

SCAPE TO MARKET

Q1 2026 | AI Meets Power Electronics: Smarter Design, Smarter Vehicles

Welcome to the eighth edition of SCAPE to Market

a quarterly update on the latest developments in the EV power electronics industry. In this edition, we focus on **Artificial Intelligence in EV Power Electronics** – a shift that is transforming how power converters are designed, validated, maintained, and operated. Keep your ear to the ground and make sure your research and innovation matter!

MARKET

- **Infineon upgrades IPOSIM with AI-enhanced simulation for SiC and GaN power converter design:** Infineon Technologies enhanced its widely used IPOSIM Power Simulation Platform in late 2025 with SPICE-based model generation, bringing AI-assisted thermal and switching simulation of SiC and GaN modules fully online. The upgrade allows power electronics engineers to factor in real-world operating conditions – including stray inductance, gate voltage and dead time – at the earliest stages of converter design, without costly hardware prototypes. The platform directly targets EV charging, motor drives, and onboard power supplies, the exact applications at the heart of SCAPE's power converter research. With GaN and SiC thermal management identified as a persistent design challenge across previous editions of this newsletter, IPOSIM's new capabilities offer SCAPE partners a practical tool to accelerate their own development cycles. [-> READ MORE](#)

Source: Infineon Technologies Press Release, October 27, 2025, | infineon.com

- **NXP brings AI-driven dynamic gate control to SiC traction inverters – a direct step change for EV converter efficiency:** NXP Semiconductors' GD3162 gate driver – already featured in the Q5 SCAPE edition for its collaboration with ZF on SiC-based traction inverters – has now become the centrepiece of NXP's AI-enabled EV inverter strategy. The GD3162 offers programmable dynamic gate strength adjustment via SPI, autonomously adapting switching behaviour in real time based on operating conditions of SiC and IGBT modules. At Embedded World 2026, NXP went further, introducing the CoreRide Z248 reference platform with a dedicated eIQ Neutron neural processing unit, bringing on-device machine learning to gate control and current sensing at the power module level.



For SCAPE's converter research, this is a concrete signal: AI is moving from the cloud into the silicon itself, directly inside the power conversion stage. [-> READ MORE](#)

Source: NXP Semiconductors GD3162 Product Page / Embedded World 2026, AllAboutCircuits | nxp.com

- Large Language Models enter power electronics design - from concept to prototype faster than ever** A peer-reviewed study published in Computers and Electrical Engineering (ScienceDirect, Vol. 123, 2025) provides the first dedicated review of LLM applications in power electronics design, demonstrating that AI models can automate topology selection, component rating, parameter optimisation, and performance simulation across the full converter design cycle - reducing total design time at every stage from specification to prototype. A parallel IEEE study confirms that fine-tuned LLMs can autonomously design high-frequency AC inverters and wireless power transfer systems, with results validated against established benchmarks. For SCAPE, whose converter designs span exactly these application categories, the message is clear: AI-assisted design tools are no longer experimental - they are becoming a competitive baseline. [-> READ MORE](#)

Source: Ibrahim et al., Computers and Electrical Engineering, Vol. 123, 2025 | ScienceDirect; Lin et al., PE-GPT, IEEE Transactions on Industrial Electronics, 2024

