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From wheels to warehousing:

How Joulen is changing the game in the multimodal sector

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In the face of global decarbonisation, the transportation and logistics sector finds itself at the nexus of transformation. From electric fleets and smart warehousing to integrated logistics systems, energy optimisation has become a strategic imperative. At Joulen, we specialise in energy optimisation technologies that deliver real operational and financial efficiencies. A critical pillar of this mission is renewable asset and battery storage optimisation - an area where nuanced decision-making and sector-specific knowledge can make or break ROI.

+ Are you getting the best from your battery?

Battery storage is often discussed in terms of its ability to shift loads, store renewable energy, or provide backup during outages. While those functions are vital, in the multimodal logistics sector, storage does far more. It enables the seamless operation of electrified fleets, supports resilient supply chains, and underpins the sustainability credentials of logistics providers. Yet, the complexity of real-world operations demands more than simply plugging in a battery. While the basics of batteries are well documented – the ability to maximise their true potential is where Joulen comes in. Think energy market participation, revenue generation and ultimately offering the realisation of virtual power plant goals.

+ Unique considerations in multimodal environments

Multimodal operations bring a unique mix of challenges and opportunities when it comes to energy storage:

- **Load variability:** Unlike static buildings, logistics hubs experience dynamic and unpredictable loads due to varying transportation schedules, dock activity, and vehicle charging patterns.
- **Infrastructure constraints:** Warehousing and intermodal terminals are often located in areas with limited grid capacity, requiring smart battery management to avoid costly demand charges.
- **Fleet electrification:** As companies shift to electric trucks and last-mile delivery vehicles, batteries must support high-speed charging at scale without compromising grid stability or asset lifespan.
- **Regulatory complexity:** Regional differences in tariffs, incentives, and emissions regulations mean that a one-size-fits-all battery strategy is rarely optimal.

+ Are you getting the best from your battery?

Renewable energy now the cornerstone of the logistics sector's decarbonisation strategy. However, its variable nature presents challenges for consistency and reliability, especially in high-demand environments like warehouses and transport hubs.

Joulen helps logistics customers turn these challenges into opportunities by:

- **Integrating with on-site renewables:** From rooftop solar to small-scale wind, we ensure renewable sources are optimally sized and paired with intelligent storage.
- **Maximising self-consumption:** Through predictive analytics and smart load management, we help logistics operators consume more of their own generated power, reducing reliance on the grid which not only saves costs but gives great control.
- **Participating in energy markets:** By optimising when and how battery systems sell energy back into the grid, Joulen can help customers clients can unlock new revenue streams and further increase grid autonomy.

+ Joulen's Approach: AI driven optimisation

Joulen's focus on intelligence means that your energy management and optimisation is centred on auto-decision making based on data.

Our proprietary optimisation platform PARIS uses machine learning to analyse thousands of variables across energy markets, fleet operations, and facility demand profiles. This allows us to deliver tailored, data-driven strategies that optimise:

- Battery configuration for specific multimodal use cases
- Real-time charge/discharge cycles based on peak shaving and arbitrage opportunities
- Integration with renewable energy assets and demand response programs
- Asset lifespan and payback windows
- Energy market participation

+ The future is layered, not linear

As logistics continues to evolve into an integrated, digital-first ecosystem, energy optimisation must keep pace. Battery storage will play a foundational role, not in isolation, but as part of a layered system of energy inputs and outputs. At Joulen, we see this not as a challenge, but as a call to innovate.

Because from wheels to warehousing, energy is not just a utility. It's a competitive edge.

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