ABSTRACT

Pre design of Bioethanol factory with 50,000 ton/year capacities are built to decrease Bioethanol import. Bioethanol are made from straw with Hydrolysis and Fermentation process, used an enzyme and yeast as a catalyst. These reaction occurred at Batch reaction. The operating condition is exothermic at the temperature of 38°C, pressure of 1 atm for Hydrolysis and temperature of 35°C and pressure of 1 atm for The Fermentation. This factory classified as low risk because the process proceed in low operating condition. This factory need straw of 20,480.45078 kg/hour, enzyme of 122.0369 kg/hour and yeast of 341.8564 kg/hour. The process supporting utilities consist of 232.1501 m^3/day domestic water, 5,692,332.8202 kg/hour cooling water, 20,082.0636 kg/ year steam, 97,997.1011 gallon/year fuel, 6.48 KW electricity. This factory was built in Karawang West Java with land size of 45,150 m^2 and employees of 155 people. The fix Capital Investment (FCI) is Rp 182,806,408,212.00 and Working Capital Investment (WCI) is Rp 164,183,507,677.00. The economic result shows that the benefit before tax is Rp 78,884,437,430 per year. Return On Investment (ROI) before tax is 21,39% and after tax is 10,69%. Pay Out Time (POT) before tax is 3.2 year and after tax is 4.8 year. Break Event Point (BEP) is 53.49% capacities, Shut Down 26.33% and Discount Cash Flow Rate (DCFR) is 16.47% capacities. Based on these result it can be concluded this bioethanol factory from straw with capacity 50,000 ton/year is interesting for next research.