

Report to: Policy and Resources Committee, 21st May 2024

Report of: Corporate Director – Operations, Homes and Communities

Subject: ASTWOOD CREMATORIUM – REPLACEMENT OF CREMATORS

1. Recommendation

That the Committee:

- 1.1 Notes the contents of the report, and in particular the award of a £1,497,237 SALIX Public Sector Decarbonisation Grant;**
- 1.2 Approves the business case for the procurement of 2 No electric cremators as set out within this report and summarised at Appendix 1;**
- 1.3 Recommends to Council an adjustment to the capital programme of up to £5,500,000 (as set out at Appendix 2) to cover the full costs of electric cremator replacement, and necessary fees & surveys to progress the project to end of RIBA Stage 3;**
- 1.4 Notes that the Medium-Term Financial Plan will need to be adjusted to include an additional minimum revenue pressure of up to £300,000 per annum from 2026/27 onwards to cover the costs of borrowing relating to recommendations 1.3;**
- 1.5 Approves the commencement of a procurement exercise for the purchase of replacement electric cremators, including abatement and heat recovery technology, and delegates the award of a contract to the Corporate Director (Operations, Homes & Communities) and the Corporate Director (Planning and Governance) in consultation with the Chair and Vice Chairs of this Committee; and**
- 1.6 Notes that following the completion of the RIBA Stage 3 design, a report will be presented to this Committee during Autumn 2024 for approval to proceed to technical design and the submission of a planning application.**

2. Background

- 2.1 Astwood Crematorium is serviced by 3 gas cremators which were installed in 1997. Due to their operational age, new cremators are required to increase operational resilience and secure environmental compliance.**
- 2.2 As of January 2024, any new or replacement cremators should be fitted with flue gas treatment that includes mercury abatement. All cremators (including existing cremators) will require flue gas treatment (including mercury abatement) by December 2026.**

- 2.3 Consideration also needs to be given to the advances in heat recovery technology, and the Council's commitment to creating a costed decarbonisation proposal for Astwood Crematorium as part of its Environmental Sustainability Strategy Action Plan.
- 2.4 Having regard to the above, the Council has, in addition to considering traditional gas cremators, considered the rapidly advancing electric cremator market. Several UK crematoria are now operating electric cremators.
- 2.5 Replacement of the existing cremators ('back of house') forms part of a broader capital project that also seeks to improve the public facing front of house offer provided at Astwood Crematorium. Two previous reports have been presented to Environment Committee on this project ([March 2023](#) & [July 2023](#)).
- 2.6 The July 2023 report set out three indicative options, with Option B being the preferred option of Members. Although at that point no decision was taken on whether replacement cremators should be gas or electric, the Committee signalled a clear preference for electric cremators should a business case support such a recommendation.
- 2.7 The report sets out a business case for two replacement electric cremators and a decision is being sought at this stage so that the cremator manufacturer can form part of the design team who will be procured to work on the broader capital project.
- 2.8 Given the cost of this capital project, its oversight has transferred to Policy & Resources Committee, in line with other projects of similar value.

3. Cremator Technology options (*Gas v Electric*)

Operational Contrast

- 3.1 Electric cremators are significantly more energy efficient than gas cremators. Electric cremators reach their operating temperatures by the heating up of electrical elements which are situated within the refractory linings (walls of the cremator), which are highly insulated. The heat from the refractory linings, in turn, heats the air space within the cremator.
- 3.2 This contrasts with gas cremators that reach their operating temperature through gas fired auxiliary burners which heat the air space first, followed by the refractory linings.
- 3.3 In practice, gas cremators can get to operating temperatures more quickly but require vastly more energy to remain at temperature, whereas electric cremators take longer to reach operating temperatures but are more efficient at retaining those temperatures, requiring less energy.
- 3.4 For the purposes of developing a business case report for electric cremators and to undertake due diligence, a soft market testing exercise has been conducted. This has confirmed that electric cremator technology has progressed from when it was first introduced into operation in the UK around 2020. The most recent electric cremator projects have seen 3rd and 4th generation cremators being installed.

3.5 In addition, during April, several officers and Councillors visited North Oxfordshire Crematorium and Memorial Park. This is a privately operated facility that was the first in the UK to operate electric cremators. The visit was an opportunity to look at electric cremators in operation but also talk to staff at the site about their operability, maintenance and lessons learned since their installation.

Capacity

3.6 As a result of development in electric cremator technology, average cremation times have reduced to on average 110 minutes. Since 2019 the average number of annual cremations undertaken at Astwood Crematorium is 1678 and with 240 working days available in a year, this will require the facility to manage an average 7 services per day. During winter months, the average number of cremations per day will increase to 9.

3.7 The Bereavement Service operates a split shift pattern of 07:30 – 15:30 and 09:45 – 18:30. Cremating hours are 08:00 – 18:30 providing 10hrs 30mins in total per cremator. The tables below illustrate how 2 electric cremators would be able to meet that level of demand across normal and peak operating periods.

