Energy Audit – Malmesbury Town Hall

Author	Reviewer	Date	Version
Nathan Tonkin	Adrian Newton	12/04/2022	1.0

ESOS-ENERGY
Energy efficient solutions

Contents

1 Malmesbury Town Hall

1.1 General description of site

Malmesbury Town Hall is a Grade-II listed building located in the heart of the historic town of Malmesbury. It serves the community with a range of events, information, a bustling café, and is the base of operations for the elected councilors and town clerk. There is a museum of local history, the café mentioned above, space for an art gallery of local artists, a local information centre, a theatre which shows films once or twice a week, and other function rooms.

The visitors centre and museum serve around 1000 visitors a month but those numbers have seen significant change with the COVID-19 pandemic. As mentioned above, the theatre shows films once or twice a week, which see huge variation in attendees. This space has a capacity of 120 but rarely caters for this number. The town hall caters for a variety of functions, from weekly exercise classes, to large weddings. The café is rented out by the council and sees visitors in the range of 50-75 people a day.

The initial construction was first built in the late 18th century as a brewery malting house, with later extensions in 1846/7 and 1886 for a market house and chapel respectively. These historic constructions remained until 1927 when the current owners, the borough council, installed a new frontage on the south east side of the building. They subsequently built a 'central core' in 1970, with both sections matching the style of the existing construction. In 2006 the town hall was purchased by the town council and underwent significant internal renovations, with an additional extension built at the rear of the building.

Today, the church sees an increasing appetite from its members to address sustainability, which is becoming more prevalent as the Government moves towards its net zero carbon target.

Figure 1: Aerial view of Malmesbury Town Council, showing pitched tiled rooves

Figure 2: Google Streetview of Malmesbury Town Council entrance

Figure 3: External shot looking at the building from the east side

Figure 4: External shot looking at the building from the west side

1.2 Summary of carbon reduction opportunities

Opportunity	Forecast kWh saving	Forecast tCO_2 saving	Estimated financial saving (£)	Estimated cost of works	Simple payback (years)
Begin training and management on heating controls	6,880	1.3	£144	£500	3.5
Insulate exposed pipework and fittings in plantroom	3,401	0.6	£71	£982	13.7
Add or replace draught strips to external doors	4,815	0.9	£101	£1,200	11.9
Install weather compensator controls to the BMS	16,099	3.0	£338	£2,500	7.4
Upgrade or retrofit the windows with double glazing	75,671	13.9	£1,589	£70,211	44.2
Replace all remaining light fittings with LED replacements	12,269	1.0	£1,872	£12,872	6.9
Install roof insulation in areas with exposed beams	7,041	1.3	£148	£5,400	36.5
Consider installing a 22kW solar pv system on south facing roof	18,239	1.4	£2,783	£18,150	6.5
Consider replacing the existing kitchen appliances with electric replacements	2,557	0.5	£54	£10,000	186.2
Consider replacing boilers with Air Source Heat Pumps	47,102	12.7	-£3,438	£170,508	N/A
Consider replacing hot water system with Air Source Heat Pumps	31,401	8.5	-£2,292	£62,731	N/A

Table 1: Summary of all carbon reduction opportunities

2 Energy Audit

2.1 Overview

2.1.1 Auditor & Disclaimer

The audit was conducted by Nathan Tonkin of ESOS Energy. All efforts were made to gather relevant and accurate information at the time but as with any non-intrusive report, the client should take efforts to ensure the accuracy and applicability of any suggestions and recommendation.

2.1.2 Conditions of our visit

We visited with external temperatures of 10^{O}C and light wind on April 7th 2022. The town hall was not hosting any functions but the café was open and around 60-80% full.

2.1.3 Energy Use

Usage for March 2021 to February 2022 for the site was:

