



**REPORT TO: THE PORTCHESTER CREMATORIUM JOINT COMMITTEE –
26 SEPTEMBER 2022**

REPORT BY: PROPERTY MANAGER IAN COUSINS

FEASIBILITY STUDY INTO CREMATOR REPLACEMENT

1. Purpose

1.1 The purpose of this report is to inform members of the results of the feasibility study into the replacement of the cremators at Portchester Crematorium.

2. Recommendations

2.1 That we proceed with option one for the supply and installation of four natural gas cremators.

2.2 That we work with the professional team to design and then obtain tenders for further consideration by members.

2.3 That a budget as set out in the exempt appendix is allocated for these works.

2. Background

2.1 The existing six cremators were installed in 1989 with the Environmental abatement equipment installed in 2012.

2.2 The number of cremations currently undertaken can be comfortably undertaken with the five operational cremators.

2.3. Whilst the existing equipment remains reliable due to the efforts of the site staff and our maintenance contractor Facultatieve Technologies replacement parts are becoming difficult to source and therefore the continued operation of these units in the longer term is unsustainable.

3. New Technology

3.1 Whilst most crematoria still utilise gas for the cremation process some sites have now adopted electric cremation. The fundamental remains that the process of cremating by gas or electric will generate carbon emissions so we have explored some of the new technology entering the market to understand if any will be suitable for our requirements.

3.2 Hydrogen has the potential to offer a solution for cremation in the future and whilst development is more advanced in the transportation sector it has yet to be developed for the cremation market. Its distribution and safety requirements make this a challenging product to handle and currently no UK crematorium operate using this fuel.

3.3 Microwave cremation is a new and exciting emerging technology. Trials have been undertaken but no commercial approved equipment is yet available.

3.4 Alkaline Hydrolysis which is also known as Resomation. Whilst this technology is being used in the USA and Canada the first UK site now has planning and water authority approval. Its operation is a very different process from Cremation and the UK's populations acceptance of this technology is unknown.

3.5 Natural Organic Reduction or Composting. Whilst used in the USA we have yet to see a facility set up in the UK. The process is very different from the Cremation process and would require a very different facility from what we currently have at Portchester. The public acceptance of this technology is again unknown.

3.6 Green (Bio) Gas is produced during the breakdown of organic material such as food waste and is referred to as anaerobic digestion. Plants have been developed to exploit this gas and these can be connected directly to the national grid. Whilst technically you could also have an on-site plant this would require a significant amount of space, so the alternative is to purchase a green tariff directly from the grid. Based on current rates this option is hugely expensive and should be treated as an 'offsetting' scheme rather than a route to reducing emissions.

3.7 Whilst one of the above options may in the future provide an opportunity to significantly reduce carbon emission at this time none of the above technologies are appropriate for our requirements.

4. Proven Technology

4.1 We have three technologies that have the potential to successfully deliver the level of cremation currently undertaken at Portchester Crematorium - Natural Gas, Bio LPG Gas and Electric all of which are discussed further below.

5. Natural Gas Cremation

5.1 This option would require four cremators which will fit into the existing space.

5.2 Due to familiarity with this type of equipment the requirement for staff training will be reduced.

5.3 These units have a supported life of between 15 and 20 years which is within the period that the gas network will continue to be maintained.

5.4 The installation of these units will be quicker and a lower cost than the alternatives. Subject to final design a phased process of installation will limit the shut-down period required. We may also be able to utilise the existing abatement equipment.

5.5 For maximum efficiency these units should be run continuously. With the provision of facilities within the building to hold coffins post service a programme of cremations can be implemented to achieve savings in both energy use and carbon emissions.

5.6 A key benefit of this technology is the re-use of waste energy from each cremation process with the introduction of energy recovery.

6. Bio LPG Cremation

6.1 This product is an eco-propane, chemically identical to LPG and therefore technically could be used as a fuel in the cremation process. Generated as co-product in the production of bio diesel from oil seed rape.

6.2 The cremation process would be very similar in both operation and result to the existing natural gas cremation. Maintenance cost would also be similar.

6.3 The product would need to be delivered by road tankers directly to storage tanks constructed on site with space and security implications.

6.4 Based on current market rates the cost of fuel per cremation would be more than double the existing natural gas cost.

7. Electric Cremation

7.1 This type of equipment is larger than the existing and the available space can only accommodate three electrical cremators. We have explored the option to construct an extension for an extra cremator and found that the requirements of the 1902 Cremation Act restrict any extension within 200 yards of residential dwellings. Therefore, due to the proximity of nearby properties three is the maximum number of this type of cremators that we can provide.

7.2 The cremation process also takes longer at 2 to 2.5 hours per cremation and with the lower number of cremators we will not be able to accommodate the existing numbers within the normal working day. Whilst longer hours are an option this wouldn't allow for any maintenance time or unplanned disruption. A more intensive and longer staff training period would be required with the change in technology.

