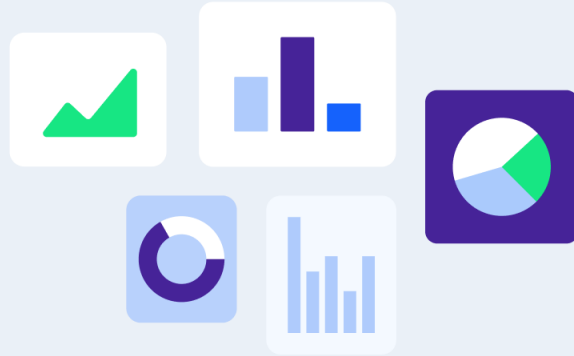


**TWAICE** | Battery  
Storage Analytics

# The State of BESS Operations

Insights from the BESS Pros Survey 2026



# What's Shaping the Industry in 2026?

The 2026 BESS Pros Survey Report brings together insights from 117 professionals working hands-on with grid-scale battery energy storage systems.

The report explores the realities of operating BESS while scaling: what challenges operators face, where they spend time and effort, how they use data and tools, and how they experience supplier relationships once the systems are up and running.

Across the findings, three themes stand out: the growing gap between deployment speed and operational readiness, supplier accountability as a mixed picture, and friction turning data into insight.

## Deployment Is Scaling Faster Than Operational Models

- BESS deployment continues to accelerate, but many operational models remain reactive and resource-intensive.
- As portfolios grow and teams stay lean, frequent issues and time-consuming investigations are becoming harder to sustain at scale.

## Supplier Accountability Is A Mixed Picture Across the Value Chain

- Despite frequent operational issues, suppliers are rated positively across accountability, product support, BESS reliability and data access.
- There seems to be a tolerance for friction and issues that may not be sustainable as portfolios scale.

## Data Ownership Is Widespread, but Data Usability Remains Limited

- Most operators report owning or having long-term access to their BESS data.
- However, fragmented systems, inconsistent KPI definitions, and distributed analytics make it difficult to turn that data into timely, trusted operational insight.

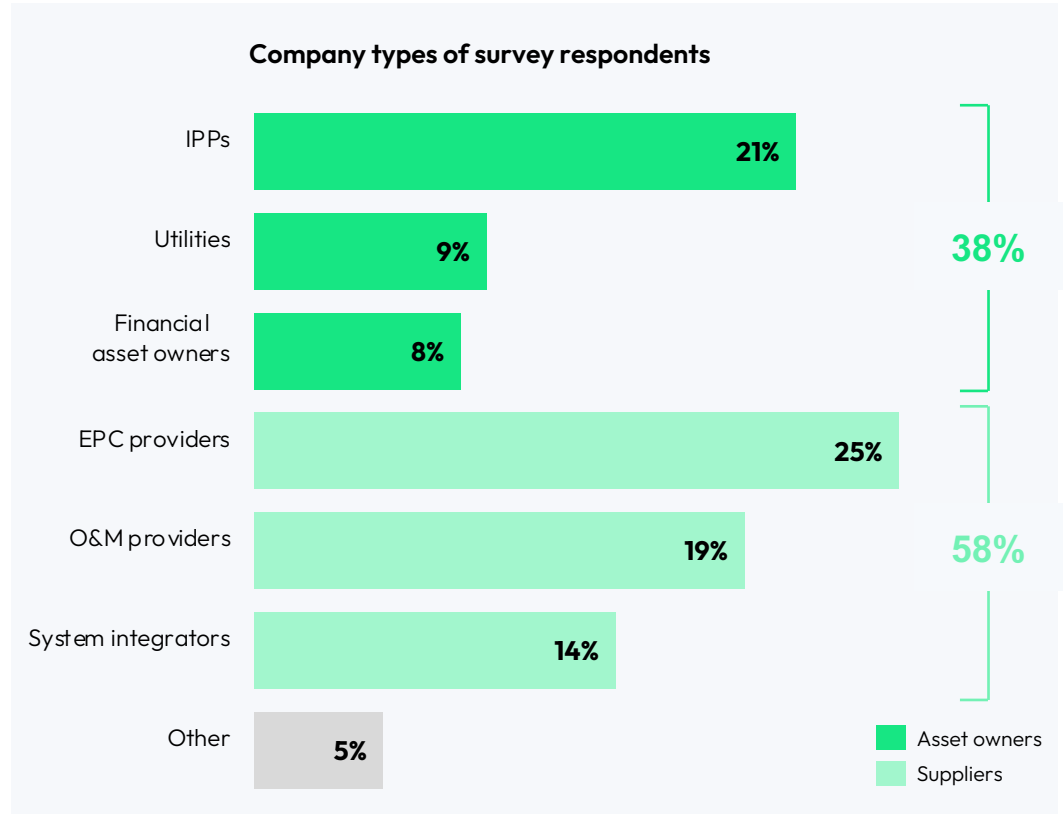
# Overview of Respondents

The 117 survey respondents directly operate, oversee, or manage BESS projects, providing a broad and representative view of BESS operations.

They work for different company types along the BESS value chain, reflecting the mix of organizations involved.

A subset of questions was directed specifically at asset owners – defined as IPPs, utilities and financial asset owners. While these entities may not always be the legal owner of an asset, they typically hold primary responsibility for performance oversight and investment decisions.

These sections specific to asset owners are clearly labelled throughout the report.

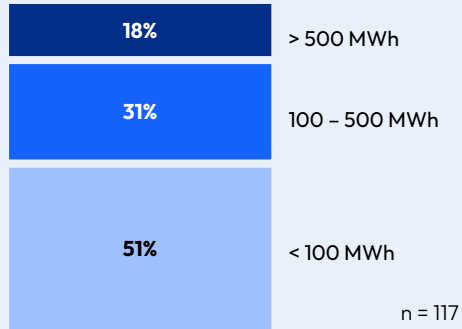


# Overview of Respondents

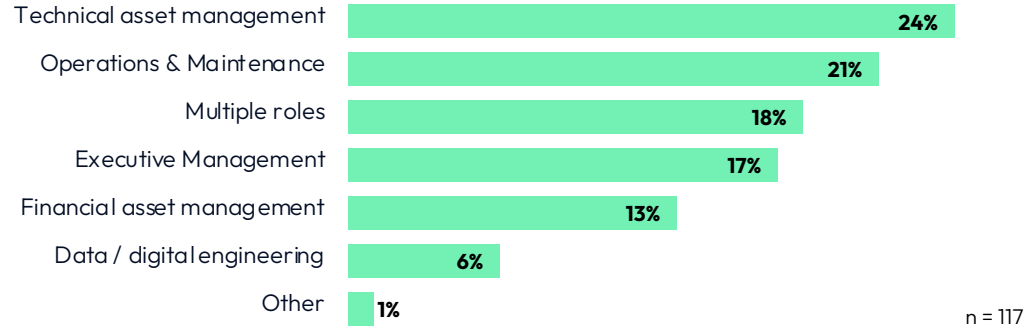
## Responsibilities, Portfolio Scale, and Regions

Respondents span a wide range of roles and operating environments, overseeing BESS projects across different portfolio sizes and geographic regions.

