

## HALLS, CEMETERIES & ALLOTMENTS COMMITTEE

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**Date:** Monday, 23 May 2022

**Title:** Burwell Hall - Heating System

**Contact Officer:** Project Officer - Nicky Cayley

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### **Background**

Officers were tasked with looking into a replacement for the existing boiler at Burwell Hall, which is now at the end of its life as replacement parts are not available.

In line with the Council's declaration of a climate emergency and aspiration to achieve carbon neutrality by 2028, a feasibility study into green energy options was commissioned from the non-profit making organisation, ESOx.

### **Current Situation**

The feasibility study is attached to the report for members information. It is clear that in the short term there are some practical and relatively inexpensive steps that could be taken to improve energy usage at Burwell Hall – such as better insulation and better timing of the heating and hot water system.

Members should note the Parks & Recreation Committee appointed Ridge & Partners to undertake a feasibility study for an extension to the Changing Rooms at Burwell Hall at its meeting on 16<sup>th</sup> May. The two projects will run in conjunction.

### **Ground Source**

In terms of a replacement heating and hot water system, the feasibility study from ESOx recommends the option of a Ground Source Heat Pump.

A ground source heat pump system harnesses the natural heat from underground. Thermal transfer fluid (TTF), a mixture of water and antifreeze flows around a loop of pipe, buried in outdoor space. This loop can either be a long or coiled pipe buried in trenches, or a long loop (called a 'probe') inserted into a borehole. The heat pump increases the temperature, and the heat is used to provide hot water and heating. It needs electricity to run but the idea is that it uses less electrical energy than the heat it produces. The pump is essentially performing the same role as a boiler but uses the ambient heat from the ground rather than burning gas.

With the decarbonisation of the grid, and the fact that the Council's electricity comes from 100% renewable sources (wind, solar, biomass and hydro), a ground source heat pump would be an environmentally sound choice. The Project Officer has obtained a quote for this as attached.

Members should note that this option would be disruptive in terms of hall usage as new radiators would be required throughout the building. If additional changing rooms are added on to the building, the ground source heat pump would be adequate for the additional water and heating requirements.

A Ground source heat pump will need annual servicing and can be expected to last for 25 or 30 years.

The Burwell Hall site is unique in the Council's estate as it is ideal for the siting of a ground source heat pump as it is surrounded by green space.

### **Air Source**

The ESOx report also details an Air Source Heat pump as an option, but Officers have serious reservations about this option. Burwell Hall does suffer vandalism, with people climbing onto the roof and causing damage to the tiles. If an air source unit was mounted on the rear of the hall it would seem very vulnerable to being damaged. The Council would also require planning permission for this option as the hall is not residential. The other negative for air source is that whereas the ground temperature for a ground source pump remains the same year-round (around 10° c), the air temperature can fluctuate significantly in the UK. When it's cold outside the pump has to work significantly harder, meaning it is less energy efficient. A quote has been obtained for the Committee's information.

### **Fuel Cell CHP Boiler**

An option not listed in the ESOx feasibility study is a Fuel Cell CHP boiler. Officers have researched this option further as it is fairly new to the market in the UK. Fuel cell CHP technology generates electricity by taking energy from fuel at a chemical level rather than burning it. It uses a steam reformer to convert methane in the gas supply into carbon dioxide and hydrogen. The hydrogen then reacts with oxygen in the fuel cell to produce electricity. The waste heat in the process is used to heat water. There is no requirement to change the radiators in the hall with this option, so it is significantly less expensive and intrusive. The installation would take around 5 days. The installer has also confirmed that it would be suitable to provide required heat and hot water to any changing room extension. It would reduce the Council's carbon footprint, particularly as the Council's gas supply is 100% green gas, created from waste via anaerobic digestion. The life span of the boiler is around 10 years and would need yearly servicing from the manufacturer. A quote is attached for members' information.

## **Additional options**

In addition to replacing the existing boiler, the Council should consider implementing some easy low costs initiatives such as better insulation to the ceiling, and better scheduling of the heating and hot water provision as detailed in the ESOx report. The heating and hot water should not be running at full capacity when the hall is empty.

Solar panels could be added at a later stage to generate electricity but, like the air source, run the risk of vandalism at Burwell Hall.

## **Environmental impact**

Having declared a Climate Change Emergency at its Council meeting on 26 June 2019 – with this in mind Councillors should have due regard to the environmental impact of any decisions they make with regard to its facilities and services it operates.

All of the options given in this report will improve the Council’s carbon footprint. Better use of timed heating and hot water will also reduce energy use.

Attached to this report is a Carbon Reduction Recommendations Report (provided at no cost to the Council via ESOx). Page 2 details the opportunities for Carbon reduction in Burwell Hall. The Fuel Cell CHP Boiler is not included in this as it is not something that ESOx deals with.

## **Risk**

In decision making Councillors should give consideration to any risks to the Council and any action it can take to limit or negate its liability.

The risk associated with this project is that if the existing boiler should fail before a new system has been chosen and implemented, the building would have no heat or hot water. There is no indication of this happening at the moment of writing.

Officers have ensured that when a changing room extension goes ahead, the new systems suggested will be able to provide the heat and electricity required. This has been based on a “mirror image” of the existing provision.

## **Financial implications**

The financial implications are as follows:-

- The Council holds an EMR (372) of £30,000 towards this project
- Within the 2022/23 budget, the Council holds a further £20,000 for energy efficiency improvements in its buildings (4918/800)
- Ground Source Heat Pump - £49, 985.96 (no requirement to add VAT)
- Fuel Cell CHP Boiler - £18, 100.00 (no requirement to add VAT)

It appears that the Council would be eligible to apply for funding from the FCC Communities Foundation (formerly WREN) as it is within 10 miles of a landfill site (Dix Pit in Standlake) – however this does require third party funding (page 5 in the Carbon Reduction Recommendations Report).

The Salix Phase 3 Public Sector Low Carbon Skills Fund is also due to reopen this year but there are no details available on what this may cover as yet (page 5 in the Carbon Reduction Recommendations Report).

### **Recommendations**

Members are invited to note the report and consider the following:

1. Which option the Council prefers – Ground Source Heat Pump or Fuel Cell CHP Boiler
2. If the Ground Source Heat Pump is the preferred option, the current budget will not cover the costs and currently there are no grant schemes open for energy improvements. Members could choose to defer the installation and budget the additional funding for 2023/24.
3. If the Fuel Cell CHP boiler is the preferred option, would the Committee like to progress this project or await the planned feasibility study for the changing room extension?