



Progress Report

WP 3.3

October 2013-January 2014

Professor Neil J Hewitt

WP3.3: Advanced Electric Heat Pump

- Domestic Heat Pump Development for i-STUTE

Main Activities:

Demand Side Management

Heat Pump **AND** Energy Storage optimisation

WP3.3: Advanced Electric Heat Pump

- Optimised Retrofit Heat Pump

Integration with Energy Storage and DSM in the Home:

Optimised Heat Pump is likely to have:

- Sized to meet demand of building – temperature/emitter relationship
- Weather compensated control to maximise COP
- Integrated soft start through variable speed capability
- Compatible with existing advanced Energy Storage concepts?

Variable Temperature Output & Energy Storage Requirements

- Water i.e. sensible heat storage – better materials?
- Latent Heat Storage – greater capacity but a limited temp. range
- Blends of PCMs etc?
- Physical Size, Duration etc. based on DSM & Network Needs

= Storage led heat pump development

WP3.3: Advanced Electric Heat Pump

- Optimised Retrofit Heat Pump & Storage

Progress to Date

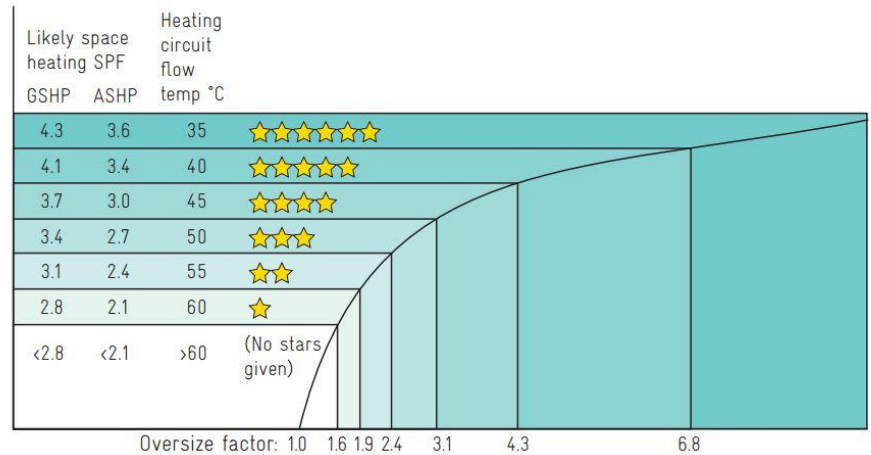
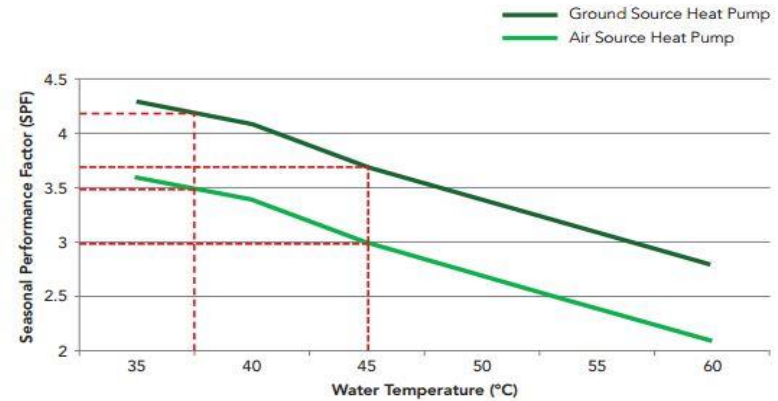
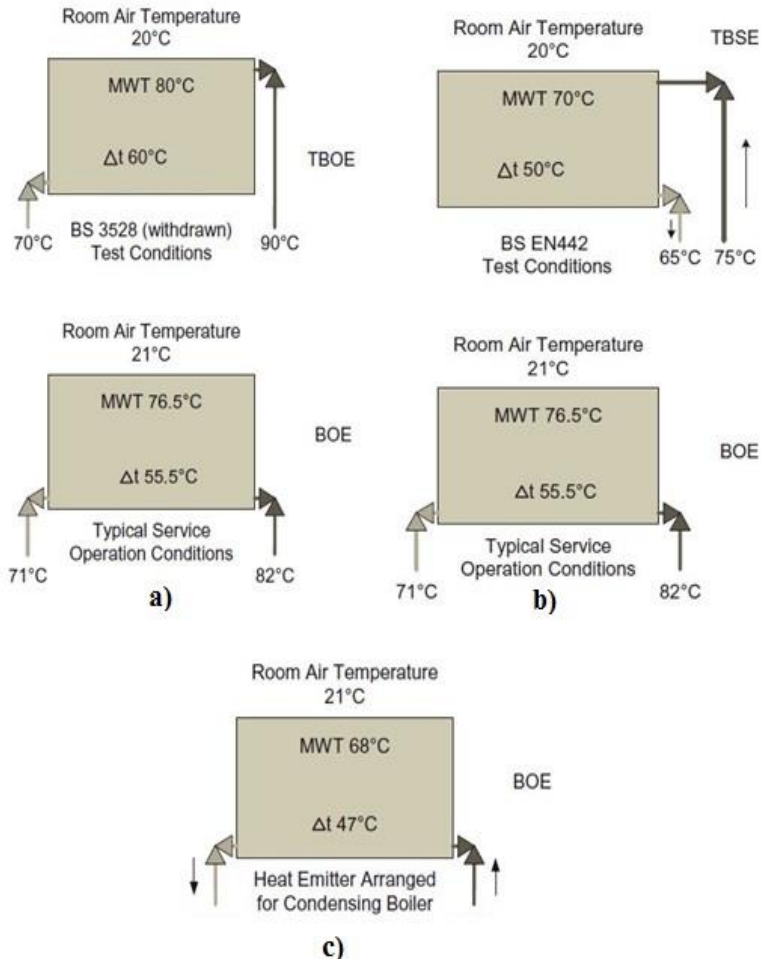
1. Radiator/Heating Distribution System Reviews
2. Heat Loss Calculations
3. High Temperature Heat Pump
4. Job Specification for a Research Associate
5. PhD student has been interviewed

