

Analisis Proporsional Fossil Carbon Pada RDF Dari Limbah Komersial Terhadap Emisi CO₂ Industri Semen ITP Menggunakan Adaptive Balance Method = Analysis of Share Fossil Carbon in Solid Refuse Derived Fuel From Commercial Waste Compared to CO₂ Emission of ITP Cement Industry Using Adaptive Balance Method

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Abstrak

Kegiatan pasar modern menghasilkan limbah padat yang berpotensi dipergunakan dalam teknologi *co-processing* dengan cara mengembalikan energi dari limbah sampah sebagai bahan bakar alternatif industri semen. Mall ITC Cempaka Mas sebagai salah satu pasar modern berencana untuk memberikan limbah sampah padat kepada PT Indocement Tunggul Prakarsa Tbk sebagai bahan bakar alternatif. Tujuan berupa analisa potensi RDF dari Mall ITC Cempaka Mas serta relevansinya terhadap nilai emisi yang dihasilkan pada proses pembakaran. Pendekatan metode ditinjau melalui proposional fossil carbon pada RDF yang didapat menggunakan pendekatan metode (aBM) *adaptive Balance Method*. Hasil penelitian berupa komposisi sampah buangan ITC adalah 41,66 % plastik, 31,81 % kertas, 13,95 % sampah organik, 5,04 % sterofoam, 1,76 % tekstil, 1,25 % karet, 1,13 % kaca, 0,33 % logam, dan 3,07 % jenis lainnya. Dari komposisi sampah ITC Cempaka Mas hanya 95,47 % sampah yang dapat di pergunakan sebagai RDF. Proporsional fraksi massa didapat sebesar 64 ± 7 % (biogenic) dan 36 ± 7 % (fossil). Faktor emisi RDF ITC didapat sebesar $705,88 \pm 122,67$ kg-CO₂/ton-RDF dari emisi carbon total sebesar 1350 ± 250 kg CO₂/ton-RDF. Potensi energi RDF ITC sebesar 4982 ± 721 kcal/kg yang didapatkan dari pendekatan aBM dan uji lab bomb calorimeter. Kesimpulan berupa limbah sampah Mall ITC Cempaka Mas berpotensi mensubstitusi 2,56 % kebutuhan batu bara tiap harinya dan diestimasikan terjadi pengurangan emisi sebesar 1,59 % dari emisi yang seharusnya dikeluarkan batu bara di industri semen PT Indocement Tunggul Prakarsa Tbk.

.....Modern market activities produce solid waste that has the potential to be used in *co-processing* technology by returning energy from waste as an alternative fuel for the cement industry. Mall ITC Cempaka Mas as one of the modern markets plans to provide solid waste to PT Indocement Tunggul Prakarsa Tbk as an alternative fuel. The purpose is to analyze the potential of RDF from the ITC Cempaka Mas Mall and its relevance to the value of emissions produced in the combustion process. The method approach is reviewed through proportional fossil carbon on RDF obtained using the method approach (aBM) *adaptive Balance Method*. The results of the study were the composition of ITC waste materials were 41,66% plastic, 31,81% paper, 13,95% organic waste, 5,04% styrofoam, 1,76% textile, 1,25% rubber, 1,13% glass, 0,33% metal, and 3,07% other types. From the composition of ITC Cempaka Mas waste, only 95,47% of waste can be used as RDF. Proportional mass fraction were 64 ± 7 % (biogenic) and 36 ± 7 % (fossil). RDF ITC emission factor is $705,88 \pm 122,67$ kg-CO₂ / ton-RDF from total carbon emissions of 1350 ± 250 kg CO₂ / ton-RDF. The RDF ITC energy potential is 4982 ± 721 kcal / kg which is found in the aBM approach and the lab test bomb calorimeter. The conclusion is that waste from Mall ITC Cempaka Mas has the potential to substitute 2,56% of coal needs per day and estimated emission reduction of 1,59% of emissions that should have been issued by coal in the cement industry PT

Indocement Tunggal Prakarsa Tbk (ITP).