessions centralised in Abuja for all universities. More staff members could also benefit from the two international networks WACEENET and TEA-LP.
4. Pursue the policy of renewing and purchasing research equipment in the programme's research themes such as solar panels or wind energy.
5. Use and develop the international networks in order to give students more opportunities for international outgoing mobility.

## Response to Recommendation 1

*In order to increase the attractiveness and number of students, it is suggested to multiply interventions in forums, congresses, publications on social networks and websites, as well as mobilising the alumni network and the socio-economic partners.*

ACE-FUELS has taken action to increase visibility and presence in various social networks, participation in relevant scientific forums and congresses, as well as championing its own initiatives, to create awareness across sectors.

The Centre has since maintained active presence on social media, highlighting its activities and engagements to broad audiences.

Facebook (Meta): <https://www.facebook.com/acefuelsfutonig?mibextid=rS40aB7S9Ucbxw6v>

LinkedIn: [https://www.linkedin.com/in/ace-fuels-futo-5ab55918a?utm\\_source=share&utm\\_campaign=share\\_via&utm\\_content=profile&utm\\_medium=android\\_app](https://www.linkedin.com/in/ace-fuels-futo-5ab55918a?utm_source=share&utm_campaign=share_via&utm_content=profile&utm_medium=android_app)

Instagram: <https://www.instagram.com/acefuelsfuto?igsh=ajNncjhybnBpZnhk>

### PARTICIPATION IN ENERGY FORUMS AND CONGRESSES

ACE-FUELS has also participated in the following forums/congresses, which provided opportunities for networking and engagement:

- Transforming Energy Access (TEA) Forum in Kigali (March 13-14, 2024)
- Africa Centres of Excellence International Partnerships Workshop with EU in Mauritius (8<sup>th</sup> – 10<sup>th</sup> May 2024)
- Alliance for Renewable Energy (ARE) Energy Access Investment Forum (EAIF) 2024 in Lagos, Nigeria (May 21-23, 2024)

### ACTIVITIES:

- ACE-FUELS virtual open day on February 17, 2024, to showcase the Centre's programmes and facilities to potential students. (<https://acefuels-futo.org/ace-fuels-open-day/>)
- ACE-FUELS Greenovation Dialogue Series on 27th March 2024, with a public lecture on "Climate-smart innovations towards green economic development in Sub-Saharan Africa" by Prof. Solomon Agbo (Forschungszentrum Jülich) <https://acefuels-futo.org/ace-fuels-greenovation-dialogue-series/>
- ACE-FUELS Innovation Series Webinar on May 2, 2024, on "The challenges of scale for printable perovskite solar cells" by Prof. Trystan Watson (Swansea University, UK) <https://acefuels-futo.org/acefuels-innovation-series/>

The Centre has established the International Network of Research Scholars and Trainees (INReST, <https://acefuels-futo.org/inrest/>), a student-run platform to formally network and form lasting relationships that will engender excellent scholarship and academic development even beyond their stay as graduate students or research trainees.

## Response to Recommendation 2

*Define the role of the student's representatives in the different bodies at least within the programme and Centre and organise an elective process to involve students in these bodies.*

The Centre has organized open elections amongst the students to elect a student representative, in the person of Mr. John Anyanwu (Future Energies). He is to interface with Centre Management and present students concerns to management.

