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Energy Efficiency for Urban transport

What Rail Industries expect from Train Operating Companies

Siemens AG

Christian Irmisch

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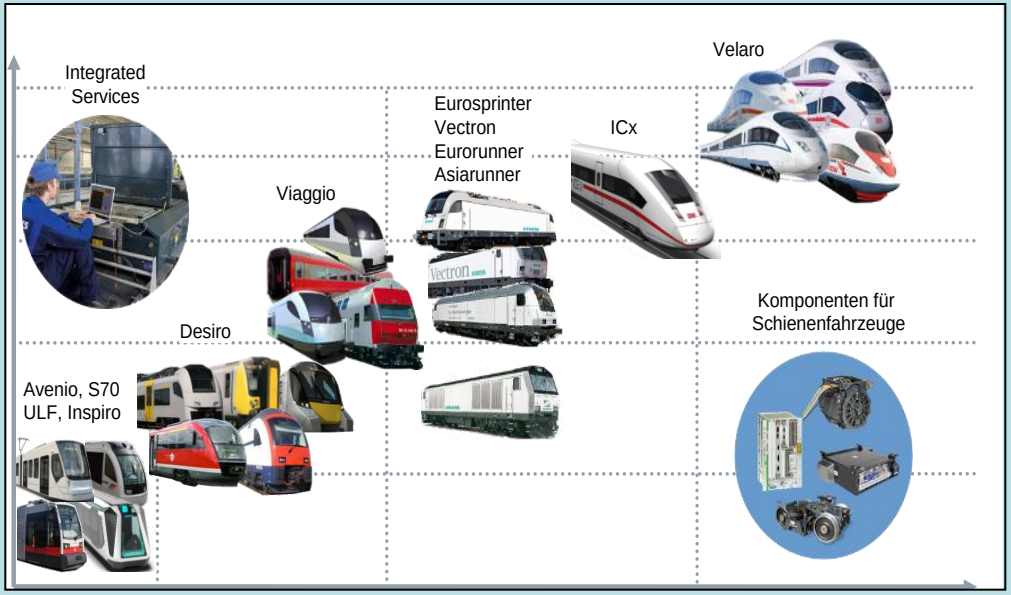
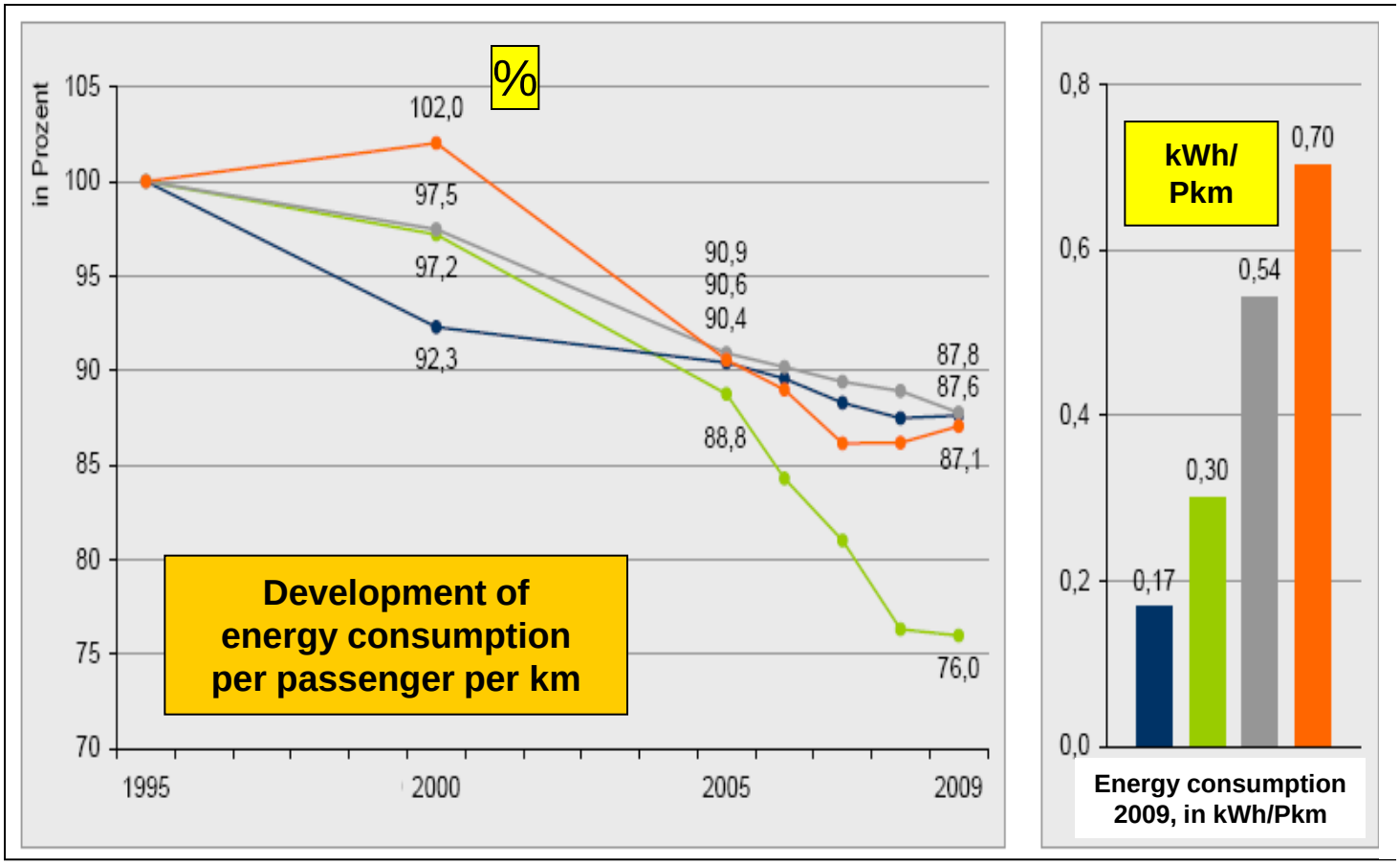
The global society expects and deserves efficient solutions for a sustainable mobility

