Energy Storage Made Simple

PowinEnergy
It’s very important for Hecate to offer turnkey solutions that are attractive financially to our utility customers and Powin Energy provides tremendous value while still delivering a highly robust energy storage system. Their responsiveness to even the smallest request and attention to detail that only energy industry veterans possess makes Powin a preferred partner."

— GABE WAPNER, DIRECTOR DEVELOPMENT, HECATE ENERGY

**APPLICATIONS**

**IN FRONT OF THE METER**
- Distribution Deferral
- Transmission Deferral
- Congestion Relief
- Resource Adequacy

**BEHIND THE METER**
- Backup Power
- Peak Shaving
- Time-of-Use Bill Management

**MICROGRIDS**
- Islanding
- Backup Power
- Renewables Integration

**GRID SERVICES**
- Energy Arbitrage
- Frequency Regulation
- Voltage Support
- Spin/Non-Spin Reserve

**SOLAR+STORAGE**
- Increased PV Self-Consumption
- Peak Shaving

**PURPOSE-BUILT UTILITY SCALE STORAGE**

Powin Energy’s Stack modular battery system has been engineered from the cell-level up to container-level [pictured below] to maximize energy density and perform rigorous in front-of-the-meter and behind-the-meter functions. Powin’s patented StackOS is at the heart of the Stack and, being purpose designed for stationary storage application, is the most advanced battery management system in the energy storage industry.
StackOS™ BMS + EMS PLATFORM

Powin’s StackOS is the only centralized ESS management platform that combines the BMS and total system control layer into one fully integrated user-friendly solution. StackOS enables Powin’s customers to dynamically control our seamlessly integrated energy storage solutions through open standard dispatch protocols.

Having a unified BMS and EMS platform allows our proprietary active balancing battery architecture to dynamically change based on which use case is performed. The StackOS software package is Powin’s standard software offering that is incorporated into all of our energy storage installations.

The StackOS Battery Management and Safety layer, was designed specifically for stationary energy storage systems, unlike most BMS software that was created for electric vehicles. The StackOS takes an advanced approach to battery management. It evenly synchronizes the voltage of every single battery cell through active and passive balancing to optimize charge and discharge cycles for battery cells.

Unparalleled system insight and functionality is provided by Powin Energy’s exclusive:

+ Battery Odometer™ – Measures battery capacity degradation and remaining battery lifetime while recording all aspects of battery usage
+ Warranty Tracker™ – Tracks warranty parameters and alerts operators to issues that exceed warranty parameters all within the battery controller

The StackOS is installed standard in all Powin Energy storage systems and comes with a comprehensive suite of tools including:

+ Battery Odometer™
+ Warranty Tracker™
+ Operating History Monitor
+ Balancing Manager
+ Alarms, Warnings and Error (AWE) Manager
+ Maintenance Manager
+ Calibration Manager
+ Plug & Play Configuration Manager
+ Communication Manager
+ Powin Cloud analytics and data warehouse

ABOUT POWIN ENERGY

Powin Energy has pioneered a cost-effective, safe and scalable battery energy storage system that is purpose-built for the demands of utility scale, commercial and industrial, and microgrid applications. Our BESS also features a modular architecture and streamlined installation process. Behind our industry-leading products is an unrivaled team of experts from across the energy industry, almost three decades of supply chain management expertise and extensive battery management software development proficiency.
“esVolta selected Powin as our OEM of choice because Powin’s commercially-proven integrated battery systems are ideally suited to meet the demands of our utility-scale storage applications. This partnership provides esVolta with competitive advantages in design, engineering, and pricing which are critical factors contributing to esVolta’s growth and success in the market.”

— RANDOLPH MANN, FOUNDER & PRESIDENT, ESVOLTAV

POWIN SOFTWARE ADVANTAGE

SOLELY FOCUSED ON ENERGY STORAGE

PATENTED TECHNOLOGY

† Synchronized EMS and BMS platform
† Detailed Cell Monitoring and Diagnostics
† Warranty Tracker
† Automated Maintenance and Calibration
† Full Scalability

SUPPLIER AGNOSTIC

† Integrates newest proven PCS technology into our AC system
† Integrates any chemistry of battery cell to meet customers performance requirements
† Can choose alternate sub component suppliers to meet customers price requirements

