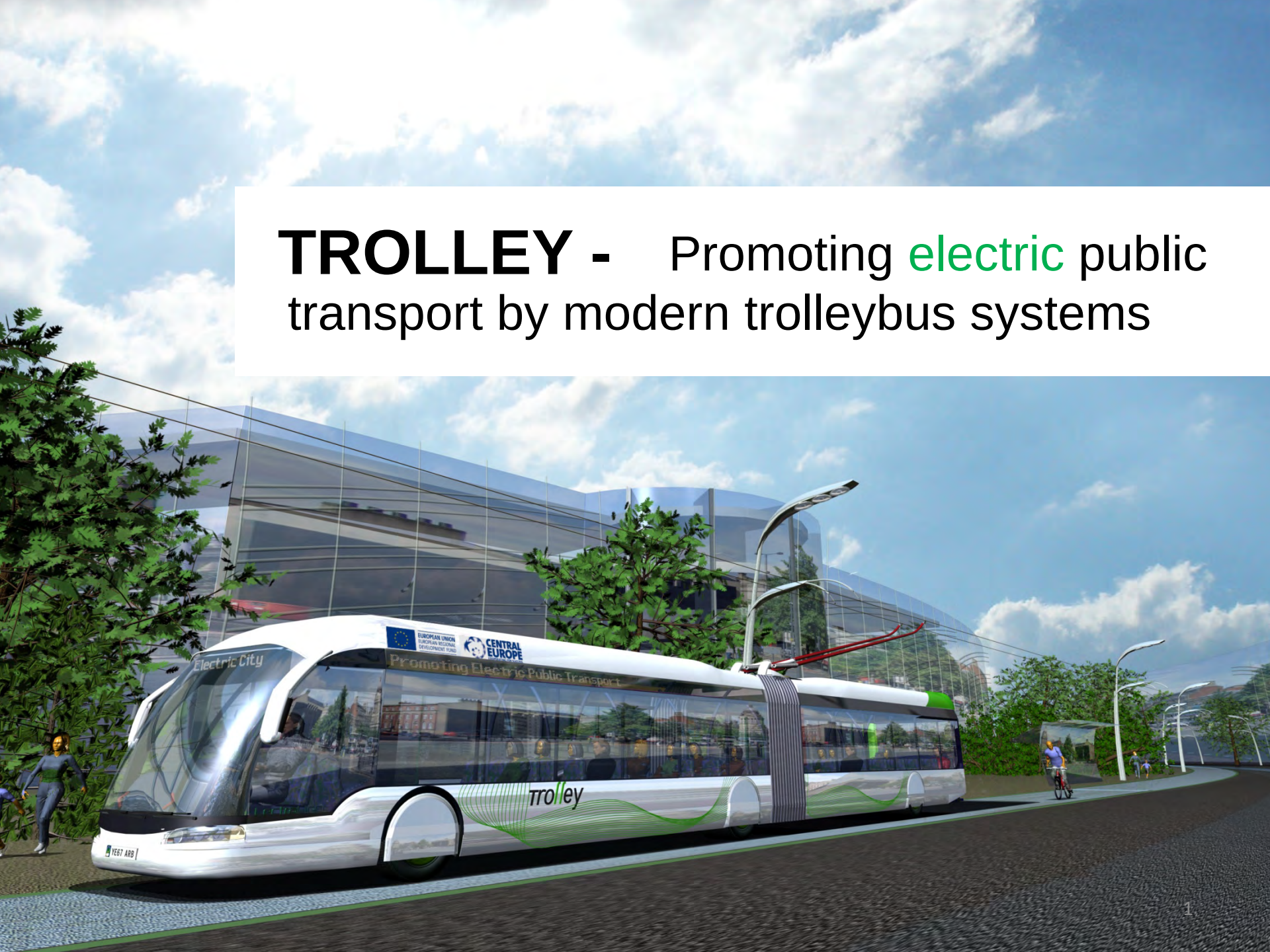
TROLLEY - Promoting electric public transport by modern trolleybus systems



Pro Trolleybus Trend

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- The Trolleybus is a reliable and **ready-to-use transport technology for emobility**, based on continuous technological development and more than 100 years of experience.