Moving from
Heat Pump to Home Heating
To
Heat Pump to Storage (+ Storage?) to Home Heating

WP3.3: Advanced Electric Heat Pump

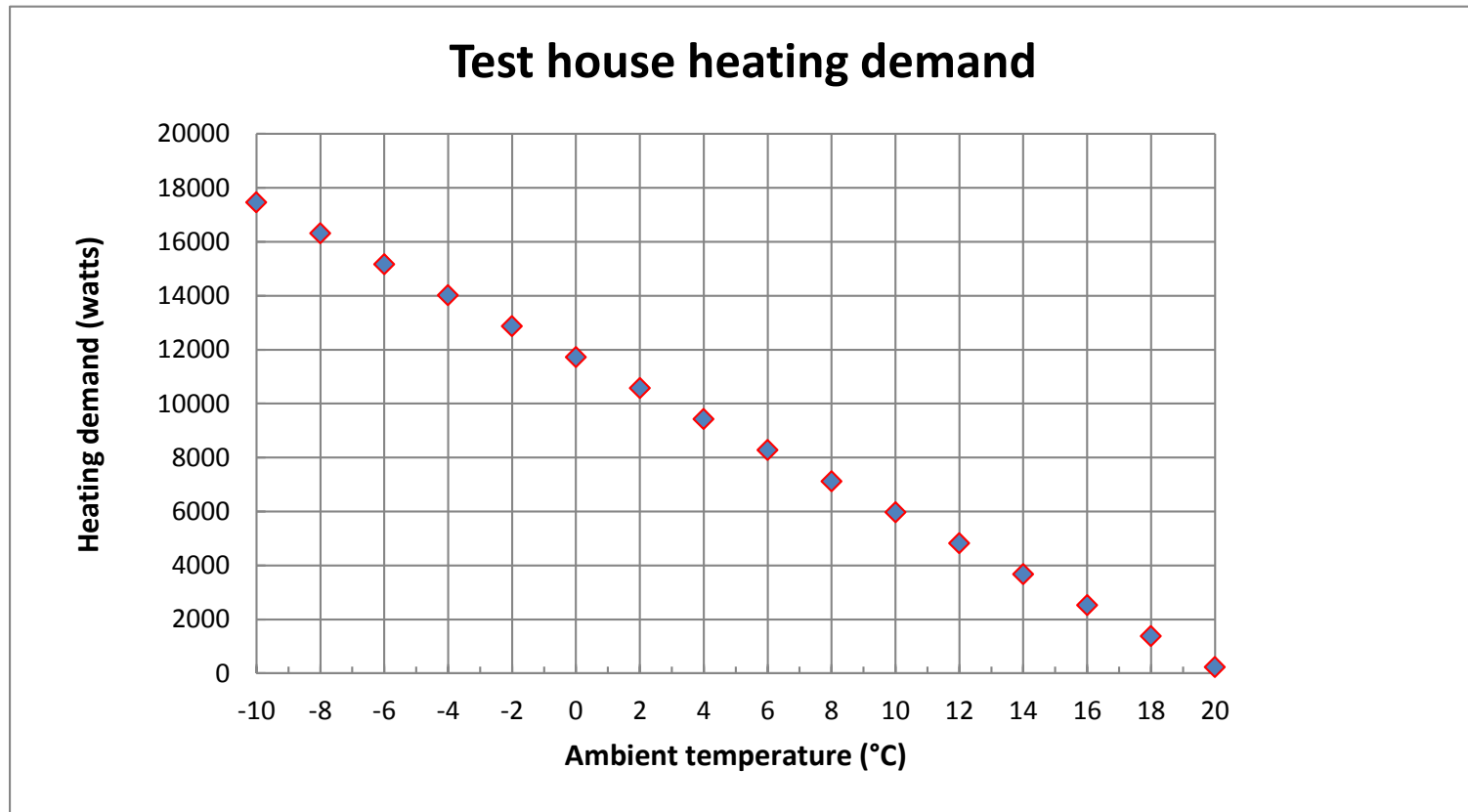
- Optimised Retrofit Heat Pump & Storage

