Demand control ventilation in residential buildings

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Overview of the presentation

Using demand control ventilation in residential buildings has a great energy saving potential. However, there is a lack of knowledge how the ventilation should be controlled in order to ensure indoor air quality, thermal comfort and avoid damages on the building. SP has an ongoing project regarding demand control ventilation in residential buildings. In one single family house a demand control ventilation system has been installed and evaluated. Also, by using models (IDA ICE) demand control system is evaluated. In this study different control strategies, including control parameters, number of sensors and placing of sensors–are evaluated (see below for examples). Conclusions from the study are that the size of the energy saving depends on control strategy and it is important to design and choose appropriate control strategy to obtain a good indoor environment. Further, there is a need for more investigations, especially if other parameters then the ones included in this study are needed. Further, Ecodesign regulation concerning residential ventilation units (No 1254/2014, No1253/2014) reward ventilation units delivered with demand control and ventilation units sold with possibilities for demand control receives a better energy-labeling. In the project it is evaluated if the size of the reward corresponds to the actual saving in a single family house.

Control parameters evaluated in project are:

- temperature
- carbon dioxide
- relative humidity
- difference in absolute humidity indoor and outdoor

Examples of sensor placings evaluated in the project are:

- centrally sensor placing, one or more sensors are placed centrally, e.g. in exhaust duct
- multiple sensor placing, one or more sensors are placed in each zone of the building

Examples of zoning evaluated in the project are:

- Every room is a zone
- Every floor is a zone
- The building is a single zone