INTISARI

Pengembangan A20 yakni bahan bakar dengan emisi rendah campuran 5% etanol, 15% metanol dan 80% *gasoline* mempengaruhi meningkatnya kebutuhan bioetanol di Indonesia. Kebutuhan bioetanol yang terus meningkat di Indonesia menjadi alasan Indonesia secara mandiri untuk memenuhinya dengan mendirikan beberapa pabrik bieotanol maupun menginvestasikan modal untuk pembuatan etanol dari beberapa pabrik gula dengan sistem terintegrasi dengan bahan baku molase. Salah satu cara pemenuhan bioetanol adalah dengan membangun pabrik biotanol dengan bahan baku singkong (*Manihot Esculenta*) dengan perbandingan hasil antara bahan baku singkong dan etanol adalah 6,1 : 1 dan kebutuhan kapasitas produksi yang diharapkan adalah 600.000 ton/tahun. Proses yang digunakan terbagi dalam 4 proses utama, *pre-treatment*, gelantinasi, fermentasi dan pemurnian. Metode perhitungan yang dilakukan adalah metode *short-calculation* untuk perhitungan proses produksi dengan memenuhi nilai *fuel grade ethanol* (FGE) 99,95% dan perhitungan investasi (*capex*, *opex*), *Payback Periode* (PP), *Net Present Value* (NPV) dan *Internal Rate of Return* (IRR). Hasil penelitian menunjukan bahwa pabrik ini layak didirikan dengan skenario yakni keadaan harga bahan baku dan harga jual etanol normal, harga bahan baku mengalami kenaikan dan penurunan harga sebesar 5% dari harga normal, namun harga jual etanol tetap dan keadaan harga bahan baku tetap, sedangkan harga jual etanol mengalami kenaikan dan penurunan harga sebesar 5% dari harga normal. NPV pada keadaan bahan baku dan harga jual normal adalah sebesar Rp 102 triliun. Persentase NPV untuk harga bahan baku naik 5% harga jual etanol tetap, harga bahan baku turun 5% harga jual etanol tetap, harga bahan baku tetap harga jual etanol naik 5% dan harga bahan baku tetap harga jual etanol turun 5% adalah -0,05% (naik), 0,05% (turun), 0,01% (turun) dan -0,01% (naik). PP terjadi pada 60 bulan 1 hari pada keadaan harga bahan baku dan harga jual etanol normal, 60 bulan 24 hari pada keadaan harga bahan baku naik 5% harga jual etanol tetap, 59 bulan 28 hari pada keadaan harga bahan baku turun 5% harga jual etanol tetap, 59 bulan 20 hari pada keadaan harga bahan baku tetap harga jual etanol naik dan 59 bulan 28 hari pada harga bahan baku tetap harga jual etanol turun 5% dari harga normal. Nilai IRR untuk harga bahan baku naik 5% harga jual etanol tetap, harga bahan baku turun 5% harga jual etanol tetap, harga bahan baku tetap harga jual etanol naik 5% dan harga bahan baku tetap harga jual etanol turun 5% adalah 18,613%, 18,342%, 18,883%, 18,645% dan 18,582%, sehingga memenuhi syarat utama studi kelayakan bisnis yakni NPV > 0, PP < 15 tahun dan IRR > MARR.

Kata Kunci: A20, Singkong, Etanol, *Net Present Value, Payback Period, Internal Rate of Return*

ABSTRACT

The development of A20, a low-emission fuel mixture of 5% ethanol, 15% methanol and 80% gasoline, affects the increasing demand for bioethanol in Indonesia. The increasing need for bioethanol in Indonesia is the reason for Indonesia to independently meet it by establishing several bieothanol factories or investing capital for the manufacture of ethanol from several sugar factories with an integrated system with molasses raw materials. One way to fulfill bioethanol is to build a bioethanol plant with cassava raw materials (*Manihot Esculenta*) with a yield ratio between cassava and ethanol raw materials is 6.1: 1 and the expected production capacity requirement is 600,000 tons / year. The process used is divided into 4 main processes, pre-treatment, gelantinase, fermentation and purification. The calculation method carried out is a short-calculation method for the calculation of the production process by meeting the fuel grade ethanol (FGE) value of 99.95% and investment calculations (capex, opex), Payback Period (PP), Net Present Value (NPV) and Internal Rate of Return (IRR). The results showed that this factory is feasible to be established with a scenario, namely the condition of raw material prices and normal ethanol selling prices, raw material prices have increased and decreased prices by 5% from normal prices, but the selling price of ethanol remains and the state of raw material prices is fixed, while the selling price of ethanol has increased and decreased prices by 5% from normal prices. NPV in the state of raw materials and normal selling prices is Rp 102 trillion. The NPV percentage for raw material prices increased by 5%, fixed ethanol selling prices, raw material prices decreased by 5%, fixed ethanol selling prices, fixed raw material prices, ethanol selling prices rose by 5%, and fixed raw material prices, ethanol selling prices fell by 5%, were -0.05% (up), 0.05% (down), 0.01% (down) and -0.01% (up). PP occurs in 60 months 1 day in the state of raw material prices and normal ethanol selling prices, 60 months 24 days in the condition of raw material prices rising 5% fixed ethanol selling prices, 59 months 28 days in conditions of raw material prices falling 5% fixed ethanol selling prices, 59 months 20 days in conditions of fixed raw material prices ethanol selling prices rising and 59 months 28 days in fixed raw material prices ethanol selling prices falling 5% of the normal price. The IRR value for raw material prices increased by 5%, fixed ethanol selling prices, raw material prices decreased by 5%, fixed ethanol selling prices, fixed raw material prices, ethanol selling prices rose by 5%, and fixed raw material prices, ethanol selling prices fell by 5%, were 18.613%, 18.342%, 18.883%, 18.645% and 18.582%, thus meeting the main requirements of business feasibility studies, namely NPV > 0, PP < 15 years and IRR > MARR.

Keywords : A20, Cassava, Ethanol, Net Present Value, Payback Period, Internal Rate of Return