

Using Multi-Physics Simulation to Estimate Energy Flexibility for Local Demand Response Strategies in a Microgrid

Iker Landa del Barrio

ilanda@vicomtech.org

Julen Cestero

jcestero@vicomtech.org

Marco Quartulli

mquartulli@vicomtech.org

Igor G. Olaizola

iolaizola@vicomtech.org

VICOMTECH, SPAIN

Naiara Aginako

Juan José Ugartemendia

This work discusses the development of a multi-physics simulated model, in the frame of the decarbonization and energy efficiency objectives of the European Commission. Its central feature is the interconnection, through a microgrid, of a distributed PV installation and of several electric dispatchable loads, thus powering a Collective Self-Consumption network.

The simulator presented within this document aims to serve as a technological enabler for the design and testing of On-Site DR strategies, which actuate directly on the connection status of the loads, before their deployment on the target, real-world systems. The simulator supports the design and validation of such strategies by generating realistic simulated data of certain loads that present monitoring difficulties, taking into account online, real external weather conditions.

All the elements described and modeled in the current work belong to a real-world installation, which is a university campus —ESTIA, Bidart, France— composed by several buildings with DER.

