

## COST ESTIMATION AND ECONOMICS

Index for 2002 =402

Therefore present fixed capital investment = $1356647586 \times (402/130)$   
=Rs 4,19,51,71,766

### Estimation of total investment cost:

#### 1) Direct cost:

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

Assume 35% of FCI

=Rs 14,68,31,0112

Installation cost:(35 – 45% of PEC)

Assume 40%

=Rs 5,87,32,4043

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

Assume 20% of PEC

=Rs 2,93,66,2022

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

Assume 50%

=Rs 7,34,15,5056

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

Assume 30% of PEC

=Rs 4,40,49,3032

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

Assume 50%

=Rs 7,34,15,5056

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

Assume 60%

=Rs 8,80,98,6061

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

Assume 12%

=Rs 1,76,19,7214

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

Assume 5%

=Rs 73,41,5501

Therefore direct cost =Rs 53,88,69,8129

**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 20%

=Rs 10,77,73,9611

Construction expenses:(10% of DC)

=Rs 5,38,86,9801

Contractors fee:(2-7% of DC)

Assume 5%

=Rs 2,69,43,4903

Contingency:(8-20% of DC)

Assume 10%

=Rs 5,38,86,9801

Therefore total indirect cost =Rs 24,24,91,4112

**Fixed capital investment:**

Fixed capital investment(FCI) = DC+IC

= Rs 78,13,61,2231

**Working capital investment:**

10 –20% of FCI

Assume 15%

=Rs 11,72,04,18122

**Total capital investment:**

= FCI + WC

=Rs 89,85,65,40084

**Estimation of total product cost(TPC):**

**Fixed charges:**

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

=Rs 7,81,36,1212

Local taxes:(3-4% of FCI)

Assume 3%

=Rs 2,34,40,83610

Insurances:(0.4-1% of FCI)

Assume 1%

=Rs 78,13,6126

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

Assume 10%

=Rs 7,81,36,1212

Therefore total fixed charges =Rs 18,75,26,6 906

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

Assume 20%

Therefore Total product cost =18,75,26,6 906/0.2

=Rs 93,76,33,4506

**Direct production:**

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

Assume 30%

=Rs 28,12,90,0355

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

Assume 15%

=Rs 14,06,45,0172

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

Assume 15%

=Rs 2,10,96,7523

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

Assume 15%

=Rs 14,06,45,0172

Maintenance:(2-10% of FCI)

Assume 6%

=Rs 4,68,81,6731

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

Assume 15%

=Rs 70,32,2504

Laboratory charges:(10-20% of OL)

Assume 15%

=Rs 2,10,96,7522

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

Assume 4%

=Rs 3,75,05,3381

**Plant overhead cost:**

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

Assume 60%

=Rs 11,67,35,3646

**General expenses:**

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

Assume 55%

=Rs 77,35,66,7592

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

Assume 15%

=Rs 14,06,45,0173

Research and development cost:(3% of TPC)

=Rs 2,81,29,0033

Therefore general expenses(GE) =Rs 94,23,40,7808

Therefore manufacturing cost(MC)= Product cost+fixed chages+Plant overhead expense

=Rs 1,24,18,95,5045

**Total production cost:**

Total production cost =MC + GE

=Rs 2,18,42,36,284

**Gross earnings and rate of return:**

The plant is working for say 330 days a year

Selling price =Rs. 21/kg

Total income = $1364 \times 330 \times 1000 \times 21$

=Rs 9452520000

Gross income =Total income – total product cost

=Rs 2365923417

Tax =50%

Net profit =Rs 1182961709

Rate of return =net profit/total production cost

=28.19%