7.3 Whilst initial maintenance costs will be lower than gas cremators the medium and longer maintenance costs are unclear at this time.

7.4 Works to install this equipment would be extensive and this would result in significant disruption during the works with investigation required into the provision of alternative facilities for the duration of the works.

7.5 A significant increased power supply would be required for this equipment which until discussions have been had with the local electricity distribution company remain unclear in terms of available capacity, timeframe, or cost. It should also be considered that the supply of electric cremators is limited with only a small number of suppliers.

7.6 The key benefit of this option is the reduction of circa 50% in the CO₂ emissions with a significant reduction in NO_x emissions over the existing arrangements.

8. Energy Costs

8.1 In the current climate energy costs continue to be volatile but based on August 2022 gas prices with four cremations per unit each day we calculate that the cost for average cremation would be as follows.

Natural Gas (2.65p/kWh) - £17.00 per cremation

Bio LPG Gas (8.4p/kWh) - £40.32 per cremation

Electric Grid (12.5p/kWh) - £15.00 per cremation

Whilst the cost difference is negligible between Gas and Electric but for Bio LPG Gas it would be significantly more expensive.

To limit our exposure to the effects of changes in energy costs we continue to purchase via contracts that allow us to fix our costs for periods of time. Currently this is for 12 months but this will be reviewed again at the next renewal.

9. Lower CO₂ not Zero CO₂

9.1 By nature of the cremation process with whatever of the three technologies is considered they all generate CO₂ in the cremation process.

9.2 The production of CO₂ varies but on average it is considered that Natural Gas Cremation generates 122kg and Electric Cremation 56.89kg.

9.3 It should be noted regardless of fuel used just the body and coffin in the average cremation produces 26.9kg of carbon.

10. Finance

10.1 As detailed in Appendix D of the Revenue Budget 2022 / 2023 Report dated 13th December 2021 a budget of £3.5million is allocated for Cremator Replacement and Site Improvements.

10.2 Further details on the funding of this work are provided in the Exempt Appendix A - Finance Update.

11. Options

11.1 Last year 2021/2022 Portchester was in the top ten of the busiest crematoria in the United Kingdom providing a critical service to a population of over 500,000 across the four constituent authorities and at one of the lowest costs.

Set out below are details of options for new natural gas or electric cremators, or the option of an alternative site.

11.2 Option One – Installation of four natural gas cremators

- (i) Provide four in number new natural gas cremators as a medium-term solution whilst new technology develops, and the market matures.
- (ii) Provide facilities for the holding of coffins on site in accordance with legal requirements to allow the efficient use of the cremation equipment.
- (iii) Investigate energy recovery from the cremation process.
- (iv) Develop a plan for investment in the longer term to further reduce carbon emission to include looking again at zero carbon generating new technologies.

With several suppliers of this type of equipment to the UK market a possible timescale would see further investigations and design completed by spring 2023. Procurement and appointment over the summer with works commenced towards the end of 2023.

With the inclusion of facilities to hold coffins on site and provision of energy recovery further steps can be taken to reduce carbon emissions.

This proposal allows for new technologies to be fully developed by the industry, tried, and then tested at smaller sites before they are adopted in the longer term to provide further reductions in the carbon emissions.

11.3 Option Two – Installation of three electric cremators

- (i) Provide three in number new electric cremators.
- (ii) Investigate the provision of alternative cremator facilities
- (iii) Understand that the number of cremations slots available would be reduced at peak times and that these services would need to be carried out elsewhere.

This option provides a significant reduction in the carbon emission but doesn't achieve the net zero objectives of some authorities. The downside is the lack of capacity to accommodate the current level of demand with customers forced to use alternative Crematorium sometimes outside the local area.

11.4 Option Three – A New Crematorium Site with electric cremators

- (i) Develop plans for a new crematorium site elsewhere.
- (ii) Inclusion of four in number electric cremators
- (iii) Development to include modern facilities to meet all customers' requirements.

Whilst this option allows services to be continued on the existing site whilst a new fully electric cremator site is developed it comes with risks associated with the identification of a site, the permission and development process alongside the continued operation of the existing cremation equipment.

12. Conclusion

12.1 By the nature of the age of the cremators we do not have a do-nothing option. If we are to continue to deliver this critical service, we need to update our equipment.

12.2 All the constituent authorities have set objectives to reduce carbon emissions over the coming years but the cremation process by its very nature generates carbon. We can reduce our emissions but with current technology we cannot achieve a zero-carbon cremation.

12.3 The replacement of this equipment whilst continuing to deliver over 3000 per year cremations on site will be disruptive and this will be particularly difficult for the electric option.

12.4 Our recommendation is based on ensuring that Portchester Crematorium can continue to reliably deliver for the 500,000 residents of the constituent authorities at their own time of bereavement.

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16 September 2022

Background List of Documents – Section 100D of the Local Government Act 1972:

CDS Group - Phase 1 Feasibility Study into Cremator Replacement at Portchester Crematorium. Dated June 2022