

Consortium - Industry & Science

The project consortium consists of eight partners that bring in their competence from complementary fields. The industrial partners Adam Opel GmbH, Daimler AG, Robert Bosch GmbH, SAP AG as well as the Stadtwerke Karlsruhe (Karlsruhe's municipal utility) cooperate with the research institutions Fraunhofer Institute for Systems and Innovation Research (ISI) and Karlsruhe Institute of Technology (KIT). The consortium is guided by the project coordinator EnBW Energie Baden-Württemberg AG.

The KIT is represented by a total of 11 chairs from 3 departments. Therefore, the interdisciplinary skills and perspectives enable it to bring in the wide-ranging competence in the fields of applied and theoretical informatics, software design, law, energy economics, electric energy systems, high voltage technology, electrical engineering as well as telematics and information management.

ICT FOR ELECTROMOBILITY

Supported by:



on the basis of a decision
by the German Bundestag



BOSCH
Technik fürs Leben



Contact

Karlsruhe Institute of Technology (KIT)
Institute of Applied Informatics and
Formal Description Methods (AIFB)

Prof. Dr. Hartmut Schmeck
Project Spokesman at the KIT

KIT-Campus South
Kaiserstr. 89
76133 Karlsruhe

Phone: +49 (721) 608-4242
Fax: +49 (721) 608-6581
E-Mail: harmut.schmeck@kit.edu

<http://meregiomobil.forschung.kit.edu>

Publisher

Karlsruhe Institute of Technology (KIT)
Universitätsbereich
Kaiserstraße 12 | 76131 Karlsruhe

As of April 2010

www.kit.edu



**ELECTROMOBILITY IN THE ENERGY SYSTEM
OF THE FUTURE**

<http://meregiomobil.forschung.kit.edu>



MeRegioMobil

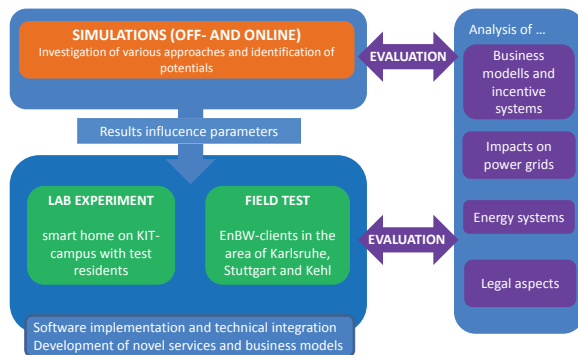
ICT FOR ELECTRIC MOBILITY

As part of its second economic stimulus package, the Federal Ministry for Economics and Technology (BMWi) carried out the technology competition "ICT (Information and Communication Technology) for Electromobility¹". The goal of this initiative of the Federal Government is the development and evaluation of ICT-based key technologies and services for the integration of electric mobility into the existing energy and transportation system.

MeRegioMobil has been chosen as one of the winning consortiums.

PROJECT STRUCTURE

The project is subdivided into the following working areas.



Laboratory experiment

Electric vehicles will be integrated into a research and demonstration laboratory in order to facilitate the practical application of the developed concepts in a realistic setting.

The laboratory is a prefabricated house with a floor area of about 60 m² and represents a prototype for a smart home with its characteristic elements, such as decentralized power plants, consumer loads, and energy storage systems.

Among other energy sources, photovoltaic panels as well as a micro combined heat and power plant will be put in place. Typical electric appliances, such as a washing machine, a dish washer, or a refrigerator, are supposed to serve as consumer loads. The electric appliances employed in the project represent both conventional commercially available devices as well as intelligent and therefore controllable ones. A battery-charging station will also be integrated into this laboratory, so that electric vehicles can be incorporated into the smart home both in forms of consumer loads and electrical storage systems.

As a buffer, the battery can store surplus renewable energy during off-peak hours and feed the stored electrical energy back into the grid when needed in order to respond to peak loads.

Field test

The technical and economic concepts validated during the laboratory test and proved to be feasible in the project will be tested within the scope of a large-scale field test planned in the area of Karlsruhe, Stuttgart, and Kehl.

The study of cross-border roaming will be carried out in cooperation with "Electricité de Strasbourg". The objective of the field test is to construct and test the technical infrastructure as well as novel value-added services that will support energy and storage management.

Simulations

As a part of the MeRegioMobil project, simulation components will be developed and employed, so that a large variety of concepts elaborated during the project runtime can be closely examined and analyzed, including the identification of their potentials.

Based on these results, different concepts can be singled out and tested during the laboratory or field test, with the results being thus verified. In addition to this, alternative approaches can be analyzed in a simple and quick manner.

The simulation scenarios comprise analyses of con-

sumption behavior, business models, underlying information and communication technology (ICT system), long-term consequences as well as effects arising from the large-scale implementation of the developed concepts. The simulations will be carried out in coordination with real experiments, parameters of the simulation components being constantly adjusted and improved in accordance with the data gained from the laboratory and field test.

Evaluations

The concepts and technologies developed in the laboratory and tested during the field experiment will be subject to a constant evaluation that will be dealing with analysis and assessment of business models and incentive systems, impact on the power grid, energy system issues as well as legal aspects. The results of the evaluation will be continually incorporated into the parameters of the simulation and laboratory experiment as well as into the implementation of the field test, so that best possible findings can be derived.

OBJECTIVES

The ultimate goal of the MeRegioMobil research project is to efficiently integrate mobile electrical storage systems in vehicles into the existing energy system by means of developing and evaluating ICT-based key technologies and services.

To achieve this goal the following aspects are to be worked on:

- Design and evaluation of innovative business models, software architectures, and incentive systems.
- Development of methods for an adaptive cooperation among laboratorial components.
- Investigation and development of intelligent battery-charging strategies as well as novel energy-related telematics services.

¹ The terms „electromobility“ and „electric mobility“ are used synonymously in this text.