

The impact of process changes to a heat pump's performance

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Top 10 CO₂-uitstoters

In 2020



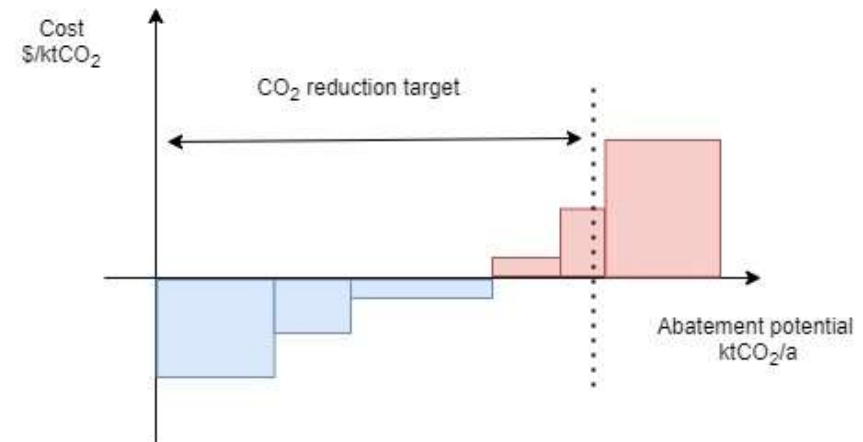
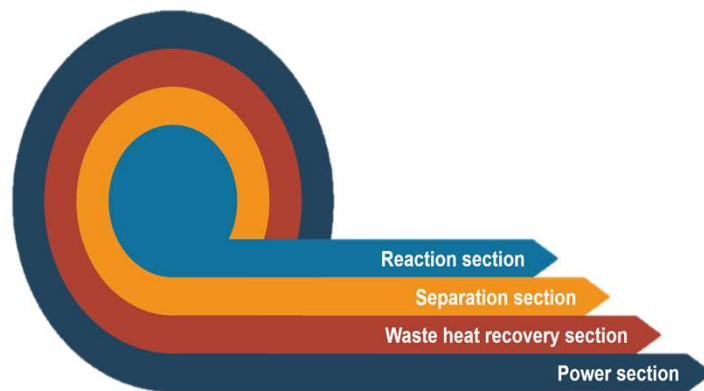
bron: Nederlandse Emissieautoriteit

