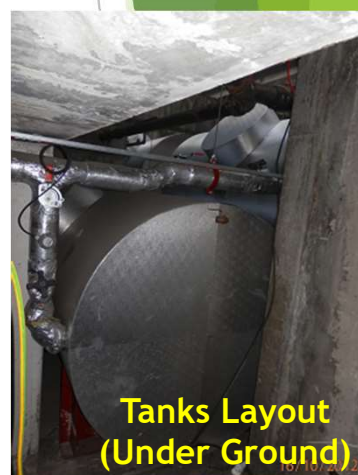
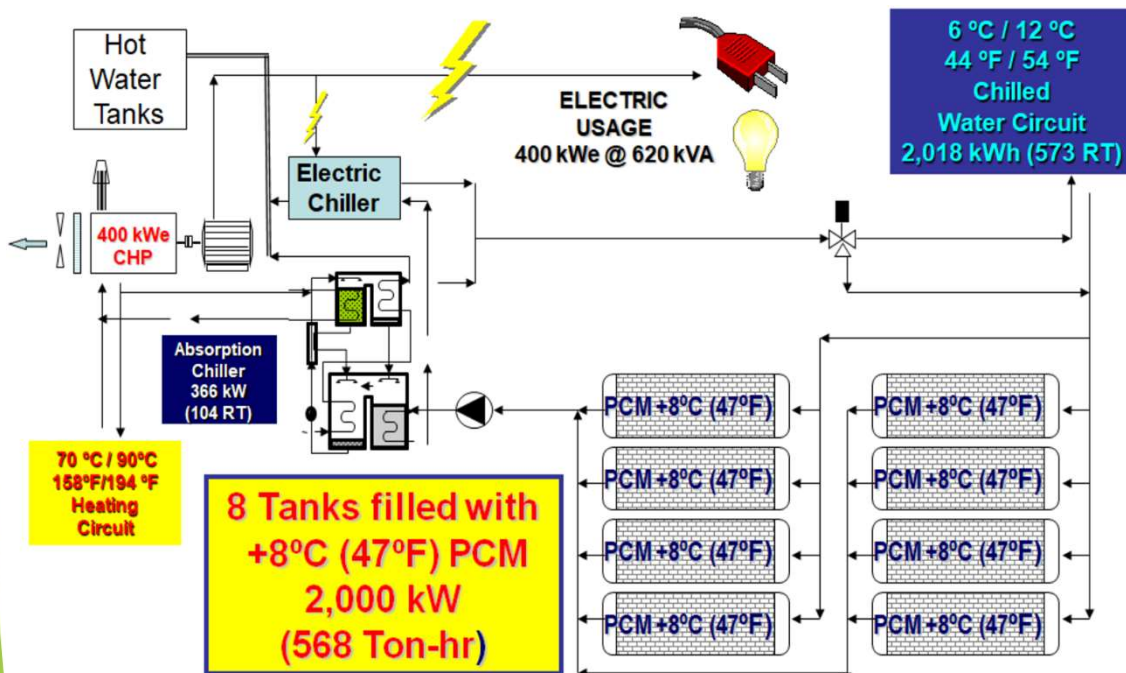


NATIONAL THEATRE, SOUTHBANK, LONDON, UK

The renovation of the National Theatre in London aimed for a significant reduction in CO2 emission and to that end it is decided to have a Combine Heat & Power (CHP) system.

Although this building house the main shows but also fair bit office element is part of the building which requires office hours building services such as water, electricity, cooling and heating all year round. On the other hand shows take place out of office hours generally in the evening period.

Electricity requirement is the main driving factor for the sizing and therefore 400 kWhe CHP plant is installed.



During office hours CHP may be fully utilized for the office electric requirement and the waste heat from the CHP engine not only provides the hot water requirement but also surplus waste heat from the CHP plant drives the absorption chillers to charge 8C(47F) PCM tanks. Nearly 2 MWH (568 RT-h) waste energy is stored free of charge and later this cooling is used as a cooling source by the theater cooling system for the 2~3 show periods.

As most of the evenings throughout the year there is a show this stored PCM-TES energy is utilised on a daily basis and once depleted they are ready to be charged next day.

If the heat is not available to drive the absorption machine an electric chiller can be utilised to charge the PCM-TES tanks using the surplus power generated by the CHP plant to improve the seasonal efficiencies.

