



INTERNATIONAL UNION
OF RAILWAYS

unity, solidarity, universality

Railenergy – At a glance

Results from a successful collaborative European rail research project

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Railenergy – An overview



- European Rail Research project under the European Commission's Sixth Framework Programme
- Duration: September 2006 - December 2010
- Budget: 14.652.742 EUR (Funding: 8 million EUR)
- Partners: 28 partners (all major European sector representatives)
- UNIFE as coordinator and UIC with a major R&D part
- Objective



The project target was to achieve a 6% reduction of the specific energy consumption of the rail system by 2020.

Railenergy is smart energy solutions answering relevant railway questions

Standardisation

UIC/UNIFE Technical Recommendations

Energy Efficient Technologies

Railenergy Calculator
Decision Support Tool



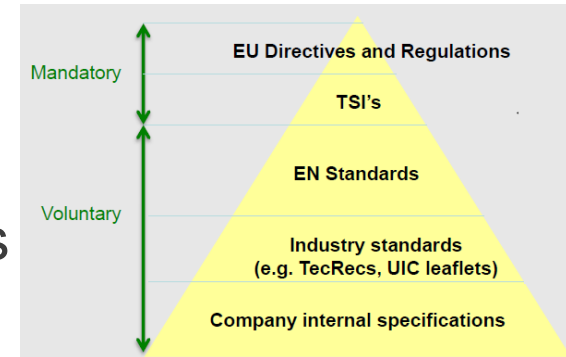
Railenergy
Recommendations

Railenergy Website:
www.railenergy.eu

Standardisation (1/2)

Railenergy delivered the input for two UIC/UNIFE Technical Recommendations

- TecRecs are voluntary UIC/UNIFE standards to be used within the European region
- Primary field of application is the European Railway Transportation Sector covering all interfaces and subsystems from vehicle to track.
- A Technical Recommendation is the preferred solution by both partners for
 - Facilitating standardisation of component interfaces
 - Publication of results of common research programs or projects/studies undertaken by either UIC or UNIFE
 - Acceleration of the European standardisation process



Standardisation (2/2)

> **TecRec 100_001 : Specification and verification of energy consumption for railway rolling stock**

Framework to compare energy performance values for trains and locomotives on a common basis allowing the benchmarking of rail vehicles' energy efficiency

Document published online



> **TecRec 400_001 : Specification for reversible DC substations**

Functional Requirements for the procurement of reversible substations in the direct current rail infrastructure

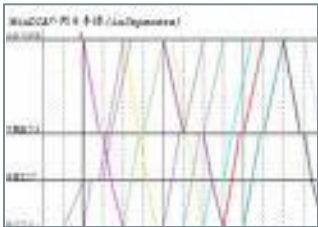
Document to be published mid 2011



Download the standards free of charge from www.tecrec-rail.org

Railenergy Technologies

Operation



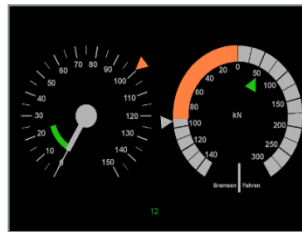
Energy efficient driving
Energy efficient timetabling

Infrastructure



Reversible DC substations
Recover losses from the network

Components



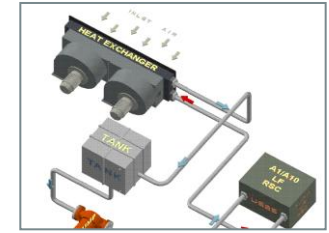
Onboard energy Storage systems
Use of waste heat

