

# Voltia: Electric Cars as Strategic Asset for Energy Aggregators

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**Voltia provides energy services for electric vehicle users, focusing on smart and cost-efficient charging that takes advantage of electricity market dynamics and grid flexibility. The goal is to go beyond simple energy delivery and instead optimize when and how electric cars are charged, using variations in electricity prices and available grid flexibility. To achieve this, Voltia relies on data-driven methods that can reliably predict charging behavior, such as when vehicles are typically plugged in, how long they remain connected, and how their energy needs vary over time. This enables more intelligent planning of charging processes, reducing costs for users while ensuring that vehicles are ready when needed and supporting a more efficient use of the power grid.**

**Project name:** Parked, Plugged, and Powerful: The New Role of Electric Cars

**Project's period:** 15. 6. 2025 – 1. 1. 2026

**Partner:** Voltia a.s.

## How we approached it

We designed and validated prediction methods based on advanced data analytics, machine learning, and AI. Given the complexity of the problem, it was decomposed into several sub-tasks, such as:

- Estimating fleet capacity at any given time
- Predicting the energy required to satisfy charging needs
- Forecasting the timing of charging sessions

We evaluated multiple state-of-the-art approaches to identify the most accurate and robust solutions. The final output is not a single point estimate but a probabilistic prediction that includes a confidence interval, providing additional insight and defining practical bounds for future electricity purchasing decisions.

*“The impact of this project can be significant as electric vehicles are becoming an increasingly common part of everyday life. The team at Voltia recognises the unused potential of electric vehicle fleets and works to transform it into a viable and scalable service. The aim is not only to deliver cost savings for EV users through smarter charging, but also to support the power system by enabling more flexible and efficient use of energy resources, ultimately benefiting both the electricity grid and the environment.”*

**Marek Lóderer**  
AI Specialist, KInIT

## What we delivered

The solution was validated using a large dataset of electric cars to thoroughly assess its performance under different conditions. The delivered source code covered the entire workflow end-to-end, including data preprocessing, model training, and generation of final predictions. In addition, we provided comprehensive knowledge transfer on the solution, explaining its key strengths, limitations, and potential directions for extension to future use cases and evolving requirements.

*“A parked, plugged-in electric car is a battery the grid could use — but only if you know it’s there, how full it is, and when its driver will unplug and leave. Across a whole fleet, that’s the hardest part of our business: each car model is different and human behavior keeps no schedule. That’s the problem we brought to KInIT. Marek Lóderer’s team didn’t hand us a single guess, they built methods that predict available capacity, energy need, and charging timing as a probability with confidence intervals. Those bounds are decision-grade: they tell us what to expect and how much to trust it — exactly what we rely on when trading spreads across multiple time horizons and energy markets without affecting the driver’s comfort. Working with KInIT was genuinely collaborative – delivered working code and an honest knowledge transfer, limitations included, so we can keep building on it ourselves.”*

**Peter Hofierka**  
CEO Voltia a.s.

## **Project team members**

**Gabriela Grmanová**

Researcher

**Martin Výboh**

Research Engineer

**Philipp Miotti**

Research Engineer

**Marek Lóderer**

AI Specialist

<https://kinit.sk/voltia-electric-cars-as-strategic-asset-for-energy-aggregators>