

De-risk and protect your battery storage asset from the very start with Digital Commissioning and In-Life Analytics



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De-risk and protect your battery storage asset from the start with Digital Commissioning & In-Life Analytics

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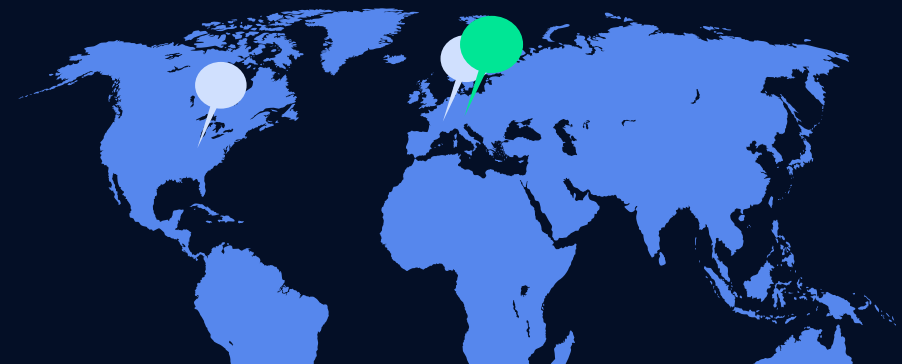


Unleash the full potential of your batteries

Value proposition and key stats

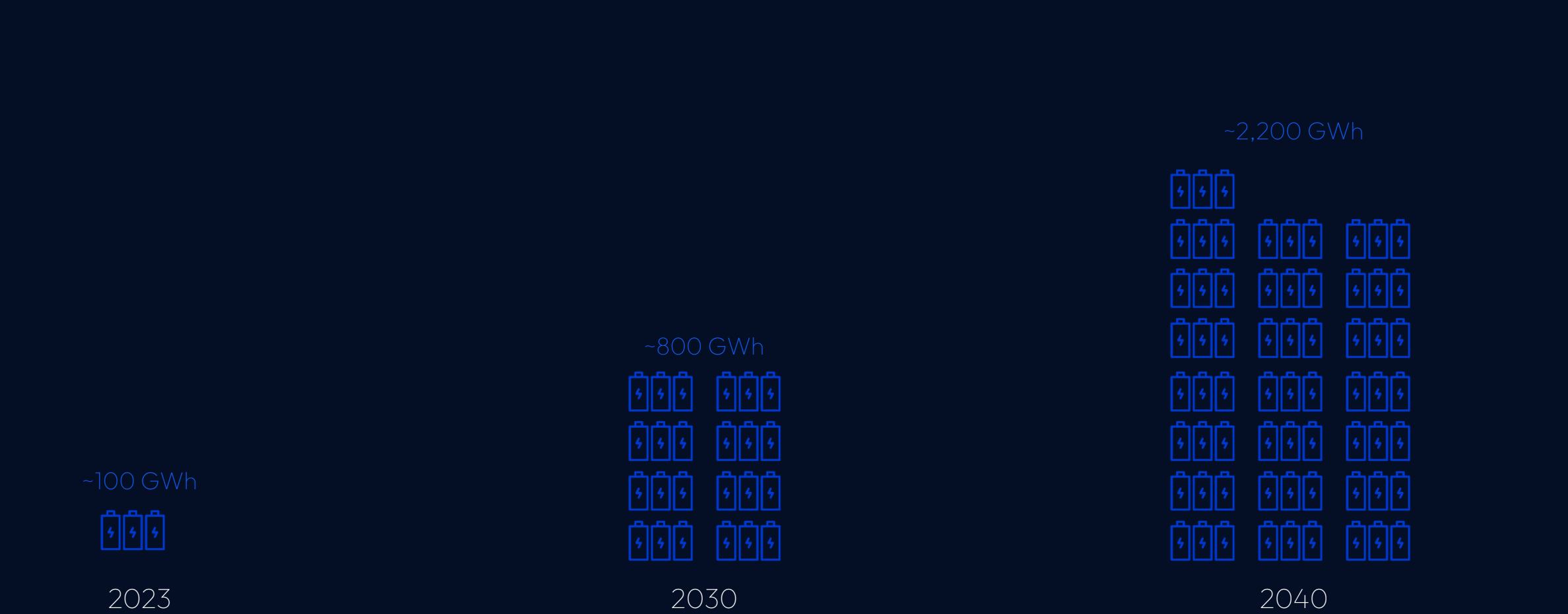
To accelerate the transition to green energy and mobility, we **eliminate risk & enable opportunities** of batteries with a **scalable software platform** leveraging battery data.

- 120+** battery & software engineers and data scientists
- 30+** patents
- 10+** industry partners, incl. Munich RE & TÜV Rheinland
- 5GWh+** Battery capacity connected to platform
- 3** Offices in Munich (HQ), Chicago (US), and Paris (FR)
- 1** Onsite battery research center



BESS Market

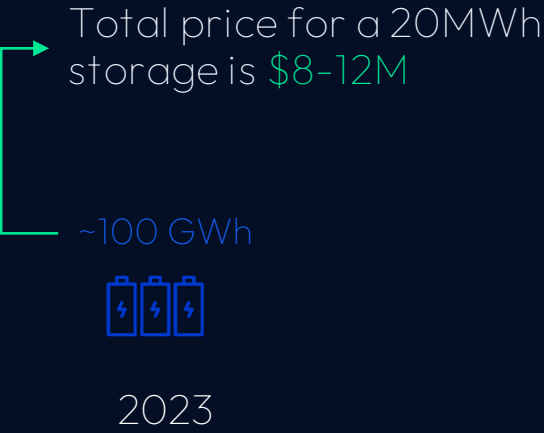
Scale increasing dramatically





BESS Market

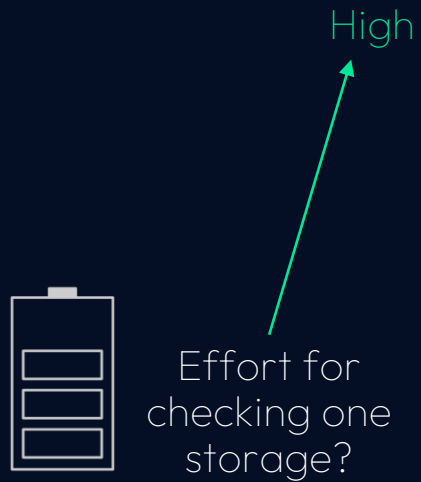
Scale increasing dramatically despite high prices



