

Electric Vehicle Charging at Public Charging Stations in the Czech Republic

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Extended Abstract

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Abstract Summary

This study provides an empirical analysis of Battery Electric Vehicle (BEV) charging behaviour at public charging stations in the Czech Republic, utilising a unique dataset of over 1.68 million observations from 2021 to 2025. The research addresses critical gaps in energy economics by quantifying price elasticities, temporal demand profiles, and infrastructure utilisation rates.

Key Findings:

Market Scale and Trends: In 2024, the analysed operators covered 73% of charging points, delivering 14 GWh. We estimate that public charging covers approximately 26% of all EV charging that year. Over the study period, mean energy consumption per session was 19.5 kWh, growing annually by 8%, while session duration grew by 16% annually to a mean of 75 minutes.

Price Elasticity: Employing a Two-Way Fixed Effects model, the study finds an average price elasticity of -0.3. Notably, sensitivity varies significantly by speed: slow charging is moderately elastic (-0.51 to -0.61), while ultra-fast charging shows no statistically significant price responsiveness.

Utilisation and Profiles: Demand peaks at 1 p.m. and 5 p.m., with working-day peaks shifting one hour later than weekends. Despite rising demand, infrastructure utilisation remains low, with the largest operator reaching a mean utilisation of only 2.39% in 2024.

The results suggest that while consumers are less responsive to price changes for higher charging speeds, public infrastructure remains vastly underutilised. These insights offer a foundation for optimising tariff designs and grid management strategies. Ongoing research extends this work through a conditional logit model to analyse spatial decision-making and facility choice among drivers.