

Promoting **clean** public transport

Trolley

Introduction: TROLLEY – Optimised energy use for trolleybus systems

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City of Gdynia (PL)

University of Gdansk (PL)

Barnim Bus GmbH,
Eberswalde (DE)

LVB, Leipzig (DE)

City of Brno (CZ)

Salzburg AG (AT)

TrolleyMotion (AT)

SZKT, Szeged (HU)

TEP S.p.A., Parma (IT)

Policy Challenges in Central Europe

- ▶ **Climate change** is leading to high economic costs
- ▶ **Oil dependency** and **costs of oil** are growing
- ▶ Growth rate of cars and **congestion** is still increasing, in particular Central European Countries face this challenge
- ▶ **Noise and air pollution** is decreasing the quality of life
- ▶ **Demographic change** will reduce public transport use (as the “car generation” is aging)
- ▶ **Urban areas** are again becoming focal points of economic growth, but also suffer from congestion and low environmental quality.

Trolley buses are an intelligent, clean and efficient answer to these challenges!

Qualities of trolleybuses

- ▶ Well established and **effective** answer to current challenges
- ▶ **Zero local emissions** → no air pollution in the city, if using renewable resources for power generation
- ▶ Lowest possible **energy** consumption of non renewable resources (50 % less compared to diesel buses)
- ▶ Recovery of **braking energy**
- ▶ Smallest possible **noise level** in public transport
- ▶ Less vibrations and thus more **comfort** for passenger
- ▶ **Wires mean visibility**, visibility means certainty, safety and reliability for passengers
- ▶ Lower **infrastructure** costs compared to trams



Objectives of TROLLEY

The project **TROLLEY** will:

- ▶ deliver **transferable strategies** for implementation of trolleybus systems
- ▶ develop **innovative ways of promoting** trolleybus systems as environmentally friendly transport mode and thereby
- ▶ “reshape” and update the **image of trolleybuses in Central Europe**

Specific aims of TROLLEY

- ▶ **Optimisation of energy use** both on the vehicle and in the energy network itself by
 - ▶ recovering energy (on-board and off-board)
 - ▶ converting regular diesel buses into trolleybuses and
 - ▶ management of new energy networks
- ▶ **Increasing the efficiency of public transport** by
 - ▶ redesigning and extending of existing trolleybus systems and/or preparation of new trolleybus networks (including studies and pilot measures)

9 Project Partners

- ▶ Salzburg AG, Public transport operator of Salzburg, Austria
- ▶ City of Brno, Czech Republic
- ▶ Barnim Bus GmbH, Bus operator of Eberswalde, Germany
- ▶ TEP S.p.A.: Public transport operator of Parma, Italy
- ▶ Leipziger Verkehrsbetriebe (LVB) GmbH, Public transport operator of Leipzig, Germany
- ▶ City of Gdynia, Poland
- ▶ University of Gdansk, Poland
- ▶ SZKT, Public transport operator of Szeged, Hungary
- ▶ TrolleyMotion Action Group, Salzburg, Austria



Optimised energy use for trolleybus systems

Transnational manual on advanced energy storage

Part 1 ("super caps")

- ▶ Results based on **pilot investment of 7 super capacitors** in Parma
- ▶ Analysis of test results (monthly evaluations of energy savings starting from 05/2012)

Part 2 (network-based energy recovery)

- ▶ Results based on **pilot investment of one network-based energy storage** in Eberswalde
- ▶ Analysis of test results (monthly evaluations of energy savings starting from 02/2012)
- ▶ Comparison of the two storage approaches in TROLLEY

Optimised energy use for trolleybus systems

Handbook on Detailed Diesel Bus to Trolleybus Conversion Principles

- ▶ Based on experiences in Gdynia a **study on technical, operational and energy saving potentials** will be elaborated
- ▶ Additionally based on an **international best-practice review** of diesel bus to trolleybus conversion principles
- ▶ Collection and **analysis of available economical and technical data** on trolleybus conversion principles in Europe (e.g. data from Debrecen, Hungary)

Optimised energy use for trolleybus systems

Reference Guide on Trolleybus-Tram Network Use

- ▶ **Feasibility study** in order to systematically analyse the **consequences, benefits** and **technical requirements** of a **joint use of tram and trolley networks**
- ▶ Study will focus on the following two main aspects:
 - ▶ **Power supply concept** for trolleybus corridors, **necessary construction measures** and **feasible scenarios** of combined power supply for tram and trolleybus systems
 - ▶ **Evaluation of investment and operation costs** of combined power supply for tram and trolleybus systems

Increasing Efficiency of Public Transport

- ▶ **Transnational take-up guide on diesel bus replacement:** including standardised approaches for route selection and efficiency analysis of the trolleybus introduction
- ▶ **Trolleybus Intermodal Compendium:** studies and investment preparation on integration of trolleybuses and tram systems and non-motorised modes

Reshaping Image of Trolleybuses

- ▶ **Joint Trolleybus Declaration:** commitment for the cooperation between the relevant trolleybus stakeholders
- ▶ **E-learning Modules** for “Optimising Energy Use of Trolleybuses”, “Increasing Efficiency of Public Transport” and “Reshaping Image of Trolleybuses”
- ▶ Establishment of a **Central European trolleybus knowledge office**



Thank you for your attention!