Normal Operating Period

Cremators	Max cremation per day / per cremator	Cremation hours per cremator	Cremation hours (practical)	Theoretical Capacity Usage	Practical Capacity Usage
2 x Electric (ave 110min per cremation)	Crem A - 4	7.3 (440min)	8.3 (500min)	70%	79%
	Crem B - 3	5.5 (330min)	6.3 (375min)	52%	60%
2 x Gas (ave 90min per cremation)	Crem A - 4	6 (360min)	7 (420min)	57%	66%
	Crem B - 3	4.5 (270min)	5.3 (315min)	43%	50%

Peak Operating Period

Cremators	Max cremation per day / per cremator	Cremation hours per cremator	Cremation hours (practical)	Theoretical Capacity Usage	Practical Capacity Usage
2 x Electric (ave 110min per cremation)	Crem A - 5	9.1 (550min)	10.4 (625min)	87%	99%
	Crem B - 4	7.3 (440min)	8.3 (500min)	70%	79%
2 x Gas (ave 90min per cremation)	Crem A - 5	7.5 (450min)	8.75 (525min)	77%	90%
	Crem B - 4	6 (360min)	7 (420min)	57%	66%

3.8 It should be noted that within the proposed 'back of house' works, space will be maintained for the installation of a 3rd cremator should the need arise. This extra capacity is not considered necessary in the near future due to the daily capacity available under normal and peak operating periods.

Energy Costs

3.9 It is estimated that there will be around a £20,000 per annum saving in energy costs associated with the installation of electric cremators. The annual cost of gas and electricity usage at the Crematorium in 2023-24 was £129,245 for gas and £19,029 for electricity. The supplies are not sub-metered, so it is not possible to distinguish exact use for different parts of the building or operation.

3.10 As well as a high demand for gas, the current gas cremators also have a significant electricity requirement, to power the supporting IT infrastructure.

3.11 Gas is also used for the space heating throughout Astwood. Under the terms of the Salix grant, the boiler for space heating at the Crematorium must be replaced as part of the cremator replacement project. The space heating will be provided via a heat exchanger from the electric cremators.

3.12 It is therefore expected that there will be no gas usage at the Crematorium following the replacement of the gas cremators with electric.

3.13 As noted by the CDS group in a public report 'the electric cremator operates as a 'hot insert', reaching its optimal temperature within 3 days of initial install and then maintaining that temperature thereafter, requiring electrically generated energy to maintain the heat. The more electric cremations completed, the lower the average electrical consumption, as the cremation activity fuels the process.'

3.14 Electric cremators often therefore appear to be kept at temperature 24/7. Many of the figures available from manufacturers estimating electricity demand from their electric cremator models are based on kWh energy usage per cremation. As explained, each cremation undertaken reduces the electrical demand of the cremators. With varying average numbers of cremations at Astwood over the seasons within a year, it is hard to be accurate in the estimations of energy usage from two electric cremators.

3.15 The table from CDS, using data from one of the manufacturers, gives an average kW/hour usage per cremation, for one cremator, for both gas and electric. CDS estimate that electric cremations whether using grid electricity or green electricity will be cheaper than gas by up to £6 per cremation.

Gas Cremation

Electric Cremation

Cremations per day	Gas Per cremation (kWh)	Electricity Consumption Per Cremation [inc. rest] (kWh)	Cost per cremation
1	1359	77	£82
2	763	47	£47
3	564	38	£36
4	483	33	£31
5	424	30	£27
6	348	28	£23

Cremations per day	kWh/hr	Costs per cremation (Grid Electricity)	Costs per cremation (Green Electricity)
1	20	£155	£197
2	18	£70	£89
3	15	£39	£49
4	14	£27	£35
5	13	£20	£26
6	12	£16	£20

- 3.16 The energy costs used in these calculations are slightly higher than the Council's green electricity tariff agreed for 2024/25.
- 3.17 Modelling on the highest expected usage scenarios suggests that there will be savings in the region of £20,000 per annum from switching to electric cremators and an electric heat exchanger, based on the current total energy costs for the Crematorium of around £150,000 annually.

Servicing, Maintenance & Repair Costs

- 3.18 In terms of maintenance costs, soft market testing has supported what has been presented previously through CDS preliminary assessment work, that maintenance of 2 gas or electric cremators will be in the region of £45,000 per annum (£22,500 each). However, given the increased fluctuation in temperatures associated with gas cremations maintenance costs are likely to increase throughout its life, when compared to electric. This is due to the impact that fluctuating temperatures have on the refractory linings of cremators.

Environmental Performance

- 3.19 The most significant area of environmental performance between electric and gas cremators is that of carbon emission savings. This is because electric cremators do not rely on the burning of gas (auxiliary burners) to reach and maintain operating temperatures.
- 3.20 Further carbon emission savings will come from the formal reduction in the number of cremators in use at the site (from 3 to 2), and the removal of the existing gas boiler which heats the crematorium building throughout. It is proposed that the building instead will benefit from a heat exchanger linked to the electric cremators. The inclusion of a heat exchanger is tied into the receipt of the Salix grant.
- 3.21 Destratification fans, also funded by the Salix grant, will be used across the building to reduce heat losses. Electricity purchased by the Council is certified as zero-emission from renewable sources and therefore the cremators and heating will be zero-emission, should the Council continue with this tariff.

- 3.22 Total current carbon emissions from the crematorium building, and therefore total carbon savings from this project, are 369tCO₂e, equivalent to almost 300 petrol powered passenger vehicles driven for 1 year or almost 250 homes electricity use for 1 year. This also represents 18% of the Council's total calculated carbon footprint being removed.
- 3.23 Replacement of the cremators will also give rise to air quality improvements. As of January 2024, any new or replacement cremators must be fitted with flue gas treatment that includes mercury abatement. All cremators (including existing cremators) will require flue gas treatment (including mercury abatement) by December 2026. Flue gas treatment including mercury abatement can be incorporated into both electric and gas cremators.
- 3.24 In addition to 'in-line' abatement, electric cremators also produce about a third less Nitrogen Oxides (NO_x) than gas cremators, as no gas is burnt. Although NO_x emissions from Astwood Crematorium are not a contributory factor in the declaration of The Worcester City Air Quality Management Area (2019), reducing such emission is a positive outcome, given the link between NO_x and cardio-respiratory disease.

