Panel 1 – Energy Efficiency Management

Knowledge Base, Decision Support Tool & Railenergy Website

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Energy Efficiency Days 2009, Railenergy Conference Tours, 23.9.2009

How do I get access to Railenergy results?

By means of internet-based tools!

1. Railenergy Knowledge Base
2. Decision Support Tool

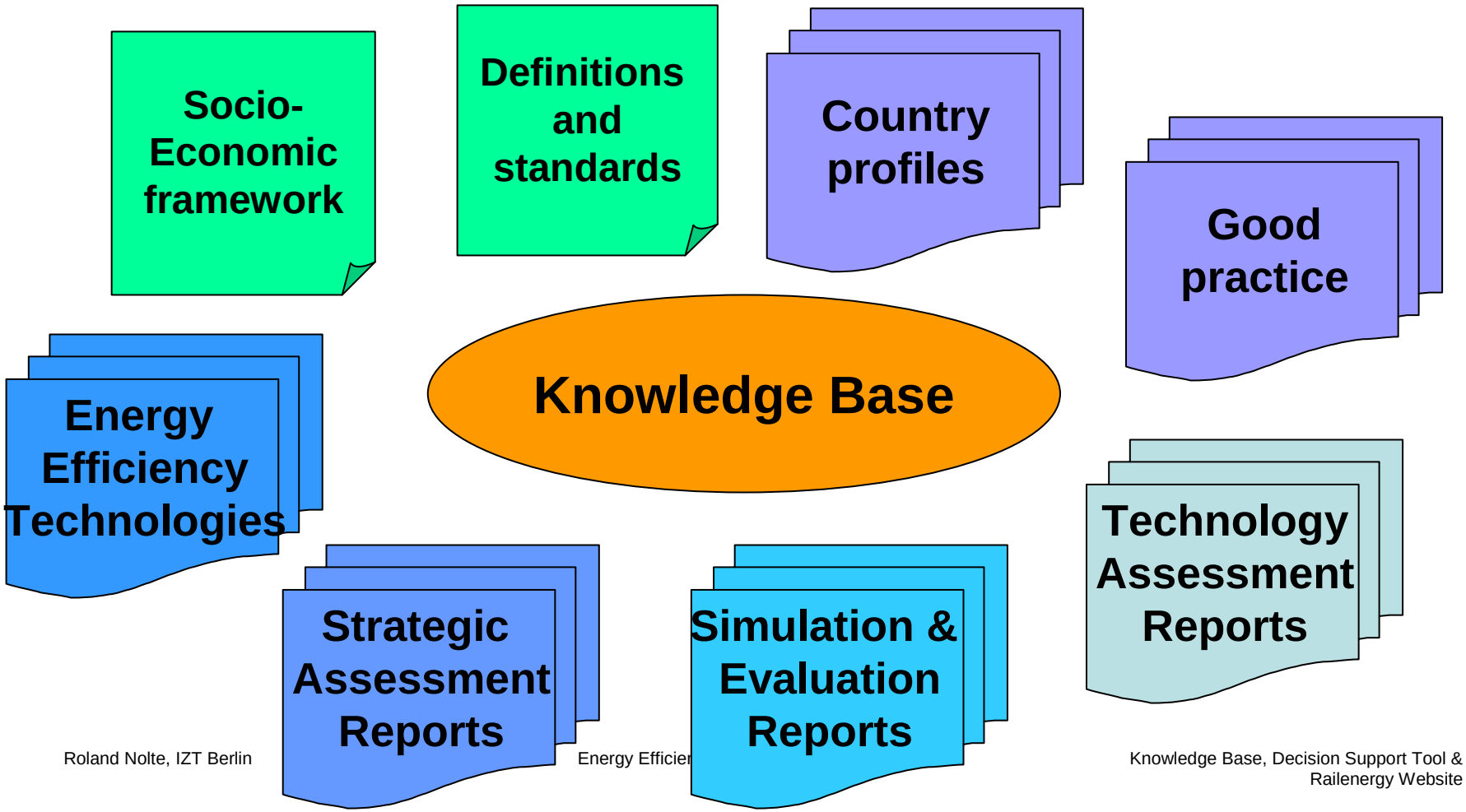
made accessible via the Railenergy Website

Railenergy Knowledge Base (1)

Why?

