

OSIRIS

Optimal Strategies to Innovate and Reduce energy consumption In urban rail Systems

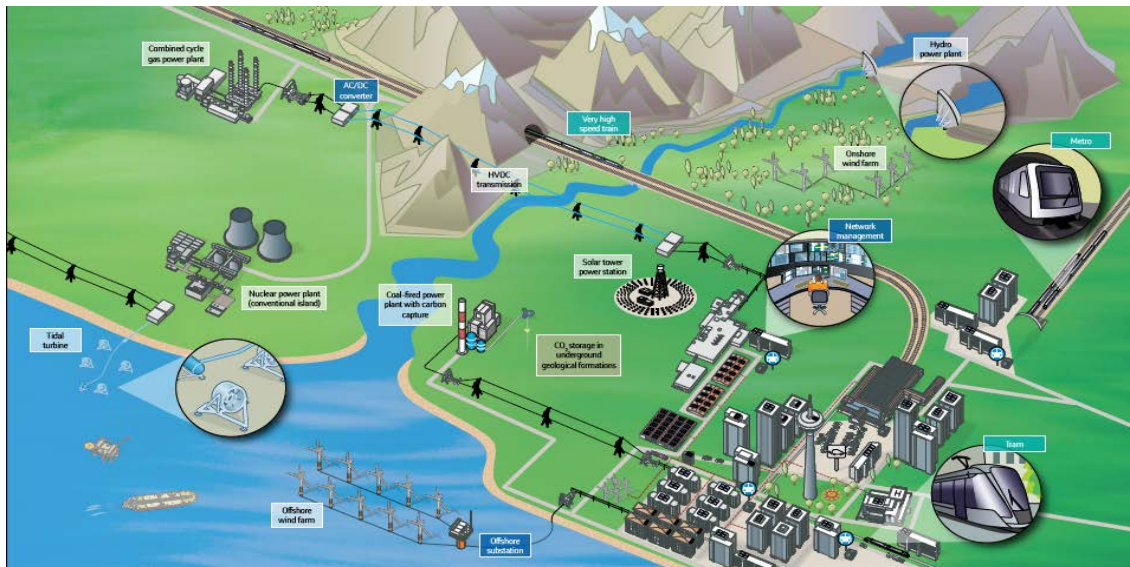
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Rail integrated in eco-cities

Rail has a central role to play in development of smart eco-cities

- meets high, medium and low capacity traffic needs in cities:
- brings added flexibility to energy management in cities:
 - recuperative braking adds to energy supply
 - outlet for surplus intermittent micro-generation
 - integration with EV charging infrastructure



SIRIS

Low hanging fruits for energy savings

Solutions under implementation by operators.

- Eco-driving
- Time-tabling - Traffic Flow Management
- Park train Management
- Energy saving at stations
- Regenerative braking



Long term solutions for energy saving

- OSIRIS can offer some answers.



Facts and figures



- Scope: Seventh Framework Programme, DG RTD
- Total budget: 7,3€ million (4.3 mil € funding)
- Project duration: 36 months
- Project start: 1 January 2012
- Partner:
 - UNIFE (coordinator)
 - UITP
 - SIEMENS
 - ALSTOM
 - CAF
 - AREVA (Technical leader)
 - ASTS
 - SAFT
 - RATP – Paris
 - ULASIM – Istanbul
 - ATM –Milano
 - ATAC – Roma
 - CMM – University of Chile
 - VUT – University of Vienna
 - ITA (Institute of Aragon)
 - DAP – D’Appolonia
 - Newrail



Context



- To promote excellence in railway operation to encourage modal shift and decongest urban transport
- To develop attractive urban transport solution.
- To consolidate environmental gains based on the greening of rail transport.
- To strengthen the worldwide competitiveness of the European rail industry sector and its ability to supply cost effective products and services.

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Objectives

- Reduction of the overall energy consumption **within Europe's urban rail systems of 10% compared to current levels by 2020.**
- Develop a systematic wide ranging evaluation and bench marking of energy consumption (AC and DC) in urban rail systems, including; rolling stock, infrastructure and operations .
- Provide energy consumption KPIs and decision support tools for system selection and operation.
- Allow storage/reuse of energy especially regenerative energy coming from braking - not only on board vehicles but also within stations or on the wayside.
- Identification of the safety risks for the customer and the staff associated with the new technologies for energy storage.
- Solutions to avoid heat dissipation in tunnels, stations and rolling stock.

