

CURRICULUM VITAE

Denis Okello, PhD.

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Date of Birth: 1st August 1975

Summary of Education

2008-2012, PhD: Completed PhD degree from Makerere University with research titled *Rock bed thermal energy storage systems for solar cooking applications*. The PhD research was supervised by Professor Ole Jorgen Nydal from NTNU (Norway) and Professor Eldad Banda from Makerere University (Uganda). The research focused on investigating the potential of using locally available materials for storing solar heat that can be used for cooking, boiling water and other related heating applications. The effect of pressure drops, airflow rates, particle size and bed size were investigated both experimentally and numerically.

2003-2005, MSc: Graduated with an MSc degree in Physics from the Norwegian University of Science & Technology (NTNU), Trondheim-Norway. The title of the thesis was *"Concentrating Solar Energy Systems for High Temperature Heat Production and Its Potential in Uganda"* under the supervision of Professor Jorgen Lovseth.

1997-2000, BSc: Completed a Bachelor of Science degree majoring in Physics from Makerere University.

Work Experience

2021 to Date: Head of Physics Department, Makerere University

2001 to Date: Joined Makerere University service as a teaching assistant at the Department of physics in 2001 and rose through the ranks. Currently I am employed as a senior lecturer at Department of Physics, Makerere University.

2013/2014: Post-doctoral research training from the Nelson Mandela University (NMU), South Africa where I investigated the energy yield of a 3.2 kWp grid-connected photovoltaic system installed at the outdoor research facility.

2004-2005: During my MSc study program I worked as tutorial assistant at the Department of Physics, Norwegian University of Science and Technology (NTNU), Norway. (Courses conducted: Electronic, Electronics and Instrumentation and Optics).

Research Interest includes: small scale thermal energy technologies for off-grid cooking applications; Energy yield of photovoltaic systems; solar resource assessment and materials for solar energy applications especially thin film technology and dye sensitized solar cells materials.

Supervision of graduate students: I have supervised three PhD and 10 MSc students to completion; currently I am supervising 4 PhDs and 4 MSc students in the field of renewable energy.

Publications: I published 25 articles in peer reviewed journals since 2014 and presented in a number of national, regional and international conferences and workshops.

