

Research content for the short video Bye highway. Hello e-railway_ Utopia 2024

"IMAGINE: Bye highway. Hello e-railway!"

... Enabled by fast pickup & charging tech taking e-cars on trains for relaxed mobility

Green Utopist: [Armin Buchroither, TU Graz](#)

Video-Team [Institut für Design & Kommunikation - FH Joanneum](#): Anja Trummer, Max Frühwirt & Selma Kury

RailCharge

In a world where the challenges of electromobility are becoming urgent, the RailCharge utopia represents a visionary solution. Electric vehicles face the problem of limited ranges and long charging times, which, together with increasing traffic congestion and the need for sustainable resources for batteries, is an urgent problem. Electricity grids are also reaching their limits with fast charging at peak times.

RailCharge addresses this problem with the following idea: instead of equipping electric cars with ever larger batteries and promoting individual transport, electric cars are loaded onto trains using innovative, efficient loading systems and automatically charged during the journey using Matrix Charging®. This concept not only provides a solution to the existing limitations of electric vehicles, but also promotes emission-free mobility and reduces traffic load.

Electric vehicles are parked on train carriages at railway stations, with an innovative transfer system significantly minimising waiting and loading times for passengers. Flexible loading and unloading at intermediate stations is also important for success and comfort. This can be achieved by adapting existing wagon systems or by developing new wagon designs.

Matrix Charging® technology is used at each car parking space in the train carriage. This automated connection technology with the charging pad on the floor of each car parking space enables an efficient and flexible charging infrastructure.

An interface to the train's energy management system ensures efficient energy distribution and grid-friendly charging. At the destination station, the vehicle is fully charged and picked up by the passengers ready to continue their journey. In the meantime, they spend a pleasant stay in train compartments.

An evaluation of customer acceptance and environmental impact has already been carried out in the project and has shown a high potential for realising this utopia.

RailCharge offers a new perspective on long-distance transport with electric vehicles by enabling the seamless integration of road and rail transport. RailCharge opens a new chapter in the history of mobility - a step towards a more efficient, sustainable and connected future: The motorway by rail

Research at the site

· ***Field of Expertise: Mobility & Production, TU Graz***

<https://www.tugraz.at/en/tu-graz/services/news-stories/planet-research/foe-mobility-production>