

Energy efficiency analysis in office building through thermal modelling

James Lau Tze Chen; Azizuddin Abd Aziz; Ahmed Nurye Oumer; Mohd Hazwan Yusof
Faculty of Mechanical Engineering, University Malaysia Pahang, 26600 Pekan, Pahang, Malaysia
*Corresponding author: azizuddin@ump.edu.my

ABSTRACT

Malaysia is hot and humid country with high temperature and humidity. The air conditioning systems that have huge energy consumption are an essential component in daily life. The aims of this research are to build a building thermal HVAC model, which could predict the amount of energy consumption required to get the comfort level using eQUEST and purpose energy saving methods. In the model the different physical properties of the building, weather, and internal load, HVAC system, operating strategies and schedules taken to account. From the result, huge energy used for space cooling resulting low room temperature outside the range of Malaysian Standard MS1525. Among the purposed method, packaged VAV DX coil air conditioning system has the most energy saving on the building's overall energy consumption following by roof and wall insulation (24°C) indoor temperature, standard VAV CW coil air conditioning system, and daylight control with low e glass. The energy reduction range from 6.0% to 21.2%. This study are significant to study and improve the building energy efficiency.

KEYWORDS:

Air conditioning; Energy conservation; Energy utilization; Office buildings