- More than **40,000 vehicles** are being operated in about **320 cities, in 47 countries.**

- Numerous new trolleybus systems are planned or currently implemented, for example:
  - Lecce, Pescara (IT)
  - Leeds (UK)
  - Verona (IT)
  - Montreal (CA)

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EU climate and energy package

- Long-term goal for 2050: the **reduction of at least 60 % of greenhouse gas emissions** (from WHITE PAPER: „Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system“, European Commission, 2011).
- Medium-term targets to be met by 2020: identify the **transport sector as one of the key factors** to achieve sustainable reduction of energy consumption and CO_2-emissions.
- Our contribution: a change of the operating system in the transport sector. **Three key levers to focus on**: avoiding traffic, changeover to environmental-friendly means of transport and enhancing efficiency.

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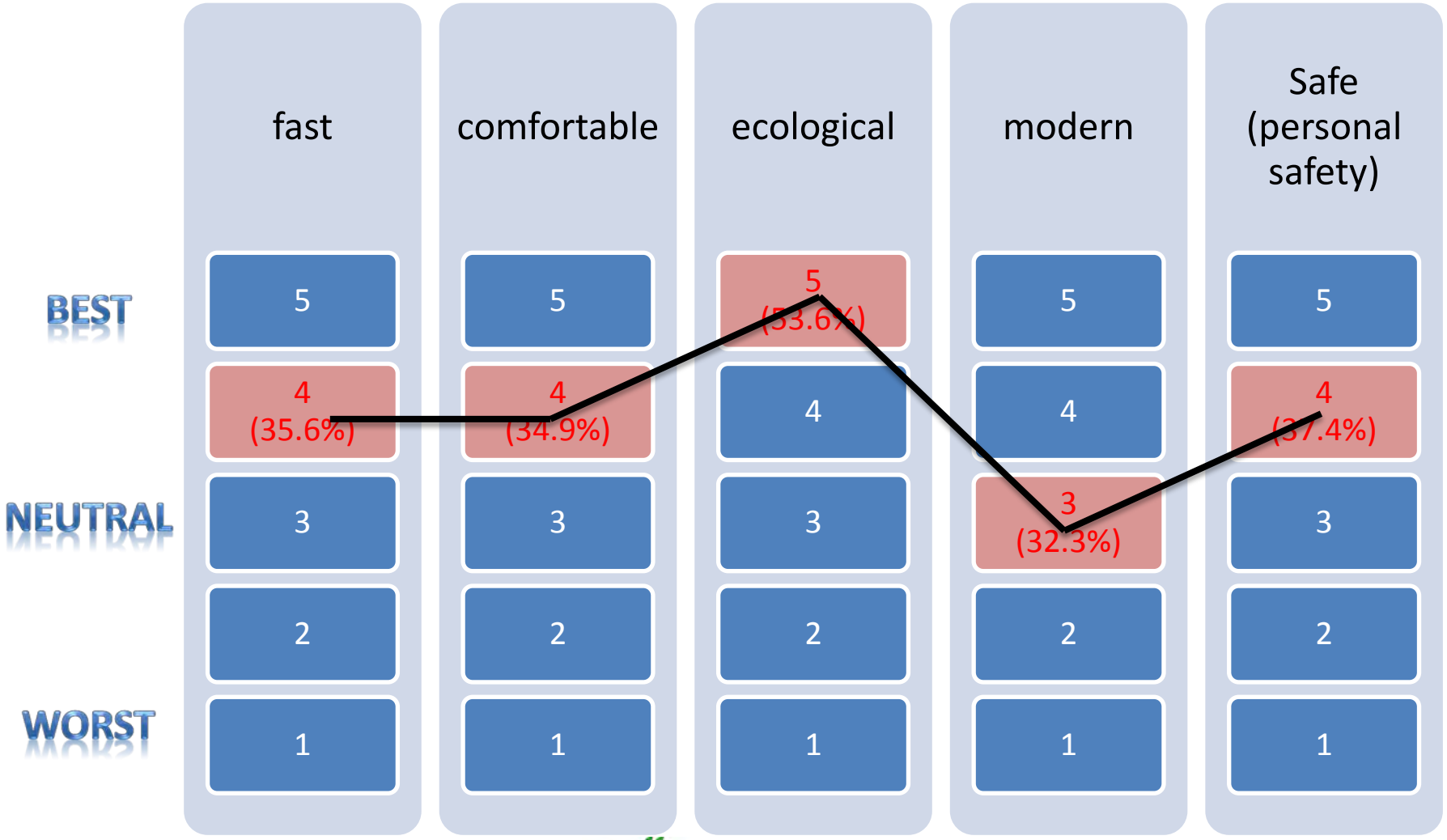
Customer‘s perception of the trolleybus