- 251,041 kWh of gas
- 64,756 kWh of electricity

2.1.4 Energy Profiles

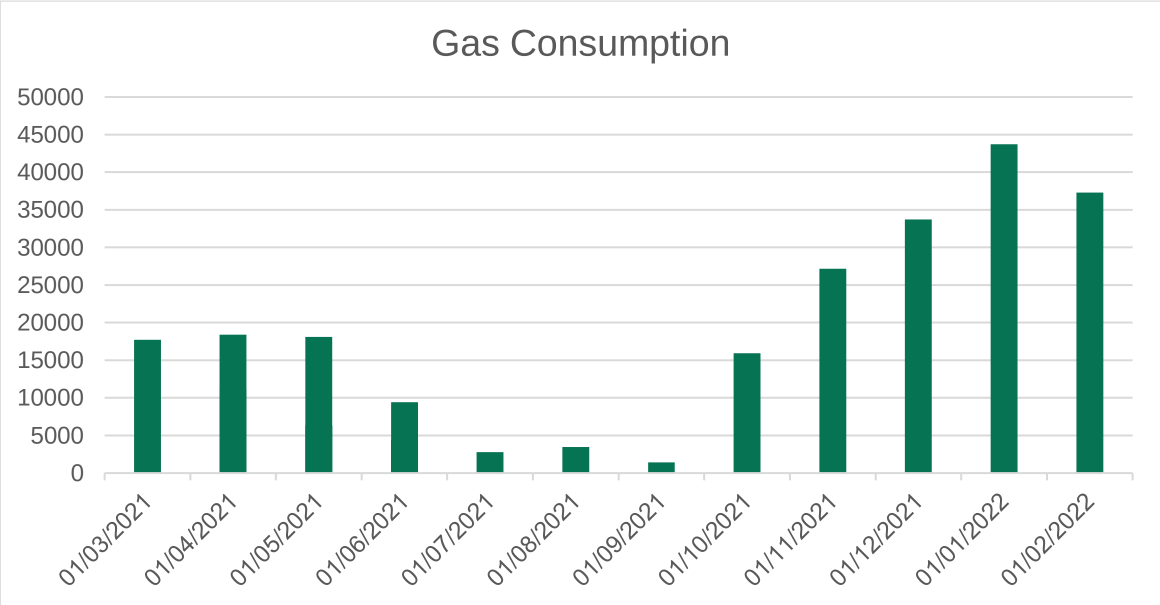


Figure 5: Gas Consumption/kWh, Mar 21 to Feb 22

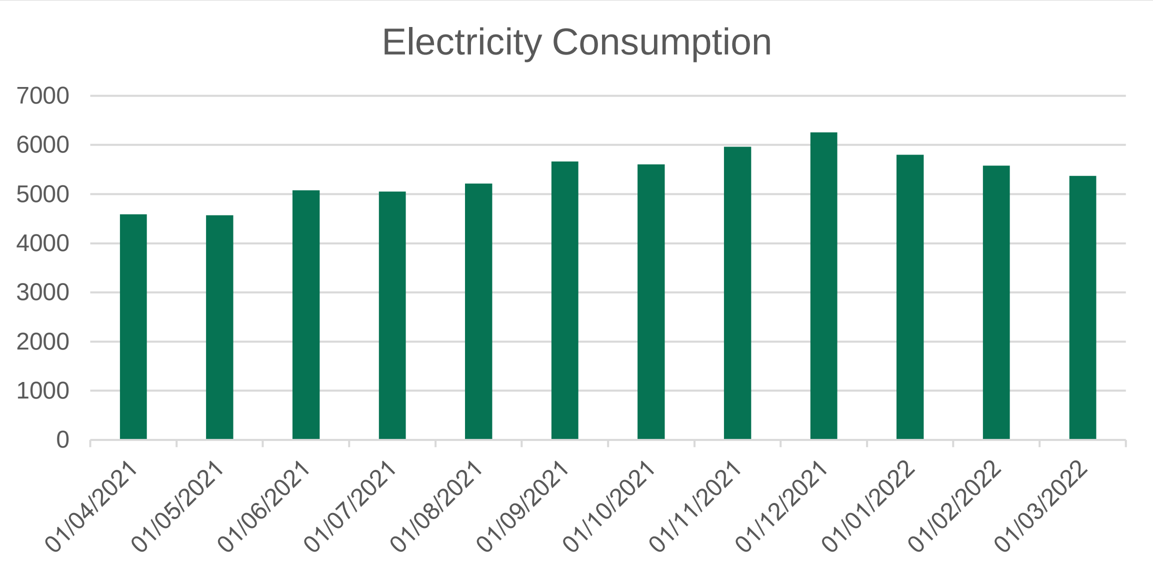


Figure 6: Gas Consumption/kWh, Apr 21 to Mar 22

Patterns of usage above show expected variation for a town hall:

- Peak gas needs November to April, when the heating system is on. Dips in heating needs in June/July/August (summer)
- Electricity profile shows a consistent demand with minor seasonal variation over winter months as lights are left on longer

2.1.5 Utility Cost Split

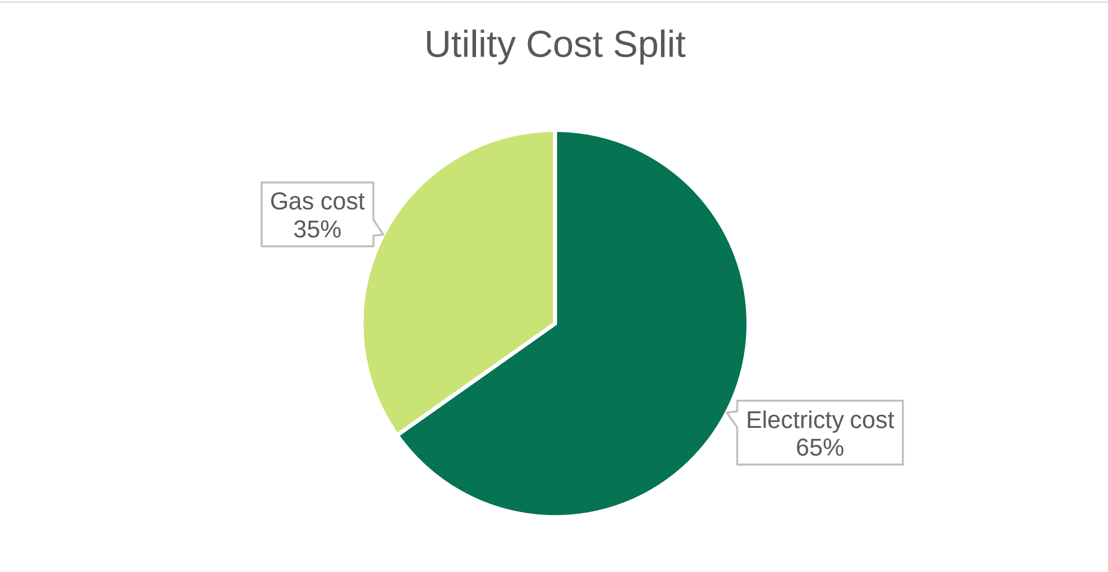


Figure 7: Utility cost split for gas and electricity

From above, electricity consumption only covers around 20% but makes up 65% of total spend.

2.1.6 Energy Benchmarking

The annual energy usage has been examined against the industry benchmark for Town Hall (which are included under the 'General Office' category) from CIBSE TM46:2008. It should be noted that these benchmarks make use of data from 2004 and that the parameters the benchmarks are based upon, such as occupancy hours, could provide wide ranging variations.

	Size (m^2 GIA)	Annual Energy Usage	Actual kWh/m^2	Benchmark kWh/m^2	Variance from Benchmark
Malmesbury Town Council (electricity)	1,690	64,756	38.32	95.00	-59.7%
Malmesbury Town Council (heating fuel)	1,690	251,041	148.55	120.00	23.8%
Total	1,690	315,797	186.87	215.00	-13.1%

Table 2: Energy benchmark comparison

The benchmark is based on:

- Usage times: Weekdays and evenings
- Building features: Offices, function rooms
- Services included Heating, lighting, cooling, office equipment

Malmesbury Town Council usage against the benchmark is generally good, consuming 13% less than expected.

The electricity consumption levels appear very efficient, but as the benchmark is based off a General Office this may assume a high volume of IT equipment that is not found in a town hall. Heating fuel is slightly above average, but could be due to a higher volume of visitors than is expected for an office. The town hall is also open for theatre viewings late into the evening which will account for some additional heating demand.

