

ABSTRAK

Agung: Analisis Audit dan Konservasi Energi untuk Pencapaian Efisiensi Konsumsi Energi Listrik Di Gedung MC Furniture Medan. Skripsi. Fakultas Teknik Universitas Negeri Medan 2026.

Penelitian ini dilaksanakan untuk menganalisis pola konsumsi energi listrik, menerapkan strategi konservasi, serta menilai aspek ekonomi melalui perhitungan periode pengembalian investasi (*payback period*) di Gedung MC Furniture Medan. Metode penelitian meliputi audit energi, pengumpulan data konsumsi listrik dari tagihan PLN dan hasil pengukuran, serta analisis sistem kelistrikan utama yang mencakup pencahayaan, pendingin udara, dan peralatan elektronik. Hasil penelitian menunjukkan bahwa konsumsi energi listrik rata-rata mencapai 907,38 kWh per bulan dengan nilai Intensitas Konsumsi Energi (IKE) sebesar 5,038 kWh/m²/bulan. Nilai tersebut termasuk dalam kategori boros energi menurut SNI dan Permen ESDM. Analisis lebih lanjut memperlihatkan bahwa sistem pencahayaan memberikan kontribusi dominan terhadap total konsumsi energi. Kondisi awal menunjukkan adanya kelebihan tingkat pencahayaan dibandingkan standar, khususnya pada ruang penjualan. Penerapan konservasi dilakukan melalui penggantian lampu dengan LED yang lebih efisien serta penyesuaian jumlah unit sesuai kebutuhan standar iluminansi. Hasilnya, terjadi penurunan konsumsi energi sebesar 25%, sehingga nilai IKE turun menjadi 2,48 kWh/m²/bulan dan masuk kategori efisien. Dari sisi ekonomi, analisis menunjukkan bahwa investasi penggantian lampu memiliki periode pengembalian sekitar 1,45 tahun, sehingga layak diterapkan. Dengan demikian, penelitian ini menyimpulkan bahwa audit energi dan konservasi pada sistem pencahayaan Gedung MC Furniture mampu meningkatkan efisiensi penggunaan energi listrik, menurunkan biaya operasional, dan mendukung implementasi manajemen energi berkelanjutan.

Kata kunci: *audit energi, konservasi energi, efisiensi energi, IKE, payback period.*



ABSTRACT

Agung: *Analysis of Energy Audit and Conservation for Achieving Electrical Energy Consumption Efficiency at MC Furniture Building Medan. Essay, Faculty of Engineering, Unimed. 2026.*

This study was conducted to analyze the pattern of electrical energy consumption, implement conservation strategies, and assess the economic aspect through the calculation of the investment payback period at MC Furniture Building Medan. The research method included an energy audit, collection of electricity consumption data from PLN bills and field measurements, as well as an analysis of major electrical systems such as lighting, air conditioning, and electronic equipment. The results show that the building's average electricity consumption reached 907.38 kWh per month, with an Energy Intensity (IKE) value of 5.038 kWh/m²/month, which is categorized as inefficient according to SNI and Ministry of Energy and Mineral Resources standards. Further analysis revealed that the lighting system contributed dominantly to the total energy consumption, with excessive illumination levels compared to the standard, particularly in the sales area. Conservation was implemented by replacing existing lamps with more efficient LED and adjusting the number of units to meet standard illuminance requirements. As a result, energy consumption decreased by 25%, reducing the IKE value to 2.48 kWh/m²/month, which falls into the efficient category. From an economic perspective, the analysis indicates that the investment in LED replacement achieved a payback period of approximately 1,45 years, making it highly feasible. In conclusion, the study confirms that energy audits and conservation measures in the lighting system of MC Furniture Building effectively improve energy efficiency, reduce operational costs, and support the implementation of sustainable energy management.

Keywords: *energy audit, energy conservation, energy efficiency, IKE, payback period*

