
# Saving $112k+ in Liquidated damages through intelligent, data driven claim

altergo

# Introduction

## HOW ALTERGO'S TECHNOLOGY HELPS

A leading ESS provider in North America, develops, owns and operates utility-scale battery energy storage projects. They faced challenges in monitoring and optimizing the performance of their energy storage sites. Altergo's Platform offered a comprehensive solution to the ESS Provider, focusing on **Site Digital Twin, Data Ingestion & Audit, Real-Time Site Dashboards, specialized reports for downtime protection and revenue maximization**, and Alerts & Notifications.

We initially didn't see a need for complex analytics, but the business needs are changing. Not only is it important to optimize our bidding strategies, we need the ability to do so while protecting the health of our batteries.
**Altergo** helps us achieve this by simulating battery health under different dispatch conditions

- Director of Asset Management

## Challenges

The ESS Provider operates multiple energy storage sites with varying capacities. Specifically, they have four operational sites:

Given this diversity in site characteristics, their challenges were multi-faceted:

1. **Warranty Protection:** They aimed to keep each site within warranty parameters. Deviations risked warranty voids and financial losses. Key conditions like voltage and temperature were monitored.

2. **Real-Time Monitoring and SoH Analysis:** They monitored multiple sites without a centralized dashboard. Metrics such as temperature, SoC, and voltage were tracked. SoH required specialized analytics.

3. **Revenue Maximization:** To ensure maximum revenue, the ESS Provider needed to provide a yearly scheduling coordinator report, a task that was both time-consuming and prone to errors.

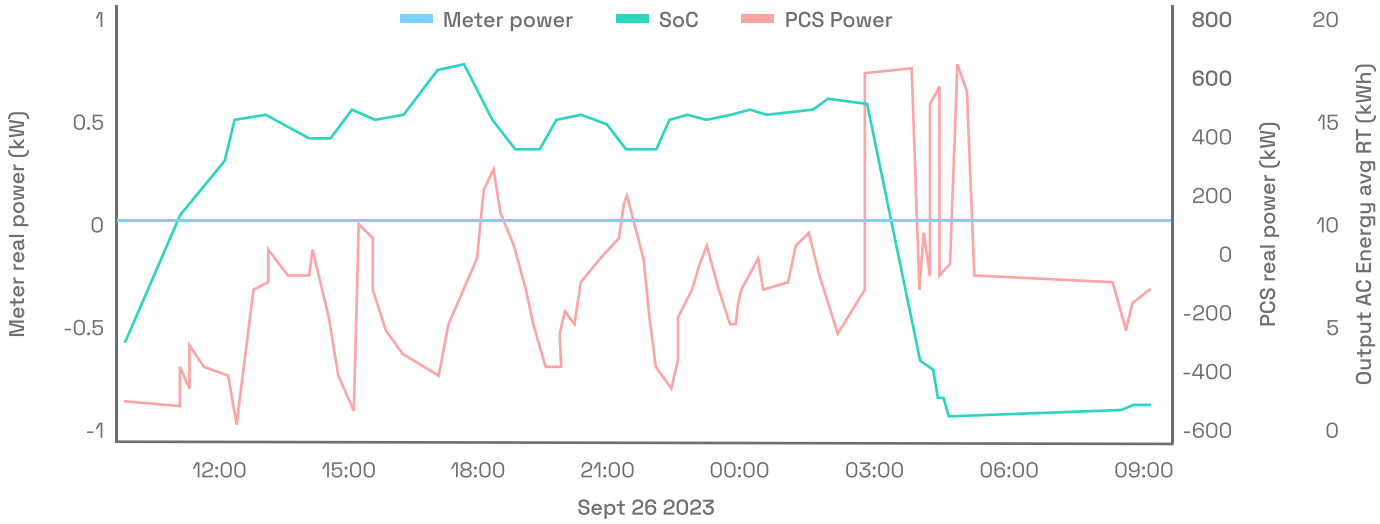
## Altergo's Solution

With Altergo we created dynamic dashboards providing real-time and all-time site monitoring, including key metrics and graphs.
The **ESS Provider's** contract with their suppliers were digitised in a way for **Altergo** to benchmark sites performance against their Contract Terms continuously.
To maintain warranty terms, Altergo developed custom Site Performance KPIs for each of the ESS sites. These KPIs were part of Altergo's Data Management layer, allowing easy access and uniformity. Alerts for conditions like low voltage and high temperature were set up, along with logs for warranty conditions.
For downtime protection, **Altergo** generated a **Liquidated Damages Report** detailing downtime data. **A Scheduling Coordinator Report** was also prepared for revenue optimization.
The platform's flexibility allowed it to meet the needs of each of **the ESS Provider's** varied sites, providing both immediate solutions and future scalability options.

