High efficient ammonia heat pump installed in central London

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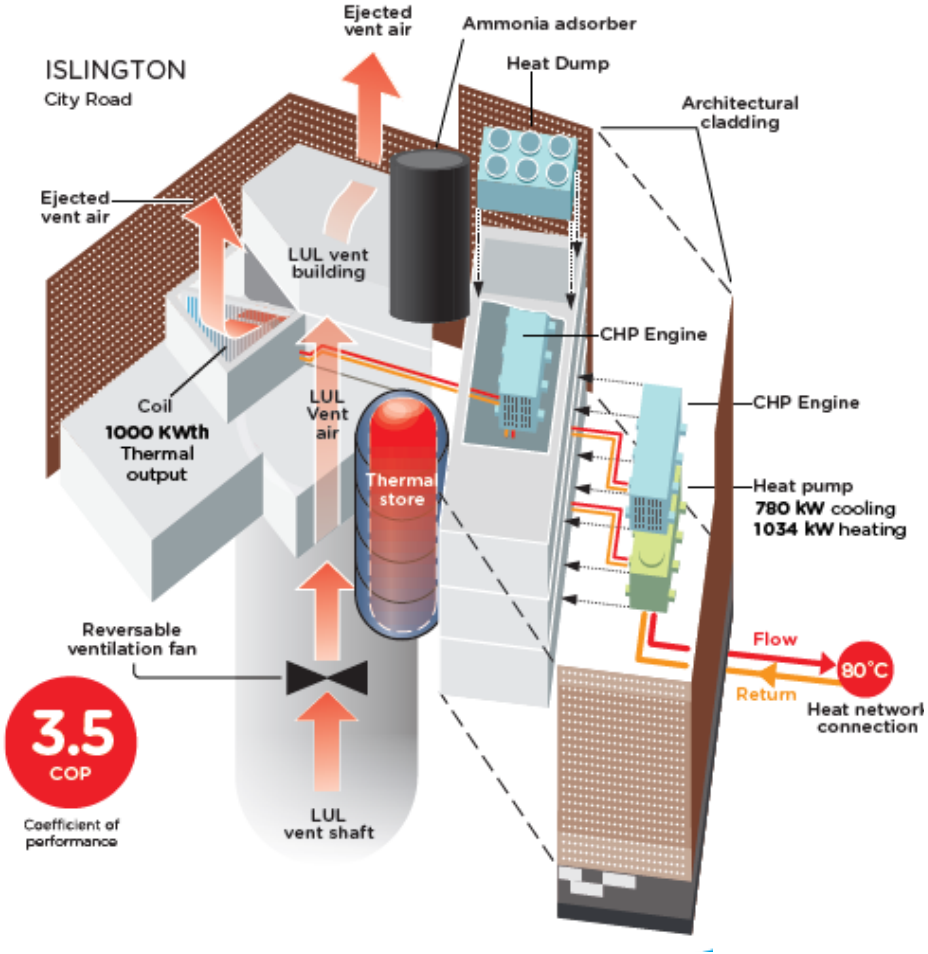
EUROPE
ATMOsphere
Business Case for Natural Refrigerants
25-27/09/17 - Berlin

