

1. INTRODUCTION

1.1 Born: 30th October 1979; **Nationality:** Ugandan; **Email:** wilson.musinguzi@gmail.com/wmusinguzi@eng.busitema.ac.ug; **Telephone (Mobile):** +256 774 076181 or +256 702 937330; **Postal Address:** Busitema University Faculty of Engineering, P.O. Box 236 Tororo (Uganda)

1.2 Preamble

I, Associate Professor Dr. Wilson Babu Musinguzi possess more than fifteen years of relevant experience in engineering professional/academic arena including but not limited to administration/management, lecturing, strategic curriculum development/review leadership, research, and community development impact projects. I have an excellent record of resource mobilization for education, research, capacity building, and community projects. I have vast experience in Total Quality Management.

I hold a PhD in Renewable Energy Engineering from Makerere University, Uganda (2015); a Master of Science in Sustainable Energy Engineering (SEE) from the Royal Institute of Technology (KTH), Stockholm, Sweden (2006); and a BSc in Mechanical Engineering from Makerere University, Uganda (2004). I have published widely in areas of Mechanical and Energy analysis. Since 2006, I have lectured many courses in engineering. I have mentored many students and staff and immensely impacted on communities.

I have served as the Dean Faculty of Engineering Busitema University, Uganda for over five (5) years (2015-2020). In this executive position, I excelled on the fronts of teaching and learning, research, community outreach, innovations, and management/leadership skills. I have played a leadership role to the development and/or review of many academic programmes to mention a few: PhD/MSc in Sustainable Energy Engineering, PhD/MSc in Materials Engineering, MSc in Renewable Energy (at Makerere, University of Dar es Salaam and University of Zimbabwe); MSc in Computer Forensics; MSc in Irrigation and Drainage Engineering. I have participated in teams developing and reviewing academic and work environment policies namely: Grants Management policy, Staff Promotion and Appointments policy; Staff Development policy; Intellectual Property policy; Research and Innovations policy; Research Ethics policy; Outreach policy; Anti-Plagiarism policy; Recognition and Reward policy; Gender policy; and Quality Assurance policy.

I am a founding member, project coordinator and the pioneer Executive Board Chairman (2017-2019) of Renewable Energy Business Incubator (REBI) Ltd., engaged in fostering Renewable Energy Access to remote and vulnerable settlements. Since the Incemption of REBI as a project in 2011, I have led the team in developing a Total Quality Management System (TQM) to the level of obtaining an ISO certification in 2019. I have been member of the Global Engineering

Deans Council (GEDC) (since 2016) whose mission is to serve as the global network of engineering Deans mobilized to advance engineering education, research, and service to the global community. I have served on a number of expert committees within and outside the University.

2. EDUCATIONAL BACKGROUND

I pursued a Bachelor of Science in Mechanical Engineering (2000-2004) and graduated with a Bachelor of Science Degree in Mechanical Engineering of Makerere University on 22nd October 2004.

I pursued a Master of Science in Sustainable Energy Engineering (2004-2006) and was awarded an MSc degree in Sustainable Energy Engineering with a Major in Mechanical Engineering of the Royal Institute of Technology (KTH), Stockholm Sweden in June 2006.

I pursued a PhD in Mechanical Engineering with Specialization in Renewable Energy (2010-2014) Awarded a Doctor of Philosophy Degree of Makerere University at the January 2015 congregation.

3. EMPLOYMENT RECORD

3.1 Pupilage Employment (2006-2009)

I worked as a part-time lecturer at Kyambogo University. The courses taught during this period included: Power Plant Engineering II (AP 417), Energy Systems I (EEM 313), Energy Systems II (EEM 416), Energy Production (ME 415), Materials Handling (ME 417), Refrigeration and Air Conditioning (AP 424), Water Sources and Treatment (EEM 321), Environmental Engineering Design (EEM 323), Environmental Impact Assessment (EEM 421), Solid Waste Management (EEM 425), Environmental Pollution (IE 423).

3.2 Post Pupilage Employment (2007-2010)

I served as a full-time lecturer at Busitema University (BU). The courses taught during this period included Engineering Mathematics I (AMI 1101), Engineering Mathematics II (AMI 1201), Engineering mathematics III (AMI 2101).

