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18. abstract

1. State of Science and Technology
Dynamic inductive charging (DWPT) is being tested worldwide, mostly on short test tracks or for passenger cars. Projects in South Korea, Spain, Sweden, and Germany demonstrate basic functionality, but large-scale applications in public transport are still missing. Key challenges include high infrastructure costs, standardization, and grid impacts.

2. Objective of the study
The aim of the ELINA project was to test DWPT in regular public transport operations in Germany. The study examined whether this technology can reduce charging times, decrease battery capacity requirements, and facilitate the integration of renewable energy. Market potential, climate impacts, and user acceptance were also assessed.

3. Method
Construction of a 980 m inductive charging lane and stationary charging points in Balingen
Operation of an electric bus for 24 months (shuttle + regular service)
Development and validation of a software-based planning tool
Measurement campaigns on charging power, efficiency, positioning, and grid impacts
National potential analysis based on geospatial and timetable data
Acceptance studies (local and nationwide)

4. Results
Technical feasibility confirmed: wireless charging during driving and at stops with efficiency >90%
Practical limitations: positioning issues, high construction costs, limited charging power
Economic viability currently not achieved; profitable operation only with high utilization and increased power
Climate impact limited (max. 12 kt CO_2 savings by 2035)
Positive acceptance among passengers and the public

5. Conclusions / Application possibilities
DWPT is technically feasible and can complement conductive charging, especially for high-frequency routes with short charging windows. For widespread adoption, improvements in charging power, user-friendliness, cost reduction, and legally compliant metering and billing are required. The next generation of inductive charging systems offers greater tolerances for vehicle alignment as well as increased charging power. This will enable a more robust and efficient operation in the future, which could become relevant for public transport, autonomous shuttles and integrated mobility concepts.

19. keywords
Dynamic inductive charging (DWPT), Public transport electrification, Charging infrastructure, Planning tool, Climate impact / CO_2 reduction

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