Scalability of insights

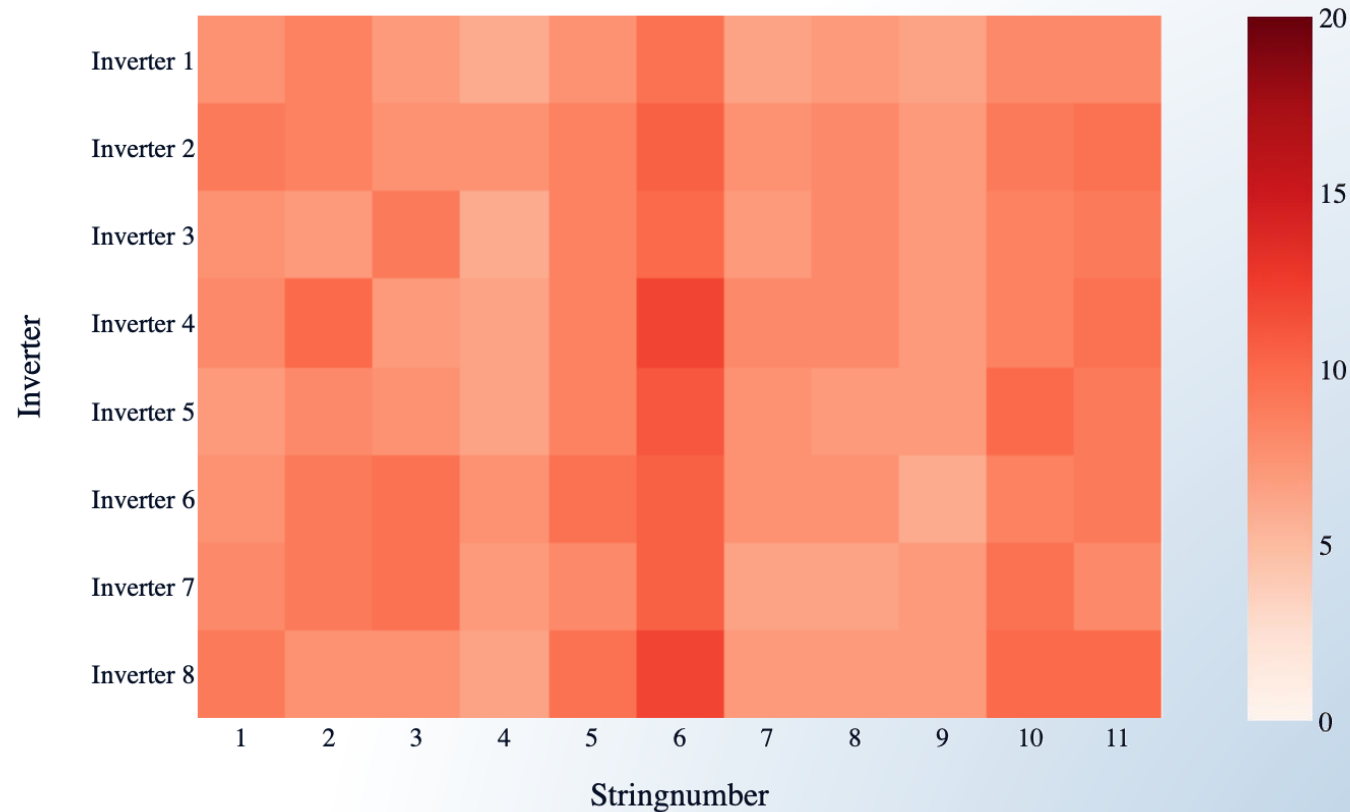
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Low-tech and hardware tests are not sufficiently scalable to provide insights



