Potensi Dekarbonisasi Sektor Energi Perusahaan Tambang Nikel PT XYZ dengan Implementasi Sistem Manajemen Energi = The Potential for Decarbonization in the Energy Sector of Nickel Mining Company PT XYZ Through the Implementation of Energy Management System

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Abstrak

Penelitian ini mengevaluasi potensi Sistem Manajemen Energi (EnMS) sebagai solusi bagi PT XYZ untuk mencapai target dekarbonisasi energi. Fokusnya meliputi perencanaan strategis dan teknis berbasis ISO 50001. Strategi melibatkan analisis isu internal-eksternal guna menyusun kebijakan energi dan membentuk tim energi yang bertanggung jawab atas EnMS. Peninjauan performa energi tahun 2022 menunjukkan total konsumsi energi sebesar 947,8 ribu GJ, dengan bahan bakar Biosolar B30 mencapai 99,93%. Sistem hauling dan mining, serta alat seperti hauler dan excavator, diidentifikasi sebagai Significant Energy Users (SEUs), mengonsumsi lebih dari 80% Biosolar B30. EnPI perusahaan sebesar 0,08 GJ/WMT, sedangkan regresi EnPI sistem (Y = 2,113X + 264.924) memiliki determinasi 0,892. Implementasi ISO 50001 berpotensi mengurangi emisi energi 30% pada 2030 melalui penghematan 9,7 juta liter Biosolar B30. Dengan ECO high impact no cost pada SEU, PT XYZ dapat menghemat 748.637,79 liter biosolar per tahun, menurunkan EnPI 0,06 liter/WMT, dan emisi 1.269,85 tCO2. Hingga 2030, penghematan dapat mencapai 5,99 juta liter biosolar, EnPI 0,45 liter/WMT, dan emisi 10.158,80 tCO2, setara 18,6% dari total emisi 2022 atau 62,13% target dekarbonisasi 2030.

.....This study evaluates the potential of implementing an Energy Management System (EnMS) as a solution for PT XYZ to achieve its energy sector decarbonization targets. The focus includes strategic and technical planning based on ISO 50001 principles. Strategic planning involves analyzing internal and external issues to develop the company's energy policy and establish an energy team responsible for EnMS. Energy performance reviews in 2022 recorded total energy consumption of 947.8 thousand GJ, with Biosolar B30 accounting for 99.93%. Hauling and mining systems, along with equipment such as haulers and excavators, were identified as Significant Energy Users (SEUs), consuming over 80% of Biosolar B30. The company's Energy Performance Indicator (EnPI) was 0.08 GJ/WMT, while the system-level EnPI regression equation (Y = 2.113X + 264.924) exhibited a determination coefficient of 0.892. ISO 50001 implementation has the potential to reduce energy emissions by 30% by 2030 through savings of 9.7 million liters of Biosolar B30. Targeted high-impact, no-cost Energy Conservation Opportunities (ECOs) in SEUs could save 748,637.79 liters of Biosolar annually, reducing EnPI by 0.06 liters/WMT and emissions by 1,269.85 tCO2. By 2030, systematic implementation could achieve savings of 5.99 million liters of Biosolar, an EnPI reduction of 0.45 liters/WMT, and emission reductions of 10,158.80 tCO2, equivalent to 18.6% of total 2022 emissions or 62.13% of the 2030 decarbonization target.