1. Radiator/Heating Distribution System Reviews



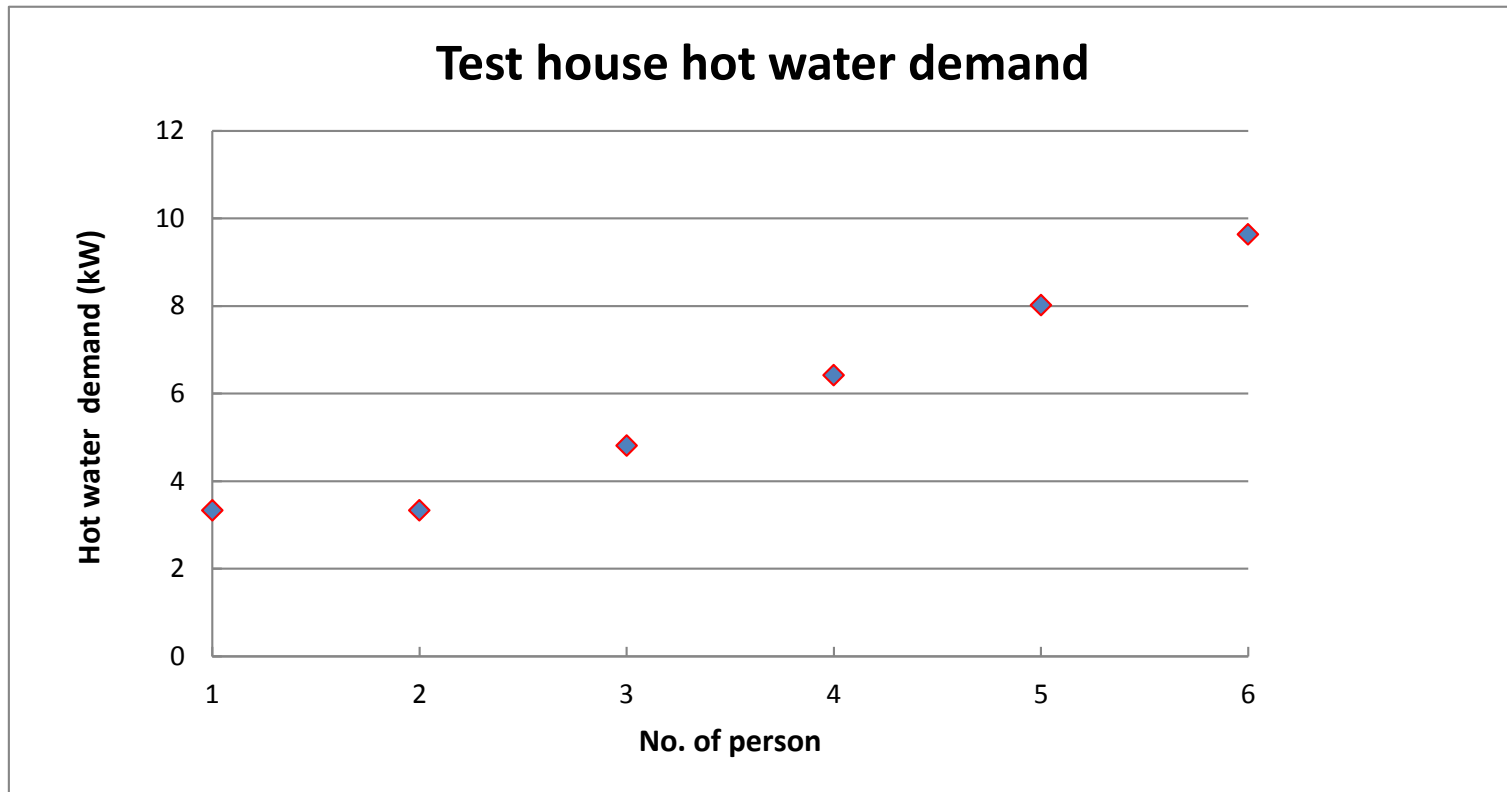
WP3.3: Advanced Electric Heat Pump

- Optimised Retrofit Heat Pump & Storage
