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Railway applications - System energy efficiency

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CONTENTS

FOREWORD 3
INTRODUCTION 5
1 Scope 6
2 Normative references 6
3 Terms, definitions and abbreviated terms 6
3.1 Terms and definitions 7
3.2 Abbreviated terms 11
4 Definition of energy efficiency for electric railway systems 11
4.1 General description of energy efficiency of electric railway systems 11
4.2 Inputs and outputs of electric railway systems 14
4.2.1 General 14
4.2.2 Inputs and outputs 15
4.3 Identification of train operation parameters 15
4.3.1 General 15
4.3.2 Train-unit 16
4.3.3 Infrastructure conditions 16
4.3.4 Timetable and driving style 16
4.3.5 Energy supply network characteristics 17
4.3.6 Environmental conditions 17
4.4 KPIs 18
4.5 Boundaries 18
5 Definition of efficiency KPIs and boundaries 19
5.1 KPI 1 - Final energy consumption per mass transported (tkm) 19
5.2 KPI 2 - Final energy consumption per offered transport (ask) 19
5.3 KPI 3 – Final energy consumption per offered transport (vkm) 20
5.4 KPI 4 - Final energy consumption per actual traffic output (pkm) 20
6 Definition of characteristic KPIs and boundaries 20
6.1 KPI 5 - Share of energy consumption for parked trains 20
6.2 KPI 6 - Energy recuperation rate 21
6.3 KPI 7 - Efficiency of the railway power network 21
Annex A (informative) Train operation parameters which influence KPIs 23
A.1 General 23
A.2 Train operation parameters 23
A.2.1 Topography of the railway network 23
A.2.2 Density of trains (number of trains per time-interval) 23
A.2.3 Transportation capacity (tkm, pkm) 23
A.2.4 Passenger load factor 24
A.2.5 Comfort requirements 24
A.2.6 Speed requirements 24
A.2.7 Available energy-resources 24
A.2.8 Architecture of the energy supply system 24
A.2.9 Availability 25
A.2.10 Conformity to ambient requirements 26
A.2.11 Costs 26

A.2.12 Technical regulations and standards 27
A.2.13 Infrastructure properties that cannot be adapted 27
A.2.14 System boundary-parameters (system-exploitation, parameterization) 27
Annex B (informative) Example of traction loads and non-traction loads 28
Bibliography 29

Figure 1 – An example of physical boundaries for electric railway system 12
Figure 2 – Input, output and driving parameters of electric railway system 14

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Railway applications - System energy efficiency

FOREWORD

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The text of this Technical Specification is based on the following documents:

Draft	Report on voting
9/3352/DTS	9/3384/RVDTS

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this Technical Specification is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

– reconfirmed,
– withdrawn, or
– revised.

INTRODUCTION

Energy efficiency is a key for preserving the environment and to save natural resources. Energy policies of railway stakeholders are supported.

This document on electric railway energy efficiency (EE) specifies key performance indicators and boundaries to assess the EE. This document establishes comparability between different (overall) railway systems based on the key performance indicators and the boundaries, which are defined in this document.

The purpose of this document is (in the following applications for energy efficiency in electric railways) to

– consider energy efficiency in standardization work;
– identify which aspects of energy efficiency are relevant for standardization;
– use a structured and harmonized approach when addressing energy efficiency;
– use a systematic approach when addressing energy efficiency.

1 Scope

This document harmonizes the requirements and criteria for Key Performance Indicators (KPIs) and specifies KPIs of energy efficiency for entire electric railway system and its subsystems such as trains, contact lines, substations, both single and combined, clarifying the boundaries to be considered. This document applies to entire electric railway systems including non-traction loads.

The purposes are:

a) to determine and to trace the energy efficiency for a specific railway system;

b) to enable comparability between the different electric railway systems (on overall system level) by means of harmonized KPIs and system boundaries concerning energy efficiency;

c) to overview the characteristics of the electric railway system on an overall level with the structure of the electric railway system (including type, hierarchy and number of substations) and the KPIs (including the ranking) for transportation quality;

d) identification of the key impacts for energy efficiency as there are system flexibility, system functions and system features as basic characteristics for the entire electric railway system;

e) definition of harmonized processes and procedures for the simulation or calculation and validation of the system specific energy consumption (including energy feedback);

f) presenting the related and referenced standards and regulations for the electric railway system and its subsystems and their possible contribution to the overall target of the energy efficiency.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60850:2014, *Railway applications - Supply voltages of traction systems*

IEC 62313:2009, *Railway applications - Power supply and rolling stock - Technical criteria for the coordination between power supply (substation) and rolling stock*

IEC 63593:20—, *Railway applications - Rolling stock - Specification and verification of energy consumption*[1]

3 Terms, definitions and abbreviated terms

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

– IEC Electropedia: available at https://www.electropedia.org/

– ISO Online browsing platform: available at https://www.iso.org/obp

[1] Under preparation. Stage at the time of publication: IEC FDIS 63593:2026.