### BESS capacity of respondents' companies

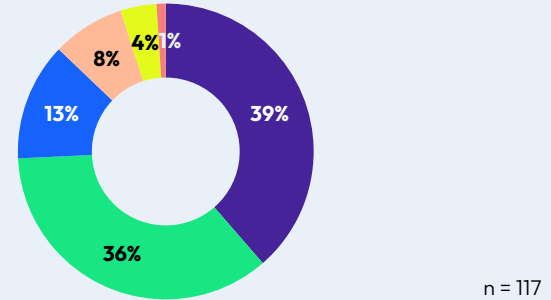


### Primary responsibilities of survey respondents



### Location of respondents' projects

- Europe
- North America
- Asia
- Middle East and Africa
- South America
- Australia and Oceania



## Key Themes Covered in This Report:

**1. Top Challenges Facing BESS Teams**

**2. How Asset Owners Structure O&M**

**3. How Asset Owners Use BESS Tools and Data**

**4. Priorities and Trends**

**5. Who's Operating BESS Assets Today?**

**6. Conclusions and Key Takeaways for BESS Teams**

1. Top Challenges

2. O&M Approaches

3. Tools and Data

4. Priorities

5. The BESS Pros

6. Conclusions

# 1. The Top Challenges Facing BESS Teams



# Performance and Availability Are Top Challenges

System performance and availability emerged as the top operational challenge, closely followed by revenue optimization and market participation. Together, these reflect a clear priority in the market: maximizing the commercial performance of BESS assets.

Safety risks, while still monitored, are perceived as less dominant day-to-day challenges, likely due to improvements in system design and manufacturing. Warranties and degradation are important but generally do not require daily operational intervention.

“If you don’t have an available asset, it’s not making money.”

**Marek Kubik**  
Energy Storage Expert



## What are the most critical challenges you face in managing your BESS assets?

System performance and availability

50%

Revenue optimization and market participation

44%

Warranty and contract management

23%

Degradation and lifespan management

22%

Data management and integration

22%

Safety and risk

22%

Other

1%

n = 117

## No Single Source of Truth Remains a Struggle

Half of the respondents cited “no single source of truth (need to use multiple tools/dashboards to get a complete picture)” as a top challenge. The result is a fragmented operating landscape where teams must piece together information across different systems.

Crucially, BESS KPIs have no universally accepted definitions. Even fundamental KPIs such as cycle count or availability can be calculated in multiple ways.

“The same KPIs are calculated in multiple “correct” ways – and today, all of them are contractually acceptable.”

**Anton Telegin**  
Product Manager, BayWa



### Which of the following challenges make it harder to perform your job?

No single source of truth

50%

Difficulty holding suppliers accountable to achieve performance promises

47%

Limited access to BESS data needed for operations

40%

Lack of expertise within the team

36%

Internal budgeting and cost constraints

26%

Organization changes disrupting continuity

24%

Other

3%

n = 117



“It depends on what is contractually agreed as the basis for the source of truth. If that’s poorly defined, that’s when you run into problems.”



**Marek Kubik**

Cleantech Entrepreneur & Energy Storage Expert

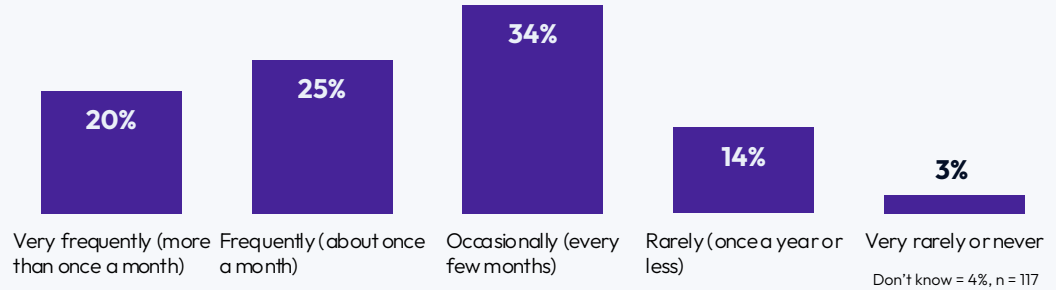
# Frequent Unexpected On-Site Issues Cause Lost Revenue

Almost half (45%) of respondents experience unexpected on-site issues that require immediate maintenance or repair at least monthly. When these issues occur, for 41%, they lead to lost revenues all or most of the time.

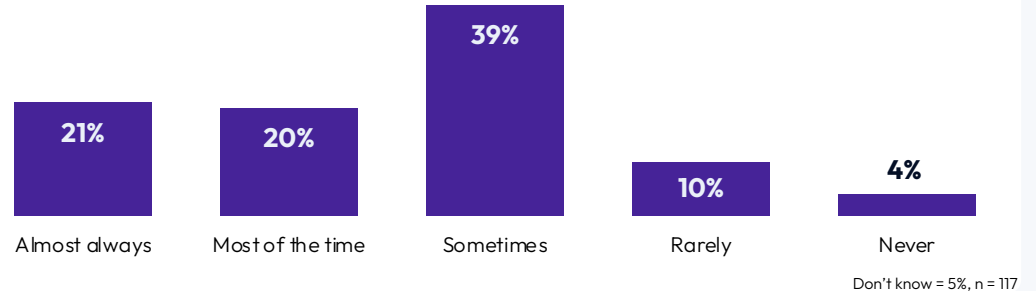
## Key Takeaways

1. In practice, every few months of stable operation are punctuated by incidents that hit revenue.
2. Technical problems are still causing revenue losses, despite recent advances in technologies.
3. Maintenance is still heavily driven by unplanned events rather than proactive interventions.

