AI Power Management System for Solar Plus Storage

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Problem: the high battery cost makes the Solar plus Storage system's return on investment (ROI) less competitive. The smallest storage size plus the most efficient operation is needed now to reduce ROI.

Solution: we invented a **sequence** of solutions, including an AI Power Management System (displayed on the right), which in the initial study outperformed a standard peak-shaving in reducing the electricity bill by 15%. This project develops the hardware of our AI Power Management System for industrial business customers and compares the offered equivalent ROI with competitors.

Here is the list of near-term **activities** planned for this project:

AI power management system hardware proof-of-concept

1) HIL subtask 1: establish secure bidirectional communication between a local server and the Opal-real-time simulator via Modbus.
2) HIL subtask 2: split the source code to system/environment and controller. Flash each segment to the corresponding hardware pieces (i.e., local server and Opal-rt).
3) HIL subtask 3: evaluate communication delay, local server's computational power required for AI and optimization, and memory for GHI and weather data.
4) Compare the performance index and ROI with competitors