

Eficiencia mediante **CO**ntról por captura de **E**nergía (ECO**E**)

IREC Lighting Group

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In buildings of the Tertiary sector the requirements on lighting and climate demand a large amount of energy what raises the operational costs. Moreover most of the buildings have inadequate management systems that create discomfort to their users reducing the performances at work and increasing the absenteeism. These two conditions produce large economic losses and increase the building carbon foot print.

The objective of this project is to develop novel control strategies to reduce the energy consumption in buildings from the Tertiary sector and increase the visual and thermal comfort of their users. To give flexibility and autonomy to the control system and reduce the retrofiting costs, several novel energy harvesting strategies will be integrated in the sensor nodes used to monitor the real state of the buildings.

This project involves the generation of the following innovations:

1. Development and implementation of systems ('Energy Harvesting') that may capture residual environmental energy and use it to develop energy-autonomous sensors that enable the extensive use of WSN in buildings to minimize the costs of maintaining these.
2. Development of new secure routing protocols for sensor networks.
3. Development of lighting control systems that minimize mismatches and fluctuations that exist in systems that use natural light.
4. The development of a new climate control system that optimizes the spatial resolution and temporal response.
5. Development of new indicators of comfort for the integrated management of energy demand.
6. Development of a pilot test that will save 20-30%.

The project has a duration of 2.5 years (October 2011 - March 2014) including a pilot test to be held in one of the buildings from "La Ciutat de la Justícia" at l'Hospitalet de Llobregat (Barcelona)

Analysis and monitoring for building characterization.

Development of models and energy simulation tools

Intelligent control algorithms development

Prototype development with Energy Harvesting element as power sources.

Final test and validation.

Objective:

The objective of this project is to develop the knowledge and technologies to design an intelligent and comprehensive control system to reduce the energy consumption and increase the users comfort in Tertiary sector buildings through the design of a wireless autonomous sensor network.

Application:

Building management control systems.

Highlights/Innovative Features

Low cost lighting and HVAC control system for retrofiting using energy harvesting techniques.

Projects Dates

October 2011 - March 2014

Sponsor:

Ministerio de Ciencia e Innovación (MICINN) - Subprograma INNPACTO 2011

Collaborating Groups:

FCC, URBICSA.