Across your projects overall, how often do you have to respond to unexpected on-site issues that require immediate maintenance or repair?



When these unplanned maintenance events occur, how often do they result in lost revenues?



## Investigating Incidents Is a Time Sink

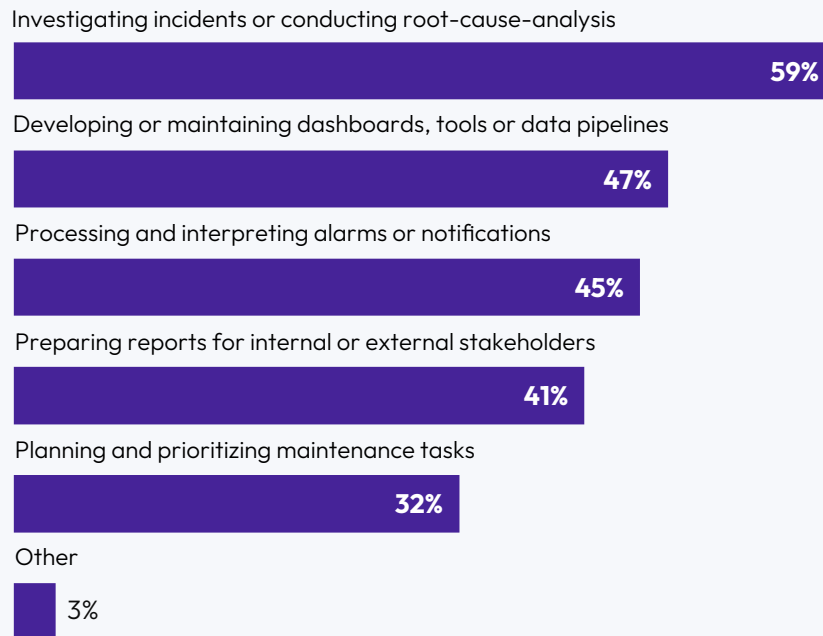
For 59% of respondents, investigating incidents or conducting root-cause analysis requires significant effort or time. When unexpected on-site issues happen, teams are under pressure to understand what is happening.

Furthermore, what qualifies as an urgent issue might vary between teams. This places a high burden on teams to understand what requires immediate action or not.

### Key Takeaway

When unexpected issues occur, teams spend a disproportionate amount of time understanding what happened and how urgent it is, leading to constant firefighting and time pressure.

### Which of these day-to-day activities takes the most effort or time?



n = 117

1. Top Challenges

2. O&M Approaches

3. Tools and Data

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## 2. How Asset Owners Structure BESS O&M



## BESS O&M Is Predominantly Managed Externally

The **44 asset owners** (IPPs, financial asset owners or utilities) who responded to the survey generally use a combination of approaches for BESS O&M. However, LTSAs clearly still dominate, with 73% of respondents using an LTSA – either as the sole approach or combined with others.

Only 5% manage O&M fully in-house, highlighting a reliance on external providers.

# 95%

of asset owners rely at least partially on external providers for O&M.

### How does your organization manage BESS O&M?

LTSA with integrator or supplier

36%

3<sup>rd</sup> party O&M contractor

20%

LTSA and 3<sup>rd</sup> party O&M contractor

18%

LTSA, 3<sup>rd</sup> party O&M contractor and in-house

11%

LTSA and in-house

7%

In-house

5%

In-house and other

2%

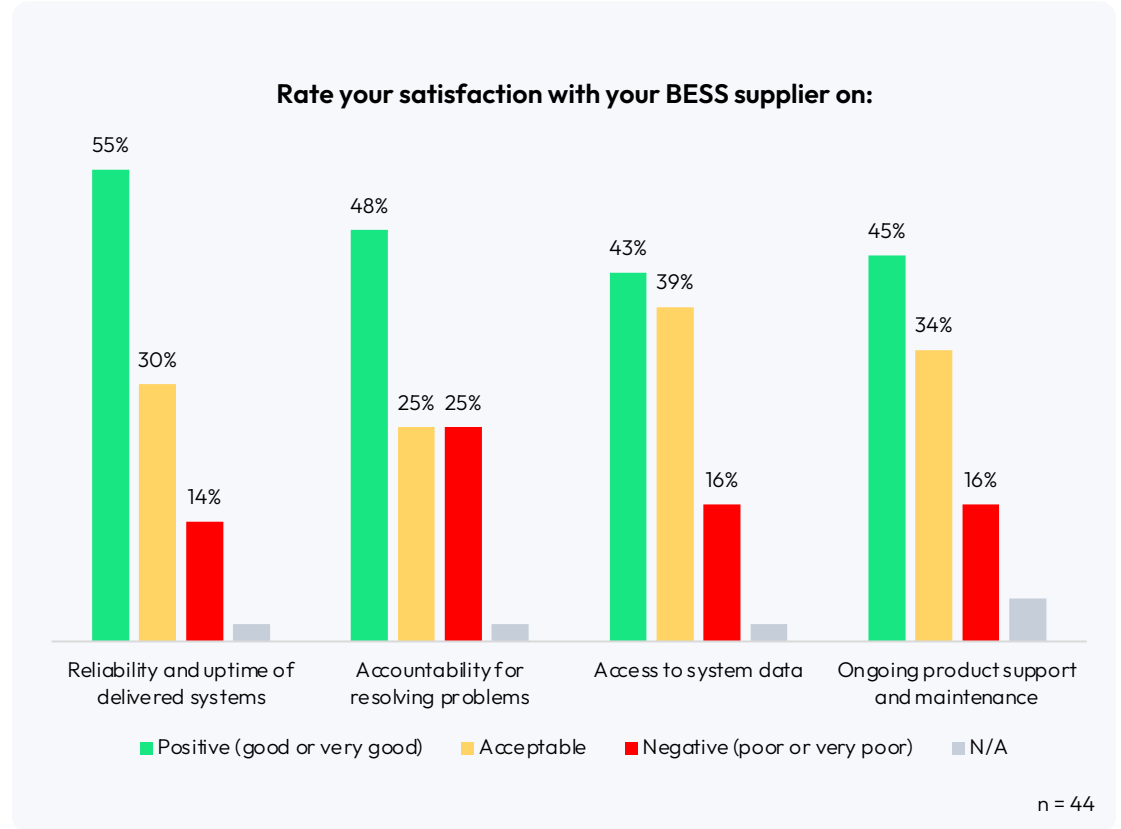
n = 44

## Suppliers Ratings Are Largely Positive, but Confidence Varies

Most asset owners rate their suppliers and integrators positively, though confidence varies meaningfully across system reliability, accountability, data access, and ongoing product support.