Case Study

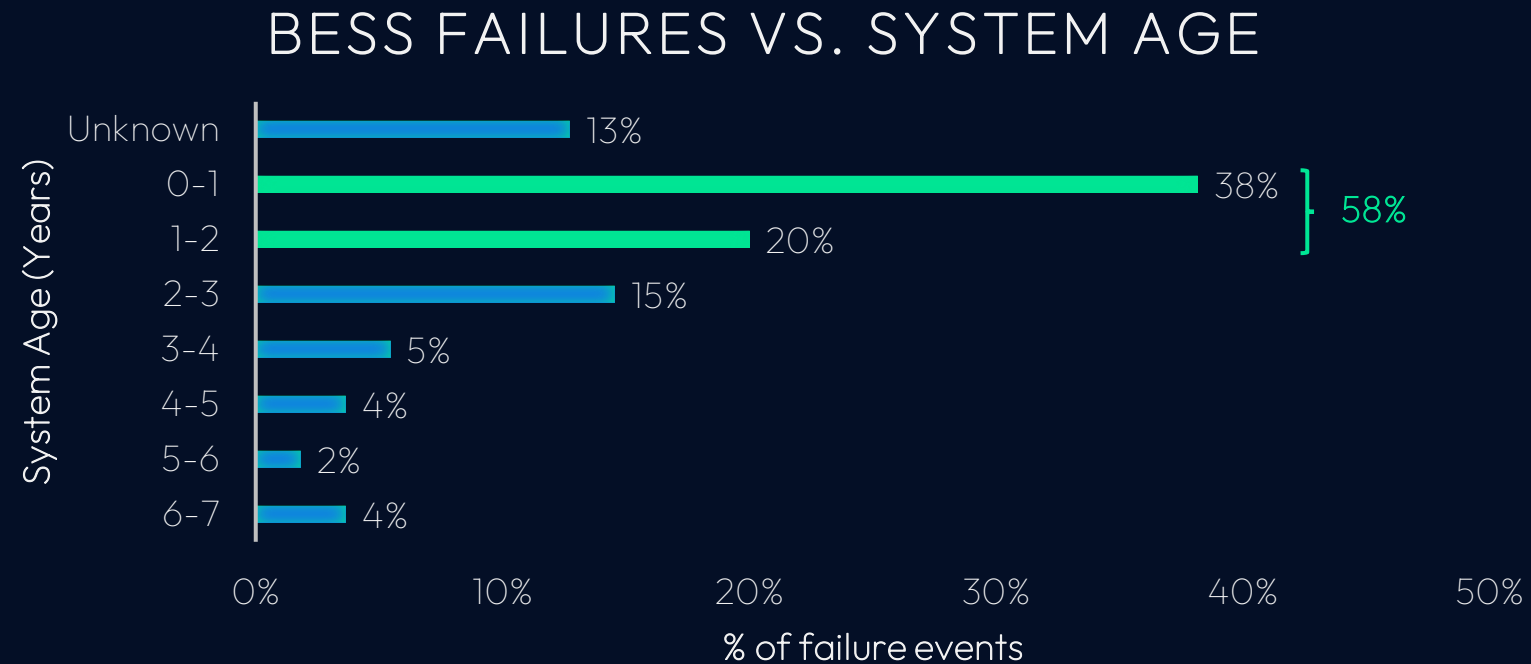
Industry challenge: Increasing deployments need surety



- System design failure diagnosis based on temperature analyses
- Weak cells are identified due to observations in various KPIs
- Strings and modules do not showcase datasheet-based behavior

Risks #1

Most failures occur in the first two years of operation



Risk #2

BESS availability is low on average

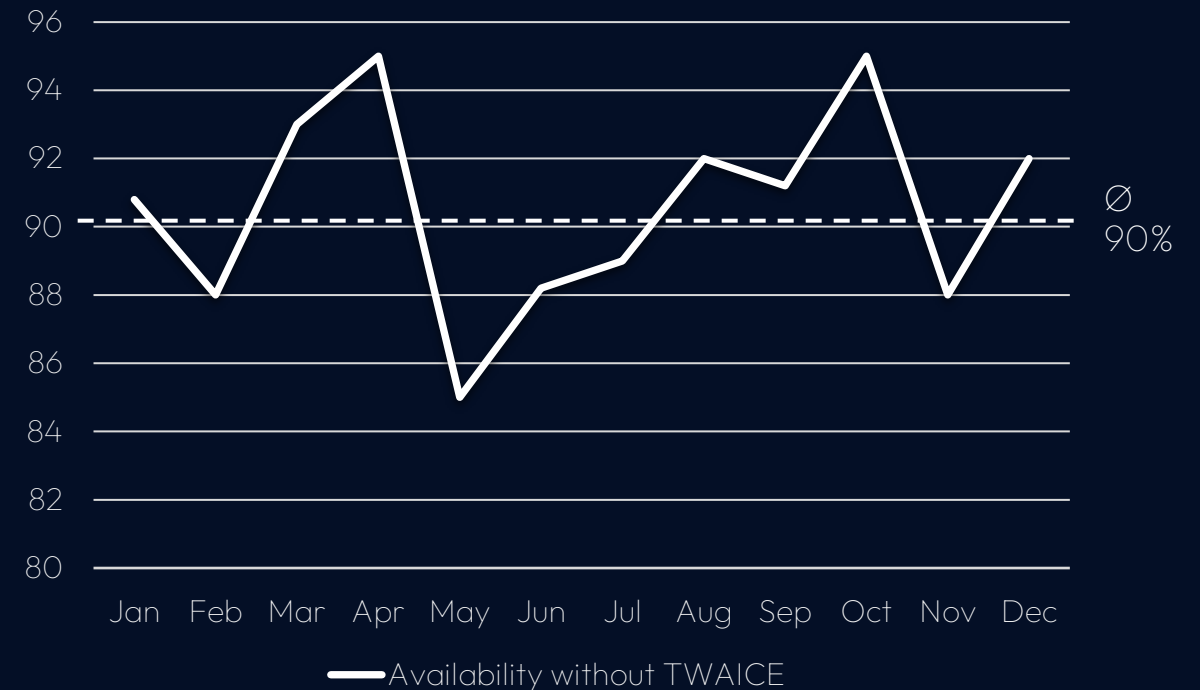
Storage availability in UK in 2022 was 82%

- *Modo Energy*

"Unplanned downtime led to an average availability across our fleet of only 84% last year"

- US asset owner

Storage Availability



Risk #3

Battery failures that lead to fires can mean high reputational damage

Investigation confirms cause of fire at Tesla's Victorian Big Battery in Australia

By [Andy Colthorpe](#)

May 11, 2022

[Asia & Oceania](#), [Southeast Asia & Oceania](#), [Grid Scale](#), [Market Watch](#), [Technology](#)

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NEWS

AES investigating cause of “thermal runaway” at Arizona site

By [Cameron Murray](#)

May 4, 2022

[Americas, US & Canada](#), [Grid Scale](#), [Technology](#)

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High performing & scalable analytics software can mitigate risks at the deployment & during operation

Start smoothly with Digital Commissioning...

