Energy Efficiency and Zero Carbon Advice

St Mary's Church, Islington
PCC of St Mary's Church

Author	Reviewer	Audit Date	Version
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Contents

1. Executive Summary

An energy survey of St Mary's Church, Islington was undertaken by ESOS Energy Ltd to provide advice to the church on how it can be more energy efficient and provide a sustainable and comfortable environment to support its continued use.

St Mary's Church, Islington is an Elizabethan era church dating from 1956, rebuilt on the site of the earlier church of 1754, largely destroyed in the war, from which the west façade and tower remain.

There is both gas and electricity supplied to the site.

The church has a number of ways in which it can become more energy efficient. Our key recommendations have been summarised in the table below and are described in more detail later in this report. It is recommended that this table is used as the action plan for the church in implementing these recommendations over the coming years.

Energy saving recommendation	Estimated Annual Energy Saving (kWh)	Estimated Annual Cost Saving (£)	Estimated capital cost (£)	Payback (years)	Permission needed	CO2 saving (tonnes of CO2e/year)
SHORT TERM						
Flush and clean church heating system	7% 12,000	£1,392	£500	<1	List B	2.1
Maintenance of radiator mounted fans	5% 9,000	£1,044	£500	<1	None	1.6
Reduce temperature setting in church by one degree	10% 18,000	£2,088	Nil	Immediate	None	3.2
Install further insulation for boiler valves and pumps	2% 3,600	£417	£500	1	List A	2.2
Install a timer for control of Crypt water heater tank	4,000	£508	£200	<1	None	0.8
Install lagging for crypt water heater hot pipe	400	£51	£50	1	List B	0.08
Purchase a temperature and humidity monitor	N/A	Allows for optimisation	£50	N/A	None	N/A
Purchase a dehumidifier for Wilson Room	N/A	N/A	£200	N/A	None (portable equipment)	N/A
MEDIUM TERM						
Install secondary glazing in Wilson Room	500	£58	£1,500	Not recovered	Faculty	0.09
Replace Crypt boiler with heat pump	20,000 gas. Use 8,000 elec	£1,300 (at new gas rates)	£21,600	17	Faculty	1.9 (more with solar power)
LONG TERM						
Install under pew heaters	180,000 gas Use 19,500 elecctric	£18,000 gas (new rates)	£47,376	3	Faculty	28

Purchase heated chairs for café area	Unknown	Unknown	Unknown (c £300 each)	Unknown	Faculty for power sockets	

The church should check any faculty requirements with the DAC Secretary at the Diocese before commencing any works.

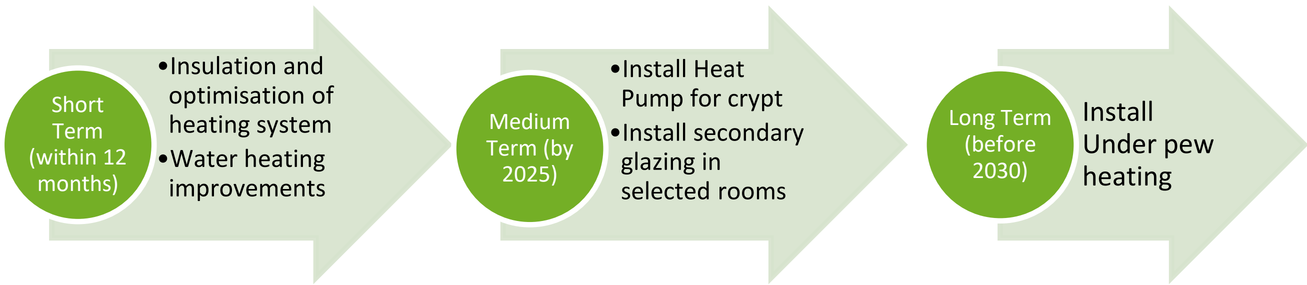
Based on current contracted prices of 12.70p/kWh and 11.6p/kWh for electricity and mains gas respectively.

If short and medium term measures were implemented this would save the church around £5,900 per year in operating costs.

2. The Route to Net Zero Carbon

The General Synod of the Church of England has indicated that the Church of England should be Net Zero Carbon by 2030. Every church, cathedral, church school and vicarage will therefore need to convert to be a net zero building in the next 10 years.

This church has a clear route to become net zero by 2035 by undertaking the following steps:



3. Introduction

This report is provided to the PCC of St Mary's Church, Islington to give them advice and guidance as to how the church can be improved to be more energy efficient. In doing so the church will also become more cost effective to run with improvements in the levels of comfort. Where future church development and reordering plans are known, the recommendations in this report have been aligned with them.

An energy survey of the St Mary's Church, Islington, Upper Street, N1 2TX was completed on the 3rd November 2022 by Dr. Paul Hamley. Paul is an energy auditor with experience of advising churches and small businesses. He is part of the Church Energy Advisors Network developing advice for the Church of England and authored the "Assessing Energy Use in Churches" report for Historic England. He is a CIBSE affiliate member and a Chartered Scientist, with experience of the faculty process gained from chairing the building committee of a Grade I listed church and has been an assessor for EcoCongregation.

The church was represented by Kate Tolson, Premises Manager.

St Mary's Church, Islington	
Church Code	Not listed
Gross Internal Floor Area	1,300m^2 [Church 688, Crypt 600]
Volume	8,700m^3
Heat requirement	220kW (church), 58kW (crypt)
Listed Status	Grade II

The church is typically used for 11 hours per week for the following activities:

Type of Use	Hours Per Week (Typical)	Average Number of Attendees
Services	6.5 hours per week	150 per week
Community Use	2.5 hours per week	School visits and up to 20 annual concerts
Occasional Offices	8 weddings	

4. Energy Procurement Review

Energy bills for gas and electricity have been supplied by St Mary's Church, Islington and have been reviewed against the current market rates for energy.

