

HALLS, CEMETERIES & ALLOTMENTS COMMITTEE

Date: Monday, 13 March 2023
Title: Burwell Hall Heating System
Contact Officer: Project Officer - Nicky Cayley

Background

At the Full Council meeting of 13 February, the Operations Manager requested that the Council looks again at the possibility of installing a CHP boiler at Burwell Hall. Previously at the Policy, Governance & Finance Committee meeting held on 21 November 2022, the Council agreed to go ahead with replacing the current boiler with a new, efficient gas boiler, rather than the CHP boiler previously considered due to concerns about the life of the current boiler and unknown reliability of CHP.

Two contractors provided quotes, and both have indicated a new water storage heater would also be required. Therefore, the cost of a new gas boiler and water heater is effectively the same cost of the CHP boiler, approximately £20,000 and may be slightly more. As the boiler appears to be working effectively and potentially the worst of the winter is over, the Operations Manager would like to re-visit CHP boilers before anything is ordered with the agreement of the Council.

Please note, under Standing Order 23(a) a previous resolution can only be rescinded within six months by a motion moved in pursuance of the above recommendation.

Current Situation

The Project Officer has carried out further research on the Micro Fuel Cell CHP boiler in order for the Committee to make a fully informed and final recommendation to Council.

How the Micro Fuel Cell CHP Boiler Works and Carbon Reduction

The Micro Fuel Cell CHP boiler (the Vitovalor in this case) works by using natural gas from the grid. There are ways that natural gas can be more environmentally friendly though, as the Vitovalor will replace a low-efficiency heating and hot water system it will reduce consumption. Vitovalor produces electricity at a higher efficiency than a traditional gas-fired power station and does that as a by-product of heating the property. These gas-fired power stations produce the equivalent of 500-900 grams of co2 per kWh they produce. The Vitovalor produces only 220g Co2 per kWh. Until these gas power stations are all shut down the Vitovalor will save the planet at least 280g of co2 for every kWh it produces.

The Vitovalor is highly optimised so will run at 85% net total efficiency for heat and hot water as well as producing up to 6000kw/h of local generated electricity per year on top.

The Vitovalor works by taking the natural gas and splitting it into hydrogen and carbon dioxide molecules. The hydrogen reacts with oxygen in the fuel cell and this chemical reaction produces electricity. Waste heat is created during this process which is used within the hot water heating system. The chemical reaction is far more energy efficient than burning natural gas and the waste it produces is used rather than lost. The fact that it uses a chemical reaction also causes less pollution than combustion (burning gas).

Control of the system

The Vitovalor PT2 model offers a touch screen control which is very user friendly. Additionally, the unit has an online portal and can be controlled by an app called ViCare which the installer will help set up after the installation. This also has the generation of power on graphs and the gas usage so it can be analysed post installation.

In summary

The Micro Fuel Cell CHP boiler is the greenest option if the Council is not going to install a Ground Source Heat Pump (previously considered but the cost is prohibitive). It is a slightly riskier and more expensive option than installing a new gas boiler and water heater, but the carbon reduction benefit is substantial, especially if the Town Council is to achieve its aim of carbon neutrality by 2028.

An information sheet is attached to this report. Please note that it refers to household – as a small community hall (rather than a large building such as a school or hospital), the installers have recommended the Vitovalor PT2 as the appropriate unit.

As spring approaches, in theory the current boiler is under less pressure, but the last service indicated that it is badly corroded inside and should be replaced as soon as possible.

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.

The chemical reaction that takes in the Fuel Cell CHP boiler is far more energy efficient than burning natural gas and the waste it produces is used rather than lost. The fact that it uses a chemical reaction also causes less pollution than combustion (burning gas).

As the Town Council has a green gas contract, which uses sources such as anaerobic digestion, the carbon footprint should be reduced to almost nothing.

There are still further energy reduction measures which could be considered at Burwell Hall, including insulating the building – this can happen regardless of which scheme is supported.

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 if this option is taken is that the technology is still fairly new (at least to the UK market) and the lifeline of the unit beyond 10 years is not guaranteed.

Members should note that the hall will be out of use for around a week to accommodate the installation. There would also be disruption if a regular gas boiler and water heater were to be installed.

Financial implications

The cost of the unit and installation is £19,000 (no VAT on this). The costs of a new gas boiler and water heater is £16,993.56 excluding VAT. Both are under budget (£30,000).

Member should note that gas is cheaper than electricity so if the Vitovalor is using gas to produce electricity, there will be a financial benefit. The gas consumption will obviously increase – and this is estimated to be 6 – 8% more costly than if a new gas boiler is installed. The information from the ESOx Feasibility Report commissioned last year suggests that the hall's annual electricity usage is 10130kWh so the Vitovalor should cut the electricity usage from the grid significantly.

Viessmann have a service plan which is around £150 per year, the cell will need a major service on year 5 which is around £600 and there is an optional overhaul on year 9/10 for about £1,000 which restores the output to "as new". They also have a callout built into the warranty which is free as long as the maintenance is kept up.

There are no current grant schemes available to facilitate a Ground Source Heat Pump.

Recommendations

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

1. Whether to proceed with the Micro Fuel Cell CHP boiler or;
2. Whether to proceed with a new gas boiler and water heater.

Officers will progress this as soon as Council has ratified the Committee's recommendation.