

Peaxy Lifecycle Intelligence

Peaxy Lifecycle Intelligence (PLI) is modular, extensible, cloud-based software that threads data at every stage of the circular battery's lifecycle, generating insights for research, manufacturing, and operations.



Peaxy Innovate
Accelerating R&D



Peaxy Build
Streamlining manufacturing



Peaxy Predict
Optimizing lifecycles



Peaxy Operate
Monitoring operations



Peaxy Innovate: accelerating R&D

Configured as a battery-focused, customer-configured laboratory information management system (LIMS), Peaxy Innovate accelerates the development of new materials and cells by integrating and analyzing all design specifications, manufacturing inputs and test bench results, including metrology and battery cyclers.

By leveraging Peaxy's extensive library of analytics pipelines for metrology*, Peaxy Innovate is able to generate the insights needed for fast, iterative innovation.

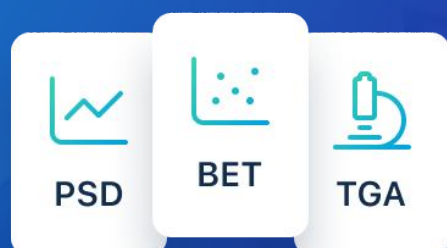
* Peaxy's analytics library includes elemental analysis, Particle Size Distribution (PSD), Thermogravimetric Analysis (TGA), Brunauer-Emmett-Teller surface area analysis (BET), Fourier-Transform Infrared Spectroscopy (FTIR), Karl Fischer titration (KF), dilatometry, compression, force displacement, heat flow, X-ray Diffraction (XRD), X-ray Fluorescence (XRF), various microscopy techniques and cyclers, Hybrid Pulse Power Characterization (HPPC), Galvanostatic Intermittent Titration Technique (GITT), Electrochemical Impedance Spectroscopy (EIS) and others.



Ensure the safest and most optimal battery material and cell design

Data pipelines and analytics

Empower battery researchers and engineers to accelerate R&D by automatically ingesting data from test bench results. Avoid manually downloading data and normalizing similar metrology and cycler data from different suppliers. Automate complex and proprietary analytics from threaded data from different sources.

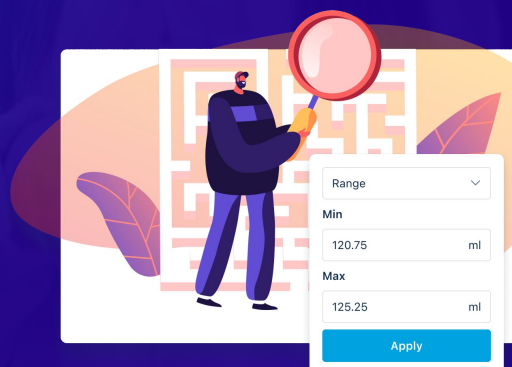


Metrology library

Leverage Peaxy's extensive library and experience of integrating over 30 suppliers of metrology and cycler suppliers to quickly integrate your existing and new testing equipment by utilizing ready-made data pipelines. This capability enables a seamless integration of metrology information into the battery design process, accelerating the optimization of safe battery cell designs.

Serialized threading

Thread data for specific test battery materials and cells from specifications, raw materials lots, processing, manufacturing, testing and analytics. Improve your design of experiments by querying on any range specification, manufacturing attribute, test result or analytics. As an option, leverage machine learning to provide recommendations on improving the test battery material and cell.



Peaxy Build: streamlining manufacturing



Peaxy Build digitizes data capture at every stage of the manufacturing and testing process, bringing multiple benefits. Quality issues can be identified immediately on the production line, allowing cells to be quarantined and reworked at the source; productivity metrics become available for every station and shift; test bench drift is immediately apparent; and thorough root-cause analysis is possible for failures in the field.

For battery energy storage system (BESS) integrators, Peaxy Build automatically generates digital, queryable, serialized bill of materials (BOM) that are interoperable with Peaxy Operate, accelerating root cause analysis, identifying parts requiring service notices by serial number, and updating BOMs with replacement parts.



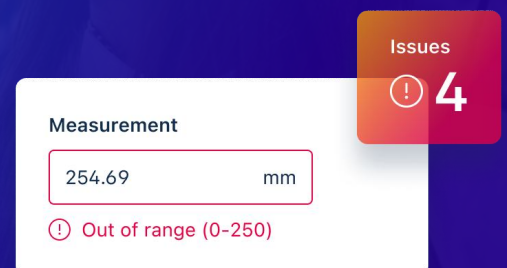
Ensure the highest standards of production quality

Integrate with current infrastructure

Maximize your current investment in digital infrastructure, including Open Protocol Communication Unified Architecture (OPC UA) frameworks, manufacturing execution systems (MES) and enterprise resource planning (ERP), by linking these systems to the threaded and parameterized battery data that matters.

