

# Battery Management

Optimise battery storage assets to **reduce energy costs**, **increase site resilience**, and **unlock additional charging capacity** — even on constrained grids. Intelligent energy storage control transforms passive batteries into active **revenue-generating assets** that enhance operational efficiency and customer satisfaction.

# Why Battery Management Matters

Battery systems are no longer passive storage devices. With **intelligent control**, batteries become **sophisticated energy management tools** that deliver measurable value across multiple operational dimensions.

Modern battery management systems leverage **real-time data**, predictive algorithms, and automated control strategies to **maximise the value** of every kilowatt-hour stored. This represents a **fundamental shift** from traditional energy infrastructure toward **intelligent, responsive systems**.

## Key Capabilities

- **Active energy optimisation assets** that respond to dynamic conditions
- **Cost reduction tools** that **minimise operational expenses**
- **Grid support systems** that **enhance network stability**
- **Revenue enablers** for EV charging sites

# Peak Shaving

Lower demand charges and maximise value from stored energy



## Reduce Peak Consumption

Significantly **reduce peak grid consumption** during high-demand periods, avoiding **costly demand charges** that can represent 30-70% of total energy costs.



## Strategic Discharge

**Discharge battery during peak loads** to avoid demand penalties whilst maintaining full charging capacity for customers.



## Energy Arbitrage

**Store low-cost energy** during off-peak periods and deploy it when grid prices are high, capturing significant **arbitrage opportunities**.



## Economic Optimisation

Improve overall site energy economics through **intelligent charge/discharge scheduling** aligned with tariff structures.

# Backup Power & Resilience

Maintain operations during outages or weak grid conditions

Grid reliability challenges are increasing globally, with extreme weather events, infrastructure constraints, and growing demand placing unprecedented stress on electricity networks. For EV charging sites, **downtime** directly translates to **lost revenue** and damaged customer relationships.

**Intelligent battery systems** provide **seamless backup power** that activates automatically during **grid failures**, ensuring **continuous operations**. This capability is particularly critical for high-traffic charging locations where **reliability expectations** are paramount.

Beyond outage protection, battery systems **enhance resilience** during grid instability, voltage fluctuations, and brownout conditions — maintaining **consistent charging performance** even when grid quality degrades.



## Backup Power

Provide **backup power** for chargers and critical infrastructure



## Continuous Operation

Ensure **continuous operation** during grid instability



## Revenue Protection

**Protect revenue** during outages



## Customer Trust

Increase **site reliability** and customer trust

# Smart Energy Flow Control

## Automated balancing between energy sources

Modern charging sites integrate **multiple energy sources** — grid connection, solar arrays, battery storage, and charging infrastructure. Managing these assets manually is impractical and suboptimal. **Intelligent energy flow control automates real-time decision-making**, ensuring the most cost-effective and efficient energy routing at every moment.



### Solar Priority

Use **renewable generation** first when available



### Battery Optimisation

Deploy **stored energy** during peak pricing periods



### Grid Supplementation

Draw from grid only when cost-effective



### Charging Delivery

Deliver **reliable power** to all charging points

The system continuously evaluates energy costs, battery state of charge, solar production, charging demand, and grid conditions to make **optimal routing decisions** in milliseconds. This **prevents grid overload** during high charging demand whilst **minimising energy costs** and **maximising renewable energy utilisation**.

# Solar Integration

Maximise self-consumption of renewable energy



**On-site solar generation** offers substantial economic and environmental benefits, but without **storage**, much of this value is lost. Solar production peaks during midday whilst charging demand often peaks during morning and evening commutes — creating a **temporal mismatch**.

**Battery storage** bridges this gap, capturing **excess solar production** for later use. Rather than exporting surplus energy to the grid at low rates, batteries store it for deployment during **high-value periods** or **peak demand**.

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## Capture Excess Solar

Store **excess solar production** instead of exporting it at unfavourable rates

03

## Reduce Grid Dependence

Significantly **reduce dependence on grid electricity** and associated costs

02

## Direct Solar Charging

Use **solar energy directly for EV charging** when production and demand align

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## Improve Solar ROI

Improve **return on investment** of on-site solar installations by 40-60%

This integration transforms solar from an intermittent resource into a **reliable, high-value energy source** that directly **supports charging operations** whilst **enhancing sustainability credentials**.