3.3 Promotions

Between 2010 and 2014, I was attending my PhD studies. After graduating with a PhD in January 2015, I returned to my duties at Busitema University as a Lecturer. In October 2015, I was appointed **Acting (Ag.) Dean** Faculty of Engineering for a period of one (1) Year. In May 2016, I was promoted to the rank of **Senior Lecturer**. In January 2017, I was appointed as a **Substantive Dean**, Faculty of Engineering for a period of four (4) years following an election process and decision of Council as provided for by the UOTIA Act. I was promoted to the rank of **Associate Professor** in October 2020. I completed my term of Deanship on 31st December

2020. I am now lecturing the following undergraduate courses; Renewable Energy Technologies (WAR 4202, APE4106), Fluid Mechanics (BEE1205), Thermodynamics (BEE1207), and Heat and Mass Transfer (PTI2206). At Master's level, I handle Applied Hydraulics (MID 8112) and Environmental Engineering and Management (MID8115).

4. RESEARCH/COMMUNITY PROJECT PARTICIPATION AND RESOURCE MOBILIZATION

- i) Renewable Energy Business Incubator (REBi) Ltd, 2017-2020, USD USD 770,000; Vocational Training for Job Creation in the Renewable Energy Value Chain in Uganda, Project No. UGA-16/0012 funded by the Royal Norwegian Embassy in Uganda (2017-2020). **Serving as Executive Board Chairman (until May 2019) and current Board Member.**

Project Brief: *"REBi Limited proposed to partner with technical and vocational institutions to equip youth and young adults with relevant skills demanded by the labour market. Upon completion of their final semester coursework, students are attached to renewable energy companies for industrial training to acquire hands-on skills and experience in areas of Electrical and Mechanical engineering relevant for the sector development. This skills enhancement is expected to increase their employability and job creation".*

Results

- Enterprise support

REBi supported 24 enterprises (incubation, training, linkage to networks and seed financing to some of them)

- Business establishment

14 businesses established and developed (some were incubated, some were already established but were struggling - REBi assisted in their development)

- Created employment opportunities

160 jobs created in the businesses and the value chain. 73 (direct) and 87 (indirect)

- ii) NORAD Master Programme: Master of Science in Renewable Energy at Makerere University and University of Dar es Salaam in collaboration with NTNU (Norway), Eduardo Mondlane (Mozambique), University of Malawi (Malawi), Mekelle University and Addis Ababa University (Ethiopia); USD 2 million, 2007 – 2014. Participated as a researcher, Assistant coordinator and later as coordinator.

Project Brief

- The program is offered by both Makerere University and University of Dar-es-salaam.
- The other collaborating institutions in Eastern Africa used to send in their students on scholarship and also send their professors to take part in lecturing and supervision of research at either Makerere University or University of Dar-es-Salaam.
- NTNU coordinated the project by linking the institutions in the south with NOMA (NORAD). Also professors from NTNU are involved in lecturing specialized courses at Makerere and University of Dar-es-Salaam and are also for the general guidance on curriculum development and quality assurance of the master program.

Funding

- 5 student cohorts (in total 82 scholarships awarded)
- Budget: 12,000,000 NOK (~ USD 2 Million) financed by SIU (Norad)

Results

- About two third of the scholarship students have graduated at both UDSM and Makerere University with the rest still following up their studies (thesis).
- The collaboration among partner universities has been remarkable.
- The project has enjoyed full support from the University administration at all levels

Spin-off projects

- Energy and Petroleum project (EnPe) sponsoring one PhD student connected to NOMA project coordination at Makerere (2010-2014), Budget: 1,000,000 NOK (~ USD 167,000). Served as Coordinator and beneficiary. **Result:** The PhD candidate (myself) completed in time and is serving the nation excellently.
 - NOMA Gender Incentive Project offering additional benefits to female students in the NOMA MSc Renewable Energy program (2011-2013). Budget: 319,000 NOK (~USD 53,000). Served as Coordinator. **Results:** The project created an enabling environment for female students to cope with both family and studies through incentives for child care, additional research grants and many completed in time. The enrolment for female students increased in the subsequent years and generally women are able to complete studies at the same rate as men.
- iii) NORAD Energy and Petroleum (EnPe) project within Energy Technologies. Partners Makerere University, NTNU (Norway), Eduardo Mondlane (Mozambique), University of Malawi (Malawi), Mekelle University and Addis Ababa University (Ethiopia); USD 1,25 million, 2010 – 2015). Participated as a researcher and coordinator at Makerere University. We are completing Phase II; USD 2 million, 2014 – 2020. Participating as a researcher and coordinator at CEDAT, Makerere University. **Results:** Capacity building at PhD – At least 3 PhD students are enrolled at each of the participating University for purposes of capacity building. A number of Master's students have completed their

studies and a few more still following up their thesis work. The staff at the Universities in the south have enhanced their supervision capacity through co-supervision with the Norwegian Professors. Also, the lab infrastructure at each University in the south has steadily improved due to the PhD experimental test rigs installed. I am supervising one PhD under this project.