Traction



Superconducting transformer
Medium frequency transformer

Topologies



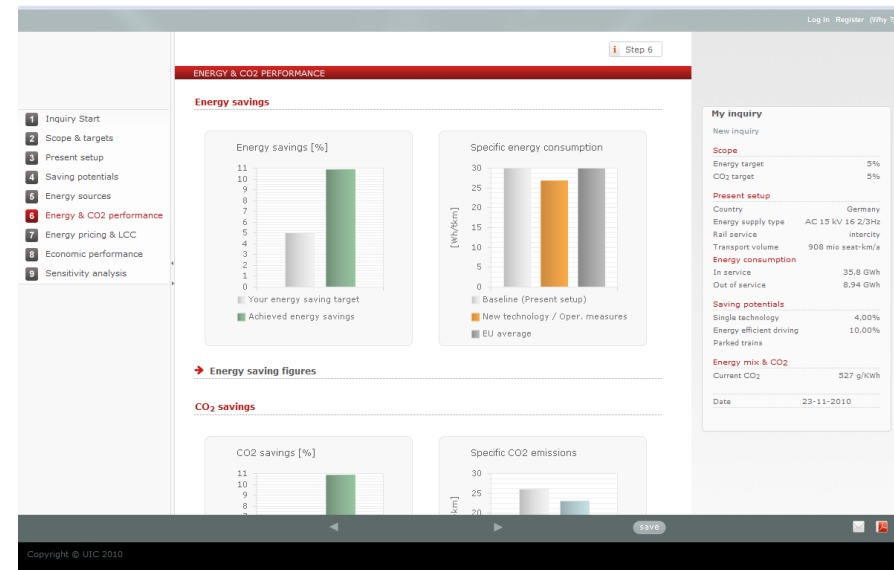
Energy efficient Cooling system
Converter control technology

Railenergy Calculator (1/2)

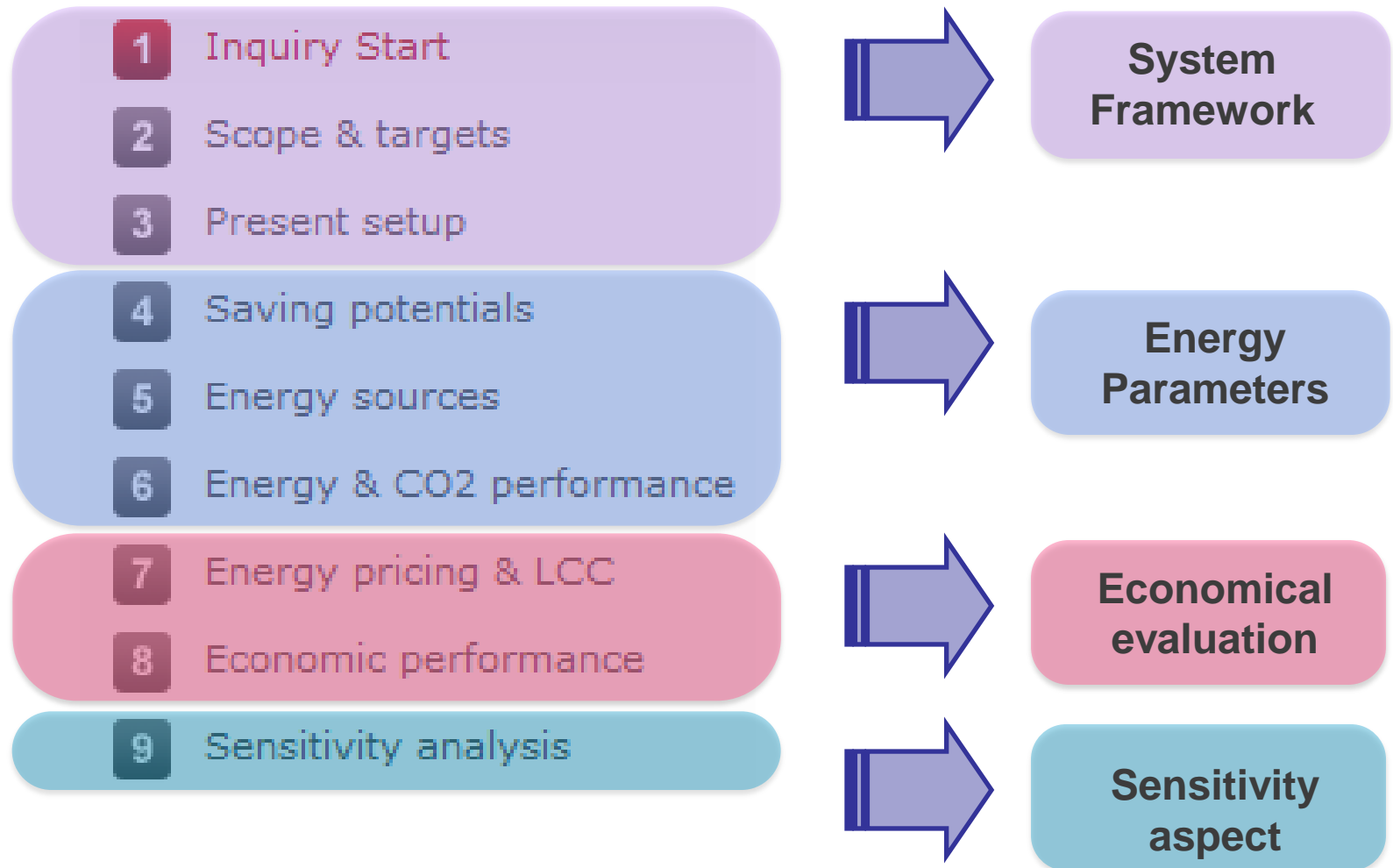
What is the Railenergy Calculator?

