Energy performance and Indoor Air Quality in Modern Buildings in Greenland: Case study Apisseq

A new dormitory for engineering students “Apisseq” was built in the town of Sisimiut, Greenland in 2010. Its purpose is not only to provide accommodation for students. Thanks to its complex monitoring system it enables researchers to evaluate the building’s energy performance and indoor air quality (IAQ) as well as performance of some single components. Some of the installed technologies (balanced mechanical ventilation with heat recovery or solar collectors) are not commonly used in the current Greenlandic building stock. Therefore evaluation of their performance under local conditions is essential for further use and development. The first year of operation has disclosed some errors made during the design process and construction phase which have negative effects on the energy performance and IAQ. The heat demand in 2011 was 26.5% higher than expected. One of the main causes of the extra heat consumption is the fact that the ventilation system was over-dimensioned, and although it is running on the lowest fan power it maintains 1.1 ACH in the building. Reduction of the air flows and better frost protection of the heat exchangers are important issues to be dealt with in order to decrease the heat demand. This paper describes the building and how it is evaluated after the first year of operation, and it explains some of the revealed problems.

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