

University Academic Curriculum Vitae

Personal information

Fabian Chidubem Eze

Education since leaving school

- 2014: Bachelor of Engineering in Mechanical Engineering, University of Nigeria
- 2019: Master of Science in Energy Management, University of Nairobi
- 2024: Doctor of Philosophy in Physics (Sustainable Energy Technologies), University of Nairobi

Present appointment

- Postdoctoral Research Fellow
- 20/01/2025
- Recognised Researcher (R2)
- University of Trento
- As a Postdoctoral Research Fellow in the Department of Civil, Environmental, and Mechanical Engineering, I developed integrated assessment models for heat pump and biomass boiler systems using TRNSYS and MATLAB, and designed optimized control and energy management strategies with MATLAB and Python to improve building energy performance. My work included building energy modelling, performance monitoring, and model calibration, as well as the application of machine-learning techniques to historical climate data for long-term performance forecasting of heat pump systems under future climate conditions. I participated in double climatic chamber experiments and carried out thermal material characterization using the Hot Disk Transient Plane Source (TPS) method. In addition, I supervised graduate students, authored and reviewed peer-reviewed journal articles, and contributed to the preparation of competitive research grant proposals.

Professional experience

08/20224 to 12/2024	Research Consultant (Remote)	Korea Institute of Energy Research, Daejeon, South Korea	R2	Conducted experimental data analysis and system validation of a dual-source heat pump, including the development and validation of a high-efficiency solar flat-plate collector. Contributed to the writing, editing, and peer review of research papers for high-impact scientific journals.
04/2022 to 05/2024	Visiting Researcher (Research Trainee)	Korea Institute of Energy Research, Daejeon, South Korea	R1	Successfully conducted building energy performance monitoring, targeting, and reporting, alongside experimental investigation, data collection, and analysis of solar-assisted heat pump (SAHP) systems and underground thermal storage (UTS). Developed and calibrated detailed UTS and building energy models using thermal network analysis, TRNSYS, MATLAB, and EnergyPlus, and applied these models to assess heat pump-based renewable solutions for domestic hot water and space heating and cooling. Performed parametric and

07/2018 to 07/2019	Energy Engineer	Eenovators Limited, Nairobi, Kenya	R1	sensitivity analyses of integrated system models, and applied machine learning techniques for parameter estimation and optimisation using MATLAB and Python As an Energy Engineer (R1) at Eenovators Limited in Nairobi, Kenya, I performed commercial and residential building energy audits and led organisational energy monitoring, targeting, and reporting activities. I recommended energy conservation measures and designed and implemented alternative energy solutions tailored to client buildings, contributing to improved energy efficiency and reduced operational costs.
09/2016 to 08/2017	Physics Teacher	City College, Enugu State, Nigeria	-	<ul style="list-style-type: none"> •Developed lesson plans, notes, and laboratory guides incorporating hands-on learning techniques. •Successfully taught and Instructed Physics to senior secondary school students
05/2015 to 05/2016	Environmental Sanitation Community Development Officer	Nigerian National Youth Service Corps (NYSC)	-	<ul style="list-style-type: none"> •Performed leadership role as a group leader •Successfully engaged in maintaining the cleanliness of the community environment •Successfully performed environmental sensitization as a team

Experience in academic teaching

- **Teaching Assistant: University of Nairobi**
Thermodynamics, Refrigeration, Air Conditioning, and Heat Pumps, Heat and Mass Transfer, and Energy Conversion Principles – Undergraduate and MSc. Students.
- **Physics Teacher**
I have demonstrated strong teaching and mentoring achievements through the design and delivery of Physics courses at senior secondary level, where I developed structured lesson plans, laboratory manuals, and hands-on experiments that improved student engagement and conceptual understanding.
- Undergraduate supervision (Bachelor + Master level): **One at Master level**

Conference Participations and other academic responsibilities

- 03/11/2025 ISES Solar World Congress 2025, Fortaleza, Brazil - *author*
– Presentation Title: Dynamic Simulation of solar-assisted air-source dual-load heat pump system for building space heating and cooling
- 07/11/2025
- 09/06/2025 33rd European Biomass Conference and Exhibition, Valencia, Spain –
– *co-author*
- 12/06/2025 Presentation Title: Modeling and optimization of hybrid heat pump systems with biomass boilers for enhanced bioenergy integration in building heating

30/10/2024 Grants Writing Training Course, Nairobi, Kenya
 –
 29/11/2024
 15/07/2024 DOCTAS Post Doc Training, Nairobi, Kenya
 – Topics: Knowledge Dissemination, Postgraduate supervision, Grant proposal
 19/07/2024 writing, Transdisciplinary, etc.
 07/11/2023 The 12th Asia-Pacific Forum on Renewable Energy (AFORE), South Korea -
 – author
 11/11/2023 Presentation Title: Simulation on the potential of long-term thermal energy
 storage: application with ideal thermal energy storage in a heat pump for
 inter-seasonal use of surplus solar energy in buildings
 14/08/2023 17th International Heat Transfer Conference (IHTC17), South Africa - author
 – Presentation Title: Calibrated models of shallow ground thermal energy storage
 18/08/2023 for heating and cooling applications

