Penilaian daur hidup produksi minyak berat Lapangan Lepas Pantai Zuli Laut Jawa Bagian Barat = Life cycle assessment of heavy crude oil production in Zuli Field Offshore West Java

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Abstrak

Environmental, Social and Governance (ESG) merupakan tiga faktor penting dari pelaku industri untuk mendukung keberlanjutan (sustainability). Target utama kriteria lingkungan dalam ESG antara lain adalah upaya mengatasi perubahan iklim dengan mengurangi dampak lingkungan dari kegiatan operasi yang dilaksanakan. Studi ini bertujuan untuk mengidentifikasi potensi dampak lingkungan dari produksi minyak mentah berat di lapangan Zuli melalui melakukan Life Cycle Assessment (LCA) menggunakan software SimaPro. Ruang lingkup penelitian ini adalah cradle-to-gate, meliputi proses pemboran, well service, ekstraksi bahan baku, proses pemisahan, proses flaring, pengangkutan fluida kotor, dan pengolahan air terproduksi. Dengan menggunakan beberapa metodologi karakterisasi dampak, yaitu IPCC 2013, CML-baseline dan non-baseline, dan Cumulative Energy Demand, hasil penilaian dampak menunjukkan bahwa untuk 1 MJ minyak yang dihasilkan, kontribusi potensial 2.49 g CO2-eq GWP, 1.49×10-10 kg CFC11-eq Ozone Layer Depletion, 2.66×10-6 kg PO4-eq Eutrophication, 1.05 MJ Fossil Abiotic Depletion, 9.42×10-10 kg Sb-eq non-Fossil Abiotic Depletion, 1.71×10-5 kg SO2-eq Acidification, 1.10 × 10-4 MJ dan 1.03 × 10-4 MJ Cumulative Energy Demand non-Renewable dan Renewable.
.....Environmental, Social and Governance (ESG) are three important factors for industry players to support sustainability. The main targets of the environmental criteria in the ESG include efforts to overcome climate change by reducing the environmental impact in every stages of their activities. This study aims to identify the environmental impact of crude oil production in the Zuli field through conducting a Life Cycle Assessment (LCA) using SimaPro software. The scope of this research is cradle-to-gate, covering the drilling process, well service, raw material extraction, separation process, flaring process, dirty fluid transportation, and produced water treatment. By using several impact characterization methodologies, namely IPCC 2013, CML-baseline and non-baseline, and Cumulative Energy Demand, the impact results show that for 1 MJ of oil produced, potential to contribute 2.49 g CO2-eq GWP, 1.49×10-10 kg CFC11-eq Ozone Layer Depletion, 2.66×10-6 kg PO4-eq Eutrophication, 1.05 MJ Fossil Abiotic Depletion, 9.42×10-10 kg Sb-eq non-Fossil Abiotic Depletion, 1.71×10-5 kg SO2-eq Acidification, 1.10 × 10-4 MJ and 1.03 × 10-4 MJ Cumulative Energy Demand non-Renewable dan Renewable.