1. Store all relevant project results in a structured way
2. Provide a basis for easy access to all information
3. Establish a new reference for energy efficiency for railway systems

Railenergy Knowledge Base (2)



Decision Support Tool - DST

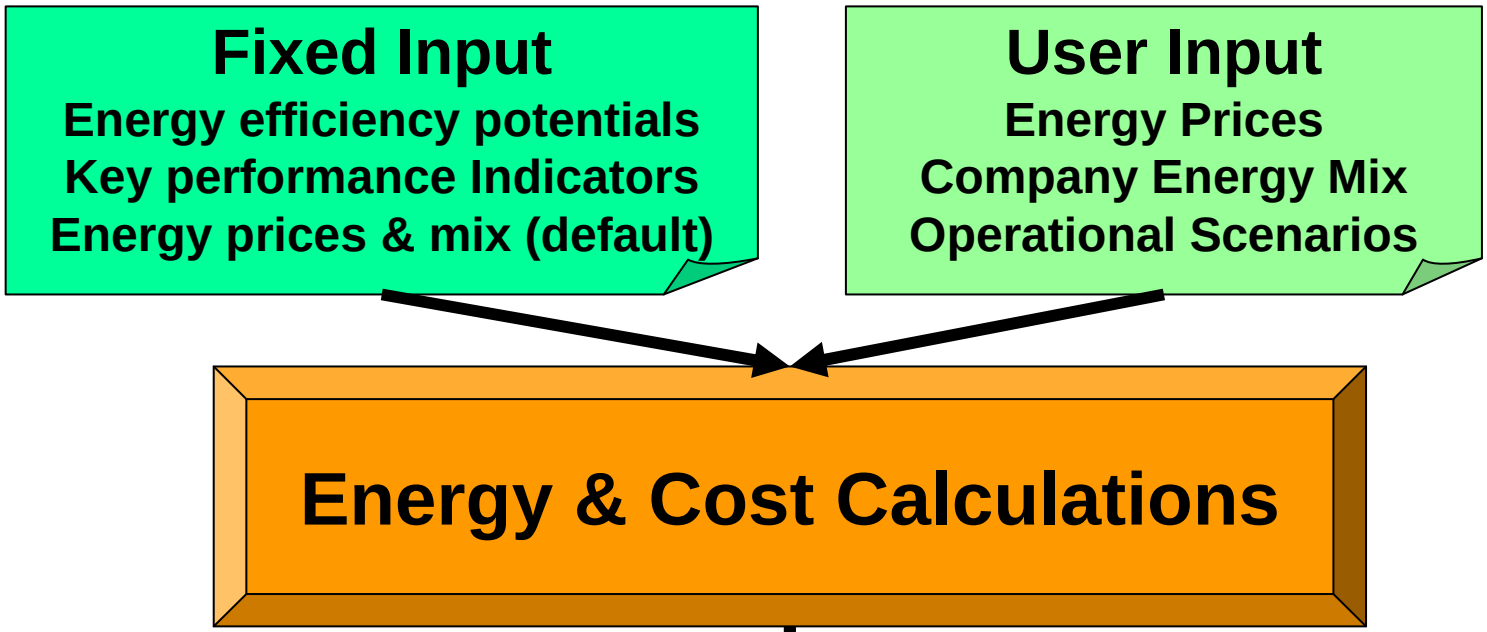
Why?

- Provide an instrument for calculating energy & cost savings for Railenergy technologies
- Illustrate the impact of energy efficiency technologies on energy savings, costs and CO_2 emissions
- Allow user-defined input data (energy prices, energy mix, scenarios)
- „Play“ with settings & options (system behaviour & saving strategies)
- Support the preparation of energy efficiency strategies

Railenergy

Energy Efficiency Days 2009

DST - Input Data & Calculation Functionalities



Output:

Energy & cost savings
CO_2 emission reductions
LCC aspects

Railenergy Website – Structure & Navigation

Energy Efficiency Solutions
for Railway Rolling Stock, Rail Infrastructure and Train Operation

