

ABSTRAK

EVALUATION OF ELECTRICAL ENERGY CONSUMPTION IN THE SULTAN MAHMUD BADARUDDIN II METEOROLOGICAL STATION BUILDING IN PALEMBANG

(2025: xvi + 53 Halaman + 11 Gambar + 17 Tabel + 10 Daftar Pustaka)

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Data yang diperoleh dianalisis menggunakan parameter Indeks Konsumsi Energi (IKE), Energy Efficiency Ratio (EER), dan Coefficient of Performance (COP) untuk menilai tingkat efisiensi sistem kelistrikan dan pendingin udara. Hasil penelitian menunjukkan bahwa total konsumsi energi listrik pada Gedung Stasiun Meteorologi SMB II Palembang mencapai 6.116,4 kWh per bulan atau 73.396,8 kWh per tahun, dengan biaya operasional sekitar Rp 8.836.363 per bulan. Beban terbesar berasal dari sistem pendingin udara (AC) dan radar C-Band, yang menyumbang lebih dari 55% dari total konsumsi energi listrik. Nilai IKE yang diperoleh sebesar 17,47 kWh/m²/bulan, menempatkan gedung ini pada kategori “Sedang” berdasarkan klasifikasi Kementerian ESDM. Selain itu, nilai EER sebesar 20 dan COP sebesar 5,86 menunjukkan bahwa sistem pendingin udara tergolong sangat hemat energi. Dari hasil analisis tersebut dapat disimpulkan bahwa pemanfaatan energi listrik pada Gedung Stasiun Meteorologi SMB II Palembang cukup efisien, namun masih terdapat potensi penghematan terutama pada sektor penerangan, komputer, dan beban siaga. Upaya konservasi energi yang direkomendasikan meliputi pengaturan suhu AC yang optimal, penggantian lampu konvensional dengan LED, penerapan sistem zonasi pencahayaan, serta peningkatan kesadaran pengguna melalui kebijakan hemat energi.

Kata kunci: Efisiensi, listrik, IKE, EER, COP.

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The collected data were analyzed using Energy Consumption Index (IKE), Energy Efficiency Ratio (EER), and Coefficient of Performance (COP) parameters to assess the efficiency level of the electrical and air-conditioning systems. The results showed that the total electrical energy consumption of the SMB II Meteorological Station building reached approximately 6,116.4 kWh per month or 73,396.8 kWh per year, with an operational electricity cost of around Rp 8,836,363 per month. The main energy loads came from the air-conditioning system (AC) and the C-Band radar, which together accounted for more than 55% of total energy consumption. The calculated IKE value of 17.47 kWh/m²/month placed the building in the “Moderate” efficiency category according to the Ministry of Energy and Mineral Resources (ESDM) standards. Furthermore, the EER value of 20 and COP value of 5.86 indicated that the air-conditioning system operates at a very high energy efficiency level. Based on the analysis, it can be concluded that the overall electrical energy utilization at the SMB II Meteorological Station is relatively efficient, but there remains potential for further optimization, particularly in lighting, computer equipment, and standby loads. Recommended energy conservation measures include optimizing AC temperature settings, replacing conventional lamps with LED types, implementing lighting zoning systems, and increasing user awareness through internal energy-saving policies.

Keywords: efficiency, IKE, EER, COP.