Selection of Alternatif Investment of Chemical Plant Equipment

Engineering Economic Analysis Section
Perancangan Pabrik Kimia 2

Schedule

- Time Value of Money (Interest Rate) & Cash Flow
- Depreciation & Salvage Value
- Profitability Analysis
- **Selection of Alternatif Investment of Chemical Plant Equipment**
- Sensitivity/Break Even Analysis
- Tax Principals (Dasar-Dasar Perpajakan)
- Selection of Plant Location
- Ujian Modul

Significant Considerations Before Economic Evaluation

- The flows of money take the form of expenditures or income
- Saving from operations are considered as income or as a reduction in expenses
- Time value of money is considered
- A reasonable rate of return (profitability) must be included
- Income taxes must be included
- A methodology must be developed to reduce the above information to a manageable format

Parameters to Determine the Choice between Alternatives

- Net Present Worth/Net Present Value
- Rate of Return on Investment
- Capitalized Cost
- Discounted Cash Flow Rate of Return

Net Present Worth/Net Present Value

- The net present worth method allows the conversion of each flows into money units
- Cash flow may be assumed to be instantaneous as in a purchase of a property or uniformly distributed over a period of time
- the alternative yielding the more positive net present worth is preferred
- If one alternative has a different life than others, the program for each must be life of the various alternatives. For example, if cases A and B have estimated lives of 7 and 9 years, respectively, the program for each must be calculated for the least common multiple of 63 years.

Example

- Problem: Filtration equipment must be installed in a plant. Assume that service life is 7 years and there is no capital recovery.
  - System A: Fixed investment = $25000; Annual operating expenses = $6000
  - System B: Fixed investment = $15000; Annual operating expenses = $11000
  - The equipment is to be depreciated over a 7-year period by straight-line method. The income tax rate is 35% and the interest rate to be used is 15%
  - Choose the investment by comparing NPV, ROI, IRR, Capitalized Cost
- Solution:

Incremental Analysis