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- Energy Savings
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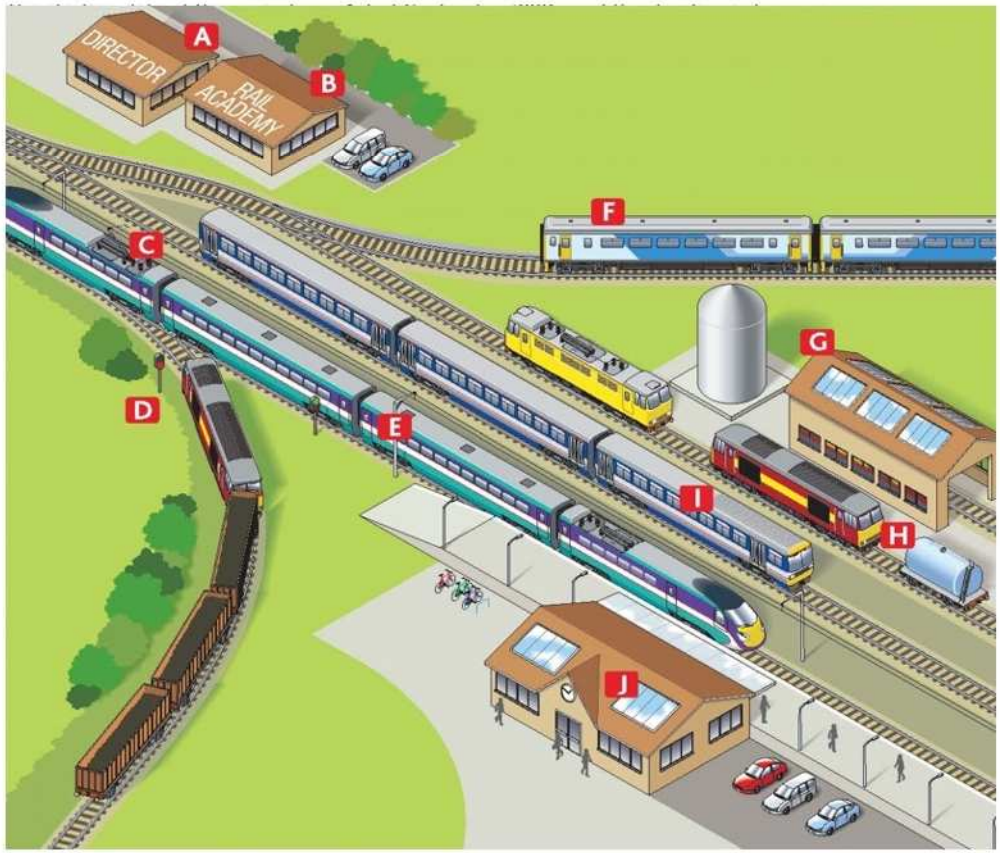
WELCOME

Railenergy is an Integrated Project co-funded by the European Commission under the 6th Framework Programme for Research and Development. The full name of the project is "Innovative Integrated Energy Efficiency Solutions for Railway Rolling Stock, Rail Infrastructure and Train Operation."



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The Railenergy Website – first content examples

Railenergy

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Country Profiles

Please select a country on the map

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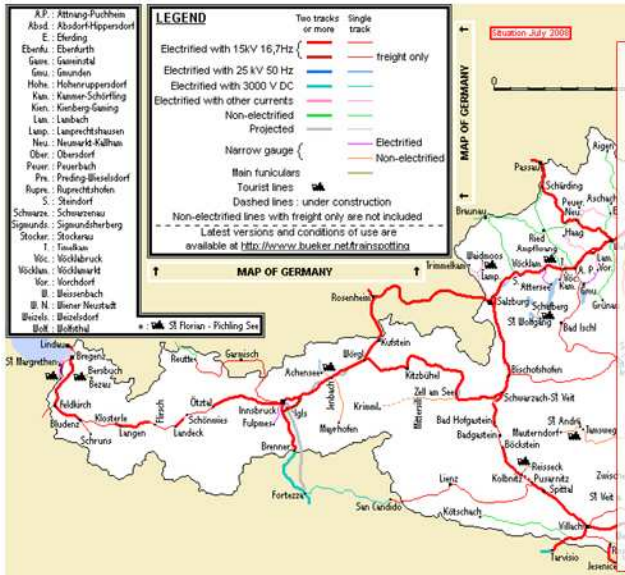
AUSTRIA



