

Public Summary of D2.2

Reference Architecture for Strategic Decision Making

What is MERLIN?

MERLIN is a collaborative project funded under the European Commission's 7th Framework Programme on Research and Development. MERLIN started on 1st October 2012 and will last 39 months.

MERLIN's main aim and purpose is to investigate and demonstrate the viability of an integrated management system to achieve a more sustainable and optimised energy usage in European electric mainline railway systems.

What are the issues at stake?

Energy management is a key issue for railway systems and this situation will continue to be prominent for the foreseeable future. Multiple operational scenarios add complexity to the development of suitable and appropriate energy management solutions. Moreover, existing assessment tools lack an integrated approach, and tend to omit the variation in emission levels, energy usage and associated costs resulting from differing traffic peaks.

Given that the railway system is a complex and interconnected system, a single supplier, operator or infrastructure manager (as large as they may be) cannot

tackle the energy management issue for the entire network alone. Hence, only through a collaborative approach such as **MERLIN** can effective solutions for this issue be developed. Appropriately, the **MERLIN** consortium brings together the key rail stakeholders from across Europe.

What are MERLIN's main achievements?

- Proposals for technical recommendations (UIC/UNIFE TecRec) on Specification and verification of energy and power consumptions of railway systems and on Energy and power related information protocols at operational level;
- Future business models & recommendations (smart energy management, cost saving);
- Optimised solutions for current and future business models;
- Reference architecture and interfaces related to a strategic support tool and operational energy management tool which supports real time suggestions to network actors.

Public summary:

WARNING: *This document is a synthesis of a confidential document. Access to the full content of the deliverable is restricted to the members of the MERLIN consortium and to the European Commission's services.*

The overarching goal of the MERLIN project is to investigate and demonstrate the viability of an integrated management system to achieve a more sustainable and optimised energy usage in European electric mainline railway systems. The purpose of this Deliverable D2.2 is to define and develop the components and interfaces of the architecture related to the specific strategic decision making functionality.

Its content is divided into three topics:

- Considering the influence of strategic decisions on energy usage within railway systems. This is to define the objectives, scope and requirements of the decision making process;
- Assessment of suitable methodologies. Based on the requirements, Multidisciplinary System Design Optimisation has been identified as well-suited for this project. The document describes the methodology in more detail, and its specific application here to a decision support tool for railway energy use;
- The third topic is concerned with detailing the architecture of the strategic decision making tool (SDMT) to be developed by the MERLIN project, based on the methodology identified.

This deliverable has been used as basis for the development of a software tool that implements the architecture described in this document (Deliverables D5.1, D5.2 and D5.3). The tool has subsequently been applied to several different real-world scenarios (D6.1), in order to test the architecture.

More information

To know more on the MERLIN project, please visit <http://www.merlin-rail.eu>.