

Accepted Manuscript

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PII: S0378-7788(16)30064-0
DOI: <http://dx.doi.org/doi:10.1016/j.enbuild.2016.02.017>
Reference: ENB 6434

To appear in: *ENB*

Received date: 22-8-2015
Revised date: 23-12-2015
Accepted date: 9-2-2016

Please cite this article as: Mehmet Bördühan Bulut, Monica Odlare, Peter Stigson, Fredrik Wallin, Iana Vassileva, Active buildings in smart grids *minus* exploring the views of the Swedish energy and buildings sectors, Energy and Buildings <http://dx.doi.org/10.1016/j.enbuild.2016.02.017>

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Active buildings in smart grids – exploring the views of the Swedish energy and buildings sectors

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Highlights

- Buildings are expected to play a key role in the future smart energy systems
- This study investigates the active building concept and the associated features
- The views of the stakeholders from the energy and buildings sectors are presented
- Respondents from Swedish companies answered interviews and a web survey
- The active building concept is closely associated with energy demand flexibility
- High costs of the technologies are the most significant barrier to the development

Abstract

The development of smart grids is expected to shift the role of buildings in power networks from passive consumers to active players that trade on power markets in real-time and participate in the operation of networks. Although there are several studies that report on consumer views on buildings with smart grid features, there is a gap in the literature about the views of the energy and buildings sectors, two important sectors for the development. This study fills this gap by presenting the views of key stakeholders from the Swedish energy and buildings sectors on the active building concept with the help of interviews and a web survey. The findings indicate that the active building concept is associated more with energy use flexibility than self-generation of electricity. The barriers to development were identified to be primarily financial due to the combination of the current low electricity prices and the high costs of technologies. Business models that reduce the financial burdens and risks related to investments can contribute to the development of smart grid technologies in buildings, which, according to the majority of respondents from the energy and buildings sectors, are to be financed by housing companies and building owners.

Keywords: smart grid; active building; demand response; energy sector; buildings sector

1. Introduction

Climate change as a result of the increasing concentrations of greenhouse gas (GHG) emissions in the atmosphere requires the reduction of the global use of fossil fuels, responsible for approximately 80% of the global GHG emissions (IPCC 2014). Replacing the use of fossil fuels with renewable energy in power systems, however, remains a challenging

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