

WISE

WATERLOO INSTITUTE
FOR SUSTAINABLE ENERGY



LECTURE SERIES

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BUILDINGS | CARBON CAPTURE AND STORAGE | FUEL CELLS | NUCLEAR | POLICY | PLANNING
RENEWABLES | SMART GRID | STORAGE | SUSTAINABLE MOBILITY | SUSTAINABILITY ANALYSES

PRESENTED BY THE WATERLOO INSTITUTE
FOR SUSTAINABLE ENERGY

Thursday July 25th, 2019

11:45 am – 12:45 pm

Evolv 1 – Canada's first Zero Carbon Building
420 Wes Graham Way, Waterloo.

LI-ION AND HYBRID BATTERY STORAGE SYSTEMS TECHNICAL HIGHLIGHTS AND OFF-GRID UTILIZATION ASPECTS.

USING CASE STUDIES WITHIN AFRICA AND NORTH AMERICA.

Mohamed Elkadragy, Renewable Energy Scientist, Expertise in Battery Storage (Li-ion & Hybrid Storage) and Off-Grid Hybrid Renewable Electricity Systems (OHRES). *Battery Technical Center, Karlsruhe Institute of Technology (KIT), Germany. Visiting Scientist, University of Waterloo.*

The main vision for our R&D activities is to support the role of sustainable energy in providing affordable energy access and ending energy poverty worldwide. Our projects are carried within the global initiative Affordable Energy for Humanity (AE4H). Using a practical, hand-on and on-field approach, with international off-grid projects deployment.

The Seminar will focus on the following related aspects:

- Overview regarding our work scope in the battery technical center along the value chain of lithium-ion (Li-ion) Battery Storage (besides other battery chemistries) from materials, battery pack assembly, Li-ion batteries safety to systems integration.
- From Li-ion cell to battery pack assembly innovative production lines developed within our group.
- Highlights of Li-ion batteries essential operational safety-related aspects, cell level testing and performance benchmarking.
- Basic barriers for batteries, Second Life usability, and economic feasibility.
- [Lead-acid | Li-ion] Hybrid Storage System used in our Off-Grid projects in Canada and Uganda.
- Comparative techno-economic analysis and system design optimization of our OHRES. For our Case studies in a contrastive remote location in North America, Canada (Nemaiah Valley) and Africa, Uganda (Jinja).
- Off-Grid Systems Data Analysis Platform (OSDAP) and AI utilization concept for the day-ahead forecast. Beside, Hybrid Off-Grid Techno-Economic Model (HOTEM) development concept and current functional status.

Biography



Mohamed M. Elkadragy is a renewable energy scientist with ten years of industrial and applied research related professional experience on an international level. He holds a M.Sc.-Eng. degree in renewable energy, and a B.Sc. in electrical engineering. Currently working as a scientist at Karlsruhe Institute of Technology (KIT). The focus of his R&D scope is renewable energy battery storage system development, and Off-Grid Hybrid Renewable Electricity Systems (OHRES) including solar PV, Small Wind, conventional Genets and Battery storage.

REGISTER NOW

A group tour is arranged for the seminar attendees explaining the renewable energy resources and concepts used in Canada's first Green Zero Carbon building