- 2. Heat Loss Calculations



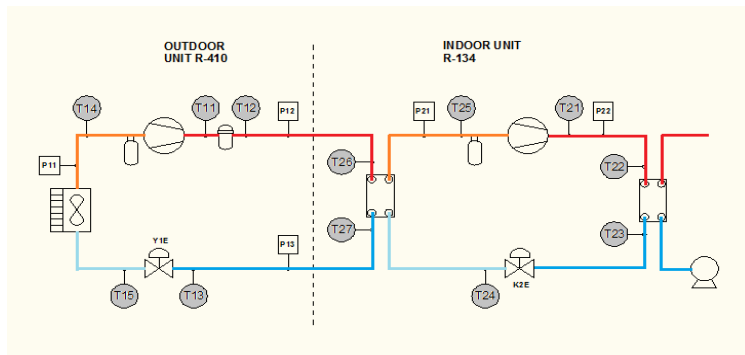
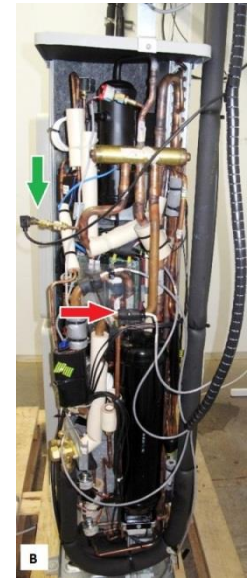
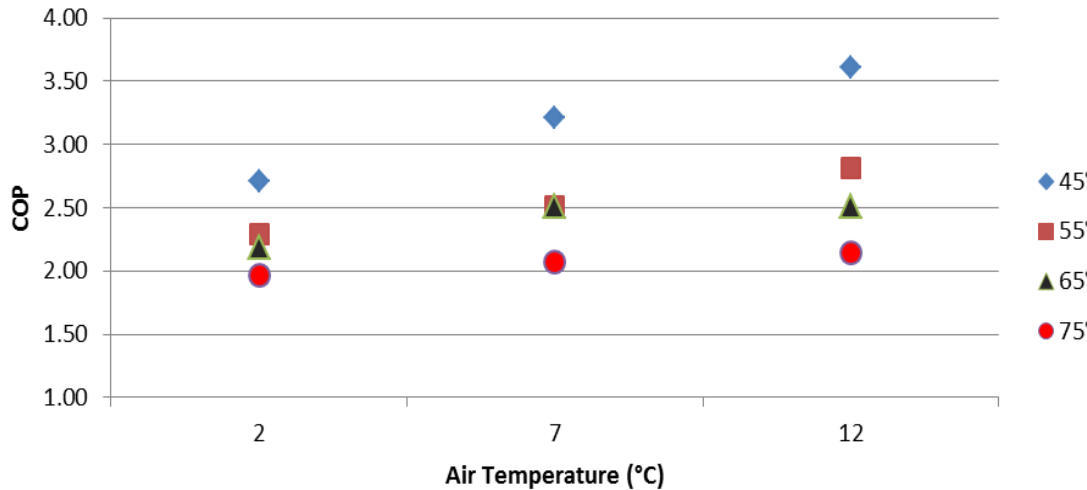
WP3.3: Advanced Electric Heat Pump

