ABSTRAK

PRARANCANGAN PABRIK *BIO-OIL* DARI TANDAN KOSONG KELAPA SAWIT (TKKS) DENGAN KAPASITAS 200.000 TON/TAHUN
(Tugas Khusus Perancangan *Condenser Partial*)

Oleh
JAUZA KHOERUNNISA

Bio-oil merupakan salah satu produk industri kimia yang digunakan sebagai bahan bakar diesel atau digunakan sebagai bahan baku dalam industri petrokimia pembangkit listrik, transportasi, dan produksi kimia. Bio-oil dapat di produksi dengan proses pirolisis cepat dan pirolisis lambat. Penyediaan kebutuhan utilitas pabrik berupa sistem pengolahan dan penyediaan air, *cooling water*, sistem penyediaan udara kering, sistem pembangkit tenaga listrik, sistem refregerasi dan sistem pembakaran gas.

Kapasitas produksi pabrik direncanakan 200.000 ton/tahun dengan 330 hari kerja dalam 1 tahun. Lokasi pabrik direncanakan didirikan di daerah Bekri, Lampung Tengah. Tenaga kerja yang dibutuhkan sebanyak 147 orang dengan bentuk badan usaha Perseroan Terbatas (PT) yang dipimpin oleh seorang Direktur Utama yang dibantu oleh Direktur Produksi dan Direktur Keuangan dengan struktur organisasi *line and staff.*

Dari analisis ekonomi, diperoleh :

Fixed Capital Investment (FCI)	= Rp1.415.541.152.979,75
Working Capital Investment (WCI)	= Rp353.885.288.244,94
Total Cost Invesment (TCI)	= Rp1.769.426.441.224,69
Break Event Point (BEP)	= 34,10%
Shut Down Point (SDP)	= 11,25%
Pay Out Time after Taxes $(POT)_a$	= 2,415 tahun
Return on Investment before taxes $(ROI)_b$	= 30,80%
Return on Investment after taxes $(ROI)_a$	= 24,64%
Discounted Cash Flow (DCF)	= 44,66%

Mempertimbangkan rangkuman di atas, sudah selayaknya pendirian pabrik Bio-oil ini dikaji lebih lanjut, karena merupakan pabrik yang menguntungkan dan mempunyai prospek yang baik.

Kata Kunci : Pabrik Bio-oil, Pirolisis Cepat, *Condenser Partial*

ABSTRACT

PRE-DESIGN OF A BIO-OIL PLANT FROM EMPTY FRUIT BUNCHES (EFB) WITH A CAPACITY OF 200.000 TONS/YEAR
(Condenser Partial Design)

By
JAUZA KHOERUNNISA

Bio-oil is one of the important products in the chemical industry, used as a diesel fuel substitute or as a raw material in petrochemical industries, power generation, transportation, and chemical manufacturing. Bio-oil can be produced through fast pyrolysis or slow pyrolysis processes. The required plant utilities include water treatment and supply systems, cooling water systems, dry air supply systems, power generation systems, refrigeration systems, and gas combustion systems.

The plant is designed with a production capacity of 200,000 tons per year, operating 330 days annually. The proposed plant location is Bekri, Central Lampung. The workforce requirement is 147 employees. The business entity will be established as a Limited Liability Company (PT), led by a President Director, assisted by a Production Director and a Finance Director, with an organizational structure based on the line-and-staff model.

From the economic analysis, the following results were obtained :

Fixed Capital Investment (FCI)	= Rp1.415.541.152.979,75
Working Capital Investment (WCI)	= Rp353.885.288.244,94
Total Cost Invesment (TCI)	= Rp1.769.426.441.224,69
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Considering the summary above, the establishment of this bio-oil plant deserves further evaluation, as it is a profitable project with strong future prospects.

Keywords : Bio-oil Plant, Fast Pyrolysis, Condenser Partial