- > A "business to business" tool based on a uniform calculation methodology to analyse & predict
 - potential energy savings,
 - life cycle costs and
 - benefits from investing in selected new or existing energy efficiency technologies & measures

- > A web-based screening tool with the purpose of assisting the industry to align their energy calculations based on the state of the art rail system knowledge



Railenergy Calculator (2/2)



Railenergy Recommendations

Operational
measures

1. DC rail services

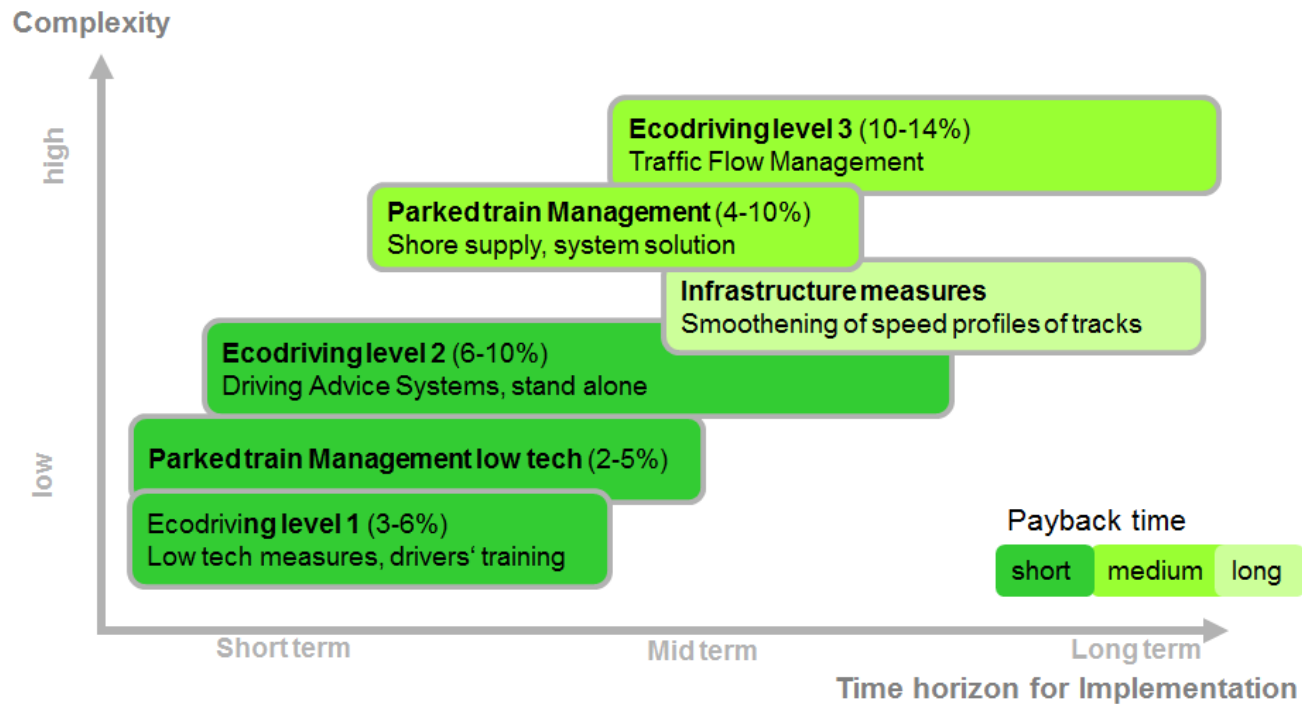
2. AC conventional rail services

3. AC high-speed rail services

4. Diesel rail services

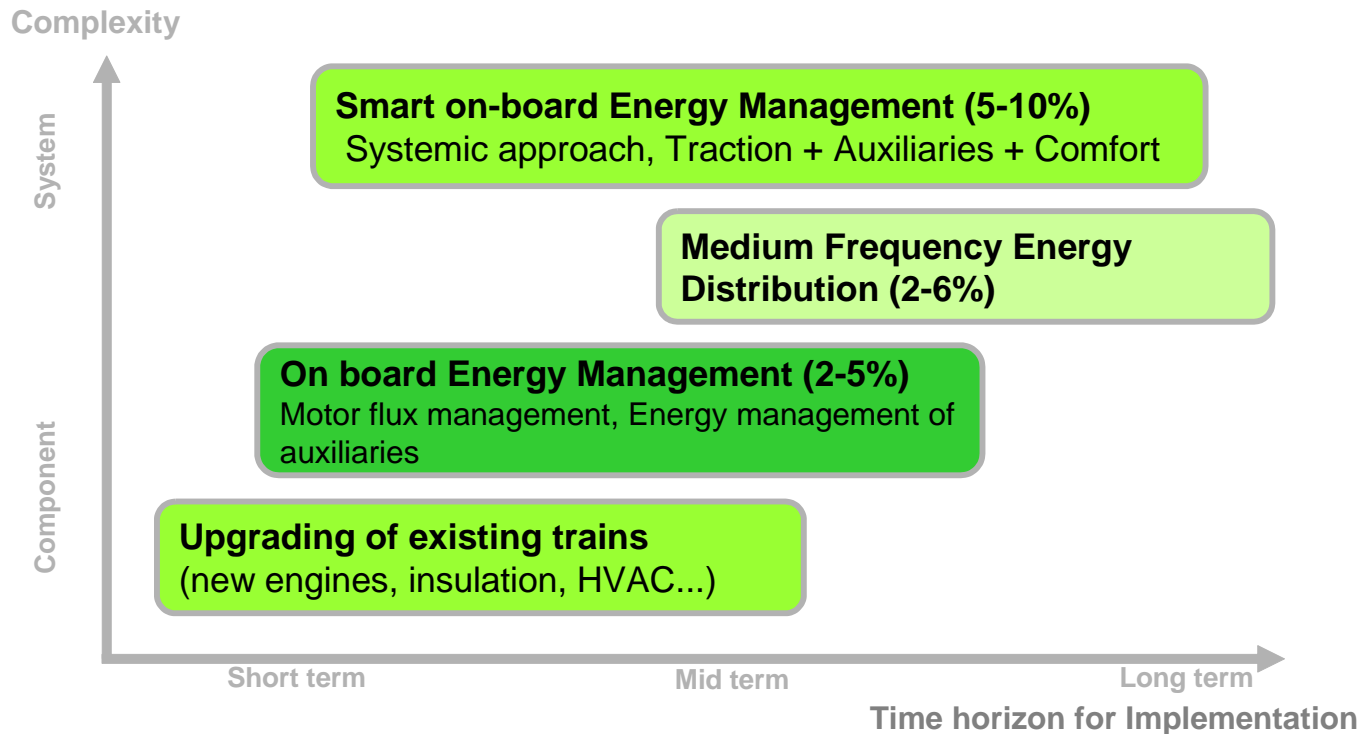
Recommendations – Operational