- Optimised Retrofit Heat Pump & Storage
- 2. Heat Loss Calculations



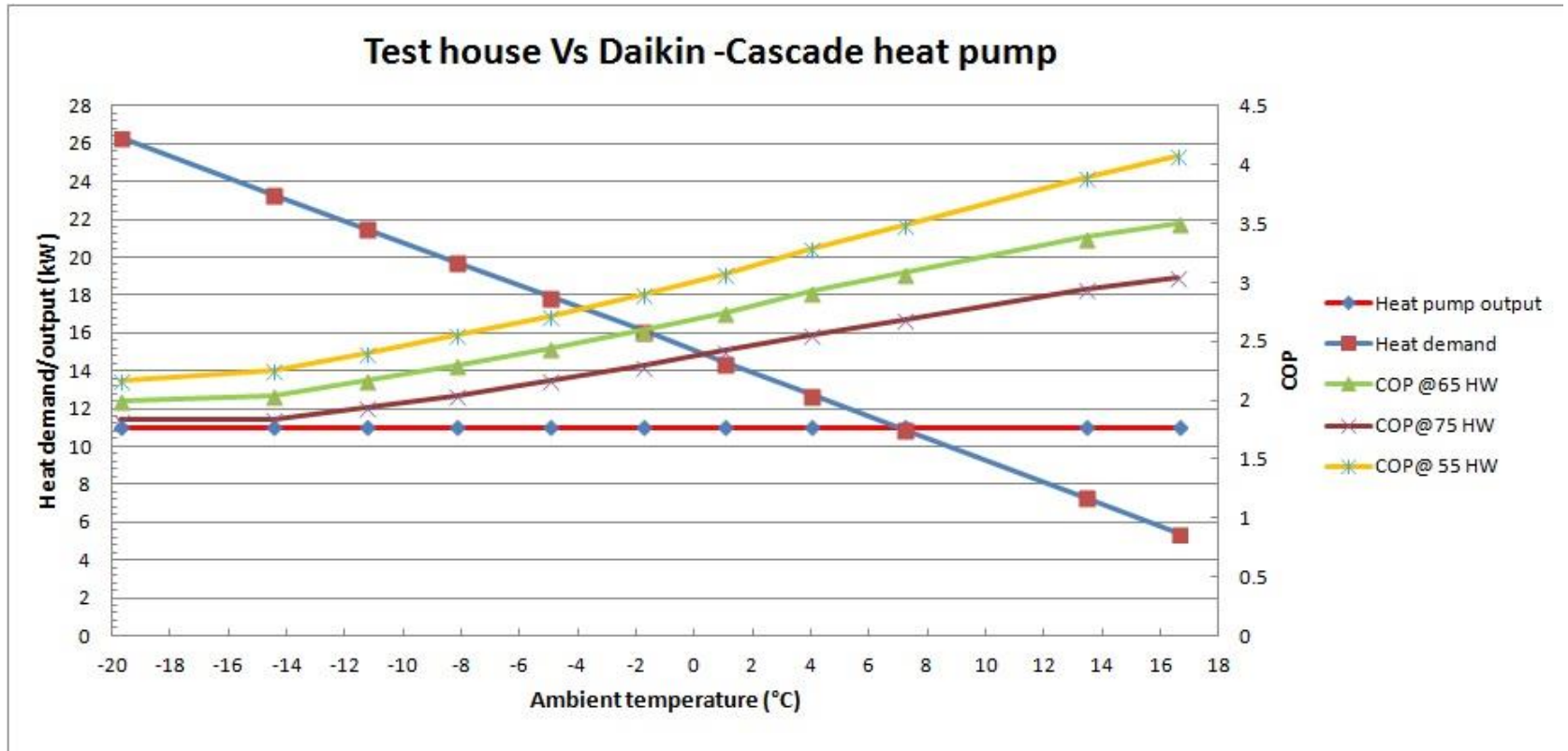
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- Optimised Retrofit Heat Pump & Storage
- 3. High Temperature Heat Pump



