

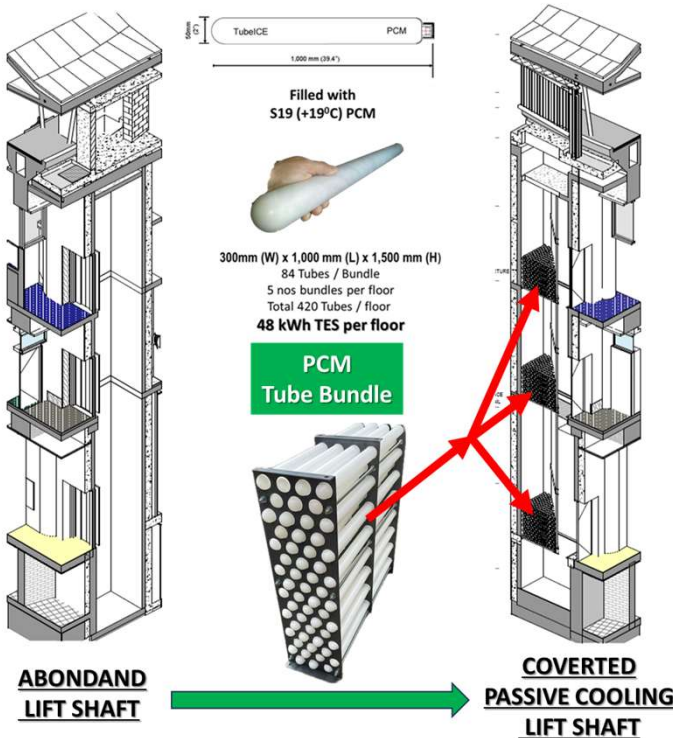
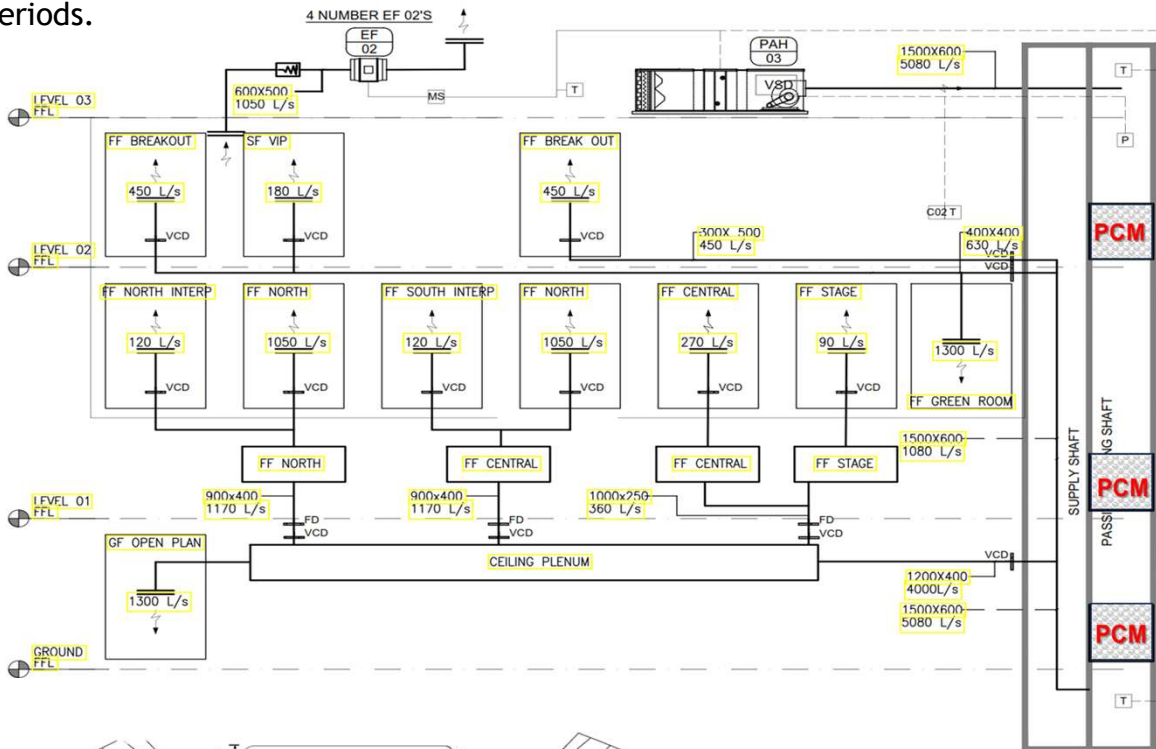
UN ECONOMIC COMMISSION FOR AFRICA, Addis Ababa, ETHIOPIA



As part of the renovation programme an internal old lift shaft was no longer required and considering almost all year cooling demand it is decided that repurposed abundant lift shaft might be possible to convert for a free cooling using cooler air at night to freeze PCM (Phase Change Material) modules, which then provide cooling during the day to reduce the air conditioning load..



In order to achieve free cooling facility a custom-made tube bundles are developed to fit within the physical shape / dimensions of the abundant lift shaft for each floor levels and fans force the air through these PCM tube bundles both during and charging periods.



Passive cooling is provided by +19°C (67°F) hydrated salt based PCM material placed inside 50mm (2") x 1m (3ft) HDPE tube containers. 84 of these PCM tubes are placed within a staggered frames in order to form heat exchanger shape whereby the air can efficiently pass through the bundle.

Existing lift shaft acting like a ductwork forcing the air across these tube bundles and providing 48 kWh (14 RTh) TES capacity on each floor level. Total three floor installation providing **144 kWh (42RTh)** passive cooling for the building simply storing the cooler night energy and bridge the gap between night and day time.