- iv) Climate Facility (NCF): Sustainable Renewable Energy Businesses in Uganda, between Norges Vel (Norway) and Makerere University; Euro 500,000, 2010 – 2014. Participated as the Local Project Manager on Makerere side. **Results:** 4 Husk Power Gasification plants were installed to demonstrate small scale electricity generation from Biomass. The communities enjoyed the power, despite the technology challenges that were experienced. A number of entrepreneurs were supported for business start-ups in Renewable Energy. Existing enterprises in Renewable Energy were also uplifted both in financing and business advisory.
- v) NORAD support grant to Renewable Energy Incubator at Makerere; USD 600,000, 2013 – 2016. Participating as an advisor/Local Project coordinator. The support was for continuation of the actions under (iv) and further equity for enterprise development in Businesses in Renewable Energy especially bioenergy for household cooking, Pico hydro and solar technologies.
- vi) Design and implementation of a 4 MW solar power plant project (Approx. US\$7 million grant from Egyptian Government to Uganda and counterpart funding from Ugandan Government) to support energy nexus projects for the University community and surrounding communities in Busia District and the region. The overarching goal of this project is to spur environmental sustainability through green and energy development, clean water projects among others. I serve as the Project Coordinator (since 2018).

5. KEY PROFESSIONAL TRAINING

- i) Training in Modern Higher Education Management and Leadership under the International Deans' Course Africa 2019/2020, Osnabruck/Berlin Germany 17th – 28th June 2019. Key competences gained include; Diversity Management, Strategic Management, Project Action Plan development and implementation, Conflict Management, Leadership, Financial Management and Quality Assurance in modern systems with emphasis on Total Quality Management of Human Resource and support systems and processes.
- ii) Training on Leadership and Change Management, Management of Higher Education Institutions and Principal Value centred leadership programme; conducted by Eastern and Southern African Institute (ESAMI), 16th – 20th April 2018. The Skills gained enhanced by corporate governance traits, creativity and holistic system thinking.

- iii) Training on Transformational Leadership and Governance in Higher Education at Moi University, Eldoret Kenya, October 2017. I got skills on corporate governance and management of universities.

6. ACADEMIC AWARDS

- i) Awarded the EnPe PhD Scholarship amounting to USD 100,000 as an exclusive offer under Norad NOMA Project for my role as the Assistant Coordinator of the project.
- ii) Awarded a contract as a consultant for the EU Energy Initiative Partnership Dialogue Facility (EUEI PDF) (Support the Enhancement and Internationalization of the Renewable Energy Master Programme at University of Zimbabwe) – October 2015 to March 2016; Contract Amount UGX 28,081,495 (USD 8,000)

7. MEMBERSHIP OF PROFESSIONAL BODIES

A member of the Global Engineering Deans Council (GEDC). Our Mission is to serve as the global network of engineering deans mobilized to advance engineering education, research, and service to the global community. Our strategic plan is focused on institutional leadership formation, curriculum leadership, corporate and public engagement, and accreditation leadership.

A member of the Uganda Institution of Professional Engineers (UIPE) – Provisionally (PR/507)

8. CONTRIBUTION TO THE COMMUNITY SERVICE

- i) A Member of the Busitema University Senate – a supreme academic organ (2015-2020)
- ii) A Member of the Busitema University Council representing Senate – A supreme governance body (2016-2020)
- iii) Member of Staff Development Committee Busitema University representing Deans (2016-2020)
- iv) A member of the Budget Committee of Busitema University representing Deans (2016-2018)
- v) A member of the Search committee for the Chancellor of Busitema University (Sept 2017)
- vi) Chairperson, 10th Anniversary organizing Committee of Busitema University (Sept-Oct 2017)
- vii) A Member of the Evaluation Committee of the National Science, Technology and Innovation Programme (NSTIP) of Uganda National Council for Science and Technology (2018)
- viii) Executive Board Chairman, Renewable Energy Business Incubator (REBI) (2017 – 2019)
- ix) A member of the Busitema University Appointments Board (2020)

- x) A Member of the UNCST-SGCII Evaluation Committee (2021)
- xi) Served as an external examiner for the School of Engineering at Makerere University on more than ten occasions.
- xii) Serving as an external examination Moderator for Namibian University of Science and Technology (NUST)