# Monitoring Solutions

| NAME | PROJECTS | TAGS |
|---|---|---|
| Dashboard 01 | Project | Tags Tags |
| Dashboard 02 | Project | Tags |
| Dashboard 03 | Project | Tags Tags |

Dashboards




Site performance of last 24 hours

## Real-Time Site Dashboards

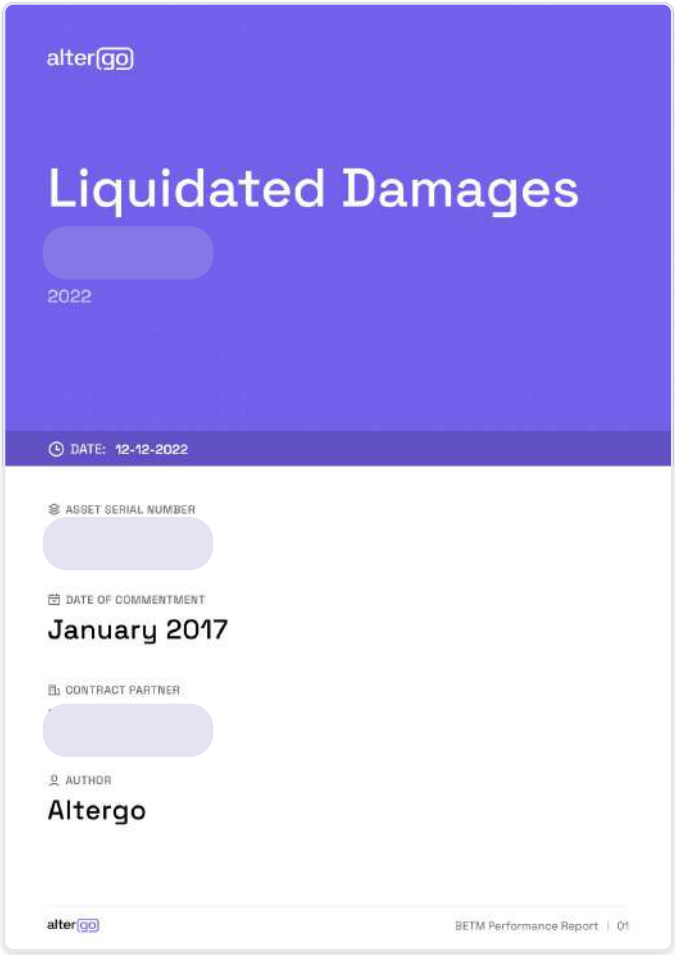
Altergo has implemented specialized real-time dashboards for each of the ESS Provider's sites.
They are designed to be comprehensive yet user-friendly, displaying KPIs for effective site management. This feature enables the ESS Provider to monitor the performance of each site in real-time.
The **Dashboard Engine's** library contains a variety of prebuilt widgets.

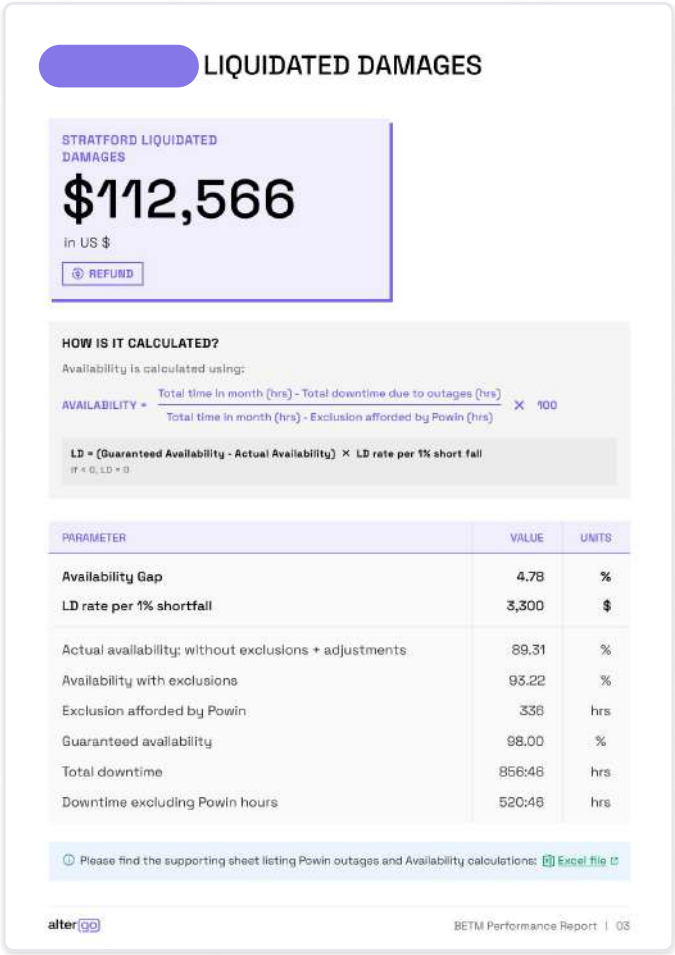
These widgets include:

