

Information for journalists and media representatives

“Micro Smart Grid”

Fraunhofer IAO works on key topics, concepts and technologies to develop the integrated mobility solutions of the future. The Mobility and Urban Systems Engineering business unit brings together around 40 employees, including engineers, urban planners, computer scientists, economists and sociologists. This interdisciplinary team works together to develop dynamic system solutions geared toward mobility and the cities of the future.

An overview of Fraunhofer IAO’s research specialties and services relating to integrated mobility and energy concepts:

- Evaluation and design tools (stand-alone applications) to assist in the scaling of energy supply facilities as well as semi-public and public charging infrastructures, including site selection
- Mobility concepts relating to the development of mobility strategies by both businesses and municipalities as well as modular vehicle fleet analysis
- Energy concepts with respect to e-mobility and the linking of all energy flows (energy-management design of micro smart grids and charging infrastructures)
- Hardware solutions based on technological research and innovative rapid prototyping technologies

Electric vehicles and charging systems are not the only key concern; the way these are integrated into the energy grid is also a matter of central importance for energy systems of the future. To this end, researchers in the field of energy and charging infrastructure are developing concepts for the construction and operation of charging infrastructure and higher-level energy systems – and testing out these concepts under real test conditions. That is why a micro smart grid was set up at the Institute Center in Stuttgart: here, the goal was to harness locally renewable energy sources in order to charge electric vehicles and at the same time to establish and optimize a local energy management system. In this process, the scientists test out individual components from different partners within the overarching system in a range of projects – and they develop, simulate and implement optimum operating strategies for generators, storage facilities and consumers. Another major focus is on developing future-oriented energy concepts for application in housing design, neighborhood planning, and urban development.

Further information

Decentralized energy systems in practice

www.microsmartgrid.de

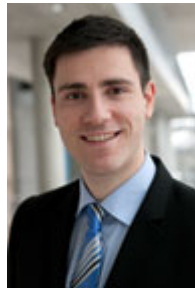
IAO blog posts on "Micro Smart Grid"

<http://blog.iao.fraunhofer.de/das-elektroauto-im-micro-smart-grid-stromspeicher-der-zukunft/>

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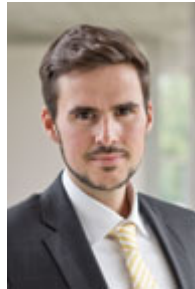


Photo material

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Micro Smart Grid (1) Fully charged in just a few minutes

Europe’s fastest direct current charging station can charge electric vehicles at a capacity of up to 150 kW. The charge point is compatible with a number of electromobility plug-in systems (CCS, CHAdeMO, type 2).



Photo: Ludmilla Parsyak, © Fraunhofer IAO

Micro Smart Grid (2) Fully charged in just a few minutes

Three different plug-in systems (CCS, CHAdeMO, type 2) can be used to charge electric vehicles in just a few minutes at two direct current charging stations.



Photo: Ludmilla Parsyak, © Fraunhofer IAO

Micro Smart Grid (3) Storing hydrogen safely and reliably

Europe’s first liquid organic hydrogen carrier (LOHC) allows 2000 kWh of stored energy to be converted into electricity using a fuel cell.



Photo: Ludmilla Parsyak, © Fraunhofer IAO

Micro Smart Grid (4)

Storing hydrogen safely and reliably

Europe's first liquid organic hydrogen carrier (LOHC) allows 2000 kWh of stored energy to be converted into electricity using a fuel cell.



Photo: Ludmilla Parsyak, © Fraunhofer IAO

Micro Smart Grid (5)

Green energy for the electric fleet

A photovoltaic system with a capacity of up to 30 kW provides green energy for the whole fleet of electric vehicles and generates power for the "Fraunhofer IAO Micro Smart Grid".

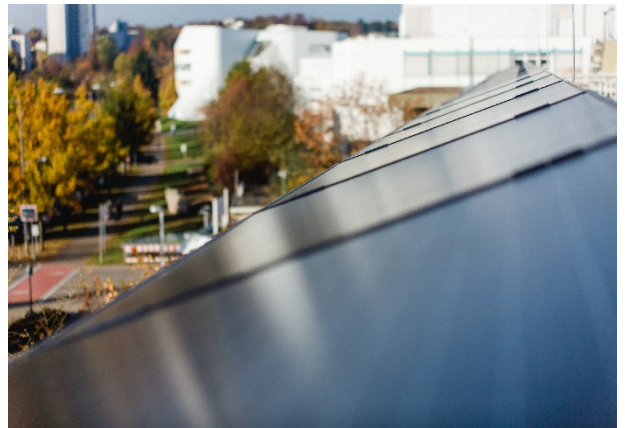


Photo: Ludmilla Parsyak, © Fraunhofer IAO

Micro Smart Grid (6)

Green energy for the electric fleet

A photovoltaic system with a capacity of up to 30 kW provides green energy for the whole fleet of electric vehicles and generates power for the "Fraunhofer IAO Micro Smart Grid".



Photo: Ludmilla Parsyak, © Fraunhofer IAO

Micro Smart Grid (7)

A living lab for top-level research

The Fraunhofer IAO fleet of electric vehicles can be charged at more than 30 standard charging stations with a capacity of up to 22 kW. The Fraunhofer Institute Center in Stuttgart offers researchers one of the largest networked charging infrastructure in Germany.



Photo: Ludmilla Parsyak, © Fraunhofer IAO

Micro Smart Grid (8)

Lithium-ion batteries

The 100-kWh capacity of the lithium-ion battery stores surplus energy from the photovoltaic system and enables dynamic load management.



Photo: Ludmilla Parsyak, © Fraunhofer IAO

Micro Smart Grid (9)

Control center for smart energy management

The "Fraunhofer IAO Micro Smart Grid" can be monitored and controlled from the main control center using a control system developed in-house.

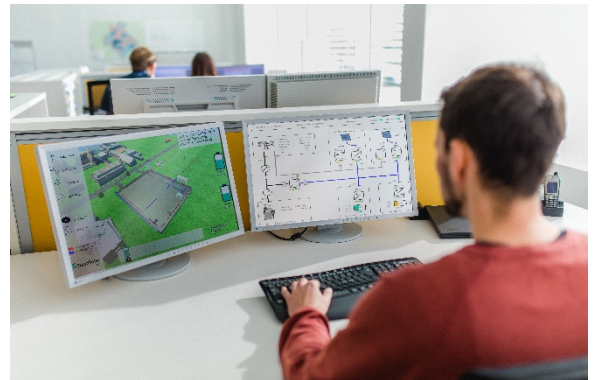


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