PROCESS INTEGRATION

Introduction to Process Integration

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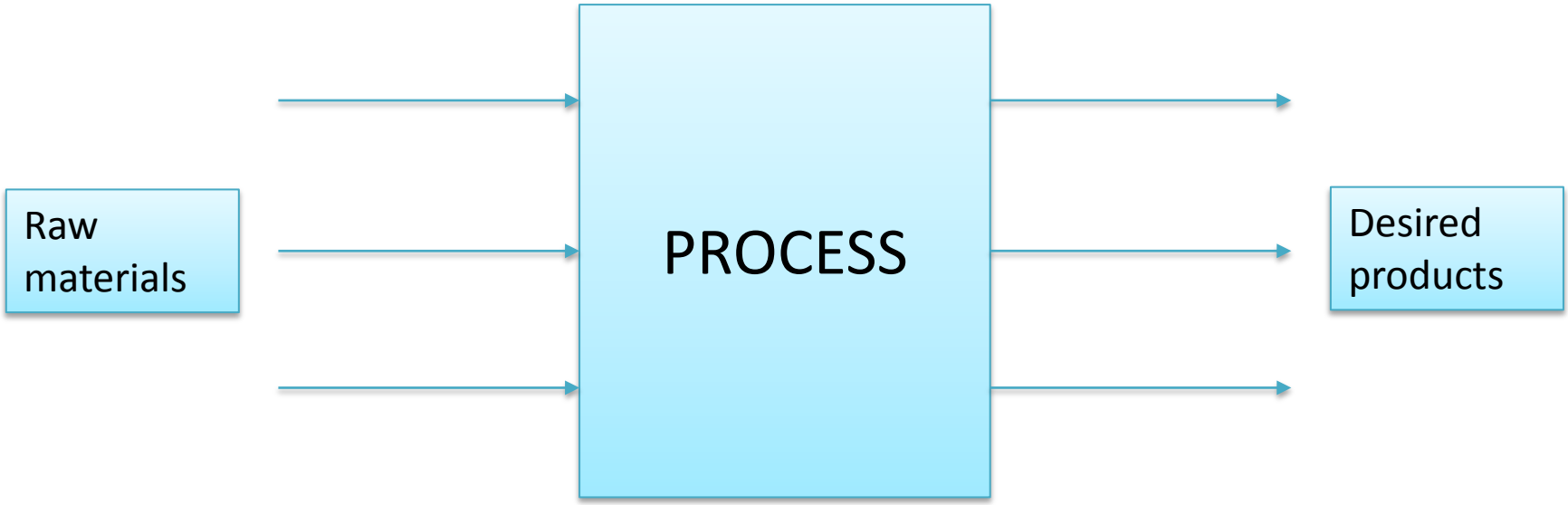
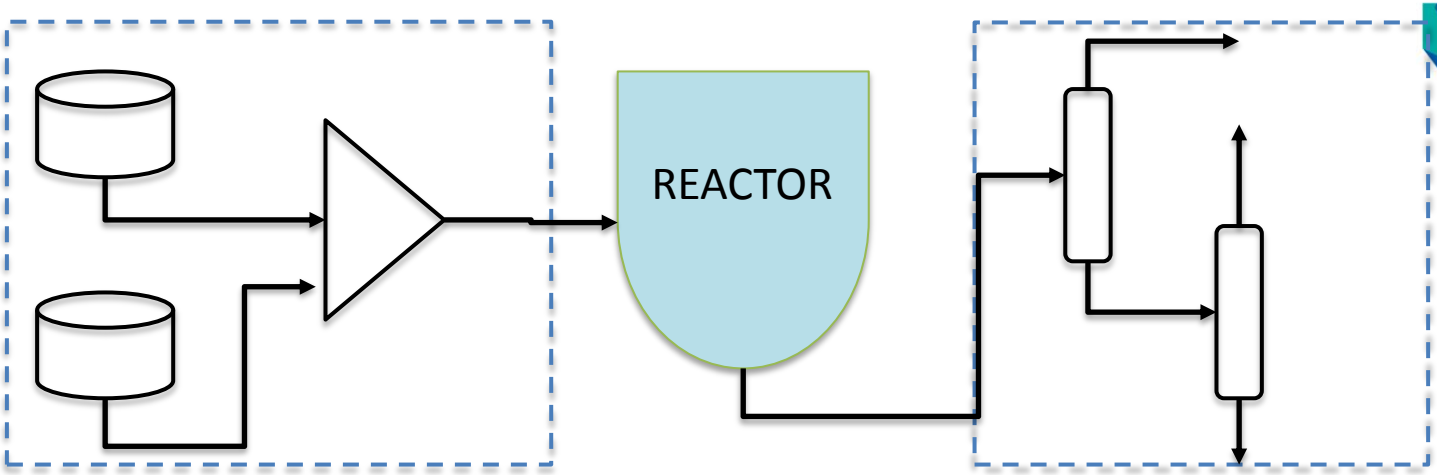
Chapter Description

