

A) General Information

Main-scientific field: Automation and control

Specific-Discipline: Energy management systems, Intelligent energy

Acronym: SREI-MG ID20111031

Title of the User-Project:

Smart buildings and Renewable Energy Integration in Micro Grids

TA Call: 5th call

Host Research Infrastructure: TU Sofia R&DS

Starting Date: 1st period from 9 of July 2012 to 13 Of July 2012

expected 2nd period from 17 of December 2012 to 21 of December 2012

End Date: 21 of December

Lead User : Luca Ferrarini , Full Professor –

Organization: Politecnico di Milano –

Dipartimento di Elettronica e Informazione

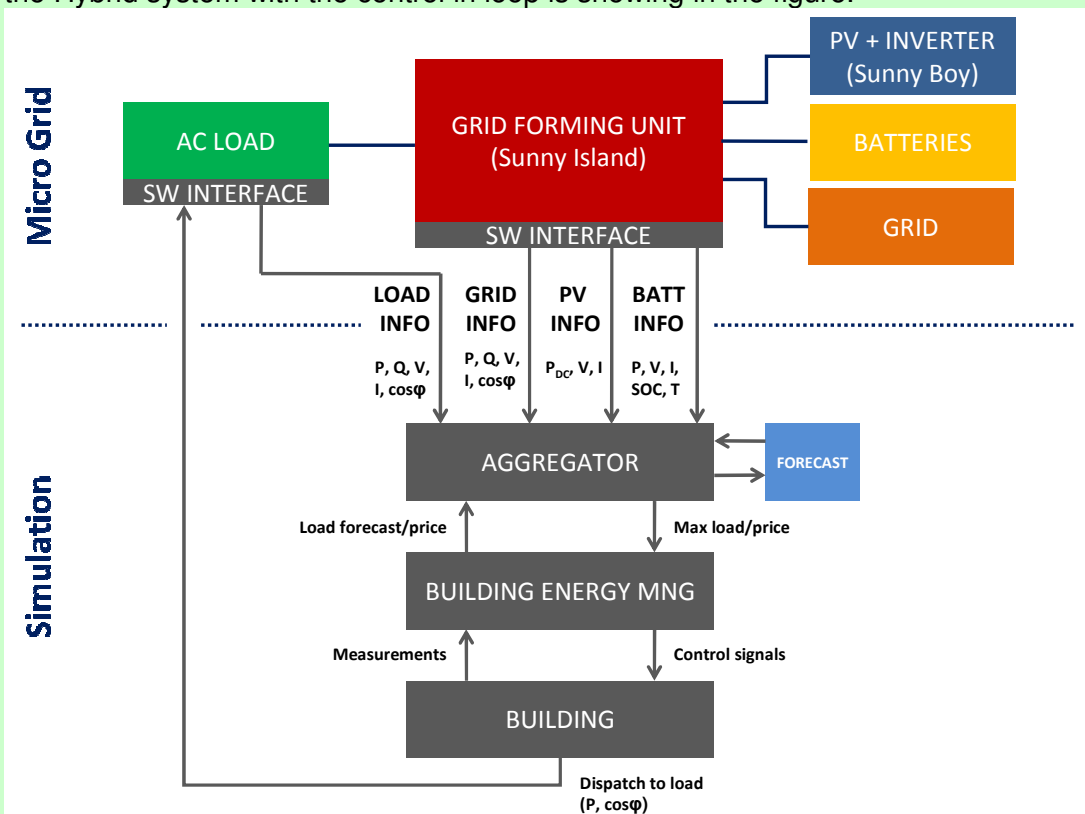
Additional Users: Giuseppe Tommaso Costanzo- Ph.D. Student

Giancarlo Mantovani - Ph.D. Student



B) Summary of the User-Project

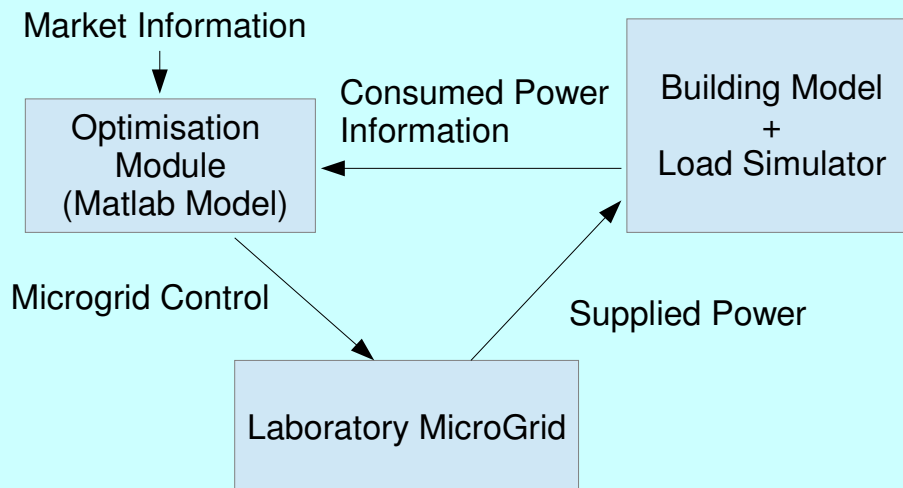
This project is focused on the design and test of control logics for integration of the Smart Buildings in micro-grids, which may host distributed generation from renewable energy sources. The work combine results from Measurement, test and control system (MTCS) in TUS RDS – Power Electronics Laboratory (PEL) under Demand/Response conditions determinates from user's Simulations stand with the use of Internet connection for communication. Blok scheme of the Hybrid system with the control in loop is showing in the figure.



The realized connection between Micro Grid in TU Sofia and Simulation tools in Polytechnic of Milano was via Internet RS 232. As an extension to the existing PV installation two contactors and PLC are added. The operation mode of the installation can be selected through local SCADA or through XML command using the same XML schema as in the Load control system

The different experimental regimes were realized: Normal operation mode- **NOM**, grid operation mode – **GOM** with out PV generation, Island operation mode – **IOM** with PV generation,

Batteries operation mode – **BOM** with out PV generation and disconnected grid.



The expected outcomes of the project are: a tested set of logics for real-time energy management in smart buildings and micro grids; a Demand/Response manager for local energy market; an Implemented and tested version of an energy manager for micro grids. The project scopes include also feasibility assessment of such a technology, in the particular aim of integrating DG sources and storages with residential and commercial customers.

C) Main Achievements (or Expected Results)

Main achievement can be presented with information schema for involving optimisation model to the system

D) Dissemination of the Results (Planned)

- Technical articles for 2013 ANIPLA conference on Energy efficiency (Italian Association for Automation) www.anipla.it
- Dissemination article for “Energia e Automazione” (italian magazine Automation and Energy, published by ANIPLA)
- Technical paper for international conferences/symposia organized by IEEE, such as SmartGridComm, CDC, ISIE, INDIN, and and by IFAC.

E) Use of the Resources (Expected)

16487 EURO

Nr. of Users involved: 3 users

Access Days: 10 days

Stay Days: 11 days for 2 persons and 7 days for 1 person