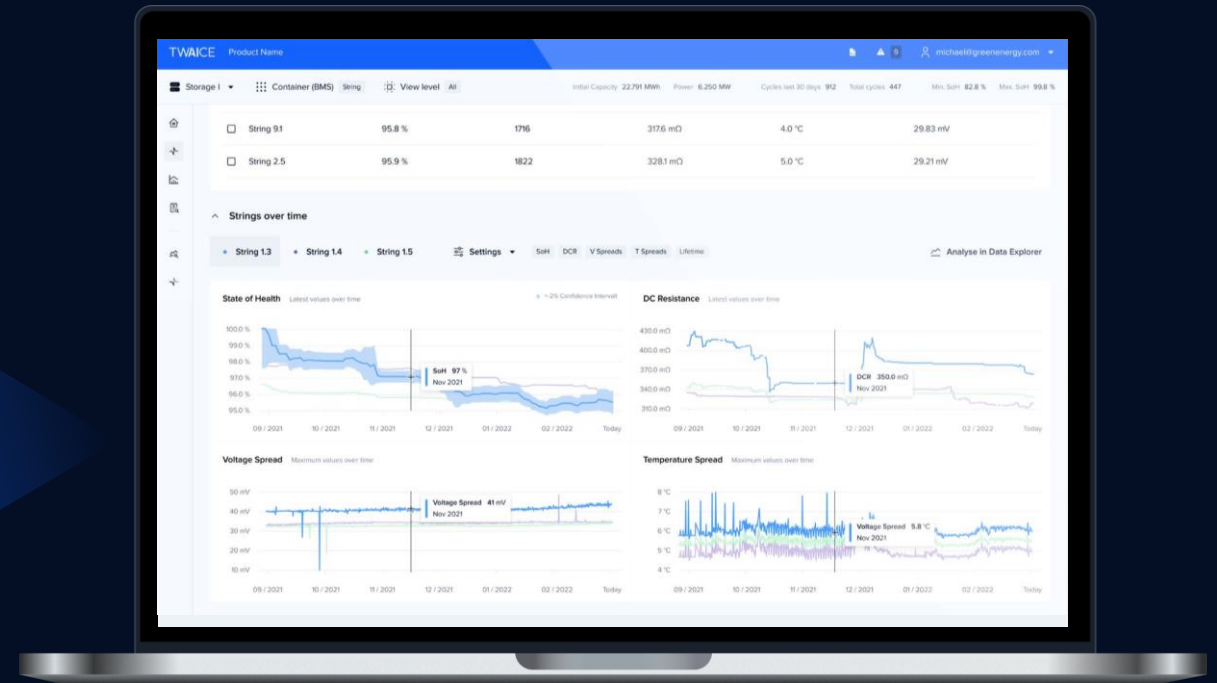


Digital Commissioning

Deeper insights into the BESS for reduced effort & costs

TWAICE Digital Commissioning

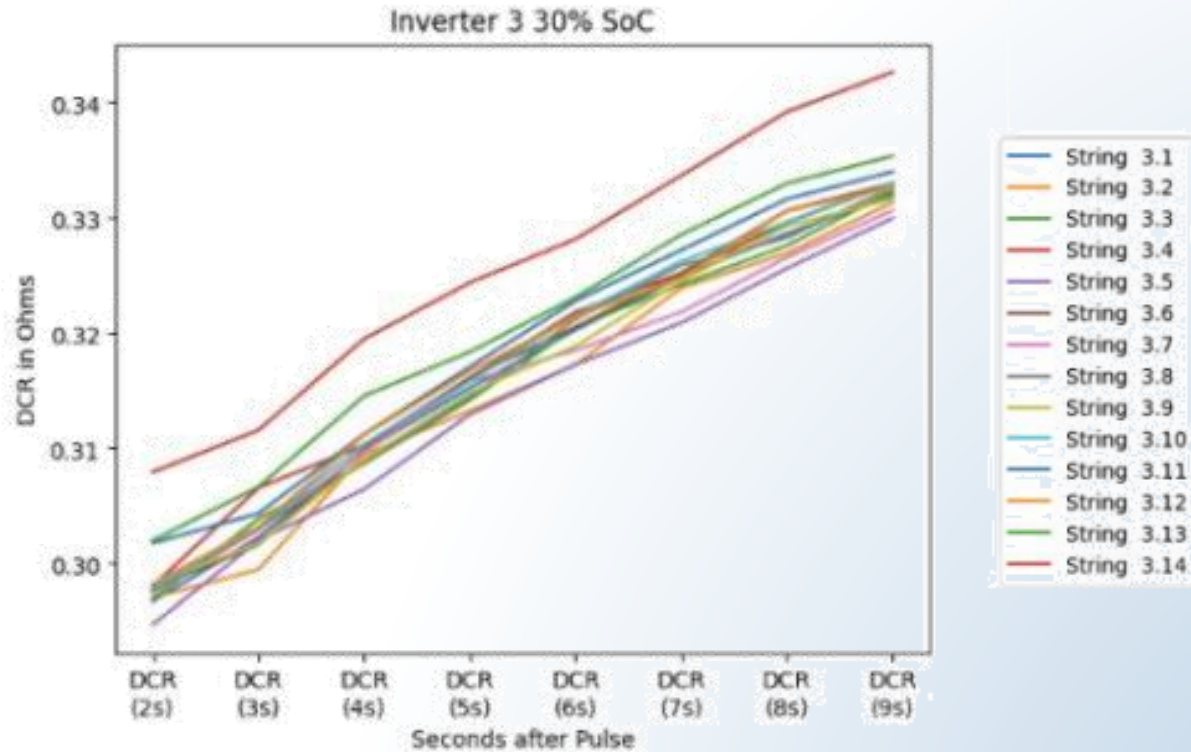
- Analysis of Charge- and Discharge Capacity, RTE, DC Resistance and Temperature Spreads
- Be informed of anomalies and inhomogeneities regarding the initial storage states
- Reduce complexity and costs with ESS commissioning

