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EMMS: Increasing Hope and Transforming Lives Through Improved Access to Electrical Power

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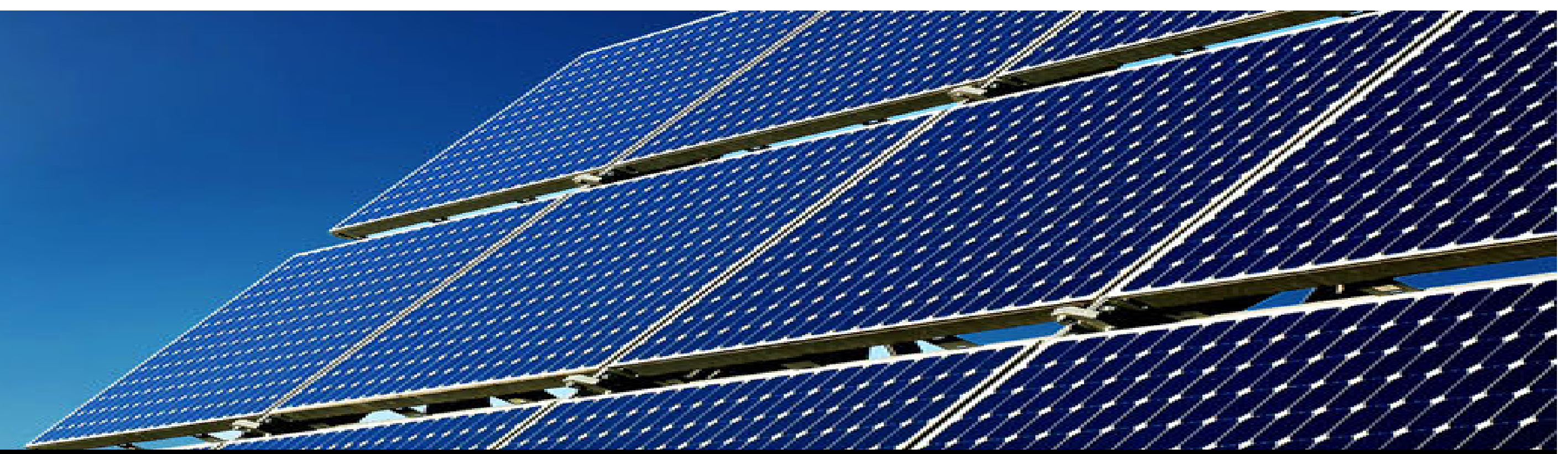
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The Energy Monitoring and Management System

