The Consortium

To continue the funding program “Information and Communication Technologies for Electric Mobility”, the Federal Ministry of Economics and Technology launched the new technology competition “Information and Communication Technologies for Electric Mobility II – Smart Car – Smart Grid – Smart Traffic” in spring 2011. The funding program of about EUR 77 million in total volume is based on previous results and extends the spectrum of topics covered by the “smart car” aspect.

The partners of the intelligent Zero Emission Urban System – iZEUS – project are ads-tec, Daimler, EnBW (coordinator), Fraunhofer, KIT, Opel, PTV, SAP, and TWT, the objectives being research, development, and practical demonstration in the areas of energy, vehicle, and traffic, the focus lying on smart traffic and smart grid.

KIT is represented by eleven chairs of three departments. Via this interdisciplinary approach, it contributes its competencies in applied and theoretical informatics, software design, law, energy technologies, electric energy systems and high-voltage technology, electrical engineering, telematics, and information management.

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ICT FOR ELECTROMOBILITY

Project: iZEUS
intelligent Zero Emission Urban Systems

SMART GRID - SMART TRAFFIC
Services for Electric Mobility

KIT - University of the State of Baden-Wuerttemberg and National Research Center of the Helmholtz Association
The Project

Area-wide Electric Mobility
The supraregional concept Southwest represents the nucleus of future traffic routing and planning. It integrates electric mobility in private and urban commercial transport.

Value-added Services
Innovative value-added services give rise to a homogeneous, multi-modal smart traffic concept to be developed under the project and tested and demonstrated in a fleet test.

Network Services
Integration of traffic and energy systems by information and communication technologies will allow for roaming and innovative charging schemes under the smart grid concept to be developed. At the same time, integration of renewable energy sources will be enhanced and distribution networks will be stabilized by decentralized energy and charge management.

Standards
In parallel, the legal framework and standards will be further developed by political and normative recommendations of actions.

KIT in the Project
KIT studies smooth integration of electric mobility in the energy system without stressing the grid. Furthermore, it supports the fleet test by the development and supply of a services platform. In the field test, users can address various services. The joint e-mobility platform serves as an interface or data exchange system for various services to communicate with each other.

Fleet Test

Development and supply of an open e-mobility services platform as an interface and data exchange system for the fleet test

Conceptual design and test of various value-added mobility services, such as energy-efficient routing, finding and reservation of nearest charging stations or visualization of the remaining driving range

Development of a smart phone app as an interface between users and the services platform for interactive participation in the field test

Technical and economic analysis of the energy system and sociological research into customer acceptance and user behavior in the fleet test (the focus lying on commercial traffic)

Analysis of legal and economic boundary conditions in terms of data protection, calibration legislation, and law of evidence relating to the demand side management of electric vehicles as well as derivation of recommendations for action

Energy Smart Home Lab

Intelligent charge management with an electric vehicle capable of feeding electricity back into the grid based on the new ISO/IEC 15118 standard

Optimization of the load profile by an intelligent control of electric/thermal household appliances and an electric vehicle capable of feeding electricity back into the grid based on an adaptive energy management system (EMS)

Living phases to validate optimized and user-friendly EMS approaches, the focus lying on the exploitation of the user’s energy flexibility and acceptance studies

Quick charging of electric vehicles without adversely affecting the grid using additional stationary energy stores

Development of a charge current converter to test the compensation deformed power and use of a H-bridge for simulation of several (instable) grid situations

Further development of incentive concepts for the optimum use of renewable energies in connection with electric mobility

Stepwise integration of other regional centers beyond the key area of Stuttgart-Karlsruhe

Integration in existing projects, such as the Stuttgart Model Region or CROME project, as well as in the Cluster of Excellence on Electromobility Southwest