



From left to right: Savannah Speikers, Bitya Birkneh, Kora O'Reilly, Teddy Pierret, Josef Richter

PROJECT BACKGROUND & DESIGN GOAL:

The Ilula Health Center in Tanzania is a medical resource for the surrounding community but is frequently hindered by an electrical grid that experiences frequent outages and significant harmonic distortion. This poor power quality poses a direct threat to the longevity and accuracy of medical diagnostic equipment.

DESIGN SUMMARY:

The system features a scalable modular rackmount architecture. The modular battery units allow for extended runtime and accommodates high load requirements. The design delivers a stabilized 230V, 50Hz output with active mitigation of total harmonic distortion.



Design enclosure



TEAM 22

INDUSTRY REPRESENTATIVE

John Toso

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DESIGN CONSTRAINTS:

- **Technical performance specifications:** The system must maintain a stable 230 V, 50 Hz output.
- **Safety:** Adhere to electrical medical safety standards.
- **Operational conditions:** Must be robust enough to handle a wide range of input conditions.
- **Spatial limitations:** Fit within a standard rackmount.
- **Price:** Less than \$5,000.
- **Scalability:** Design must be modular and scalable.
- **Cooling:** Inside the enclosure must not exceed 40 °C (104°F).
- **Mobility:** Enclosure must be able to be moved without use of heavy machinery.