Survey in TROLLEY partner cities



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Trolleybus – new developments

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New designs and energy storage technologies

New trolleybus for Riad,
Viseon 2011

New trolleybus for Parma,
Van Hool 2012

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Advantages & disadvantages – Trolleybus

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- Lower energy & operating cost
- Visibility: visual presence in public space as orientation, trolleybuses are les involved in accidents
- Strong but smooth acceleration and grade-climbing ability; less vibration
- Zero local emission (air & noise): 100 % environmental- friendly when using renewable energy sources
- Higher investment costs (starting phase) compared to diesel bus systems
- Overhead-wires: Visibility & maintenance, less flexibility due to overhead connection
- Image: old-fashioned & not innovative

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The TROLLEY project

The European project **TROLLEY**:

- delivers **transferable strategies** for implementation of trolleybus systems
- develops **innovative ways of promoting trolleybus systems** as environmentally friendly transport mode and thereby
- reshapes and **update the image of trolleybuses** in Central Europe!

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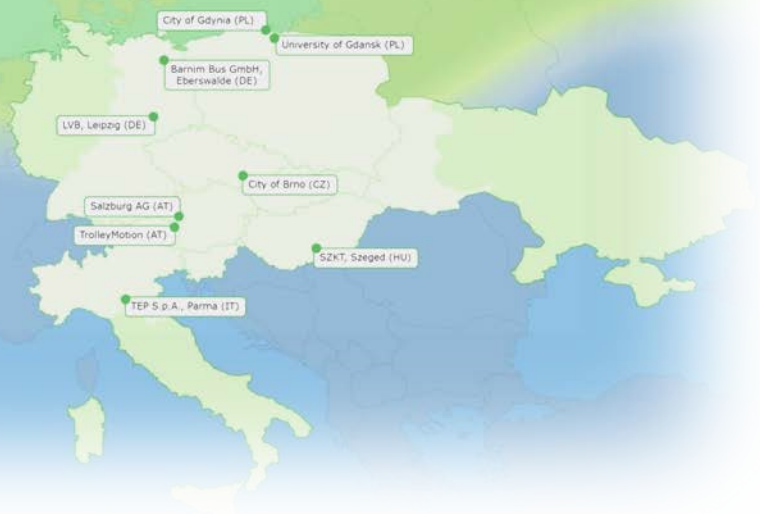
The TROLLEY consortium

- The **TROLLEY** consortium is an **EU funded project** consisting of nine partners located in the EU:
  - Salzburg AG (Austria), Lead Partner
  - City of Brno (Czech Republic)
  - Barnim Bus GmbH, Eberswalde (Germany)
  - TEP S.p.A., Parma (Italy)
  - LVB, Leipzig (Germany)
  - City of Gdynia (Poland)
  - University of Gdansk (Poland)
  - SZKT, Szeged (Hungary)
  - TrolleyMotion, Salzburg (Austria)



