

# - Connected E-Mobility -

B. Born, M. Günther, B. Jähn, S. Müller, S. Scherer,  
A. Temmler & J. Teuscher

## Motivation

Alternative mobility concepts are able to reduce the CO<sub>2</sub>-emission and fine dust pollution [1]. This reduction could be increased through the integration of renewable mobility systems and the connection of them in an extensive traffic concept, especially in an urban environment.

Today over 2,000 employees are working at Technische Universität Chemnitz at four different sites. An intelligent charging infrastructure and a fleet of electric vehicles and pedelecs have been put in operation in a pre-project in 2013 [2] in order to guarantee a renewable mobility service for employees.

## Objectives

Based on the pre-project [2] the objectives of ECoMobility are the **implementation and evaluation** of an innovative and **multimodal mobility concept** by means of the integration of electric vehicles, pedelecs and the public transport in an integrated mobility system at the example of the Technische Universität Chemnitz. The research is concentrated on four main interdependent fields: **ECo-type adaptive**, **E-Connected**, **ECological** and **Economic**.

## Project structure

### ECo-type adaptive

Groups of persons with different mobility styles are motivated by incentives targeted to energy-efficient mobility and usage behavior.

research interests:

- analysis of user acceptance, driving behavior, attitude and adaptation for **energy efficient driving (i. e. eco-driving)**
- development of a comprehensible, user-friendly and adaptable user-interface

### E-Connected

Providing and integrating technical system components.

research interests:

- fast data processing
- prediction of **energy consumption** and state of charge

### ECological

By analyzing the traveling data of all vehicles, new strategies for charging systems are going to be developed with respect to environment protection and efficient energy consumption.

research interests:

- implementation of **ecological charging performance** with maximum portion of produced renewable energy
- connecting an electric **energy storage** to the charging infrastructure

## ECoMobility

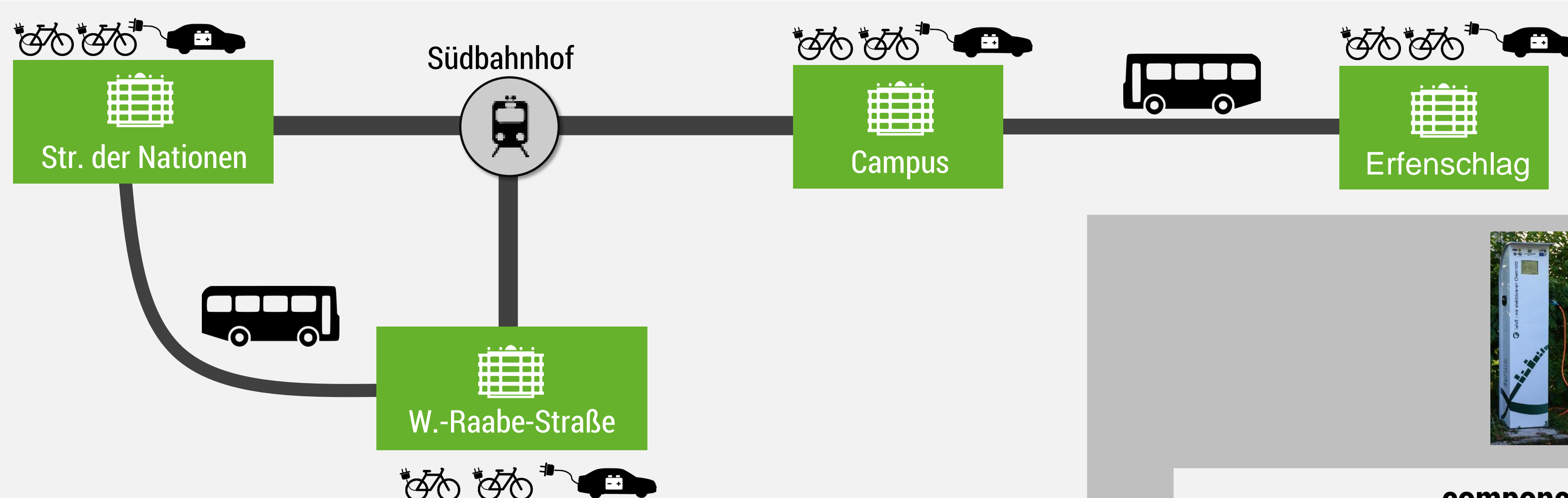
The objectives are to examine the **economic efficiency** of innovative connected mobility concepts from the point of view of **all involved market actors** as well as to develop viable **business models** for realizing the complete system.

research interests:

- modeling potential **value adding structures** of market participants and deriving business models
- formulating and (further) developing appropriate instruments for economic valuations of connected mobility concepts
- **evaluating the economic efficiency** of selected decision alternatives for designing the mobility concept and its individual elements

### Economic

## Methods



The employees of the Technische Universität Chemnitz will use four Smart Electric Drive, eight pedelecs and the free access to the public transport for their official channels.

### during the field tests:

evaluations by experts, longitudinal user-interviews and questionnaires, focus groups, market analysis, usability tests, data logging and routing

**charging infrastructure:**

- authentication
- charging energy

### components of realization

**mobility assistant:**

- smartphone
- web
- booking

**mobility platform:**

- Smart Electric Drive
- pedelecs
- public transport

## References

[1] Umweltbundesamt (2016). *Schadstoff- und Treibhausgas-Emissionen des Straßenverkehrs*. Retrieved from: <https://www.umweltbundesamt.de/daten/verkehr>

[2] Langer, D., Bauer, S., Dettmann A. & Kühnert, D. (2015). *Nachwuchsforscherguppe fahrE: Konzepte für Multimodale Mikromobilität unter Nutzung lokaler regenerativer Energien*. final report Technische Universität Chemnitz, Chemnitz, Germany.

