Fraunhofer
IOSB

ADVANCED SYSTEM TECHNOLOGY AST

sMobility
COMMERCIAL

sMobilityCOM - ECONOMICALLY ELECTROMOBILE

ADVANCED SYSTEM TECHNOLOGY AST

Am Vogelherd 50
98693 Ilmenau, Germany

Department of Energy

Dipl.-Wirtsch.-Inf. Oliver Warweg
Phone +49 3677 461-111
oliver.warweg@iosb-ast.fraunhofer.de

Dipl.-Ing. Alexander Arnoldt
Phone +49 3677 461-183
alexander.arnoldt@iosb-ast.fraunhofer.de

www.iosb-ast.fraunhofer.de
www.smobility.net

Supported by:
Federal Ministry for Economic Affairs and Energy
on the basis of a decision by the German Bundestag

Challenge

Due to the high number of vehicles and their typical routes, the home care sector is perfectly suitable as an "early adopter" for electric cars. These companies are extremely cost-sensitive, which is both a challenge and an opportunity. By using innovative vehicles with lower energy costs and a higher annual mileage, the economic efficiency threshold is more likely to be reached. The economical and comfortable use of electric vehicles is the target of the sMobilityCOM consortium.

Targets

As part of the project, an integrated information and communication system for the use of these vehicles is being developed for electro-mobility-based service providers. It combines predictive fleet management with predictive load and charging management. The development follows the needs and requirements of home care services in order to make the use of electric vehicles economical. The research of Fraunhofer IOSB-AST focuses on how a fleet of electric vehicles can be integrated into low-voltage networks both in a grid-friendly and economical manner.

Optimization for a predictive, network and market-oriented load and charging management

The research focus of Fraunhofer IOSB-AST is on the integration of e-vehicles and e-fleets into the network and the market, taking into account a multitude of solution approaches: On the one hand, charging planning with the help of innovative new models, taking into account the deployment planning of electric vehicles (mobility ready on demand). On the other hand, the reduction of grid connection costs within the existing legal framework, which should also enable the deployment-optimised power control (intelligent quarters) of e-vehicles or e-fleets. Further aspects are locally generated renewable energies and the self-consumption optimisation. Within the framework of these approaches:

- existing methods for network analysis and network capacity estimation for low voltage are further developed,
- methods for the optimal operational management for predictive network and market-oriented load and charging management are developed
- and flexibilities of controllable consumers are determined.

Results / Field test

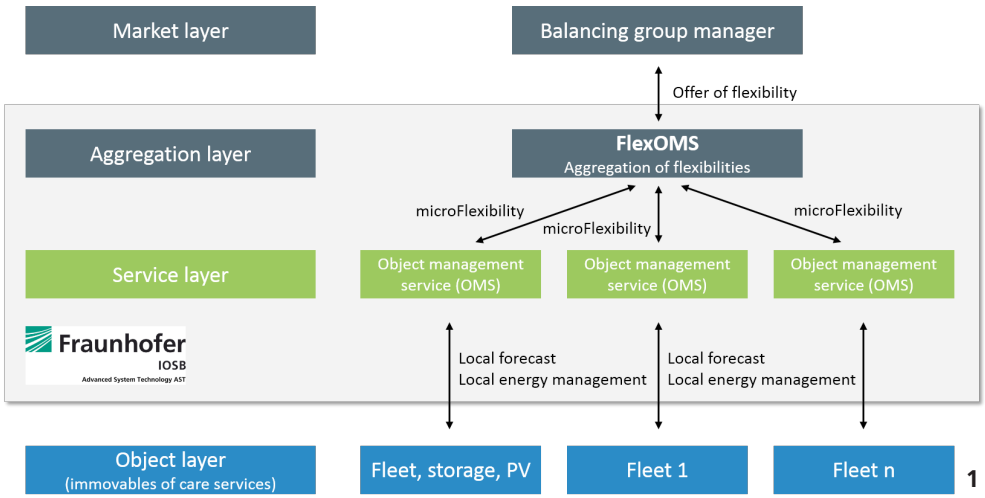
- Predictive restriction planning
- Network analysis for the integration of heterogenous e-fleets
- Optimization for load and object management
  - Consideration of flexibilities
  - Distributed Optimization
  - Modeling of decentralized generation and consumption equipment
- Local, direct and prohabilistic forecast
  - Local loads
  - Local energy provider
  - Local feed-in
  - Deep Learning

Project consortium

- DAKO EDV-Ingenieur- und Systemhaus GmbH
- envia Mitteldeutsche Energie AG
- Fraunhofer IOSB-AST
- HKW Elektronik GmbH
- INNOMAN GmbH (consortium leader)

Appilcation partner

- AWO AJS gGmbH
- Volkssolidarität Thüringen gemeinnützige GmbH
- Lebenshilfe Erfurt Service gGmbH



1

1 *Technical concept of load and charging management*