- Aims
  - To understand the basic concept of process integration and its application in industry
- Expected Outcomes
  - Students are able to explain the role and application of process integration principles

In this lecture we will learn the basic principles of process integration and its application in industry



Process design is to create a PROCESS SYSTEM to convert raw materials to desired products

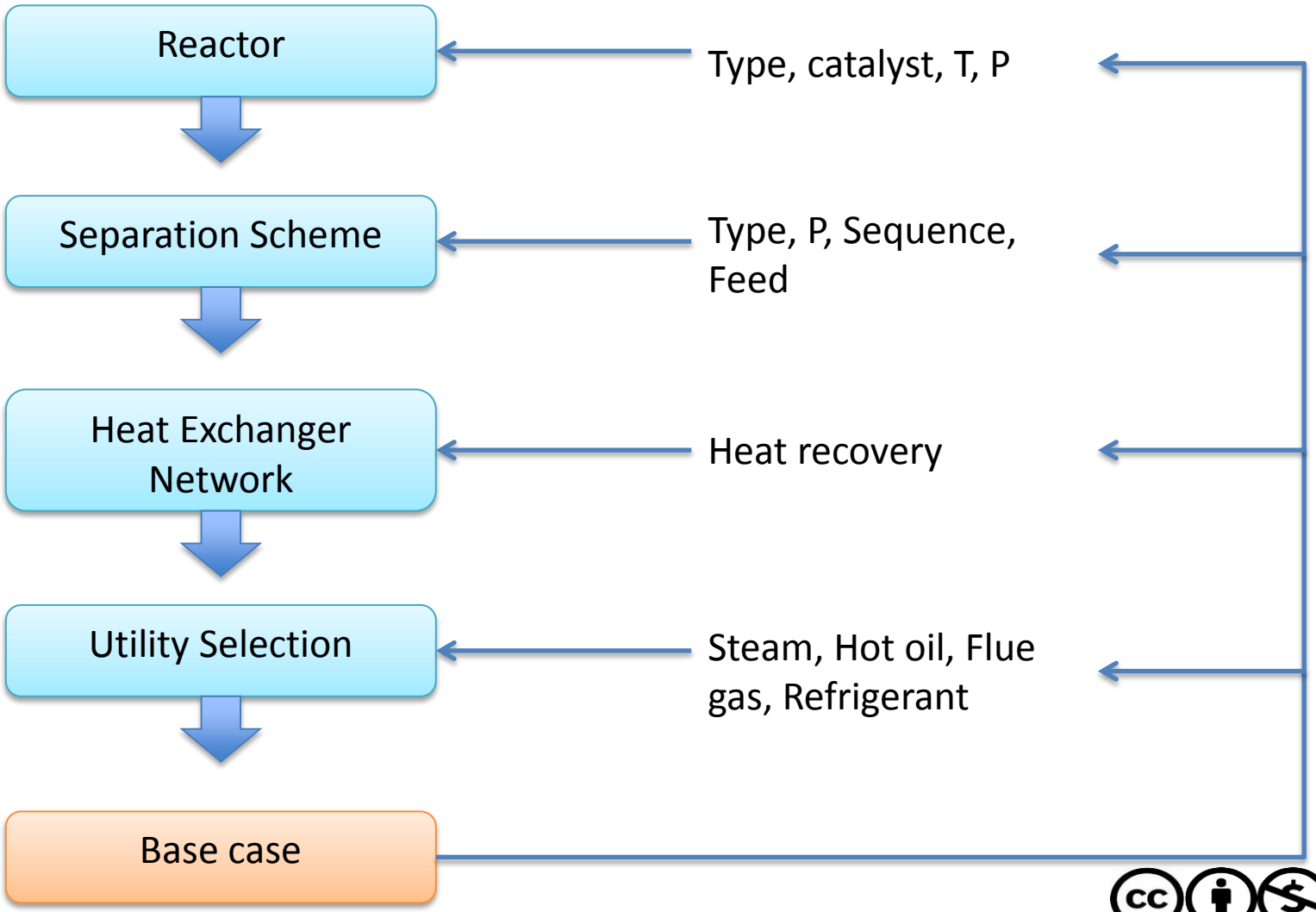


Process design starts with the reactor. It then goes backward for raw materials preparation, or backward for product purification.

Reactor dictates the separation and recycle problems.