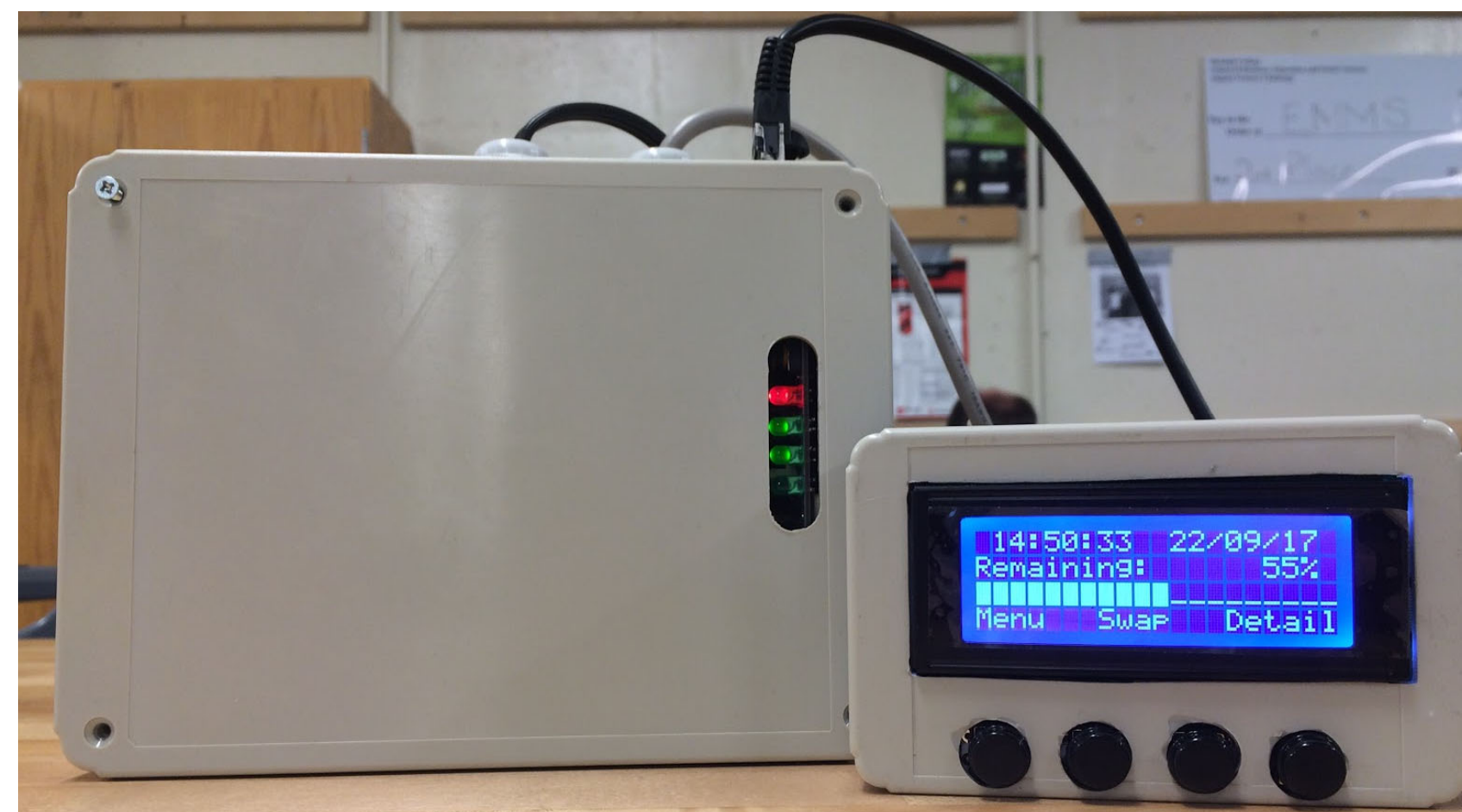
Zach Gillen, Sam Goertzen



Our Project

The Need: An estimated 16% of the global population do not have access to electricity. When one looks at the 50 poorest nations in the world, 79% of the population does not have access to electricity.

The Goal: The Energy Monitoring and Management System project is developing a meter to help manage energy use in order to maintain a reliable energy supply for these energy-impooverished areas. Our primary partner is the Theological College of Zimbabwe, or TCZ, located in Bulawayo, Zimbabwe. We are developing meters to be used on their campus in both residential halls and academic buildings in conjunction with their present solar power grid.



