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Sustainable mobility and transportation — Roadside feeding electric road system —

Part 2: Service and operational concept

Mobilité et transports durables — Système routier électrique d'alimentation en bord de route —

Partie 2: Service et concept opérationnel

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Foreword

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Introduction

Achieving carbon neutrality for heavy-duty commercial vehicles, which are responsible for intercity freight transport, is essential. Possible solutions include battery-electric vehicles (BEVs) and hydrogen-powered vehicles.

There are challenges associated with using BEVs for long-haul intercity commercial transportation.

For large BEVs, long-distance travel that relies solely on stationary charging is inefficient and uneconomical due to the significant time required for charging.

Therefore, an effective approach is to supply electricity from roadside infrastructure while the vehicle is in motion on interurban corridors, thereby providing driving energy and charging the on-board battery.

At the beginning and end of a trip, the vehicle can operate as a pure BEV, producing no carbon dioxide emissions. Various dynamic charging technologies – systems that provide electrical power to vehicles while driving – have already been developed worldwide.

This document describes the service and operational concept of contact-type roadside electric road systems (ERS).

To eliminate carbon dioxide emissions, the use of electric vehicles (EVs) powered by renewable energy is important. Installing energy-storage equipment enables fluctuations in the load to be smoothed out when variations in energy demand happen.

Safety measures to protect humans from hazards associated with roadside power-supply equipment are important. In addition, cybersecurity measures are effective against cyber-attacks.

Authentication of both the power-supply side and the power-receiving side is also important to prevent unauthorized energy use by third parties.

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Only when these measures are taken can a highly reliable ERS be established.

The ISO 4078 series specifies the roadside ERS and related services supporting intercity commercial electric vehicle transportation systems.

Because multiple methodologies exist for presenting the role and functional models, there is a need for commonly understood presentation guidance and requirements. This document defines such guidance and requirements for a generic roadside-powered electric road service role and functional model.

This document provides the service and operational concepts as a baseline. It intends to support, not hinder, future business development, and to assist in developing business cases for other future road system services beyond electric road services.

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