

The European Commission's science and knowledge service

Joint Research Centre



JRC Smart Grids Interoperability Laboratory – Petten, NL

Technical description of the lab

Petten, NL, January 2019

SGIL main objective

- Promote the interoperability of digital energy in the interface between smart homes and smart grids



Scope of the SGIL

- Test the Interoperability (IoP) of solutions from the market and from research projects
- Promote the use of a common IoP testing methodology based on the CEN-CENELEC-ETSI framework
- Become a knowledge hub by disseminating processes and results of testing campaigns
- Network with European industrial actors, as well as other laboratories and research centres

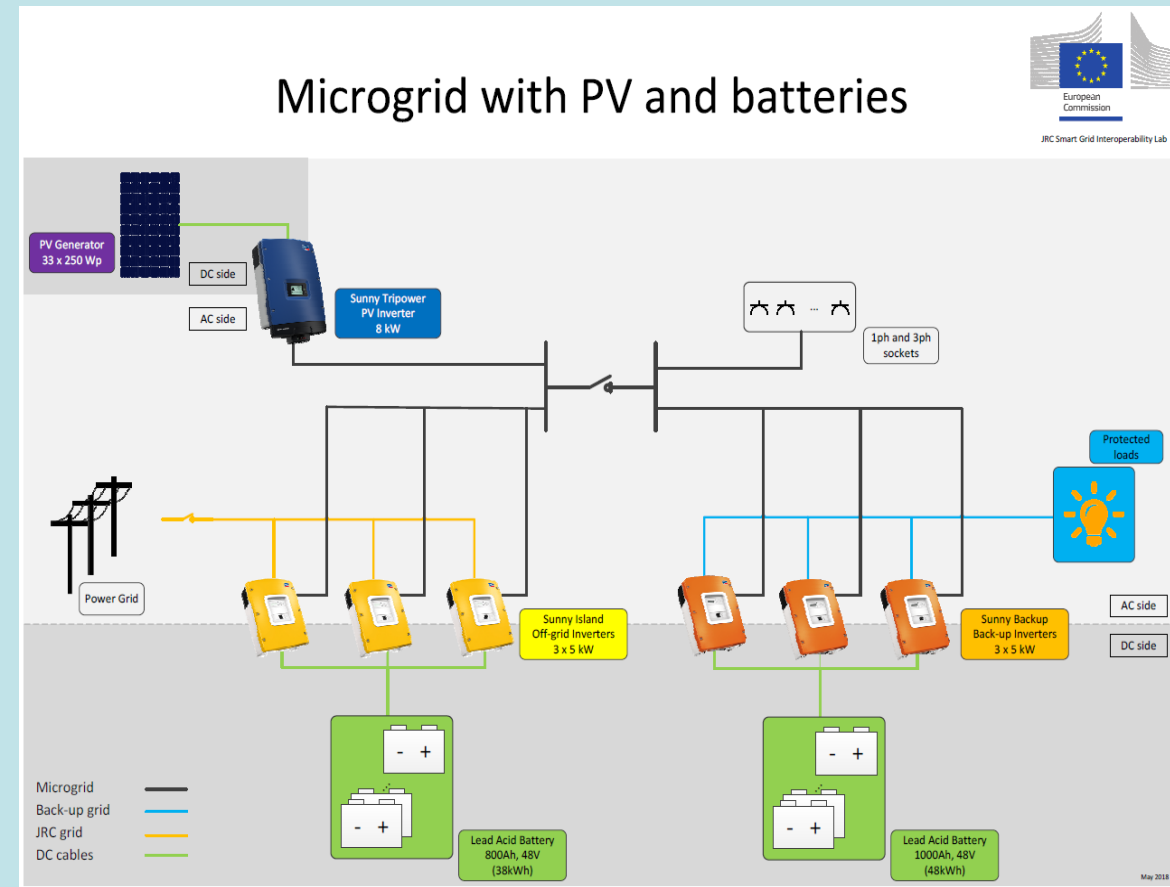
SGIL test bed infrastructure

- Smart Home
 - Smart appliances (washing machine, dryer, dishwasher, oven, etc.)
 - Heat Pump
 - Smart plugs (various brands)
 - Different kind of sensors (temperature, movement, light, etc.)
 - Smart light bulbs
 - Smart sun-blinds
 - Home automation system



SGIL test bed infrastructure

- Microgrid
 - Battery Energy Storage
 - PV
 - Loads



SGIL test bed infrastructure

- Battery Energy Storage Systems
 - BESS 1: 15kW/45kWh with Lead acid batteries (VRLA) - indoor
 - BESS 2: 75kW/150kWh with Li-ion (LFP) batteries - outdoor
 - BESS 3: 75kW/150kWh with Li-ion polymer batteries - outdoor



SGIL test bed infrastructure

- Real-time Simulation
 - Opal-RT real-time simulator
 - Amplifiers (5kVA, 20kVA)
 - Load emulator (15kVA/13.5kW)
 - Super-computing power



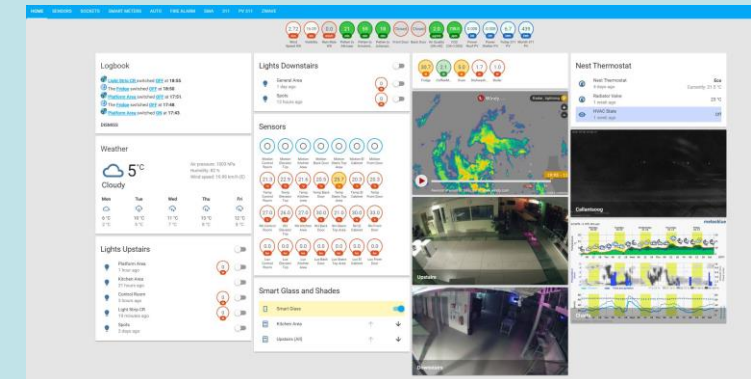
SGIL test bed infrastructure

- E-mobility
 - 1 PHV (Toyota Prius, 2013)
 - 1 BEV (Nissan Leaf, 2019)
 - EV charging poles (incl. V2G)
 - 5 electric bikes (500Wh)



SGIL test bed infrastructure

- SCADA, Monitoring
 - Open source system for control, data collection, automatisisation, on-the-fly reconfiguration, etc.
- Database
- Back-up versioning
- Visualisation



SGIL other equipment

- Diesel Generator (with Synchronizer and electronic speed control unit)
- Smart meters
- AnyPLACE energy management device (Horizon2020 project)
- National Instruments (real-time controller, FPGA)
- De Lorenzo smart grid educational setup
- Oscilloscope and digital precision multimeter
- Fluke power quality analyzer

SGIL activities

- AnyPLACE (2015-18). Low-cost, modular energy management system for home automation and grid services (Horizon2020 project, <http://www.anyplace2020.org/>)
- ERIC-LAB (2015-). European Real-time Integrated Co-simulation laboratory (<http://www.eric-lab.eu/>)
- ENERCHAIN (2019). Blockchain Technologies in the Energy System (internal EC project with DG ENER)
- ERIGrid-II (2019-2023). European Research Infrastructure supporting Smart Energy Systems Research, Technology Development, Validation and Roll Out - Second Edition (Horizon2020 project, <https://erigrd.eu/>)



Contact

You can find us at: JRC-PTT-Interoperability@ec.europa.eu

<https://ses.jrc.ec.europa.eu/>