Benefits of OSIRIS

Operators

- Common understanding with the manufacturers on energy savings and related innovative technologies (KPIs, duty cycles, TecRecs)
- Decision Support Tool methodology: selecting optimum combinations of technical and operational solutions
- Real experimental results from the field of innovative technologies to save energy (RS, Infrastructure & operational measures / thermal & electric energy)

Manufacturers

- Clearly defined and harmonised requirements by operators
- Extended electrical system simulations tools to integrate the new smart grid concept and new thermal simulation tool

Community:

- Energy and CO2 savings thanks to progress in real tested technologies and solutions.

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Main expected results

- Definition of standard urban rail duty cycles .
- Holistic model framework with interfaces to company specific multitrain tools, but with the innovation of the 'thermal' aspects.
- Safety risk assessment of onboard energy storage systems.
- Technical Recommendations for the use of onboard energy storage systems.
- Validation and demonstration based on real use cases.

Some specific technological innovations:

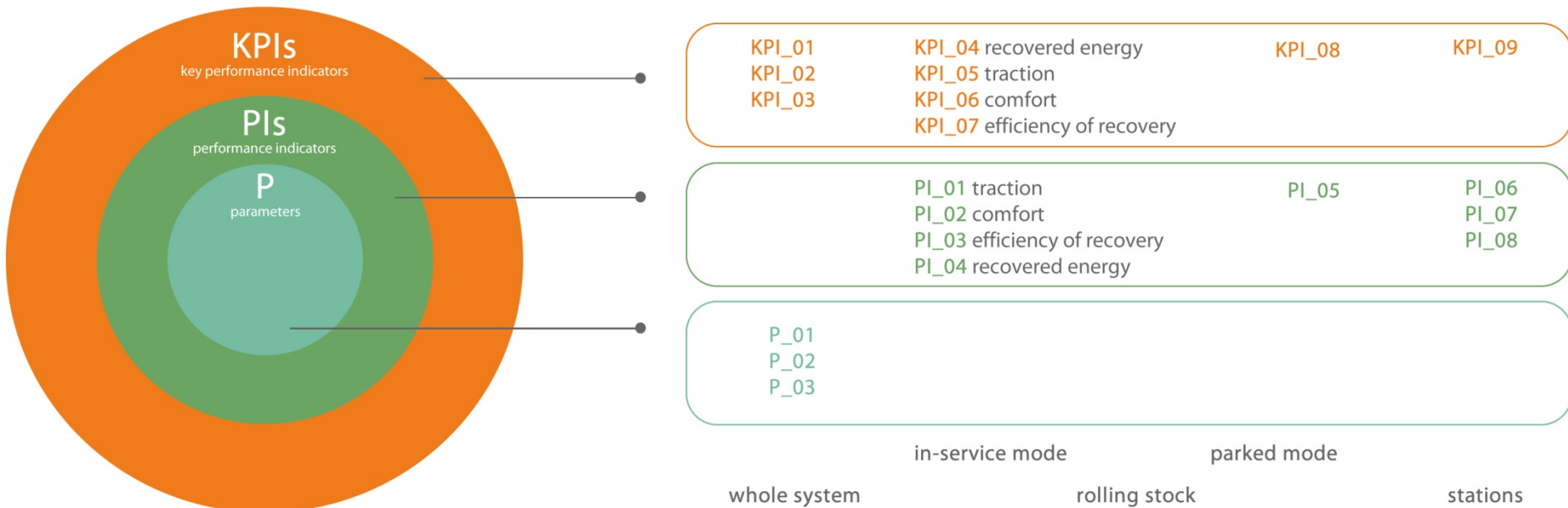
- auxiliary converter and innovative transformer development;
- onboard storage Li-Ion development;
- infrastructure HVAC system efficiency improvement through heat pump;
- smart grid.

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First results - Key Performance Indicators

Defining adequate and measurable energy consumption related KPIs for urban rail systems as well as rules for measurement and formulae for calculation.



Thank you

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