WP3.3: Advanced Electric Heat Pump

- Optimised Retrofit Heat Pump & Storage
- 3. High Temperature Heat Pump



Thank you for your attention

- Any questions?

Progress Report

WP 4.1

October 2013 – January 2014

Professor Neil J Hewitt

WP4.1: Advanced Electric Heat Pumps

- Industrial/Flexible Storage Heat Pumps for i-STUTE

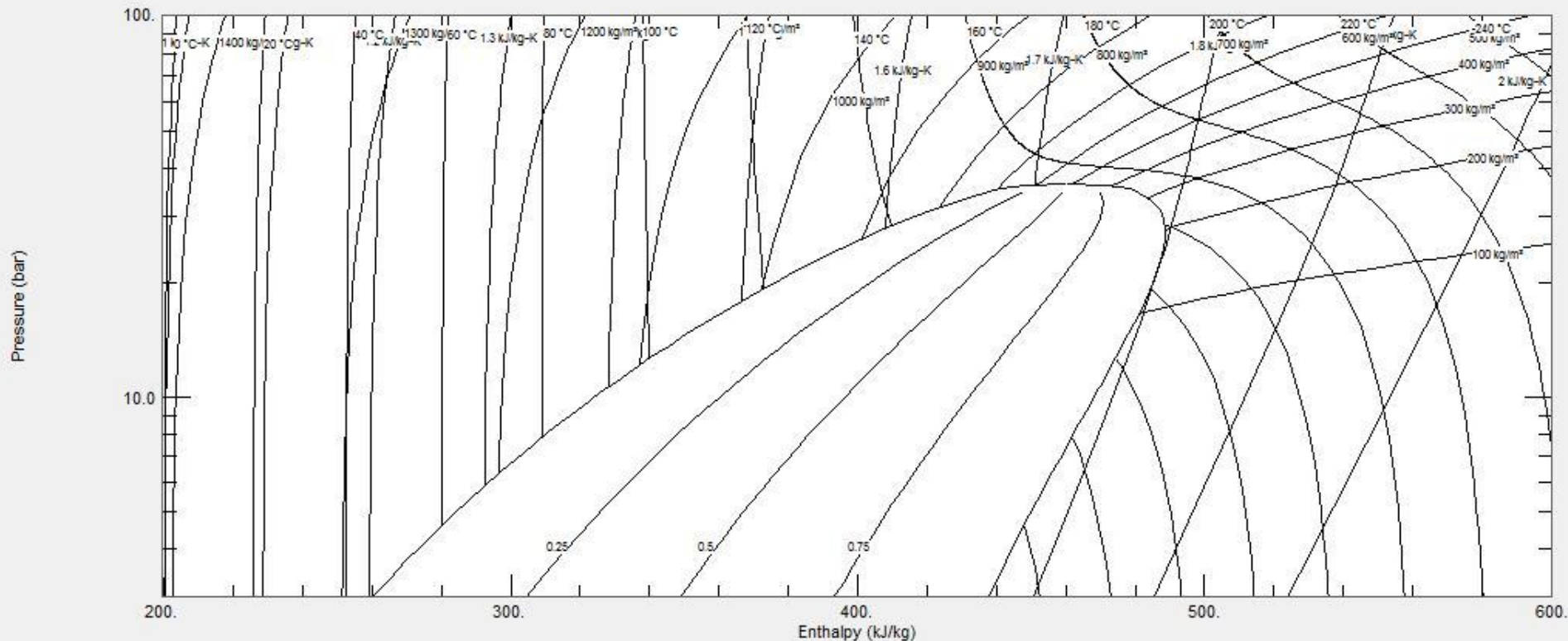
Main Challenges:

