



**Aalborg Universitet**

**AALBORG UNIVERSITY**  
DENMARK

## **Energy saving potentials – A case study on the Danish building stock**

Wittchen, Kim Bjarne; Kragh, Jesper; Jensen, Ole Michael

*Published in:*  
ECEEE 2011 Summer Study

*Publication date:*  
2011

*Document Version*  
Publisher's PDF, also known as Version of record

[Link to publication from Aalborg University](#)

*Citation for published version (APA):*  
Wittchen, K. B., Kragh, J., & Jensen, O. M. (2011). Energy saving potentials – A case study on the Danish building stock. In *ECEEE 2011 Summer Study: Energy efficiency first: The foundation of a low-carbon society* (1 ed., Vol. 1, pp. 139). European Council for an Energy Efficient Economy, ECEEE.

### **General rights**

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- ? Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- ? You may not further distribute the material or use it for any profit-making activity or commercial gain
- ? You may freely distribute the URL identifying the publication in the public portal ?

### **Take down policy**

If you believe that this document breaches copyright please contact us at [vbn@aub.aau.dk](mailto:vbn@aub.aau.dk) providing details, and we will remove access to the work immediately and investigate your claim.

## Energy-saving potential – a case study of the Danish building stock

**Author:** Kim Wittchen  
**Affiliation:** Danish Building Research Institute, Aalborg University  
**Co-author(s):** Jesper Kragh, Ole Michael Jensen  
**Keywords:** energy savings potential, building energy certification, energy savings, Energy Performance of Buildings Directive (EPBD), knowledge extraction

A study of data extracted from the building Energy Performance Certification scheme data-base reveals a great potential for energy saving in existing buildings. A building energy labelling became mandatory in Denmark in 1997. Data were used to set up an energy balance for the entire Danish building stock, divided into different sectors and periods of construction. The energy-saving potential is high even considering years of campaigns promoting energy saving, the energy-saving subsidies given and building-energy-performance audits, and the fact that in Denmark the energy consumption has not increased since 1980. The general perception is that much has been achieved and generally house owners claim that they are conscious of their energy consumption, but that further investment in energy-saving measures cannot pay for itself.

This paper analyses the current energy status of the existing building stock from a scientific point of view and quantifies the national energy-saving potential by extracting data from the Energy Performance Certification scheme and combining it with data from other sources. In an analysis, where only 50% of the least energy-efficient constructions are improved, this potential is about 30% of the national energy consumption for space heating and 10% of the CO<sub>2</sub> emission that can be related to housing. Furthermore the method is used to investigate possible paths that Denmark may follow in order to become CO<sub>2</sub> neutral by 2050 and how buildings can supply their share of the required savings. Identification of how to act now in order to reach the goal by 2050 by means of an acceptable investment rate for building upgrading is discussed.

The paper also discusses how knowledge recorded in the energy performance certificates can be used through different kinds of actions, ranging from promoting the Energy Performance Certification scheme to definitions of pilot projects addressing different target groups.