

Friendly Intelligent Energy Management System for Existing Residential Buildings

FIEMSER project will focus on “Use less energy” and “Make more energy locally” and it will also provide the necessary conditions and platform for future developments to sell surplus energy.

Project website:

<http://www.fiemser.eu>

Consortium:



Grant Agreement:

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3.922.313 €

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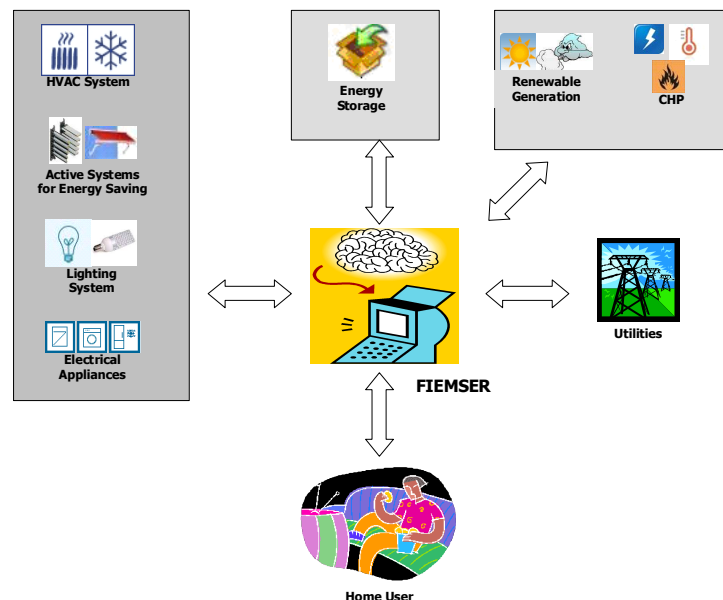
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Main Objectives

The main objective of this project is the development of an innovative energy management system for **existing and new residential buildings** (BEMS), which pursues the increase of the efficiency of the energy used and the reduction of the global energy demand of the building, but without penalizing the comfort levels of the users. To the achievement of this goal, it will follow two main strategies:

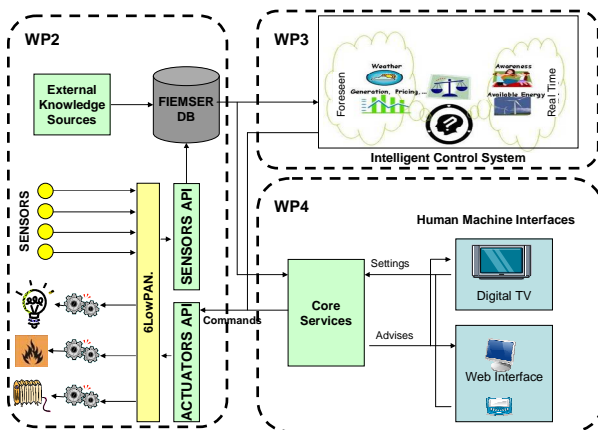
Increasing energy efficiency in residential buildings without penalizing comfort, through intelligent control and friendly user interfaces

- **Minimizing the energy demand from external resources**, through the reduction of the energy consumption in the building and the correct management of local generation (heat and electricity) and energy storage equipment to satisfy the energy demand of the building, and even provide the capability to export energy to the utilities when needed.
- **Interaction with the building user**, in such a way as to increase the consciousness of the consumer of his energy consumption and CO₂ emissions, providing hints to make punctual changes in his behaviour without major disruptions of his comfort conditions.



Technical Approach

Project work plan is started with WP1 – “FIEMSER Specification”, which will define the FIEMSER functional requirements, the main modules of the system, their interaction and the data model that will support FIEMSER platform. Once FIEMSER functionality and modules are defined, three workpackages will run in parallel: WP2 (Monitoring&Operation Tool), WP3 (Intelligent Control System) and WP4 (Multimodal User Interface). These workpackages will develop the 3 main components of the system.



- WP2 – “Monitoring&Operation Tool” provides the adequate tools to interact with the building (sensors and actuators) and its “context” (environmental conditions, utilities...). Interaction with building sensors and actuators will be based on wireless monitoring and control network.
- WP3 – “Intelligent Control System” will develop the control strategies that optimize the thermal and electrical energy management of the building in such a way that the building energy demand, energy cost and CO₂ emissions are minimized. Local generation and energy storage systems will be managed.
- WP4 – “Multimodal User Interface” will develop a friendly user interface that will allow interacting with the control system through the TV.

WP5 – “System Integration” will assemble these three main components to create the FIEMSER system. WP6 – “Validation” will validate the performances of FIEMSER platform in two real buildings in two different climatic areas, representative of the European weather conditions.

Expected Results

As result of FIEMSER project, several potential products are expected, which could be exploited as an integrated energy management system for residential buildings, the FIEMSER platform, or each component as an independent product:

- **IPv6 Wireless control network.** There is a huge potential to this type of communication networks, because in the near future, homes will be more intelligent and will require flexible and non intrusive communication platforms which will have to be fully compatible with Internet.
- **Holistic home energy manager.** Latest EU initiatives are evolving towards energy positive buildings in order to reduce CO₂ emissions and energy costs; building related legislation and building users are becoming more aware about its need. Consequently, a new generation of control systems will be required to coordinate the main energy demand systems in the building (HVAC and lighting) with the local generation (RES and CHPs (Combined Heat and Power)).
- **Multimodal user interface.** Increasingly, all services are becoming more supported by ICTs. The FIEMSER multimodal user interface will open these services to the typical ICT user (used to manage computers), to the mobile users (familiarized with PDAs, smartphones ...) and also to the ICT “excluded users”, as elderly people or technologically unskilled users, which are much more comfortable with the TV.

Acknowledgement

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