# Scalable Architecture

## Expand charging capacity without costly grid upgrades

**Grid connection capacity** represents one of the **largest barriers** to EV charging infrastructure deployment. Distribution network operators often require **expensive upgrades** — transformer replacements, cable installations, substation modifications — that can cost **hundreds of thousands of pounds** and require **12-24 months** to complete.



### Existing Grid Capacity

Start with **available connection** without immediate upgrades



### Battery Augmentation

Use **battery storage** to support additional charging points beyond grid limits



### Flexible Expansion

**Add chargers incrementally** as demand grows without infrastructure delays



### Future-Ready

Enable **continued expansion** with minimal infrastructure investment

**Battery storage** effectively creates "**virtual grid capacity**" by buffering energy during low-demand periods and releasing it during peaks. This allows sites to deploy significantly more charging infrastructure than their grid connection would otherwise support — often **doubling or tripling practical capacity**. The result is **faster deployment, lower capital costs**, and **greater operational flexibility** as charging demand evolves.

# Performance Insights & Analytics

## Data-driven battery optimisation

Effective battery management requires **continuous monitoring, analysis, and optimisation**. Advanced analytics platforms provide **comprehensive visibility into battery performance**, enabling proactive management and long-term value maximisation.



### Real-Time Monitoring

Monitor battery usage, state of charge, power flows, and operational status across all assets



### Health Tracking

Track battery health metrics, degradation rates, and maintenance requirements



### Cycle Analysis

Analyse charge/discharge cycles, efficiency metrics, and utilisation patterns



These insights support multiple strategic objectives: identifying **optimisation opportunities** to enhance performance, validating financial returns against projections, planning maintenance activities proactively, and informing long-term asset lifecycle decisions. **Data-driven management** ensures batteries deliver maximum value throughout their operational life whilst maintaining optimal health and performance.

Advanced platforms also provide **predictive capabilities**, forecasting future performance, anticipating maintenance needs, and recommending operational adjustments to **extend asset life and maximise return on investment**.

# Battery Management for EV Charging Sites

Intelligent battery management delivers measurable improvements across every dimension of charging site performance. The benefits extend beyond simple cost savings to encompass operational excellence, customer satisfaction, and strategic competitive advantage.



## Higher Charger Utilisation

Eliminate capacity constraints that limit charging availability, enabling **higher utilisation rates** and **revenue per charger**. Sites report 20-35% increases in utilisation after deploying battery systems.



## Lower Operating Costs

**Reduce total energy costs** through **peak shaving**, **demand charge reduction**, and **energy arbitrage**. Typical sites achieve 25-40% reductions in electricity expenses.



## Increased Energy Efficiency

**Optimise energy flows** to minimise losses, maximise renewable utilisation, and **improve overall system efficiency** by 15-25%.



## Improved Reliability

Provide backup power and grid support that ensures **consistent charging availability**, even during grid disturbances or outages.



## Better Customer Experience

Deliver **faster, more reliable charging** with **higher availability** — driving customer satisfaction, repeat visits, and positive reviews.

# Intelligent Storage as a Revenue Enabler

The traditional view of battery systems as mere cost centres fundamentally undervalues their strategic importance. With **intelligent management**, batteries become **multi-functional assets** that generate value through diverse mechanisms whilst **enabling business models** that would otherwise be impossible.

## Revenue Protection Tool

Eliminate downtime and **capacity constraints** that directly impact revenue generation, **protecting income streams** during grid disturbances and peak demand periods.

## Cost Optimisation Engine

Continuously **minimise energy costs** through **automated arbitrage**, **peak shaving**, and **demand management** — delivering ongoing operational savings.

## Scalability Enabler

**Unlock growth opportunities** that grid constraints would otherwise prevent, enabling **faster expansion** and higher charging capacity without infrastructure delays.

## Infrastructure Pillar

Serve as a **foundational element** of modern EV charging infrastructure that **enhances performance** across all operational dimensions.

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Forward-thinking operators recognise that **battery systems are not optional accessories but essential components** of **competitive, sustainable charging infrastructure**. As grid constraints intensify, energy costs rise, and customer expectations increase, **intelligent battery management transitions from competitive advantage to operational necessity**.

The sites that **deploy sophisticated battery management today** will be best positioned to capture the opportunities of tomorrow's **rapidly expanding EV charging market**.