CIVITAS ELIPTIC 3rd Webinar:
Experiences from European cities in using electric public transport infrastructure for the charging of other e-vehicles

9 April 2018, 11:00 - 12:30
Welcome to the 3rd ELIPTIC webinar!

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<td>Dr. Hartwig von Bredow, von Bredow Valentin Herz</td>
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The Webinar Team

Moderators

Henning Günter, Rupprecht Consult
- Moderator of the webinar-

Lisa Bloß, Rupprecht Consult
- Questions manager-

Panellists

David Talbot, TfL

Oscar Puigdollers, B:SM

Dr. Hartwig von Bredow, von Bredow Valentin Herz
Phone or internet connection

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Access Code: 976-804-002
Audio PIN: 12
Already on the call? Press #12# now.

Talking: Gabi Wegeler
Participation tools

Mute

Raise your hand

Questions
Quick poll: User background

• What kind of organization do you represent?
ELIPTIC – electrification of public transport in cities

- Horizon 2020 Research and Innovation project
- 33 partner in 8 Countries
- 20 use cases (demo + feasibility studies)
- Duration, 36 months: 01.06.2015 – 30.05.2018
- Coordinator: Freie Hansestadt Bremen
- Budget: 5,9 Million EUR
Three thematic technology pillars

A. **E-buses**
   Safe integration into existing electric PT infrastructure

B. **Energy efficient electric PT system**

C. **Multi-purpose use of electric PT infrastructure**
20 Use Cases

+ 11 Twinnings

+ User Forum (PTO / PTA)

+ UITP, POLIS, VDV, ASSTRA, LCVP

Project coordinator: Bremen
Project manager: Rupprecht Consult

- Public transport company/operator
- Research and innovation
- Industry
- Associations
# Scenario comparison of bus charging technologies

<table>
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<tr>
<th>Charging concept</th>
<th>Battery concept</th>
<th>Low Capacity / High power</th>
<th>Medium Capacity / Medium Power</th>
<th>Large Capacity / Low Power</th>
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<tr>
<td>Opportunity-Charging</td>
<td>Public Grid</td>
<td>Barcelona</td>
<td>Oberhausen Leipzig Warsaw</td>
<td>Bremen</td>
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<td></td>
<td>Tram/Metro grid</td>
<td>Brussels</td>
<td>Warsaw London</td>
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<td>Overnight-Depot-Charging</td>
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<td>Charging on route</td>
<td></td>
<td>Gdynia</td>
<td>Szeged Eberswalde</td>
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### Passenger car
- **Daily usage**: < 1 hour
- **Engine size**: Small (- medium)
- **Fuel**: 50 - 60% Diesel
- **local pollutants**: Diesel: PM$_{10}$ + NO$_2$
- **Annual fuel consumption**: 500 l gasoline/Diesel
- **CO$_2$ emission p.a.**: ~ 1.2 to
- **Total impact**: Equals to app. 100 electric passenger cars

### Bus (18m)
- **Daily usage**: 12 - 16 hours
- **Engine size**: big
- **Fuel**: 95 – 98 % Diesel
- **local pollutants**: Diesel: PM$_{10}$ + NO$_2$
- **Annual fuel consumption**: 40,000 l Diesel
- **CO$_2$ emission p.a.**: ~ 100 to

### Total impact
- **Factor 100**: Equals to app. 100 electric passenger cars
Factor 100

...but not 100 fold financial support!

< 1 hrs/d

12-16 hrs/d
Pillar C - Multi-purpose Use of electric public transport infrastructure
Electrification of public transport

Reduce costs and energy consumption of electric public transport by optimising infrastructure and rolling stock

- Trolleybuses as „backbone“ of transport chains
- Micro-Mobility & Vehicle-Sharing to complete start & end mile
Multi-purpose public transport grid with integrated REs

Source: RWTH Aachen
Pillar C use cases: guiding questions

- Where to place multi-purpose charging infrastructure?
- What different parties need to be involved?
- What are the economic advantages to use existing electric PT infrastructure? Is there a business case?
- What are the legal barriers preventing the multi-purpose use of PT infrastructure?

**Bremen:**
C.1: From uniqueness to system: Extension of existing multimodal mobility hub station

**London:**
C.2: Use of metro sub-station for (re)charging TfL fleet vehicles (e-cars & e-vans) and zero-emission capable taxis

**Barcelona:**
C.3: Use of metro/tram infrastructure for recharging e-cars (municipal fleet and private e-cars)

**Leipzig:**
C.4: Use of tram network sub-station for (re)charging e-vehicles

**Oberhausen:**
C.5: Fast-charging stations for e-cars powered from the tram network

**Szeged:**
C.6: Multipurpose use of infrastructure for (re)charging trolley-hybrids & e-vehicles
Any questions?
## Our next presentation

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Experiences from Oberhausen, Germany
Separated route for the mixed operation of trams and buses

→ Good solution: Opportunity charging
Tram-powered e-bus charging stations (at Sterkrade station)
Extension of the bus charging device with 3 fast chargers for e-vehicles

Re-selling energy to private customers to charge e-cars
Experiences from Oberhausen

Main issue: calibrated/standardized DC metering system not available

- 18 months-long struggle with gauging office/bureau of standards („Eichamt“) to receive permit

- Result: exceptional and preliminary permit – charging allowed with the help of vouchers (1x charging - 15€; cannot be calculated by time or per kWh)

- Need for new regulations + funding for DC infrastructure + investments/research by charging infrastructure manufacturers necessary
Concluding remarks
Preliminary results from the ELIPTIC experience: currently existing barriers in the field of multi-purpose charging

- It is **technically possible** to use tram/ metro/ trolleybus energy infrastructure to charge other e-vehicles
- The **internal use of energy is less complicated** (ex. London) than re-selling energy to third parties (ex. Oberhausen)
- Many **uncertainties** stemming from the **shortcomings of the current energy law** (taxation, administrative requirements, measuring/ distinction)
- Whether there is a **business case** depends on various factors (time of charging, energy capacities of grid, distance to substations, etc.)
- **Needs assessment/ demand estimation**: suitable locations; what and where is demand for electric charging points? (ex. Barcelona)
- **Technical constraints**: Voltage stability concerns, lack of charging systems/ chargers on the market (few manufacturers), lack of standardised DC metering systems for billing and charging
Thank you for your attention!

Join us at the ELIPTIC Final Conference, Bremen, 26/27 April, Registrations open

http://www.eliptic-project.eu/events/eliptic-final-conference

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