## ABSTRACT

**FACTORY DESIGN OF BIOETHANOL FROM LIGNOCELLULOSIC BIOMASS CORN COBS WITH PROCESS SEPARATED HYDROLYSIS AND FERMENTATION (SHF) WITH CAPACITY 37.000 TONS/YEAR (Design Of *Hydrolysis Reactor* (RE-201))**

**By**

**ADELLIA NOVARINGGA**

The Bioethanol Factory from raw materials corn cobs, will be build in Kediri, Jawa Timur. Establishment of this factory is based on some consideration due to raw material resources, transportation, the labors availability and also the environmental condition.

This factory is planned produce 37.000 tons/year, with time of operation 24 hours/day, and 330 days/year. The raw material used is corn cobs as much as 18.355,1006 kg/hour

This factory has utility units which the function are for water supply system, instrument air supply system, steam, power generation system, refrigerant supply system and waste treatment system. The bussines entity of this plant is limited liability company (PT) and using line and staff structure with 211 labors

From the economic analysis, it is obtained that :

| | | | |
|---|---|---|---|
| *Fixed Capital Investment* | (FCI) | = | Rp 974.993.363.486 |
| *Working Capital Investment* | (WCI) | = | Rp 172.059.652.380 |
| *Total Capital Investment* | (TCI) | = | Rp 1.147.051.015.866 |
| *Break Even Point* | (BEP) | = | 44,38 % |
| *Shut Down Point* | (SDP) | = | 23,47 % |
| *Pay Out Time before taxes* | $(POT)_b$ | = | 2,39 years |
| *Pay Out Time after taxes* | $(POT)_a$ | = | 2,82 years |
| *Return on Investment before taxes* | $(ROI)_b$ | = | 27,11 % |
| *Return on Investment after taxes* | $(ROI)_a$ | = | 21,69 % |
| *Discounted cash flow* | (DCF) | = | 29,93 % |

The result of technical and economic feasibility study is feasible and need further analysis, because the plant is profitable with good sustainability

# ABSTRAK

## PRARANCANGAN PABRIK BIOETANOL DARI BIOMASSA LIGNOSELULOSA TONGKOL JAGUNG DENGAN PROSES SEPARATED HYDROLYSIS AND FERMENTATION (SHF) DENGAN KAPASITAS 37.000 TON/TAHUN
**(Perancangan Reaktor Hidrolisis (RE-201))**

**Oleh**

**ADELLIA NOVARINGGA**

Pabrik Bioetanol dari Biomassa Tongkol Jagung, akan didirikan di Kabupaten Kediri, Jawa Timur. Pabrik ini berdiri dengan mempertimbangkan ketersediaan bahan baku, sarana transportasi yang memadai, tenaga kerja yang mudah didapatkan dan kondisi lingkungan.

Pabrik ini direncanakan memproduksi Bioetanol sebanyak 37.000 ton/tahun, dengan waktu operasi 24 jam/hari, 330 hari/tahun. Bahan baku yang digunakan adalah Tongkol Jagung sebanyak 18.355,1006 kg/jam.

Penyediaan kebutuhan utilitas pabrik Bioetanol terdiri dari unit pengadaan air, pengadaan udara instrument, *steam*, pengadaan listrik dan pengolahan limbah. Bentuk perusahaan adalah Perseroan Terbatas (PT) menggunakan struktur organisasi *line* dan *staff* dengan jumlah karyawan sebanyak 211 orang.

Dari analisis ekonomi diperoleh :

| | | | |
|---|---|---|---|
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Hasil study kelayakan teknik dan ekonomi menyatakan bahwa pendirian Pabrik Bioetanol layak dikaji lebih lanjut karena menguntungkan dan mempunyai masa depan yang baik.