Get can't-miss advice on electrical trends

Our panel of experts delivers must-have advice for power and electrical systems.

Q: What are the biggest trends in power and electrical systems going into 2026?

Matthew Keeler: The biggest trends are accelerating electrification, rising load density and a shift toward digitally enabled, resilience-focused system design. Industrial facilities face tighter timelines, longer equipment lead times and greater pressure to plan capacity earlier. At the same time, smarter monitoring, analytics and artificial intelligence (AI)-enabled tools are allowing owners to extract more value from existing infrastructure before investing in major upgrades.

Lanny Floyd: Two of the biggest trends in power and electrical systems going into 2026 are infrastructure renewal and capacity to meet data center demand.

Q: What are some of the biggest trends in energy monitoring and power management software?

Matthew Keeler: Energy management platforms are evolving from dashboards to intelligent systems. AI-enabled tools support load forecasting, peak management and better utilization of existing assets, reducing the need for immediate capital expansion.

Q: How is electrification changing industrial power system design?

Matthew Keeler: Electrification is pushing facilities to treat power systems as scalable platforms rather than static installations. In my work with energy-intensive manufacturing environments, electrification and modernization are driving higher peak loads, increased sensitivity to power quality and the need for phased upgrades. Facilities are increasingly designing substations, switchgear and distribution systems with physical space, spare capacity and flexibility for future electrified processes.

Q: What is the role of smart grids on reliability and reliance?

Matthew Keeler: Smart grids improve reliability through advanced sensing, automation and faster fault isolation. For industrial customers, this provides better visibility into upstream disturbances and more coordinated responses to grid events. When paired with local automation, smart grids help reduce outage duration and improve operational resilience.

Q: How are microgrids changing energy independence for manufacturers?

Julie Holmquist: Our two manufacturing sites in Croatia are now equipped with solar panels, meaning these plants no longer must rely solely on the traditional energy grid. This trend promises to provide more flexibility to manufacturers who can balance their power bill with input from solar and wind. This investment should be calculated on a case-by-case basis to justify the overhead cost of panels/turbines. It also presents the opportunity for at least a partial backup power supply in the event of a main grid failure.

Lanny Floyd: Microgrids are not eliminating manufacturing dependence on utility supply, but they are helping to reduce dependence on utility reliability.

Learning **Objectives**

- **Understand trends** in power management and electrical systems in 2026.
- **Develop an understanding** of electrical industrial system designs.
- **Learn how emergin technologies** like artificial intelligence are impacting energy management and design.

FIGURE 1 : Applying a VPCI emitter inside a control panel and recording the date. Courtesy: Cortec Corporation

Q: What role does predictive maintenance play in reducing downtime in electrical systems?

Matthew Keeler: Predictive maintenance identifies degradation before failures occur. Artificial intelligence (AI)-enabled inspection tools allow organizations to process far more data than traditional methods. Similar approaches are used in high-safety environments like amusement rides, where platforms such as Mobaro support condition monitoring and maintenance efficiency.

Lanny Floyd: Predictive maintenance, specifically online continuous monitoring, is essential for electrical systems reliability and avoidance of downtime. AI will help effectively use data from continuous monitoring to optimize asset management.

Julie Holmquist: Preventive maintenance seeks to address an issue before it becomes a problem and creates downtime. Corrosion prevention is one important factor to consider. For example, the routine installation of corrosion inhibiting devices into electronic and electrical cabinets can cut down on failures caused by corrosion.

Q: What are some of the hidden costs from electrical downtime?

Julie Holmquist: The costs of electrical failure are real but sometimes difficult to calculate, especially before the problem occurs.

The repair costs such as with internal failures like corroded wires and contacts, as well as downtime costs at minimum the value of the production that was lost.

For example, a manufacturing company that produces $10,000 worth of goods per hour will lose that much revenue in an hour of downtime. The longer the downtime is, the greater the loss. Tech giant Siemens shares some eye-opening numbers of how much that might add up to for large-scale industries.

For heavy industry, they calculated the cost of one hour of downtime at more than $200,000 in fiscal year 2023, and for automotive, a cost of more than $2 million per hour. Of course, the potential causes of downtime can vary, but the impact is similar, which is why measures taken to avoid downtime — whether through corrosion prevention, predictive maintenance, redundancy or some other strategy — can have such a significant return on investment (ROI).

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Q: What are some examples of how corrosion prevention has reduced electrical failures and downtime?