4. Cost comparison

Initial capital cost estimates and Salix bid

- 4.1 An initial cost assessment exercise was undertaken to inform the Environment Committee's decision-making but also to enable the Council to apply for a Salix grant.
- 4.2 Salix is a non-departmental public body, wholly owned by the UK Government. The company was formed in 2004 to administer funds on behalf of the Department for Energy Security and Net Zero, the devolved administrations in Scotland and Wales and the Scottish Funding Council, to enable public bodies and Housing organisations to reduce carbon emissions.
- 4.3 Following a bid to the Salix 'Phase 3c - Public Sector Decarbonisation Scheme', in late February 2024, the Council was awarded £1,497,237. The bid was premised on the Council replacing its existing gas cremators with low carbon electric cremators and the building's heat being supplied via a heat exchanger rather than the existing gas boiler.
- 4.4 On submission of the bid in October 2023, investigation works up until that point had estimated the total cost of replacing the existing 3 gas cremators, with 2 electric cremators to be £2,984,737. This was broken down as follows –

Element	Cost (£)	% of Total Cost
Design & Engineering	250,000	8
Main Equipment Capital	1,650,000	56
Installation & Commissioning	300,000	10
Project Management & Delivery	160,000	5

Contingency	250,000	8
Enabling Measures	364,737	12
Project Ancillaries	10,000	<1
Total	2,984,737	100

- 4.5 The bid had estimated the main equipment capital made up of 2 electric cremators, costing £825,000 each (including destratification fans, and an element of inflationary increase). The enabling measures include works required to increase the electrical supply to Astwood as the current supply would not support the connection of electric cremators.
- 4.6 Based on these costs, and considering the successful Salix grant award of £1,497,237, the net cost of procuring electric cremators was estimated to be £1,487,500.
- 4.7 As at May 2023, the comparative cost of a gas cremator was £575,000. With similar installation and commissioning costs of £300,000, this would mean that procuring 2 replacement gas cremators would cost the Council in the region of £1,450,000. Hence the electric option was significantly more expensive in terms of procurement costs, but the successful Salix grant award meant that the costs of electric cremators was brought in line with the gas option.
- 4.8 The key elements of the Salix grant are as follows –
- The Council cannot claim any grant towards costs incurred before 1 April 2025
 - The Council can pay for project costs prior to April 2025 as part of the required match funding it is putting towards the cremator element of the project
 - The Council must complete (in terms of costs we want to claim for) all works associated with the grant by 31 March 2026
 - The Council cannot claim for VAT
 - The Council is expected to provide match funding of £1,487,500.

Current capital cost estimates

- 4.9 Further costs analysis alongside recent soft market testing, has led to more detailed cost estimates which are higher than initial estimates for both gas and electric cremators, but which result in the electric option being less costly in capital terms.
- 4.10 The full cost estimates are set out in **Appendix 2**. In summary, the cost of gas cremators, including all installation costs, but excluding the wider building works, is now estimated to be £4.551m, including VAT. The estimated costs of installing electric cremators is £5.490m. However, once the Salix grant is taken into account this is reduced to due to £3.992m, including VAT.
- 4.11 These figures assume that the installation costs are broadly the same but do not take into account the restructuring of the 'front of house' proposed and supported by Environment Committee (option B in the report of July 2023). No further detailed cost estimates have been made for this part of the project, which therefore remains

at an estimated £2.7m. Note that for this estimate, 50% of the 'fees and surveys' costs set out in **Appendix 2** are deemed to be attributable to the 'front of house' works.

5. Revenue Costs

- 5.1 The capital cost outlined above indicate that the electric cremators, with the Salix grant, are the least costly option. This assumes that the building works associated with cremator replacement remain the same for either type of cremator. The revenue impact of financing the capital spend is set out in the Financial Implications section of the report.
- 5.2 In terms of deciding on the best option, ongoing running costs also need to be considered. Section 3 of the report has confirmed that switching to electric cremators and a heat exchange mechanism will reduce energy costs by around £20,000 per annum.
- 5.3 In addition, maintenance costs would be in the region of £45,000 per annum for 2 cremators. As pointed out however, given the increased fluctuation in temperatures associated with gas cremations maintenance costs are likely to increase throughout its life, when compared to electric.
- 5.4 The revenue implications can be summarised in the following bullet points, although further work to establish more definitive figures will be presented in future reports –
- The borrowing costs associated with procuring and installing electric cremators will be around £300,000 per annum over 25 years
 - The loss of income during the 9-month construction phase of the project will be around £150,000, although this should be significantly offset by a reduction in energy costs during that period (see paras 6.15 - 6.20)
 - There will be energy costs savings of around £20,000 per annum by switching to electric cremators
 - Maintenance costs for 2 gas or electric cremators will be very similar at around £45,000 per annum, but costs are likely to increase for maintenance of gas cremators as they age
 - Although officers believe switching to electric cremators will attract a new share of the market, it would be difficult to quantify this for the purpose of a public report

Application of VAT Exemption

- 5.5 The operation of Astwood Crematorium generates income to the Council of around £1.5m per annum. Cremation fees which are exempt from VAT make up around 90% of this income.
- 5.6 The Council benefits from the Partial Exemption calculation, which enables recovery of VAT payable on any of the associated costs of running business activities.

However, the amount of exempt income generated from the crematorium and some other smaller exempt services, means that the Council operates close to the Partial Exemption limit each year. If the limit is exceeded, the Council would be required to pay VAT on all its costs relating to exempt supplies recovered during the year.