List of Publications

- i. Chaciga, J., Nyeinga, K., **Okello, D.**, & Nydal, O. J. (2024). Design and experimental analysis on a single tank energy storage system integrated with a cooking unit using funnel system. *Journal of Energy Storage*, 79, 110163.
- ii. Chaciga, J., **Okello, D.**, Nyeinga, K., & Nydal, O. J. (2025). Experimental analysis on a solar photovoltaic indoor cooker integrated with an energy storage system: A positive step towards clean cooking transition for Sub-Saharan Africa. *Solar Compass*, 100109.
- iii. Katongole, D. N., Nyeinga, K., **Okello, D.**, Mukiibi, D., Mubiru, J., & Kisira, Y. (2024). Empowering the solar energy landscape: The techno-economic analysis of grid-connected PV power plants in Uganda. *Energy for Sustainable Development*, 82, 101544.
- iv. Komakech, I., **Okello, D.**, Kavuma, A., Abal, B., & Wygoda, A. (2025). Validation of clearcalc for efficient patient specific QA. *Medical Dosimetry*.
- v. Komakech, I., **Okello, D.**, Kavuma, A., Orem, J., Tagoe, S. N. A., & Wygoda, A. (2024). Errors in manual radiotherapy treatment procedures and their evolution in a low resource setting: Uganda's experience. *Physica Medica*, 118, 103212.
- vi. Katongole, D. N., Nyeinga, K., **Okello, D.**, Mukiibi, D., Mubiru, J., & Kisira, Y. (2023). Spatial and Temporal Solar Potential Variation Analysis in Uganda Using Measured Data. *Tanzania Journal of Science*, 49(1), 1-14.
- vii. Olanya, A., **Okello, D.**, Oruru, B., & Kisolo, A. (2023). Natural Radioactivity Levels and Radiogenic Heat Production in River Sediments from Gulu and Amuru Districts, Northern Uganda.
- viii. **Okello, D.**, Omony, R., Nyeinga, K., & Chaciga, J. (2022). Performance Analysis of Thermal Energy Storage System Integrated with a Cooking Unit. *Energies*, 15(23), 9092.
- ix. Kajumba, P. K., **Okello, D.**, Nyeinga, K., & Nydal, O. J. (2022). Assessment of the energy needs for cooking local food in Uganda: A strategy for sizing thermal energy storage with cooker system. *Energy for Sustainable Development*, 67, 67-80
- x. Okello, A., Owuor, B. O., Namukobe, J., **Okello, D.**, & Mwabora, J. (2022). Influence of the pH of anthocyanins on the efficiency of dye sensitized solar cells. *Heliyon*, 8(7), e09921.
- xi. Olanya, A., **Okello, D.**, Oruru, B., & Kisolo, A. (2022). The primordial radionuclides activity concentrations and associated minerals in rocks from selected Quarries in northern Uganda. *International Journal of Sciences: Basic and Applied Research (IJSBAR)*, 66(1), 45-65.
- xii. Tusiime, S., Nyeinga, K., **Okello, D.**, & Nydal, O. J. (2022). Performance Investigations of the Charging and Discharging Processes in a 3-Tank Thermal Energy Storage System. *Tanzania Journal of Science*, 48(4), 727-740.
- xiii. Bwayo, E., Okullo, W., Mukiibi, D., **Okello, D.**, Lugolole, R., & Ireeta, T. W. (2021). Dependence of reflectance on angular deposition and film thickness of ZnS/Ag nanolayers. *Engineering and Applied Science Letters*, 4(4), 26-42.
- xiv. Alex Okello, Brian Owino Owuor, Jane Namukobe, Denis Okello, Julius Mwabora

- Influence of concentration of anthocyanins on electron transport in dye sensitized solar cells. **Heliyon** (2021 V0, <https://doi.10.1016/j.heliyon.2021.e06571>)
- xv. Pamella K. Kajumba, **Denis Okello**, Karidewa Nyeinga, Ole J. Nydal. Experimental investigation of a cooking unit integrated with thermal energy storage system. *Journal of Energy Storage*, 32 (2020). doi.org/10.1016/j.est.2020.101949
- xvi. Mavuto H. Banda, Karidewa Nyeinga, **Denis Okello**. Performance evaluation of 830 kWp grid-connected photovoltaic power plant at Kamuzu International Airport-Malawi. **Energy for Sustainable Development** 51 (2019) 50–55. <https://doi.org/10.1016/j.esd.2019.05.005>
- xvii. Robert Lugolole, Ashmore Mawire, **Denis Okello**, Katlego A. Lentswe, Karidewa Nyeinga, Adedamola B. Shobo. Experimental analyses of sensible heat thermal energy storage systems during discharging, *Sustainable Energy Technologies and Assessments* 35 (2019) 117–130
- xviii. R. Lugolole, A. Mawire, K.A. Lentswe, **D. Okello**, Karidewa Nyeinga (2018) Thermal performance comparison of three Sunflower Oil based sensible heat thermal energy storage systems during charging cycles. *Sustainable Energy Technologies and Assessment. Volume 30, December 2018, Pages 37-51.* <https://doi.org/10.1016/j.seta.2018.09.002>
- xix. **Shobo A.B., Mawire A., Okello D.** (2017). Experimental thermal stratification comparison of two storage systems. 9th International Conference on Applied Energy, ICAE2017, 21-24 August 2017, Cardiff, UK, **Energy Procedia** (142) 3295-3300. doi.org/10.1016/J.EGYPRO.2017.12.460
- xx. Tabu Bernard, Karidewa Nyeinga, Jimmy Chaciga, **Denis Okello**. *Thermal performance of selected oils in Uganda for indirect solar domestic cooking applications*. Tanzania Journal of Sciences, 2018.
- xxi. Karidewa Nyeinga, Ole J. Nydal, **Denis Okello**, and Eldad J. K.B. Banda. 2016. *Dynamic model of a small scale concentrating solar cooker with rock bed heat storage*. *Journal of Energy in Southern Africa*; Vol.27, No.1, pp.20-27.
- xxii. **Denis Okello**, Ole J. Nydal, Karidewa Nyeinga and Eldad J. K. Banda. 2016. *Experimental investigation on heat extraction from a rock bed heat storage system for cooking applications*. *Journal of Energy in Southern Africa*; Vol.27, No.2, pp.30-37.
- xxiii. **D. Okello**, E.E.van Dyk, F.J. Vorster. Analysis of measured and simulated performance data of a 3.2 kWp grid-connected PV system in Port Elizabeth, South Africa, **Energy Conversion & Management**, 100: 10-15, 2015
- xxiv. **Denis Okello**, Choo W. Foong, Ole J. Nydal, and Eldad J.K. Banda. An experimental investigation on the combined use of phase change material and rock particles for high temperature (350°C) heat storage. **Energy Conversion and Management**, 79: 1 - 8, 2014.
- xxv. **Denis Okello**, Ole J. Nydal, and Eldad J.K. Banda. Experimental investigation of thermal de-stratification in rock bed TES systems for high temperature applications. **Energy Conversion. Mgmt**, 86:125-131, 2014.