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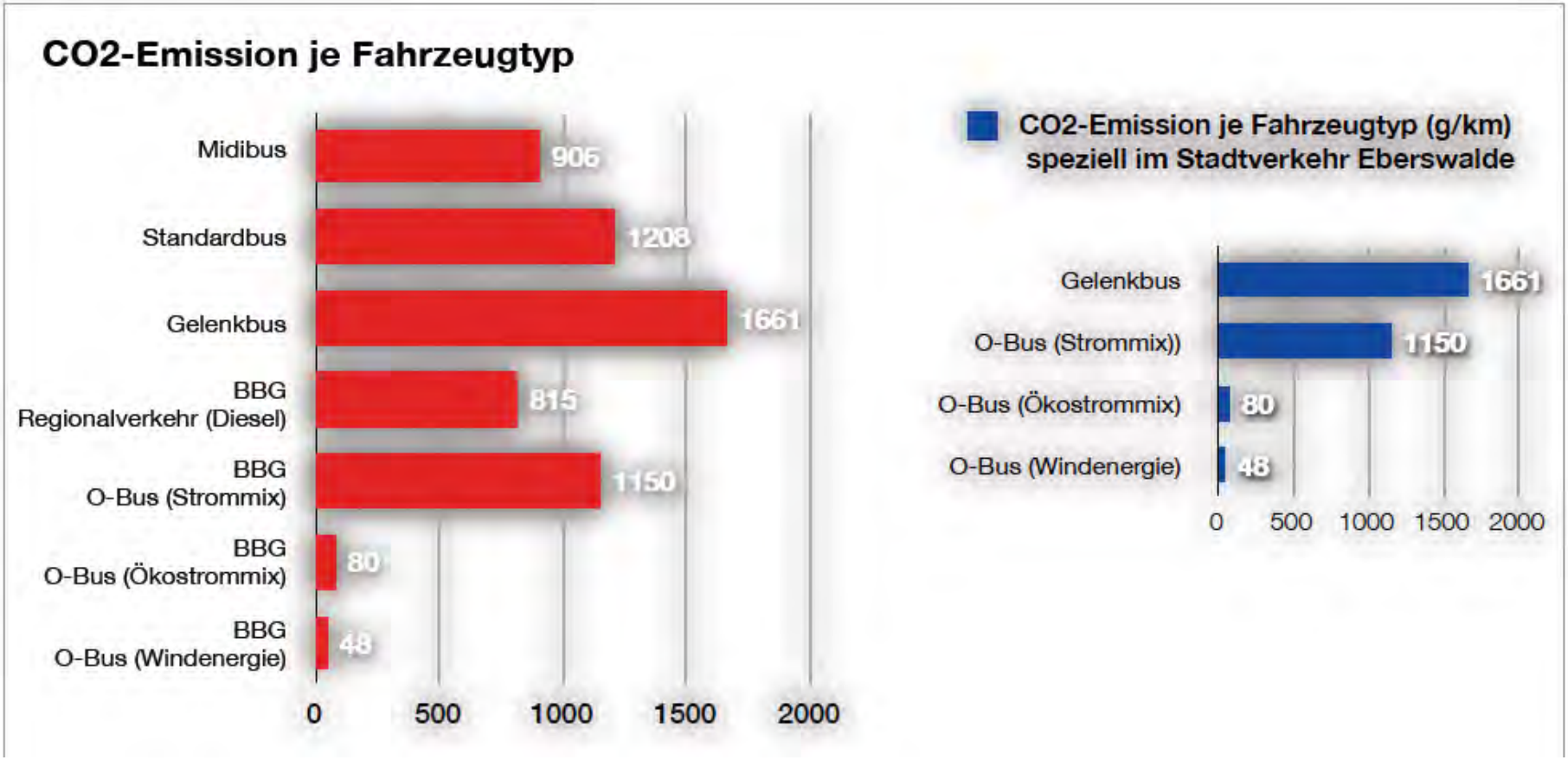
Comparison Trolleybus vs. Diesel bus

Study: Barnimer Busgesellschaft mbH, Eberswalde



Source: PBV

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Comparison Trolleybus vs. Diesel bus

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Study: Barnimer Busgesellschaft mbH, Eberswalde