What stands out:

- **Reliability and uptime are clear strengths**, with 55% of respondents rating them as good or very good.
- **Accountability for resolving problems is a comparatively weaker area**, with 25% of respondents rating it as poor or very poor.
- **Access to system data** has the largest confidence gap, showing the lowest positive rating (43%) and the highest concentration of “acceptable” ratings (39%).



## Accountability Is a Mixed Picture Across the Value Chain

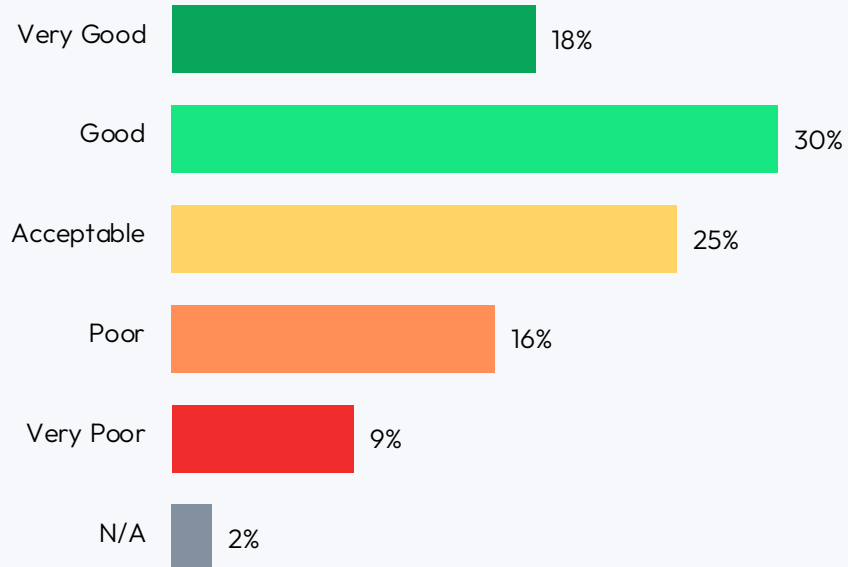
Most asset owners rate supplier accountability as good or acceptable when assessed against their defined contractual responsibilities such as responding to tickets or providing support under LTSA terms. At the same time, nearly half (47%) of respondents across the full survey sample say that “difficulty holding suppliers accountable to performance promises” makes it harder to perform their jobs ([page 8](#)).

Taken together, these findings suggest accountability challenges are more structural than supplier-specific.

### Key Implication

With multiple stakeholders across the value chain and lack of standardized KPI definitions, no one party has full accountability for operational outcomes.

Asset owner ratings for suppliers / integrators on: Accountability for resolving problems (willingness to take ownership and deliver solutions)



n = 44



“Everyone says “it’s not my problem”, but the problem still exists.”



**Gregory Sonn**  
Global Sales Manager at Nebulosity

## Data Access Is Common, but Operational Usability Varies

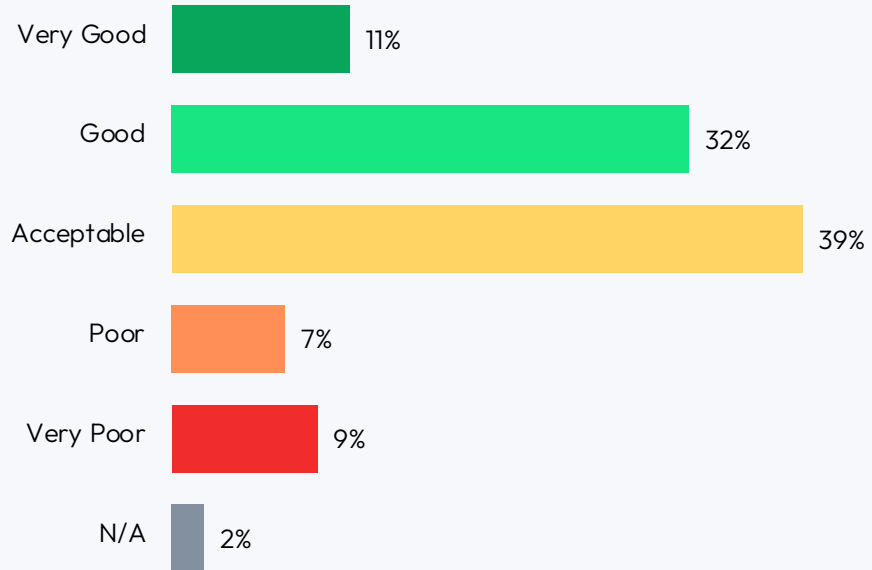
Operators may be making a distinction between data availability and data usability.

Most asset owners rate suppliers / integrators positively on access to data, indicating that they receive data as defined in contracts. Nevertheless, a significant share of asset owners (43%) still cite limited access to BESS data needed for operations as a top challenge.

### Key Implication

Asset owners receive data from suppliers, but it may not be actionable enough to effectively support BESS operations.

Asset owner ratings for suppliers / integrators on: Access to system data (availability and quality of supplier-provided data, APIs or portals)



n = 44

## Understanding the Gap Between Supplier Ratings and Reality

The results appear contradictory: suppliers are rated positively for accountability and data access, yet difficulty holding suppliers accountable and limited access to operational data remain top challenges.

This could reflect a distinction operators make between supplier performance within defined scopes and the broader operational experience of running BESS projects. In many cases, suppliers are meeting their contractual obligations, providing data and support within agreed scopes. However, when issues arise in practice, operators want **timely responses** and **clarity on root causes** - expectations that do not appear to be consistently met, based on the survey results.

At the same time, accountability can be challenging to navigate within the BESS industry, as **responsibility is often distributed across multiple suppliers** and upstream partners. As a result, operators and suppliers may lack clarity on where issues originate or which party is best positioned to resolve them.



## Fragmented Tool Landscape Increases Operational Effort

Most report using two or more tools to manage their BESS assets. Many rely on a mix of SCADA, EMS, vendor platforms, and custom or in-house tools, meaning data often needs to be pulled together from multiple systems to understand performance issues.

This fragmented tool landscape helps explain why half of respondents cite the lack of a single source of truth as a top operational challenge (as shown on [page 8](#)).