9. INTERNATIONAL SCIENTIFIC CONFERENCES ATTENDED

- i) The World Engineering Education Forum- Global Engineering Deans' Council (WEEF-GEDC 2019), 20-27 October 2019, Santiago Chile. A Panelist for the session "Engineering and Sustainable Development"
- ii) The World Engineering Education Forum- Global Engineering Deans' Council (WEEF-GEDC 2018), 12 – 16 November 2018, Albuquerque, New Mexico, USA.
Conference Theme: "Peace Engineering". I presented a paper titled "*Mechanization on small Holder Farmers – An Innovative Approach by Busitema University*"

10. LIST OF SCIENTIFIC PUBLICATIONS

- i) Edmund Tumusiime, John B. Kirabira, **Wilson B. Musinguzi** (2020). Performance evaluation of cellulose fiber's effectiveness as a thermal insulation material for productive biogas systems. *Journal of Energy Reports (Science Direct, Elsevier Ltd)*. <https://doi.org/10.1016/j.egy.2020.12.014>.
- ii) Christine Nambajjwe, **Wilson Babu Musinguzi**, Samson Rwahwire, Allan Kasedde, Catherine Namuga, Ildephonse Nibikora (2020). Improving electricity from silk cocoons through feeding silkworms with silver nanoparticles. *Materials Today: Proceedings (Science Direct, Elsevier Ltd)*, Vol. 28 part2 (2020), pp. 1221-1226. <https://doi.org/10.1016/j.matpr.2020.01.518>
- iii) **Wilson Babu Musinguzi***, Ibrahim Luqman Mpungu (2019). The Impact of Using Upgraded Biogas on Generator Performance. *Advances in Science, Technology and Engineering Systems Journal Vol. 4, No. 5, 186-192 (2019)*. ISSN: 2415-6698.
*Corresponding Author.
- iv) Edmund Tumusiime, John B. Kirabira, **Wilson B. Musinguzi** (2019). Long life performance of Biogas systems for productive applications: The Role of R&D and Policy. *Journal of Energy Reports (Science Direct, Elsevier Ltd)*, 5, pp. 579-583. <https://doi.org/10.1016/j.egy.2019.05.002>.

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- v) Rwahwire, S., **Musinguzi, W.B.** (2019). Impact Resistance and Shore Hardness of Barkcloth Reinforced Epoxy Composites for Interior Automotive Panels. *Materials Science Forum*, 951, 9-13 <https://www.scientific.net/MSF.951.9>
- vi) Kale, B. M., Rwahwire, S., Nilkanth Kisan Kale, **Musinguzi, W., B.** (2019). PLA Composite Films Based On Acetate Substituted Microcrystalline Cellulose. *Key Engineering Materials*, 801, 133-138. <https://www.scientific.net/KEM.801.133>
- vii) Mackay A.E. Okure, **Wilson B. Musinguzi***, Terese Løvås (2016). Parametric modeling of producer gas-combustor and heat exchanger integration for micro-gas turbine application. *Journal of Energy Challenges and Mechanics*, Volume 3 (2016), Issue 4, pp. 191-200. ISSN 2056-9386.
- viii) Okure M.A.E., Tuhairwe F., **Musinguzi W.B.** (2016). *Technical and Economic Viability of Biogas-based Electricity Generation for Distributed Renewable Energy Systems in Livestock Communities of Uganda*. in: E. Delfino & C. Vezzoli, eds., *Proceedings of the LeNSes Conference: Sustainable Energy for All by Design*, pp 87-93. ISBN 978-88-95651-23-1.
- ix) Abbo M.S., Da Silva I.P., Okure M., Lating P., **Musinguzi W.** (2016). *Selection of Distributed Renewable Energy sites using Simple Additive Weighting*. in: E. Delfino & C. Vezzoli, eds., *Proceedings of the LeNSes Conference: Sustainable Energy for All by Design*, pp 211-217. ISBN 978-88-95651-23-1.
- x) **Wilson B. Musinguzi**, Mackay A.E. Okure, Adam Sebbit, Terese Løvås and Izael Da Silva (2014). Thermodynamic Modeling of Allothermal Steam Gasification in a Downdraft Fixed-bed Gasifier. *Journal of Advanced Materials Research*, 875-877 (2014) pp 1782-1793 © (2014) Trans Tech Publications, Switzerland doi:10.4028/www.scientific.net/AMR.875-877.1782.
- xiii) Mackay A.E. Okure, **Wilson B. Musinguzi**, Adam Sebbit, Terese Løvås (2014). Exergoeconomic analysis of a novel small-scale CHP system for rural electrification in Uganda. *Published in the conference proceedings of the 10th International Conference on Heat Transfer, Fluid Mechanics and Thermodynamics (HEFAT2014) conference, 14 – 16 July 2014. Orlando, Florida, USA, pages.1978-1985. ISBN: 978-1-77592-068-73.*
- xiv) Mackay A. E. Okure, **Wilson Musinguzi**, Andrew Wabwire, Ssengonzi Bagenda (RegConf2014). Experience from Rural Electrification in Uganda: A Case Study of a Husk Powered System in Tiribogo Village". *Published in the proceedings of the 9th regional*
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collaboration conference on Research and Innovations forum for sustainable regional Development. 20 – 23 July, 2014 Imperial Resort Beach Hotel, Entebbe Uganda, pages 28 – 37.

