



MARCH 2, 2021

David Kidston

Dear David,

As per our conversation I've detailed the rationale behind our recommendations not to replace the gas boiler plant at the Corn Exchange with an Air Source Heat Pump (ASHP).

The Corn Exchange currently is one of the Council's most challenging assets from a decarbonisation perspective due to both a lack of available space and a number of existing issues with both the building itself and the heating distribution system. The lack of open space means we cannot consider a Ground Source Heat Pump as an option, the only open space nearby would be Market Square but is unlikely to receive approval from Heritage and would likely prove cost prohibitive. Similarly, a lack of space either on the roof or around the building mean that larger, commercial ASHPs are also not viable at this stage. Both the roof and high-level glazing at the Corn exchange are shortly due for replacement and are thermally inefficient. This twinned with a flawed heating distribution layout and Air Handling Units (AHUs) at the end of their operating life means that the building requires high temperatures to be able to satisfy the heating demands. Typically heat pumps operate most efficiently at temperatures below 50DegC, the building is currently operating with an 80DegC flow temperature with very little opportunity to reduce this.

The current roof and glazing system are thermally extremely inefficient and result in significant heat loss. When these are replaced, the thermal performance of the building will improve dramatically. This will also give the council a rare opportunity to make sweeping alterations to the ventilation layout and replace the existing aged air handling units with ones capable of operating at lower temperatures. The improved thermal performance of the building twinned with the upgraded heating distribution system will then give the Council the opportunity to consider on site renewable heat generation that would be able to satisfy most, if not all, of the sites heating demand. Due to the historical importance of the Corn Exchange, proposals will take time to fully develop and cost, then once finalised will need to pass through Listed Buildings Consent before implementation. It is likely that implementing such changes could take up to three years from conception through to delivery which would leave the building in a precarious situation with aged, inefficient boiler plant.

Whilst the installation of ASHPs either on the small flat roof area at the Corn exchange or on the Grand Arcade Car Park both could be considered we would advise against them at this stage. While a full structural and spatial assessment of the existing space will confirm exactly what capacity could be installed on site, without making the aforementioned alterations to the building envelope and heating distribution system an ASHP would be unable to satisfy a meaningful proportion of the buildings heating demand. A commercial ASHP on the Grand arcade roof may

be able to satisfy the sites heating requirements at current design conditions but the costs associated with distribution pipework and trenching across Corn Exchange street will make any potential project commercially unviable. It is then likely that once the upgrades to the building envelope and heating systems have been made the heat pump at the Grand Arcade would be oversized to match the remaining load.

I'm happy to go through this in greater detail should anybody have any queries.

Warm regards,

WINGATE, Alex

ENERGY ENGINEER