

ABSTRAK

Permasalahan lingkungan telah menjadi perhatian negara khususnya Indonesia. Kerusakan sumber daya alam serta penurunan kualitas dan kondisi lingkungan dihasilkan karena adanya proses produksi industri. Penelitian ini bertujuan merancang strategi mitigasi dampak lingkungan menggunakan metode Life Cycle Assessment (LCA) di industri fabrikasi PT Semen Indonesia Logistik. Studi ini mencakup analisis proses fabrikasi conveyor dengan seri 4-1C yang meliputi tahap pengumpulan data, *Life Cycle Inventory* (LCI), *Life Cycle Impact Assessment* (LCIA), dan *Life Cycle Interpretation, Focus Group Discussion* (FGD), perbaikan dengan perhitungan *Replacement Analysis*. Hasil penelitian menggambarkan proses fabrikasi conveyor seri 4-1C memiliki dampak lingkungan sebesar 526 Pt. Tahap yang memiliki dampak terbesar adalah transportasi pada proses pendatangan material dengan kategori dampak *ozone formation (human)* sebesar 47,3 Pt. Untuk mencari rekomendasi perbaikan dari permasalahan tersebut dengan *Focus Group Discussion* (FGD) bersama pihak perusahaan sehingga dapat dilakukan perbaikan. Terdapat dua rekomendasi perbaikan yang diusulkan untuk permasalahan dampak lingkungan pada proses pendatangan material. Usulan rekomendasi perbaikan tersebut adalah pergantian jenis bahan bakar dan pembelian armada transportasi baru. Usulan rekomendasi yang telah diusulkan akan diperhitungan manfaat dan biayanya sehingga dianggap layak untuk diimplementasikan menggunakan perhitungan *replacement analysis*. Rekomendasi perbaikan yang dianggap layak untuk permasalahan dampak lingkungan dengan kategori *ozone formation (human)* adalah pergantian jenis bahan bakar dari solar ke biosolar B35 dengan hasil kelayakan sebesar Rp 14.990.650.000.

Kata Kunci : Dampak lingkungan, Proses Fabrikasi, *Life Cycle Assessment* (LCA), *Replacement Analysis*

ABSTRACT

Environmental issues have become a major concern for countries, particularly Indonesia. The degradation of natural resources, as well as the decline in environmental quality and conditions, are caused by industrial production processes. This study aims to design a strategy for mitigating environmental impacts using the Life Cycle Assessment (LCA) method in the fabrication industry of PT Semen Indonesia Logistik. The study covers the analysis of the fabrication process of conveyor series 4-IC, including data collection, Life Cycle Inventory (LCI), Life Cycle Impact Assessment (LCIA), and Life Cycle Interpretation, Focus Group Discussion (FGD), and improvements using Replacement Analysis. The results of the study indicate that the fabrication process of the conveyor series 4-IC generates an environmental impact of 526 Pt. The stage with the highest impact is transportation during the material procurement process, with the highest impact category being ozone formation (human) at 47.3 Pt. To seek improvement recommendations for this issue, a Focus Group Discussion (FGD) was conducted with the company, which led to proposed improvements. Two improvement recommendations were proposed to address the environmental impact during material procurement: a change in fuel type and the purchase of new transportation fleets. These recommendations were evaluated for cost-benefit feasibility using replacement analysis. The recommended solution considered most feasible to address the ozone formation (human) impact category is the change from diesel fuel to B35 biodiesel, with a feasibility result valued at IDR 14,990,650,000.

Keywords: *Environmental Impact, Fabrication Process, Life Cycle Assessment (LCA), Replacement Analysis*