Sustainability?

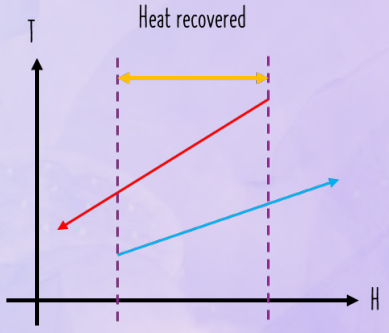
- Process integration helps achieve net zero carbon emissions by optimizing energy use & reducing waste in industrial processes

Energy Efficiency

- Pinch technology helps identify most efficient ways to use energy in a process
- Minimizes use of external heating & cooling by maximizing heat recovery within the process

Temperature-Enthalpy Diagram

- Method of visualization
- Can be used to represent heat exchange
- Can determine heat recovery potential



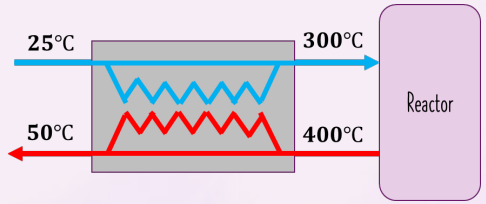
Enthalpy change

$$\Delta H = mCp\Delta T$$

$$\Delta H = CP\Delta T$$

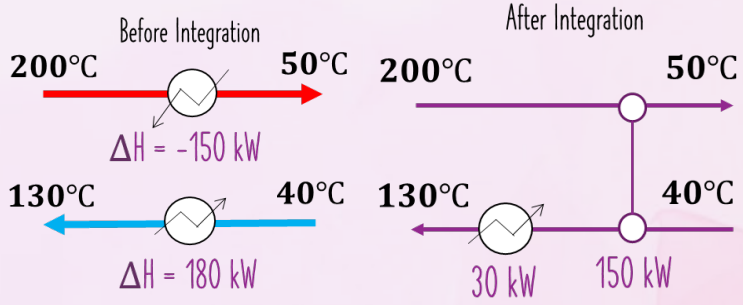
How?

- Match hot streams with cold streams and identify the energy targets



Streams

- Any flow which requires heating/cooling
- Does not change in composition



CHAPTER 1

Process Integration

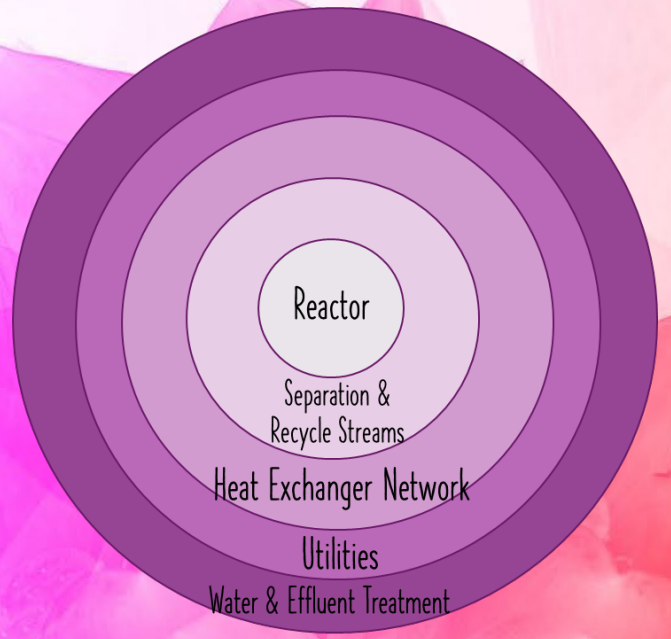
Introduction & Basic Concepts

Process integration is method to optimize utility usage in industrial processes.

Pinch Point

- Location where the difference between the hot and cold streams is the minimum (ΔT_{min})
- Determines maximum heat that can be recovered
- ΔT_{min} has a relationship with energy targets

Onion Diagram



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