

## **ABSTRACT**

*A hospital is a building that in its design and construction must follow the standards set by the government. Hospitals have a high level of energy consumption, this is because the services are available for 24 hours in 7 days, medical equipments, requirements for clean air, and disease control are continuously carried out. Therefore, with such operational demands, good design and development are needed so that the energy consumed is not excessive. With this case research was carried out on an ongoing hospital development project, Rumah Sakit Salman Hospital (RSSH). In this study, hospital system modeling and design will be made using open source software SketchUp, OpenStudio and EnergyPlus, it will be carried out which refers to the applicable provisions to obtain a presentable Energy Use Index (EUI). In this study, 3 cases studies were conducted with 3 different system input scenarios. The 1<sup>st</sup> Scenario is the RSSH building with input definition for Heating, Ventilation, and Air Conditioning (HVAC) systems using Variable Refrigerant Flow (VRF) but not using Dedicated Outdoor Air Systems (DOAS) and not using Fresh Air. The 2<sup>nd</sup> Scenario is the RSSH building with input definition for Heating, Ventilation, and Air Conditioning (HVAC) systems using Variable Refrigerant Flow (VRF) and Fresh Air but not using Dedicated Outdoor Air Systems (DOAS). The 3<sup>rd</sup> Scenario is the RSSH building with input definition for Heating, Ventilation, and Air Conditioning (HVAC) systems using Variable Refrigerant Flow (VRF) and using Dedicated Outdoor Air Systems (DOAS) also using Fresh Air. The results of the study show that the building model with the 1<sup>st</sup> scenario produces EUI at 123.219 kWh/m<sup>2</sup>/year, the 2<sup>nd</sup> scenario produces EUI at 127.755 kWh / m2 / year, and in the 3<sup>rd</sup> scenario produces EUI at 212.136 kWh / m2 / year. It can be seen that, air conditioning with input of VRF systems only produces the lowest Energy Use Index (EUI) value.*

**Keywords :** EUI, HVAC, Hospital