- The significance of a **sustainable mobility** is growing fast in the general perception.
- **Efficient Transport and Logistic systems** are key factors for the quality of life and for the competitiveness of cities, regions and countries.
- The society and consequently, transport administrations and train operators are looking for **intelligent and integrated solutions** that enable a more efficient use of resources and the existing transportation infrastructures.

Siemens rail vehicles have proven to be ecologically and economically efficient and are ready to play a significant role in the world of rail transport – now and in the future.



Reduction of energy consumption in transportation: We should not loose out on the market!



Source: : IFEU, Mai 2011

Key demands of Rolling Stock Manufacturers towards: 1. The train operating companies (TOC)

- Informal clarification meetings with manufacturers
  - well before the tender phase;
  - in order to identify and discuss the available economic and ecologic solutions with the best efficiency;
  - In order to provide the best value for money within the frame of a limited budget;
- The evaluation scheme for the selection of the appropriate vehicle has to be comprehensive and sustainable considering all cost driving and ecologic factors during the vehicle lifetime
  (or, at least, for the duration of the transportation contract);
- The cost for energy has to be stipulated for the duration of the transportation contract.

Key demands of Rolling Stock Manufacturers towards: 2. The Public Transport Administrations (PTA)

- Informal clarification meetings with manufacturers
  - well before the tender phase;
  - in order to identify and discuss the available economic and ecologic solutions with the best efficiency;
  - To provide the best value for money within the frame of a limited budget;
- Overall targets (i.e. **Ecorails principles, international CO_2 reduction commitments**) have to be taken into consideration by the Public Transport Administrations. Amongst others, the following issues should be addressed:
  - Long-term incentives for the TOCs to invest in energy-saving technologies;
  - Evaluation schemes for the TOC selection have to be comprehensive and sustainable considering all relevant factors during the vehicle lifetime (or, at least, for the duration of the transportation contract);
  - Evaluation scheme for tenders that do not exclude used vehicles must take into consideration all ecologic aspects that are or might be relevant for their deployment at least for the duration of the transportation contract.

