Design and operation of ventilation in low energy residences – A survey on code requirements and building reality from six European countries and China

One of the key objectives of the IEA Annex 68 research programme entitled “Indoor Air Quality Design and Control in Low Energy Residential Buildings” is to provide a generic guideline for the design and operation of ventilation in residential buildings. Modern and refurbished domestic buildings need to have minimal energy consumption, and at the same time maintain a high level of Indoor Air Quality. The paper reports on preliminary results of an interview survey conducted among different stakeholders involved in design, installation and operation of residential ventilation in countries involved in the Annex. There were two main objectives, firstly, to describe and analyse a transition between actual requirements (national building codes and standards) and current practice. Secondly, to investigate current barriers and challenges regarding installation of mechanical ventilation in residences. In total, 35 interviews from six European countries and China have been analysed, certainly not enough for a representative sample. However, the results provide a valuable snapshot of current practices and insights into potential barriers. The results show that mechanical ventilation with heat recovery is becoming the dominating ventilation system installed in new residences in Europe. However, there are countries, where, due to tradition, national legislation and/or cost reasons, other types of ventilation like mechanical exhaust or manual window ventilation are applied. Demand Controlled Ventilation is often allowed or even recommended in standards, but rarely implemented in practice, except for humidity controlled trickle vents in France. The main barriers against mechanical ventilation with heat recovery seem to be high capital cost, space requirements and duct routing as well as problems resulting from poor construction, lack of commissioning and/or maintenance.

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