- graphs of meter real power with time,
- output energy AC with time,
- average DC voltage over time,
- meter reactive power,
- PCS real power,
- PCS reactive power

For instance, the **Site Performance Graph** widget provides a real-time view of the State of Charge (SoC) versus meter power.

# Downtime Protection



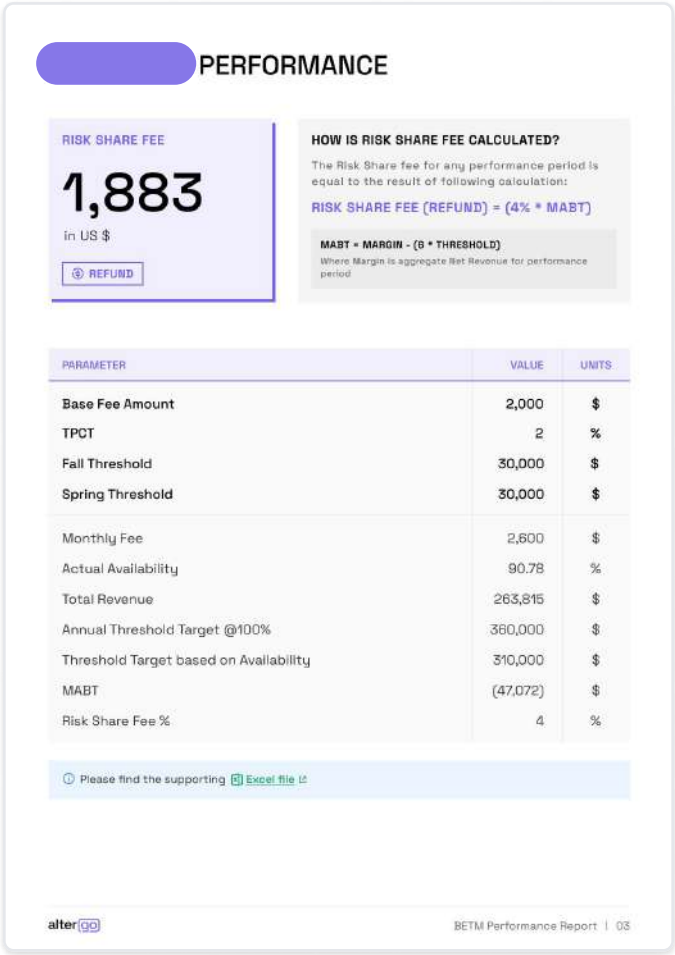




## Liquidated Damages Report

This specialized report helps the ESS Provider claim liquidated damages for each site by providing a detailed analysis of the downtime. It is accessible via the "Reports" tab at the top of the platform, this report is customizable by site and year. It offers a comprehensive breakdown of downtime, including exclusions for specific causes at each site.

The report also includes visualisations such as the Strings Uptime Distribution and String Uptime Time Series, providing a quick yet detailed overview of site performance. Furthermore, the report is hyperlinked to two additional datasets. The first table offers monthly downtime metrics, including columns for total time, outage downtime, capacity downtime, and more. The second table focuses on outage information, detailing the start and end times, reasons for downtime, and the affected array.
This feature empowers the ESS Provider to claim liquidated damages effectively while also gaining insights into the operational health of their sites.