...and ensure seamless operation with In-Life Analytics

Case study

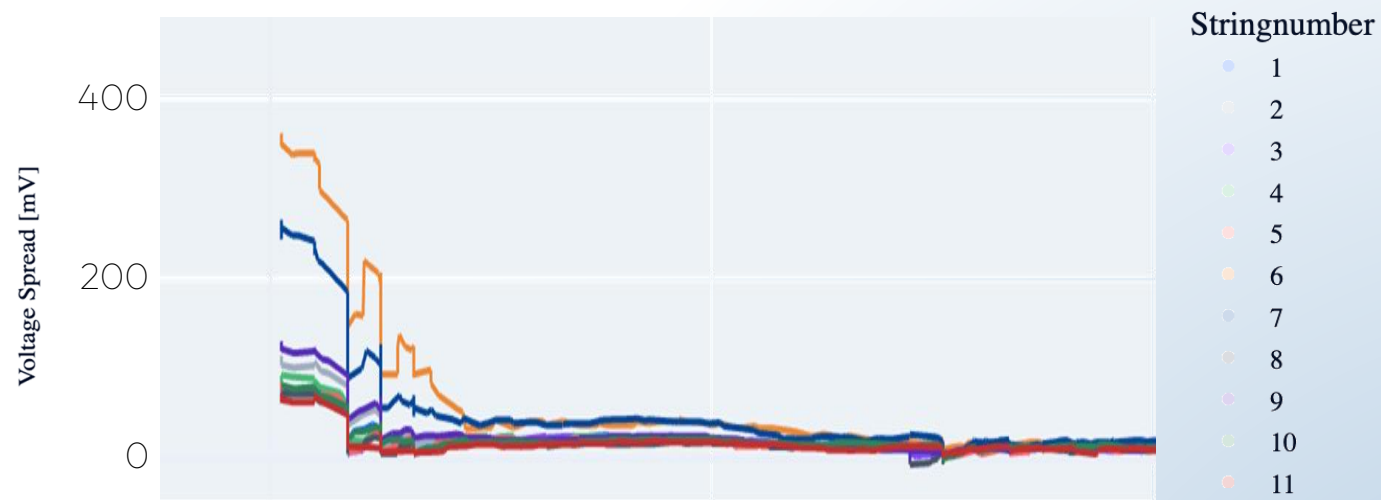
DC Resistance as key indicator for potential failure points



- High DC resistances identified
- Identification of five modules containing faulty cells, likely due to manufacturing defects
- Ability to compare and benchmark now and in the future

