



CUE2015-Applied Energy Symposium and Summit 2015: Low carbon cities and urban energy systems

Innovation capabilities and challenges for energy smart development in medium sized European cities

Erik Lindhult^{a*}, Javier Campillo^a, Erik Dahlquist^a, Stephen Read^b

^aMälardalen University, Eskilstuna, Sweden

^bTU Delft, Delft, The Netherlands

Abstract

Transition towards becoming Energy smart city integrating different areas of energy production, distribution and use in a community requires a spectrum of capabilities. The paper reports on findings from the EU planning project PLEEC, involving six medium sized European cities. The purpose of the paper is to describe innovation capabilities and challenges in the complex, systemic innovation journey of cities in the transition to sustainability. A case of implementing an innovative project for electrical vehicles in Eskilstuna is presented illustrating both technological potentials and innovation challenges.

© 2016 Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Peer-review under responsibility of the organizing committee of CUE 2015

Keywords: innovation; systemic innovation; Low carbon city; urban energy system; Renewable energy; electrical vehicles.

1. Introduction

* Corresponding author. Tel.: +46-739607140; fax: +46-16153610.
E-mail address: erik.lindhult@mdh.se.

More than 50% of all people globally are living in cities today [1]. Enhancing sustainability and efficiency of city energy systems is thus of high priority for global sustainable development. Energy solutions and their efficiency improvement is dependent on action from in principle all people and organizations, but in development of energy system efficiency collective action of different kinds is often needed. We are focusing on medium sized cities which are collective action bodies for sustainable energy planning which have considerable potentials in this respect.

2. The EU project Planning for Energy Efficient Cities

The PLEEC project – "Planning for Energy Efficient Cities" – funded by the EU Seventh Framework Programme uses an integrative approach to achieve sustainable, energy-efficient, smart cities. By coordinating strategies and combining best practices, PLEEC will develop a general model for energy efficiency and sustainable city planning. The main strategies covered by PLEEC are technology, structure and behavior. Some of the objectives of the project are:

- To assess the energy-saving solutions and potentials for a comprehensive city planning
- To demonstrate how integrative planning is more efficient than separate measures
- To develop a synergized model for energy efficiency planning considering city key aspects
- To create action plans to be presented to decision-makers in the cities
- To identify the future research agenda on the issue of energy-smart cities.

The partner consortium consists of 18 partners from 13 different European countries representing six mid-sized cities (Eskilstuna, Tartu, Turku, Jyväskylä, Santiago de Compostela and Stoke-on-Trent), nine universities (Mälardalen University, Turku University of Applied Sciences, Hamburg University of Applied Sciences, Vienna University of Technology, University of Copenhagen, Delft University of Technology, University of Rouse, Santiago de Compostela University and University of Ljubljana) and three industry partners (Siemens, Smartta, Eskilstuna Energy and Environment).

In the PLEEC project we have covered different aspects of energy efficiency improvement actions like technological, structural and behavioral aspects. These have then been integrated into action plans for the participating cities, but will also be utilized by any city. In this paper we will cover primarily the technological aspects, but also touch the other, and focus on the issue of innovating more sustainable technologies.

This is not the only initiative on energy efficient or smart cities. It is one of few within the EU FP7 programs. Another initiative is by smart cities council where guidelines has been presented for city mayors, city managers and their staff. This shall help cities with vendor-neutral information. They also have ranked different cities with respect to different factors as good examples.

3. Innovation capabilities and challenges

Sustainable development towards energy smart cities are quite complex sociotechnical processes where technological and market systems, and social factors like stakeholder networks and coalitions, culture and economic factors, interact. A sociotechnical perspective is needed addressing changes on concrete sectorial or systems level, focusing on the dynamic interactions and co-evolution between technology, market and behavioral change. In PLEEC this is covered by the parallel focus on technological, structural and behavioral perspectives. The systems of technological and social factors need to be recognized as dynamically evolving innovation systems, involving multiple actors and groups as drivers in technological, market, institutional and social domains [2, 3, 4, 5, 6] where the appropriate

Download English Version:

<https://daneshyari.com/en/article/1508806>

Download Persian Version:

<https://daneshyari.com/article/1508806>

[Daneshyari.com](https://daneshyari.com)