



3<sup>rd</sup> International Symposium on  
**E**nergy **C**hallenges & **M**echanics  
- towards a big picture

7-9 July 2015  
Aberdeen, Scotland, UK

## **Heat Loss Measurements in Buildings Utilizing a U-value Meter**

Dr. Lars Schiøtt Sørensen

*Danish Building Research Institute, University of Aalborg, Copenhagen 2450, DK*

Accepted for publication on the 20th of February 2015

Heating of buildings in Denmark accounts for approximately 40% of the entire national energy consumption. For this reason, a reduction of heat losses from building envelopes are of great importance in order to reach the Bologna CO<sub>2</sub> emission reduction targets. Upgrading of the energy performance of buildings is a topic of huge global interest these years. Not only heating in the temperate and arctic regions are important, but also air conditioning and mechanical ventilation in the tropical countries contribute to an enormous energy consumption and corresponding CO<sub>2</sub> emission. In order to establish the best basis for upgrading the energy performance, it is important to measure the heat losses at different locations on a building facade, in order to optimize the energy performance. The author has invented a U-value meter, enabling measurements of heat transfer coefficients. The meter has been used in several projects to upgrade the energy performance of buildings in temperate regions. For instance, the U-value meter was utilized in a EUDP (Energy Technological Development and Demonstration Program) focusing on renovation of houses from the 1960s and 1970s.

This study has focus on the consumption of energy for heating and cooling of buildings. There is a huge energy-saving potential in this area for reducing both the global climate problems as well as economy challenges. In fact, global energy efficiency can be obtained in two ordinary ways. One way is to improve the energy production and supply side, and the other way is, in general, to reduce the consumption of energy in society. The U-value meter is intended for the latter purpose.

**Keywords:** Energy reduction; heat loss measuring; energy performance; heat loss measuring device; global climate