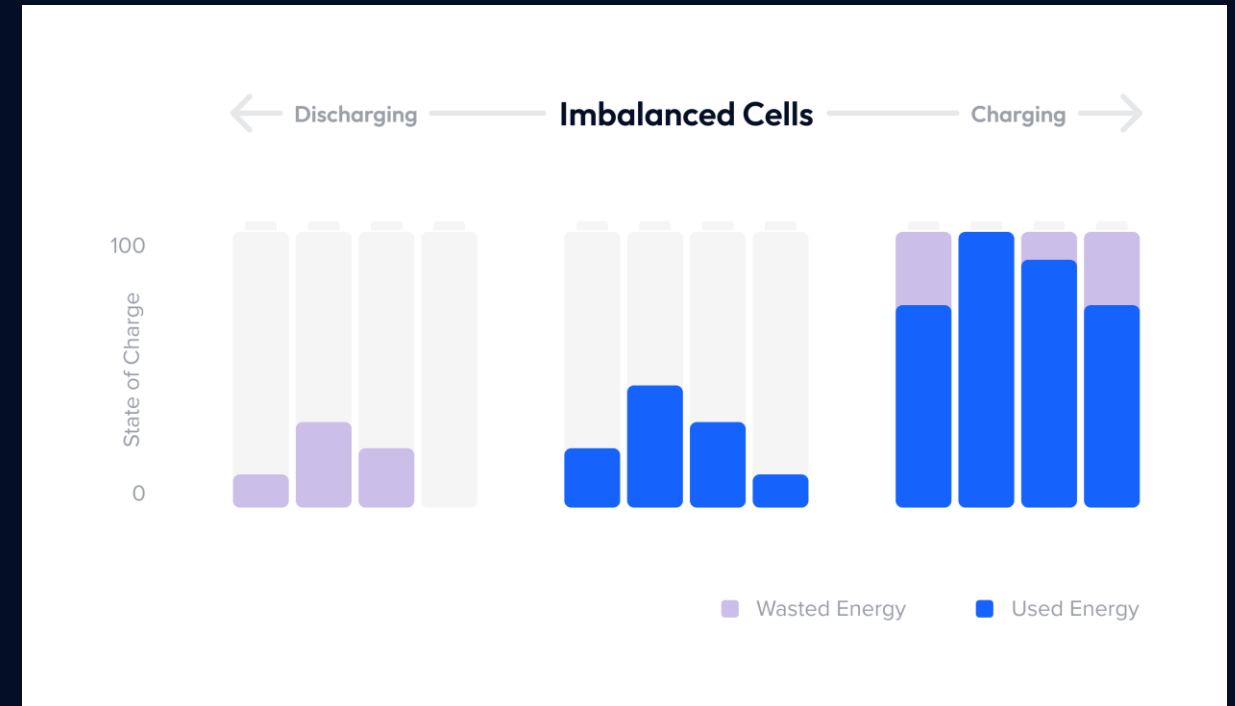
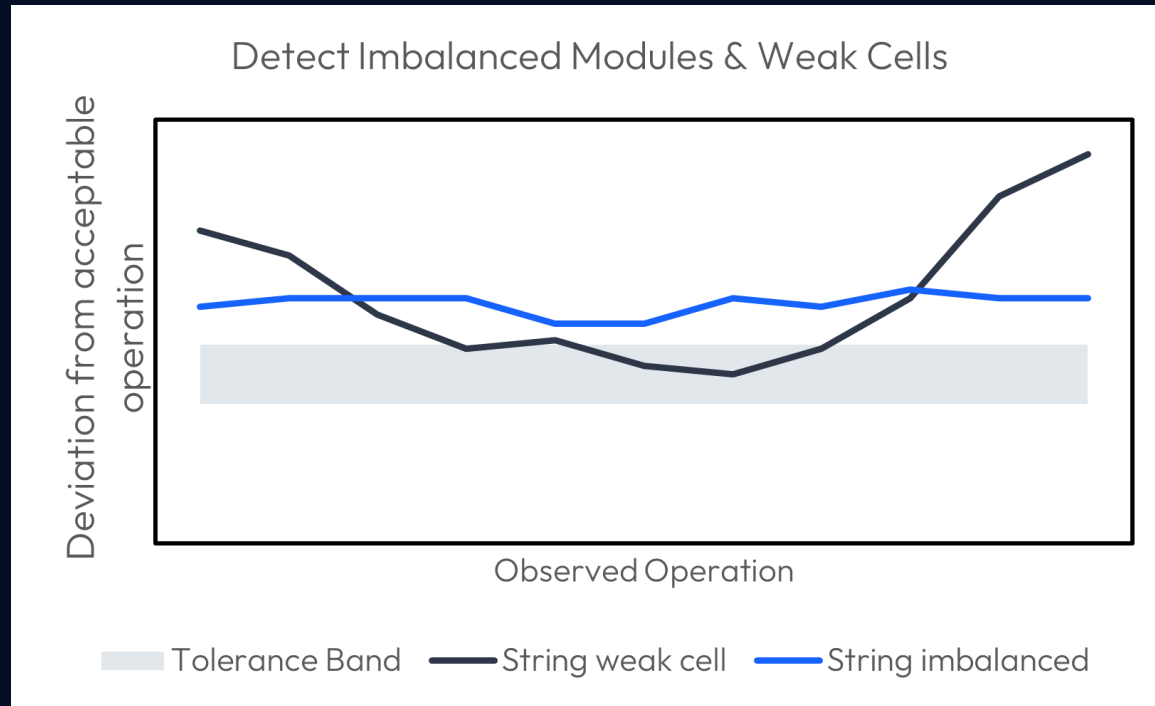
Case study

Voltage Spread as early indication for long-term storage underperformance



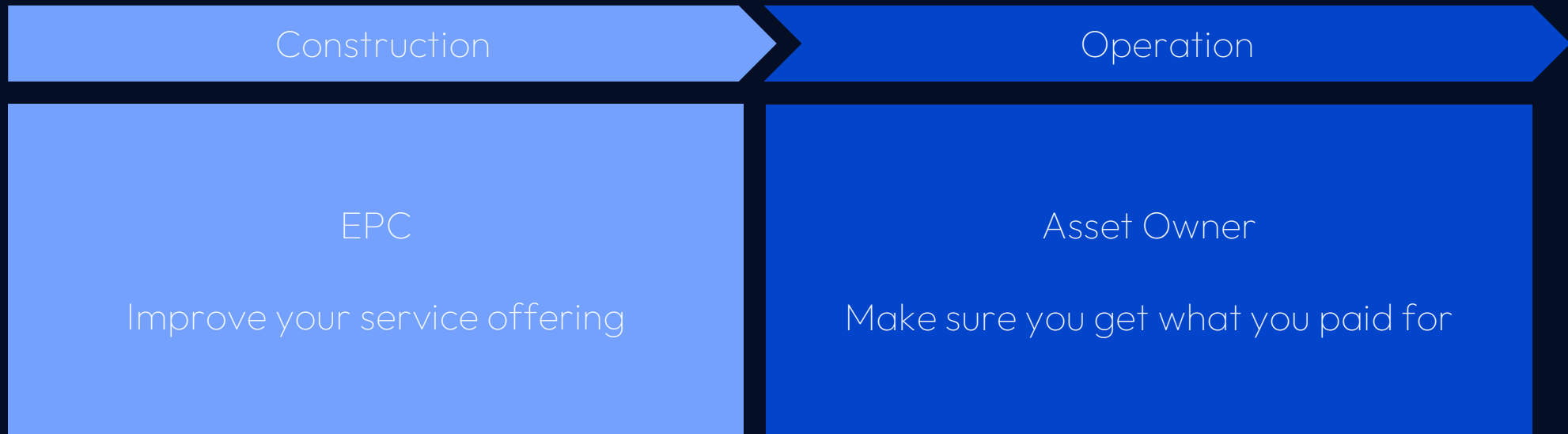
- Voltage spread detected at low SOC ranges in several modules
- Highly granular data
- Indicates weak cells that should be replaced

Wonder how we detect additional errors?



