

Ronald Muhumuza  
Research Associate  
Belfast School of Architecture & the Be  
Faculty Of Computing, Eng. & Built Env.  
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## Biography

I am a doctoral researcher at the Centre for Sustainable Technologies (CST), developing modern technology for harnessing renewable energy resources in remote locations of developing countries. My research is aimed at creating affordable synergetic concepts based on new and readily available technologies with humanitarian engineering in mind – discovering novel approaches for meeting the needs of the energy poor. Preliminary work involves design and development of renewable solar energy cogeneration for electricity and hot water supply in off-grid rural households in developing countries followed by a scientific investigation of compelling techno-economic, social and sustainability questions. I have supported tutorial classes in Engineering Mathematics and laboratory demonstration classes relating to designing and testing custom pico-solar photovoltaic modules and water heating kits for students of BSc (Hons) in Energy and BEng (Hons) Architectural Engineering.

Besides academic work, I worked in the Manufacturing Industry growing from manufacturing team leader to unit manager covering food packaging, factory facilities and maintenance operations. Furthermore, my experience includes implementing electrical and energy audits in various industries, energy monitoring systems, environmental audits and social impact assessments, occupational health and safety, quality management systems and technical capacity development.

I am holder of BSc (Hons) in Mechanical Engineering from the Makerere University (Kampala, Uganda), MSc Sustainable Engineering: Renewable Energy Systems & the Environment from University of Strathclyde, UK; and a professional member of the Association of Energy Engineers (AEE) USA.

## Qualifications

Master, University of Strathclyde  
Sep 2009 → Sep 2010  
Award Date: 5 Nov 2010

Bachelor, Makerere University  
Aug 2001 → Aug 2006  
Award Date: 5 Oct 2006

## Employment

### Research Associate

Research Associate  
Belfast School of Architecture & the Be  
Vice-Chancellor's Office  
1 Aug 2017 → present

### Research Associate

Faculty Of Computing, Eng. & Built Env.  
Vice-Chancellor's Office  
1 Aug 2017 → present

### Lecturer

Busitema University  
Uganda  
1 Aug 2015 → present

### Manufacturing Unit Manager

Coca-Cola Sabco Pty, Century Bottling Company Ltd, Uganda, Mbarara Plant

Uganda

1 Jul 2014 → 1 Jun 2015

**Technical Trainer**

Century Bottling Company Ltd

Kampala, Uganda

1 Feb 2014 → 1 Jul 2014

**Manufacturing Unit Manager**

Century Bottling Company Ltd

Kampala, Uganda

1 Oct 2011 → 1 Jan 2014

**Energy Consulting Engineer**

Air Water Earth Ltd, Uganda, Kampala

Uganda

1 Sep 2010 → 1 Sep 2011

**Maintenance Controller**

Century Bottling Company Ltd

Kampala, Uganda

1 Jun 2009 → 1 Sep 2009

**Manufacturing Team Leader**

Century Bottling Company Ltd

Kampala, Uganda

1 Dec 2006 → 1 May 2009

**Mechanical Engineering Graduate**

Trainee, Eskom Uganda Ltd (hydropower plant)

Uganda

1 Aug 2006 → 1 Nov 2006

**Research outputs**

**Overview of SwanaSmartStore energy hardware: Presentation of solar simulator laboratory testing**

Pugsley, A., Mondol, J., Smyth, M., Zacharopoulos, A., McLarnon, D. & Muhumuza, R., 24 Nov 2020.

**Modelling and experimental evaluation of an innovative Integrated Collector Storage Solar Water Heating (ICSSWH) prototype**

Smyth, M., Barone, G., Buonomano, A., Forzano, C., Giuzio, G. F., Palombo, A., Mondol, J., Muhumuza, R., Pugsley, A., Zacharopoulos, A. & McLarnon, D., Sep 2020, In: Renewable Energy. 157, p. 974-986 13 p.

**Experimental characterisation of different hermetically sealed horizontal, cylindrical double vessel Integrated Collector Storage Solar Water Heating (ICSSWH) prototypes**

Smyth, M., Mondol, J., Muhumuza, R., Pugsley, A., Zacharopoulos, A., McLarnon, D., Forzano, C., Buonomano, A. & Palombo, A., 31 Aug 2020, In: Solar Energy. 206, p. 695-707 13 p.

**Simulation and experimental validation of solar radiation distribution on the absorber of a line-axis asymmetric compound parabolic concentrator**

Muhumuza, R., Zacharopoulos, A., Mondol, J., Smyth, M., Pugsley, A. & McGee, J., 1 Mar 2020, In: Solar Energy. 198, p. 36-52 17 p.

**Experimental investigation of horizontally operating thermal diode solar water heaters with differing absorber materials under simulated conditions**

Muhumuza, R., Zacharopoulos, A., Mondol, J., Smyth, M., Pugsley, A., Francesco Giuzio, G. & Kurmis, D., 31 Aug 2019, In: *Renewable Energy*. 138, p. 1051-1064 14 p.

**Experimental study of heat retention performance of thermal diode Integrated Collector Storage Solar Water Heater (ICSSWH) configurations**

Muhumuza, R., Zacharopoulos, A., Mondol, J., Smyth, M. & Pugsley, A., 31 Aug 2019, In: *Sustainable Energy Technologies and Assessments*. 34, p. 214-219 6 p.

**Solar electricity & hot water for dispersed off-grid households in Botswana: Demand-based sizing & Prototype testing initial results**

Pugsley, A., Muhumuza, R., Giuzio, G. F., Zacharopoulos, A., Smyth, M., McLarnon, D. & Mondol, J., 17 Oct 2018, *2nd International Conference on Solar Technologies & Hybrid Mini Grids to improve energy access*. Palma de Mallorca, Spain

**Energy consumption levels and technical approaches for supporting development of alternative energy technologies for rural sectors of developing countries**

Muhumuza, R., Zacharopoulos, A., Mondol, J., Smyth, M. & Pugsley, A., 29 Aug 2018, In: *Renewable and Sustainable Energy Reviews*. 97, 2018, p. 90-102 13 p.

## **Prizes**

**Best Literature Review – Architecture, Built Environment and Planning**

Muhumuza, Ronald (Recipient), 23 May 2019