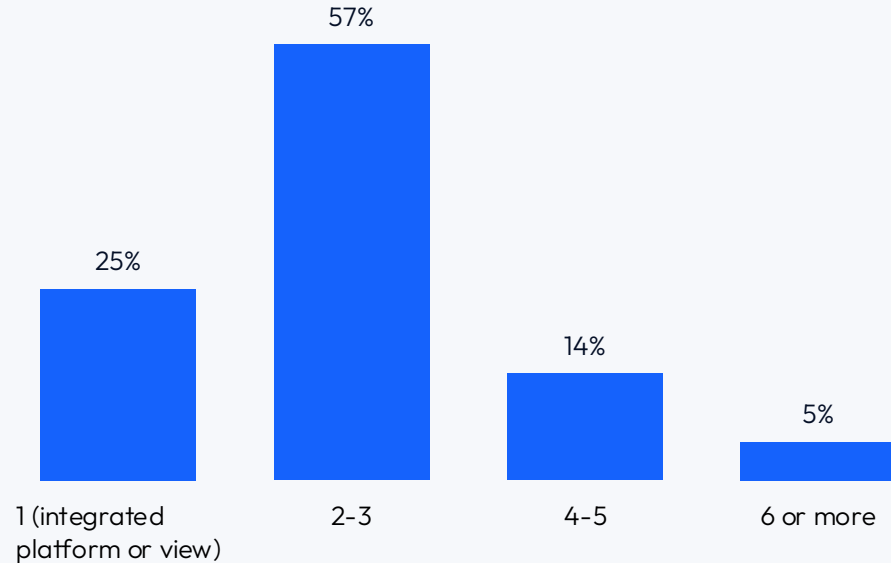
“Having to look in multiple places and manually pull data definitely slows you down.”

**Chris Swanson**

Director of Performance Engineering,  
Fullmark Energy



How many different tools do you typically use to manage your BESS assets?



n = 44

## No Single Approach to BESS Performance Analytics

Most calculate performance KPIs themselves using internal tools such as spreadsheets or custom dashboards.

Operators often combine multiple approaches, highlighting that no single method is sufficient across all operational needs, reinforcing earlier findings about a lack of a single source of truth.

# 52%

Are using more than one approach to BESS data analytics.

### What best describes your current approach to BESS data analytics?

We use supplier-reported KPIs

32%

We calculate KPIs ourselves using internal tools

68%

We use third-party analytics platforms

34%

We rely mainly on periodic reference tests

27%

We do not actively calculate or analyze KPIs

9%

Don't know

2%

n = 44

## Data Ownership Does Not Guarantee Insights

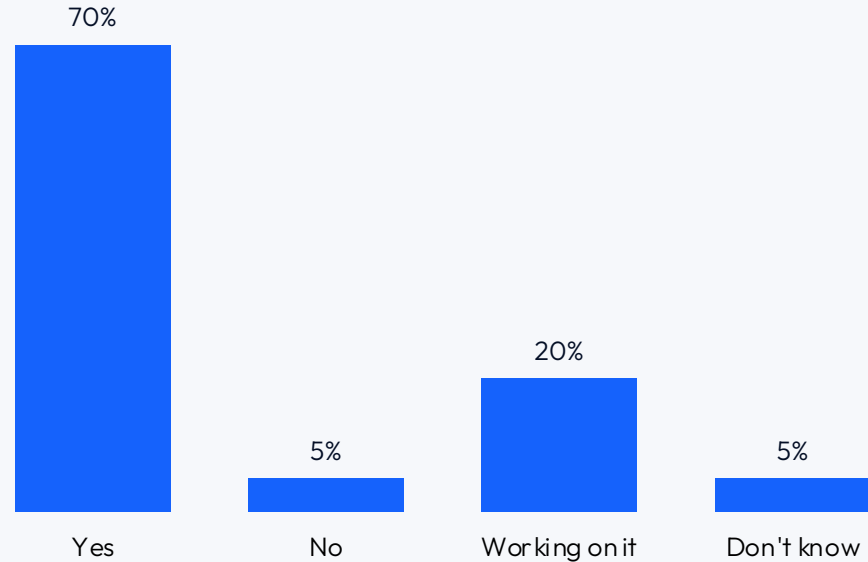
Most asset owners report contractually owning or having long-term access to data, indicating that formal data ownership is well established. This reinforces findings on [page 17](#), showing that suppliers are rated positively or acceptable on access to system data.

However, 43% of asset owners say “limited access to BESS data needed for operations” makes it harder to perform their job, pointing to a gap between contractual data ownership and operational usability.

### Key Implication

Contractually owning or accessing BESS data does not guarantee that this data can be used effectively in BESS operations.

Does your organization own or have long-term access to BESS data?



n = 44



“What stands out is not a lack of data in BESS operations, but the difficulty of turning that data into something teams can confidently act on. As BESS deployments scale, usability and trust in performance data become just as important as access.”



**Stephan Rohr**  
CEO of TWAICE

1. Top Challenges

2. O&M Approaches

3. Tools and Data

4. Priorities

5. The BESS Pros

6. Conclusions

# 4.

## Priorities and Trends Shaping the Industry



# BESS Teams Stay Focused on Growth

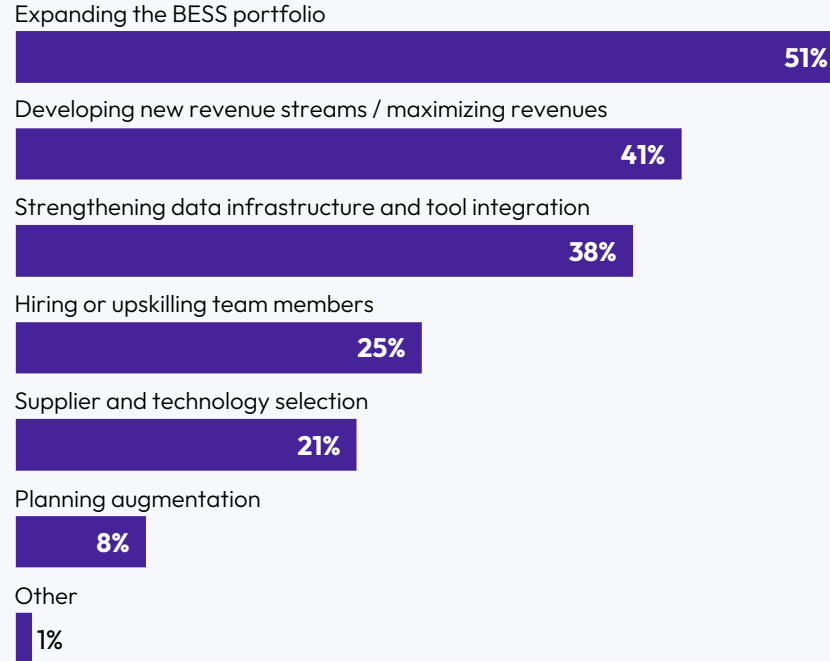
As BESS teams look ahead, growth remains the dominant priority, both in expanding portfolios and maximizing revenues.