2.2 Whole Site Issues

2.2.1 Operating Hours

The town hall is opened at 08:30 in the morning by maintenance staff. Office operating hours are 09:00 – 17:00 Monday to Thursday and 09:00 – 16:30 on Fridays. The theatre usually runs from the afternoon into late evening when showing are on. The site heating runs depending on a set programmed schedule with little monitoring or amendments. This is updated during regular maintenance checks.

2.2.2 Access

The site has good pedestrian access to the south side and is across the road from an easily accessible car park.

2.2.3 Current and previous decarbonisation actions

- Lighting has been upgraded to LEDs in some areas
- PIR movement sensors for the lighting have been installed in toilets
- Double glazing windows and doors installed in modern extension

2.3 Main Building

The DEC for this building shows a lower electricity usage per m^2 compared to a higher gas usage, with an overperformance (C/54 vs 100) compared to the reference set. Gas is also responsible for around two thirds of the carbon emissions, with electricity making up the remaining third.

2.3.1 Building Energy Use and Management

2.3.1.1 Heating:

Generation: 2 x Rehema Quinta condensing gas boilers serve the building. They are approximately 14 years old, and are about 5-8 years away from their 'end-of-life' in terms of the need to replace them due to likelihood of failure and age.

Figure 8: 2x boilers serving the building

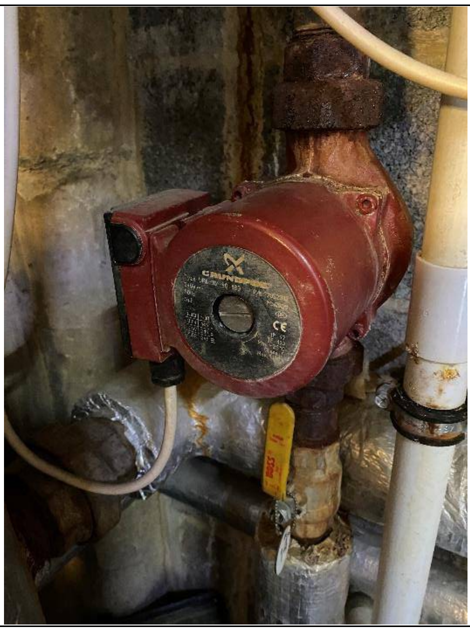


Figure 9: Unlagged Pumps

2.3.1.2 Distribution:

4x Grundfos pumps distribute heating through a LTHW system to the rest of the building. The pumps in the boiler room are unlagged and were recorded using a thermal gun at surface temperatures of ca. 68^{O}C (see Figure 10). Other pipework was insulated but requires valve and flange jackets. There are separate distribution pipes and pumps for the two heating and hot water systems.


Figure 10: Unlagged pipework

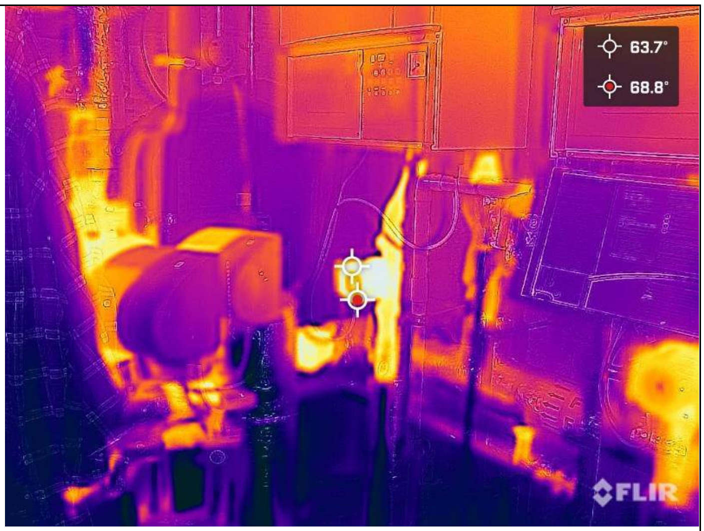


Figure 11: Thermal image of uninsulated pipework

The building is served by wall mounted radiators. These have individual thermostatic valves which are monitored and switched off when not required.


Figure 12: Example of wall mounted hot water radiator


Figure 13: Thermostatic radiator valve

2.3.1.3 Control:

Heating delivery is controlled by a Honeywell controller in the plant room which is updated during general maintenance. These controls should be monitored by on site staff so occupancy can be matched with boiler output more accurately.

Figure 14: Honeywell heating controls

2.3.1.4 Domestic Hot Water:

This is provided through taps across the building, across the multiple kitchens, toilets, and office sinks. It is heated through the main boilers and stored in an 250L MegaFlo CL250HE electric immersion heater with 200L Zilmet expansion tank.

Figure 15: MegaFlo CL250HE electric immersion heater

Figure 16: Zilmet expansion tank

2.3.2 Fabric:

2.3.2.1 Walls:

Understood to be original, solid brick in the areas built historically. There is no solid wall insulation, but due to nature and Grade-II listing this is expected. In the modern extension, the walls are rendered brick with a cavity.

2.3.2.2 Roof:

In all areas apart from the modern extension, they are pitched tiled rooves which have no insulation. Some areas have the original timberwork exposed and therefore the roof serves as the ceiling. This has poor insulation and will contribute to these areas losing a high quantity of heat. While on site, the roof was recorded having a lower temperature than the external air temperature. The small roof area covered in the modern extension is steel cladding.

Figure 17: Example of exposed timberwork

Figure 18: IR photo showing the lack of insulation in roof

2.3.2.3 Floor:

The ground floor has stone floors with a vinyl render. The majority of these were refurbished in 2006 so in good condition. On the first floor they are constructed of timber.

2.3.2.4 Glazing:

Most external windows are single glazed, metal frame in areas of original construction. A handful have had additional double-glazed frames built on the interior to reduce heat loss, without affecting the exterior appearance. Others, such as seen at the entrance to the building have been upgraded to double glazing. All windows and doors in the modern 2006 extension are double glazed as per the building regulations of the time.

