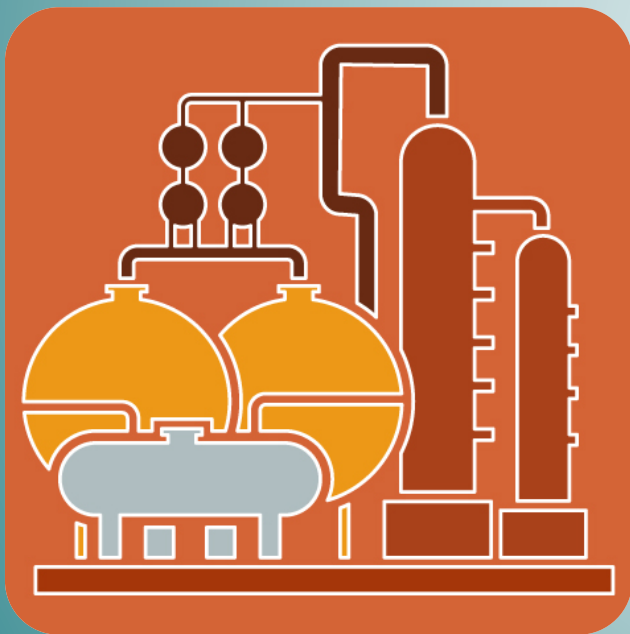


Chemical Process Design / Diseño de Procesos Químicos

Topic 6.1. Cost estimation



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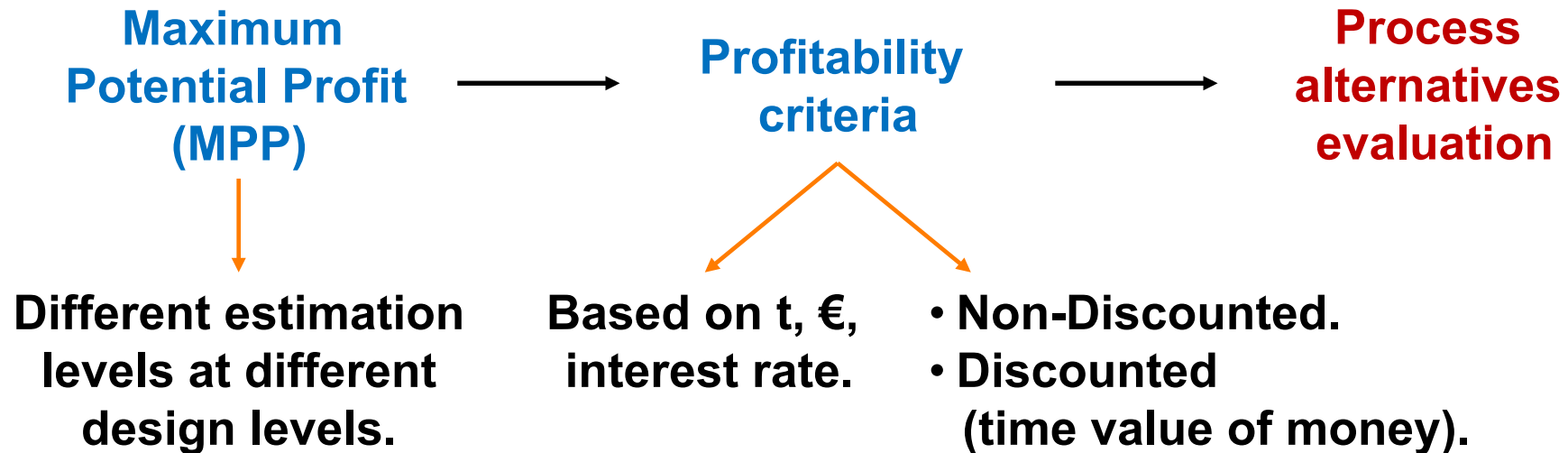
7.- Further Reading and References

PRACTICAL CHAPTER

RELEVANT TO LEARNING

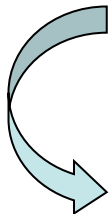
1.- Economic aspects of the preliminary design

Economic evaluation throughout:



Maximum Potential Profit

Design using hierarchical levels of decision (Levels of Douglas).



Use of hierarchical levels to estimate the potential profit.

1.- Economic aspects of the preliminary design

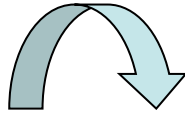
1st Estimation (PP1):

[Income from product sale] –
[Annual cost of raw materials]



- Importance of the stoichiometry.
- Levels 1 and 2 of Douglas decision.
- Knowledge of PFD.

PP1 > 0



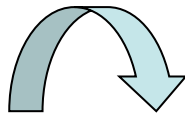
2nd Estimation (PP2):

[Income from product sale] –
[Annual cost of raw materials] –
[Manufacturing costs]



- Knowledge of energetic needs.
- Levels 1-5 of Douglas decision.

PP2 > 0



3rd Estimation (PP3):

[Income from product sale] –
[Annual cost of raw materials] –
[Manufacturing costs] –
[Capital costs]



- Capital investment and manufacturing cost estimation.

2.- Cost Estimates: Costs related to the process

Fixed Capital (*Capital Fijo o Inmovilizado*)

Portion of the total fixed capital that is invested in fixed assets to build the physical process itself, that stay in the business almost permanently, or at the very least, for more than one accounting period.

Land, buildings, machinery, vehicles and equipment, patents, incidental expenses (estimation adjustments).

Working Capital (*Capital Circulante*)

Represents funds required to operate the plant due to delays in payment and maintenance of inventories.

The money available to fill the tanks (solvents, catalysts, industrial and configured consumer products) and meet the initial payroll and expenses.

CAPITAL INVESTMENT or CAPITAL COST (*Inversion de Capital*) CI [€]

Startup Cost (*Coste de Arranque*)

2.- Cost Estimates: Costs related to the process

Direct Manufacturing Costs

(DMC):

Vary with production rate.

Fixed Manufacturing Costs

(FMC):

Independent of changes in production rate.

MANUFACTURING COSTS
(Costes de fabricación) [€ / t]
(COM)

$$\text{COM} = \text{DMC} + \text{FMC} + \text{GE}$$

General Manufacturing Expenses (GE):

Business functions and seldom vary with production level. Associated with management level and administrative activities not directly related to the manufacturing process.