Validation ranges

By rigorously testing batteries against established parameters, validation ranges can quickly pinpoint deviations signaling potential manufacturing defects, allowing the operator to quarantine and rework out-of-specification cells, ensuring consistent battery quality and integrity of the production line.



Manufacturing insights

Closely monitor shift productivity and station health with real-time analytics to identify bottlenecks and inefficiencies in the manufacturing process, ensuring optimal performance, reduced downtime, and the highest standards of production quality.

Serialized threading

Automatically thread in-line manufacturing test results and sample testing from an MES to streamline root cause analysis for manufacturing and operating defects. When applied to the BESS, the issuance of targeted service notices ensures that corrective actions are limited to the impacted fleet.



Peaxy Operate: monitoring operations



BESS fleet monitoring is handled at scale by Peaxy Operate, where every serialized asset's key performance indicators (KPIs) can be captured, stored and visualized at full resolution. Aggregated KPIs are calculated in near real time and at daily intervals for every level of the BOM hierarchy, including cell, module, string, system, site and fleet.

The serialized asset's metadata can include information for supporting battery passports or track-and-trace requirements. Rule-based alerting is available on all these metrics, as well as automated technical and financial reports.



Peaxy Operate can be extended to monitor other systems, including inverters, heating ventilation air conditioning (HVAC), ultracapacitors, wind turbines, photovoltaic (PV) systems, turbine generators, compressors, and other industrial systems. For commercial and industrial facilities and micro-grids, Peaxy EcoGrid monitors energy production and consumption to identify opportunities for efficiency improvements. EcoGrid also automates the accounting and reporting of regional subsidies, including those for renewable energy communities (RECs).

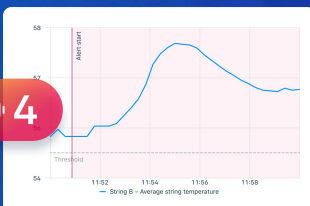
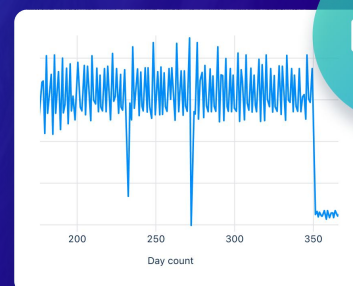
Ensure continuous system health and prolonged operational lifespan

Automated reporting

Configurable at the fleet, customer and site levels to dramatically decrease the time spent informing stakeholders of systems health and performance.

High-resolution accurate data

Detect shifts in battery performance, ensuring early identification of potential issues, preempting significant disruptions. Operators can maintain continuous system health and prolong the operational lifespan of their battery assets.



Customized alerts

Advanced warning of potentially significant battery management system (BMS) alarms by identifying anomalies from normal operating ranges, allowing the operator to take preemptive actions. Filter high priority alarms that can be emailed or texted to a distribution group.

KPI calculation

By optimizing energy output, charge/discharge cycles, estimated revenue, and other metrics at the fleet, site, system or string levels, operators can optimize BESS performance and operations for improved energy trading and financial returns.

Total lifetime energy discharge

⌚ **16.49 GWh**

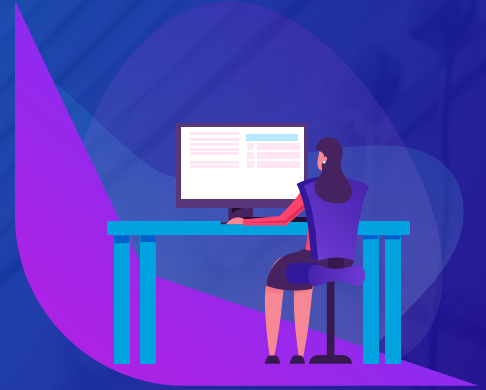
Estimated revenue

\$3.76 mln

Peaxy Predict: optimizing lifecycles

By leveraging the machine learning algorithms of digital twins on live metrics and industry performance estimates, Peaxy Predict is able to tackle some of the toughest challenges in BESS fleet lifecycle optimization: reliable state of health (SOH) degradation forecasting, accurate state of charge (SOC) estimation for lithium iron phosphate (LFP) batteries, and calculating the warranty impact, both from actual and forecasted operations.