Julie Holmquist: One electricity provider we worked with was facing expensive corrosion failures in outdoor electrical control cabinets during shipping, storage and operation. The problem was exacerbated near the coast.

They addressed the corrosion issue during shipping and storage by wrapping the cabinets in specialty packaging that contained Vapor Phase Corrosion Inhibitors (VPCI). Operational cabinets were maintained by installing small VPCI-emitting devices inside. The company found these steps to be a very simple, cost-effective approach to minimize remedial work and failure.

Q: How are regulations and sustainability goals influencing investment in power infrastructure upgrades?

Matthew Keeler: Sustainability goals and regulations are accelerating investment in electrification, efficiency, renewable integration and advanced monitoring. Utility-community partnerships, such as BC Hydro's collaboration with the Haida Nation, illustrate how policy, sustainability and infrastructure planning increasingly align.

Julie Holmquist: In an age when consumers are often on the lookout for products made by manufacturers who exhibit stewardship and environmental responsibility, investing in these sources of renewable energy has become a significant part of shaping a company's corporate environmental image. For example, Cortec has invested in renewable energy sources at three of its plants because we're committed to sustainability and environmental responsibility.

Q: How is the rise of data centers and AI workloads affecting system design?

Lanny Floyd: Data centers must be continuously available, without interruption of services to customers. This requires designs to enable essential maintenance and to be resilient to equipment failures.

Matthew Keeler: Data centers and AI workloads are driving rapid load growth, higher power density, and stricter reliability requirements. Even facilities outside the data center sector are affected through regional capacity constraints and longer interconnection timelines, reinforcing the need for early planning.

Q: How is AI optimizing power systems and maintenance?

Matthew Keeler: AI is increasingly applied to both power system analytics and engineering workflows. In our own work, internally developed AI tools have fundamentally changed inspection processes by enabling high-volume image review and prioritization. This allows teams to scale inspections, identify issues earlier, and focus engineering effort where it delivers the most value.

Q: What lessons have recent grid failures or extreme weather events taught the industry?

Lanny Floyd: Grid failures and extreme weather have taught the industry that system designs must anticipate failures and events.

Matthew Keeler: Recent events have shown the importance of planning for extended outages. Organizations now consider fuel supply, communications, staffing, spare parts and environmental exposure alongside traditional electrical design criteria.

Q: What emerging technologies have the potential to disrupt the power industry in the next decade?

Lanny Floyd: AI will continue to drive data center growth for some time. Growth in the demand for energy, electrical equipment and skilled workforce will strain supply chains. The strain will have a negative impact on the ability to meet demand.

Q: How should organizations future-proof their electrical systems amid rapid technological change?

Matthew Keeler: Future-proofing requires modular design, data-driven decision-making, cyber-resilient architectures and workforce development. Designing for expansion and investing in analytics allow systems to adapt as technology evolves.

Lanny Floyd: Organizations need to form strategic partnerships with suppliers to enable effective planning and preparation for future needs.

Q: How are manufacturers balancing reliability with decarbonization efforts?

Matthew Keeler: Manufacturers are prioritizing reliability while sequencing decarbonization efforts. In practice, this often means starting with better measurement, monitoring and controls, followed by efficiency and demand management, before adding electrified processes or renewable generation to reduce operational risk.

Q: How are renewable energy sources reshaping traditional power distribution models?

Julie Holmquist: Our own experience as a manufacturer of corrosion inhibiting products includes a combination of traditional and renewable models that represent the diversification of power distribution.

Two of our facilities in Croatia have installed solar panels in the last several years to supplement their power source with readily available solar power. Our CorteCros facility on the Adriatic Sea is especially suited to take advantage of excellent sun exposure and draws most of its power from this form of renewable energy. Our headquarters in Minnesota doesn't have physical solar panels, but we choose to invest a little extra in our power bill to contribute toward our energy company's construction of solar and wind fixtures to help supply the grid.

"Manufacturers are prioritizing reliability while sequencing decarbonization efforts."

Matthew Keeler: Renewables are transforming distribution systems from one-directional to bidirectional networks. The BC Hydro and Haida Nation Solar North project in Haida Gwaii demonstrates how local renewable generation, storage and microgrid strategies can replace diesel dependence while improving resilience and energy sovereignty in remote communities.

Insights

Power insights

- **Trends in electrical for 2026** include rising load density and a shift towards enabled, resilience-focused design.
- **Energy management systems** are moving toward dashboard formats for easier evaluation.
- **Data centers and AI** are driving rapid growth in power supply.