

INTISARI

Kokas merupakan bahan bakar yang banyak dipakai dalam industri pembuatan logam. Kokas banyak dipakai sebagai bahan bakar karena memiliki nilai kalor yang tinggi dan menghasilkan pembakaran yang relatif lebih bersih dari batubara. Kokas diproduksi dari reaksi karbonisasi batubara pada temperatur tinggi dan bebas oksigen.

Pembuatan kokas dari batubara berlangsung dalam beberapa tahap. Tahap pertama dimulai dari karbonisasi dalam *rotary kiln 1* untuk menghasilkan kokas dan *coke oven gas*. Kokas dari *rotary kiln 1* diturunkan suhunya dalam *spray quencher 1* kemudian direduksi dengan *roller mill*. Kokas keluaran *roller mill* dicampur dengan aspal sebagai pengikat lalu direkarbonisasi dalam *rotary kiln 2* untuk menghilangkan zat terbang aspal dan proses *curing*. Keluar dari *rotary kiln 2*, kokas didinginkan kembali dalam *spray quencher 2*, sebelum masuk ke *rotary dryer* untuk dikurangi kadar airnya.

Pabrik ini dirancang dengan kapasitas 700.000 ton/tahun. Produk kokas diproduksi dari batubara sebanyak 1.250.940 ton/tahun dan aspal sebanyak 98.117 ton/tahun dengan produk samping berupa 158.400 ton/tahun COG. Kebutuhan utilitas meliputi air sebanyak 195943,3978 ton/tahun; dan listrik dengan daya 12000 kVA. Pabrik ini direncanakan untuk didirikan di Muara Enim, Propinsi Sumatera Selatan dengan luas tanah 5 Ha. Total karyawan yang dibutuhkan ialah sebanyak 184 orang.

Dari perhitungan hasil evaluasi ekonomi diperoleh parameter sebagai berikut: *Fixed Capital Investment (FCI)* sebesar \$ 114.840.878 + Rp 5,3649 x 10¹¹; *Working Capital (WC)* sebesar \$ 48.357.350 + Rp 14.112.445.774; Keuntungan sebelum pajak US\$ 95.821.842; Keuntungan setelah pajak US\$ 63.881.228; *Return On Investment before taxes* = 69,44%; *Return On Investment after taxes* = 46,30 %; *Pay Out Time before taxes* = 0,89 tahun; *Pay Out Time after taxes* = 1,26 tahun; *Break Even Point (BEP)* = 47,05%; *Shut Down Point (SDP)* = 10,21%, *Discounted Cash Flow Rate of Return (DCFRR)* 47,68% .

Berdasarkan data-data diatas, Pabrik Kokas dari batubara menarik untuk dikaji lebih lanjut.

Kata Kunci : Kokas, Batubara, *Coke oven gas*

ABSTRACT

Coke is a solid fuel mostly used in steel-making industry. Coke is used as a fuel instead of coal because of its high calorific value and cleaner combustion. Coke is produced from carbonation reaction of coal at high temperature and oxygen-free environment.

Coke making from coal has several step. At first coal is carbonized in rotary kiln 1 producing coke and coke oven gas. The coke from rotary kiln 1 is cooled in spray quencher 1 and its size is reduced in roller mill. The coke then is mixed with asphalt as a binder and recarbonized in rotary kiln 2. Out of rotary kiln 2, coke is cooled again in spray quencher 2 before entering rotary dryer to reduce the water content.

The plant is designed with a capacity of 700,000 tons/year. Products of coke is produced from coal as much as 1,250,940 tons/year and asphalt as much as 98,117 tons/year with the by-product is COG as much as 158,400 tons/year. Utilities includes water as much as 195,943.3978 tons/year and 12,000 kVA electrical power. The plant is planned to be established in the City of Muara Enim, South Sumatera Province, with an area of 5 hectares. Total employees are needed as much as 184 people.

The calculation results the economic evaluation parameters obtained as follows: Fixed Capital Investment (FCI) of US\$ sebesar \$ 114,840,878 + Rp 5.3649 $\times 10^{11}$; Working Capital (WC) of US\$ \$ 48,357,350 + Rp 14,112,445,774; Profit before tax of US\$ 95,821,842; Profit after tax of US\$ 63,881,228; Return on Investment (ROI) before taxes = 69.44%, Return on Investment after taxes = 46.30%; Pay Out Time (POT) before taxes = 0.89 years; Pay Out Time after taxes = 1.26 years; Break Even Point (BEP) = 47.05%; Shut Down Point (SDP) = 10.21%, Discounted Cash Flow Rate of Return (DCFRR) = 47.68%.

Based on the data above, Plant of Coke from Coal with a capacity of 700,000 tons/year is interesting for further studies.

Keywords: *Coke, coal, coke oven gas*