A notable share of respondents also point to strengthening data infrastructure and tool integration, suggesting that some teams are already investing in the operational foundations needed to support scaling portfolios.

## Key Takeaway

Growth remains at the forefront, but some teams are beginning to think more deliberately about how to scale effectively.

## What will your team focus on most next year?

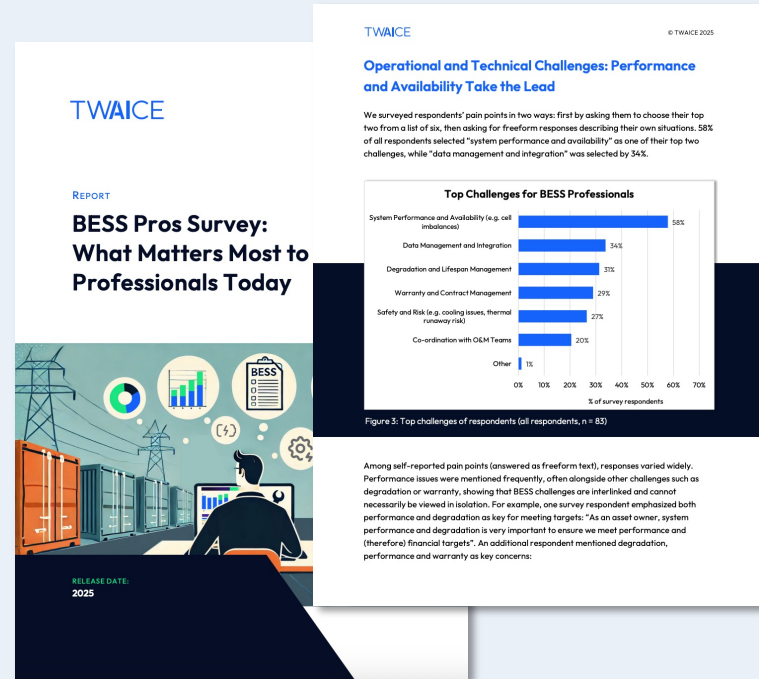


n = 117

# How Priorities Around Growth Are Evolving

The 2025 BESS Pros Survey Report captured insights from 83 professionals working with grid-scale BESS. While the surveys are not directly comparable, several points stand out:

- **The focus is expanding beyond hiring:** Hiring and upskilling remain important, but this year's report shows growing attention on the operational and data foundations needed to support larger portfolios.
- **Core operational challenges still exist:** Performance and availability continue to surface as top challenges, underscoring the gap between growing scale and operational maturity.



1. Top Challenges

2. O&M Approaches

3. Tools and Data

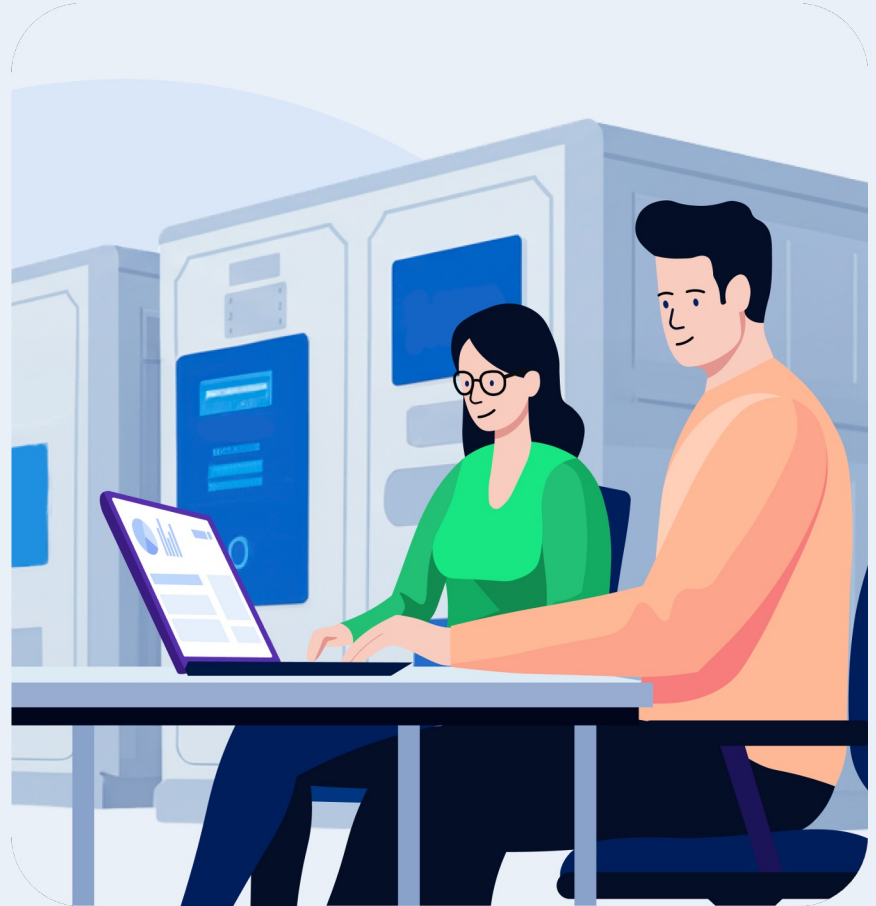
4. Priorities

5. The BESS Pros

6. Conclusions

5.