	O-BUS	DIESELBUS
Energie/Diesel	264.000 €	442.600 €
Fahrer	keine Kostenunterschiede	
Wartung Fahrzeuge	80.000 €	72.000 €
Personal Werkstatt	keine Kostenunterschiede	
Personal Fahrleitung	126.000 €	- €
Wartung Fahrleitung	19.000 €	- €
Fahrzeugversicherung	48.000 €	24.000 €
Investitionskosten Fahrzeug bei Abschreibungszeitraum	37.800 € 18 Jahre	31.000 € 10 Jahre
Sonstige Kosten	keine Kostenunterschiede	
Differenz	**+ 5.200 €**	

FAZIT:

Die Unterschiede liegen in den Kostenblöcken:

- Treibstoff (O-Bus deutlich günstiger)
- Wartung Fahrzeuge (Dieselbus geringfügig günstiger)
- Fahrleitung (Dieselbus keine Kosten)
- Fahrzeugversicherung (Dieselbus günstiger)
- Investitionskosten Fahrzeug (Dieselbus günstiger)

Umgerechnet auf den **Fahrplankilometer** (Status quo Stadtverkehr Eberswalde) beträgt der **Unterschied 0,01 €.**

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TROLLEY investment - “Zero Emission Vehicle“

Europes’ first trolleybus-hybrid for Barnimer Busgesellschaft mbH, Eberswalde, Germany

- Charging the bus battery en route using trolley overhead wires
- Planned distance of overhead wire free sections: up to 5 km
- Possibility to extend the trolleybus network without investing into expensive infrastructure

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The new „ebus“ campaign

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The new „ebus“ campaign, Parma

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The new „ebus“ campaign, Parma

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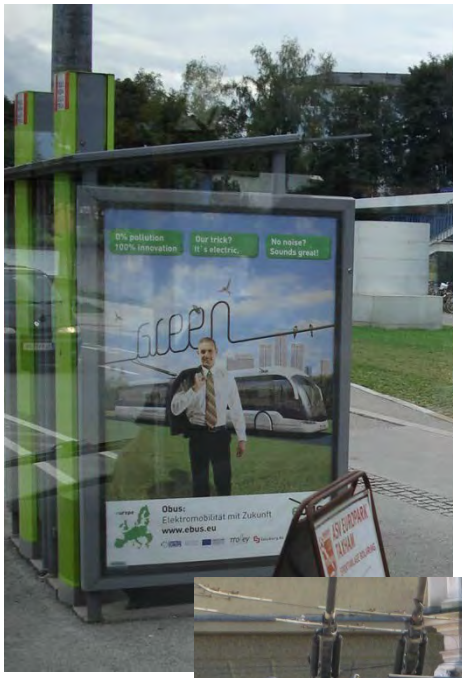
The new „ebus“ campaign, Salzburg



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European Trolleybus Day

- In 2010 the TROLLEY consortium initiated the **European Trolleybus Day**, celebrated on the first Saturday of the **European Mobility Week**
- ETD “starter kits” for approx. 150 European trolleybus cities in March 2013 to promote this initiative and ensure its sustainability beyond TROLLEY’s project runtime

- **TROLLEY’s final conference on 22-23 January 2013 in Szeged, Hungary** incl. presentations of core outputs and main results & TROLLEY Marketing Award 2012 ceremony

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The movie & eLearning courses