R245fa Heat Pump Compressor not available

WP4.1: Advanced Electric Heat Pumps

- Industrial/Flexible Storage Heat Pumps for i-STUTE

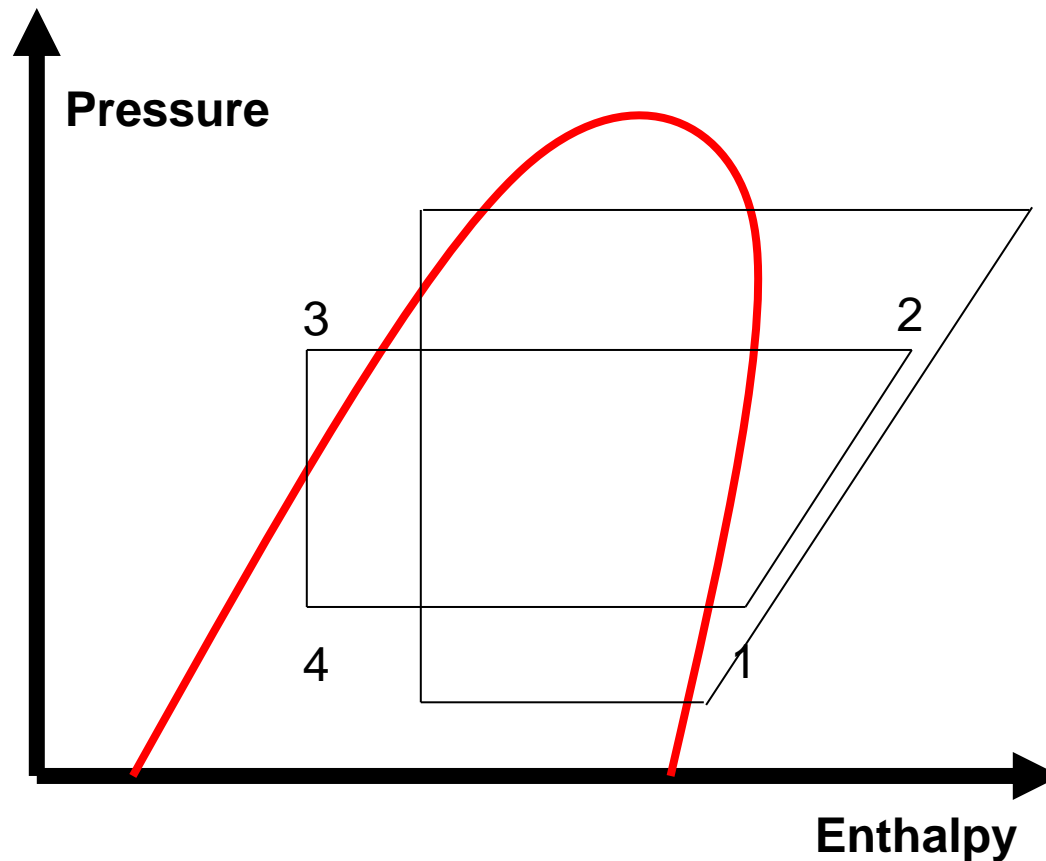
Main Challenges: R245fa



WP4.1: Advanced Electric Heat Pumps

- Industrial/Flexible Storage Heat Pumps for i-STUTE

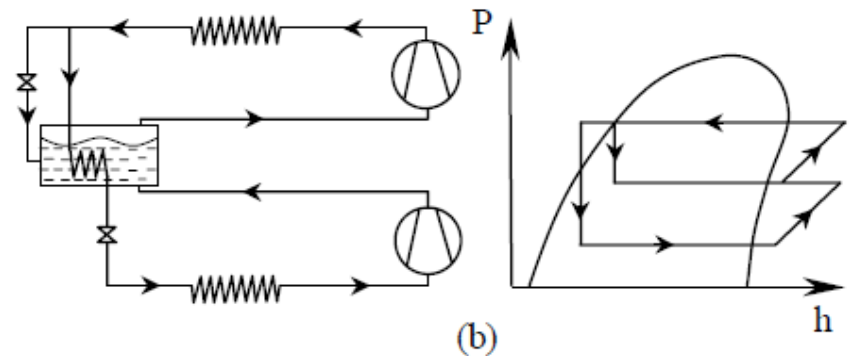
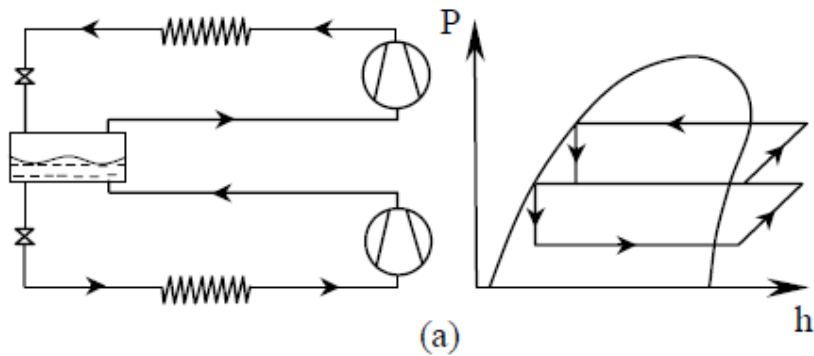
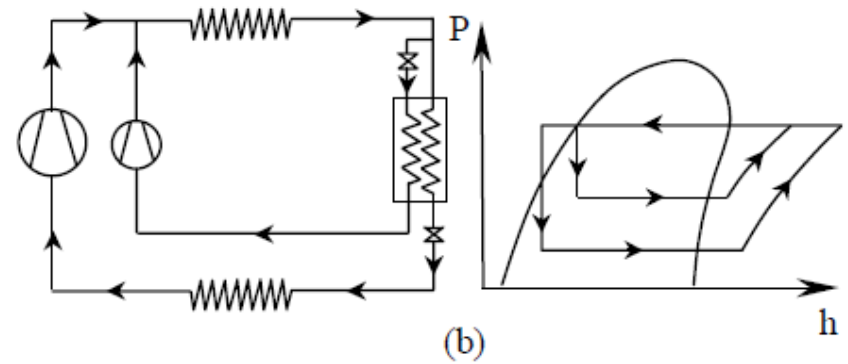
