



EnergyVille Home Laboratory

The EnergyVille Home Lab infrastructure is a testing facility where industrial partners can perform technology validation for home energy management systems, residential demand response technology and in home communication technology.

The Linear pilot tested its newly developed and deployed residential demand response technology in this Home Lab. Also Intelligator®, a hierarchical market based demand response control mechanism, was developed and tested here.

For each of the two households, the electrical conditions can be controlled and measured in high detail and with high reproducibility.

The Home Lab **infrastructure** consists of:

- two residential electrical distribution boards, each of which represents a household.
- a flexible electrical connection system that facilitates for devices and appliances to be connected in any single or **three-phase configuration** to the distribution boards.
- all measurement and peripheral equipment is **powered** separately as to not influence test results.
- each electrical node is **individually measured** for a wide range of electrical parameters.
- measurement data is **automatically** synchronised and stored in a central database. Via the dedicated interface configuration, management of the measurement campaigns is easy.
- Each electrical connection point is equipped with an Ethernet connection that is part of an **ICT infrastructure**. Each of these connection points can be routed into any number of parallel secured, open or islanded network configuration.
- The Home Lab is equipped with an **external internet connectivity**.



Technical Notes

The EnergyVille Home Lab setup enables the integrated testing of products and services that are key to the implementation of Smart Grids, such as home energy management systems, residential demand response technology and in-house communication technology.

Peripherals

- a programmable load (10kW) with a dedicated interface that allows for easy configuration of consumption profiles
- a PV inverter simulator (2.5 kW)
- a PV panel simulator (2 kW)
- multiple types of smart meters, energy management systems, smart plugs
- multiple smart appliances, including state of the art smart washing machines, dishwashers, tumble dryers, airco's and domestic hot water (DHW) buffers
- various battery packs

Inter-lab connections

- **The Home Lab can be connected to the smart grid infrastructure lab to set up low voltage distribution grid tests.**
- The Home Lab can be connected to the Thermo Technical Lab in order to include (smart) heat pumps, μ CHPs and thermal storage components.



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*EnergyVille is an association of the Flemish research institutes KU Leuven, VITO and imec in the field of **sustainable energy and intelligent energy systems**. Our researchers provide expertise to industry and public authorities on energy-efficient buildings and intelligent networks in an urban environment. This includes, for example, smart grids and advanced district heating and cooling.*

This EnergyVille lab functions according to the international quality, environment and safety standards: ISO 9001, ISO 14001 and OHSAS 18001.