International Network of Research Scholars and Trainees (INReST, <https://acefuels-futo.org/inrest/>), also provides an organized rallying point for students, with several benefits:

- i. Create a strong network and bond among the research students.
- ii. Assist the Centre in proper on-boarding of newly admitted students and scholars while also helping to share the Centre's activities within the wider student population outside of ACE-FUELS.
- iii. Enhance research and academic mentoring through interactions between current and new students as well as the past students (alumni)
- iv. Organising academic conferences or workshop, seminars, webinars etc in collaboration with ACE-FUELS and other institutions.
- v. Helps to share best practices and knowledge among student scholars themselves for example, organizing academic tutorials or mentoring sessions within the student body (e.g. Research papers writing, statistical and data analysis, material studio BIOVIA suite usage for molecular modelling etc).
- vi. Helps to strengthen the relationship between the scholars and the research scientists or faculty in the Centre
- vii. Helps the students and scholars to work and share together opportunities like funding and grants, scholarships, student exchange programs etc.
- viii. Information dissemination from Centre's academic and administrative staff to students or trainees can be done seamlessly via the association or its officers.
- ix. To create a smooth transition between ACE-FUELS studentship status to alumni status.

### **Response to Recommendation 3**

*Teaching, administrative and technical staff could be trained inside the FUTO University, but also through training sessions centralised in Abuja for all universities. More staff members could also benefit from the two international networks WACEENET and TEA-LP.*

The Centre is putting together robust training schedules for all categories of staff. Management has approved regional staff development workshops for staff of the Centre, including:

- Sending 4 participants to the Executive Course on Beyond Funding: Sustainable Strategies for Donor-Supported Programs In Lusaka, Zambia (June 17-21, 2024), <https://ccafrica.africa/programme/beyond-funding-sustainable-strategies-for-donor-supported-programs/>
- Sending 2 participants to the Leading Change through Monitoring and Evaluation: A Masterclass Experience, in Kigali, Rwanda (July 8–18, 2024), <https://ccafrica.africa/programme/leading-change-through-monitoring-and-evaluation-me-excellence-a-masterclass-experience/>

**Response to Recommendation 4**

*Pursue the policy of renewing and purchasing research equipment in the programme's research themes such as solar panels or wind energy.*

The Centre is currently embarking on massive procurement of research equipment to support all the specializations in the Future Energies programme.

**The Centre has recently taken delivery of:**

- (i) Pico solar simulator (G2V Optics, Canada) to support solar energy research.
- (ii) Solar panels and charge controllers
- (iii) Renewable energy trainer (Heliocentris, GMBH) to support solar, wind and hydrogen and fuel cells research.

**Centre has placed orders for:**

- (i) Pouch Cell and coin cell Lab Line Quotation SHANDONG AME ENERGY CO., LTD (China) for battery research
- (ii) RK900-01 Automatic Weather Station (Hunan Rika Electronic Tech Co. Ltd, China)
- (iii) ST-100 PEM Fuel Cell and ALK alkaline fuel cell (Dongguan City Secondary Idea Machinery Co. Ltd., China)
- (iv) HE-50 ml, HE-100 ml, HE-200 ml and HE-300 ml PEM water electrolyzers (Guangzhou kainuo Gas Equipment, China)
- (v) Hydrogen generator from Wuxi Inki Energy Co. Ltd., China
- (vi) VTC-200 vacuum spin coater from Shenyang Kejing Auto Instruments Co. Ltd., China

More equipment and facilities will be sourced as the year progresses.



### **Response to Recommendation 5**

*Use and develop the international networks in order to give students more opportunities for international outgoing mobility.*

- Centre's participation in the Transforming Energy Access (TEA) Forum in Kigali (March 13-14, 2024) led to the establishment of collaboration with Sustainable Product Engineering Centre for Innovative Functional Industrial Coatings, Swansea University, UK, on a project to develop Next Generation PV Manufacturing in Africa. Our joint proposal on this topic to UKRI for Ayrton Funds has scaled the first stage and incorporates sufficient opportunities for outgoing mobility.
- The Centre has established relationships with the Alliance for Renewable Energy, Chinese Academy of Sciences, Forschungszentrum Jülich towards promoting international outgoing mobility for students and faculty.