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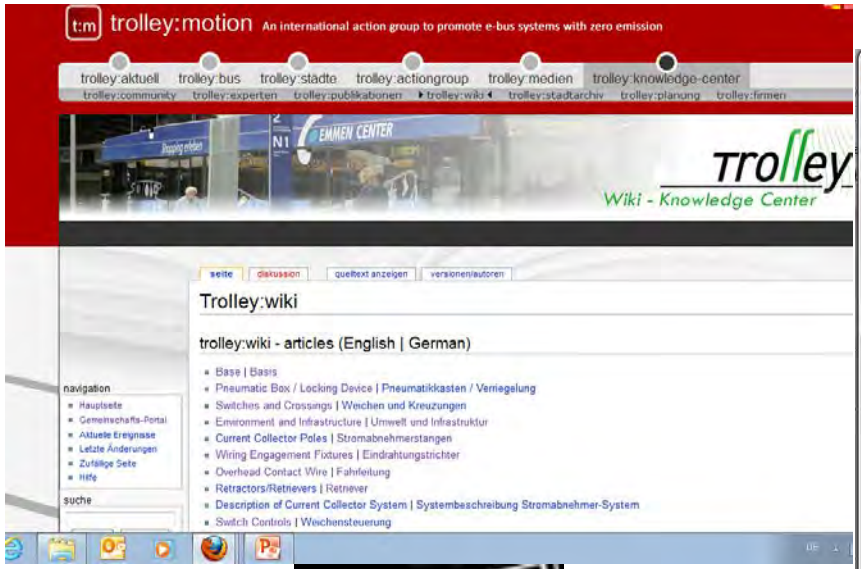
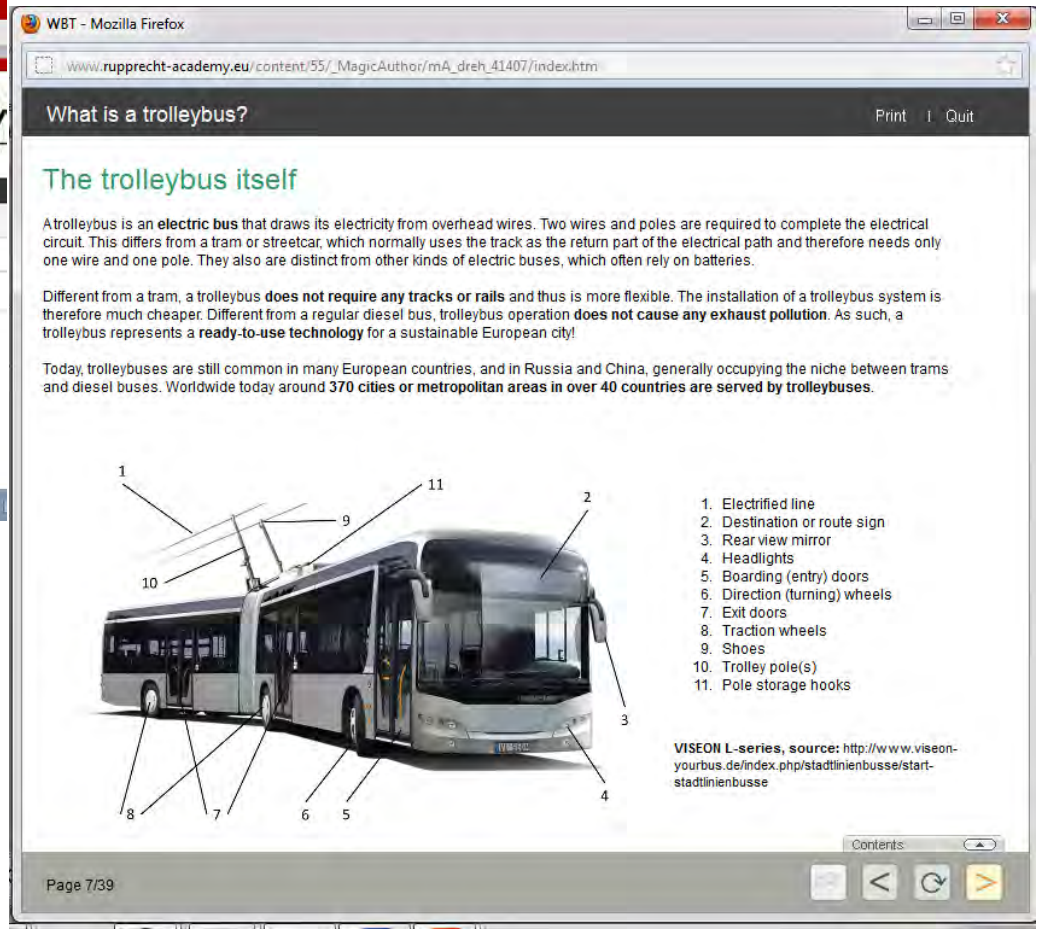
available via TROLLEY project website: www.trolley-project.eu





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The TROLLEY Declaration

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Declaration for Electric Trolleybus Mobility

If you wish to demonstrate your commitment toward trolleybuses, sign the Declaration!