Memberships

08/2023 – Current Member, American Society of Heating, Ventilation, and Air-
 Conditioning Engineers (ASHRAE)
 08/2023 – 08/2024 Member, Association of Energy Engineers (AEE)
 03/2019 - Current Association of Energy Professionals, Eastern Africa (AEPEA)

Research and scholarships

Dec. 2024	Fabian Chidubem Eze	Caritro Foundation, Italy	Innovative solutions for the use of heat pumps in residential contexts Research	€ 27,000.00
2020 – 2024	Fabian Chidubem Eze	Partnership for Skills in Applied Science, Engineering, and Technology – Regional Scholarship and Innovation Fund (PASET-RSIF)	Ph.D. Research Scholarship Award	\$ 100,000.00
2022 - 2024	Fabian Chidubem Eze	Samsung Dream Scholarship Foundation	Global Hope Scholarship Award	₩ 14,000,000.0 0
2017 - 2019	Fabian Chidubem Eze	Queen Elizabeth Commonwealth Scholarship	MSc. Scholarship Award	Full scholarshio with monthly stipend and research fund

Publications

Eze, F., Lee, W.-J., An, Y. S., Joo, H., Lee, K., Ogola, J., and Mwabora, J. (2024). Development and simulated evaluation of inter-seasonal power-to-heat and power-to-cool with underground thermal storage for self-consumption of surplus solar energy in buildings. *Energy Conversion and Management*, 320, 119013. <https://doi.org/10.1016/j.enconman.2024.119013>

Eze, F., Lee, W., An, Y. S., Joo, H., Lee, K., Ogola, J., and Mwabora, J. (2024). Experimental and simulated evaluation of inverse model for shallow underground thermal storage. *Case Studies in Thermal Engineering*, 59, 104535. <https://doi.org/10.1016/j.csite.2024.104535>

Eze, F., Ogola, J., Kivindu, R., Egbo, M., & Obi, C. (2022). Technical and economic feasibility assessment of hybrid renewable energy system at Kenyan institutional building: A case study. *Sustainable Energy Technologies and Assessments*, 51, 101939. <https://doi.org/10.1016/j.seta.2021.101939>

Eze, F., Egbo, M., Anuta, U.J., Ntiriwaa, O.-B.R., Ogola, J., Mwabora, J., 2024. A review on solar water heating technology: Impacts of parameters and techno-economic studies. *Bull. Natl. Res. Cent.* 48, 29. <https://doi.org/10.1186/s42269-024-01187-1>

Ossei-Bremang, R. N., Eze, F., Anane-Fenin, K., & Kemausuor, F. (2024). Choice modelling of eCooking adoption by households in Ghana. *International Journal of*

Sustainable Engineering, 17(1), 1–13.
<https://doi.org/10.1080/19397038.2024.2327832>

Eze, F., Lee, W., An, Y., Joo, H., Lee, K., Ogola, J., Mwabora, J., 2023. Calibrated Models of Shallow Ground Thermal Energy Storage for Heating and Cooling Applications, in: Proceeding of International Heat Transfer Conference 17, Begellhouse, Cape Town, South Africa, p. 9.
<https://doi.org/10.1615/IHTC17.430-180> (**Conference Proceeding**)

Syed, M. W., Kazmi, W. W., Hussain, A., Shah, S. F. A., Kariim, I., Mehdi, A. M., Omer, A., Bhatti, A. H., Eze, F., & Bhatti, U. H. (2024). Lignin Liquefaction: Unraveling the effect of process conditions and sustainable pathways for biofuel production– A comprehensive review. *Energy Conversion and Management*, 313, 118615.
<https://doi.org/10.1016/j.enconman.2024.118615>

**Publications
about the
applicant**

September 13, 2024 Lior Kahana; Using surplus PV power for seasonal underground thermal storage. Available at <https://www.pv-magazine.com/2024/09/13/using-surplus-pv-power-for-seasonal-underground-thermal-storage/>

Entrepreneurship

Company name and address: EenGreen Tech Limited, Awka, Nigeria
Position: Director/Founder

Website: <https://eengreentech.com/>

Description: EenGreen Tech Limited is an ambitious energy consulting firm that was established to provide innovative, sustainable, and reliable energy efficiency solutions across Africa, targeting residential and commercial buildings for the global decarbonisation agenda. I established this company since 07/10/2020

**Statement of
interest**

My expected contribution to the RTDa position lies in strengthening research on the interaction between the built environment and users, with a focus on comfort, health, performance, and adaptive behaviour. My background in mechanical engineering, energy management, and a PhD focused on Sustainable Energy Technologies has provided me with strong expertise in indoor environmental quality analysis, including the thermal comfort, and building performance analysis. I have experience in laboratory and field experimentation, including climatic chamber testing, non-invasive building energy and environmental monitoring, and long-term data collection, combined with advanced modelling using TRNSYS, EnergyPlus, MATLAB, and Python. I have also applied statistical and machine-learning techniques to analyse occupant responses and system behaviour, supporting the development of digital twins and intelligent building control strategies. Beyond research, I would contribute to teaching, student supervision, interdisciplinary collaboration, EU grants proposal writing, and engagement with public institutions, in line with the Free University of Bolzen-Bolzano's mission and international profile.

**Language
competence**

English language. International English language Testing System (IELTS). **Level C2**