## Who's Operating BESS Assets Today?



## Most Bring Experience From Other Energy Sectors

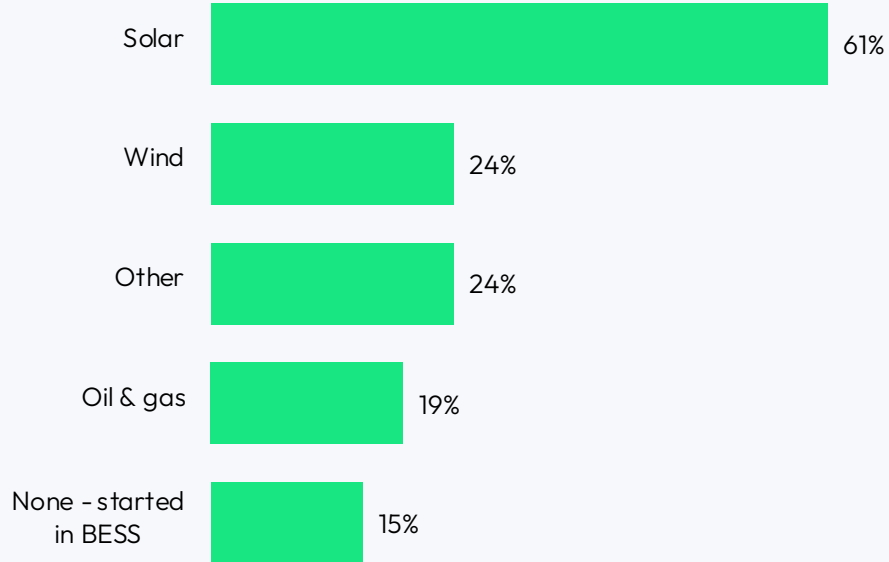
Only 15% started their career in BESS. Most transitioned from other industries, with solar the most common.

While experience from other sectors brings strong foundations, grid-scale BESS is more data-intensive than wind or solar, placing new demands on existing systems and processes.

### Implications for the Industry

1. The industry is being built by people importing mental models from other sectors, notably solar.
2. BESS operations are more data-intensive, requiring new operational and analytical approaches.

### Did you have experience in other energy industries before BESS?



n = 117

## BESS Experience Levels Remain Relatively Low

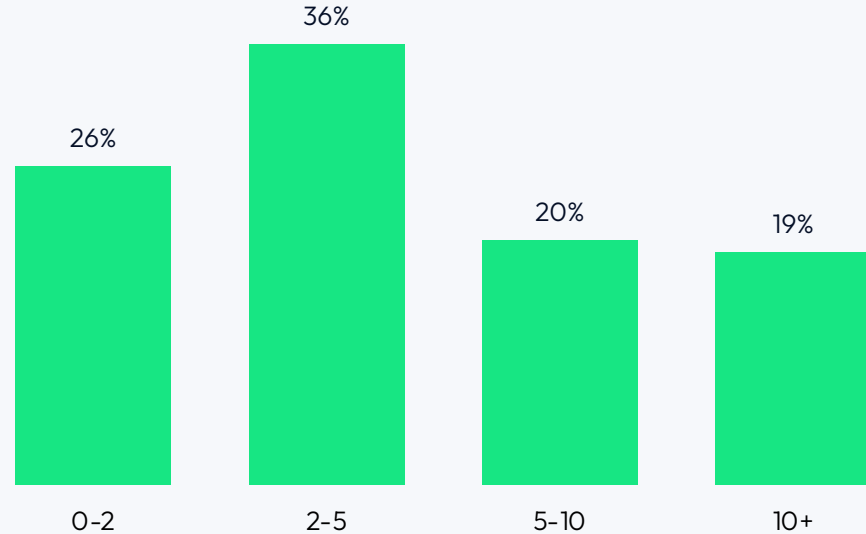
With 62% of respondents having 5 years or less of BESS experience, the industry remains in an early maturity phase, with standards, processes and best practices still taking shape.

“BESS isn’t new, but the industry is still figuring out how to make systems operate in line with expectations.”

**Chris Swanson**  
Director of Performance Engineering,  
Fullmark Energy



How many years of experience do you have in the BESS industry?



n = 117

# Most Manage More Than One Project

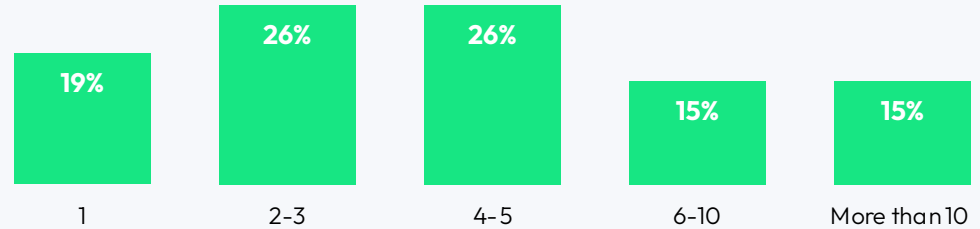
81% are responsible for managing or overseeing at least 2 projects, highlighting the operational load placed on teams as portfolios scale.

Furthermore, many respondents report that relatively small numbers of people are directly involved in managing and overseeing BESS projects.

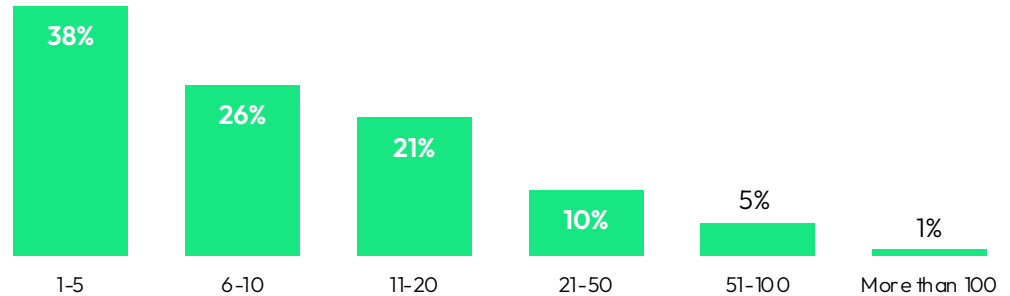
## Key Takeaways

1. Small internal teams have to coordinate complex, multi-party BESS operations.
2. Fragmented workflows and the use of multiple tools can become a bottleneck as portfolios scale.

How many BESS projects do you manage / oversee?



Approximately how many people within your organization are directly involved in managing, operating or overseeing BESS projects?



n = 117

1. Top Challenges

2. O&M Approaches

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# 6. Key Takeaways for BESS Teams



## Frequent On-Site Issues Continue To Disrupt Operations and Revenue

The industry is still operating in a reactive mode. Survey findings show that frequent issues disrupt operations ([page 8](#)), incident investigation is time-intensive ([page 11](#)), and that small teams manage multiple projects ([page 30](#)). Together, these findings explain why reactive operations place pressure on BESS teams.

