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# NEWSLETTER

## 800V+ Ultra-Fast Charging Platforms

High-voltage architectures that reduce charging time and improve efficiency. Supports 350–500 kW charging speeds. Reduces charging to ~10 minutes for 80% SOC. Enables thinner, lighter cabling. Maturity: In production for premium EVs; expanding to mid-range models by 2027.

## Structural Battery Composites (SBCs)

Ranked among the Top 10 Emerging Technologies of 2025, SBCs integrate structural strength with energy storage potentially slashing system weight by up to 50% and extending EV range by up to 70%

## Sand Battery for Thermal Energy Storage

Finland's 1 MW "sand battery," launched in mid-2025, stores heat using soapstone tanks capturing excess renewable energy and discharging it as heat when needed.

## Quantum Sensors & Neurological Interfaces

Quantum sensing technologies are advancing applications in positioning, communication, and geophysical sensing. Neurological enhancements, including bi-directional brain computer interfaces, are emerging in engineering workflows raising exciting potential and ethical considerations

## Power Electronics: Wide-Bandgap Semiconductors & Wireless Power

GaN and SiC semiconductors deliver higher efficiency and faster switching in power systems. Renewable integration and EV systems benefit from bidirectional converters and emerging wireless power transfer techniques even for biomedical implants.

## AI, Robotics, and Digital Twin Technologies

Digital twins enable real-time monitoring, predictive maintenance, and virtual simulation for complex systems. Automation, AI-driven power systems, and advanced robotics (including cobots and autonomous construction machinery) are making engineering more efficient and resilient.

