

# First results of the implementation of an ICT based smart street lighting system

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## Introduction

This paper concentrates on the evaluation of the implementation process of two public street lighting pilot areas in San Sebastian (Spain) and Almada (Portugal). The street lighting areas are part of a European project (BESTEnergy<sup>1</sup>) that deals with the integration of current state of the art ICT technologies in public buildings and street lighting. The implemented ICT technology offers real-time monitoring and management of energy consumption and allows for a more effective control over lighting conditions. A further objective is the evaluation of users' acceptance and needs for participation and information during the implementation process and to gain insights into users perceptions and their criteria for evaluation and preference of a new, intelligent and energy efficient street light.

## Smart Street Lighting

Smart street lighting attempts to decrease energy consumption, reduce light pollution and concurrently be "smarter", in that it can be adapted to traffic volume. Nonetheless, it needs to be approved, if the goal of improvement for vehicles and people's safety is to be effective. Current research on energy efficient street lighting concentrates mostly on the technological aspects (Harrington, 1995) while research on street lighting in general highlights the perception of safety aspects (Rea, 2009). A lighter area not only proved to be safer for drivers, but for pedestrians as well, who are the main group involved in traffic accidents (Fors & Lundkvist, 2009). As a result, a more comfortably perceived and thereby preferred street also correlates with lower crime rates in better-lit areas (Rea et al., 2009).

## Methods

Besides the often discussed physiological aspects of human perception of street lighting, we concentrate on detecting more psychological predictors, e.g. is the technological benefit of adapting the intensity of light to the volume of traffic perceived as a benefit by the driver? What could help to increase acceptance, what might be lacking to make this acceptable? Do street users recognize the smart adaptation of the light? How does this influence their safety perception?

These are only a few questions developed during a workshop with an expert group of technicians and environmental psychologists. Based on the results of this workshop, a users' assessment was developed that is carried out as a survey to all affected groups before and after the implementation of the street lighting. With the questionnaire, a longitudinal before-and-after comparison of variations of street lighting conditions and perceived quality of the new system are assessed. Nevertheless, the focus of this study concentrates on exploring perceptual and evaluation impact factors to develop a first effort for a theoretical model of smart street light acceptance.

## References

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<sup>1</sup> The ICT - Policy Support Programme (PSP) of the European union funds the BEST Energy project (no.238889).