SLAM
Schnellladennetz an Achsen und Metropolen
Fast-Charging Network for Axes and Metropolises

Dipl.-Ing. Waldemar Brost

Fuels of the Future 2017
Berlin | 24th January 2017
Selected goals of project SLAM

• Analysis and identification of the criteria for an ideal site for fast-charging stations
• Implementing a simulation tool to determine potential sites for fast-charging stations
• Investigating the impact of the fast-charging network on the power grids in Germany
• Developing a research charging network funded by private investors (€20.6 m; ca. €17 m in the fund)
• Conducting user studies at the charging network
• Duration: Jan. 2014 - Aug. 2017
**Selected goals of project HansE**

- Installing 50 charging points in the metropolitan area of Hamburg (MAH) (regular and fast-charging stations)
- Selecting the sites with a site assessment model and strategy concept transferable to other regions
- The project partners want to make the entire MAH region reachable by electric vehicles.
- Valuable practical experience from the existing CI in the City of Hamburg can be transferred to the MAH region.
- Duration: Mar. 2015 - Dec. 2017
Further projects in the context

Countrywide Fast-Charging Network

- Quantity structure of High-Capacity Charging Stations
- Publication of the results in „Nationaler Strategierahmen über den Aufbau der Infrastruktur für alternative Kraftstoffe als Teil der Umsetzung der Richtlinie 201/94/EU“ (9th November 2016, Berlin)

Further application of the model STELLA for...
STEELA – Study Areas

German model

Model region Stuttgart

HansE

Transfer of knowledge (Parameters, connection models)

User study

Power grid
STELLA – Main Indicator Groups

Transport networks

User traits

User behavior

Vehicles and CIs

Site potential
Demand in levels

The demand determined at the level of the municipal associations is allocated to the other levels.

Further data, such as commuter traffic, is added to the calculation at the level of urban quarters.
Classified network

Constitutes the basis for network analyses and numerous depictions.

Covers all of Europe and is increasingly simplified the further it is from Germany.

Axes are linked with international traffic. Allows for consideration of international connections.
Spatial distribution

At the regional level, a connection between the municipal associations is formed.

They represent linkages independently from administrative boundaries and take a realistic view on traffic.

Database: continuous spatial monitoring by the BBSR
Geometrical Basis: BKG, municipal associations/ urban-rural-regions 31. Dec 2013
Editing: P. Kuhlmann
Bipolar consideration of the trip relations

By identifying catchment areas and sensitivity to detours, the acceptance level of individual sites can be determined.

Comparison of the MiD* trips – difference between the trips to and from the destination.

* Mobilität in Deutschland - Mobility in Germany
Continuous Survey on Travel Behaviour
Duration of Stay

Frequency of the duration of stay at a place of activity.

Every point of interest (POI) can be selected as a destination with a specific duration of stay.

On this basis it is possible to describe the need for normal or fast-charging infrastructure.

* selection an Points of Interest and number (March 2016)
Accessibility radii

The existing and planned sites are analyzed in the network regarding their spatial impact. The resulting coverage is passed on to further model steps.
Settlement structure

STELLA calculates potentials for charging infrastructure at existing developed areas at national level.

This approach is flexible in terms of temporal resolution and spatial components.
Partial output of indicators

Quantifying fast-charging points at the level of municipal associations

250,000 BEVs in 2020 based on settlements
Distribution of the potentials on potential areas

Potential of the settled area within the urban quarters

Mesh width 250m

<table>
<thead>
<tr>
<th>Potential of the settled area within the urban quarters</th>
<th>high potential</th>
<th>medium potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>very high</td>
<td>high</td>
<td>medium</td>
</tr>
<tr>
<td>high</td>
<td>medium</td>
<td>low</td>
</tr>
<tr>
<td>medium</td>
<td>very low</td>
<td></td>
</tr>
</tbody>
</table>
STELLA – Summary

Research questions covered
• positioning charging infrastructure
• nationwide / demand-based calculation
• charging point demand at the sites
• different charging standards (11, 22, 50, 150, 350 kW)
• users mobility demands
  (number, distance and purpose of trips, trip chains)

Input data
Transport networks, track loads, spatial structure, user behavior, POIs

Model output
Spatially detailed sites for charging infrastructure throughout Germany (250m)
Thank you for your attention

Institute of Urban and Transport Planning
Chair: Univ.-Prof. Dr.-Ing. Dirk Vallée

Mies-van-der-Rohe-Straße 1
52074 Aachen

Telefon: +49 / 241 / 80 - 25200 (office)
Telefax: +49 / 241 / 80 - 22247
Mail: institut@isb.rwth-aachen.de

www.isb.rwth-aachen.de

Contact

Waldemar Brost
Telefon: +49 / 241 / 80 - 25235
Telefax: +49 / 241 / 80 - 22247
Mail: brost@isb.rwth-aachen.de

Cover photo: Waldemar Brost
Pictograms: icons8.com
References


DDS (2014): PLZ8 Deutschland Grenzen, PLZ8 Deutschland XXL. Data Services GmbH. Karlsruhe 2014


EuroRastpark in Lippetal

1 x CHAdeMO - 50 kW
4 x Combined Charging - 50 kW
2 x Typ 2 43 kW
2 x Typ 2 22 kW