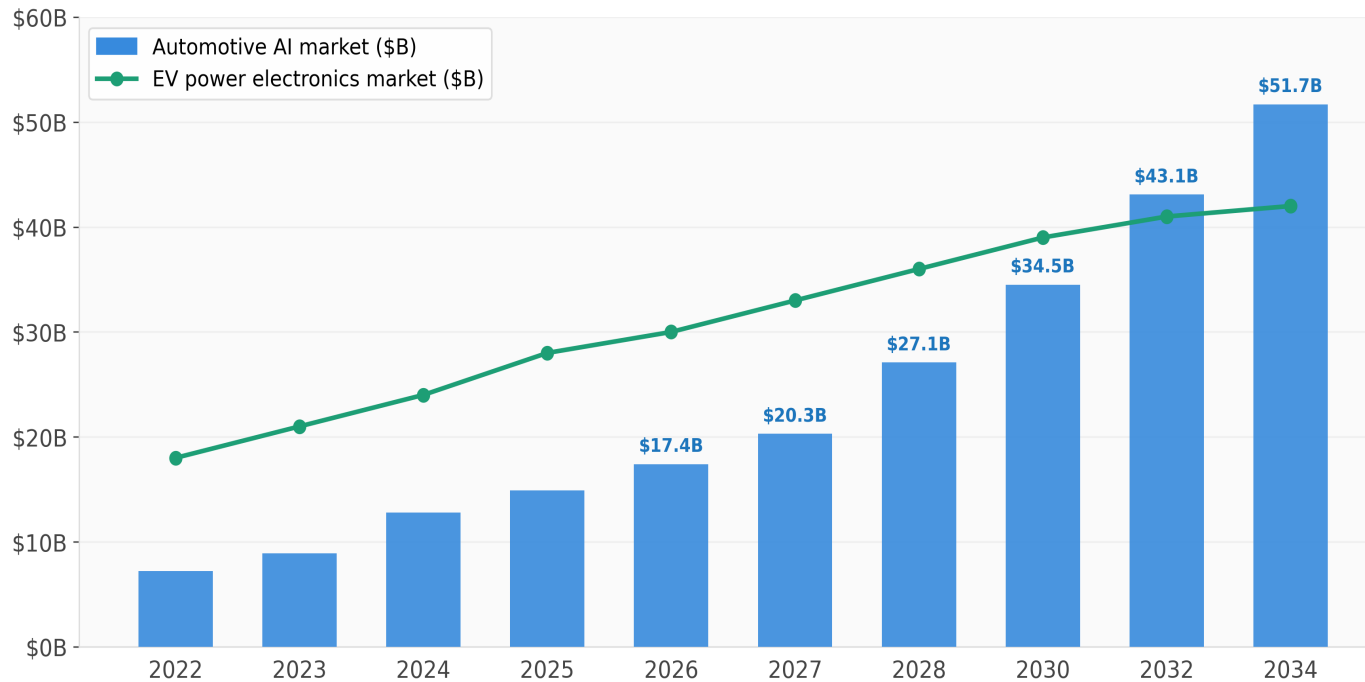
- AI in EV Power Electronics - At a Glance**

AI Application	Benefit	Key Player	Stage
AI Thermal Simulation	Hours vs weeks	Infineon IPOSIM	Commercial - 2026
Dynamic Gate Control	Real-time SiC optimisation	NXP GD3162	In production
LLM Design Automation	Faster topology design	Navitas / VisiC	Emerging



Market Growth: Automotive AI and EV Power Electronics (2022-2034)

The blue bars track the broader automotive AI market, spanning AI tools used across vehicle software, autonomous driving, predictive maintenance, and crucially, power electronics design automation (the focus of this edition). The green line tracks the EV power electronics market specifically, which covers the inverters, onboard chargers, and DC-DC converters that sit at the core of SCAPE's research. Both markets are growing in parallel because AI is not just a theme running alongside power electronics; it is increasingly the method by which the next generation of converters will be designed, validated, and optimised. For SCAPE, this growth represents a direct opportunity: the SiC and GaN converter technologies being developed within the project are precisely what this expanding market will need.



Sources: Fortune Business Insights - Automotive AI Market Report 2026 | IDTechEx - Power Electronics for Electric Vehicles 2026-2036



POLICY

- **EU AI Act enters full enforcement on August 2, 2026:** The EU Artificial Intelligence Act becomes fully applicable on August 2, 2026. For the power electronics sector, the implications are concrete: AI systems embedded as safety components in products already subject to EU conformity assessment – such as AI-assisted converter testing rigs, automated SiC/GaN module validation platforms, or intelligent onboard charger control systems – are independently classified as high-risk under Article 6(1), triggering full documentation, conformity assessment, and post-market monitoring obligations. These are precisely the types of tools that SCAPE partners are developing. Non-compliance carries penalties of up to 15 million EUR or 3% of global annual turnover. Baker Botts and the European Commission advise treating August 2, 2026, as the binding deadline regardless of the Digital Omnibus delay proposals still under negotiation. [-> READ MORE](#)

Source: European Commission Digital Strategy; Baker Botts Legal Alert, March 2026 | digital-strategy.ec.europa.eu; bakerbotts.com

- **EU doubles down on AI and semiconductor sovereignty – Infineon Dresden Smart Power Fab on track for 2026:** Infineon's 5 billion EUR Smart Power Fab in Dresden – backed by approximately 1 billion EUR in EU Chips Act and IPCEI ME/CT funding reported in Q7 – is on track to open in 2026 with a focus on energy-efficient power solutions for AI applications. This directly links Europe's semiconductor sovereignty ambitions to the AI transition in power electronics and signals a strategic funding and partnership opportunity that SCAPE stakeholders should actively monitor. [-> READ MORE](#)

Source: Infineon Technologies Press Release, May 8, 2025, | infineon.com

