ABSTRACT

To advance the development of the Indonesian economy required the industrialized world. For the pre-draft of this proposed plant. Pre-draft of this plant on the construction of an ethanol plant with raw materials used are ethylene and water.

Ethanol plant capacity in the pre draft of this plant is 40,000 tons / year. Ethanol to be produced is about 99% ethanol. Ethylene is used to be reacted with water assisted with phosphate acid catalyst, in a fixed bed reactor multi tube with temperature 250^{o}C and pressure of 68 atm. Because of the pressure and temperature used is high enough then the plant is classified as a plant with a high risk.

This plant will be planned at Cilegon, Banten, West Java. This plant work continually for 24 hours/day and 330 days/year. It covers 11.369 m^2 and needs 146 employees. Process unit requires 4438,0012 kg/hours ethylene to produced 40.000 ton/years ethanol. Whereas utility unit needs 535612,2056 kg/hours water for cooler, 60540,2770 kg/hours water for domestic and 213086,5846 kg/hours of steam.

The economic evaluation shows Fixed Capital of Rp. 213.075.832.519 = US$ 17.347.214, Working Capital of Rp. 350.469.224.551 = US$ 28.532.869,Profit before taxes Rp. 162.012.829.450, Profit after taxes Rp. 81.006.414.725. Feasibility studies results in Break Even Point (BEP) of 43,29% (BEP required in Indonesia 40% - 60 %), Shut Down Point (SDP) of 34,34%, and Discounted Cash Flow Rate of Return (DCFR) of 22.97%. Meanwhile, Return On Investment Before Taxes (ROI_b) of 76% (ROIb required for high risk plant > 44%) and Return On Investment After Taxes (ROI_a) of 38%. along with Pay Out Time Before Taxes (POT_b) of 1.16 years (POTb required for high risk plant < 2 years) and Pay Out Time After Taxes (POT_a) of 2.08 years in a row. Based on this economic evaluation, it can be concluded that ethanol plant40.000ton/year is economically feasible.