Analisa kelayakan ekonomi dimetil eter sebagai alternatif bahan bakar = Economic feasibility analysis of dimethyl ether as an alternative fuel

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Abstrak

[ABSTRAK
Kebutuhan energi yang semakin meningkat dari tahun ke tahun, dimana ketergantungan terhadap minyak bumi dan terakhir terhadap LPG perlu disiasati dengan mencari sumber energi baru. Dimetil Eter dinilai sebagai sumber energi alternatif yang potensial menimbang sumber bahan baku pembuatan DME dapat diperoleh dari biomassa, batubara dan gas alam, yang mana merupakan sumber bahan baku yang terbarukan dan tidak terbarukan, menjamin ketersediaan DME secara terus-menerus. Kajian pustaka terhadap keekonomian pembuatan Dimetil Eter dari tiga bahan baku tersebut dengan menggunakan Indirect dan Direct Technology) akan dibahas, yang mana lebih lanjut analisa pada tesis ini hanya terbatas kepada bahan baku biomassa dan batubara saja.
Dengan membandingkan empat variasi yaitu BB1PI (Biomassa ? direct technology), BB2P1 (Batubara- direct technology), BB1P2 (Biomassa ? indirect technology), BB2P2 (Batubara- indirect technology) dengan basis kapasitas produksi DME 5.000 ton/hari (351 hari operasional) dan harga DME adalah USD 1.000/ MT DME atau USD 907.220/ ton DME diperoleh nilai CAPEX dan OPEX terendah USD 3.203.965.095,66 dan USD 373.546.794,34 berturut, dengan nilai IRR tertinggi 38% dan PBP (Pay Back Period) terendah 2.63 tahun untuk variasi BB2P1 (Batubara ? direct Technology). Sehingga dengan membandingkan empat variasi tersebut diatas diperoleh kesimpulan bahwa bahan baku dan proses teknologi yang dinilai paling ekonomis didalam penerapannya adalah variasi BB2P1 (Batubara-direct technology).
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ABSTRACT
The need for energy is increasing from year to year, where the dependence on petroleum and LPG should last to overcome by finding new sources of energy. Dimethyl Ether assessed as a potential alternative sources of energy considering its raw material can be obtained from biomass, coal and natural gas, which is the renewable source of raw materials and non-renewable, ensuring the availability of DME continuously. Literature review on the economical manufacture of Dimethyl Ether from three raw materials by using Indirect and Direct Technology will be discussed, which further analysis in this thesis is limited to biomass and coal feedstock only.
By comparing the four variations of the BB1PI (Biomass - direct technology),

BB2P1 (Coal - direct technology), BB1P2 (Biomass - indirect technology), BB2P2 (Coal - indirect technology), with base DME production capacity of 5,000 tons / day (351 operational days) with price USD 1,000/MT DME or USD 907.220/ ton DME, obtained lowest CAPEX and OPEX values USD 3,203,965,095.66 and USD 373,546,794.34 respectively, with the highest value of IRR 38% and the lowest value of PBP (Payback Period) 2.63 years for BB2P1 variation (Coal - Direct Technology). Therefore, by comparing the four variations of the above it is concluded that the raw materials and process technologies are considered the most economical in its application is BB2P1 (Coal-direct technology).;The need for energy is increasing from year to year, where the dependence on petroleum and LPG should last to overcome by finding new sources of energy. Dimethyl Ether assessed as a potential alternative sources of energy considering its raw material can be obtained from biomass, coal and natural gas, which is the renewable source of raw materials and non-renewable, ensuring the availability of DME continuously. Literature review on the economical manufacture of Dimethyl Ether from three raw materials by using Indirect and Direct Technology will be discussed, which further analysis in this thesis is limited to biomass and coal feedstock only.

By comparing the four variations of the BB1PI (Biomass - direct technology), BB2P1 (Coal - direct technology), BB1P2 (Biomass - indirect technology), BB2P2 (Coal - indirect technology), with base DME production capacity of 5,000 tons / day (351 operational days) with price USD 1,000/MT DME or USD 907.220/ ton DME, obtained lowest CAPEX and OPEX values USD 3,203,965,095.66 and USD 373,546,794.34 respectively, with the highest value of IRR 38% and the lowest value of PBP (Payback Period) 2.63 years for BB2P1 variation (Coal - Direct Technology). Therefore, by comparing the four variations of the above it is concluded that the raw materials and process technologies are considered the most economical in its application is BB2P1 (Coal-direct technology)., The need for energy is increasing from year to year, where the dependence on petroleum and LPG should last to overcome by finding new sources of energy. Dimethyl Ether assessed as a potential alternative sources of energy considering its raw material can be obtained from biomass, coal and natural gas, which is the renewable source of raw materials and non-renewable, ensuring the availability of DME continuously. Literature review on the economical manufacture of Dimethyl Ether from three raw materials by using Indirect and Direct Technology will be discussed, which further analysis in this thesis is limited to biomass and coal feedstock only.

By comparing the four variations of the BB1PI (Biomass - direct technology), BB2P1 (Coal - direct technology), BB1P2 (Biomass - indirect technology), BB2P2 (Coal - indirect technology), with base DME production capacity of 5,000 tons / day (351 operational days) with price USD 1,000/MT DME or USD 907.220/ ton DME, obtained lowest CAPEX and OPEX values

USD 3,203,965,095.66 and USD 373,546,794.34 respectively, with the highest value of IRR 38% and the lowest value of PBP (Payback Period) 2.63 years for BB2P1 variation (Coal - Direct Technology). Therefore, by comparing the four variations of the above it is concluded that the raw materials and process technologies are considered the most economical in its application is BB2P1 (Coal-direct technology).]