Title: Energy saving achieved with adaptive setpoint temperatures based on EN16798-1: application of the category III

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Abstract:

Climate change is one of the main problems of the society of the 21st century. High emissions of Greenhouse Gases (GHG) are generating more and more extreme living conditions, so GHG emissions should be reduced. Regarding buildings, their high energy consumption is mainly responsible for the contributions of GHG to the atmosphere. Ambitious goals for reducing GHG emissions have therefore been established by 2050. This study analyses the potential of the energy saving achieved using adaptive setpoint temperatures. These setpoint temperatures based on different thermal comfort models as energy conservation measures have been analysed in previous studies. However, the European Committee for Standardization has recently published a new standard. The new European thermal comfort model, the standard EN16798-1, is therefore used in this study. A total of 15 building models in southern Spain were analysed using EnergyPlus. The energy consumption obtained with adaptive setpoint temperatures was compared to that obtained using a static thermal comfort model. The results reflected the potential for the energy saving obtained by using adaptive setpoint temperatures in warm climatic zones.

Keywords: Energy consumption; adaptive setpoint temperatures; building; HVAC system; warm climate.