- 5.7 The total cost of electric cremator replacement, as per Appendix 2 will be approximately £4.6m. Additional VAT at 20% would be in the region of £900,000. However, the overall costs of the capital project, once the additional building works of £2.7m, are taken into account, would be £7.3m for the electric cremator option and £6.5m for gas. Total VAT to be incurred on this spending would be £1.44m or £1.26m respectively.
- 5.8 The scale of the project and the fact that we operate close to the limit of our partial exemption means that we would exceed the annual partial exemption de minimis limit. The Council has written to His Majesty's Revenue & Customs (HMRC) on 11th April 2024, seeking their flexibility in agreeing to reduce the rate of VAT that we stand to incur on the project, and awaits their response.

6. Governance

Procurement of Cremators

- 6.1 Work to investigate and better understand the electric cremator market has been carried out including a soft market exercise. This has enabled officers to start developing an Electric Cremator Manufacturer Tender which would be advertised subject to approval of this report.
- 6.2 It is proposed to advertise the tender during June and July 2024, utilising August and September to review tender submissions, making a recommendation in line with the delegation provided and, subject to approval, instruct the preferred contractor.
- 6.3 It is intended to run a process that will involve negotiation, given the highly technical and critical nature of the equipment, its operation and maintenance, and the fact that the electric cremator market is still developing.
- 6.4 Procuring an electric cremator contractor by September 2024, will enable the chosen contractor to form part of the wider design team which is appointed to design and develop a remodelled building, as set out in the July 2023 Environment Committee report. An early understanding of the infrastructure requirements and design implications of the preferred cremator model will inform the design team's work across the whole project and should help to mitigate the risk of any technical or structural conflicts.
- 6.5 Given the need for the off-site upgrade in electricity supply, it will be essential to be able to specify technical specification of cremators to National Grid at the earliest possible opportunity to place an order for these works without delaying the commissioning of the new cremators.
- 6.6 The reinforcement of the supply to the site is likely to involve statutory consultation with Network Rail and Highway Authority approvals given the need for works to services within the highway under Brickfields Road Railway Bridge.
- 6.7 Should Members at some future point decide they do not wish to proceed with the front of house improvements, then it should be noted that this will have no impact

on the back of house works focussed on cremator replacement, which are required to secure environmental compliance and operational resilience.

- 6.8 Both sets of works although interlinked are not reliant on each other and there is little if any risk therefore in procuring electric cremators ahead of RIBA Stage 3 being completed.
- 6.9 The award of the cremator contract will be managed alongside decisions to proceed with the wider project, the next of which will be presented to this Committee in Autumn 2024 at the end of RIBA Stage 3 design.

Regulatory Permissions

- 6.10 In respect of planning, it is proposed to submit a single planning application for the broader project, rather than separate planning applications that would potentially deal with replacement cremators and their impact on stack design and height, and internal and external front of house improvements.
- 6.11 The Policy and Resources Committee will receive a further report on the progress of the project before any application for planning consent is submitted. On the current project timetable, submission of a planning application is scheduled for November 2024, and this would be preceded by the submission of a pre-application with the Local Planning Authority, Building Control and other key stakeholders during the Summer, along with a public consultation and engagement exercise.
- 6.12 As mentioned at the outset of this report the Environmental Permitting Regulations prescribe that as of January 2024, any new or replacement cremators should be fitted with flue gas treatment that includes mercury abatement.
- 6.13 Worcestershire Regulatory Services who regulate Astwood Crematorium sit on the Officer Working Group that oversees the project and an application to vary the Environmental Permit covering the facility will be submitted in good time and ahead of the commissioning of the new cremators.
- 6.14 As reported to Environment Committee in July 2023, as part of the work to investigate the options available to the Council for continuing to provide a crematorium, the Council must pay attention to The Cremation Act 1902.
- 6.15 This Act sets out that *'No crematorium shall be constructed nearer to any dwelling house than two hundred yards, except with the consent, in writing of the owner, lessee and occupier of such house, nor within fifty yards of any public highway, nor in the consecrated part of the burial ground of any burial authority'*.
- 6.16 The Council has obtained Counsel's advice on the implications of this legislation in respect of any improvements that the Council wishes to make to its operations at Astwood. The legal advice provides a clear mandate for making improvements to the existing buildings, but not constructing a wholly new facility within the site. The options for redevelopment are considered by Counsel to be compliant with the legislation.

Business Continuity Planning

- 6.17 It has been estimated that the works associated with cremator replacement and front of house improvements will take 9 months to deliver and will require the facility to be closed for public access. During this time, it is planned to continue to offer a Worcester City Council Cremation and Funeral Service offer.
- 6.18 Work has commenced on identifying a suitably located and appropriate venue to host services, whilst arrangements are being discussed to utilise a neighbouring Local Authority crematorium to undertake cremations on the Council's behalf.
- 6.19 Analysis has been undertaken to identify the additional costs the Council will incur in delivering services during this interim period. It is forecast to undertake 1315 services during 2024/25 at an average of 110 per month.
- 6.20 Soft market testing has indicated that the cremator replacement element of the project is likely to take up to 5 months. It is estimated that transportation costs to and from the preferred alternative crematorium, and cremation costs would be around £130,000. This is broken down into £20,000 for transportation costs and £110,000 in cremation costs
- 6.21 Furthermore, the costs of hiring an alternative venue (as replacement for the chapel) for the 9-month construction period is estimated to be around £20,000. In total therefore the potential loss of income during the project will be around £150,000. These costs will be offset by the fact that energy usage (gas) will reduce significantly at Astwood with no cremations taking place for up to 5 months.
- 6.22 Future reports to this Committee will include further updates on these costs as arrangements are finalised. In addition, interim arrangements will be communicated effectively to a wide range of stakeholders so that the Council is being transparent in how it intends to manage services during this period.