Figure 19: Typical glazing across building

Figure 20: Example of retrofit double-glazed interior windows to reduce heat loss

Figure 21: Close-up showing single glazed pane

Figure 22: IR photo showing heat loss through a single glazed window in The Old School Room

2.3.3 Lighting:

Provided by 50% LED lights upgraded in the refurbishment or by recent installs, and by some natural light from windows. PIR movement controls are installed in toilets, all other rooms are controlled manually.

There are still some significant areas still covered by halogen or tungsten filament bulbs which should be looked at to replace.

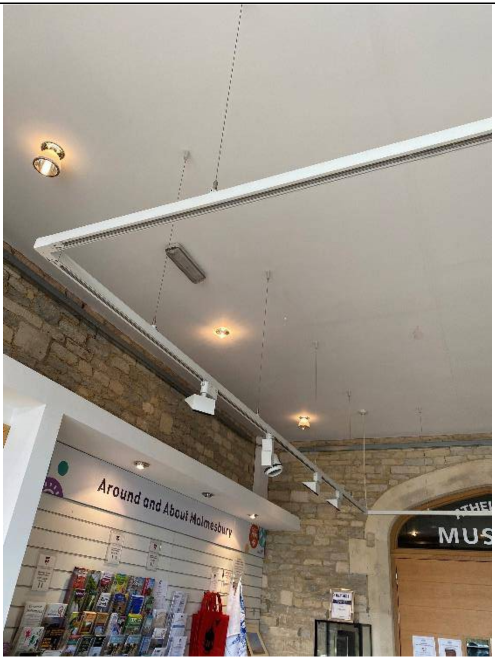


Figure 23: Typical lighting in main areas	*Figure 24: LED lighting in main office*

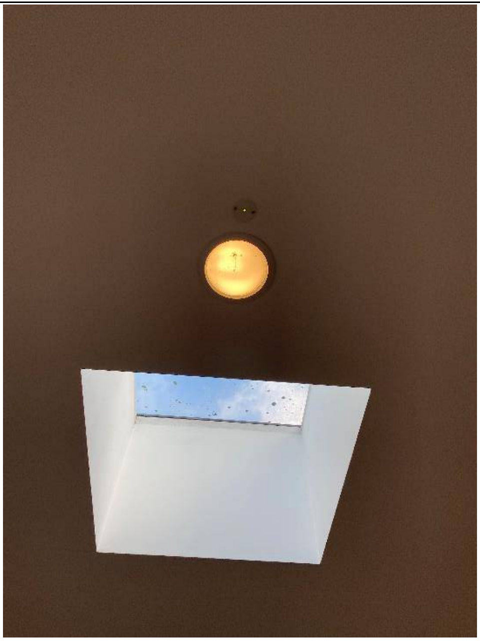



Figure 25: Skylights providing passive lighting in corridors along with a halogen light fitting	*Figure 26: PIR movement controls in toilets*

3 Carbon Reduction Opportunities

3.1 Begin training and management on heating controls

Currently the BMS system is only operated by an engineer who visits to perform routine maintenance on the boiler system. Giving control to the town hall would allow them to program the boiler to operate only when required. Currently the operating hours are unknown so the boilers could be firing when the town hall is unoccupied. Also, as the town hall opens during unusual and varied hours, allowing local control will allow the hall to only be heated when required. This change would reduce the operating hours of the boilers.

When buildings are required to be warmed to a certain temperature, there is an optimum time that it takes to reach the required temperature. The same is also true for when the heating is no longer required, as the building retains heat for an amount of time after the heating is switched off. During the evenings the heating is not required to be on, so adding in optimised start-stop times will reduce the operating hours of the boiler. This leads to a reduction in the waste heat generated and ultimately a reduction in savings.

It is estimated this will reduce the operating hours of the boiler by 100 hours a year, which translates to savings of 6,880 kWh of gas savings each year.

Opportunity	Forecast kWh saving	Forecast tCO_2 saving	Estimated financial saving (£)	Estimated cost of works	Simple payback (years)
Begin training and management on heating controls	6,880	1.3	£144	£500	3.5

3.2 Insulate exposed pipework and fittings in plantroom

The pipework within the plant room has the majority of its straight lengths insulated but the more complex shaped pipework fittings, such as flanges and valves, have been left uninsulated. These exposed areas of pipework contribute significantly to heat loss from the system and make the plant room unnecessarily warm. The exposed hot surfaces also represent a health and safety risk of burns for those working in the area.

It is recommended that these areas of exposed pipework and fittings are insulated with bespoke flexible insulation jackets. These wrap around the various elements but can be removed and then replaced for any servicing activities.

A free survey and quotation for the supply and installation of insulation of pipework fittings can be arranged through ESOS Energy Ltd (contact Rhys Jones 0117 930 9689, rhys.jones@esos-energy.com).

Figure 27: Unlagged pipework

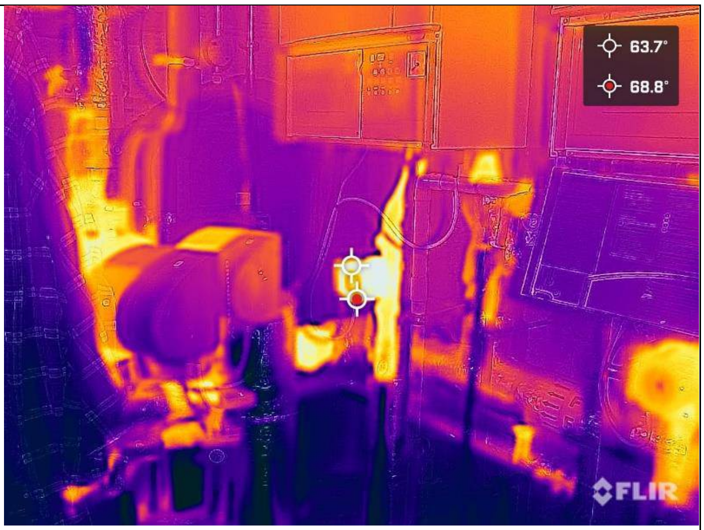


Figure 28: Thermal image of uninsulated pipework

Opportunity	Forecast kWh saving	Forecast tCO_2 saving	Estimated financial saving (£)	Estimated cost of works	Simple payback (years)
Insulate exposed pipework and fittings in plantroom	3,401	0.6	£71	£982	13.7

3.3 Add or replace draught strips to external doors

There are a number of external doors in the town hall. While the historic timber doors have been replaced at the entrance, there are still some outdated doors around the town hall. There are gaps between the double doors themselves, as well as between the doors and floor, hence a large amount of cold air is coming in to the church.