The Austrian Federal Railways (ÖBB, Österreichische Bundesbahnen) is the national railway company of Austria. A new organization structure was put in place in 2004, with the creation of the ÖBB Group (controlled by ÖBB-Holding AG), that encompasses several companies in the different activity areas, with individual business results. Among those, ÖBB-Personenverkehr AG is in charge of passenger transport, and Rail Cargo Austria AG is in charge of freight transport. ÖBB-Infrastruktur Betrieb AG and ÖBB-Infrastruktur Bau AG are respectively responsible for maintenance of railway lines, stations, and infrastructure; and infrastructure planning, management, and construction. There are plans to unite both ÖBB-Infrastruktur Betrieb AG and ÖBB-Infrastruktur Bau AG in early 2010. There were 15 licensed railway undertakings in Austria in 2006.

Electricity generation mix

Primary energy sources for power generation in Austria (%)

	Coal	Oil	Gas	Nuclear	Others, non renew.	Hydro-electric	Wind	Others, renew.
Austria	13	2,8	19	0	0,5	61	0,5	2,9

Source: Railenergy (2007), "Railenergy SP1 Questionnaire", Rail Cargo Austria

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Technologies

Railenergy aims at the development of new validated energy efficiency oriented railway technologies for trackside and on-board sub-systems and equipment. The technologies in the Railenergy project were developed in the four technologies driven subprojects.

- ☐ Rolling Stock
- ☐ Infrastructure
- ☐ Operation

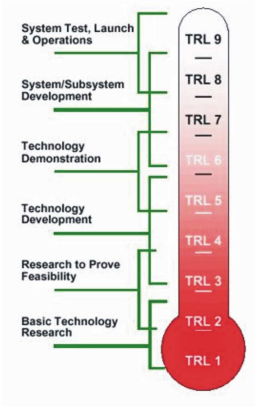
- ☐ Passenger
- ☐ Freight

- ☐ AC
- ☐ DC
- ☐ Diesel

Service Type

- ☐ Suburban
- ☐ Regional
- ☐ Inter-city
- ☐ High-speed
- ☐ Freight

Technology Readiness Level TRL



TECHNOLOGIES
Eco-driving
DC Substation
Real time management
2x 1.5 kV DC Traction System
Asymmetrical system
Parallel substation
Reduced line impedances
Increased line voltage (4kV)
Trackside Energy Storage Unit
On-board energy storage technology
Use of Waste Heat
Superconducting transformers and inductances for railway traction
Medium frequency energy distribution
Innovative hybrid diesel electric propulsion
New PWM technique to optimize converter commutation losses
Input voltage management
New control tech. to use braking energy
New control tech. to reduce converter energy consumption during vehicle coasting
Active filtering tech. to reduce input passive filter (reactors) losses
Optimization of Converter losses vs. ambient temperature
Architectural solutions to integrate traction and auxiliary converters
Architectural solutions to save energy during normal operation
Reuse of converters energy loss
MT Loads management
Use of a centralized cooling system for traction and auxiliary converter

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Reversible DC Substation

Technologies / Infrastructure / Reversible DC Substation

− Description

New technology includes reversible DC substation able to recover into the upstream network almost total regenerative braking energy (98% of recoverable regenerative braking energy) after leaving priority to natural exchange between trains...

+ Advantages

+ Range of application

+ Energy efficiency potential

Current development stage: ***prototype***

Time to market: ***201x***

Technology title	Technology field	Description	Operational evaluation	Strategic assessment
Reversible DC Substation	Infrastructure			
Real Time Management	Infrastructure			
2x1.5 kV DC Traction System				
Reduce line impedances				
Increase line voltage (4 kV)				
Trackside Energy Storage Unit				

DS 3 / Use Case 3.3

− General description

General data: description of regional line line Utrecht - Zwolle, map, rolling stock (also figure)..

ICM 3

+ Technical description (Baseline)

+ Operational description (Baseline)

- Infrastructure
- DC

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Related Downloads:

- Technology Assessment Report
- Strategic Assessment Report
- Use Case Description

How can I get involved?

- Provide information on good practice (projects, measures, activities)
- Update & upgrade EVENT technologies
- Support development of Railenergy website (user workshops, contributions, editorial work,...)
- Provide energy consumption data for your rolling stock (Railenergy Performance Baseline)

Please contribute!

to make the Railenergy Knowledge Base & Website the new reference for energy efficiency for railway systems!

Thank you very much for your attention !