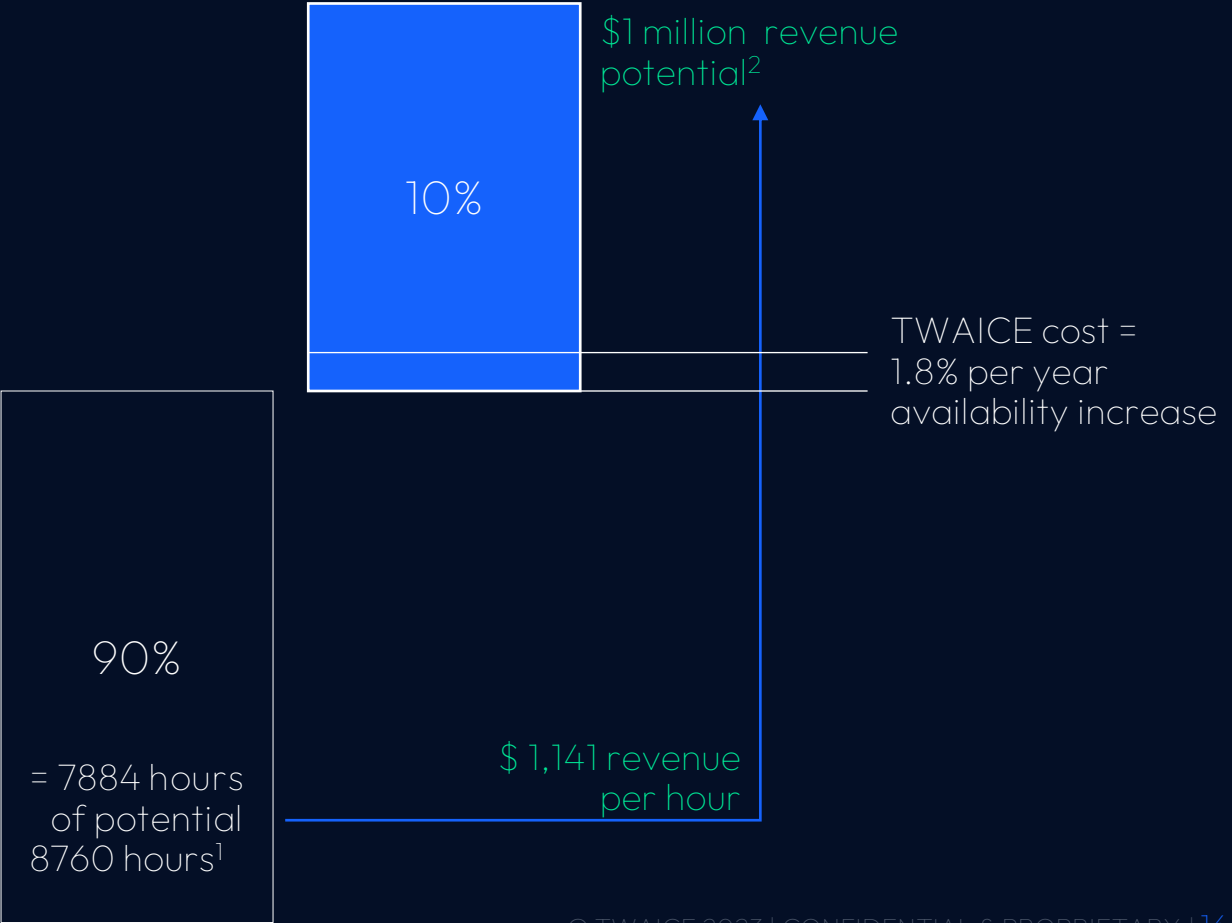
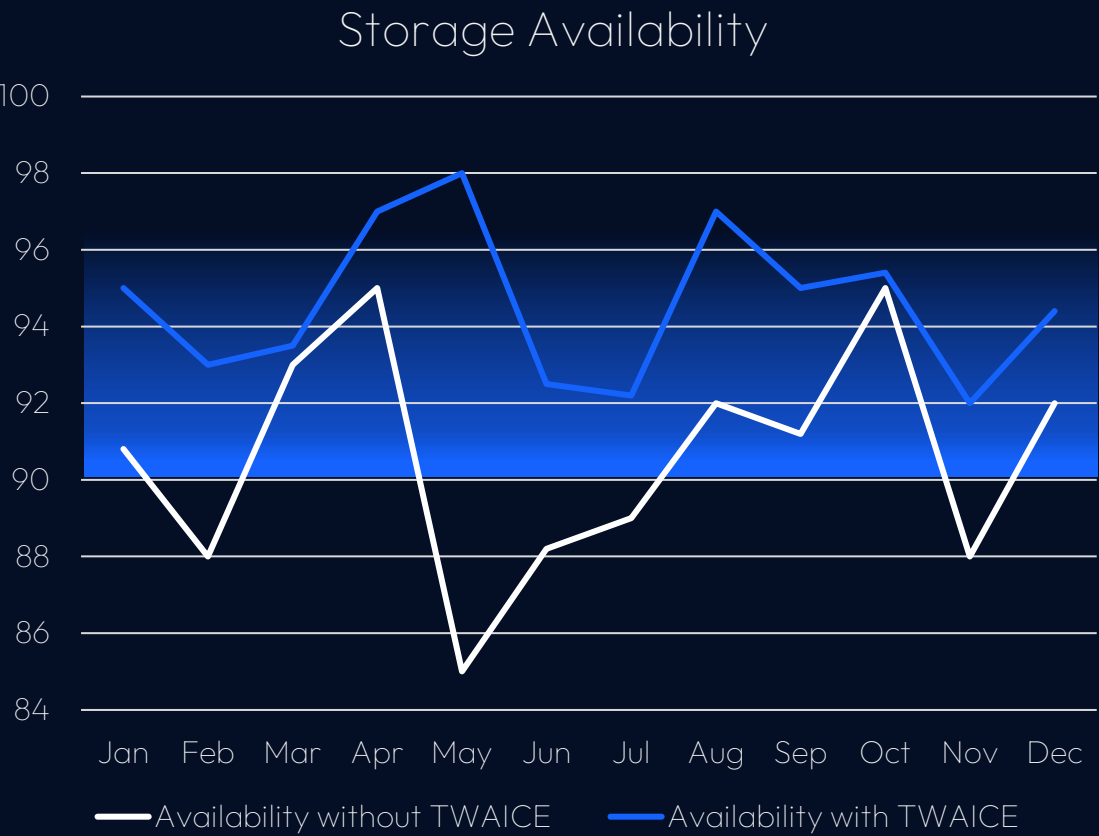
Benefit #1

