

Decarbonising Road Freight - Synergy Potential and Rationality of Combined Infrastructures for Stationary and Dynamic Charging of Electric Trucks

- European perspectives and Research agenda -

Prof. Dr. Michael Lehmann ⁽¹⁾

1) University of Applied Sciences Erfurt – Faculty of Economy, Logistics and Transport
p/o box 45 01 55, 99051 Erfurt, Germany (E-mail: michael.lehmann@fh-erfurt.de)

KEY WORDS: environment energy resources, alternative fuel, alternative fuel, policy analysis (D2)

The aims of this contribution are twofold. Firstly, it deals with a review of recent ERS (Electric Road Systems) and alternative drive technology actions in Germany to reduce truck traffic related CO₂ emissions, illustrating that a combination of technologies is gaining reasonability. The second focus will be laid on an international review of studies and technology assessment with emphasis on European activities including examples, how standardization and regulation contribute to harmonized approaches. The conclusion will discuss the rationality to combine technologies and the next necessary steps towards a joint and resilient road freight transport system.

In late 2020 the German Federal Ministry for Digital and Transport announced a mid to long-term strategy(1) to decarbonize road freight traffic (see Fig. 1). While BEV (battery electric vehicle (BEV) are considered a mature technology for regional operations and ready for roll-out long-distance traffic with heavy duty vehicles sees itself confronted with a set of different technology options:

- BEVs for long-distance operations
- Hydrogen scenario
- Overhead hybrid featuring a catenary type ERS

As a basis for the choice of the preferable technologies different research and test actions were identified – both for infrastructure and vehicle related aspects. In order to support the scale-up phase the German Federal Ministry for Digital and Transport announced the implementation of a couple of innovation clusters along major German highways or in important economic clusters.

In terms of a European action plan an actor model for operating, billing and managing the road and ERS infrastructure is necessary. A possible approach was developed in the AMELIE project with a dedicated European focus and is discussed in the paper. A further prerequisite for an European network and synchronized roll-out is the harmonization of the technologies and the detailing of the system interactions. The most important interfaces are related to the interaction between supply infrastructure and vehicles. In Cenelec TC9X committee two different working groups are heading for a pre-standard (TS technical specification) to be published in 2022. Summarizing the technical framework and the identified fields of cooperation the following conclusions can be drawn:

- Planning, design, and decision making should develop an integrated understanding of the dependance of stationary charging and dynamic ERS as integrated system to decarbonise road freight traffic.
- National actors should seek to harmonize and synchronize their roll-out plans to adequately consider national and international freight corridors.
- Technical standardization should continue and best be intensified to allow for an integrated system set-up with both stationary and dynamic charging infrastructure that can be seamlessly operated and used.

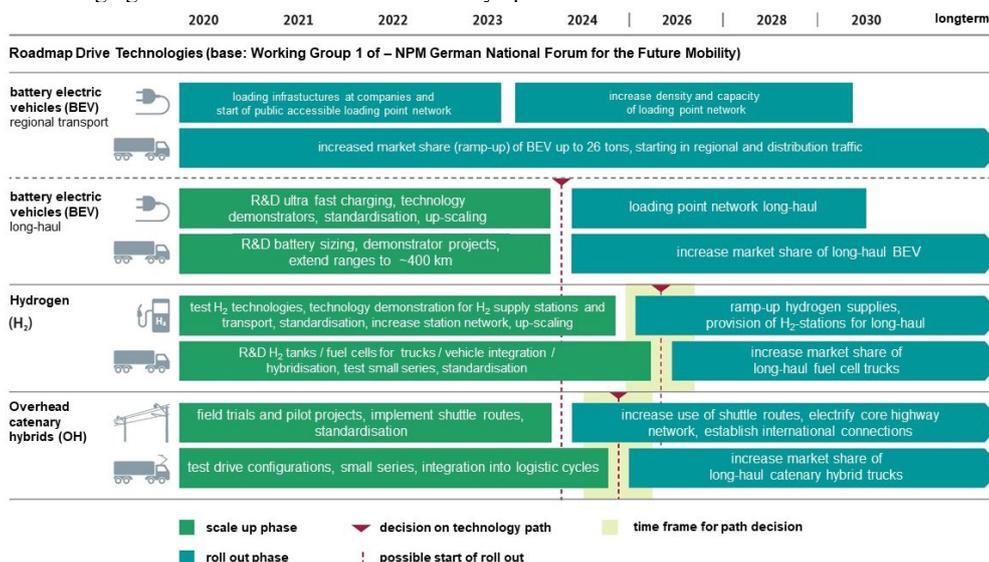


Fig. 1 Scale-up and Roll-out phases to decarbonize road freight traffic in Germany

(Federal Ministry of Transport and Digital Infrastructure (BMVI) (2020): An Overall Approach to Climate-Friendly Commercial Vehicles. BMVI - Division G 22 – Alternative Fuels and Drivetrains, Infrastructure, Energy. Ber.lin.)