Partnerships for Enhanced Engagement in Research (PEER) Science

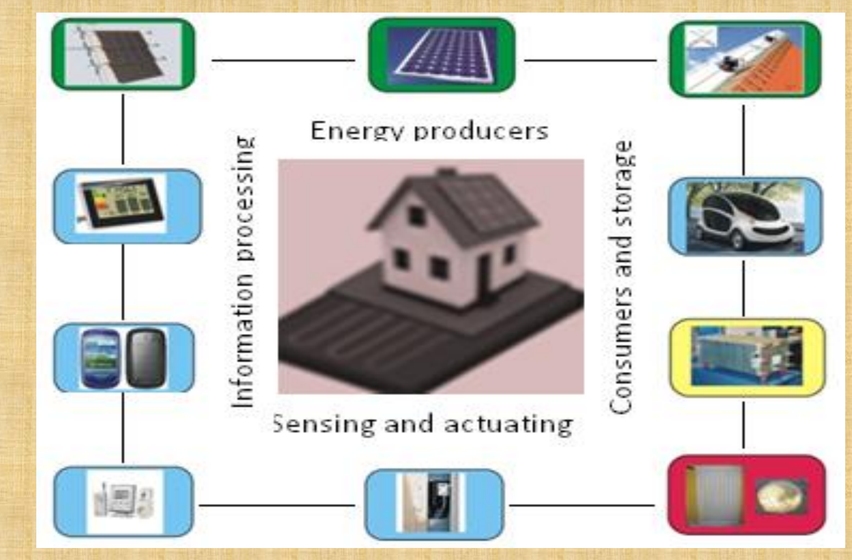
Towards Smart Microgrids
Renewable Energy Integration into Smart Buildings

Description

In this project, we envision two main venues: leveraging renewable energy usage, and promoting energy-efficient systems. MIGRID project is meant to leverage these venues via the integration of renewable energy sources into smart buildings, and via the promotion of an energy-efficient management system based on "context-awareness" whereby electrical appliances' status, consumption, and energy production are tracked and controlled in a real-time mode.

Three major research issues will be addressed:

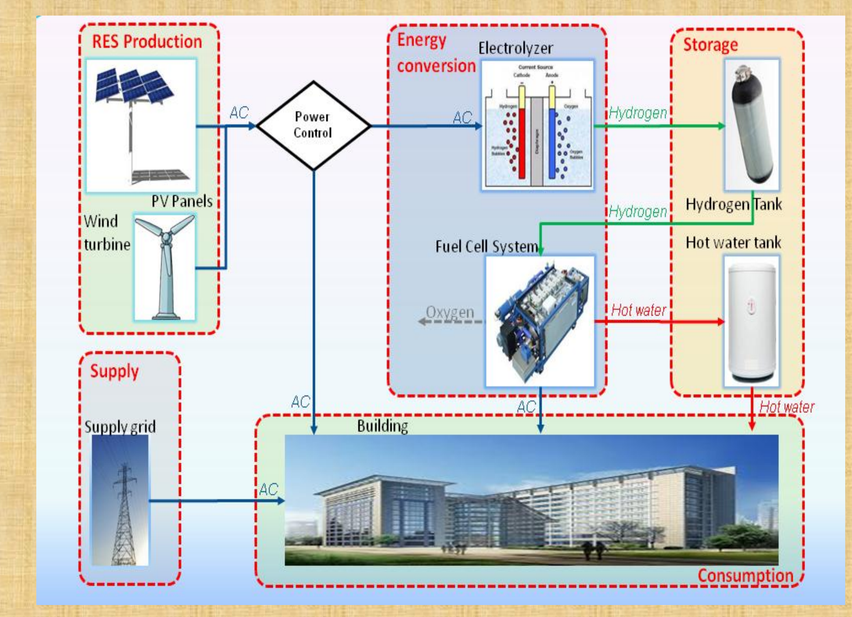
- Renewable energy integration and demand/response variance tracking.
- Context-awareness and data gathering/processing.
- ICT for connecting/networking the different building components.



Objectives

The aim of MIGRID project is to develop a holistic platform that integrates smart microgrids and renewable energy sources towards energy efficient buildings. Main objectives are:

- **Objective 1**: a global control strategy able to predict, estimate and control the demand/response variances.
- **Objective 2**: an optimization approach for dimensioning power generation systems and storage devices.
- **Objective 3**: develop and deploy an Advanced Metering Infrastructure (AMI).
- **Objective 4**: deploy the final field operational test and assess the "relative" impact in terms of energy saving, and thus CO2 reduction.



Outcomes

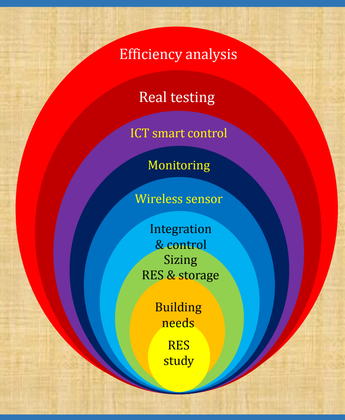
MIGRID main outcomes are:

- **Outcome 1**: a holistic context-aware platform that integrates CEP and event triggered control in order to support the development of context-aware applications for energy efficient buildings.
- **Outcome 2**: a holistic AMI architecture based on wireless communication, thus leveraging the ease-of-deployment independently from the buildings architectures.
- **Outcome 3**: demonstrate the feasibility of renewable energy integration and study more precisely the impact of using hydrogen storage for heat and electricity co-generation process using fuel cell.
- **Outcome 4** : promoting a novel demand/response algorithm for a better balancing between power productions, storage, and building demands.

Overall strategy

The MIGRID project is divided into four main tasks:

- **Task 1**: connection, integration, and management of Renewable Energy Resources.
- **Task 2**: dimensioning energy production and storage.
- **Task 3**: development of the AMI and the relevant Context-aware and Monitoring platform.
- **Task 4**: integration and Real-world final testing.



Partners

جامعة الأخوين AL AKHAWAYN UNIVERSITY

الجامعة الدولية للرباط
Université Internationale de Rabat
L'UNIVERSITÉ INNOVANTE

جامعة شعيب الدكالي
Université Chouaïb Doukkali

UNIVERSITY of HOUSTON

Contacts

http://www.casa-net.team/