ABSTRAK

**PRARANCANGAN PABRIK DIMETIL ETER (DME)
DARI METANOL PROSES DEHIDRASI KATALIS ALUMINA
KAPASITAS 40.000 TON/TAHUN
(Perancangan Reaktor (RE-201))**

Oleh

RIAN ADI PRAYOGA

Dimetil Eter (DME) merupakan zat kimia yang dapat digunakan sebagai pengganti LPG (*Liquified Petroleum Gas*), biodiesel, CFC (*Chlorofluorocarbon)*, prekursor untuk produksi dimetil sulfat dan asam asetat, *refrigerant* dan pelarut untuk ekstraksi komponen organik. DME umumnya dihasilkan dari reaksi dehidrasi Metanol dengan katalis Alumina. Akan tetapi penyediaan DME dalam negeri masih mengandalkan impor, sehingga peluang untuk didirikannya pabrik DME memiliki prospek yang bagus. Penyediaan utilitas pabrik berupa sistem pengolahan dan penyediaan air serta penyedia udara dan instrumentasi. Kapasitas produksi pabrik DME direncanakan sebesar 40.000 ton/tahun dengan 330 hari kerja dalam 1 tahun. Lokasi pabrik direncanakan didirikan di Kota Bontang, Kalimantan Timur. Tenaga kerja yang dibutuhkan sebanyak 164 orang dengan bentuk badan usaha Perseroan Terbatas (PT) dengan struktur organisasi *line* dan *staff*.

Dari analisis ekonomi diperoleh:

Fixed Capital Investment	(FCI)	=	Rp759.293.495.512
Working Capital Investment	(WCI)	=	Rp84.365.943.945
Total Capital Investment	(TCI)	=	Rp843.059.439.458
Break Even Point	(BEP)	=	55,27%
Shut Down Point	(SDP)	=	20,76%
Pay Out Time before taxes	$(POT)_b$	=	3,058 tahun
Pay Out Time after taxes	$(POT)_a$	=	3,551 tahun
Return on Investment before taxes	$(ROI)_b$	=	20,44%
Return on Investment after taxes	$(ROI)_a$	=	16,35%
Discounted cash flow	(DCF)	=	32,71%

Berdasarkan hasil analisis diatas, maka pendirian pabrik DME ini layak untuk dikaji lebih lanjut, karena merupakan pabrik yang menguntungkan dari sisi ekonomi dan mempunyai prospek yang relatif baik.

ABSTRACT

MANUFACTURING OF DIMETHYL ETHER (DME) PLANT FROM METHANOL DEHYDRATION PROCESS WITH ALUMINA CATALYST WITH CAPACITY 40.000 TONS/YEAR (Design of Reactor (RE-201))

By

RIAN ADI PRAYOGA

Dimethyl Ether (DME) is a chemical substance with versatile applications, serving as a viable alternative to Liquified Petroleum Gas (LPG), biodiesel, Chlorofluorocarbons (CFC), a precursor for the production of dimethyl sulfate and acetic acid, as well as a refrigerant and solvent for organic component extraction. DME is typically synthesized through the dehydration reaction of methanol using Alumina catalyst. Despite its broad utility, the domestic supply of DME relies heavily on imports, presenting a promising opportunity for the establishment of a DME production plant. The proposed facility will incorporate utility provisions, including water treatment and supply systems, as well as air supply and instrumentation. The production capacity of the DME plant is envisaged to be 40,000 tons per annum, operating for 330 days per year. The chosen site for the plant is in Bontang City, East Kalimantan. The anticipated workforce requirement is 164 individuals, and the proposed business structure is a Limited Liability Company (PT) *with a streamlined organizational structure comprising both line and staff functions.*

From the economic analysis are obtained:

Fixed Capital Investment	(FCI)	=	Rp759.293.495.512
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Based on the above analysis, the establishment of the DME plant is deemed worthy of further consideration, as it proves economically viable and holds relatively positive prospects.