



1 SYSLAB

Flexible intelligent laboratory for distributed energy resources

Research and testing of control concepts and strategies for power systems with distributed control and integrating a number of decentralized production and consumption components including wind turbines and PV-plant in a systems context.

- ▶ 400 V grid with flexible configuration; autonomous/isolated operation, public grid connection and combinations hereof.
- ▶ Renewable energy units: Wind turbines, PV panels
- ▶ Back to Back Converter
- ▶ Controllable dump loads
- ▶ Vanadium battery for power storage
- ▶ Embedded computing power and flexible communication platform
- ▶ Interconnected with the PowerFlexHouse facility
- ▶ Grid connections and communication lines to the NEVIC; Nordic Electric Vehicle Interoperability Centre at DTU Risø Campus



Application and operation

Analysis, test and demonstration of:

- ▶ Power components and control systems
- ▶ Smart Grid communication platforms
- ▶ Interaction of combined energy systems
- ▶ Micro Grid systems
- ▶ Distributed Energy Resources and flexible consumption
- ▶ Advanced Smart Grid control concepts
- ▶ Renewable energy integration
- ▶ Battery aging

TEST AGAINST STANDARDS:
PowerLabDK facilities are suitable for technology development related testing of electric power components and systems against a wide range of standards; including IEC and CENELEC standards.

PowerLabDK secretariat

Technical University of Denmark | Elektrovej 325 | DK-2800 Kgs. Lyngby

PowerLabDK partners



Technical University of Denmark

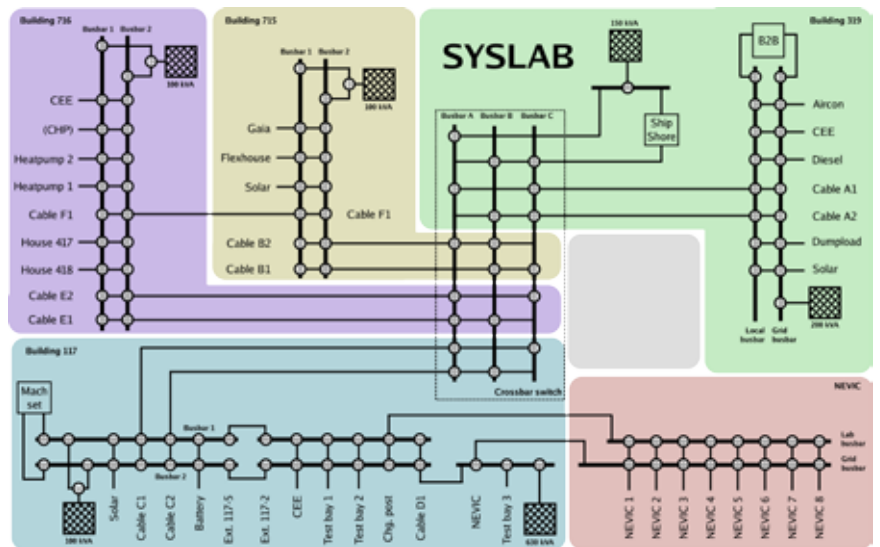


2 SYSLAB



Infrastructure for measurements and data acquisition

Layout: Distributed energy sources and load are all connected in one distributed control and measurement system that enables a very flexible setup with respect to experimental configuration, grid connected operation, isolated operation, and operation in parallel with wind turbine or PV-plant.



Testing and characterization of measurement devices installed in the switchboards and signals from the battery control system. SYSLAB can be used as part of a Virtual Power Plant or otherwise accessed externally to be part of a large experiment.

Energy sources: 2 wind turbines (10 kW and 11 kW), 3 PV plants (10 kW, 10 kW and 7 kW), Diesel generator set (48 kW / 60 kVA).

Energy storage: 15 kW / 120 kWh vanadium redox flow battery

Energy loads: Controllable loads (75 kW, 3 x 36 kW). Interconnected to the PowerFlexHouse facility with an intelligent office building, two domestic houses with controllable loads (10 to 20 kW). Interconnected to the Nordic Electric Vehicle Interoperability Centre (NEVIC).