### Practical Considerations

1. Ensure clear definitions and processes for incident investigation.
2. Reduce reliance on ad-hoc analytics where possible to help teams work more efficiently.

45%

Respond to unexpected on-site issues at least monthly, often leading to lost revenue

59%

Say root-cause analysis and incident investigation is a time sink

56%

Manage 4 or more BESS projects simultaneously

38%

Have less than 6 colleagues working on BESS operations

## A High Tolerance for Issues Could Be a **Barrier to Scalability**

Despite frequent operational issues ([page 10](#)), survey findings show that asset owners rate suppliers generally positively ([page 14](#)).

This indicates that there is a tolerance for friction and issues that may not be sustainable as portfolios scale, particularly when owners/operators continue to rely on 3<sup>rd</sup> parties for O&M.

### Practical Considerations

3. Clarify ownership and accountability across suppliers. Shared performance definitions can help reduce delays when issues arise.

# 95%

Of asset owners use external providers for BESS O&M (either LTSAs or 3<sup>rd</sup> party contractors)

# 48%

Of asset owners cite “difficulty holding suppliers accountable” as a top challenge

# 48%

Represents the average positive rating from asset owners for suppliers / integrators

# 55%

Of asset owners rate suppliers positively on reliability of delivered systems

## Moving From Data to Insight Is Harder Than It Should Be

BESS teams generally own their data contractually ([page 22](#)). However, the report indicates several times that contractual data ownership does not translate into operational insights.

Lacking a single source of truth ([page 8](#)), using multiple tools ([page 20](#)), and above all, mentioning “limited access to BESS data needed for operations” as a top challenge underscores this contradiction.

### Practical Considerations

4. Assess whether existing tools provide a transparent view of performance.

# 70%

Of asset owners own or have long-term access to data

# 75%

Of asset owners use more than one tool to manage BESS

# 50%

Of asset owners cite “lack of a single source of truth” as a top challenge

# 43%

Of asset owners cite “limited access to BESS data needed for operations” as a top challenge

# Summary and Conclusions

As more grid-scale BESS projects move from development into live operations, it is becoming clear that BESS do not behave like other renewable assets.

Once systems are live, operators encounter a range of surprises, from unexpected issues, to complex performance behavior, and data volumes that far exceed what other renewable assets produce.

This shift is exposing gaps between how BESS projects are planned and how they are ultimately operated – from reactive maintenance models and fragmented accountability, to data that exists but is difficult to turn into timely, trusted insight.

## Deployment Is Outpacing Operational Models

- Maintenance remains largely reactive, driven by unexpected events.
  - Investigating issues and root cause analysis consumes significant time.
- As portfolios grow but teams remain lean, scalability becomes a challenge.

## Supplier Accountability Is A Mixed Picture Across the Value Chain

- Most asset owners rate suppliers and integrators positively.
  - However, difficulty holding suppliers accountable is cited as a top challenge.
- There is a high tolerance for issues, which may not be scalable.

## Data Ownership Is Widespread, but Data Usability Remains Limited

- Most operators own or have long-term access to BESS data.
  - Insights are spread across different tools and KPI definitions are inconsistent.
- Access to data does not automatically translate into actionable, operational insight.

# Methodology: How We Collected the Insights

## Survey Design and Sample

**Timeframe:** TWAICE conducted the survey from October–December 2025.

**Sampling approach:** The survey was distributed to BESS professionals via TWAICE’s network and industry channels.

**Responses and qualification:** 287 people responded in total; 117 met the qualification criteria by answering “yes” to both questions:

- Does your organization own, operate or manage grid-scale battery storage projects that are currently in operation?
- In your role, are you involved in the management, oversight or operation of BESS assets?

**Analysis:** Results shown reflect aggregated responses from qualified participants. Percentages do not always equal 100% due to rounding and multiple selections.

**Geographic coverage:** Global, majority in Europe or North America (see [p.4](#)).

**Role seniority:** Multiple roles including technical asset managers, O&M managers, executives, financial asset managers (see [p.4](#)).

**Anonymity:** The survey was 100% anonymous.

**Additional qualitative interviews:** In addition to the survey, TWAICE conducted five qualitative interviews with BESS professionals to gain more context.

## Segmentation of Asset Owners / Suppliers

The survey respondents self-identifying as working for IPPs, financial asset owners or utilities were asked additional questions in the survey:

- O&M and supplier ratings
- Data ownership
- Approaches to BESS data analytics

In the report, this segment of 44 respondents is referred to as the “asset owner” segment.

## Disclaimers and Limitations

The survey report presents a wide view of the market. However, as it was 100% anonymous, it is possible that more than one person within a company could have completed the survey.

# BESS Experts Featured During the Report



**Dr. Marek Kubik** [in](#)

Cleantech Entrepreneur & Energy Storage Expert

Dr. Marek Kubik is a cleantech entrepreneur and energy storage expert with over 17 years of experience advancing grid-scale battery storage and renewable power systems globally. He helped pioneer battery storage in Europe as an early employee at AES Energy Storage and later co-founded Fluence, supporting its growth from start-up to a global energy storage leader. Today, Marek advises governments, investors, and industry leaders on scaling operational and system-level models for resilient, low-carbon power systems.



**Anton Telegin** [in](#)

Product Owner of BESS Data Platform at BayWa r.e.

Anton Telegin is a Product Manager at BayWa r.e. specializing in BESS data products, KPI standardization, and operational performance analytics. He works closely with asset owners, operators and technology providers to align stakeholders around a shared view of system performance.



**Chris Swanson** [in](#)

Director of Performance Engineering at Fullmark Energy

Chris Swanson leads asset management, operations, and performance optimization for battery energy storage systems at Fullmark Energy. With nearly two decades of experience spanning engineering, project development, and commissioning, he has guided battery storage projects across design, implementation, and operations. Chris specializes in performance metrics, partner engagement, and advancing next-generation battery storage capabilities.



**Gregory Sonn** [in](#)

Global Sales Manager at Nebulosity

Gregory is a subject matter expert with more than 35 years of experience across sustainable and renewable energy, clean baseload power, smart cities, and advanced manufacturing. He has supported high-growth and early-stage companies in developing and scaling complex energy and digital solutions, including digital twin and AI-enabled technologies.

See how BESS analytics helps you move **beyond reactive troubleshooting**, toward **proactive, data-driven operations**.

[Watch a Product Tour](#)

**TWAICE**  
Battery Storage Analytics