It is recommended that the draughtproofing around the door is improved and draught strips are added. This could be achieved by adding in brush draught strips rebatted into the edge of the door by a skilled joiner. Other traditional methods such as using hessian or felt pads tacked to the door could be used and keeping the door maintained in good condition is important.

Simple measures such as having a 'sausage dog' style draught excluder laid along the base of a door, using plasticine of the right colour to fill gaps where daylight can be seen and putting painted fridge magnetic over large keyholes can all be simple DIY measures which are effective.

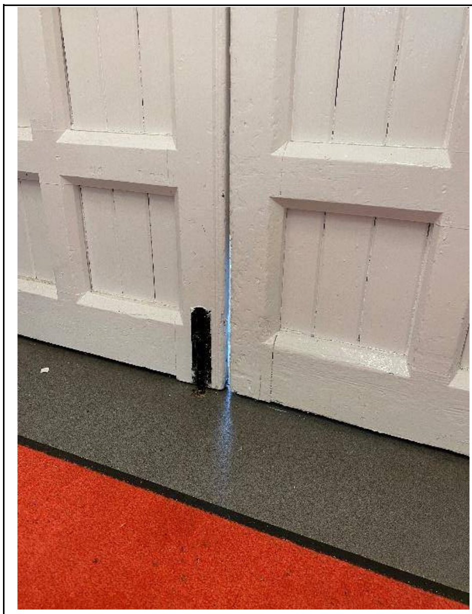


Figure 29: Door showing visible gaps

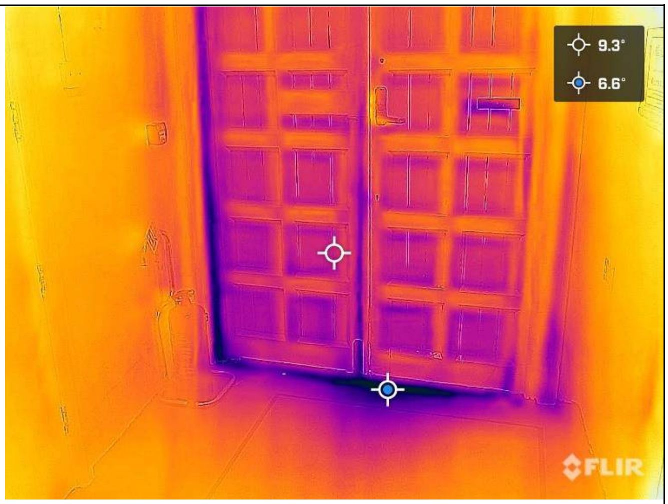


Figure 30: IR photo showing cold air entering through gaps

Opportunity	Forecast kWh saving	Forecast tCO_2 saving	Estimated financial saving (£)	Estimated cost of works	Simple payback (years)
Add or replace draught strips to external doors	4,815	0.9	£101	£1,200	11.9

3.4 Install weather compensator controls to the BMS

Additional controls for the boiler would further increase savings. One prominent example would be the addition of weather compensation controls, which allow for seasonal variation in external temperatures to affect the output of the boiler. In summer months, output is decreased whereas in cooler, winter months the output is placed back to normal.

Weather compensator controller can reduce the heating setpoint by 1.5 degrees, which translates into a reduction in kWh output of the boiler of around 16,099 kWh.

Opportunity	Forecast kWh saving	Forecast tCO_2 saving	Estimated financial saving (£)	Estimated cost of works	Simple payback (years)
Install weather compensator controls to the BMS	16,099	3.0	£338	£2,500	7.4

3.5 Upgrade or retrofit the windows with double glazing

There are multiple areas throughout the building that are in almost constant use and heated. The café downstairs and meeting rooms are used on a daily basis, with the Assembly room seeing events happening multiple times a week. The majority of the windows in these areas have single glazing with metal frames. It is not possible or desirable to change these windows as the building carries listed status. Therefore, retrofitting the windows with a secondary double-glazed pane is a logical choice.

The introduction of secondary glazing would considerably reduce the heat loss through the existing windows and improve both thermal comfort and noise levels as well as providing added security.

Any possible installation would need to be carefully specified, such as the work that has been already carried out in the office downstairs. This will incur some additional cost. Achieving a well-insulated building will facilitate reduction of heating costs and is recommended before installing a heat pump.

Figure 31: Typical glazing across building

Figure 32: Example of retrofit double-glazed interior windows to reduce heat loss

	
Figure 33: Close-up showing single glazed pane	*Figure 34: IR photo showing heat loss through a single glazed window in The Old School Room*

Opportunity	Forecast kWh saving	Forecast tCO_2 saving	Estimated financial saving (£)	Estimated cost of works	Simple payback (years)
Upgrade or retrofit the windows with double glazing	75,671	13.9	£1,589	£70,211	44.2

3.6 Replace all remaining light fittings with LED replacements

The lighting around the building is being slowly upgraded to LED lighting. However, there are many fixtures and fittings around the building which have yet to be changed. It is recommended that the fittings are all changed for LED. There are a vast number of specifications of LED lights on the market, but it is recommended that any LED light should come with branded chips and drivers and offer a 5-year warranty. Besides the energy saving, moving to LED lighting will provide a high quality of light output into the space and will reduce maintenance costs as there will be no lamps/light bulbs that need to be changed within these units.

A summary of the lighting on site and proposed upgrades is as follows.

