Fostering Smart Cities through ICT Driven Policy-Making: Expected Outcomes and Impacts of DAREED Project

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ABSTRACT

The concept of smart city is emerging as a key strategy to tackle the problems generated by the urban population growth and rapid development. It is widely recognised that Information and Communications Technology (ICT) play a key role in addressing some of the urban societal challenges such as improving energy efficiency and reducing carbon emissions. Although there are various ICT tools providing intelligence and services relating to energy consumption and monitoring processes, they mostly tend to work in isolation. Therefore, this paper presents the outcomes and impacts of the concept of DAREED which aims to deliver an integrated ICT service platform to drive energy efficiency and low carbon activities at neighbourhood, city and district levels. Furthermore, the research highlights the need for ICT-driven policy making using platforms such as DAREED in the context of e-Government. This paper contributes to the current understandings of e-Government literature in terms of how ICT can help public authorities and stakeholders such as policy makers to achieve and drive energy efficiency. From a practical stance, the paper offers valuable insights to public administrations on how ICT can be used to address pressing societal challenges such as efficient energy use and facilitate better policy making.

Keywords: Decision Support Systems (DSS), Energy Efficiency, Information and Communications Technology (ICT), Policy Making, Smart City

1. INTRODUCTION

Energy efficiency is at the forefront of energy policies in European Union (EU) (European Commission, 2012). According to the last European Commission’s (EC) Energy Efficiency Directive that was published in 2012, all the member states of the EU are required to use energy more efficiently at all stages of the energy chain, from the transformation of energy and its distribution to its final consumption, with the goal to reduce energy consumption by

DOI: 10.4018/ijegr.2014070101
20% by 2020. The strategy followed includes a mix of measures that involve efficiency in energy generation, new obligations for energy producers and distributors, new initiatives by the government, new roles and more empowerment to the consumers. As a result, cities across Europe are forerunners in the transition towards a low carbon and resource efficient economy. They are starting to plan and act for a more sustainable future characterised by investments in innovative, energy efficient integrated technologies and services such as buildings, heating/cooling, mobility, lighting, and other utilities to name a few (Caragliu et al., 2011; Nam and Pardo, 2011). A number of challenges are still open concerning energy management at city level, micro-generation from renewable energy sources, Combined Heat and Power (CHP) and its integration into the smart grid just to mention a few ignoring the needed change in private transport towards low emission and hybrid vehicle (Karnouskos, 2011).

Urban environment, cities and the construction sector are fully aware of their huge responsibility, being the highest energy consumers in the EU and main contributors to Green House Gas (GHG) emissions. The figures provided by the “Multi-annual roadmap and longer term strategy” of the Energy Efficient Building PPP (European Commission, 2010) claim that energy consumption from the construction sector accounts for the 40% of the total EU energy consumption and that contributes to the 36% of the total EU CO$_2$ (Carbon dioxide) emissions. Thus, fostering energy efficiency in the residential sector could play a fundamental role in achieving carbon emission reductions (European Commission, 2014). This will imply significant investments in the short term, but will provide long-term substantial savings in the future along with a much higher degree of sustainability as presently being tested in Cambridgeshire, UK. One of the fundamentals of the long term strategy is that energy efficiency will respond to climate change and energy issues, providing the stakeholders are able to focus on the proper working scale and are able to trigger concerted actions concerning all stakeholders involved in the process, namely citizens, energy providers and policy makers. Concerning the working scale, one of the pillars of the long term roadmap of the Energy Efficient Building (EEB) is the district level management. Only district scale intervention will permit the achievement of the much higher energy efficiency targets required by optimising the use of energy at different levels and involving all stakeholders in the process. This will involve the availability of adequate monitoring facilities and management tools that would enable local authorities to plan, execute and when needed enforce adoption of needed measures through better informed policy decision making.

It is broadly recognized that ICT solutions have the potential to be an enabler to reduce a significant part of total CO$_2$ emitted by non-ICT industries (Vasseur and Dunkels, 2010; Weber and Shah, 2011). At district or city level, ICT solutions might provide intelligence on the energy consumption process, the distributed micro-generation, the management of complex installations, their monitoring and control and also provide new business models and policy guidelines that foster good practices in energy consumption leading to significant GHG reductions. A number of ICT solutions have been described in the literature (e.g. González et al., 2012; Lazaroiu et al., 2012; Niemi and Mikkola 2012), developed and applied in practice for supporting energy saving, user engagement, user profiling, demand aggregation and energy management. Despite the fact that many ICT tools exist, they all work in isolation and mostly independently. Therefore this paper presents the concept of DAREED that aims to develop an integrated ICT platform by exploiting existing tools to support decision making for policy makers, citizens and other stakeholders in order to help them achieve energy efficiency. In doing so, DAREED seeks to foster smart cities through innovative application of ICT and informed policy decision making. DAREED (Decision Support Advisor For Innovative Business Models And User Engagement For Smart Energy Efficient Districts, www.dareed.eu) is a project co-funded in the seventh framework programme of the
Consumers' Awareness of the Value of e-Government in Zambia: Empirical Evidence

Local Democracy Online: An Analysis of Local Government Web Sites in England and Wales
[www.igi-global.com/article/local-democracy-online/2019?camid=4v1a](www.igi-global.com/article/local-democracy-online/2019?camid=4v1a)