

BAB XII

KESIMPULAN

XII.

XI.1 Diskusi

Pabrik pengolahan limbah B3 berupa *spent bleaching earth* (SBE) menjadi *Recovered Oil* (R-Oil) dan *De-Oiled Bleaching Earth* (De-OBE) didirikan sebagai respons terhadap pesatnya perkembangan industri pemurnian atau *refinery crude palm oil* (CPO) di Indonesia yang menghasilkan limbah SBE dalam jumlah besar setiap tahunnya. Pembangunan pabrik pengolahan SBE diharapkan dapat menjadi solusi dalam pengelolaan limbah SBE secara berkelanjutan sekaligus meningkatkan nilai tambah limbah melalui pemulihan minyak sisa dan pemanfaatan residu padat hasil pengolahan. Selain memberikan manfaat lingkungan, keberadaan pabrik ini juga berpotensi mendorong pengembangan industri hilir yang memanfaatkan R-Oil dan De-OBE sebagai bahan baku, menciptakan lapangan kerja baru, serta mendukung pertumbuhan ekonomi nasional. Pembangunan pabrik direncanakan berjalan pada tahun 2027 dan beroperasi pada kapasitas 100% pada tahun 2031. Kelayakan pendirian pabrik pengolahan SBE dapat ditinjau berdasarkan beberapa aspek berikut.

1. Segi Bahan Baku dan Produk yang Dihasilkan

Bahan baku yang digunakan adalah SBE dengan kapasitas pengolahan 250.000 ton/tahun. Bahan baku diperoleh dari *refinery* CPO yang berada di sekitar lokasi pabrik. Produk yang dihasilkan yaitu R-Oil (kandungan minyak >99%) sebanyak 72.558,8447 ton R-Oil/tahun dan De-OBE (kandungan *bleaching earth* >90% dan kadar minyak <3%) sebanyak 172.369,3738 ton De-OBE/tahun. R-oil dapat digunakan dalam industri oleokimia sebagai bahan baku biodiesel dan biolubrikan.. Sedangkan De-Obe dapat diaplikasikan pada bidang konstruksi.

2. Segi Proses

Proses pengolahan SBE menggunakan metode *solvent extraction* dengan pelarut berupa N-Heksana 99%. Proses terdiri dari beberapa tahapan meliputi tahap ekstraksi menggunakan n-heksana, pemisahan padatan dan cairan, penghilangan pelarut dari De-OBE, pemurnian *miscella* melalui evaporasi dan *stripping* untuk memperoleh R-Oil, serta kondensasi dan pemisahan pelarut guna memungkinkan daur ulang n-heksana ke dalam proses. Melalui rangkaian proses tersebut, diperoleh produk utama berupa R-Oil dan De-OBE dengan pemanfaatan kembali pelarut secara efisien.

3. Segi Lokasi

Pabrik pengolahan SBE ini direncanakan berlokasi di Kota Dumai, Provinsi Riau, yang merupakan salah satu pusat industri pengolahan dan hilirisasi minyak kelapa sawit (CPO) di Indonesia. Pemilihan lokasi tersebut didasarkan pada berbagai pertimbangan teknis, ekonomis, dan operasional, antara lain ketersediaan bahan baku, kecukupan pasokan air dan utilitas pendukung, ketersediaan energi, kemudahan akses transportasi dan distribusi produk, ketersediaan tenaga kerja, serta potensi perluasan area pabrik. Seluruh pertimbangan pemilihan lokasi tersebut telah dibahas secara rinci pada Bab VI.

4. Segi Ekonomi

Pabrik pengolahan SBE dinyatakan layak untuk didirikan dari segi ekonomi. Kelayakan tersebut ditunjukkan oleh nilai Return on Investment (ROI) dan *Return on Equity* (ROE) yang berada di atas *Minimum Acceptable Rate of Return* (MARR) sebesar 24–32%. Selain itu, *payout time* setelah pajak diperkirakan selama 2 tahun, 6 bulan, dan 15 hari, yang lebih pendek dibandingkan umur operasi pabrik selama 10 tahun. Nilai *Break Even Point* (BEP) sebesar 35,66% juga berada di bawah batas 60%, sehingga menunjukkan fleksibilitas operasi dan ketahanan ekonomi yang baik.

XI.2 Kesimpulan

Nama Perusahaan : EcoClay Nusantara

Bentuk Perusahaan : Perseroan Terbatas (PT)

Produk Utama : *Recovered Oil* (R-Oil) dan *De-Oiled Bleaching Earth* (De-OBE)

Bahan Baku Utama : *Spent Bleaching Earth* dan N-Heksana

Kapasitas Produk : 172.369,3738 ton De-OBE/tahun dan 72.558,8447 ton R-Oil/tahun

Kapasitas Bahan Baku : 250.000 ton SBE/tahun

Tipe Operasi Semi-Kontinyu

Utilitas : • Air Sanitasi = 13,5080 m³/hari

• *Cooling Water* = 9212,6330 m³/hari (*Make Up* : 116,2865 m³/hari)

• *Chilled Water* = 1493,3286 m³/hari

• Air Umpan Boiler = 205,2937 m³/hari (*Make Up* : 13,2309 m³/hari)

• *Saturated steam* : Suhu 180°C; Tekanan 10 bar abs = 165893,8691 kg/hari

• Listrik : 727,9258 kW

• Bahan Bakar IDO (*Industrial Diesel Oil*) = 6159,2460 kg/tahun

• Bahan Bakar GPC (*Green Petroleum Coke*) = 4830,3015 ton/tahun

- Gas N₂ = 3268,8436 kg/jam (Sirkulasi pada RVDF)
- *Compressed air* : 100 Nm³/jam

Jumlah Tenaga Kerja : 114 orang

Lokasi Pabrik : Bangsal Aceh, Kec. Sungai Sembilan, Kota Dumai, Riau 28826

Luas Pabrik : 54.600 m³ (Panjang 280 m dan Lebar 195 m)

Dari analisa ekonomi yang telah dilakukan, didapatkan:

- *Total Capial Investment* (TCI) = Rp970.029.675.560
- *Total Production Cost* (TPC) = Rp 436.837.218.262
- Pendapatan per tahun = Rp 1.088.294.475.539

Analisis ekonomi berdasarkan *cash flow* perusahaan menghasilkan:

- ROI setelah pajak = 44,60%
- ROI sebelum pajak = 54,79%
- ROE setelah pajak = 76,05%
- ROE sebelum pajak = 96,48%
- POT setelah pajak = 2 tahun 7 bulan 7 hari
- POT sebelum pajak = 2 tahun 2 bulan 13 hari
- BEP = 36,51 %

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