INTEGRATION

† PCS-DC Battery Integration
† System Control Software and EMS included
† Capable of delivering full scope of work to Point of Interconnection
† EPC partners to provide turnkey service

OUTDOOR ENCLOSURES

Standard scalable and modular outdoor enclosure design. Comes pre-engineered and fitted with the following components:
† Climate control using forced air HVAC
† Fire detection and suppression
† Insulation for hot and cold weather climates

WITH THE FORESIGHT TO ANTICIPATE WHAT’S NEXT FOR ENERGY STORAGE

Powin Energy is committed to developing the most advanced battery energy storage hardware and software to serve our customers’ needs today and in the future. Our BESS innovation is driven by collaboration with customers, industry advancements and new technologies that our engineers and scientists envision and create.
POWIN ENERGY SCALABLE HARDWARE PRODUCTS

Powin Energy's advanced energy management and battery management platform, StackOS, is installed in every Stack product. It provides visibility into every layer of the energy storage system down to the cell level and delivers elegant software integration with additional infrastructure. Each module includes the exclusive Battery Odometer and Warranty Tracker™, with the Powin Cloud providing analytics and data warehouse services.

The Stack is a modular, purpose-built battery array that easily and cost-effectively scales from 125 kW to multiple megawatt applications. We offer indoor and IP54 rated Smart Enclosures outdoor applications, each of which are engineered to maximize energy density to minimize system footprint. The modularity of the Stack simplifies installation and associated costs, decreases maintenance, reduces downtime and mitigates operations costs.

Stack can perform a wide variety of front of the meter, behind the meter, and microgrid applications to fulfill today's energy storage requirements, but is designed to be flexible enough to be prepared for the future. Outdoor installations come in single enclosed Stacks of 225 kWh or 230 kWh capacities – 53” enclosures housing up to 4.6 MWh. Both enclosed systems have been optimized for ideal energy density with simplified maintenance access.

BY PEOPLE WHO GET THE ENERGY INDUSTRY

Powin Energy's management team brings decades of successful leadership experience in the energy, storage and utility industries, all with top level expertise in product design, project development and grid-level installation. We understand the challenges that can be presented by utility scale energy projects. This is why we focus on simplifying the procurement, installation and interconnection processes to deliver our BESS on-time, under-budget and with superior project ROI.
ERCOT FRRS PROJECT
Powin Energy products and services were selected by various developers and IPP’s to build, deliver and install ESS solutions for the ERCOT market. This example project is a 9.9 MW / 13.4 MWh system built to meet the growing demand for merchant market fast response regulation services (FRRS) on Texas’ ERCOT grid network. To ensure the systems performance in the ERCOT market, Powin had developed an EMS protocol to enable our systems to receive and respond to P&Q signals generated from the ERCOT dispatch system. To date, Powin has installed over 60 MWh of projects in Texas to date with another 45 MWh to be delivered in Q4 2020.

- Project Size: 9.9MW / 13.4MWh
- Project Location: Texas, USA
- Project Completion Date: March 2020
- System Use Cases: Fast Response Frequency Regulation, One Hour Capacity

ONTARIO GA PROJECT
Powin Energy had teamed up with Honeywell Process Solutions - Renewable Energy to supply, deliver and install an 8.8MW / 19MWh BESS to Saturn Power, who played the role of Developer and EPC. This system was installed to reduce peak demand charges for a large industrial site under the Ontario Global Adjustment (GA) demand charge tariff. This large industrial facility is deemed as critical infrastructure, and required Powin to meet stringent site and cybersecurity measures to connect safely and reliably to their network.

- Project Size: 8.8MW / 19MWh
- Project Location: Ontario, Canada
- Project Completion Date: February 2020
- System Use Cases: Ontario Global Adjustment, Peak Demand Reduction

MEXICO MICROGRID
Working with Mitsubishi Electric Power Products, Inc. (MEPPI), ESI Inc. of Tennessee, Asset Engineering, and San Francisco-based Plus Power, Powin Energy supplied a 12 MW / 12 MWh energy storage system to support the primary gas generation facility. The microgrid, which can generate up to 131 megawatts of capacity, provides the plant with its own self-contained power source, that allows the factory to exist “off the grid.”

- Project Size: 12MW / 12MWh
- Project Location: Nuevo León, Monterrey, Mexico
- Project Completion Date: October 2018
- System Use Cases: Frequency Response, Spinning Reserve