Agenda

1. Deployment pathways & strategies
2. Case study: Biodiesel production
3. Take-aways
4. Future work



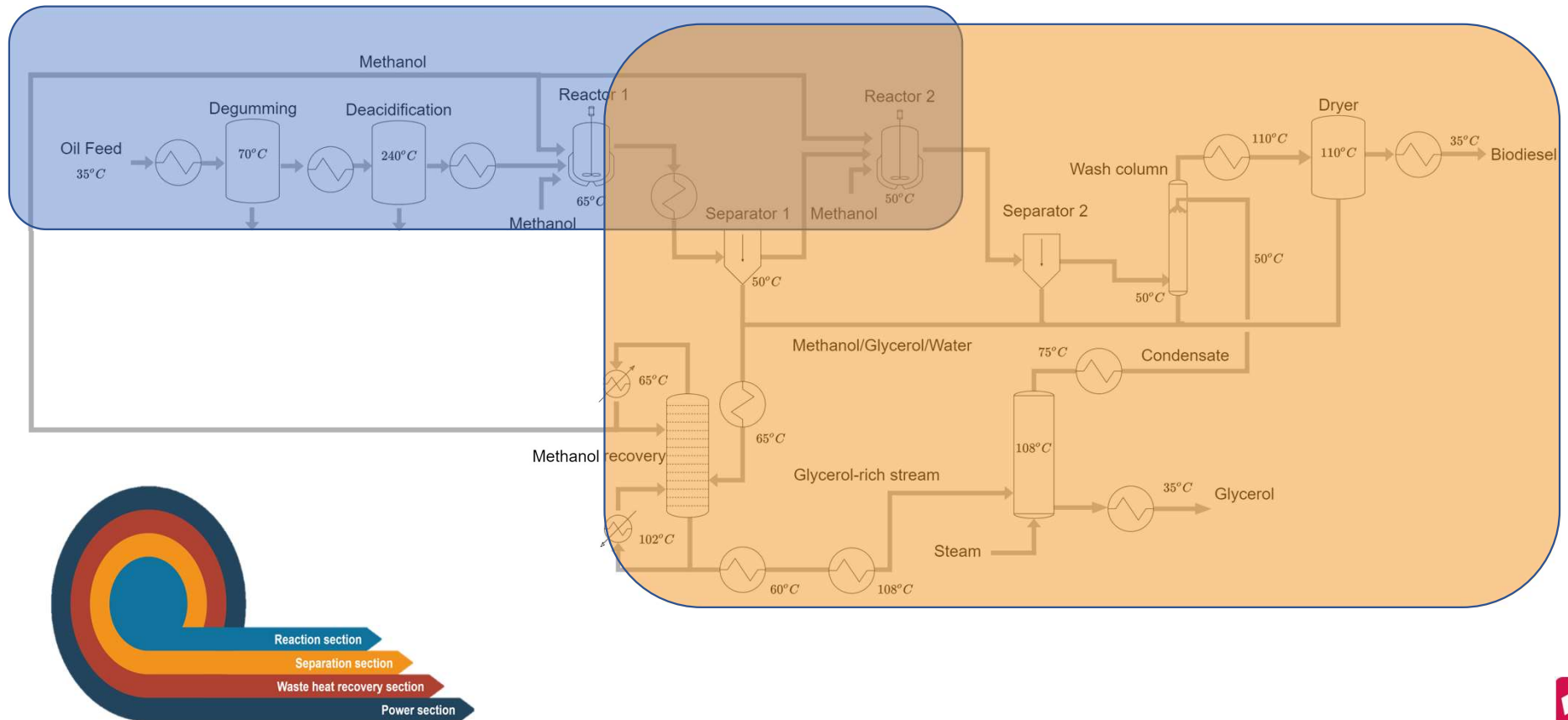
Deployment pathways & strategies



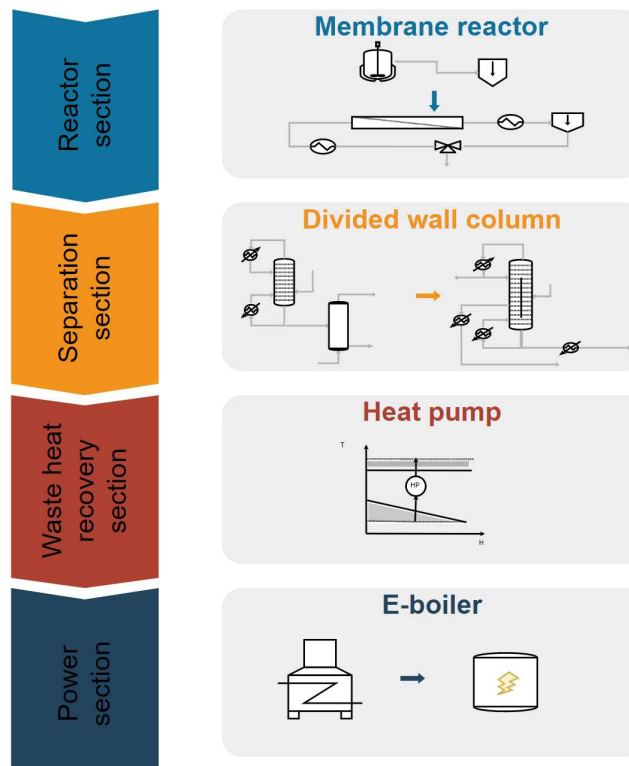
1. Brownfield approach
2. Greenfield approach
3. Expertise-based approach



