APR 2023/RE/SN-2

TECH FLASH

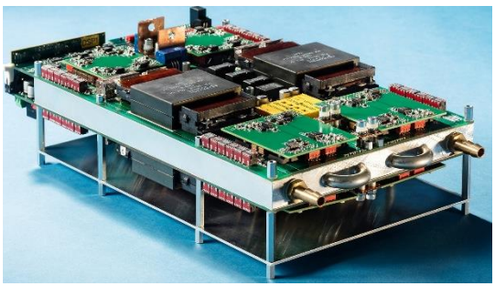
Fraunhofer

Power Electronics and Grid Integration

Electrification plays a major role in the energy transition and power converters increasingly provide the basis for a stable power supply. The demand for innovative power electronics in the sectors of electricity, heat, industry and mobility is becoming huge. For more than 40 years, Fraunhofer ISE has been dedicated to the research and the development of power electronics for energy supply. We have decades of experience in the field of power electronics which enable us to constantly set new standards and bring our progressive ideas to market, in close cooperation with our partners from industry and research. We research, develop and test power electronic components, circuits, and advanced system concepts. We design, simulate and test control algorithms and systems for the reliable operation of converter-based grids

We offer:

- Development of innovative power electronics for low and medium voltage applications such as photovoltaics, wind, storage, hydrogen, and e-mobility
- Design of highly sophisticated control algorithms for power converters and grids
- Simulation, test and characterization of power electronic devices and components



Our extensive laboratory equipment includes:

- Power Converter Lab for PV, storage, and e-mobility applications
- Multi-Megawatt Lab for devices up to 10 MW
- Medium Voltage Lab for voltages up to 36 kV
- Experimental grid with connection to the 110 kV grid
- Accredited Test Lab Power Electronics

Converter-Based Power Grids:

In the course of the energy transition, the electrical energy system will change from an electromechanical to a system based on power electronics. Fraunhofer ISE develops grid-forming converters which stabilize the grid without the need for conventional power plants. These converters provide the full range of ancillary services and stabilize the grid during normal operation as well as in fault situations.

Moreover, due to the decentralized installation of renewable energy sources, the structure of the grid will change fundamentally. Converter-based renewable generation will replace conventional power plants in future power grids. Fraunhofer ISE offers a wide range of services in this field:

- Development of grid-forming control algorithms for stable power grids
- Development of methods for dynamic grid stability analysis in converter-based power grids
- Test of grid control strategies and grid-forming converters in our Multi-Megawatt Lab
- Analysis and optimization of protection schemes for converter-based power grids

Our focus is on reducing costs, saving resources, and optimizing power density as well as control performance. Fraunhofer ISE offers R&D services for power electronics in the field of photovoltaics, storage systems and e-mobility:

- Customized power converters from design concepts to prototypes
- Development of inductive and contactless power transfer solutions
- Controller design and embedded systems programming for converters
- Innovative assembly and cooling concepts

Fraunhofer *is one of the world's largest applied R&D organizations, with nearly 80 research units in all sectors of industry, 30000 employees and an annual outlay of Euros 2.9 billion. Of this sum, 2.4 billion euros is generated through contract research. Our global footprint is very strong, with offices and research centers in the Europe, USA and Asia. Some of our renowned innovations are the MP3 format, the white LED, the smallest of cameras. Fraunhofer covers the entire spectrum of energy (Renewables, Storage, E-Mobility, Grid, Hydrogen…) across the value chain from materials to testing and certification. Fraunhofer has been active in India since the past several years, bringing innovative technologies and research competence to India. Fraunhofer in India is the chosen R&D and innovation technology partner of some of the major players in the field of Energy, Environment, Automotive, Electro-mobility, Materials, Production Technology and Smart Cities working with Industry, Government and Public Sector.* ***>>CLICK HERE<<*** *to receive more info on this TechFlash.*

Kindly get in touch with us if you are interested in this technology or require further information.
Thanks and Regards,

Ms. Anandi Iyer
Director, Fraunhofer Office India

Mr. Sanmati Naik
Sr. Manager - Energy (RE), Fraunhofer Office India
405-406, 30 MG Road, Bengaluru – 1
E-Mail: sanmati.naik@fraunhofer.in
Tel: +91 80 40965008/09
www.fraunhofer.in www.fraunhofer.de