

## Smart Meters and In-Home Displays to Encourage Water Conservation through Behavioural Change

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**Abstract :** Urbanization, population growth, climate change and the current increase in water demand have made the adoption of innovative demand management strategies crucial to the water industry. Water conservation in urban areas has to be improved by encouraging consumers to adopt more sustainable habits and behaviours. This includes informing and educating them about their households' water consumption and advising them about ways to achieve significant savings on a daily basis. This paper presents a study conducted in the context of the European FP7 WISDOM Project. By integrating innovative Information and Communication Technologies (ICT) frameworks, this project aims at achieving a change in water savings. More specifically, behavioural change will be attempted by implementing smart meters and in-home displays in a trial group of selected households within Cardiff (UK). Using this device, consumers will be able to receive feedback and information about their consumption but will also have the opportunity to compare their consumption to the consumption of other consumers and similar households. Following an initial survey, it appeared necessary to implement these in-home displays in a way that matches consumer's motivations to save water. The results demonstrated the importance of various factors influencing people's daily water consumption. Both the relevant literature on the subject and the results of our survey therefore led us to include within the in-home device a variety of elements. It first appeared crucial to make consumers aware of the economic aspect of water conservation and especially of the significant financial savings that can be achieved by reducing their household's water consumption on the long term. Likewise, reminding participants of the impact of their consumption on the environment by making them more aware of water scarcity issues around the world will help increasing their motivation to save water. Additionally, peer pressure and social comparisons with neighbours and other consumers, accentuated by the use of online social networks such as Facebook or Twitter, will likely encourage consumers to reduce their consumption. Participants will also be able to compare their current consumption to their past consumption and to observe the consequences of their efforts to save water through diverse graphs and charts. Finally, including a virtual water game within the display will help the whole household, children and adults, to achieve significant reductions by providing them with simple tips and advice to save water on a daily basis. Moreover, by setting daily and weekly goals for them to reach, the game will expectantly generate cooperation between family members. Members of each household will indeed be encouraged to work together to reduce their water consumption within different rooms of the house, such as the bathroom, the kitchen, or the toilets. Overall, this study will allow us to understand the elements that attract consumers the most and the features that are most commonly used by the participants. In this way, we intend to determine the main factors influencing water consumption in order to identify the measures that will most encourage water conservation in both the long and short term.

**Keywords :** behavioural change, ICT technologies, water consumption, water conservation

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