Level / Floor	Room Name / Number	Type of Luminaire / Lamp	No. Luminaires	kWh/year	Proposed Type of Luminaire/Lamp	Saving kWh
Ground Floor	Tourist Information	50W Halogen Spot	24	3,000	LED Spotlamps	2,400
Ground Floor	Foyer	28W 2D	18	1,386	16W LED 2D	666
Ground Floor	Café	28W 2D	10	770	16W LED 2D	370
Ground Floor	Gallery	50W Halogen Spot	11	1,375	LED Spotlamps	1,100
Ground Floor	Toilets	50W Halogen Spot	4	500	LED Spotlamps	400
Ground Floor	Museum	50W Halogen Spot	10	1,250	LED Spotlamps	1,000
First Floor	Stairs over Foyer	28W 2D	4	308	16W LED 2D	148
First Floor	Hobbes Parlour	28W 2D	4	308	16W LED 2D	148
First Floor	Corridor	28W 2D	3	231	16W LED 2D	111
First Floor	Kitchen	1500mm T8 Twin	2	696	1500mm LED Twin	396
First Floor	Wesleyan Room	1500mm T8 Twin	8	2,784	1500mm LED Twin	1,584
First Floor	Wesleyan Room	23W CFL lamp	48	2,760	12W LED lamp	1,320
First Floor	Wesleyan Room	28W 2D	10	770	16W LED 2D	370
First Floor	Eilmer Bar	23W CFL lamp	6	345	12W LED lamp	165
First Floor	Assembly Room	23W CFL lamp	72	4,140	12W LED lamp	1,980
First Floor	Bar Store	28W 2D	3	231	16W LED 2D	111

Table 3: Lighting audit, proposed upgrades, and associated savings

If all the lights were changed the total capital cost (supplied and fitted) would be an estimated £12,872. The annual cost saving would be £1,872 resulting in a payback of around 6.9 years.

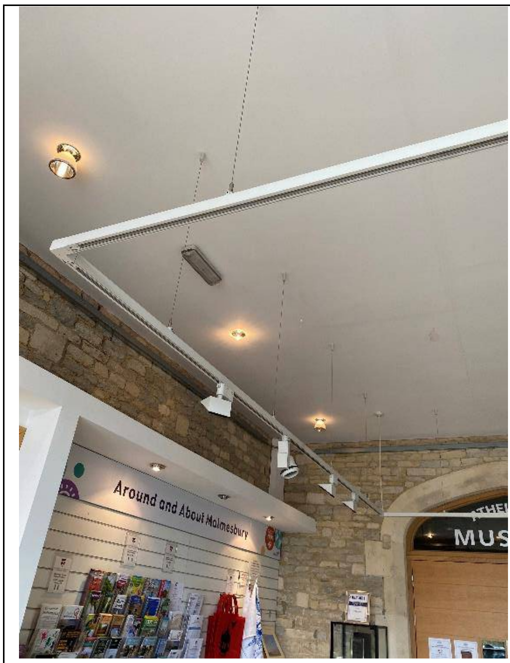


Figure 35: Typical lighting in main areas	*Figure 36: LED lighting in main office*

Opportunity	Forecast kWh saving	Forecast tCO_2 saving	Estimated financial saving (£)	Estimated cost of works	Simple payback (years)
Replace all remaining light fittings with LED replacements	12,269	1.0	£1,872	£12,872	6.9

3.7 Install roof insulation in areas with exposed beams

The ceiling/roof of a building is the largest contributing area to heat loss from a building as heat rises. The insulation of such spaces can therefore have a dramatic impact on both the efficiency of the heating system and the temperature of the space below.

There are multiple areas of the building with no internal ceiling and no visible insulation on the roof. While these show the distinctive characteristic of the building, they are not cost effective for saving energy and insulating these spaces should be considered.

It is estimated the cost of works would be £5,400 however a detailed survey should be carried out to determine the structural capability and feasibility of installing such insulation. This can be arranged through ESOS Energy Ltd (contact Rhys Jones 0117 930 9689, rhys.jones@esos-energy.com).

Figure 37: Example of exposed timberwork

Figure 38: IR photo showing the lack of insulation in roof

Opportunity	Forecast kWh saving	Forecast tCO_2 saving	Estimated financial saving (£)	Estimated cost of works	Simple payback (years)
Install roof insulation in areas with exposed beams	7,041	1.3	£148	£5,400	36.5

3.8 Consider installing a 22kW solar pv system on south facing roof

Consideration should be given to installing a Solar PV array on the south facing roof. There is a large area which has little to no shading, and could have a 22kW system installed.

As the building is listed, the guidance from Historic England stated they must be of 'minimum intervention and reversibility', meaning panels that can be installed and removed without damaging the building. A structural survey would have to be carried out to determine whether the roof could support such a structure, as well as the methodology for installing it without causing any damage to the town hall.

The area for consideration is shown below.

Figure 39: Arial view showing area for solar pv consideration

Opportunity	Forecast kWh saving	Forecast tCO_2 saving	Estimated financial saving (£)	Estimated cost of works	Simple payback (years)
Consider installing a 22kW solar pv system on south facing roof	18,239	1.4	£2,783	£18,150	6.5

3.9 Consider replacing the existing kitchen appliances with electric replacements

Currently the majority of the cooking taking place in the main catering kitchen is undertaken with gas-fired appliances (two, 6-burner ranges, one double oven). The small kitchen on the ground floor already uses electric appliances, but these are outdated and should be considered for replacement along with the main kitchen.

It is recommended that these units are replaced with electrically powered units when they reach the end of their life in approximately 10 years. It is estimated that the total cost of replacing these units is £10,000. With the current cost of gas and electricity it does not provide an attractive payback, but with the ever-changing market this could improve as the cost of gas increases.

Figure 40: Existing gas fired appliances considered for replacement

Opportunity	Forecast kWh saving	Forecast tCO_2 saving	Estimated financial saving (£)	Estimated cost of works	Simple payback (years)
Consider replacing the existing kitchen appliances with electric replacements	2,557	0.5	£54	£10,000	186.2

3.10 Consider replacing boilers with Air Source Heat Pumps

The building is currently heated from gas boilers which provides hot water into the heating system. The use of fossil fuels for heating means that it will not be possible for the building to become zero carbon without changing the heating system. A boiler also has heat and other efficiency losses within it, which means that the efficiency of a boiler in converting the gas into the heat is typically around 80 to 95% (depending on the age and type of boiler). Air source heat pumps use electricity to power the heat pump which takes heat from the air and puts this into water which can then go into the heating system. A heat pump can create around 3 units of heat for every one unit of electricity.