2 stage heat pumps in London, UK



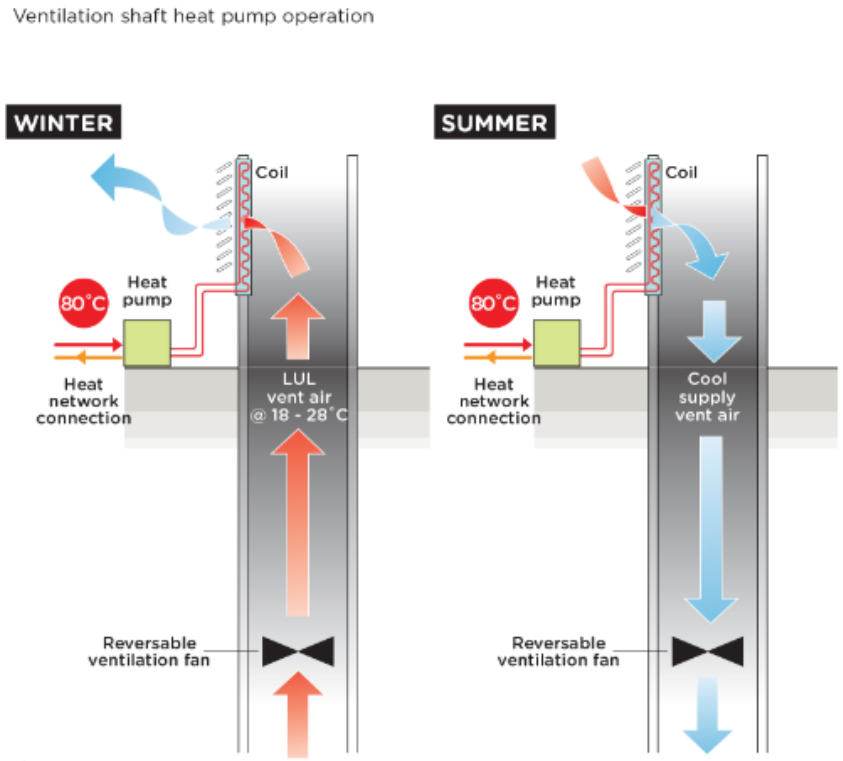
Combined cooling and heating

Heat source:
Underground ventilation air
18ºC to 30ºC

Heat sink:
District heating water
55ºC to 75ºC

Heating COP >3.50

Ventilation shaft operation



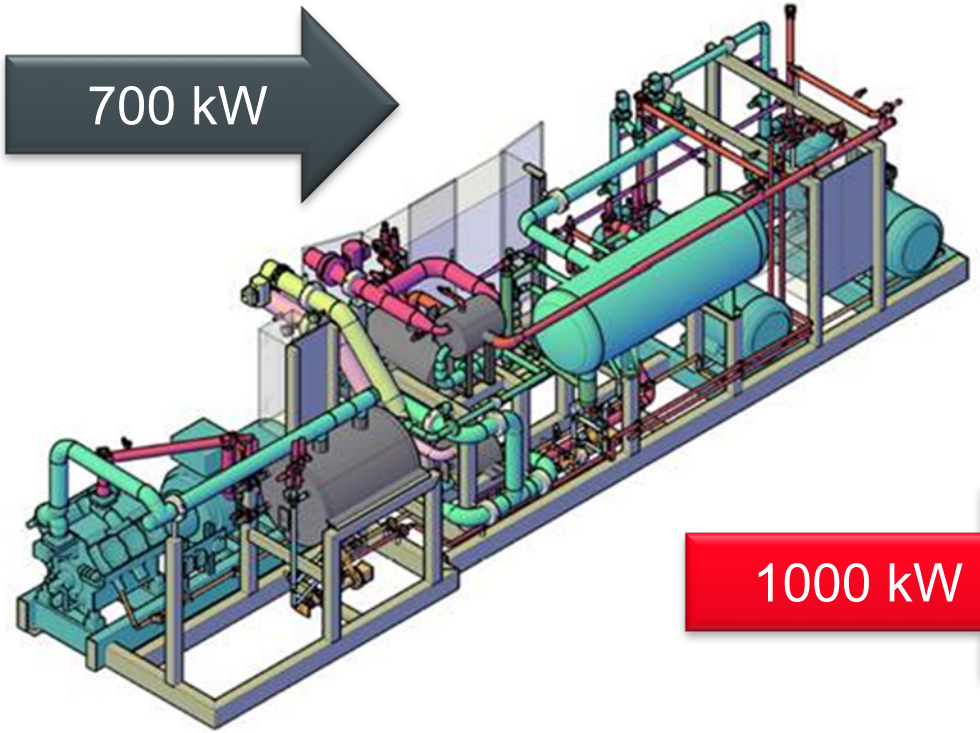
Reversible fan ensure both waste heat recovery and active cooling can be provided of the underground train tunnels

