

ABSTRACT

The Diethyl Ether plant gives good prospect, considering the requirement of Diethyl Ether in Indonesia which progressively increase. Preliminary design of Diethyl Ether plant from ethanol is planned to built in Cilegon, the province of Banten, in the area of land of 9.828 m² with production capacity 15,000 tons/year. This chemical plant will be operated for 330 days or 24 hours a day with total 122 employees. Raw materials needed are ethanol 20.475,2772 tons/year. The production process will be operated at temperature 130-252°C and pressure about 1,3 atm using a adiabatic fixed bed reactor. The convert reaction is 97.45%, resulting product Diethyl Ether, Water, and Ethylene. This plant are needed 23.222,98 kg/hour of water from Cikandek river which processed in utility unit, 5.865,71 kg/hour of steam, and 785,76 kVA of electricity power provided by PLN and also need a generator as reserve. A parameter of appropriateness uses an economic analysis with total capital investment Rp 253.162.596.190 consisted of Rp 137.034.635.241 as a Fixed Capital Investment, and Rp 116.127.960.950 as a Working Capital. Total Cost Rp 140.732.545.706 and Annual Sales Rp 716.360.335.278 thus it can get profit Rp 76.744.401.262 before taxes, and Rp 38.372.200.631 after taxes. A count result of parameter after taxes is percentage of Return On Investment (ROI) 28%, Pay Out Time (POT) 2,63 year after taxes, Discounted Cash Flow (DCF) 22,97%, Break Event Point (BEP) 43,32%, while Shut Down Point (SDP) 31,18%. From the analyses above it showed that the result was satisfied so the plant are interesting and appropriate to build.