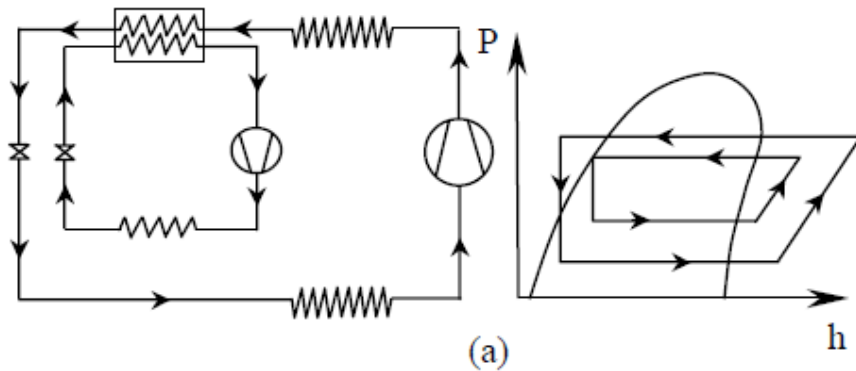
Main Challenges: R245fa



WP4.1: Advanced Electric Heat Pumps

- Industrial/Flexible Storage Heat Pumps for i-STUTE

Main Challenges: R245fa



WP4.1: Advanced Electric Heat Pumps

- High Temperature Heat Pump/Flexible Storage

Progress to Date

1. Design started
2. Job Specification for a Research Associate (roll through)
3. PhD student being sought in 2014

Thank you for your attention

- Any questions?