

## Services offered by TU Sofia R&DS Installations

With reference to the presented Test Facility of four Laboratories of TUS RDS provides following main services:

- Testing of network connected to the grid and Island operation in hybrid installation with controllable loads and storage.
- Methods and models for analyses and testing of distributed systems with improved power factor relative to the electrical network.
- Computer aided design and simulation with MATLAB, PSIM, PLECS and OrCAD Design Centre of DC/DC, DC/AC and AC/AC converters. Test procedures for validations.
- Simulation models of DER devices and control systems in MATLAB/SIMULINK environment - validation utilizing the physical stands.
- Test of Energy conversion and transfer in the system wind turbine (variable speed) – generator (asynchronous or synchronous) - electronics converters – grid;
- Voltage stability analysis of LV and MV networks with distributed generation – modeling and validation.
- Testing of reliability and electromagnetic field compatibility of relay protection.
- Technology for assessment of generators and power transformers insulation.
- Real-time software for fast and distributed process control and simulation.
- Power-line communications in networks with DER

For safety reasons, the users are not expected to operate the systems by themselves. Tests are carried out by the highly skilled and experienced TUS Laboratories staffs, who also give support for the preparatory work and the data processing and analysis. The scheduling of the experiments will be done jointly with the users, according to the availability of the distributed energy resources on the planning of one of the experimental platforms.

The users will be provided with all measurement data, and with a report produced in collaboration with TUS Laboratories staffs.

The access being offered includes:

- Preparatory work: installation of the devices, including electrical connections and specific instrumentation, preparation of a test procedure (if necessary) on the basis of the users requests, programming of the experimental conditions.
- Realization and follow-up of the experiment,
- Support for the data processing and analysis and for test report preparation.