Update on Broader Project and Indicative Programme

- 6.23 Following a procurement exercise, the council has recently appointed (under delegated powers approved by Environment Committee on 18th July 2023) Multi Discipline Design Team comprising Architect, Interior designer, Structural Engineer, Mechanical and Electrical Engineers, Landscape Architects.
- 6.24 Proposals were invited from bidders to deliver RIBA Stages 1-6 but this initial appointment will be to complete RIBA Stage 3 Spatial Coordination and prepare a planning application following which a further approval and appointment will be required to proceed to the end of Stage 4 Detailed Design.
- 6.25 A tender process is currently underway to select an external Project Manager and Quantity Surveyor. It will follow a similar process to the above Design Team Tender.
- 6.26 Further updates will be provided to Policy and Resources Committee at the end of RIBA Stage 3 and to seek approval to proceed to RIBA Stage 4 and the submission of a planning application.
- 6.27 An indicative programme is included below.

Stage	Start	Complete	Activity / Output
Select Design Team	Dec 23	May 24	
Select QS/PM	Feb 24	June 24	Potentially earlier
Select Cremator Manufacturer	July 24	Sept 24	Dates to be discussed further and confirmed –
RIBA Stage 1&2 Brief & Concept	June 24	July 24	Review Feasibility Report Undertake Surveys & Investigations Pre –application discussions with Planners and Building Control
RIBA Stage 3 Spatial Coordination	July 24	Nov 24	Develop & Coordinate Design Prepare Planning Application Latest Date To Place Order for Cremators Stage End Report / Gateway Council Approval to Submit Planning Application Council Capital Programme Approvals
Submit Planning Application	Nov 24	Feb 25	Submit Planning Application
RIBA Stage 4 Technical Design	Nov 24	April 25	Progress Detailed Design Prepare Tender Docs for Contractor
			Tender and Appoint Contractor Stage End Report / Gateway Council Approval to Proceed Contractor mobilisation
RIBA Stage 5 Construction	May 25	Jan 26	To include power upgrades on network Cremators installed Aug / Sept 25
RIBA Stage 6 Handover		Feb 26	Commissioning and Testing complete Completion Report
Salix Funding Claim Window	April 25	March 26	This is the period Salix have advised in the event the application is successful.

6.28 Corporate risks have been identified and discussed in para 9.3 of this report. In terms of project specific risks, a Risk & Issue Schedule is included at **Appendix 3**.

7. Preferred Option

7.1 As set out within the report and summarised at Appendix 1, this report recommends the procurement and installation of electric cremators on several grounds, and these are summarised below -

- Electric cremator technology has developed significantly, meaning that it can meet the operational requirements and demand of Astwood Crematorium
- Taking into account the Salix grant, the capital cost of electric cremators is less, meaning the borrowing costs are less by around £40,000 per annum
- Electric cremators will result in a reduction in ongoing revenue costs by around £20,000 per annum due to them being powered by green electricity which costs less than gas
- Electric cremators will reduce the Council's total carbon emissions by 18%, reduce its emissions of NOx and support progress of its Environmental Sustainability Strategy and Action Plan

7.2 Furthermore, the report recommends (as part of the £5.5m capital adjustment proposed) an element of additional capital expenditure to progress the project to end of RIBA Stage 3 design.

8. Alternative Options Considered

- 8.1 The primary alternative option is to undertake a 'like for like' gas replacement of cremators. As set out within the report, to support the Council's environmental sustainability commitments and contribute to better air quality this option has not been recommended.
- 8.2 Furthermore, the impact of the Salix grant which can be applied to the procurement of electric cremators, means the capital costs of electric cremators and associated borrowing costs are less than gas.
- 8.3 In the last several months the crematorium has moved from operating all 3 of its cremators throughout the working week, to having 2 operational and 1 resting. This has worked well, has had no operational impact on service provision and has significantly reduced energy usage.
- 8.4 This report recommends procuring 2 electric cremators, as this would provide more than sufficient capacity to meet the maximum number of services the service can provide. The alternative option of procuring a single cremator has not been recommended, as this would introduce significant operational, reputational, and financial risks.
- 8.5 The option of not replacing the cremators has not been recommended. As part of previous reports on this subject Members have clearly indicated their support for the city continuing to have its own Crematorium to support its residents and communities and to safeguard an important income stream for the council.
- 8.6 In terms of timescales, there is an alternative option to commence the procurement of the cremators at a later stage in the project, when the design work, construction budget and overall project programme is better understood. This is not recommended because the early selection of the cremators will help inform the design and construction workstreams as they develop.

9. Implications

9.1 Financial and Budgetary Implications

This report focuses on the costs of procurement and installation of electric cremators at a capital cost of approximately £4.6m. As indicated in the report, under current VAT regulations the Council would also incur additional non-recoverable VAT costs of £900,000, making the total contract value £5.5m.

The overall estimate for the project, as per the report to Environment Committee in July 2023, was initially £6.225m. Following the revised cremator replacement and installation costs outlined in the report, the overall project cost for the electric cremators option is now estimated to be £7.3m, with potentially a further £1.46m in unrecoverable VAT, including the £900,000 above. In addition, all VAT incurred in operating the Council's exempt business activities would be unrecoverable in the years that the Exemption Limit is breached.

The Salix grant will not reduce the costs incurred for the purposes of calculating the VAT, but it will reduce the overall amount of borrowing that the Council needs to undertake. The annual revenue impact of borrowing the above capital funds is set out in the table below. The costs with and without VAT are shown as both scenarios

are possible depending on HMRC's response to the Council's application for an exemption to the regulations. For this purpose, the Salix grant is deducted from the cremator costs specifically.

