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## Bigger picture

Globally there are over 5000 district energy projects in their local communities operational. The majority has water as a safe thermal energy carrier. Closed loops with a flow and return, where the  $\Delta T$  and the diameter limits the amount of thermal energy to be distributed. Australia's first is the globally published P.E.P. in Dandenong, cogeneration project developed by a very small team. Melbourne based PHTR-architects, Places Victoria and COMFORTiD have had many requests to visit the arty-powerstation facility, right next to Dandenong Metro-station. Unfortunately the a 1.1 km thermal exchange network is not visible.

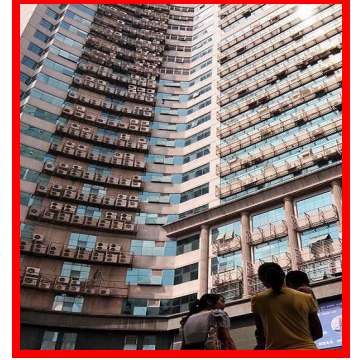


## Requirements for a community EXCHANGE network for thermal energy

ENGINEERING OUTLINE: The city of Melbourne's 1200 buildings program has isolated the properties with greatest potential for energy-efficiency upgrade. To enable detailed engineering we need of current energy consumption data for heating and cooling. To reach the community, the network design and especially component sizing needs to be done with an education component in mind, as this is relatively new in the ASIA-Pacific area and often forgotten potential. Many need to be trained.

Waste-heat is currently under-valued, precious water is wasted in cooling-towers.

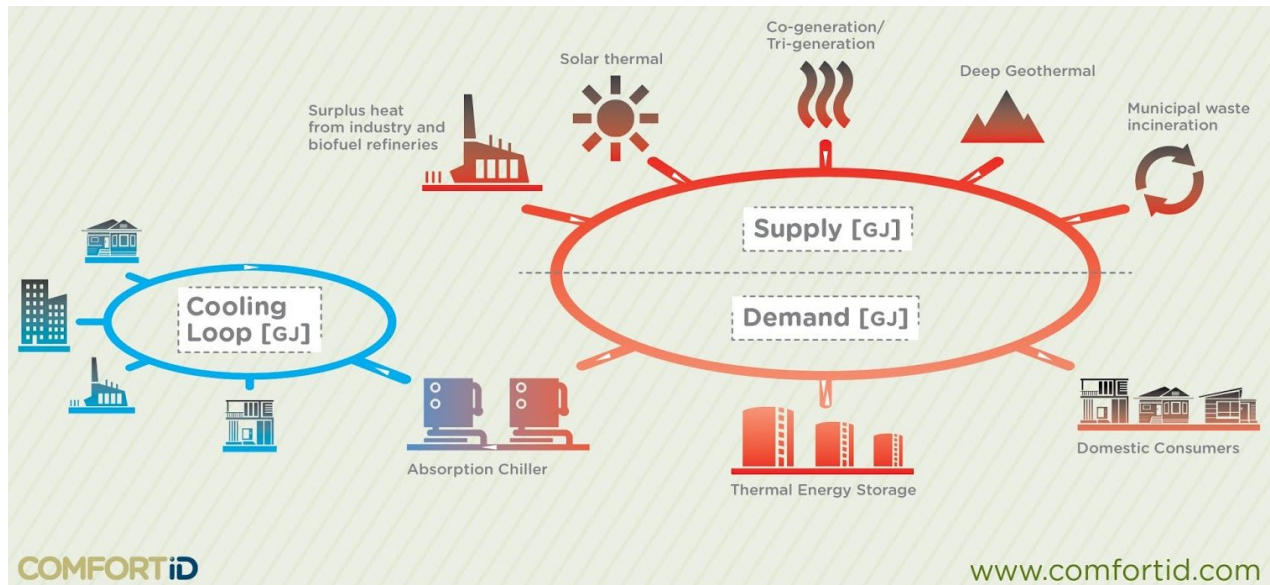
Extra facet is the phase-out of the HFC and HCFC refrigerants and transition to natural refrigerants like CO<sub>2</sub>. Hybrid thermal networks are much more reliable with a range of heat-sources. Industrial waste-heat from existing industries or new to develop regional waste-to-energy plants, solar-thermal-, co-/trigeneration facilities.



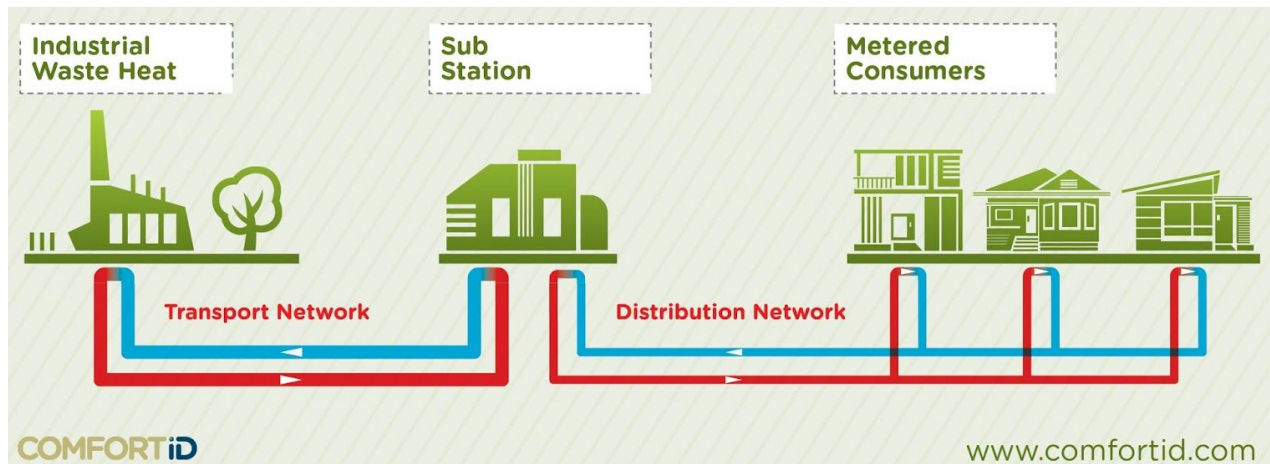
MANAGEMENT: A local (water) utility, like Yarra Valley Water, is already used to manage big pipe networks to distribute water in a linear direction to the end-users, invoice the consumed amounts of water. The linear sewage and storm-water handling is a different department. These closed loop thermal energy distribution solutions with insulated pipes require a similar management, they can be put in the same trench and invoice end users for consumed amounts of heating- and cooling-energy from the heat-meters. We will have to dematerialize our buildings and enable clean modern proven solutions to be implemented and become resilient thriving city. That is all possible with off-the-shelf products, KAV Consulting and COMFORTiD have the transformation-team capacity. The City of Melbourne and various departments of Melbourne's academic institutions like RMIT, Melbourne and Swinburne University have shown keen interest to collaborate on this EXCHANGE initiative. Also Victorian minister Lily d'Ambrosio is VERY supportive.



EDUCATION: Thermal energy distribution by water is much more efficient than air as an energy carrier. Many don't think that is possible. As this hybrid-district energy solution is relatively new for Australia-asia and multi-disciplinary, a visitor's education centre is required, so many engineers and decision makers need to be trained. This is necessary though as the transition out of fossil-fuels is inevitable.



Hybrid district energy and thermal storage schematic



Thermal energy distribution schematic, only indicating heating, cooling is the same.