Every party involved: Get a complete view on the battery



Benefit #2

Increase availability

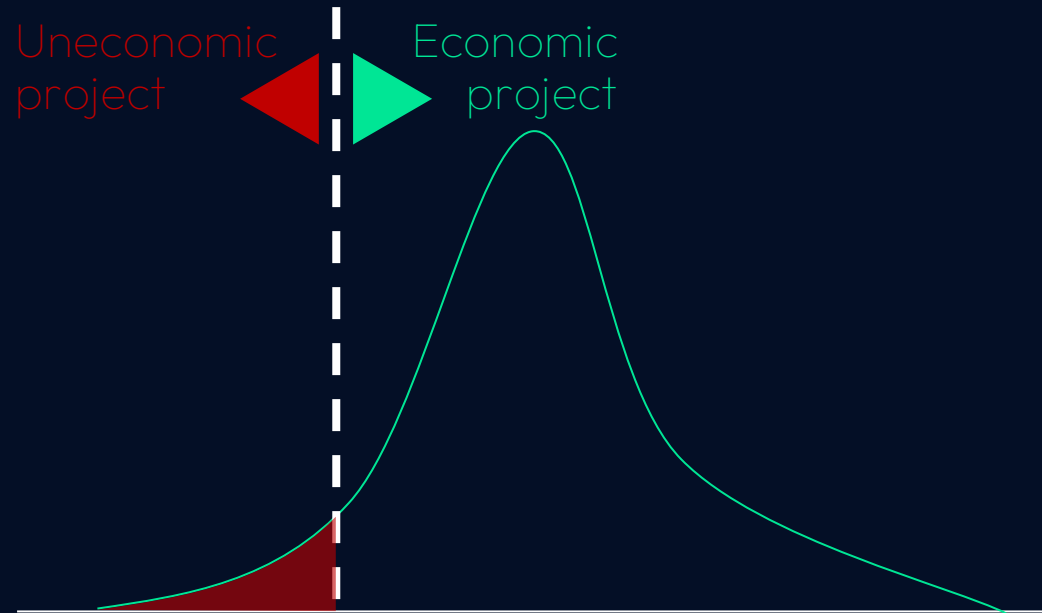


1) 365 days equals 8760 hours; 2) based on 300MWh storage

Benefit #3

We help to avoid exposure to the outliers!

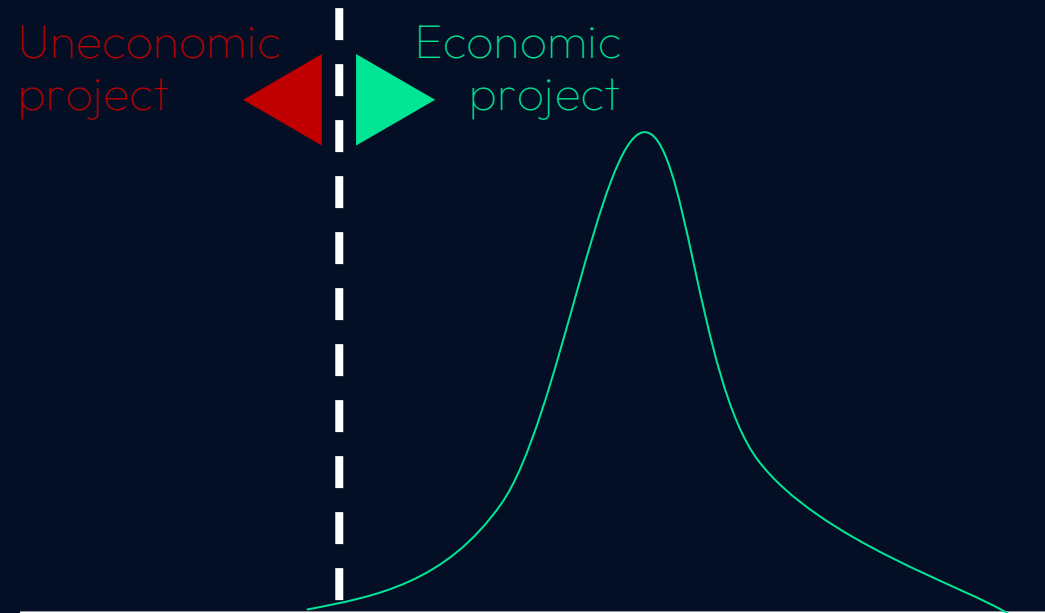
Project NPV - Without TWAICE



Benefit #3

We help to avoid exposure to the outliers!

Project NPV – With TWAICE



EASY TO USE - No extra time & no extra labor required

SIMPLICITY AT SCALE - All storages sizes (especially for large storages)

GLOBALLY APPLICABLE - Take care of all your storages with one solution

Get in contact to de-risk your next BESS project

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Munich, Germany
14-16th June
Booth B1.280



Las Vegas, Nevada
11-14th September
Booth 2926 (Level 1)



Santa Fe, New Mexico
5-8th June

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De-risk your batteries & outperform your competitors with battery analytics

