

## Lancaster City Council | Report Cover Sheet

<b>Meeting</b>	Cabinet	<b>Date</b>	26 October 2021
<b>Title</b>	Boiler replacement - City Museum, incorporating Lancaster Library		
<b>Report of</b>	Director for Economic Growth and Regeneration		
<b>Purpose of Report</b>			
To request funding be released from the capital budget in order to deliver a joint project between Lancaster City Council and Lancashire County Council that will see the replacement of essential boiler plant and equipment, housed in the City Museum but serving both this site and Lancaster Library.			
<b>Key Decision (Y/N)</b>	<b>N</b>	<b>Date of Notice</b>	<b>N/A</b>
<b>Exempt (Y/N)</b>	<b>N</b>		

### Report Summary

The report will provide background, investigations carried out in relation to meeting the climate change agenda, financial breakdown and recommendations.

### Recommendations of Councillors

To release the capital budget in order for the essential boiler plant to be replaced, before equipment failure occurs.

### Relationship to Policy Framework

### Conclusion of Impact Assessment(s) where applicable

<b>Climate</b> Investigations into green alternatives were carried out, followed by more in-depth investigations into air source heat pumps. We discovered that options were limited due to the historic nature of the building, its' location and the heat demand placed on the system.	<b>Wellbeing &amp; Social Value</b>
<b>Digital</b>	<b>Health &amp; Safety</b> The project and associated costs include the removal of asbestos where possible and encapsulation where this is not possible, making the building safer and easier to manage.
<b>Equality</b>	<b>Community Safety</b>

### Details of Consultation

Climate Officers; Energy Council (external consultant); e-On (external consultant); Lancashire County Council mechanical and electrical engineers; City Council finance, procurement, museums and legal officers have all been involved in the consultation.

### Legal Implications

As this is a joint project between Lancaster City Council and Lancashire County Council, there is an agreement in place relating to the split of project costs and ongoing maintenance. Energy bills will be separate for each site.

#### **Financial Implications**

The Capital Programme agreed by Council on 24 February 2021 included provision of £127,000 in 2021/22 in respect of this project. Cabinet subsequently agreed at their meeting on 8 June 2021 to re-allocate £22,000 to works on Palatine Recreation Ground Pavilion leaving an allocation of £105,000 available for the City Council's share of the boiler project. As the City Council is acting as project lead the Capital Programme will be grossed up to reflect Lancashire County Council's contribution toward the full cost of the project following the outcome of the current decision.

#### **Other Resource or Risk Implications**

None.

#### **Section 151 Officer's Comments**

The s151 Officer has been consulted and has no additional comments to add to those

#### **Monitoring Officer's Comments**

The Monitoring Officer has been consulted and has no further comments to add

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#### **Links to Background Papers**

## **Report**

### **1.0 Background Information**

- 1.1 The boiler, housed in the City Museum basement, services both the Museum and Lancaster Library. This is because the two buildings were originally joined.
- 1.2 Investigations were carried out to establish the feasibility of having two plant rooms; the existing in the City Museum, and a new one to supply the Library. This was dismissed for two reasons:
  - The changes may have involved significant alterations to the building fabric in both the Museum and Library. This would have been very costly and difficult given the listed status of both buildings.
  - It is more cost effective for both parties to work from one plant room, and technology allows us to effectively split the feeds to each site meaning they can operate independently (i.e., one building can be being heated whilst the other is switched off).
- 1.3 The boiler and associated plant was identified as a category D (lowest condition quality) on the 2012 condition survey, meaning it was at the end of its serviceable life and required planned replacement. It is unknown why the project was not planned in at that point; however, since changes in the Facilities Management team in 2016 we

have been seeking to reach an agreement with Lancashire County Council on how to arrange works and split costs.

## **2.0 Climate Change agenda**

- 2.1 Given the Council priority to reach net carbon zero by 2030, detailed feasibility work on alternative heating options for these buildings was commissioned from the Energy Council (report attached)
- 2.2 The City Museum (in combination with Lancaster Library) is 10th on the list of the Councils CO<sub>2</sub> emitting buildings, with 83 tonnes/ yr.
- 2.3 Their conclusion, in brief, was that a like for like replacement would be the most realistic option both in terms of cost, installation and maintenance. At this point air source heat pumps, ground source heat pumps and biomass boilers were discounted based on the costs to install and maintain (life cycle cost analysis also circulated with this report); the requirement of a gas boiler in addition to cope with peaks in demand on the heating; and the difficulties in preserving the historic nature of the buildings with the size of equipment required.
- 2.4 They also highlighted that an improvement in CO<sub>2</sub> emissions was still achievable even with the like for like replacement option:  
“Replace the existing boiler with a complementary gas-fired boiler installation to provide a reliable heating system. The existing boilers, due to deterioration of performance over time and the 30-year-old technology being inherently less energy efficient, will have a seasonal efficiency rating of about 60% (SAP 2012 version 9.92, Table 4b). When compared to new boiler plant, which will have a seasonal efficiency of circa 95%, there will be a 35% improvement in energy consumption and therefore CO<sub>2</sub> emissions for heating the 2 buildings.”
- 2.5 In order to test this further an opinion was sought from another expert source (e-On). They were asked to consider and report on decarbonisation solutions and the Public Sector Decarbonisation Scheme (PSDS) route. They considered air source heat pumps were technically feasible...although it would still require the installation of gas boilers to meet the demands at peak times. However, further practical work would need to take place to confirm this.
- 2.6 Officers consulted with the lead mechanical and electrical engineer at Lancashire County Council on the proposal that e-On put forward for air source heat pumps. Following a number of meetings and deeper analysis of the schematics, all parties agreed (City and County Councils, and e-On) that air source heat pumps were not realistic at this time and that the air source heat pump technology requires a further advancement in order to cope with buildings of the museums age and nature.
- 2.7 The boiler replacement schematic could, however, be altered to include valves that would allow the introduction of air source heat pumps at a later date, once further technological advancements have been made.

