PIARC Strategic Plan - 2020-2023

TASK FORCE 2.2 – ELECTRIC ROAD SYSTEMS

TF 2.2.1. Electric Road Systems (ERS)

Strategies / Objectives

- Literature review and synthesis document about the need of decarbonization of the road transport, both for passengers and freight, and which role ERS could play in that decarbonization.
- Literature review of different ERS technologies, their Technology Readiness Level (TRL) and their integration in the "smart road" infrastructure:
    - Analyze new experiences from demonstration projects around the world, strengthening the practical, engineering, operational, traffic management, road safety and cyber security perspectives and other effects of deploying ERS
    - Technological aspects of interoperability among ERS and interaction with other road systems.
    - Life cycle analyses (LCA) for different types of ERS including the life cycle costs (LCC) and benefits
    - Objective 1: common understanding of pros & cons of different ERS technologies
    - Objective 2: learnings/best-practices for building & operating ERS demo sites.
- Identify stakeholders for ERS.
- Identification and analysis of national policies promoting ERS.
- Review existing and planned projects implemented on roads open to public traffic, as well as research projects outside open roads.
- Establish potential business models for road and transport administrations including:
    - Different possibilities of vehicles using ERS: only HGV, also buses, or also light vehicles
    - Potential evolutions of technologies over the next years, including recommendations for interoperability of technologies and evolution of the vehicle's categories using the ERS
    - Potential subsidies that could be granted by Governments (at least at initial stages) in exchange of reduced emissions, and their Cost Benefit Analysis (CBA)
    - Evolutions of other technologies and their impact on ERS such as electric batteries capacity, ultra-fast static charging, autonomous and shared vehicles…
    - Assessment of needs to change legislation for the road operator to be able to implement ERS, particularly when road operators/administrations will be providing the service
    - Identify and existing forum and liaise with it (or establish an stakeholders consultation group) gathering relevant stakeholders from the energy, vehicles manufacturers and haulers/logistic sectors to exchange with them about feasibility of business models
- Establish recommendations on:
    - Strategies that could accelerate implementation of ERS including CBA and risk assessment
    - Steps forward for road and transports administrations in different stages of ERS implementations (willing to analyze ERS, first implementations, further development…)
    - Future international cooperation on ERS and role of PIARC
- Contribute to an international narrative for ERS.
- Coordinate with other TCs and TFs, such as *T.C.2.3 – Freight, T.C.2.4 – Road Network Operation / Intelligent Transportation Systems, T.C.3.1 - Road safety, T.C.3.3 - Asset Management,* and *T.C.3.4 - Environmental Sustainability in Road Infrastructure and Transport.*

There is a need for decarbonizing the road transport all over the world both for freight and passengers. The international Paris Agreement about the climate challenge (UNFCCC) calls for action in every aspect of the modern society. The transport sector is addressed as well, and particularly the road transport, which represents above 75% of global inland transport.

So far ERS are more developed for freight transport than for passengers but both aspects must be addressed within *TF 2.2* at different levels.

The Governments of Sweden, Germany and France have agreed to cooperate within the field of ERS. ERS is one possible solution for diminishing the carbon footprint from road bound freight transports in the near future and for road passengers transport some years later. ERS bears the advantage to overcome limitations in loading capacity and driving range that impede a large-scale application of batteries and fuel cells for heavy trucks with today's technology.

Both in Germany and Sweden different ERS projects or technologies are deployed. In France there are discussions on possible tests. There are also tests being planned or conducted in many countries for example in China, USA, South Korea, Italy, India etc.

Many of the ERS techniques can be used not only for HGV but also for buses and light vehicles. This means that a possible business model for ERS could be broadened to include more types of vehicles. ERS systems bears also many possibilities to interact with other ITS systems for roads and therefore can contribute to a "smart road".

Whatever ERS techniques that can be deployed a power system to supply the ERS is also to be established. Cooperation with the power suppliers is very important for any deployment of ERS. Other stakeholders should be approached as well.

TF 2.2 could play a leading role in exchanging knowledge and experience in ERS globally. Countries should be invited to share knowledge and experiences from their planned or conducted Research and Development projects as well as from demonstrators. Findings from these activities should be continually logged and extensive summaries from the reports will be translated into English and discussed inside the TF in order to produce a Collection of case studies, a Briefing note and a Technical Report on ERS.

To promote knowledge within the field of ERS, the TF is invited to address concerns raised by parliaments and administrations, as well as from industry and non-governmental organizations. TF is invited to address as well road operation, road safety, road maintenance and cyber security aspects. TF should asses the needs and broad principles to adapt legislation to enable ERS, particularly when road operators/administrations will be providing this service.

ERS do not evolve alone within the road sector and the evolution of other technologies could have an impact on ERS, their deployment and their relevance. TF is invited to offer a brief overview of these other aspects and how their evolution could impact ERS: electric battery capacity, speed of static charging, deployment of shared and autonomous vehicles, alternative engine energies with ultra-low CO2 emissions, etc.

The cooperation should also grasp the field beyond research and development. Ways to deploy ERS should be investigated using different scenarios.

Outputs	Expected Deadlines
• Collection of case studies	• April 2021
• Briefing note	• November 2021
• Full report	• September 2022