Recommendations for Operational Measures

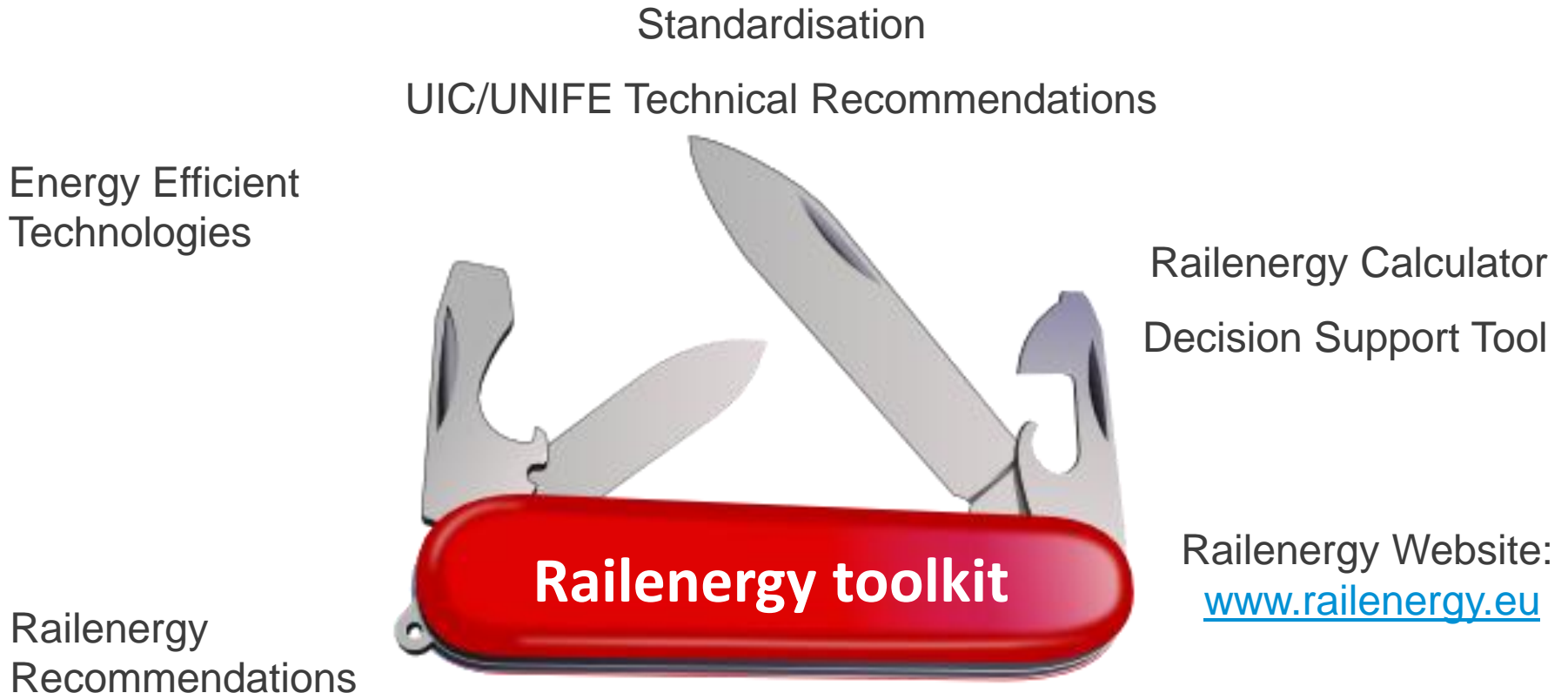


Recommendations – AC High Speed

Recommendation for AC system High Speed services



Conclusion



Average relative energy savings can be more than 7% throughout the entire European railway system!

The Railenergy team after 4 years!



■ ■ ■ Thank you for your kind attention

Enno Wiebe, UIC