



Electrification at Scale: Powering the Next Generation of Warehouses and Logistics Hubs



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The logistics and warehousing sector is undergoing one of the most significant transformations in its history. Driven by decarbonisation targets, technological innovation, and surging e-commerce, demand for electrification at scale has never been greater. From powering EV fleets to integrating renewable energy systems, warehouses and logistics hubs must evolve their electrical infrastructure to remain competitive, compliant, and resilient.

This whitepaper explores how estates can prepare for the new era of electrification — addressing EV charging, sustainable lighting, energy efficiency, and expanded electrical loads while ensuring safety, compliance, and cost-effectiveness.



The Drivers of Large-Scale Electrification

1. Decarbonisation Commitments

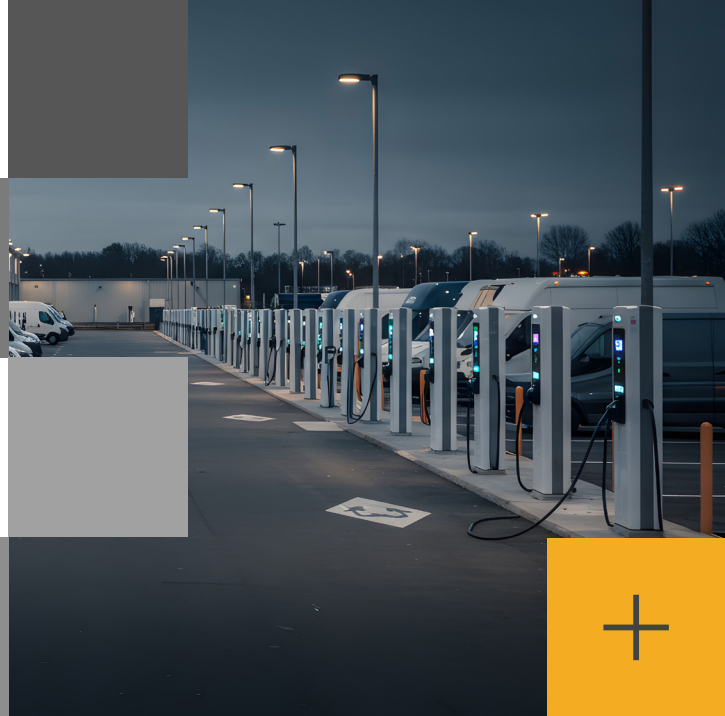
- **UK Net Zero 2050:** Logistics accounts for over 30% of UK transport emissions. Decarbonisation requires widespread adoption of EV fleets and low-carbon operations.
- **Corporate ESG priorities:** Tenants and logistics providers are under pressure to demonstrate sustainability throughout their supply chains.

2. The Surge of E-Commerce and 24/7 Operations

- Online retail continues to expand, increasing the demand for warehouses operating round the clock.
- Higher energy loads for automation, refrigeration, and lighting drive the need for robust and efficient electrical infrastructure.

3. Regulatory and Safety Requirements

- **BS 7671 compliance:** Electrical installations must meet rigorous safety and efficiency standards.
- **Fire safety integration:** Increased electrical demand raises fire risk, requiring proactive design and monitoring.
- **Government incentives and mandates:** EV charging infrastructure is being accelerated by grants and planning requirements.



The Core Pillars of Electrification

1. EV Charging Infrastructure

- **Fleet transition:** Heavy goods vehicles (HGVs), vans, and company cars are rapidly moving toward electrification.
- **On-site charging hubs:** Warehouses can serve both operational fleets and staff vehicles, requiring scalable solutions.
- **Load management systems:** Smart charging ensures that electrical demand is balanced, avoiding overloading or costly upgrades.
- **Case in point:** According to National Grid projections, the UK could see over 14 million EVs on the road by 2030, underscoring the urgent need for charging-ready estates.