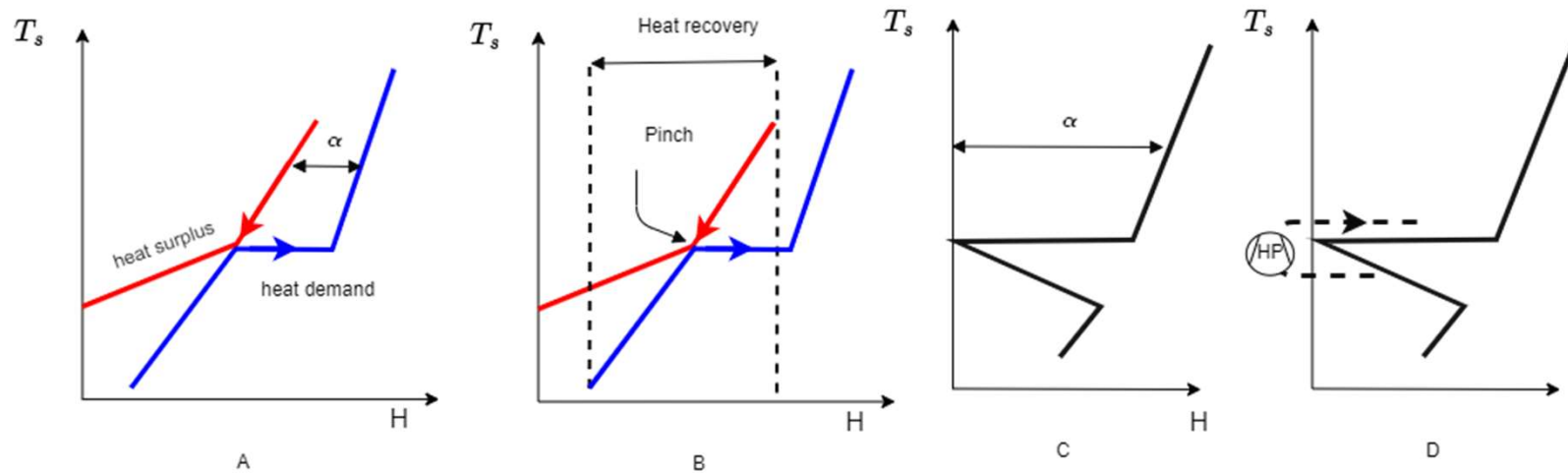
Case study: Biodiesel production



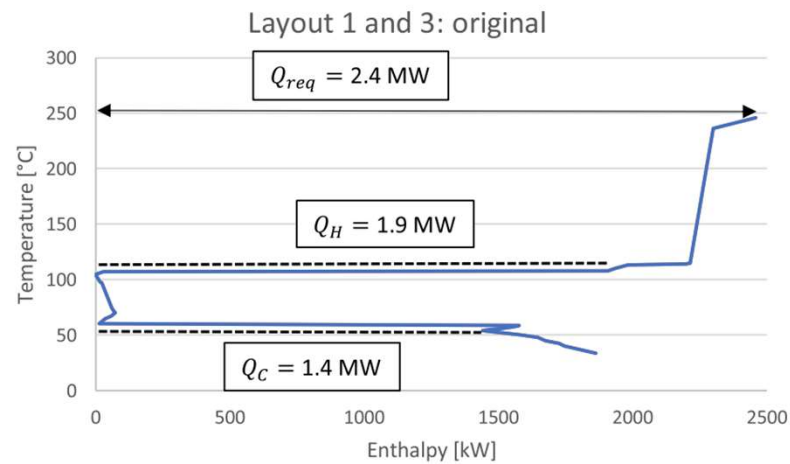
Selected CO₂-mitigation options



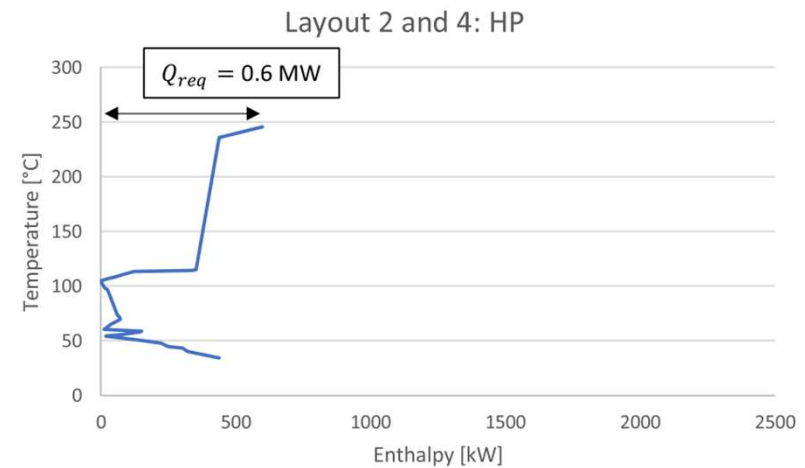
(recap) Pinch analysis



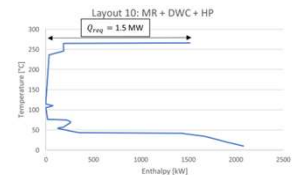
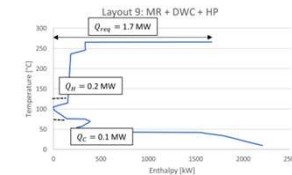
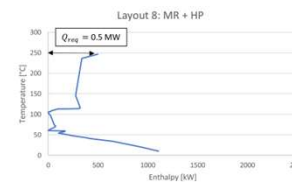
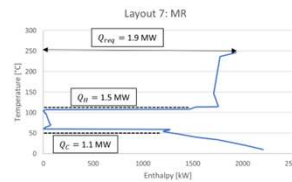
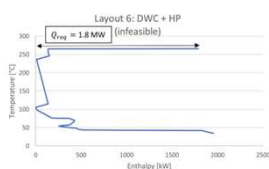
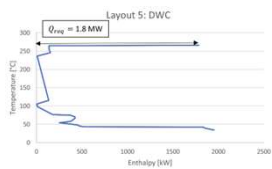
Changes in the heat profile