## **3.0 Proposal Details**

- 3.1 It is proposed that £105k in the allocated capital budget (“Lancaster City Museum Boiler”) is released and used to complete the project.

- 3.2 The work has been provisionally costed. Financially, we would receive all invoices for the project (as project leads) and then invoice Lancashire County Council for their proportion.
- 3.3 The cost of the project is split between Lancaster City Council (City Museum) and Lancashire County Council (Lancaster Library) based on 42% / 58% respectively. This has been calculated based on the gross internal area (GIA) of each site.
- 3.4 The allocated budget allows for costs of work (including some asbestos related work), professional fees and a contingency amount. This level of contingency is necessary due to:
- the asbestos issues;
  - age of the existing equipment;
  - complexities of working within a listed building;
  - possibility of some COVID measures still being required at the time the work is complete;
  - account for the fact that the current construction prices are higher than we have experienced in the past; and
  - to allow for additional valves to be put in place so that air source heat pumps may be added at a later date (see section 4, option 2).
- 3.5 The asbestos removal/encapsulation work in the boiler room and surrounding area will be captured in the project and split as per the agreed percentages; however, there are other areas in the basement of the City Museum where asbestos is needed to take place at the same time. Doing it at the same time is safer and there is an economy of scale. This additional work would be solely costed to us, i.e., not split as it is not directly related to the boiler replacement work. This has been taken into account in the request for budget.
- 3.6 Summary of estimated project costs/justification for amount requested:

<b>Task</b>	<b>Total Estimated Amount</b>	<b>City Council proportion (42% unless stated)</b>
Boiler costs	£86,500	£36,330
Project costs (prelims, temporary heating plant, asbestos and other H&S work, building work, strip out old equipment)	£43,500	£18,270
12% professional fees	£15,600	£6,552
Asbestos works required but not included in boiler replacement project	£7,000	£7,000 (100%)
Contingency at 20%	£26,000	£10,920
<b>Total</b>	<b>£178,600</b>	<b>£79,072</b>

- 3.7 Going forward, a single gas bill will be received but newly installed heat meters for each site will allow us to split the bill accurately according to usage. Therefore, each site will only pay for what it uses. Currently, there is an arbitrary 50/50 split which does not reflect consumption.
- 3.8 Due to new technology (more efficient boilers, working and well-placed thermostats,

and heat meters) we anticipate a saving in gas utility bills for the City Museum. This saving is estimated to be 10% on current spending and based on 2019/20 outturn this would be £1400 per annum.

- 3.9 Ongoing servicing and maintenance costs will also be split on the same percentages (42% City/58% County), which is an improvement for us on the existing arrangement of 50/50.

#### 4.0 Options and Options Analysis (including risk assessment)

In support of the proposal the Options considered are as follows:

	<b>Option 1: Do nothing/wait for air source heat pump technology to advance</b>	<b>Option 2: Replace the gas boilers on a like for like basis but ensure mechanisms are in place to install air source heat pumps at a later date</b>	<b>Option 3: Carry out a like for like replacement of the gas boilers</b>
Advantages	<p>The council does not spend the allocation of capital funds requested.</p> <p>It could lead to complete decarbonisation and potentially avoid any modifications or removal of newly installed gas heating systems further down the line.</p>	<p>The City Museum asset is protected, as is the County's asset.</p> <p>Reduced gas consumption and cost savings (gas and maintenance).</p> <p>Better working environment for staff.</p> <p>Better control over the environment for the benefit of the collections.</p> <p>The work is planned so costs associated with it can be known in advance.</p> <p>Costs can be split out accurately going forward.</p> <p>As air source heat pump technology evolves, we will be in a position to install retrospectively and realise the benefits associated with this.</p>	<p>The City Museum asset is protected, as is the County's asset.</p> <p>Reduced gas consumption and cost savings (gas and maintenance).</p> <p>Better working environment for staff.</p> <p>Better control over the environment for the benefit of the collections.</p> <p>The work is planned so costs associated with it can be known in advance.</p> <p>Costs can be split out accurately going forward.</p> <p>No changes are required to the existing scheme.</p>
Disadvantages	<p>The boiler plant will fail (become unrepairable), at which point emergency, temporary heating will need to be installed for both sites until a permanent replacement is organised. This will be a more costly option than the planned replacement.</p> <p>The current lack of accurate heating control is creating an</p>	<p>The Council will need to expend the requested capital funds this financial year.</p> <p>The changes required to ensure air source heat pumps can be added on to the system at a later date will mean a scheme revision and small additional costs.</p>	<p>The Council will need to expend the requested capital funds this financial year.</p>

	<p>uncomfortable working environment for staff.</p> <p>Loss of heating and/or the installation of temporary heating could cause damage to the Museums collections.</p> <p>Asbestos work would still be required imminently, whether the boiler replacement goes ahead or not.</p>		
Risks	<p>Loss of heating and potential damage to collections could result in a reduction of visitor numbers or force a temporary closure of the Museum.</p> <p>If our lack of action impacts the Library as well as our own site, there could be significant reputational damage.</p>	None.	This makes no allowance or acknowledgement towards the City Councils net zero ambitions.

## 5.0 Officer Preferred Option (and comments)

5.1 Facilities Management preferred option is Option 2. The condition of the boilers has been of concern for a number of years and we have put considerable time and effort in to ensuring they continue to function. However, they are inefficient and there is a real risk that they will become unrepairable, leaving both the City Museum and Lancaster Library at risk. With option 2, we remain open to introducing green alternatives at a time when the technology has evolved adequately enough.