This project has received funding from the European Union's Seventh Programme for research, technological development and demonstration under grant agreement No 314125

Public Summary of

D6.2 Complete evaluation of the optimisation possibilities for the defined scenarios

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.*

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D6.2 "Complete evaluation of the optimisation possibilities for the defined scenarios" intends to present the discussion, evaluation and conclusions taken from simulations carried out in five real scenarios all over Europe with MERLIN developmets.

Based on Operational Railway Energy Manager System (REM-S) architecture defined with SGAM Model and the algorithms/tools developed accordingly, different optimisation missions are identified to test MERLIN optimisation prospects. REM-S software tool includes generic algorithms with Day Ahead Optimisation (DAO), Minutes Ahead Optimisation (MAO) and Energy Storage System (ESS) features.

From the strategic side, Strategic Decision Making Tool (SDMT) defined and developed during the project is also used in order to assess scenario improving prospects. SDMT is intended to be a decision support system for optimisation of energy use in different railway systems, specifically targeting the strategic decisions required when designing new railway systems or carrying out significant modifications to existing systems, such as timetable changes, new rolling stock, electrification infrastructure, energy storage systems or revising contractual arrangements for the supply of electricity.

The simulated scenarios cover:

- Sc 1. French Scenario, High Speed 25Kv 50Hz AC, Paris Lyon
- Sc 2. Swedish Scenario, High Speed 15kV 16.7Hz, Alvesta – Malmö – Simrishamn
- Sc 3. Spanish Scenario, Suburban 3000Vdc line, Málaga-Fuengirola
- Sc 4. British Scenario, Mixed Freight and passenger traffic, Penrith to Euxton Junction
- Sc 5. British Scenario, 750Vdc Regional, Weymouth and Bournemouth

The document covers for each of the scenario results discussion and conclusions. The content is finalised with general conclusions.

The main aim of the deliverable is assessing the detailed results obtained from simulating the five real scenarios with MERLIN developments.

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