ABSTRAK

Dwelling and commercial building consume most energy in Indonesia. Based on Green Building Council Indonesia, 60% of operational energy in commercial building is used for cooling system. 55% of heat in a multistorey building comes from heat gain on facade and it can increase the cooling load. There’s relation between building form and facade material to cooling energy. This research aim to formulate the composition of the material in some form of medium-rise efficient energy office buildings.

A method used was experimental. Computer simulations with ecotect software used as a tool to analyze the data. Research was conducted by evaluating the influence of building forms and material, in this case influence of s/v ratio, the ratio of the west wall area of the sorvace area, material of the wall and glass material to the cooling energy efficiency. Evaluation is based on the energy efficiency standards for energy use AC power, cooling loads and OTTV.

The evaluation shows that building with octagon shape has the best energy performance. Other buildings may change the composition of material to achieve energy efficiency. Building with a rectangular prismatic or inclined and prismatic L will be efficient if it uses a combination of light brick with aluminum cladding and double glass or single low-e. Rectangular building wedding cake if using a wall without insulation, the glass used must be double low-e, if using light brick wall with cladding, clear glass can be applied. Building with a square forms and H must use a combination of material such as light brick walls with aluminum cladding and double low-e glass in order to be efficient buildings.

Key words: Building form, cooling energy, efficient, materials, middle-rise