All costs are approximate and are subject to potential inflation increases and revised estimates prior to project completion. For the purposes of this analysis, it is assumed that 50% of the fees and surveys element shown in **Appendix 2** is allocated to the front of house component. If the front of house component (Option B) does not proceed, all of the fees and surveys costs will fall to the cremator replacement stages of the project, resulting in the full capital cost of £4.575m + VAT shown in Appendix 2. This would increase the revenue costs of borrowing to £227k without Vat and £294k with VAT.

Component	Asset life in years	Interest rate at 1/5/24	Total annual cost £	Total annual cost £
Cremators with VAT costs recovered	25	5.4%	211,364	
Cremators including VAT	25	5.4%		275,743
Buildings with VAT costs recovered	40	5.58%	173,148	
Buildings including VAT	40	5.58%		207,777
Total with VAT recovered			384,512	
Total costs if VAT not recoverable				483,520

For comparison, the revenue implications of replacing the gas cremators with new gas cremators, which would not attract Salix grant, are set out below.

Component	Asset life in years	Interest rate at 1/5/24	Total annual cost £	Total annual cost £
Cremators with VAT costs recovered	25	5.4%	264,453	
Cremators including VAT	25	5.4%		317,344
Buildings with VAT costs recovered	40	5.58%	172,045	
Buildings including VAT	40	5.58%		206,454
Total with VAT recovered			436,498	
Total costs if VAT not recoverable				523,798

In addition, in both cases, there will be a revenue impact of not being able to recover input VAT on exempt supplies during the two-year period of the project. This is estimated to be £70,000 per annum, based on previous years' VAT returns.

The work to be undertaken to install the new cremators, and further building works should these be approved, will require the crematorium to be closed for a period. It is proposed to continue services using a third-party provider. It is estimated at this stage that the impact this will have on loss of income will be mitigated by the reduction in energy costs. No allowances have been made for any potential losses in the MTFP at this stage, and a detailed appraisal of temporary closure will be presented to Members in November 2024.

In the longer term there is expected to be a reduction in annual running costs, as per the July 2023 report to Environment Committee and there may be some additional value arising from the Council providing the only carbon neutral service in the region because of installing the electric cremators.

9.2 Legal and Governance Implications

There is no statutory duty on a local authority to provide burial or cremation facilities, but if they do so, the management is governed by the Local Authorities' Cemeteries Order 1977 and the 2008 Regulations.

Local authorities are defined as burial authorities and/or cremation authorities and given the power to provide services by virtue of the Local Government Act 1972.

The Cremation (England and Wales) Regulations 2008, state that the cremation authority must ensure that a crematorium is:

- a. maintained in good working order
- b. provided with a sufficient number of attendants
- c. kept in a clean and orderly condition.

The Cremation Act 1902 sets out restrictions on the construction of cremation facilities in proximity to housing. The Council has taken expert legal advice to assure itself that the proposed project remains fully compliant with this legislation.

The Salix grant conditions establish a legally binding monitoring and reporting regime for the grant and provide Salix with rights of clawback of the grant in a number of circumstances which are outlined in the grant conditions. Provided the Council maintains regular reporting to Salix and complies with all of the specific grant conditions (including as to the approved use and eligibility, project start date and end date) then the risk of clawback should not materialise.

The procurement process for the acquisition of new cremators will be subject to the existing Public Contracts Regulations 2015, as it is expected that this procurement will commence prior to the new Procurement Act 2023 becoming effective.

9.3 Risk Implications

The key corporate risks associated with this project are:

- 1) 'City Plan Priorities Financial Resources' – this is the risk of having insufficient financial resources to deliver City Plan priorities, and
- 2) 'Asset Maintenance' – this is the risk of the council failing to conduct relevant assessments and maintain owned assets and buildings which could result in building damage and risks to Health and Safety

As set out within the report, investing in new cremators will enable the council to continue to provide a critically important service to its residents and communities. Although it is acknowledged that the level of capital investment will impact on the net operating position of the Bereavement Service (minimum revenue provision on capital borrowing), it will go some way to safeguarding a valuable income stream.

Given the age of our current cremators, it is prudent to replace them within the quickest practical timescale to minimise the risk of operational downtime which could present both reputational and financial risks.

A further corporate risk is that of 'Civil Emergencies', which is the risk of not being able to respond effectively in the event of a major civil emergency, including a flu pandemic. Having an operational and resilient crematorium is an essential asset where a civil emergency includes the potential for mass fatalities as was sadly the case with COVID-19. Crematorium across the country during the Pandemic, moved on to different operational footing with an increased number of services provided across greater operating hours, including weekends.

9.4 Corporate/Policy Implications

The Worcester City Plan 2022 – 2027 has as one of its priority themes '*A Healthy & Active City*'. Under this theme it states that '*we want our city's residents to have a good start in life, enjoying long, healthy and fulfilling lives, through to a dignified end*'.

Under the '*Enhancing and Sustaining our Beautiful City for Future Generations*' priority theme, the council seeks '*sustainable and sympathetic growth which is in tune with the environment*'. Furthermore, it sets out that the council will '*capitalise in the most positive way on the environmental opportunities and potential within the city*'. It goes on to set out that it aims to '*combat the climate change emergency by leading city-wide measures to reduce carbon emissions*', leading to '*improved air quality through reduction in carbon emissions*'.

9.5 Equality Implications

There are no equality implications associated with this report. Astwood Crematorium and Cemetery will continue to accommodate cremations, burials and services for all communities.

Although this report focusses on the replacement of cremators, it is worth noting that as part of the front of house improvement to the chapel building, a changing places toilet has been identified as being required.

