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Women Champions in the Energy Sector



Dr. Ngalula Sandrine Mubenga
Director General
Electricity Regulatory Authority, DRC /
Professor, College of Engineering, University
of Toledo



Dr. Mubenga in her lab, demonstrating the battery management system she helped developed.

Photo credit: Dan Miller, University of Toledo

This portrait is part of the West Africa Energy Program and Women in Energy (WIE)-Ghana's series on women champions in the energy sector, featuring women who have overcome barriers, defied stereotypes, and succeeded in their chosen professions.

“When you do a good job, people recognize it... It really comes down to results. This is something everyone respects and understands.”

Dr. Ngalula Sandrine Mubenga was 17 years old when a case of appendicitis demonstrated to her in a most intense way the very real impacts of energy poverty. Dr Mubenga was living in the town of Kikwit, DRC with limited access to electricity or water, when she fell ill. The local clinic had no fuel to start the power generator, and she spent three days in extreme pain. She was close to dying when her father found fuel necessary to perform the needed surgery. “This changed my perspective forever and made (me) want to pursue an engineering career to help improve the situation in (the DRC),”

In 2000, she enrolled at the University of Toledo (UT) College of Engineering in Ohio, specializing in renewable energy. While doing her bachelor’s, she joined General Electric where she completed three internships. She also joined Advanced Distributed Generation as an apprentice, where she learned about distributed generation and solar system integration. After graduating, she joined First Energy, where she worked on planning for the future of a distribution system. While there, she noticed that most people in management positions had a master’s degree. This prompted her to pursue a master’s degree in engineering, also at the University of Toledo. For her research, she designed a hybrid vehicle using hydrogen. This project won the 2008 University of Toledo EECS Department Most Outstanding Thesis Award.

After completing her master’s degree in 2008, she joined Orbital Tech Solutions as an electrical engineer. She worked on utility-scale power systems in the mid-west. The firm was later acquired by SSOE, one of the biggest engineering firms in the world. She worked in the power group and designed utility-scale solar systems. She also designed Supervisory Control and Data Acquisition systems for over 20 substations across the US.

Sandrine recalls encountering many of the often-documented challenges of working in a male-dominated field. “Even in school, there were many instances where I was the only woman in the room, or the only black woman of African origin. That is just the reality. And (in those situations) people have a tendency to doubt,” says Sandrine. “But when you do a good job, people recognize it. The moment they work



Dr. Mubenga with a graduate student testing the prototype in their research lab.

Photo credit: Dan Miller, University of Toledo



Dr Mubenga, as Director General of the Electricity Regulatory Authority, in a meeting with her staff in Kinshasa

Photo credit: DRC Electricity Regulatory Authority

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with me – they respect me. I deliver results. It really comes down to results. This is something everyone respects and understands.”

In 2012, Sandrine was contacted by her alma mater to manage the electrical engineering department and a \$65 million budget. “One of my biggest accomplishments was helping UT save \$5 million in utility bills,” Sandrine says proudly. While at UT, Sandrine pursued her PhD, focusing on battery management systems, one of the bottlenecks in the electricity sector, for her research. “Batteries don’t last long. One way we can make them last long is having a good battery management system to increase capacity and longevity,” Sandrine says. Her research won the 2018 IEEE National Aerospace and Electronics Conference Best Poster Award.

Sandra has also worn the hat of solar entrepreneur. Back in 2011, as she was pursuing her professional engineer license, she started her own company, SMIN Power Group, in the U.S. She opened a branch two years later in Kinshasa. The company designed and installed solar systems in communities, mainly in schools. They also did public lighting projects and solar-based water pumping projects. To date, their portfolio consists of 30 projects. In July 2020, Sandrine stepped down from her role as CEO of SMIN Power Group when she was hand-picked and appointed as Director General of the DRC’s Electricity Regulatory Agency by DRC President Felix Tshisekedi. She formally started the position in August but continued to teach and conduct research at the University of Toledo, doing her government meetings virtually due to COVID-19 travel restrictions. “After the pandemic, I plan to travel during my breaks and the summer when I am not teaching so I can manage the office in Kinshasa,” notes Sandrine. The DRC has one of the lowest electrification rates in the world, with 20% of the population without access to power. It also has tremendous potential, particularly hydro, with an estimated 100,000 megawatts that could be developed.

One of Sandrine’s biggest passions is encouraging girls and boys to pursue careers in science, technology, engineering, and math (STEM). In 2018, she founded the STEM DRC Initiative, a nonprofit organization. Since then, the group has awarded scholarships to pay all associated costs for more than 60 students in the Congo to attend college, including transportation and books. This year, STEM DRC has secured many sponsors and will be able to give out 100 scholarships.

Sandrine’s advice for women who want to pursue a career in energy/STEM? “Just go for it. You only live once. You only have one time when you can impact the world. (STEM) is rewarding on so many levels. There are so many ways you can have an impact. There is a place for everyone.”