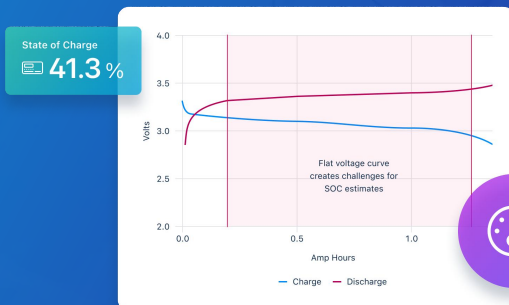
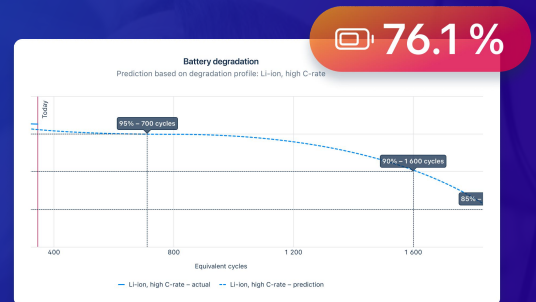
These advanced metrics allow optimized battery augmentation schedules and improved dispatch decisions, while smart warranties can estimate operating regimes that maximize financial returns over the lifecycle.



Ensure higher efficiency and longevity with predictive insights

Improved SOH forecasts

Operators can strategically defer or advance investments based on improved SOH forecasts and the optimization of augmentation and end-of-life schedules. This ensures the longevity and efficiency of battery systems and a robust foundation for decision-making.

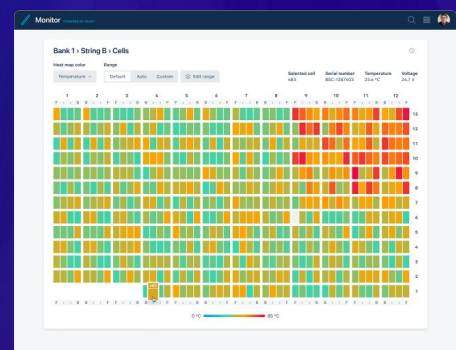


Improved SOC estimates

Operators can make more accurate estimations of available dispatch energy, leading to greater confidence when delivering energy required during peak demand or bidding into forward energy markets.

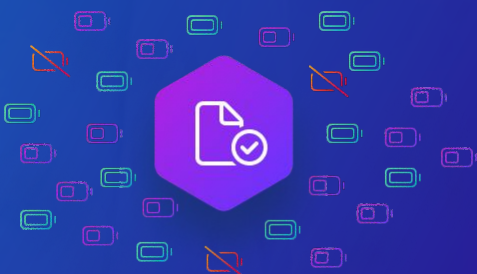
Digital Twins

Operators can access enhanced predictive insights to proactively schedule maintenance, minimize disruptions, and optimize battery operations with a digital twin created for each managed battery, capturing its entire lifecycle from deployment to retirement.



Smart warranty

Offers a transformative approach to asset management by estimating the warranty's remaining useful life (RUL) impact on future use cases, allowing customers to develop strategies to maximize the return on investment (ROI) for the remaining warranty period.



Why Peaxy



Peaxy's product offering differentiates itself from the competition in multiple ways:

- Expedited 90–120 day initial implementation and deployment schedule.
- Expertise in batteries, battery data, data modeling, data threading and digital twins.
- Deep industry experience leveraged from multiple battery data analytics projects.
- Monitoring expandable to inverters, HVAC, ultracapacitors, wind turbines, PV systems, turbine generators, compressors, and other industrial systems.
- Proven technology stack on a cloud infrastructure, with 99.99% industry-leading uptime, support and maintenance.
- Data security vetted by the US Department of Defense (DOD) and Department of Energy (DOE).
- Professionally designed and customizable UI for BESS, including fleet/site/unit KPIs.

Trusted by

Battery & Energy



Defense



Other



About Peaxy

Founded in 2012, Peaxy offers a modular, cloud-based software platform providing predictive analytics for the battery storage, electrification, and defense industries.



Trust

Peaxy is trusted by some of the most security-conscious organizations in the world, collaborating on five projects with the US DOD and DOE, spanning 14 cumulative years. We are listed with DoD Iron Bank, Impact Level 4/5 accredited. You will benefit from the same military-grade security ciphers and techniques.



Monitoring and analytics is in our DNA

Peaxy has extensive experience managing, shaping, and orchestrating unstructured data sets such as geometry, simulations, and sensor telemetry for government and private industrial companies. Our solutions provide condition-based maintenance (CBM+), compound digital twins, machine learning algorithms and asset health scores.



Fast iteration and deployment

We believe in rapid deployments and an iterative approach to development. We deliver fully integrated, extensible, modular software in 90–120 days to provide immediate and tangible business value, using a simplified enterprise-wide license that scales with your success. Agile throughout with rapid deployment.

Contact

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