

ABSTRACT

Preliminary design of Ethanol with capacity 45.000 ton/year is plant to be built in industry area Tangerang-Banten, in the area of land 30.000 m². This chemical plant will be operated for 330 day/year or 24 hours a day with 167 employees.

Raw material neededs is Ethylene 14,943.29 kg/hour, Water 8,005.333 kg/hour. The production process will be operated at temperature 250°C, at pressure about of 68 atm using Fixed Bed Multitube with conversion 23% . The utiliy consist of 115,4992.4552 kg/hour of cooling water, 2,216.94kg/hour of processing water, 2041.6667 kg/hour of housing water, 241,838.5891 kg/hour of steam, 3,615.081 m³/hour of fuel while the power of electricity of about 15,915.128 kwh provided by PLN. This chemical plant also use generator set as reserve.

An economic analysis shows thats this chemical plant need to be covered by fixed capital of about Rp.369,203,179,395.53, working capital of about Rp.226,027,125,785.75. The profit before tax is Rp.79,505,888,323.88 while the profit after tax is Rp.39,752,944,161.94. Percentage of return on investemen (ROI) before tax is 21,53% while after tax is 11,77%. Pay out time (POT) before tax is 3,17 years while after tax is 4,82 years, Discounted cash flow rate (DCFR) for about 23,99% The value of break evek point (BEP) for about 52,74% and shut down point (SDP) of about 21,04%. Based on the economic analysis, It is concluded that plant design of Ethanol with capacity 45,000 ton/years visible to be built.