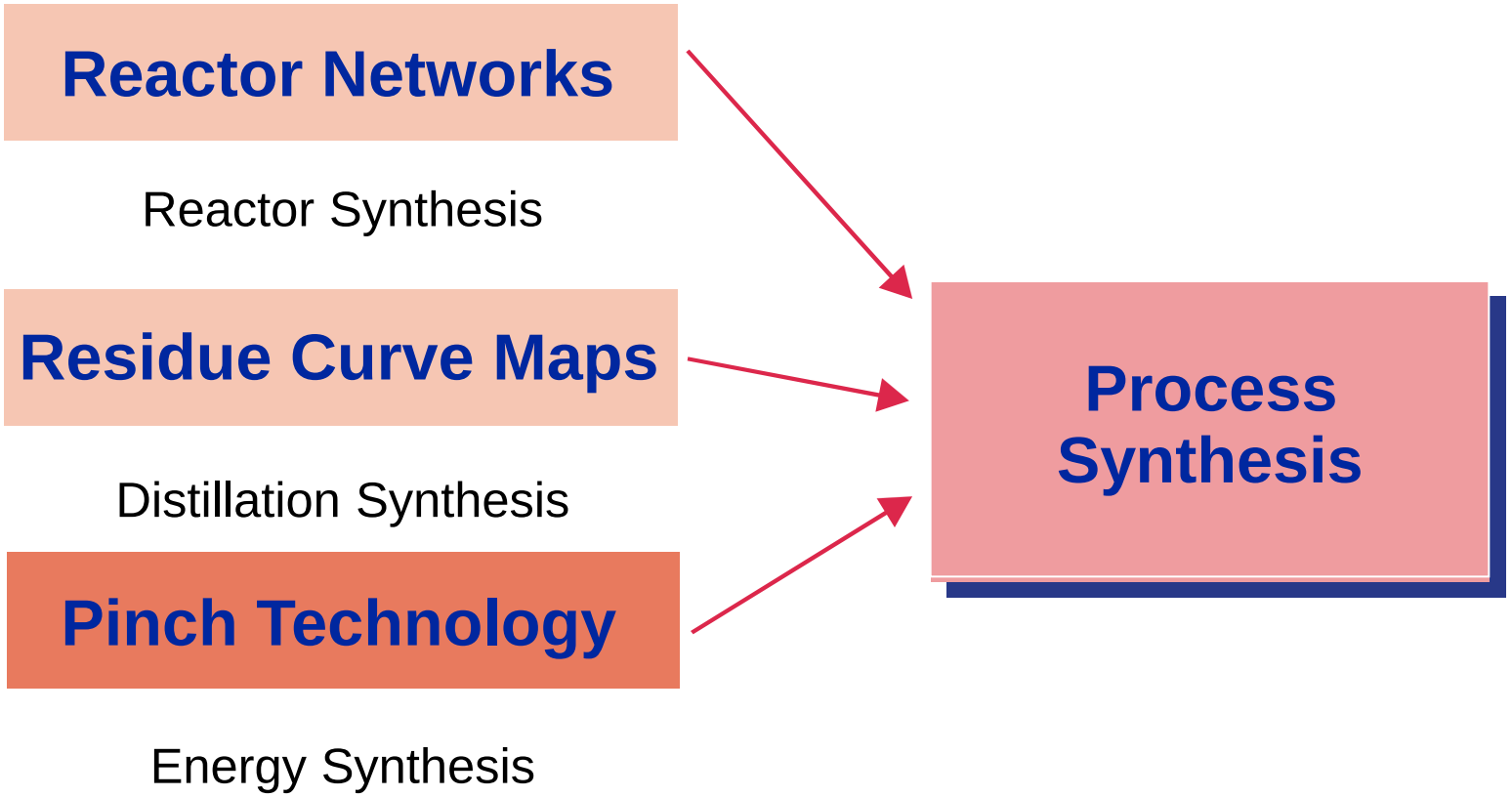
The reactor and separator system dictate the heating anf cooling duties of the streams, so the heat exchanger network can be developed.