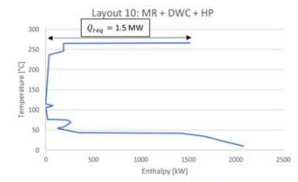
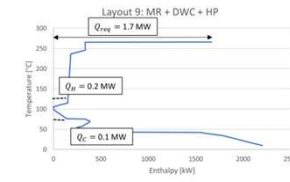
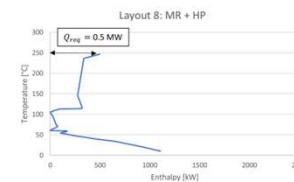
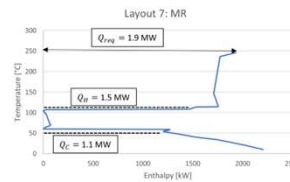
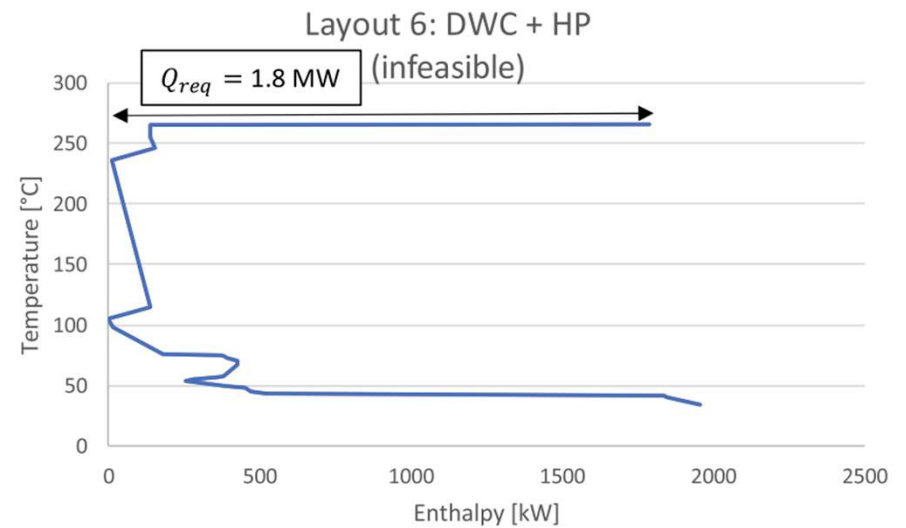
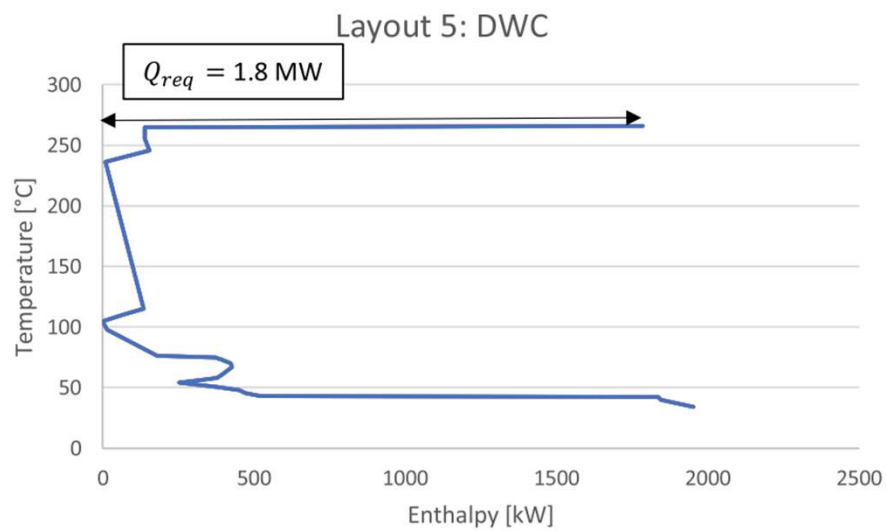
(A)



