

ABSTRAK

Gedung pemerintahan bertingkat khususnya di Kantor Gubernur Provinsi Kalimantan Timur memiliki konsumsi energi listrik masih relatif tinggi, terutama pada sistem HVAC, penerangan, dan peralatan perkantoran. Pengelolaan gedung yang masih bersifat konvensional berpotensi menyebabkan pemborosan energi dan meningkatnya biaya operasional. Penelitian ini akan menganalisis karakteristik konsumsi energi listrik eksisting, membuat strategi optimasi berbasis sistem bangunan cerdas, serta mengevaluasi dampaknya terhadap efisiensi energi dan biaya operasional pada Gedung Kantor Gubernur Provinsi Kalimantan Timur.

Penelitian ini meliputi audit energi awal, analisis pola konsumsi energi listrik, penerapan *Building Management System/Building Energy Management System* (BMS/BEMS) untuk pengendalian operasional gedung, serta evaluasi kinerja energi menggunakan indikator kinerja energi dan pendekatan pengukuran dan verifikasi. Fokus optimasi diarahkan pada pengaturan operasional sistem HVAC dan penerangan. Data di peroleh dari survey lokasi dan pengukuran dilapangan.

Hasil penelitian menunjukkan bahwa penerapan sistem bangunan cerdas di kantor gubernur provinsi kalimantan timur akan mampu menurunkan konsumsi energi listrik dan beban puncak gedung sekitar 15 - 30 %, sehingga berdampak pada penghematan energi dan biaya operasional listrik. Penelitian ini memberikan kontribusi akademis dalam kajian optimasi energi bangunan serta menjadi dasar teknis bagi pemerintah daerah dalam meningkatkan efisiensi pengelolaan energi dan biaya operasional gedung pemerintahan.

Kata kunci: optimasi, konsumsi energi, gedung pemerintahan, sistem bangunan cerdas.

ABSTRACT

Multi-story government buildings, particularly the East Kalimantan Governor's Office, still consume relatively high amounts of electricity, particularly for HVAC systems, lighting, and office equipment. Conventional building management has the potential to lead to energy waste and increased operational costs. This study aims to analyze the characteristics of existing electricity consumption, design an optimization strategy based on intelligent building systems, and evaluate its impact on energy efficiency and operational costs at the East Kalimantan Governor's Office.

The research methods included an initial energy audit, analysis of electricity consumption patterns, implementation of a Building Management System/Building Energy Management System (BMS/BEMS) for building operational control, and energy performance evaluation using energy performance indicators and a measurement and verification approach. The optimization focused on the operational management of the HVAC and lighting systems.

The results indicate that implementing an intelligent building system at the East Kalimantan Governor's Office will reduce electricity consumption and peak building loads by approximately 15-30%, resulting in energy savings and electricity operational costs. This research contributes academically to the study of building energy optimization and provides a technical basis for local governments to improve energy management efficiency and operational costs in government buildings.

Keywords: optimization, energy consumption, government buildings, intelligent building systems.