Schematic structure

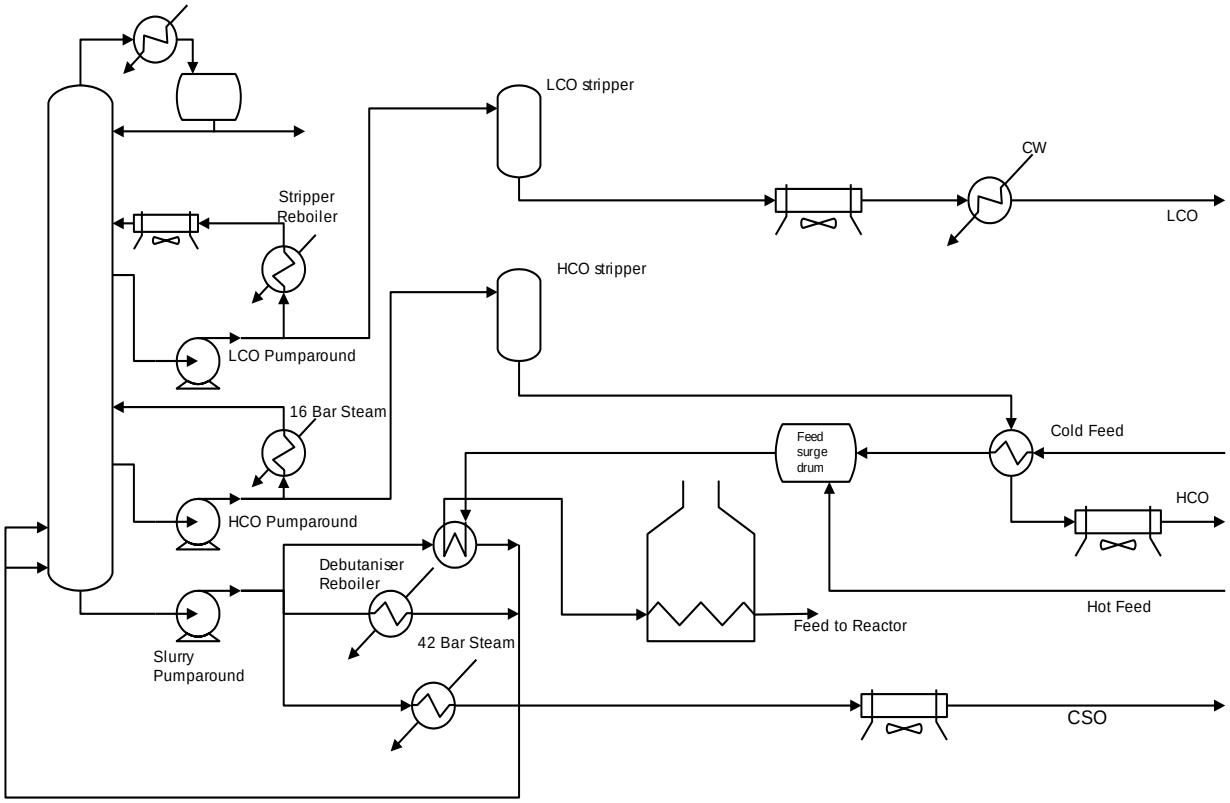


Impact on profitability

Pinch Technology:
one of the key methodologies for process synthesis

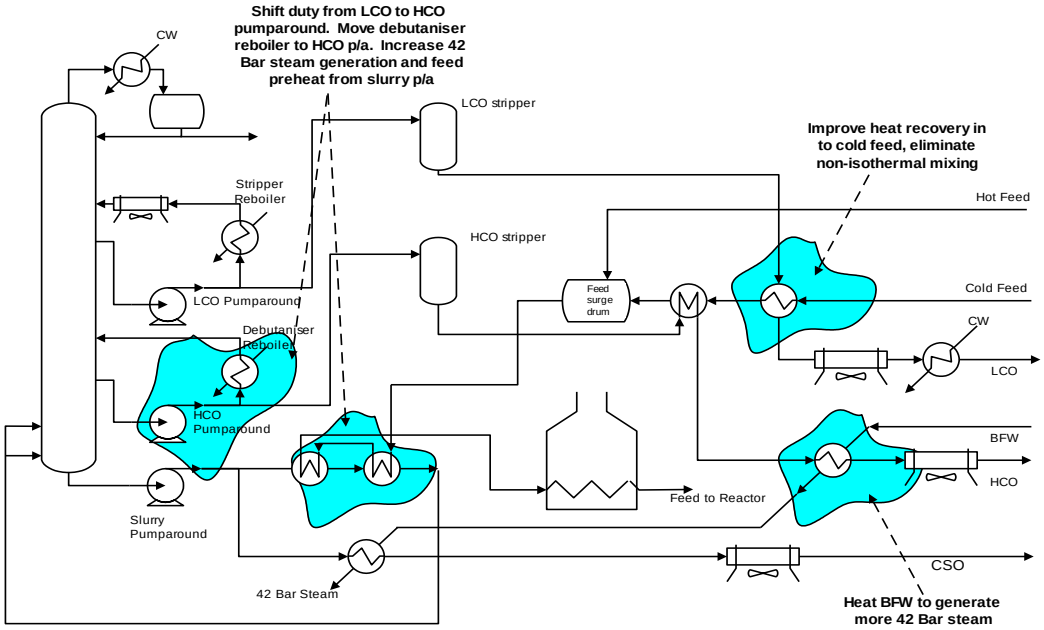


Example 1
Improve heat integration



Fluid Catalytic Cracking Unit - Existing Design

Design based on pinch technology



- 30% fuel savings
- 42 bar steam generation
- Product specs satisfied
- Payback = 1.5 yrs

Example 2
Utility Selection

Conslusion

- Pinch technology helps engineers improve the process design
- Pinch technology can be used to reduce the cost by savings more energy through energy integration.

Thank you