Contact the TROLLEY project manager to get an adapted template.
All signee will be published on the TROLLEY website as supporters of the trolleybus idea (upon consent) and a final list of signee will be sent to the European Commission with an accompanying statement (at the beginning of 2013).
60 signee from city authorities, public transport operators, industry and research so far!

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TROLLEY Research Roadmap

- **Step 1:** identify and summarise problems, concerns, issues and research needs of/for trolleybus systems: November – *December 2012*
- **Step 2:** analyse results of step 1 and identify innovative approaches and technical solutions for future trolleybus systems: *December 2012 – January 2013*
- **Step 3:** compilation of the Future Research Agenda for trolleybus systems and position paper of TROLLEY (incl. technical, institutional, policy etc. recommendations): *January 2013 – February 2013*
- **Step 4:** presentation of the TROLLEY Research Roadmap to decision makers and policy maker in Brussels: *beginning of March 2013*

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Trolleybus systems in smart cities

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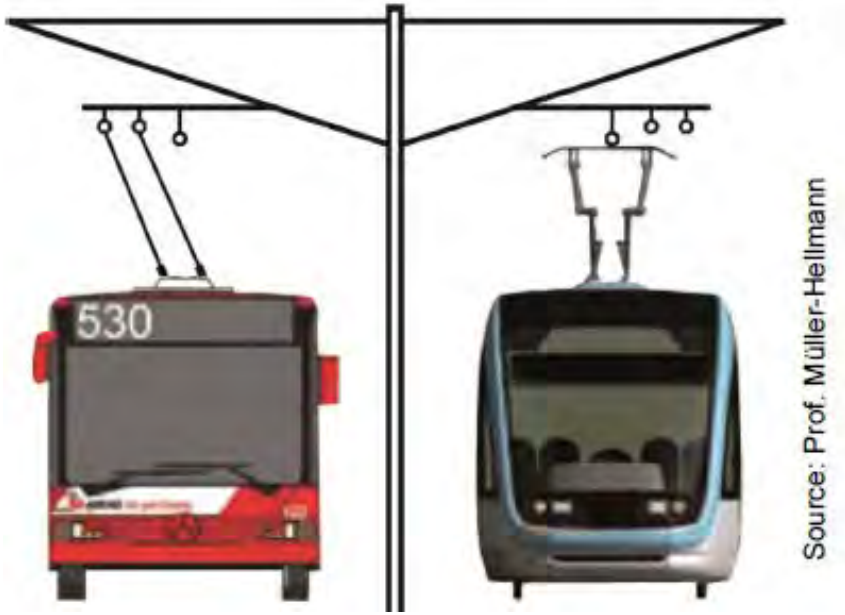
- Trolleybus systems as key factor in the SCCI of the EC
- Public transport with **trolleybus** or tram systems will be a **key-technology area** with a high potential for synergies and the backbone **for smart city solutions** (as reliable and proven electro-mobility solutions that are capable to recharge energy on a big scale into the energy network, e.g. recuperation of **up to 25 % of their energy consumption could be used by other e-modes**)



Source: Prof. Müller-Hellmann

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Read more about TROLLEY, read the “Declaration” & download the campaign

@ **www.trolley-project.eu**

@ **www.ebus.eu**

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Innovative e-mobility in urban transport

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- "ebuses" do not lose energy but **recharge braking energy** and thus save up to 25 % of their energy consumption.
- They are a **ready-to-use transport technology** of the future for urban areas.
- They have the **lowest possible consumption of non-renewable resources** and are 100 % environmentally friendly when using energy from renewable sources.
- Trolleybuses are a **primary mode** to complement **e-mobility transport systems** in cities and suburbs.