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## ACCREDITATION DECISION

### M.Sc. Future Energies

Africa Centre of Excellence in Future Energies  
and Electrochemical Systems (ACE-FUELS)

Federal University of Technology Owerri (FUTO)

Owerri, Nigeria

**June 2024**

## SCOPE OF THE ACCREDITATION GRANTED BY HCÉRES

HCÉRES has based its evaluation process on a set of objectives that study programmes must pursue to ensure recognised quality within France and Europe. These objectives are divided up into four accreditation criteria.

The Accreditation Commission issues an opinion about the accreditation of the study programme after examining the file. The Hcéres President takes the decision based on the Commission's opinion and the final evaluation report of the programme. This accreditation decision, taken in plenary session, is the result of a collegial and reasoned process.

The decision issued by Hcéres regarding the accreditation of the study programme corresponds to the awarding of a label to the evaluated entity.

This decision is independent of the accreditations carried out by the French State and therefore does not entail recognition in France of the institution or the diplomas delivered by it.

## **Decision No. EI-2024-37 on the accreditation of the M.Sc. Future Energies, delivered by the Federal University of Technology, Owerri, Nigeria**

### **The President of the High Council for the Evaluation of Research and Higher Education,**

Considering the Research Code, in particular Articles L. 114-3-1 to L. 114-3-6;

Considering the Board's deliberation of 29<sup>th</sup> September 2022 on the accreditation criteria for courses abroad (excluding doctoral/PhD programmes);

Considering the Decision No. 2023-9 of 16<sup>th</sup> March 2023 on the international accreditation procedure of the High Council for the Evaluation of Research and Higher Education;

Considering the agreement DEI\_2023\_CONV17 of 14<sup>th</sup> June 2023 for the evaluation/accreditation of fourteen training courses, delivered by six Centres of Excellence in Nigeria;

Considering the opinion issued by the Accreditation Commission on 18<sup>th</sup> June 2024;

### **Decides:**

#### **Article 1**

Noting that the M.Sc. Future Energies delivered by the Federal University of Technology, Owerri, in Nigeria meets the four accreditation criteria, voted by the Board of the High Council on 29<sup>th</sup> September 2022, as follows:

#### **ACCREDITATION CRITERION 1: TRAINING POLICY AND CHARACTERISATION**

The M.Sc. Future Energies programme aligns perfectly with one of the four strategic areas defined by the Federal University of Technology Owerri, focusing on Energy and Environment. It also supports national plans for the development of renewable energies in Nigeria. The programme adopts a well-constructed multidisciplinary and interdisciplinary approach, leveraging the University's Departments and their research laboratories. As a key component of the Africa Centre of Excellence in Future Energies and Electrochemical Systems (ACE-FUELS), established in 2019, it operates alongside with its own research laboratory. Building upon various science Bachelor's degrees (chemistry, physics, etc.), the programme serves as a pathway to a Ph.D. within the ACE-FUELS.

Academic partnerships extend from the national level (laboratories within the same university but also other universities in Nigeria), to the international level, including collaborations with universities in the East Africa sub-region (in particular a network bringing together several West Africa Centres of Excellence on Energy Network WACEENET), and other continents. These partnerships have facilitated outgoing exchanges and attracted nine foreign students from the sub-region during the evaluated period. The programme is encouraged to further enhance and sustain these international links, particularly in terms of outgoing mobility opportunities.

Students engage in well-structured and supervised research projects over two years, with the requirement of an accepted article before graduation. Students benefit from various communication tools and have access to extensive documentary resources, both physical and online. While the existing research facilities are varied, additional resources would be beneficial. Extensive partnerships with the socio-economic sector, both nationally and internationally, contribute to programme development and offers opportunities for involvement in courses for professional seminars. The programme also delivers several structured professional courses tailored to various external audiences. The programme has established its own entrepreneurial structure in renewable energies, providing students with exposure to real-world industrial contexts and dedicated entrepreneurship courses.