9.6 Human Resources Implications

There are no human resource implications associated with this report.

9.7 Health and Safety Implications

There are no health & safety implications associated with this report.

9.8 Social, Environmental and Economic Implications

Astwood Crematorium plays a vital role in the city and hosts a significant number of families and friends of loved ones who have passed away over the course of a year. Modernising the facility through replacement of its cremators and providing an improved front of house offer, will ensure families can continue to be supported at what is one of the most difficult and sensitive times, encouraging social interaction with the coming together of families and friends to remember their loved ones.

Environmentally, the inclusion of electric cremators and improved thermal efficiency will have significant benefits in respect of lowering emissions, reducing carbon and increasing energy efficiency.

There are no economic implications associated with this report.

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Appendix 1 – 5 Case Business Model Summary for Electric Cremators

BUSINESS CASE THEME	SUMMARY
STRATEGIC	<ul style="list-style-type: none"> • Maintain provision of an important and local sensitive service • Significantly progress the Council’s Environmental Sustainability Strategy and Action Plan • Protect a key income stream for the Council • Safeguards the Council against the potential for carbon taxes etc • Meet future growth of the City, including a growing older population
ECONOMIC	<ul style="list-style-type: none"> • Attracts a Government grant that will make the cost of cremator replacement less than that of gas • Will deliver environmental improvements by way of carbon reduction and NOx reduction • Electric cremator technology has developed significantly in last several years and working effectively across several sites in the UK
COMMERCIAL	<ul style="list-style-type: none"> • Soft market testing has provided reassurance around operational requirements of Council being met • Soft market testing has enabled the Council to construct a procurement tender package that will include an element of negotiation given the technical nature and criticalness of technology • No personnel implications identified
FINANCIAL	<ul style="list-style-type: none"> • Capital costs and revenue impact of cremator replacement identified within this report and supports business case for electric cremators • Will impact Medium Term Financial Plan, but necessary to avoid the total annual loss of surplus from operating Astwood Crematorium • Members have previously indicated support for electric cremators subject to business case • Stakeholder management ongoing
MANAGEMENT	<ul style="list-style-type: none"> • Robust programme and project governance arrangements in place (CLT Sponsored) including oversight by Major Programmes Member Reference Group and Policy & Resources Committee • Specialist Technical Consultancy procured to work on project • Key gateway reports to be presented to Policy & Resources Committee, including benefits to be realised through project • Risk & Issues Schedule being developed, and to be focussed on as part of a dedicated session at Major Programmes Member Reference Group

Appendix 2 – Indicative Capital Programme Comparison

Item / Activity	Estimated Cost Gas	Estimated Cost Electric	Variance
	£	£	
A - Cremator Replacement			
New Cremators Capital Cost	1,600,000	2,000,000	
Automated operating and monitoring	30,000	inc above	
Hydraulic Charging loading table	0	0	
Remains Processing Unit / cremulator	30,000	30,000	
Abatement Plant Gov Directive PG 5/2	145,000	Incl above	
Heat Exchanger	30,000	30,000	
Electricity Upgrade - NG Network	0	350,000	
Floor Strengthening for electric Crems	0	50,000	
Sub Total	1,835,000	2,460,000	
Indexation 3%	55,050	73,800	
Total A	1,890,050	2,533,800	643,750
B - Construction Works			
Back Of House' Works			
Decomissioning existing	25,000	25,000	
Demolitions / alteration	100,000	100,000	
Floor Strengthening for electric Crems	0	0	
Enabling Works for access	35,000	35,000	
Roof alteration to suit Crem extract	50,000	50,000	
Shutter to Crematory Hall	10,000	10,000	
Walls / Partitions / Floors / Walls	75,000	75,000	
MEP Services	400,000	400,000	
Total	695,000	695,000	
Contractors Preliminaries 12%	83,400	83,400	
Total	778,400	778,400	
Contractors OH+P 6%	46,704	46,704	
Sub Total	825,104	825,104	
Indexation 3%	24,753	24,753	
Total B	849,857	849,857	0
C - Fees / Surveys			
Client Side PM	80,000	80,000	
Internal Staff Time	60,000	60,000	
Design Team Fees 10%	100,000	105,000	
QS / PM 6%	60,000	63,000	
External Legal Fee	30,000	30,000	
Council Advice / Opinion on planning	10,000	10,000	
Surveys and Investigations	50,000	50,000	
Asbestos Management	30,000	30,000	
Planning Pre-App	500	500	

Total C	420,500	428,500	8,000
Indexation 3%	0	0	
Summary			
A - Cremator Replacement	1,890,050	2,533,800	
B - Construction Works	849,857	849,857	
C - Fees and Surveys	420,500	428,500	
	3,160,407	3,812,157	651,750
Contingency 20%	632,081	762,431	130,350
Sub Total	3,792,489	4,574,589	782,100
VAT 20%	758,498	914,918	156,420
Grand Total	4,550,986	5,489,506	938,520
Salix Grant	0	1,497,237	
Net GrandTotal	4,550,986	3,992,269	558,717