2. Sustainable Lighting Systems

- **LED upgrades:** Warehouses that transition to LEDs can achieve up to 70% energy savings compared to legacy systems.
- **Smart controls:** Motion sensors, daylight harvesting, and zoned lighting improve both efficiency and safety.
- **Wellbeing benefits:** Improved lighting quality enhances worker safety, reduces fatigue, and supports productivity.



The Core Pillars of Electrification

3. Expanded Electrical Loads

- ✚ **Automation and robotics:** Modern warehouses depend on electrically powered conveyors, sorters, and automated guided vehicles (AGVs).
- ✚ **Data centres and digital infrastructure:** Smart logistics requires expanded ICT loads and resilient power supply.
- ✚ **Cold storage facilities:** Electrified refrigeration adds significant demand but also opportunities for efficiency optimisation.

4. Renewable Integration and Storage

- ✚ **Rooftop solar PV:** Warehouses offer vast roof space ideal for solar generation.
- ✚ **Battery storage systems:** Capture renewable power and provide backup during grid outages.
- ✚ **Microgrids:** Enable sites to balance their own generation, storage, and consumption for resilience.





Challenges in Scaling Electrification

Grid Capacity and Connection Delays

- Many sites face long wait times for grid upgrades to support EV charging and renewable integration.
- **Solution:** On-site generation and load management reduce reliance on grid capacity.

Rising Capital Costs

- Electrical upgrades require significant investment in infrastructure, switchgear, and cabling.
- **Solution:** Phased implementation, combined with access to green finance, spreads cost and maximises ROI.

Safety and Compliance

- Overloaded systems risk fire and equipment failure.
- **Solution:** Proactive design, BS 7671 adherence, and regular compliance inspections ensure resilience.



ROI of Electrification Investments

Direct Benefits

- **Energy cost savings:** LEDs, smart controls, and on-site renewables reduce utility bills.
- **Fleet efficiency:** EVs deliver lower running costs compared to diesel counterparts.
- **Maintenance reduction:** Electrical systems generally require less maintenance than legacy fossil-fuel systems.

Indirect Benefits

- **Tenant attraction and retention:** ESG-aligned, electrified sites appeal to sustainability-focused occupiers.
- **Investor confidence:** Electrification strengthens asset value in line with green building certifications.
- **Operational resilience:** Reduced downtime from more efficient, reliable systems.



Case Example: Electrification in Action

A logistics operator managing a national distribution hub implemented a phased electrification programme:

- **Phase 1:** LED lighting retrofit across the warehouse floor, delivering immediate savings.
- **Phase 2:** Smart controls and energy monitoring introduced for HVAC and machinery.
- **Phase 3:** EV charging infrastructure for both fleet vans and employee cars.
- **Phase 4:** Rooftop solar PV and battery storage integrated to offset grid demand.
- **Phase 5:** Load balancing systems and predictive maintenance to future-proof expansion.

The result: a 40% reduction in energy costs, enhanced compliance, and improved tenant retention through demonstrable ESG delivery.



The Road Ahead: Building Future-Ready Electrical Estates

Building Future-Ready Electrical Estates

Looking to 2030 and beyond, warehouses and logistics hubs must prepare for:

- Electrified fleets at scale, requiring significant charging infrastructure.
- Growing automation, demanding stable and high-capacity electrical supply.
- Stricter ESG reporting, requiring demonstrable action on sustainability.
- Resilience planning, ensuring estates can adapt to climate-driven disruptions and grid instability.

Conclusion

Electrification at scale is no longer a future aspiration — it is a present-day necessity. Warehouses and logistics hubs that invest now will not only comply with regulations but also secure competitive advantage through operational savings, ESG alignment, and enhanced asset value.

The key is strategic, phased investment: aligning EV infrastructure, sustainable lighting, and renewable integration under a unified electrical strategy. Done correctly, electrification transforms estates into future-ready assets — powering growth, resilience, and sustainability in equal measure.