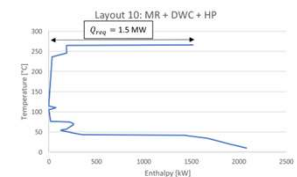
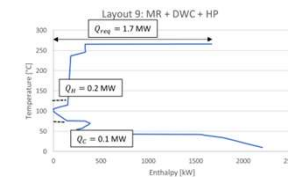
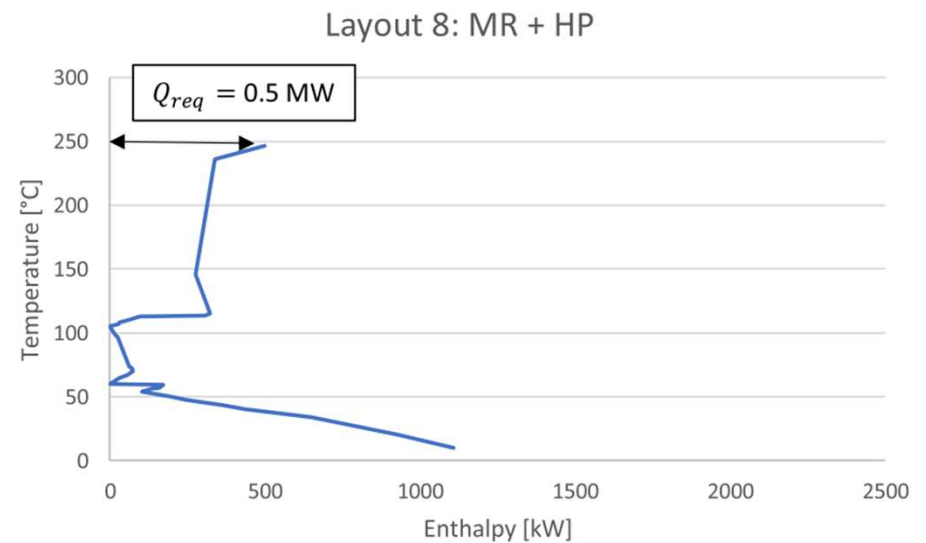
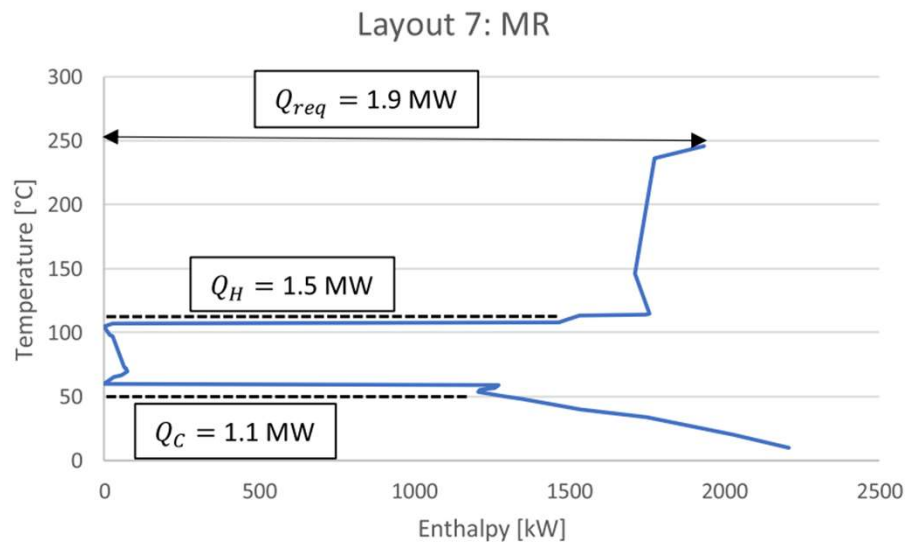
(B)