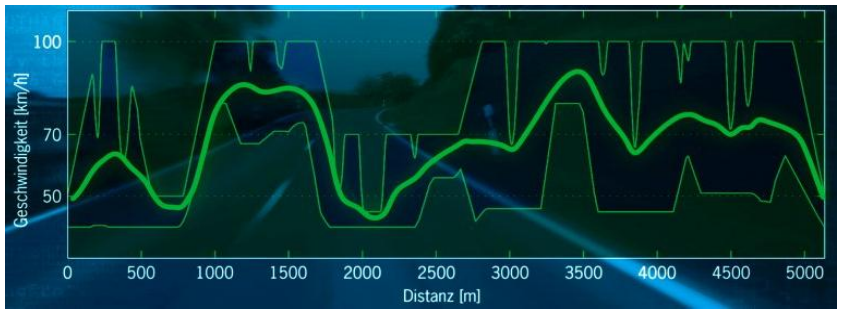
Key demands of Rolling Stock Manufacturers towards: 3. The Legislative Authorities

The European principle of subsidiarity is not designed to provide optimum solutions for basic and common passenger demands for a safe, convenient and affordable mobility. Therefore, the European Legislative needs to push forward the following issues:

- Support for the adaption of rail infrastructures
- facilitate the creation of a common technical base for commuter & regional rail vehicles to minimize the need for regional solutions.
- Mutual, at least facilitated acceptance of homologated vehicles from other European countries (cross acceptance);
- Charging all external costs to all competing means of transport and thus emphasizing the use of Public Transport;
- Politically stipulate the development of the energy price for the lifetime of the vehicles as a major part of the decisive price for the purchasing procedure;
- Standardisation of a major part of the evaluation scheme for European tender procedures.

A few good examples for energy saving practice:

- Feedback of energy into the catenary as a unique railway-system-immanent feature;
- Onboard or lineside storage of energy in order to reduce peak load, bridge catenary gaps or to avoid heat dissipation via brake resistors.
- Onboard energy management to balance excess energy and demand for A/C, pressured air, battery charging and other energy consuming equipment.
- Driver assistance for economic driving:
  - Driver Assistance Systems are able to provide recommendations to the driver to optimise the vehicle speed, thereby reducing traction energy consumption by appr. 10%.
  - The trainguard MT train control system operates the train automatically according to the most energy-efficient “motion path”. On a typical metro line the CO_2 emissions can be reduced by up to 10,000 tons annually.
  - **But let’s hurry up:** **Porsche** recently also announced its innovative ACC InnoDrive system!



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Selected examples of environmental friendly concepts in Siemens Rail vehicles (1/2)

Inspiro – Inspiration Citylife
Sustainable and environmentally friendly Design

- Light weight design with aluminum carbody
- Vehicle concept with a recyclability of app. 95%, proven by environmental impact study
- Materials with low carbon footprint, e.g. innovative floor design made from renewable primary products

Avenio: Better for the environment

- The unique Avenio concept minimizes wheel/rail wear, track noise and jolting.
- The brake system is purely electrical, all the way to full stop, with no abrasion of brake pads and no screeching: reduced fine particles and noise.
- By using on-board energy storage the regenerative drive system can save up to 30% of the energy.

Selected examples of environmental friendly concepts in Siemens Rail vehicles (2/2)

Desiro ML – Drive ahead into the future

- Uses the equivalent of only 0.2 liters of gasoline per person per 100 km (at 100% passenger load).
- Active motor management and energy storage of DMU version will reduce consumption by up to 40%.
- Diesel-electric drives already meet the future Stage IIIb emissions regulations that go into effect in 2012.

Green light for the most modern train in the world - ICx sets new standards for Intercity traffic.

Replacement of the IC, EC and the ICE 1 & 2 fleet will reduce the energy consumption per seat by approximately 30 Percent (70% of the total DB Intercity fleet).

United efforts - let us fight against waste of resources and climate change!

- Protecting the climate and resources is one of the most important global challenges today.
- Siemens' knowledge and superior products can make a direct and measurable contribution to environmental protection
  – if they are ordered!
- Conclusion:
  Eco-friendly and forward-looking solutions need to be requested and form a major part of the evaluation criteria:

Siemens is ready to deliver!

Contact

Siemens AG

Christian Irmisch

Tel: +49 9131 721303

e-mail: christian.irmisch@siemens.com

Siemens Mobility Division

Nonnendammallee 101 • 13629 Berlin, Germany

www.mobility.siemens.com