Green Energy Automation & Optimization System

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Introduction

Global energy consumption has increased exponentially in the last century. The 2018 release of the Intergovernmental Panel on Climate Change report sheds new light on the dangers of continuing our current carbon emission path. Experts warn the planet has until 2030 to stem this catastrophic climate change [1]. Innovative solutions must be found to satisfy our insatiable appetite for energy.

Problem

Current state-of-the-art systems fail to optimize generated renewable energy, maximize battery life, or offer remote access and control.

Solution

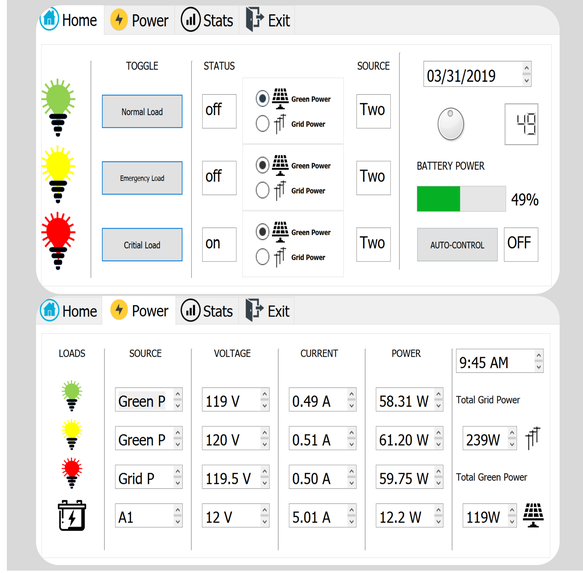
A hybrid IoT load management system that automatically optimizes generated green power.

Current Systems	GEAOS Solution
➢ Cost parity with utilities	➢ Lower levelized cost of electricity
➢ Sells excess energy at a discount	➢ Higher return on investment
➢ Fails to maximize battery life	➢ Utilizes all generated green energy on site
➢ Absence of IOT technology	➢ Maximizes battery life
➢ User interaction and functionality	➢ Incorporates IOT technologies
	➢ Attractive user interface
	➢ Offers remote communication and control

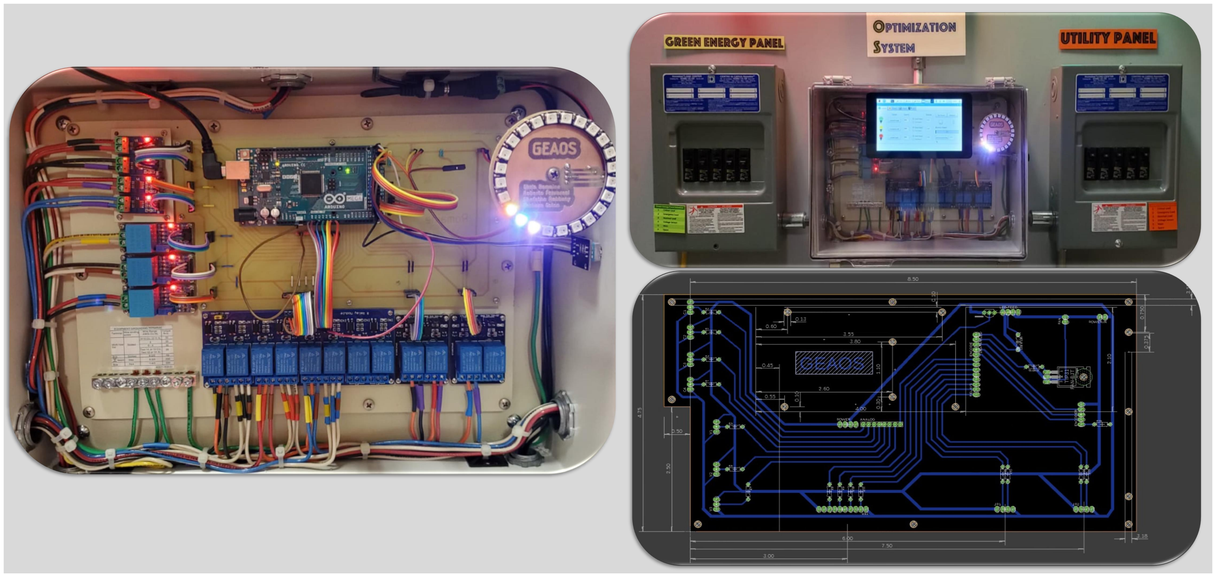
Method

The method includes automatic and manual power management through employment of Internet of Things (IoT) technology. It also enhances on-site generated renewable energy usage and extends battery life and offers superior usability to feature interactive remote monitoring and management capabilities for both power and load.

GEAOS: “Engineering Innovative Solutions”



Graphical User Interface



LEFT: Monitoring Subsystem; UPPER RIGHT: Central Control Panel; LOWER RIGHT: Integrated PCB Design

Results

The system provides control through the main user interface installed in between the central electrical panel. The user interface gives access to:

Data Acquisition	Consumption Analyses	Optimal Setting Recommendation
Voltage	Total system data	Power optimization
Current	Individual loads	Critical load prioritization
Power		Automation through IoT

Future

- Continue code development to expand IoT capabilities to promote awareness and conservation of power consumption
- Develop a business plan and marketing strategy
- Build a commercial prototype for testing and certification

Discussion

To conquer the eminent environmental challenges, GEAOS project proposes to engineer a more marketable and consumer appealing alternative energy system which reduces the Levelized Cost of Energy (LCOE) and increases the stakeholders Return on Investment (ROI). Also, optimize and proliferate investment in generated renewable energy usage, extend the energy storage system to provide unprecedented user functionality via elevating actual and perceived customer value.

References

[1] CNN, Brandon Miller and Jay Croft. (). Planet has only until 2030 to stem catastrophic climate change, experts warn.