#### **ACCREDITATION CRITERION 2: THE PEDAGOGICAL ORGANISATION OF THE STUDY PROGRAMME**

The programme is meticulously structured, featuring compulsory and elective aligned with one of the five possible pathways: Solar Energy, Bioenergy, Clean Hydrocarbon, Geothermal Energy, and Hydrogen Energy. It encompasses a research project and a one-to-six-month internship, both culminating in written and oral reports. The programme's content, objectives, and desired skills are clearly defined and accessible to all.

A diverse array of teaching methods is employed, ranging from online courses to flipped classroom approaches, facilitated by an online learning platform and industry contributions. Throughout their academic journey, students receive guidance from both a supervisor and a dedicated person at the Centre. Foreign students are provided with an English language refresher course to support their integration. The programme offers numerous and varied opportunities for further training through collaborations with socio-economic partners.

### ACCREDITATION CRITERION 3: ATTRACTIVENESS, PERFORMANCE AND RELEVANCE OF THE STUDY PROGRAMME

The programme employs a variety of virtual and physical channels to enhance its attractiveness. Its robust policy to attract regional students, including full scholarships, accommodation, and language support programme, has led to enrolment of nine students from multiple countries (Senegal, Egypt, Tanzania, Sierra Leone, Liberia, and Ghana). However, there is room for improvement in overall student enrolment and access to full scholarships for Nigerian students. The programme diligently monitors student progress through a structured assessment protocol, which informs ongoing improvements to teaching plans and support measures. Additionally, the programme has implemented the graduate tracer mechanism developed by the AAU to track the progress of alumni, with this data publicly available on the Centre's website. Nonetheless, the requirement to publish in peer-reviewed journal has hindered the graduation process, resulting in only three graduates since 2020.

### ACCREDITATION CRITERION 4: MANAGEMENT AND CONTINUOUS IMPROVEMENT OF THE ACADEMIC PROGRAMME

The programme's organisation and management are transparent and cohesive, with collaborative management at the ACE-FUELS level, a dedicated programme coordinator, and clear allocation of responsibilities for courses and content at the lecturer level. The lecturers, sources from FUTO University, possess diverse expertise required for interdisciplinary approaches, supplemented by professionals from the socio-economic world and from foreign universities. Sufficient teaching and technical/administrative staff ensure the smooth operation of the programme, with opportunities for further training, particularly on an international scale, which could be expanded upon.

Course evaluations by students and lecturers contribute to ongoing improvements, supported by a comprehensive plan at the Centre level. Various bodies oversee different aspects of the programme, including a student representative, although increased student representation in management bodies could be beneficial. Recruitment, assessment, and graduation procedures are well-defined and accessible, meeting the University's standards.

Quality assurance measures, in collaboration with the University of Nigeria, underscore the programme's commitment to maintaining high standards. Continuous improvement is evident through regular surveys, both internal and external evaluations, and alignment with university admission requirements. The programme's accreditation by the NUC for five years further solidifies its commitment to delivering a high-quality education.

## Article 2

The M.Sc. Future Energies delivered by the Federal University of Technology, Owerri, in Nigeria, is accredited for a period of five years from the date of this decision.

## Article 3

The decision is accompanied by the following recommendations and comments:

- In order to increase the attractiveness and number of students, it is suggested to multiply interventions in forums, congresses, publications on social networks and websites, as well as mobilising the alumni network and the socio-economic partners.
- Define the role of the student's representatives in the different bodies at least within the programme and Centre, and organise an elective process to involve students in these bodies.
- Teaching, administrative and technical staff could be trained inside the FUTO University, but also through training sessions centralised in Abuja for all universities. More staff members could also benefit from the two international networks WACEENET and TEA-LP.



Pursue the policy of renewing and purchasing research equipment in the programme's research themes such as solar panels or wind energy.  
Use and develop the international networks in order to give students more opportunities for international outgoing mobility.

**Article 4**

This decision will be published on the Hcéres website.

Paris, 27<sup>th</sup> June 2024.

The acting President  
signed

Stéphane Le Bouler



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