- xiii) **Wilson B. Musinguzi**, Mackay A.E. Okure, Adam Sebbit, Terese Løvås (2012). Thermal characterization of Uganda's *Acacia hockii*, *Combretum molle*, *Eucalyptus grandis* and *Terminalia glaucescens* for gasification. *Journal of Biomass and Bioenergy (Science Direct, Elsevier Ltd)*, 46, pp. 402-408.
- xiv) Houshfar E., Sandquist J., **Musinguzi W.**, Khalil R.A., Becidan M., Skreiberg Ø., Goile F., Løvås T., Sørum L. (2012). Combustion properties of Norwegian biomass: wood chips and forest residues. *Journal of Applied Mechanics and Materials*, 110-116, pp. 4564-4568.
- xv) Khalil R.A., Houshfar E., **Musinguzi W.**, Becidan M., Skreiberg Ø., Goile F., Løvås T., Sørum L. (2011). Experimental investigation on corrosion abatement in straw combustion by fuel-mixing. *Journal of Energy & Fuels*, 25 (6), pp. 2687–2695.
- xvi) **Wilson B. Musinguzi**, Mackay A.E. Okure, Adam Sebbit, Terese Løvås (2011). Small-scale CHP for Rural Electrification in Uganda – The State-of-the-art and Prospective Development. *The 2nd International Conference on Advances in Engineering and Technology (AET2011)*. Entebbe, Uganda.
- xvii) Mackay A. E. Okure, **Wilson Musinguzi** (2006) *A Novel Combined Heat and Power (CHP) Cycle Based on Gasification of Bagasse*, *Advances in Engineering and Technology*, Oxford, UK., Elsevier Ltd, 465- 472 pages, ISBN=0-08-045312-0

11. GRADUATE STUDENTS SUPERVISED

- i) **Mr. Smith Tukahirwa (2015/HD08/168U) – MSc Renewable Energy (Makerere University)**. Thesis title: *Techno-economic analysis of MSW Gasification for electricity generation; Case study of Mbarara municipality*. Graduated in May 2021.
- ii) **Mr. Adongo Owora Leo (BU/GS16/MID/1). MSc Irrigation and Drainage Engineering (Busitema University)**. Thesis Title: *Application of the Soil and Water Assessment Tool (SWAT) Model in Water Resources Assessment to Guide Irrigation Development in Malaba Sub-Catchment, Uganda*. Graduated in October 2019.
- iii). **Ms. Ikwap Flavia Agatha (BU/GS16/MCF/3) – Msc Computer Forensics (Busitema University)**. Thesis Title: *Framework for Detecting and Extracting Files Hidden by*

Encryption and Steganography on Android Devices – Case study Uganda. Graduated in October 2019.

- iv) **Mr. Ibrahim Luqman Mpugu(2014/HD08/1351U) – MSc Renewable Energy (Makerere University)**. Thesis Title: *The Effect of Using Upgraded Biogas on Generator Performance*. Graduated in January 2019.
- v) **Mr. Yoronimo Oketcho (BU/GS14/MID/27) – MSc Irrigation & Drainage Engineering (Busitema University)**. Thesis Title: *Application of “SWAT” to Identify Potential Irrigation Development Sites – Upper Aswa Catchment, Northern Uganda*. Graduated in October 2018.
- vi) **Mr. Fred Tuhairwe (2013/HD08/362U) – MSc Renewable Energy (Makerere University)**. Thesis Title: *Technical and Economic Viability of Biogas Production for Electricity Generation in Uganda*. Graduated in January 2017.
- vii) **Mr. Edmund Tumusiime (MSc. RE, BSc. Mech Eng) (2015/HD08/18805U)**
PhD in Renewable Energy at Makerere University. Title: *Toward Optimization of Energy Recovery from Organic Waste Streams for Productive Applications: The Case of Productive Biogas for Heat and Power Generation in Uganda*. At advanced stage of completion.

12. REFEREES

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