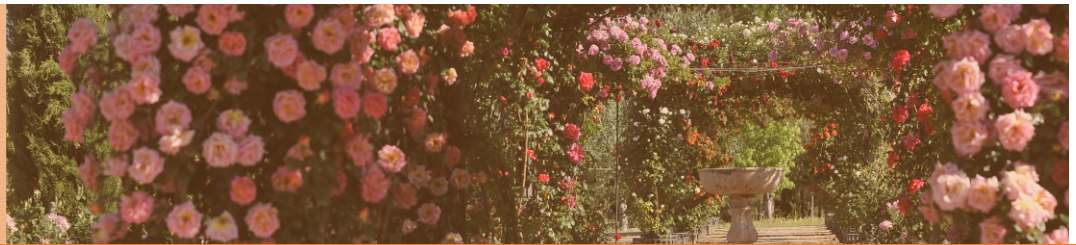




Universidad  
de Alcalá



## ENEFF-PILOT: A COOPERATIVE SYSTEM FOR SUSTAINABLE ENERGY-EFFICIENT COMMUNITIES

### TECHNOLOGY OFFER

#### Code

ENER\_UAH\_08

#### Application areas

- Information and Communication Technologies
- Energy
- Physical and Exact Sciences



#### Type of collaboration

- Manufacturing Agreement
- Outsourcing Agreement
- Subcontracting

#### Main researches

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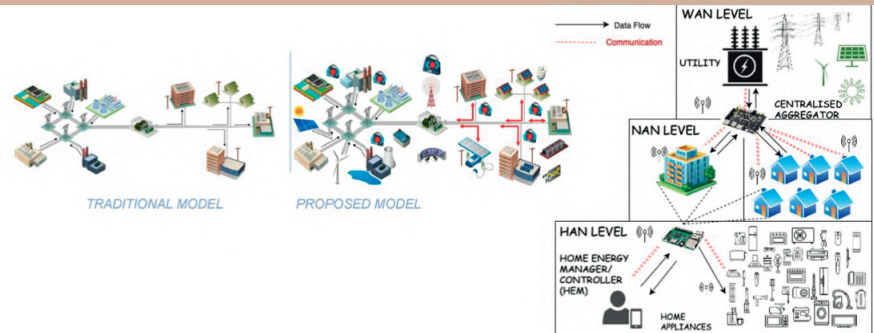
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### ABSTRACT

The ever-increasing technological development over the last decades has significantly changed the energy efficiency environment. The research presents a cooperative demand response system aimed at promoting behavioural changes in small and large communities.

This project aims to provide sustainable and socioeconomic evidence for the Information and Communication Technology investment within the new IoT applications such as smart metering infrastructures that promote energy efficiency in residential dwellings. A cooperative demand response system is designed to promote behavioural changes in small or large communities with common interests. The involved entities will reach binding agreements and coordinated behaviour.

Consumers will adapt their energy consumption cooperatively on a centralised way, that is, sharing their demand schedule with a data collector, which facilitates the integration of energy consumption information into a common view. This integration is performed over the so-called Aggregator, an optimal system providing energy management services in order to efficiently manage demand. It allows to distribute locally the energy provided according to the availability of renewable resources. This energy management system will be connected to the Utility defined as a set of energy suppliers shared by customers.

The pilot system will demonstrate that a community of consumers cooperating based on their energy demand analysis can realize the potentials of energy saving measures. At the same time, the system will lead to a behavioral change in the electricity consumption habits through sustainability and environmental protection goals. Main goals:

- To offer alternative resources in terms of accessibility and demand
- To develop of an energy efficient system

### ADVANTAGES AND INNOVATIONS

- The system will lead to improved scenarios of energy efficiency by applying strategies for energy demand response applied to smart residential communities.
- Consumers will have the opportunity to reduce their electricity cost and/or peak-to-average ratio through scheduling their power consumption.
- The system will integrate the electricity supply available from renewable energy sources into the scheduling process.
- The research will provide empirical comparison of the developed algorithm design on different implementation strategies for player turn selection, optimisation heuristics as well as case scenarios of community's consumption patterns