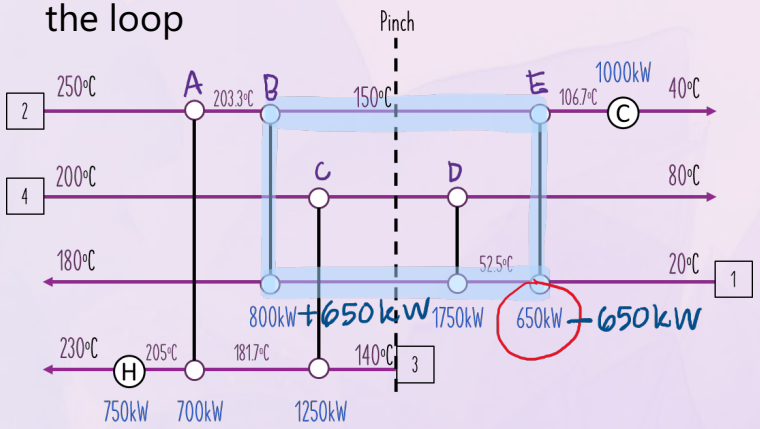
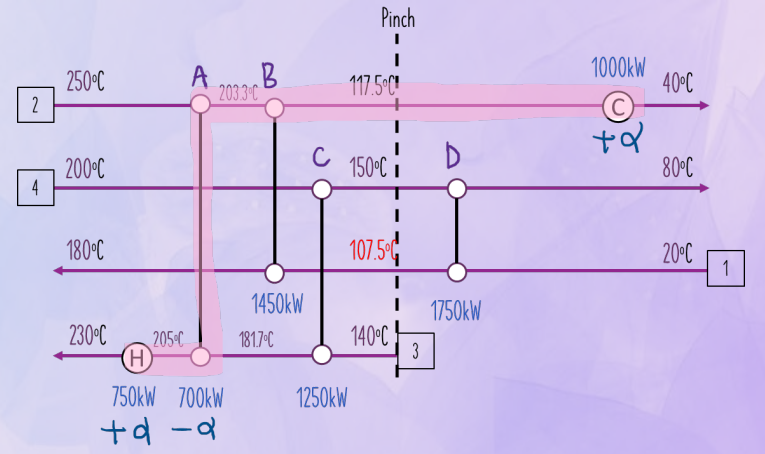
Loop

- Circular path that enables heat load shift
- Starts and ends at the same exchanger
- Can remove the smallest heat exchanger in the loop



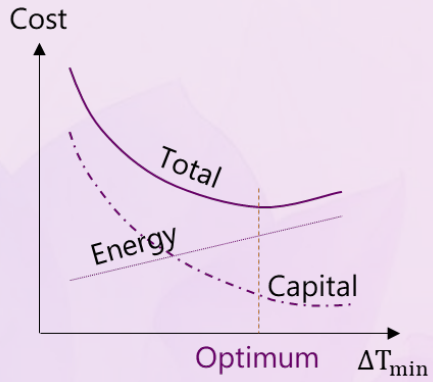
Path

- Connects heaters and coolers
- Heat load can be shifted along the path
- Performed to correct ΔT_{min} violation



Capital & Energy Cost Trade-Offs

- Heat recovery involves trade-off between reduced energy cost and increased capital cost
- The correct setting for ΔT_{min} is economical
- Best ΔT_{min} relates with lowest total cost



Loop breaking & path relaxation

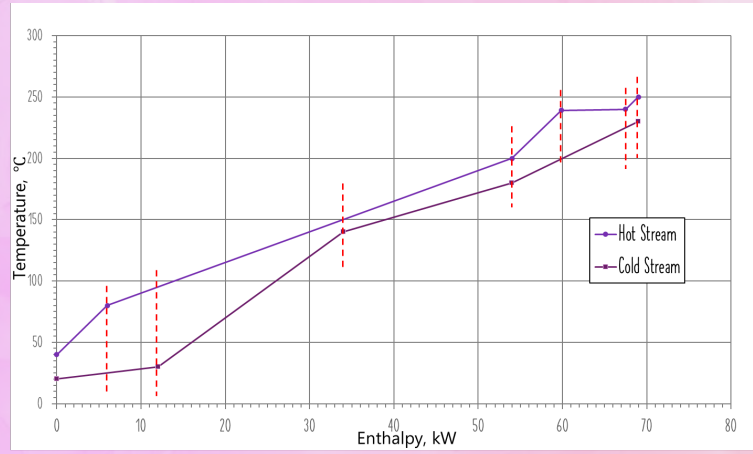
- Can reduce the number of HE units
- May lead to increase of utilities to balance out the loads
- A degree of freedom in design to optimize HEN

CHAPTER 4
Process Integration
Capital Cost Considerations

Optimizing the heat exchanger network to reduce total costs.

Heat exchanger network area targets

- Network heat transfer areas can be predicted using balanced composite curves (BCC)
- Network Area $= \frac{\Delta H}{U\,\Delta T_{LMTD}}$
- Need to calculate area of each section



Dr Nurul Haiza Sapiee