

COST ESTIMATION

Benzene plant size = 250 T/day

Fixed capital investment for cost index of 130 = Rs 3.7253×10^8

Cost index for 2002 = 402

Therefore present fixed capital investment = $3.7253 \times 10^8 \times (402/130)$
=Rs 1,15,19,77,385

Estimation of total investment cost:

1) Direct cost:

a) Purchased equipment cost:(15 – 40% of FCI)

Assume 40% of FCI

=Rs 46,07,90,953

b) Installation cost:(35 – 45% of PEC)

Assume 45%

=Rs 20,73,55,929

c) Instrument and control installed:(6 –30% of PEC)

Assume 30% of PEC

=Rs 13,82,37,286

d) Piping installation cost:(10 –80% of PEC)

Assume 80%

=Rs.36,86,32,764

e) Electrical installation cost:(10 – 40% of PEC)

Assume 40% of PEC

=Rs 18,43,16,381

f) Building process and auxilliary:(10-70% of PEC)

Assume 70%

=Rs 32,25,53,667

g) Service facilities:(30-80% Of PEC)

Assume 80%

=Rs 36,86,32,762

h) Yard improvement:(10-15% of PEC)

Assume 15%

=Rs 69,118,642

i) Land:(4-8% of PEC)

Assume 8%

=Rs 3,68,63,276

Therefore direct cost =Rs 2,15,65,01,660

Indirect cost:

Expenses which are not directly involved with material and labour of actual installation or complete facility

a) Engineering and supervision:(5-30% of DC)

Assume 30%

=Rs 64,69,50,498

b)Construction expenses:(10% of DC)

=Rs 21,56,50,166

c)Contractors fee:(2-7% Of DC)

Assume 7%

=Rs 15,09,55,116

d)Contingency:(8-20% of DC)

Assume 20%

=Rs 43,13,00,332

Therefore total indirect cost =Rs 1,44,48,56,112

Fixed capital investment:

Fixed capital investment(FCI) = DC+IC

= Rs 3,60,13,57,772

Working capital investment:

10 –20% of FCI

Assume 15%

=Rs 54,02,03,665

2) Total capital investment:

= FCI + WC

=Rs 4,14,15,61,438

Estimation of total product cost(TPC):

Fixed charges:

- a) Depreciation:(10% of FCI for machinery)

=Rs 36,01,35,777

- b) Local taxes:(3-4% of TPC)

Assume 3%

=Rs 10,80,40,733

- c) Insurances:(0.4-1% of FCI)

Assume 0.4%

=Rs 1,44,05,431

- d)Rent:(8-12% of FCI)

Assume 8%

=Rs 28,81,08,621

Therefore total fixed charges =Rs 77,06,90,562

But, Fixed charges = (10-20% of TPC)

Assume 20%

Therefore Total product cost =770690562/0.2

=Rs 3,85,34,52,810

Direct production:

- a) Raw material:(10-50% of TPC)

Assume 40%

=Rs 1,54,13,81,124

- b)Operating labour(OL):(10-20% of TPC)

Assume 15%

=Rs 57,80,17,922

- c)Direct supervisory and electric labour:(10-25% of OL)

Assume 20%

=Rs 1,156,03,584

- b) Utilities:(10-20% of TPC)

Assume 15%

=Rs 57,80,17,922

c) Maintenance:(2-10% of FCI)

Assume 8%

=Rs 28,81,08,622

d) Operating supplies (OS):(10-20% of maintenance)

Assume 15%

=Rs 4,32,16,293

e) Laboratory charges:(10-20% of OL)

Assume 12%

=Rs 6,93,62,151

f) Patent and royalties:(2-6% of TPC)

Assume 4%

=Rs 15,41,38,112

Plant overhead cost:

50-70% of (OL+OS+M)

Assume 65%

=Rs 26,04,46,593

General expenses:

a) Administration cost:(40-60% of OL)

Assume 50%

=Rs 28,90,08,961

b) Distribution and selling price:(2-30% of TPC)

Assume 20%

=Rs 77,06,90,562

c) Research and development cost:(3% of TPC)

=Rs 11,56,03,584

Therefore general expenses(GE) =Rs 1,17,53,03,107

Therefore manufacturing cost(MC)= Product cost+fixed charges+Plant overhead expenses

=Rs 4,88,45,89,965

Total production cost:

Total production cost =MC + GE

=Rs 6,05,98,93,072

Gross earnings and rate of return:

The plant is working for say 320 days a year

Selling price =Rs.140 /kg

Total income = $100 \times 345 \times 1000 \times 140$

=Rs 4,83,00,00,000

Gross income =Total income – total product cost

=Rs 97,65,47,190

Tax =50%

Net profit =Rs 48,82,73,595

Rate of return =net profit/total capital investment

=11.78 %