



## Comparison energy consumption between VRF system and Chilled water system in case study of the Chamchuri 10 Building

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**Abstract.** Bangkok is a city with a crowded population, so there is a high demand for buildings. Energy consumption in high-rise buildings, especially in cities with tropical climates, mostly comes from air conditioning. Therefore, choosing the right air conditioning system for high-rise buildings is important in the energy management of the building. This research aims to analyze energy use in air conditioning in high-rise buildings located in tropical climates. By comparing the water-cooled chiller water system and VRF systems, which are centralized air conditioning systems often used in high-rise buildings. Based on the calculation of the whole year of operation from the EnergyPlus and OpenStudio energy simulation program. The program simulates the air conditioning system of the Chamchuri 10 Building, which is a 20-story building equipped with VRF air conditioning systems and located in Bangkok. The geometric model of building, simplified from the official blueprint of the building, is constructed using the SketchUp program. Weather data, used for simulation, is based on the database from Meteorological of Thailand. For comparison purpose, VRF air conditioning system is modeled based on the specifications of the real air conditioning system installed in the building, while a chiller in the chilled water air conditioning system is chosen according to the design of the building from the Trane company specification. The comparison results show that the whole-year total energy consumption of the water-cooled chiller water system is about 27% less than the consumption of the VRF system. In summer and rainy season, the water-cooled chiller system consumes 13.88% and 10.81% less than energy of the VRF system respectively. However, in winter season the water-cooled chiller system consumes 14.68% more than energy of the VRF system.

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