Research Projects Coordinated

- a) **2019-2025: Coordinator** of UGA 01 project on Material Science and Solar Energy; funded by SIDA through the International Science Programme (ISP) Sweden.

- b) **2021-2026: Deputy Coordinator**, Energy Technology Network funded by NORAD, Norway through NORHED II Projects. Other partners in the project include: NTNU Trondheim; University of Dar es Salaam, Mekelle University, Addis Ababa University, and Eduardo Mondlane University.
- c) **2021-2023: Deputy Coordinator**, University Project on Energy Technology funded by EU Erasmus + project. Other partners in the project include: NTNU Trondheim and partners universities from Africa
- d) **2015-2020: Deputy Coordinator**, Energy & Petroleum (EnPe) project; Building capacity & research in Renewable Energy, Makerere University. The project was funded by NORAD-Norway through the Energy & Petroleum (EnPe) Program. Other partners in the project are: The Norwegian University of Science & Technology (NTNU), Trondheim-Norway, University of Dar es Salaam -Tanzania, Mekelle University-Ethiopia, Eduardo Mondlane University, Maputo-Mozambique.
- e) **2018-2025: Node Coordinator**, Material Science and Solar Energy in Eastern and Southern Africa (MSSEESA).

Membership

- a) A member of International Solar Energy Society (ISES)
- b) A member of the Energy Accessibility and Efficiency (ENRICH) in East Africa.
- c) A member of the Material Science and Solar Energy Network in East and Southern Africa (MSSEESA)
- d) A reviewer of the Energy Conversion and Management Journal (ELSEVIER)
- e) A reviewer of the Solar Energy Journal (ELSEVIER)
- f) A group leader of the Renewable Energy Research group at the Department of Physics

External Examination Appointment

- a) An external examiner, Department of Physics, University of Dar es salaam (2020-2022)
- b) An external examiner, Department of Physics, University of Namibia (2021)
- c) An external examiner, Department of Physics, Kyambogo University (2020-2023)
- d) An external examiner, Department of Physics, Kampala International University (2016-2018)

Referees

1. **Prof. Ireeta Tumps Winston**, Principal, College of Natural Sciences, Makerere University,
Email: winston.ireeta@mak.ac.ug
2. **Prof. Ole Jorgen Nydal**, Department of Energy and Process Engineering,
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