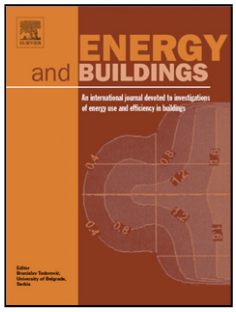

Title: IEA EBC Annex 67 Energy Flexible Buildings

Authors: Søren Østergaard Jensen, Anna Marszal-Pomianowska, Roberto Lollini, Wilmer Pasut, Armin Knotzer, Peter Engelmann, Anne Stafford, Glenn Reynders

PII: S0378-7788(17)31702-4
DOI: http://dx.doi.org/10.1016/j.enbuild.2017.08.044
Reference: ENB 7873

To appear in: *ENB*

Received date: 17-5-2017
Revised date: 17-7-2017
Accepted date: 17-8-2017

Please cite this article as: Søren Østergaard Jensen, Anna Marszal-Pomianowska, Roberto Lollini, Wilmer Pasut, Armin Knotzer, Peter Engelmann, Anne Stafford, Glenn Reynders, IEA EBC Annex 67 Energy Flexible Buildings, Energy and Buildingshttp://dx.doi.org/10.1016/j.enbuild.2017.08.044

IEA EBC Annex 67 Energy Flexible Buildings

Søren Østergaard Jensen[a], Anna Marszal-Pomianowska[b], Roberto Lollini[c], Wilmer Pasut[c], Armin Knotzer[d], Peter Engelmann[e], Anne Stafford[f], Glenn Reynders[g]

[a] Danish Technological Institute, Gregersensvej 2, DK-2630 Taastrup, Denmark. sdj@teknologisk.dk
[b] Department of Civil Engineering, Aalborg University, Sofindelsvej 9-11, DK-9000, Aalborg, Denmark. ajm@civil.aau.dk
[c] EURAC research Institute for Renewable Energy, Via G. Di Vittorio 16, I-39100 Bolzano, Italy. roberto.lollini@eurac.edu, wilmer.pasut@eurac.edu
[d] AEE - Institut für Nachhaltige Technologien, Feldgasse 19, A-8200 Gleisdorf, Austria. a.knotzer@aee.at
Fraunhofer Institute for Solar Energy Systems, ISE, Department Energy Efficient Buildings, Heidenhofstrasse 2, 79110 Freiburg, Germany, Peter.Engelmann@ise.fraunhofer.de
f Leeds Sustainability Institute, Leeds Beckett University, BPA223 Broadcasting Place, City Campus, Leeds LS2 9EN, UK. a.stafford@leedsbeckett.ac.uk
[g] Department of Civil Engineering, KU Leuven, Kasteelpark Arenberg 40, B-3001 Heverlee, Belgium. glenn.reynders@kuleuven.be

Abstract

The increasing global energy demand, the foreseen reduction of available fossil fuels and the increasing evidence off global warming during the last decades have generated a high interest in renewable energy sources. However, renewable energy sources, such as wind and solar power, have an intrinsic variability that can seriously affect the stability of the energy system if they account for a high percentage of the total generation.

The Energy Flexibility of buildings is commonly suggested as part of the solution to alleviate some of the upcoming challenges in the future demand-respond energy systems (electrical, district heating and gas grids). Buildings can supply flexibility services in different ways, e.g. utilization of thermal mass, adjustability of HVAC system use (e.g. heating/cooling/ventilation), charging of electric vehicles, and shifting of plug-loads. However, there is currently no overview or insight into how much Energy Flexibility different building may be able to offer to the future energy systems in the sense of avoiding excess energy production, increase the stability of the energy networks, minimize congestion problems, enhance the efficiency and cost effectiveness of the future energy networks. Therefore, there is a need for increasing knowledge on and demonstration of the Energy Flexibility buildings can provide to energy networks. At the same time, there is a need for identifying critical aspects and possible solutions to manage this Energy Flexibility, while maintaining the comfort of the occupants and minimizing the use of non-renewable energy.

In this context, the IEA (International Energy Agency) EBC (Energy in Buildings and Communities program) Annex 67: "Energy Flexible Buildings" was started in 2015. The article presents the background and the work plan of IEA EBC Annex 67 as well as already obtained results.