The existing boilers are expected to have another 5 years before the end of their serviceable life and it is therefore recommended that at that stage the replacement of the existing boilers for an air source heat pump is considered.

3.10.1 Assumptions

For high-level estimation purposes we have assumed the following:

- A high temperature heat pump solution, with identical output capacity to existing boilers = 85 kW thermal requirement
- Upgrades will be needed to the heat emitters and these have been priced at £200 per radiator. We have not priced any pipework upgrades as it is assumed the ASHP can be directly installed into the existing system.
- An estimated whole system average SCOP of 2.4 is achievable and that the resultant SCOP and impact on operating energy costs will be acceptable
- That DNO permission will be provided for grid connection
- That any consequential costs for reinforcement of grid supply to the site and major electrical infrastructure in the site are excluded. Using an estimated SCOP of 2.4, additional supply capacity of at least 50 kVa is suggested
- £1,150/kW installed cost for ASHP including connection into existing LTHW network. This is based on installed costs from other projects, excluding unknown costs for electrical upgrades where required

Opportunity	Forecast kWh saving	Forecast tCO_2 saving	Estimated financial saving (£)	Estimated cost of works	Simple payback (years)
Consider replacing boilers with Air Source Heat Pumps	47,102	12.7	-£3,438	£170,508	N/A

3.11 Consider replacing hot water system with Air Source Heat Pumps

Along with the heating system, the hot water system should be considered for an upgrade to an ASHP. The current system still uses a gas fired boiler to heat the water before moving onto efficient electrical heating. To become fully carbon neutral the town hall should move away from all gas consumption.

Much of the same assumptions and workings were carried over from the opportunity above so have not been repeated here.

Opportunity	Forecast kWh saving	Forecast tCO_2 saving	Estimated financial saving (£)	Estimated cost of works	Simple payback (years)
Consider replacing hot water system with Air Source Heat Pumps	31,401	8.5	-£2,292	£62,731	N/A

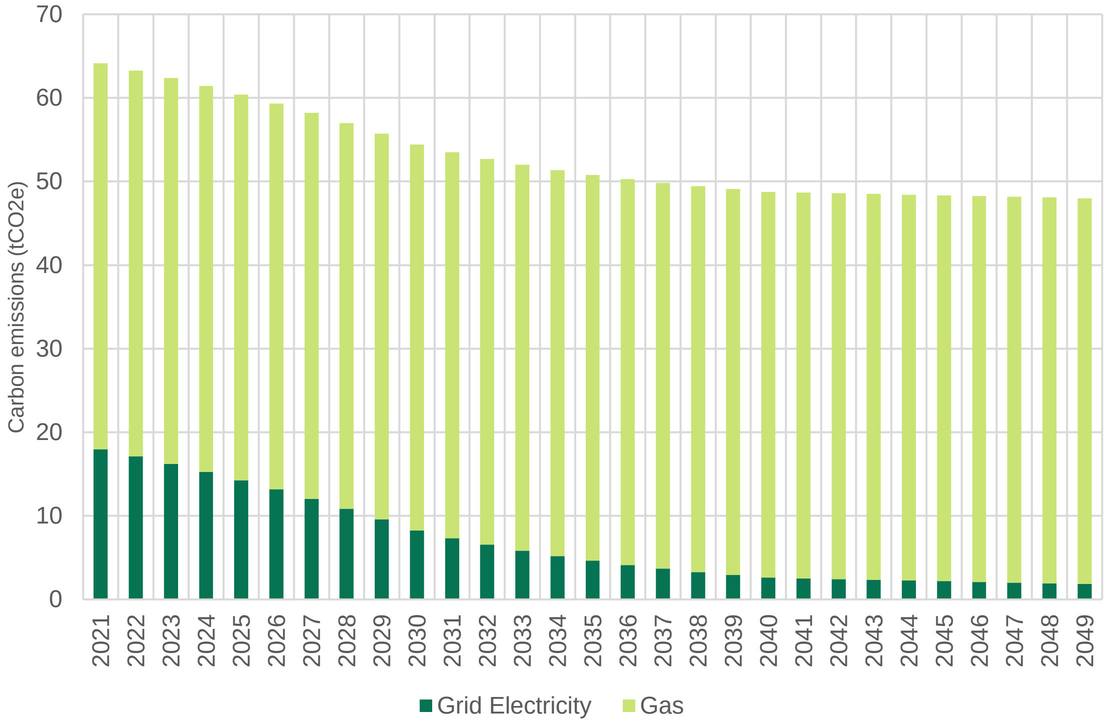
3.12 Electric vehicle charging points

There is a parking area located to the front of the building. In order to facilitate sustainable transport choices, it is recommended that an electric vehicle charging point is fitted. This would enable any staff and visitors that have an electric car to be able to charge while at the building and it would also facilitate staff and other visitors to transition to electric vehicles over time.