Heat recovery from London Underground

warm air
18ºC – 28ºC

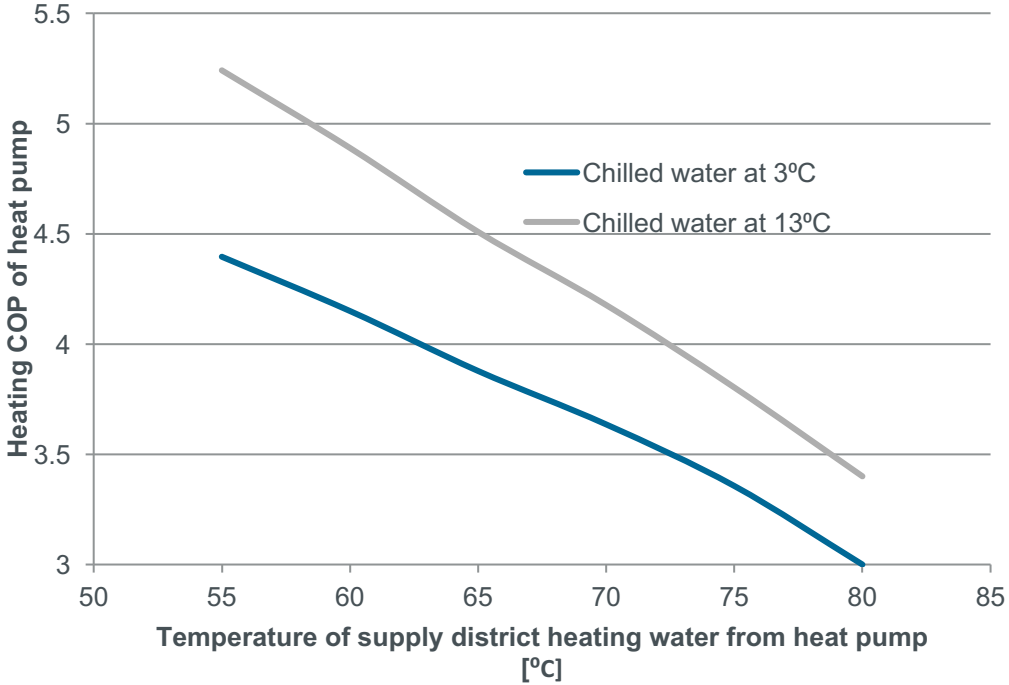
700 kW

Underground
Ventilation shaft

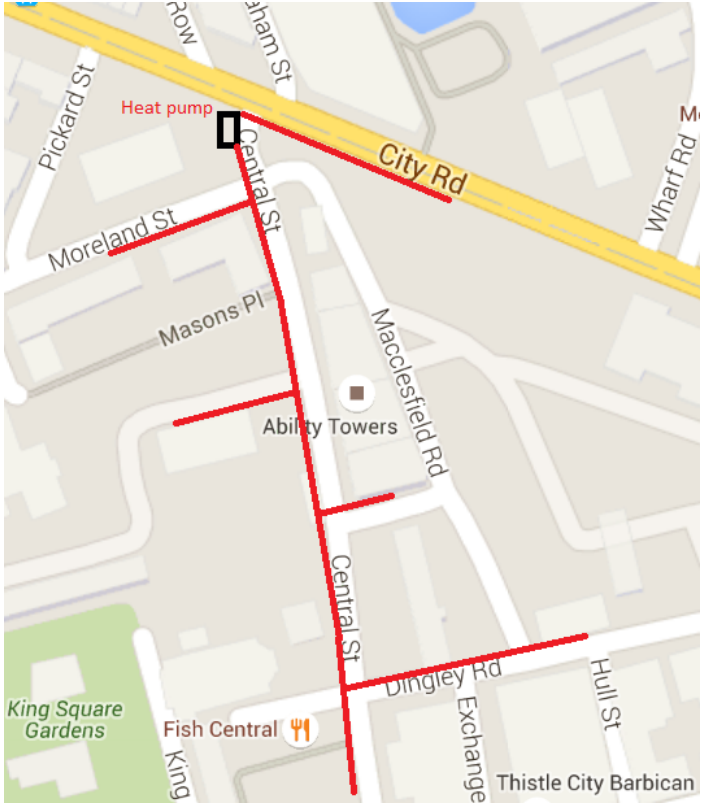


1000 kW

2 stage piston heat pump



Heat recovery from London Underground



700 kW of cooling (can be reversed in summer)

300 kW of electricity

1000 kW heating

District heating water: 55ºC - 75ºC

Yearly heating COP: 3 – 4.5

Payback of heat pump only: 2 - 3 years

Payback of total project: 8 - 10 years

Results

New landmark installation for urban heat recovery	Lower energy cost for 10 counsel flat blocks	Reduction of CO_2 emissions
District heating water up to 95°C Heat pump outlet temperature up to 80°C	Containerised solution with ammonia absorber to eliminate ammonia smell to surrounding area	New area of applications