Appendix 3 – Risk & Issue Schedule

Ref	Risk / Issue	Possible Impact	Mitigation / Control Measures
1	Poor Product Performance & Reliability Particular emphasis on the New Cremators	Significant impact on operations and delivery of service. Cost of downtime and loss of income. Reputational issues.	Engagement with cremator manufacturers and gain as much intel and data on product performance currently and when available. Review performance of product installation, commissioning, operating and after care with other crematoriums. Lessons learnt – from others Establish a clear set out Client Requirements for product and performance for tender stage and consider a set of Key Performance Indicators. Benchmark outputs and performance with other authorities.
2	Timing of the decision on cremator specification and manufacturer and orders being placed. – Things to consider; Particular specification informing design at an early stage,	Delays to design programme & overall delivery programme. Failure to meet Salix Grant drawdown Window. Abortive work as redesign required	Market feedback regarding design, manufacturing and installation periods to inform programme. Tendering and appointing Cremator Manufacturer to embed them in to the design process Build in the Cremator Manufacture design requirements in to Stage 3 End Report. Early commitment to progress with electric cremators following grant award from Salix. Approval to commence a tendering exercise and appointment to inform the Stage 3 Design.
3	Extended period of crematorium 'down time' due to delays in delivery of the works.	Programme delays impacting on crematorium operations and services for residents. Cost and Reputational Risk. Impact on revenue	Clear design and delivery strategy to be implemented setting out phasing and sequencing of works. Regular reporting and updates with supply chain to de-risk delivery including long lead materials / products Temporary arrangements and facilities to be established during 'down time' with sufficient contingency provisions. Regular communication with key stakeholders including Funeral Directors.
4	Electricity supply reinforcement works in National Grid Network. An increased electricity supply will be required for the electric cremators. This will require reinforcement in the network and the enquiry to date indicates accessing apparatus in the highway beneath a railway bridge.	Programme Delays and Budget pressures	Early activity of the design team will be engagement with National Grid. Establish required loadings and check availability of increased power. Obtain updated cost and programme estimate. Engagement with Network Rails will be important to meet their required approval processes.
5	Ring fencing Salix Grant funding and the ability to drawdown funds within the grant claim window of April 25 – March 26	Programme delays impacting on grant drawdown	Through the design process consideration will need to be given to the design and delivery of the works to ensure the related qualifying works can be delivered.

6	Failure to obtain / delay in obtaining Statutory Approvals – Planning Consent, Building Control, Regulatory	Programme / Cost / Reputation	<p>Establish a robust planning strategy including consultation process. Early engagement with planners at the start of the design process.</p> <p>Regular updates and feedback with key officers via the Project Working Group.</p> <p>Seek legal opinion to de-risk objections / challenge</p>
7	Delay to obtaining necessary approvals and decisions.	Delays impacting on programme	<p>Regular reporting and briefing through the agreed governance structure and 'Gateways'. Clear identification of required decisions by whom and by when.</p>
8	Cost Increases to the CDS Feasibility Report.	Pressure on available budget and scope delivery	<p>Early review by the Design Team and Quantity Surveyor of the feasibility work to date.</p> <p>Undertake intrusive surveys and investigation to inform design and costs</p> <p>Continue engaging with the market and supply chain to gather cost & programme data.</p> <p>Progress costed risk and contingency register.</p> <p>Continually test 'Value for Money' through market competition, cost and performance benchmarking and, market intelligence.</p>
9	Design / Scope creep	Budget pressures that could lead to scope reduction.	<p>Establish a clear set of project deliverables for both the Front of House and Back of House works.</p> <p>Implement a robust design management process to ensure design is coordinated and progressing against an agreed budget.</p> <p>Implement a strict Change Control process with clear decision timelines.</p>
10	Costs of electric cremators and associated works increases significantly from the CDS estimates due to cost inflation	Cost increases which may see budget pressures.	<p>Early market intelligence to inform budget update reports.</p> <p>Regular budget and cost reporting to identify budget pressures and inform decision making.</p>
11	Delays in preparing the procurement specification due to the complexity of the technology	Project costs not incurred by the funding deadline of 31 March 2026	<p>Have allowed a full 'planning year'; engagement with other LAs who have already procured and installed electric cremators; early engagement with the Procurement team; consider commissioning external support from CDS or other consultant</p>
12	Delays in essential electrical supply upgrade works being undertaken by National Grid (DNO)	Project delay	<p>Identify where there may be issues within the National Grid programme and allow for this. Early task of the appointed Mechanical and Electrical engineer to progress with NG.</p>
13	Inability to secure alternative cremation / memorial services arrangements during essential works down time	Unhappy customers leading to reputation issue in short, medium and long term. Loss of revenue	<p>Temporary Arrangements strategy to be developed in consultation with legal services and procurement to ensure all compliant.</p>
14	Installation unable to take place according to programme plan due to delays in closing the Crematorium and providing alternative crematorium services for local residents	Project delay	<p>Contingencies built into the programme; external project manager with experience of large capital projects to be used</p>
15	Poor performance by contractor on installation	Programme delays	<p>Works to be carefully project managed</p>

16	Poor condition of emitter system & pipework	Delay in programme. Impact on budget	Work with installer to design pipework from cremator heat exchanger to secondary heat exchanger
17	Unforeseen electrical work required	Delay in programme. Impact on budget	New connection has been requested and new distribution boards costed in by the consultants
18	Asbestos discovered during work	Delay in programme. Impact on budget	RAD (Refurbishment and Demolition) Survey to be undertaken and potential works and scoped.
19	Impact from noise between 'back' and 'front' of house	Impact on services. Unhappy customers. Reputational issues	Acoustic surveys and consideration of specification and workmanship monitoring.
20	Negative press, particularly around the use of the heat exchanger to use waste heat from the cremators to heat the Chapel and other areas of the building	Loss of confidence from users and poor publicity; increased officer time to respond to and alleviate concerns; increased member involvement	Careful stakeholder engagement and early involvement of Communications team on the messages
21	Issues arising during the design, preparation and delivery of the works.	Negative customer experiences. Reputational issues.	Site Constraints document to pass to the appointed Project Manager identifying any specific / sensitive areas and site rules.