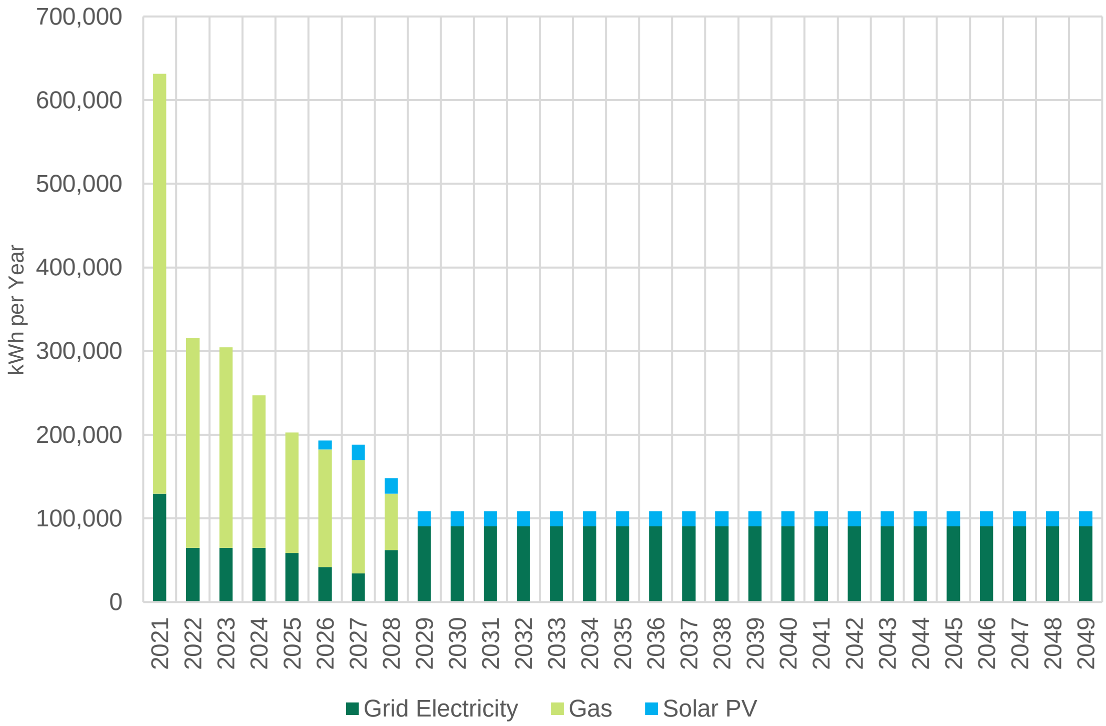
Opportunity	Forecast kWh saving	Forecast tCO_2 saving	Estimated financial saving (£)	Estimated cost of works	Simple payback (years)
Consider installing electric vehicle charging points	N/A	N/A	N/A	£2,500	N/A

3.13 Forecast graphs

3.13.1 Business as usual (BaU)

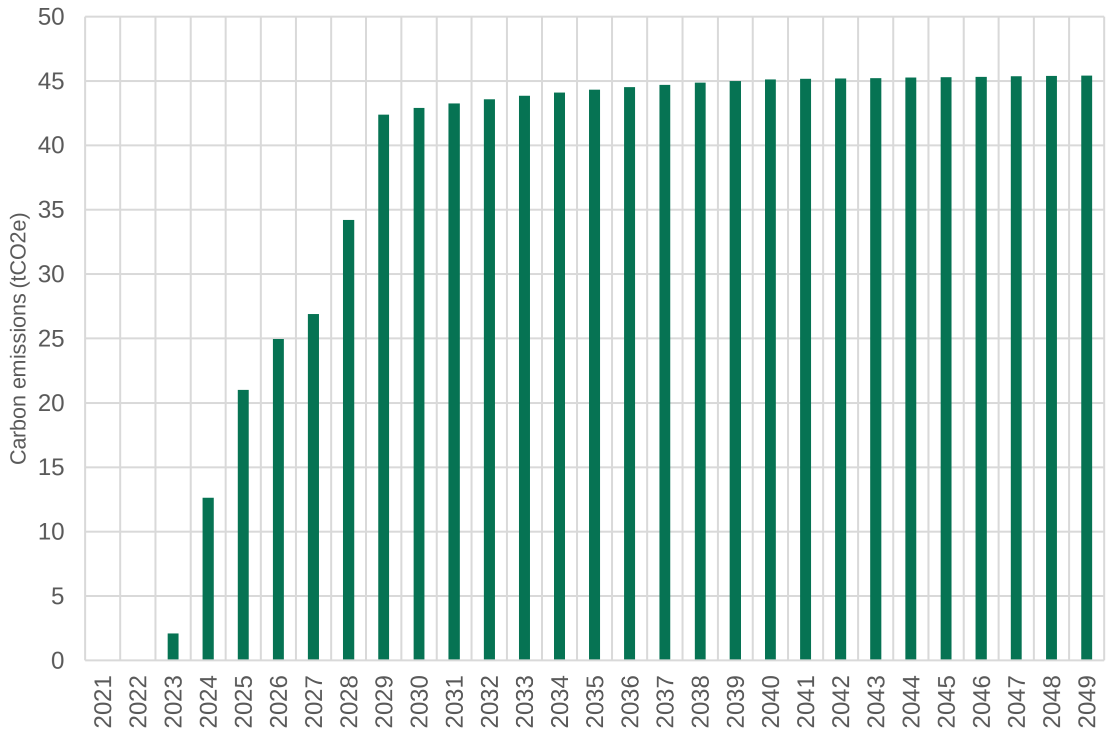


3.13.2 Forecast annual energy consumption by source



3.13.3 BaU vs forecast emissions

3.13.4 Forecast CO_2 saving



4 Resources Used for This Report

This energy audit has been developed for the council by ESOS Energy to provide additional resource to the in-house capacity and skillset.

Management of day-to-day energy consumption at the property is the responsibility of the site management team in line with comfort policies and operational strategies established by the council and in line with good practice.

Overall responsibility for energy consumption across the estate, and for delivery of this audit, sits with:

Claire Mann, Town Clerk
Town Hall, Cross Hayes, Malmesbury, SN16 9BZ

Financial requirements for delivery of this energy audit will be reviewed and built into subsequent financial years capital expenditure programs upon agreement of a suitable delivery program. Immediate enabling works which can be delivered from within existing budgets will be scheduled for more rapid delivery. Grant-funding will be considered.

4.1 Supporting information

4.1.1 Site baseline energy use and emissions

Summary:

- Annual cost (2021) — £5,272 (Gas) & £9,882 (Electricity)
- Annual emissions (tCO2e) — 46.16 tonnes (Gas) & 7.33 tonnes (Electricity)

Energy data provided by site team at the council.

4.1.2 Display energy certificates (DECs)

Existing DECs and associated Recommendation Reports were reviewed during the development of the HDP. These are available at: https://find-energy-certificate.digital.communities.gov.uk/ or by clicking the links in the relevant text in the report.

4.1.3 Photographs

Photos and videos were taken during the site visit to support assessment, with permission of the site.

4.1.4 Project Commercial Data

Energy-savings were calculated using data from previous quotes for similar sites; note that these are for guidance only and specific quotes should be sourced for any projects being considered.