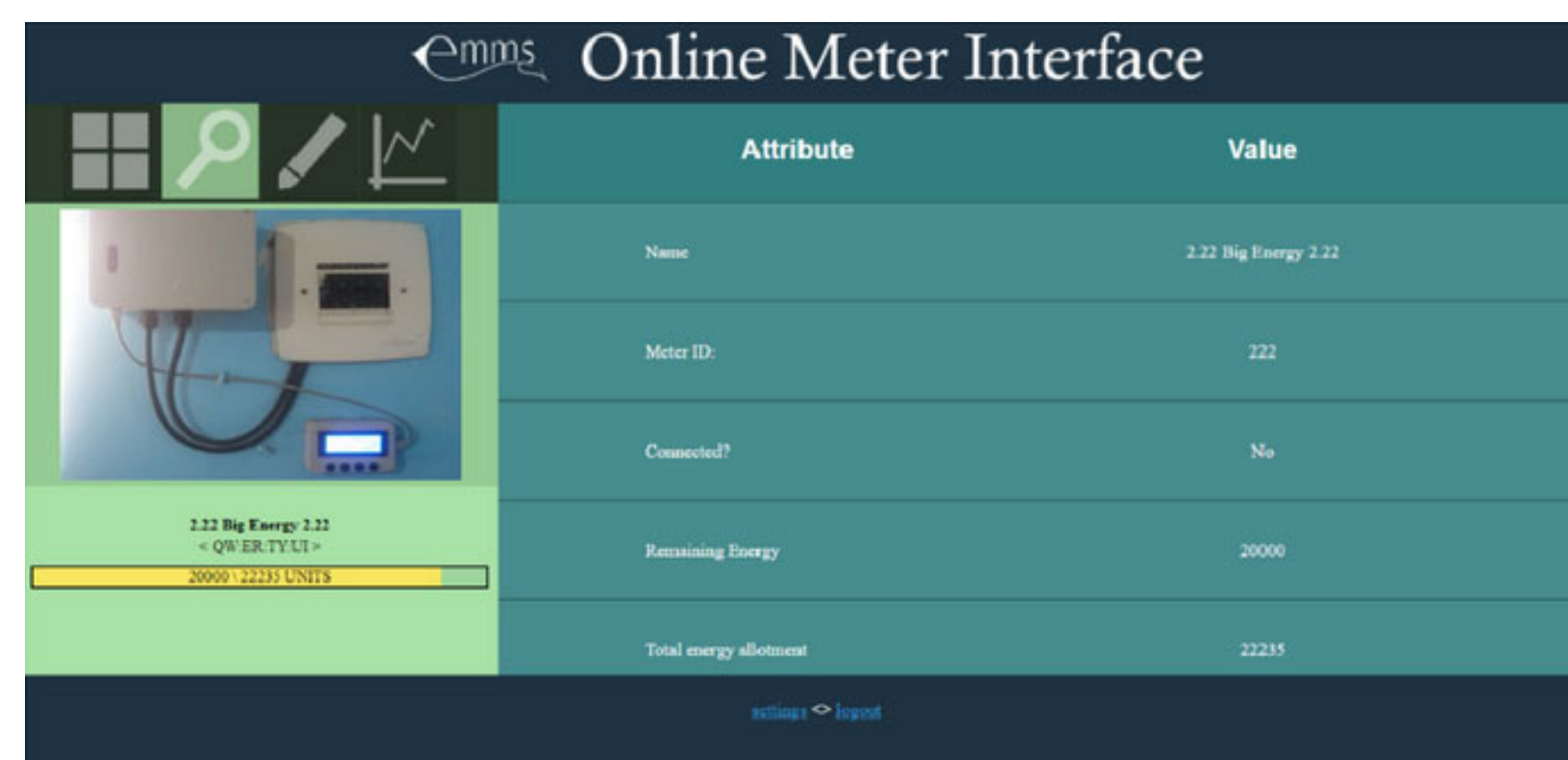
Method

Method: Our solution consists of a meter which allocates a configurable daily energy limit per facility, along with a display that provides feedback to the user. This display includes information about how many watt-hours remain in a day and how many watts are being used at any time.

How It Works: By connecting to an energy source in series, the meter is able to measure the voltage and current drawn by the system, and is then able to calculate how much energy is being used. When the daily energy is used up, the meter shuts off the power until the next day. In the field, a meter is typically installed on a building by being wired into the incoming power lines. Once installed, the measured energy can be accessed from either the User Interface or from our website connected to the meters via WiFi.

Project Status

This past year, the team has been working to fix known bugs in their code and finishing the development of a centralized meter admin website. Now approaching completion of this goal, the team is preparing to send the new finished code to their clients to get their meters up and running. This summer, several team members will be travelling to TCZ to install additional meters and update communication hardware on existing meters. The finished code has been sent through an extensive test procedure to verify complete meter functionality.



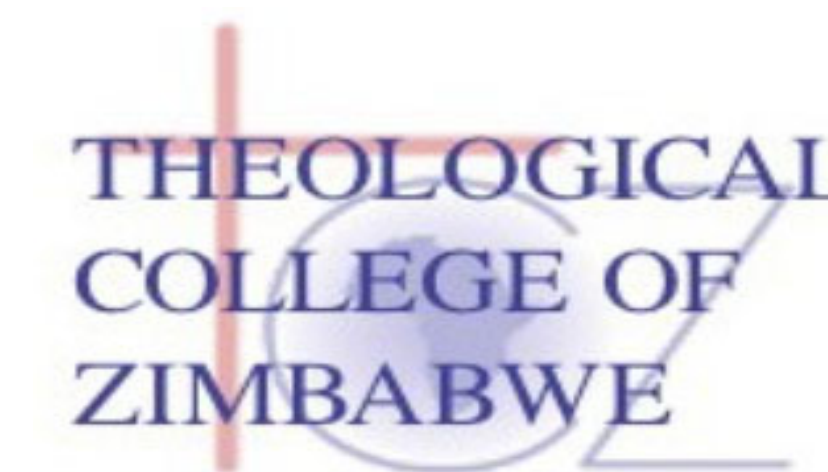
Meter Installation

Installing a meter requires **safely** splicing an incoming power line (120VAC or 240VAC) and using the provided cable junction and labels housed in the meter enclosure to wire line, neutral, and ground through the box. The spliced wires are held by terminal blocks and housed inside the enclosure to protect wires and prevent the connections from weathering.



Clients

- *Ray Motsi*; President of the Theological College of Zimbabwe
- *Matt Walsh*; Open Door Development, *Mahadaga, Burkina Faso*.
- *IEEE Smart Village*
- *Institut Missiologique du Sahel (IMS)*



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DEPARTMENT OF ENGINEERING

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