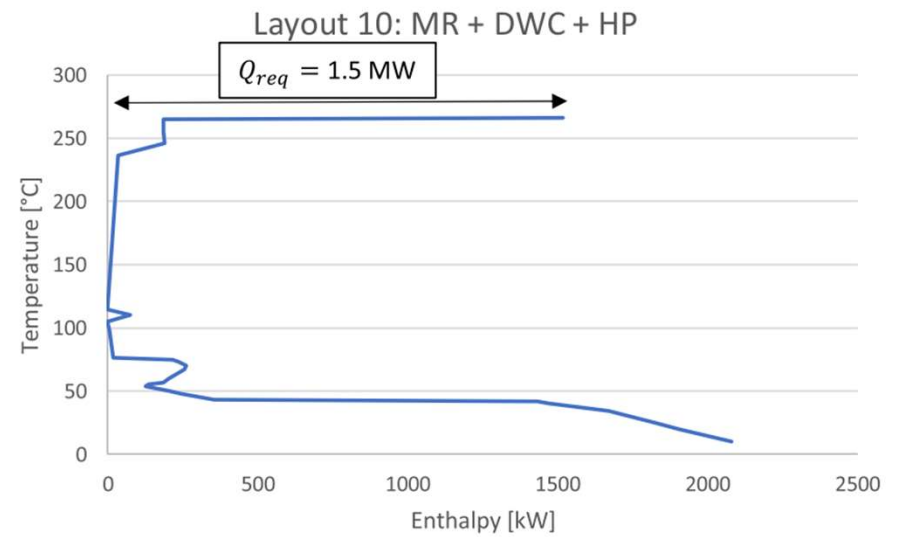
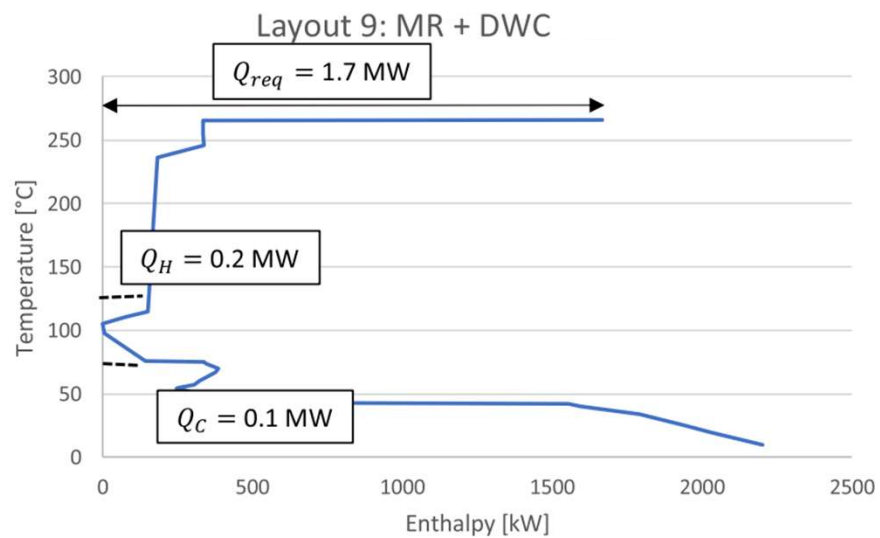
Changes in the heat profile



