

<b>Committee(s):</b>	<b>Date(s):</b>
Port Health & Environmental Services Committee - For Decision	7 July 2015
<b>Subject:</b> Waste Heat Recovery from Cremation	<b>Public</b>
<b>Report of:</b> Director of Open Spaces	<b>For Decision</b>

### **Summary**

This Report seeks approval from your Committee to install equipment that enables the hot water created as part of the mercury abatement process to be used to heat the crematorium service chapels during the winter.

At present, the hot flue gases that are created as part of the mercury abatement process are cooled by a heat recovery boiler, and the heat is then dissipated to atmosphere by an air blast cooler. A separate gas fired central heating system is used to heat the chapels. This process does not demonstrate the efficient use of energy.

The current cost of heating the chapels is approximately £6,000 and the cost of cooling the hot water that is created as part of mercury abatement process is approximately £1,300 per annum. The cost of installation of the waste heat recovery equipment is estimated at £35,000 and the annual saving is estimated to be £5,000 per annum.

The cemetery and crematorium division of Open Spaces Department exceeded its income target by £419,000 and achieved an underspend across all budgets of £457,000 for the year 2014/15. A carry forward of £35,000 has been requested to fund the installation of heat recover equipment.

### **Recommendation(s)**

Members are asked to:

- Support the recommendation to install waste heat recovery equipment at the City of London Crematorium in order to use waste heat from the mercury abatement process to heat the service chapels.

## **Main Report**

### **Background**

1. The City Corporation has been operating a crematorium at its cemetery in East London since 1904, with a strong history of innovation and high standards of service to the bereaved. The City carries out over 2,500 cremations each year and to-date has carried out over 265,000 cremations.
2. The Modern Crematorium Building which opened in 1974 has large spacious chapels capable of seating 100 people. The primary heating for the building at that time was electric fan heaters.
3. In 2003 the chapel heating was converted from electric fan heaters to a gas fired hot water system using radiators, and at that time the heating boilers were installed in the crematory at high level.
4. Since 2012 the crematorium has been required by law to remove mercury and other harmful contaminants from at least half of all cremations carried out. In 2009 the City pre-empted this change in legislative requirement and installed a cremator with ancillary equipment capable of removing such contaminants.
5. Mercury abatement is the process used to remove contaminants from the cremation process and involves the cooling of cremator exhaust gasses so that they can then pass through a carbon filter before being allowed into the atmosphere.
6. The process of cooling the exhaust gases, from up to 1000° to 120 -160 Celsius, uses water and creates a large amount of hot water which is then pumped to an air blast cooler, on the roof of the crematorium building.

### **Current Position**

7. At present the crematorium is required to use electricity to force cool a large amount of waste hot water from the mercury abatement process whilst using gas to heat up more to provide heating in the service chapels.
8. The cost of cooling the water from abated cremation is approximately £1,300 per annum and gas usage for heating the service chapels is approximately £6,000 per annum. The gas boilers will be used to heat the building, early in the morning before the cremators are operational. but it is estimated that a saving of £5,000 per annum is possible by using waste heat from cremation to heat the service chapels.
9. Eight years ago, using waste heat from cremators in this way was a very new and rather revolutionary idea, but now it is used in at least five crematoria in the UK to heat swimming pools, run turbines creating energy and to heat buildings. The City Surveyor's Department has provided expert research and advice and has guided the development of this proposal.
10. The cost of diverting the waste hot water to the chapel heating system is approximately £35,000 and is to be funded from a carry forward from local risk

underspends in 2014/15. Any additional costs (including on-going maintenance) will be met from local risk budgets.

## Options

11. **Option 1** – Install heat reclamation equipment, attach it to the current hot water heating system and use the waste heat from the mercury abatement process to heat the service chapels, using the proposed carry forward from 2014-5 Cemetery and Crematorium budgets. **Recommended**
12. **Option 2** – Not install heat reclamation equipment and continue to heat the chapels and cool the waste heat in the ways described previously within this report. **Not Recommended**

## Proposals

13. The cemetery and crematorium division of Open Spaces Department exceeded its income target by £419,000 and achieved an underspend across all budgets of £69,000 for the year 2014/15. It is proposed that a small portion of the cemetery and crematorium underspend be used to fund the installation of waste heat recycling plant. This will allow us to use the waste heat from the mercury abatement process to heat the crematorium chapels. It must be accepted that heat will still need to be dissipated to atmosphere by an air blast cooler and that some gas powered heating will be required at times during the winter.
14. The cemetery and crematorium uses a significant amount of gas and electricity (costing approximately £109,000 per annum) and this proposal is in line with the Open Spaces Department drive to reduce energy use. The crematorium already produces over £8,000 of electrical energy each year through the photovoltaic cells installed on the crematorium roof and this further saving will help reduce costs even further.

## Corporate & Strategic Implications

15. The efficient and effective management of the City of London Cemetery and Crematorium supports the local community and protects, promotes and enhances the local environment in accordance with the City of London Corporation's Community Strategy. In 2010 Open Spaces Department implemented its sustainability Audit System. This has been used to drive down energy usage and costs across the Department as a means of meeting the overall corporate carbon reduction target of 25% during the period of 2009/10 to 2017/18. This challenge now forms part of the department's Key Performance Indicators and its aim to reduce utility consumption by 2.5% per annum.
16. The recommendations of this report support the departmental approach and are consistent with the division's commitment to reducing energy costs and making best use of energy generated locally.

## **Implications**

17. There are no legal or HR implications arising from this proposal. The financial implication is set out within this report and is to be funded from 2014/15 carry forward. Any on-going maintenance costs will be met from the cemetery and crematorium local risk budget.

## **Conclusion**

18. To conclude, the crematorium currently uses a gas fired central heating to heat its service chapels whilst using electrical energy to cool the water used during the process of mercury abatement from cremation.
19. This report proposes that the waste heat from mercury abatement be used to provide heating for the service chapels, therefore saving energy and money. This will mean that the crematorium will become more energy efficient and save money on heating the service chapels as well as on cooling of water during the mercury abatement process.

## **Appendices**

- None

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