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Comfort and safety for passengers

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- "ebuses" operate at the **lowest possible noise** and **vibration** levels in public transport.
- They make cities more livable by running **safely** and **smoothly** and producing **no exhaust fumes**.
- Their strong but **smooth acceleration** and **grade-climbing** ability are highly appreciated by passengers.
- Due to the visibility of the overhead wires the Trolleybus systems are safer as they are **less involved in road accidents** than other means of public transport. Moreover, the "booms" make it easy for passengers to **locate** and to **find** the "ebus".

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Ecological: good air guaranteed

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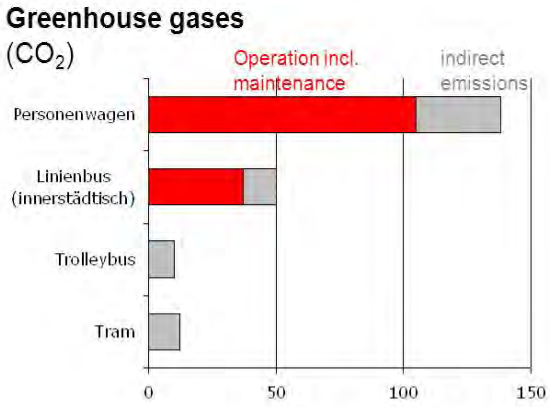
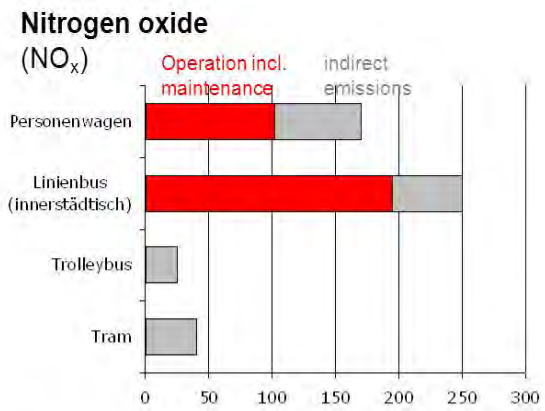
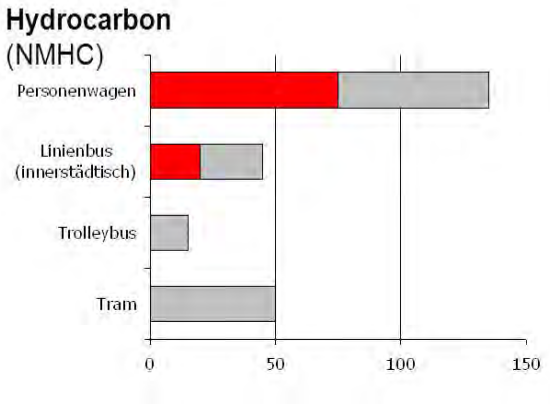
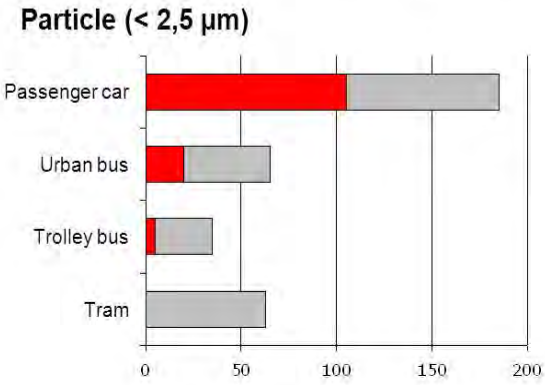
Almost no air pollution during operation, low indirect emissions.









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Competitive with other modes

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- Trolleybuses **safe weight** compared with other public means of transport.
- "ebuses" are more **flexible** and **reliable** because of their **new energy storage technology**. As they can be equipped with **additional power sources** they can carry on when the "booms" are not connected.
- The **lifetime** of a Trolleybus is approximately 50 % longer compared to other buses.
- Compared to trams, Trolleybuses can reach **similar passenger capacity** at much **lower construction costs** (up to 80 % less).
- Realization requires **less time** and produces **less inconvenience** during construction than for a tram system.

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