# Revenue Maximization


## Scheduling Coordinator Report

This specialized report helps the ESS Provider to claim their risk share fee and maximize revenue. It is accessible via the "Reports" section of the platform. By selecting "Scheduling Coordinator" as the report type and specifying the year and site, users can generate this report. The report is a comprehensive tool that calculates the risk share fee the ESS Provider can claim, and other important metrics as well such as monthly fees, actual availability, actual revenue and total revenue based on availability. The report features a performance table that includes information about downtime and revenue on a monthly basis, the table has columns for the month, overall system online hours, total hours, actual availability, and market revenue. Additionally, it incorporates a Strings Uptime Distribution graph, offering a visual representation of system performance and a hyperlinked datasets. The dataset is a site availability metrics table providing detailed monthly site availability, actual revenue and threshold revenue metrics. This report enables the ESS Provider to claim their risk share fee accurately and provides a detailed analysis of revenue streams and system availability.

# Warranty Protection and Alerts Management

## Real-Time Warranty Protection

| ASSET | CONDITIONS | DURATION | AVG. VALUE | |
|---|---|---|---|---|
| PPA Grand | DCCurrent >= 4000 / DCCurrent <= 2000 | 17.32 m | 1.44 V | ⋮ |
| ACORN | DCCurrent >= 4000 / DCCurrent <= 2000 | 0.42 m | 3.5 °C | ⋮ |
| Stratford | DCCurrent >= 4000 / DCCurrent <= 2000 | 03.45 m | 1.59 V | ⋮ |

Altergo's real-time alert system serves as a cornerstone in ESS Provider's warranty protection strategy. The system is configured to notify the company immediately of any warranty violations, allowing for swift corrective actions.

By monitoring key parameters like low voltage and high temperature, the system ensures that each site operates within the warranty-defined parameters. It also monitors high-temperature scenarios and high C-rates, both during charging and discharging.

Specific warranty conditions are meticulously set up to monitor various parameters. This is crucial for the ESS Provider as any deviation could result in warranty voids, leading to financial losses and operational setbacks.

The real-time nature of these alerts allows the ESS Provider to take immediate corrective action, thereby minimizing the risk of long-term damage to the assets. This feature highlights Altergo's ability to offer customized solutions tailored to the ESS Provider's unique operational needs.

# Warranty Protection and Alerts Management

## Custom Alert Conditions

| ALERT NAME | TAGS | CONDITIONS | TRIGGER | INTERVAL |
|---|---|---|---|---|
| DC Overvolatage<br>Active \| 5sent | rack | System Voltage > 20 | Immediate | 10 m |
| Meter Power Zero<br>Active \| 12 sent | rack | Meter Power = 0 | 10 s | 600 m |
| Low State Of Charge<br>Active \| 94 sent | rack | State of Charge < 15 | Immediate | 600 m |

In addition to warranty protection, Altergo has implemented a robust custom alert system tailored to the ESS Provider's operational needs providing an additional layer of operational safety and efficiency. These alerts are designed to flag conditions that may not necessarily violate the warranty but are crucial for optimal performance and safety. For example, the "Cell Voltage Abnormality" alert is set for system cell voltages that are either too low or too high. Similarly, frequency abnormalities are also tracked. Other conditions like "High Temperature," "Low SOC," and "Low Temp" are also part of this comprehensive alert system, each with its specific triggering time and time interval for maximum operational efficiency.

These alerts are particularly important for managing the complexities of real-time energy storage and distribution, allowing the ESS Provider to preemptively address issues before they escalate into major problems. The robust data management and tracking layer of Altergo's platform ensures that all monitored data are not just collected but also analyzed in a way that is actionable, equipping the ESS Provider with the tools they need to operate efficiently, safely, and within compliance.

# Conclusion

This collaboration with Altergo has proven to be a transformative experience for the ESS Provider, offering both strategic and actionable insights that have significantly enhanced the operational efficiency and lifespan of their energy storage sites.

Central to this transformation has been the focus on downtime protection and revenue maximization. With the implementation of real-time dashboards, specialized reports, and custom alerts, the ESS Provider's engineering teams are now empowered with tools that provide real-time updates and predictive analytics.
These tools ensure that the energy storage systems operate at their optimal best, allowing the ESS Provider to significantly reduce downtime and maximize revenue through contract-specific claims like risk share fees, while also laying the groundwork for the next generation of energy storage solutions.

The engagement has not only helped them overcome their **immediate challenges** but has also set them on a path towards future **scalability and innovation.**