

SMART GRID LABORATORIES AND FAULT-RIDE-THROUGH TEST FACILITIES

Secure system operation with more and more decentralized energy resources (DER) and high share of renewables is the top priority. Consequently grid codes for connection of DER are updated continuously worldwide. For compliance testing of DER against grid codes and validation of smart grid functionalities as well as R&D activities on system and component level special laboratories are required with an infrastructure meeting the challenges of future electricity supply.

SysTec - Reference laboratory at Fraunhofer IEE

For more than 30 years Fraunhofer IEE accompanies the German energy transition and smart grid development with testing services. Testing facilities are operated and developed continuously.

In its test centre for smart grids SysTec, Fraunhofer IEE is developing and testing new equipment and operation strategies for smart low and medium voltage grids. In addition, investigations on photovoltaic systems, wind energy plants, storage, hybrid systems and Microgrids are carried out under realistic "close-to-field" conditions.

In the test centre SysTec, we develop and test the electrical properties and in particular the ancillary services of generators in the power range up to 6 MVA. Mobile test containers for under- and over-voltage-ride-through (UVRT and OVRT), designed by our testing experts are used to validate the grid support capabilities of generation units.

Based on this long-standing expertise Fraunhofer IEE can offer a unique support for your smart grid laboratory development.

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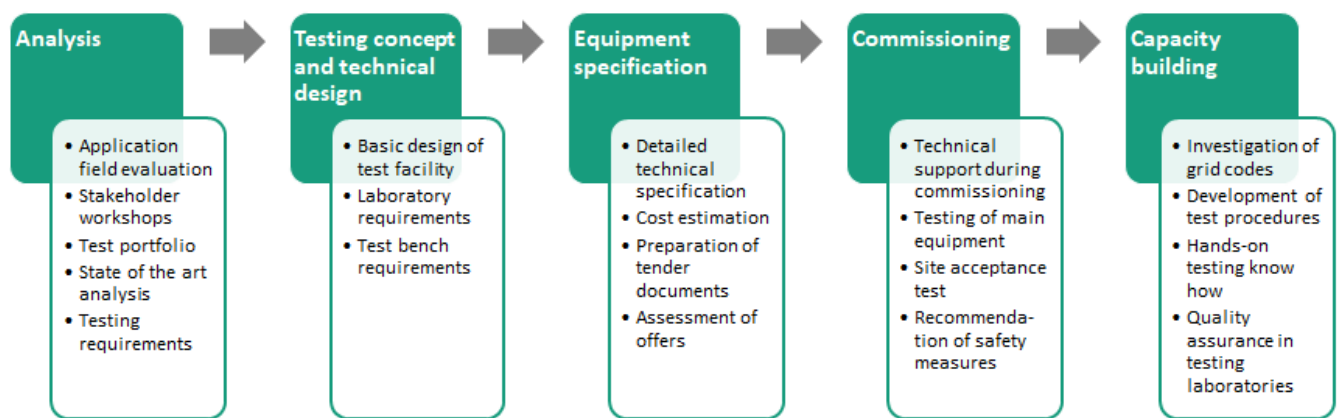
Description of services

The following services are provided by Fraunhofer IEE in the field of laboratory consulting:

- Specification of laboratory infrastructure, in particular for smart grid applications
- Specification and design of OVRT and UVRT testing equipment
- Development of recommendations for grid connection guidelines / grid codes
- Development of testing methods and testing procedures

From the idea to the lab

All phases in the planning and design process of the laboratory infrastructure are supported by Fraunhofer IEE, starting from the analysis of the initial situation to the commissioning of the realized laboratory as well as capacity building.



Example: OVRT Test System



Mobile OVRT test system in a 40-foot sea container

- Power range: 0.25 MVA to 6 MVA
- Voltage levels: 10 kV, 20 kV
- Frequency: 50 Hz
- Short-circuit power range: 50 MVA to 350 MVA
- Ambient Temperature: -25 to +60 °C
- Operation temperature: 0 to +50 °C
- Generation of over voltages: up to 1.4 p.u.

Our OVRT test container with a rated power of 6 MVA is an in-house development and was realized in close cooperation with industrial partners. Extensive experience is available concerning:

- conceptual design (incl. container construction, coil design and/or power electronics, switchgear design, operating concept and safety at work),
- preparation of tenders for the components and assessment of bids,
- monitoring of construction work, and
- supervision of commissioning and acceptance.