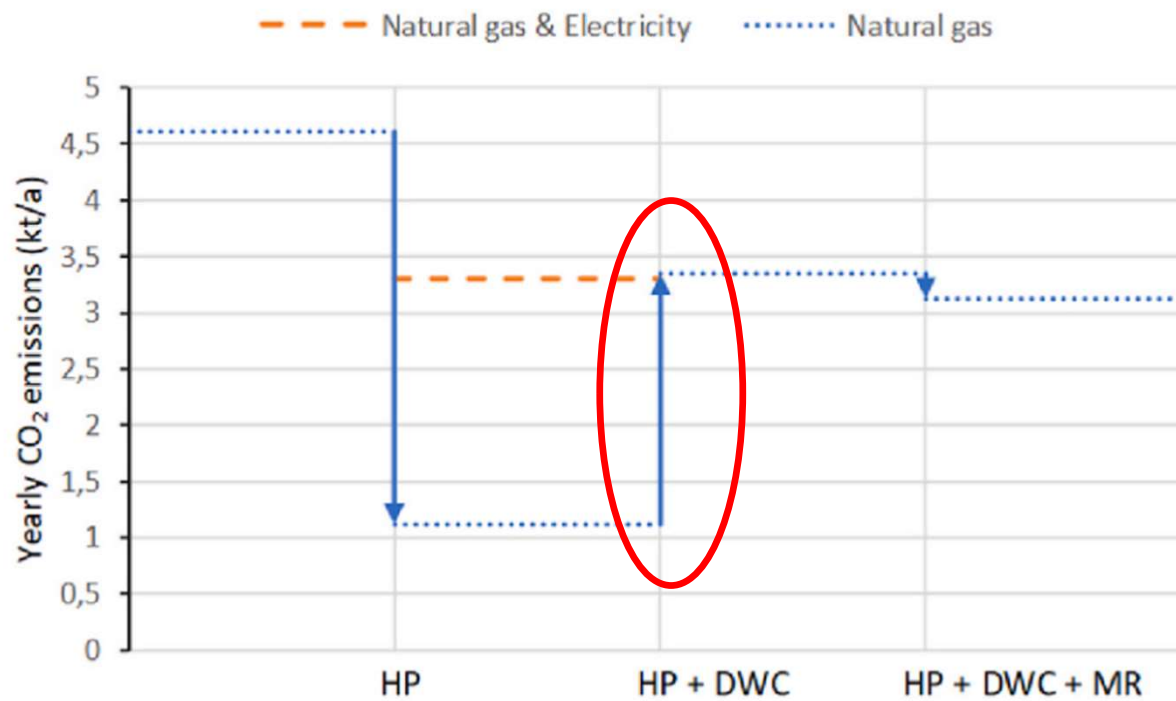
Changes in the heat profile



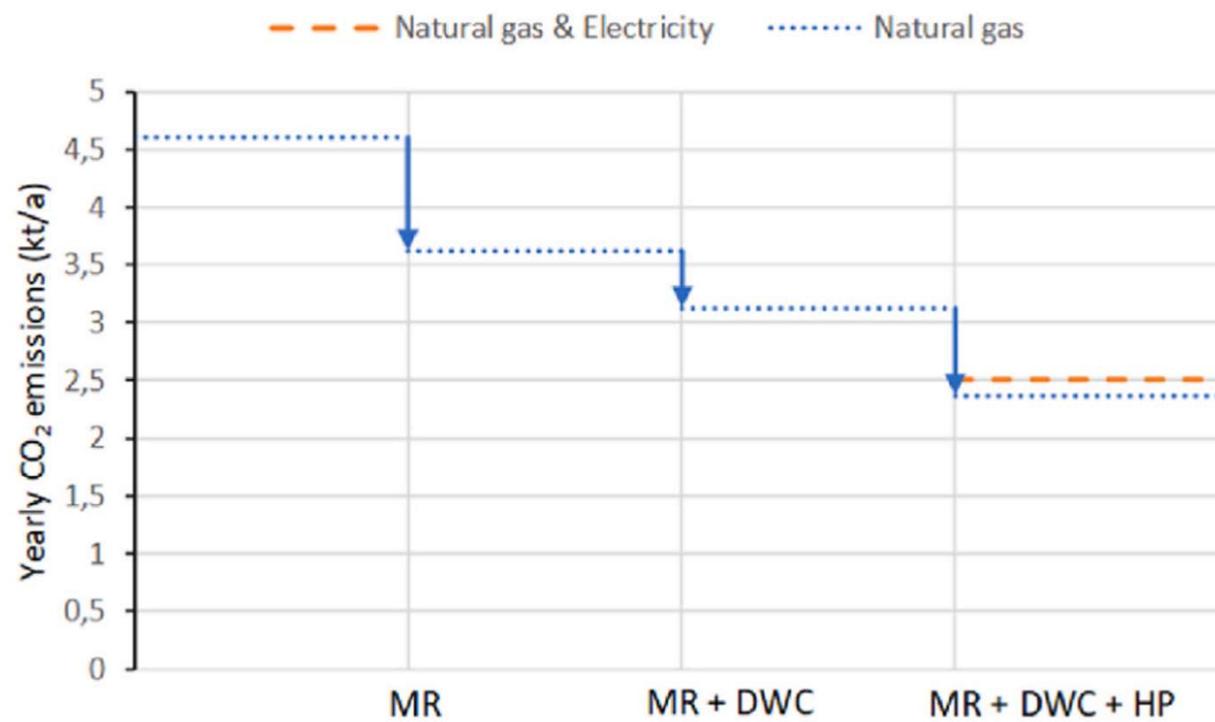
Changes in the heat profile



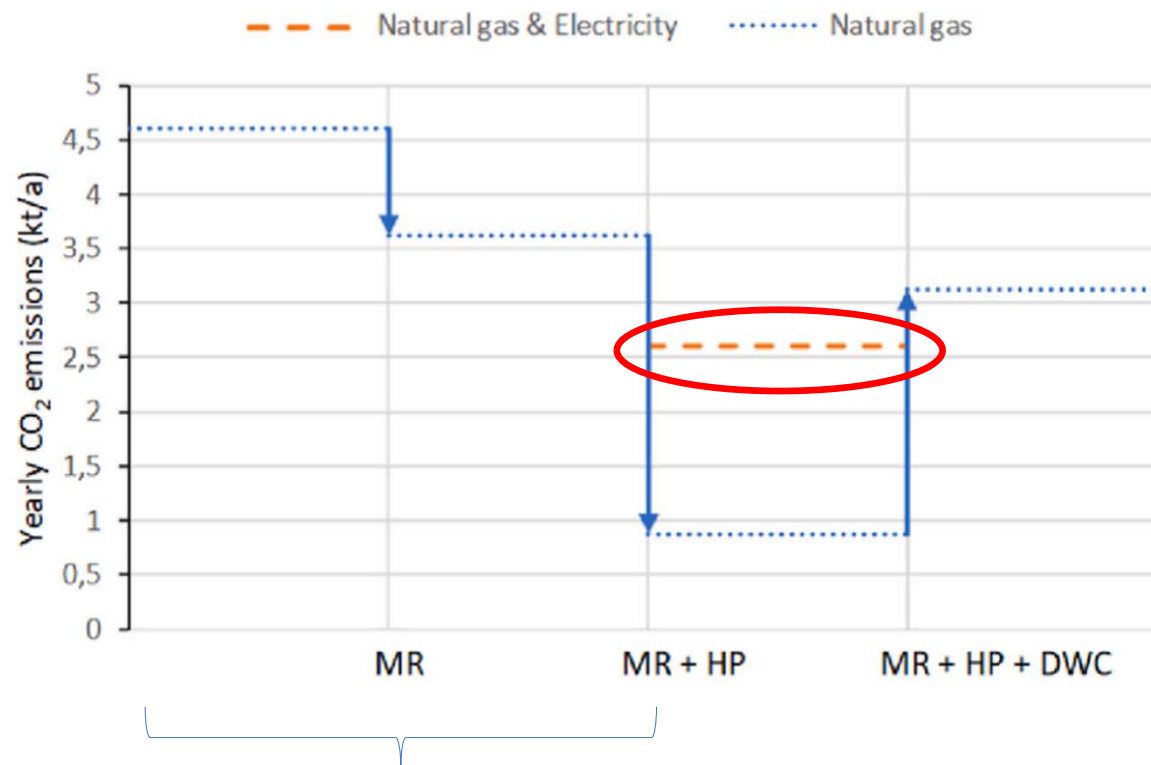
Combined CO₂ reduction: outside-in



Combined CO₂ reduction: inside-out



Combined CO₂ reduction: ideal combination

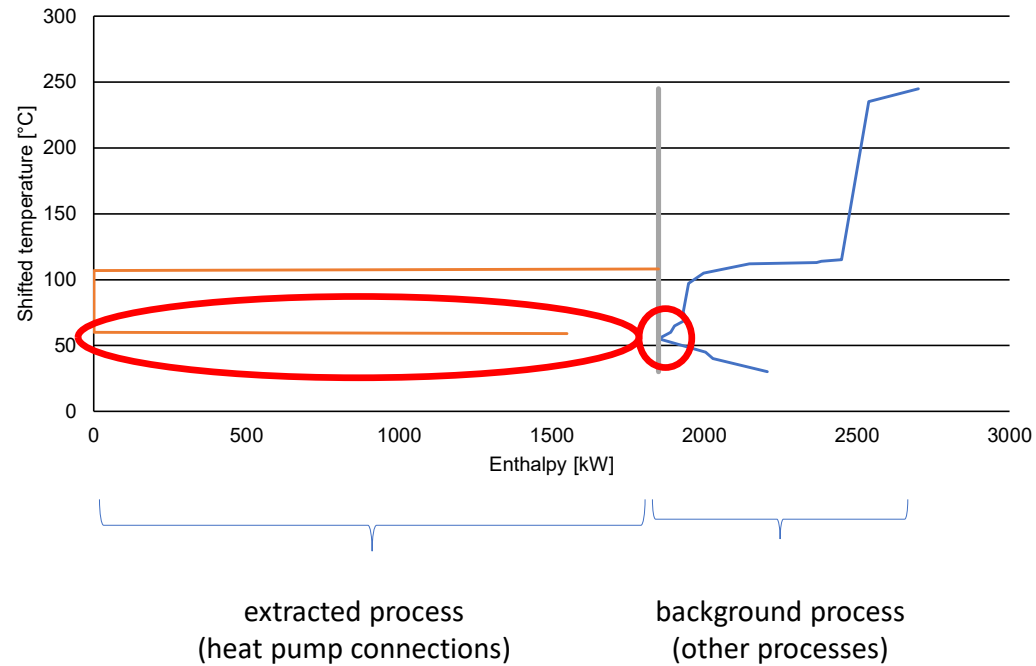
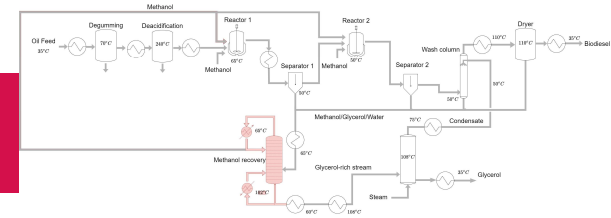


Take-away

- Decarbonize from a heat integration perspective to avoid loss of capital or lock-ins
- Outer sections are more sensitive to the deployment of measures in the inner sections.
- Application of tools like MACC should only be applied under very stringent conditions.



Future work: Process Change Analysis



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Further reading

