

PRESS RELEASE

PRESS RELEASEMarch 13, 2018 || Page 1 | 6

Efficient and Flexible – Fraunhofer ISE Presents Innovations in Storage at the Energy Storage Europe

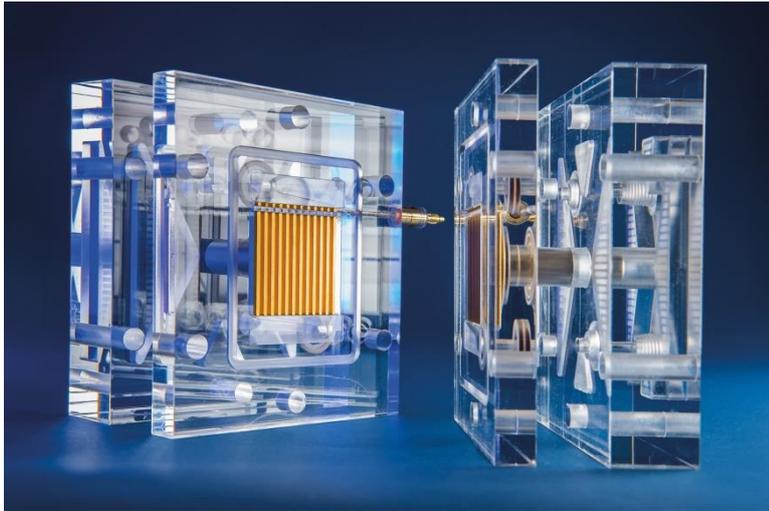
The Fraunhofer Institute for Solar Energy Systems ISE is presenting innovative solutions and projects on renewable energy storage and grid integration at the Energy Storage Europe, the leading international trade fair for storage in Düsseldorf, Germany from March 13-15. Fraunhofer ISE is presenting at a joint booth of the Fraunhofer Energy Alliance (Hall 8b, booth B39). Parallel to the trade fair, the 12th International Renewable Energy Storage Conference (IRES) and the 7th Energy Storage Europe Conference (ESE) are taking place. They address two thematic foci: the scientific research on storage technology, legal frameworks, network and market aspects (IRES) and the business and finance aspects for the rollout of these technologies to the global market (ESE). Fraunhofer ISE researchers are involved in leading conference sessions and presenting their results in the fields of thermal and electrical energy storage, sector coupling and Power to Gas/Power to X.

Fraunhofer ISE is presenting its technologies in “Chemical and Electrochemical Energy Storage” and “Storage Systems / Grid Integration.”

Successful Model: Laboratory Test Cell for PEM Water Electrolysis

The functional cell is pressure-tight up to 50 bar and serves to analyze membrane electrode units for PEM electrolysis. The integrated reference electrode for the anode and cathode are a unique feature.

FRAUNHOFER INSTITUTE FOR SOLAR ENERGY SYSTEMS ISE



PRESS RELEASE

March 13, 2018 || Page 2 | 6

The test cell has been successfully implemented in research projects at Fraunhofer ISE and duplicated for project partners. ©Fraunhofer ISE

Silicon Carbide Inverter: High Frequency at Low Losses

Thanks to the SiC transistors, the three phase inverter for uninterruptible power supplies has 10kW power and a volume of only 5 liters with an efficiency of almost 99 percent. The good dynamic and static characteristics of the transistors enable a frequency that is five times faster than conventional silicon devices without appreciably increasing the losses in the semiconductors. As a result, storage elements can be dimensioned smaller and a compact cooling unit can be implemented to save costs and materials.

FRAUNHOFER INSTITUTE FOR SOLAR ENERGY SYSTEMS ISE



PRESS RELEASE

March 13, 2018 || Page 3 | 6

The inverter enables up to 40 % reduction in the operating costs in a USV system, in comparison to conventional systems. ©Fraunhofer ISE

Into the Grid! Hydrogen in the Natural Gas Grid

The model shows the hydrogen feed-in plant to the natural gas distribution grid that is being demonstrated in the project "Freiburg Communal Energy Network."

The hydrogen generated by a PEM electrolyzer is fed into the local natural gas grid. A gas buffer storage decouples the electricity and gas grids.

FRAUNHOFER INSTITUTE FOR SOLAR ENERGY SYSTEMS ISE



PRESS RELEASE

March 13, 2018 || Page 4 | 6

The demonstration system tests the coupling between the electric and gas sectors, novel components for hydrogen and gas applications as well as operation.
©Fraunhofer ISE

“Cell Booster” – Embedded Electronics for Battery Stacks

The project aim of “Cell Booster” is to optimize the energy and cost efficiency of today’s battery storage and increase the operation and lifetime. A new embedded electronic enables a direct DC/DC conversion, making it possible to couple a 48 V battery pack with a high voltage DC bus of typically 800 V. Advanced modulation modes and a power-dependent frequency adaption enables efficiencies of up to 97%.

FRAUNHOFER INSTITUTE FOR SOLAR ENERGY SYSTEMS ISE



PRESS RELEASE

March 13, 2018 || Page 5 | 6

Singular modules can be exchanged during operation, facilitating a simple maintenance. Defect or old battery cells can be substituted with more modern cells.
©Fraunhofer ISE

The “Netfficient” Inverter: Compact, Modular and Reactive

Contained in a 19” housing with a height of 2 meters, this extremely compact battery inverter provides 1 MW power. The high switching frequency of 40 Hz combined with a predictive control enables the inverter to react much more quickly to fluctuations in the power grid. Therefore, this unit is particularly suitable for fast primary control, peak shaving or self-consumption solutions on an industry scale.

FRAUNHOFER INSTITUTE FOR SOLAR ENERGY SYSTEMS ISE



PRESS RELEASE

March 13, 2018 || Page 6 | 6

The size of the battery inverter is 2 to 4 times smaller than comparable units available today. It has a modular construction with eight slots each with 125 kW power.
©Fraunhofer ISE

The Energy Storage Europe is the trade fair for the global energy storage industry and flexible sector coupling offering the worldwide largest conference program on energy storage solutions and their applications. In 2017 more than 4200 participants from 55 countries and over 160 exhibitors attended.

Link to the trade fair: <https://www.energy-storage-online.com/>

Program: Sessions and talks from Fraunhofer ISE scientists:
<https://www.ise.fraunhofer.de/en/events-and-trade-fairs/energy-storage.html#tabpanel-1304387185>