



Protecting Road Electric Vehicles Ecosystem through Enhanced Cyber Resilience and Networked Threat Mitigation



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EXPLORE THE PROJECT

PROJECT BACKGROUND

PrEvent delivers Europe's first end-to-end cybersecurity framework for the e-mobility ecosystem, addressing the rising complexity of cyberattacks on EVs, charging stations, and grid systems. Aligned with the Cyber Resilience Act (CRA), NIS2, and ISO/SAE 21434, the project provides a modular, standards-based architecture. Key innovations include secure-by-design hardware, hardened firmware, post-quantum PKI, and AI-enhanced digital twins for threat detection. By utilising reinforcement learning for decision support, PrEvent enables self-healing capabilities and proactive incident response across EVs, EVSE, and backend platforms.

To ensure robustness, a shift-left testing methodology is applied before deployment across four European pilots, including car-sharing and logistics fleets. Beyond technology, PrEvent offers training to upskill the workforce and authorities on CRA compliance. The project provides an EU-wide exploitation roadmap to ensure adoption by OEMs and DSOs, securing EU leadership in trusted, zero-emission mobility and 2ZERO resilience goals.

PROJECT OBJECTIVES



ESTABLISH a unified, scalable cybersecurity framework and secure modular architecture for the entire EU e-mobility landscape, fully aligned with current regulations.



PREPARE against advanced threats by delivering CRA-compliant hardware guidelines, sophisticated risk analysis tools, and a robust Post-Quantum PKI solution.



DETECT anomalies early using an AI-enhanced Digital Twin and visualisation dashboard to monitor the EV-to-grid ecosystem in real-time.



RESPOND rapidly with an AI-driven multi-agent Decision Support System, managing cross-domain incidents and executing Over-The-Air (OTA) mitigation strategies.



VALIDATE the system-of-systems resilience through novel co-designed penetration testing, rigorous lab trials, and attack simulations in the Digital Twin.



DEMONSTRATE the full-lifecycle performance of PrEvent innovations across diverse real-world use cases, including e-buses, logistics, and V2G scenarios.



SUSTAIN long-term cross-border impact through stakeholder engagement, policy recommendations, and scalable exploitation strategies for new innovations.

PROJECT FACTS

Duration

05/2026 to 10/2029

Programme

Horizon Europe

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HORIZON Innovation Actions

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