The current electricity rates are:

Single / Blended Rate	12.70p/kWh
Standing Charge	35p/day

Supplier: Drax

The current gas rates are:

Single / Blended Rate	11.6p/kWh
Standing Charge	27.4

Supplier: National Gas

The above review has highlighted that when the current contracts expire, there will be opportunities to gain cost savings from improved procurement of the energy supplies at this site using a group purchasing scheme.

We would therefore recommend that the church looks into 100% renewable tariffs and obtains quotations for its gas and electricity supplies from group purchasing schemes such as the Big Church Switch scheme, Charity Buying Group and the Parish Buying scheme, http://www.parishbuying.org.uk/energy-basket.

These scheme offers 100% renewable electricity and a proportion of renewable gas and therefore are an important part of the process of making churches more sustainable.

A review has also been carried out of the taxation and other levies which are being applied to the bills. These are:

VAT	5%	The correct VAT rate is being applied
CCL	not charged	The correct CCL rate is being applied.

The above review confirmed that the correct taxation and levy rates are being charged.

5. Energy Usage Details

5.1 Annual Consumption

St Mary's Church, Islington uses 19,000 kWh/year of electricity, costing in the region of £3,000 per year, and 200,000 kWh/year of gas, costing around £7,000 to date, but £24,000 at new rates. The total carbon emissions associated with this energy use are 38.5 CO_2e tonnes/year.

This data has been taken from the annual energy invoices provided by the suppliers of the site.

Utility	Meter Serial	Type	Pulsed output	Location
Electricity - (left)	19L 344 2918	Landis & Gyr Type 5424	Yes	South crypt electrical cupboard
Electricity – (middle)	19L 344 2971	Landis & Gyr Type 5424	Yes	As above
Electricity – (right)	19L 344 2846	Landis & Gyr Type 5424	Yes	As above
Gas – Church	M025 A01787 08 A6		Yes	

All the meters are AMR connected and as such an annual energy use profile for the site could be obtained from the supplier.

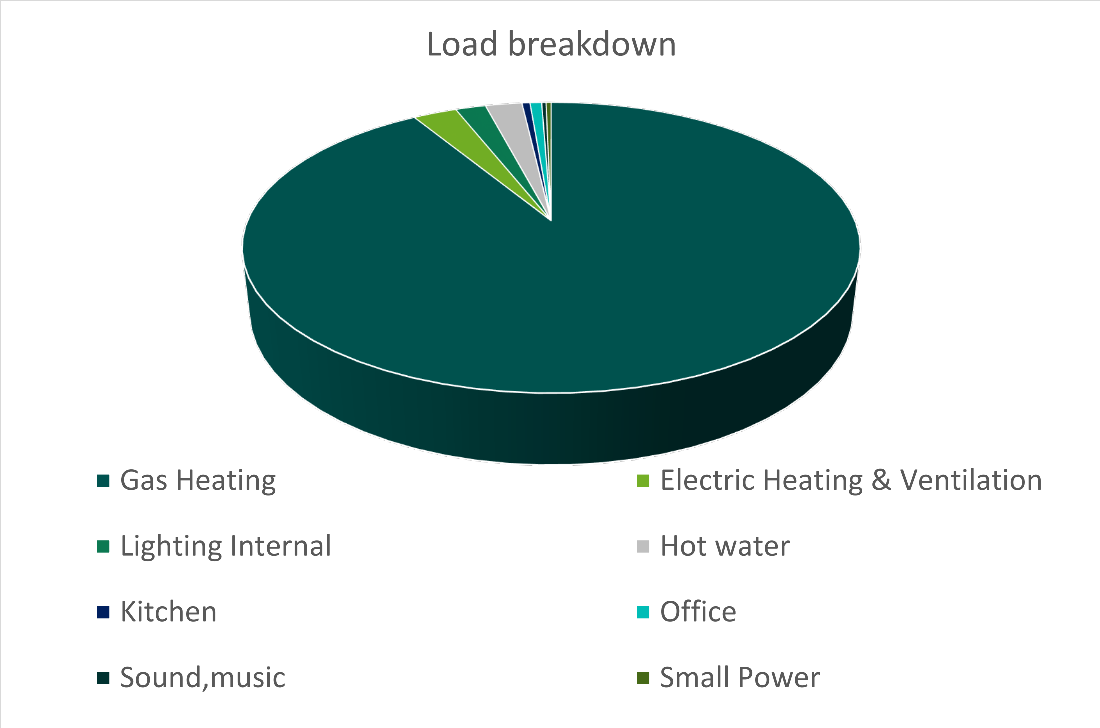
5.2 Energy Profiling

The main energy consuming plant can be summarised as follows:

	Equipment	Power kW	Annual Consumption kWh	Portion
Heating [Gas]	CHURCH 2 x Remeha Quinta Pro 114kW input/107kW output CRYPT Remeha Avanta Plus 305 90 hours x 25 weeks	228 30	180,000 20,000	91%
Heating & Ventilation [Electric]	Boiler circulation pumps 3 toilet hand driers 3 extraction fans (rooms, toilets, kitchens) – if run constantly	1 3 x 2 3 x 0.2	500 500 5,000 TOTAL 6,000	2.7%
Lighting [Internal]	CHURCH 32 LED, ceiling level 4 large spotlights 2 theatre spotlights [570 hours] CRYPT LED strip lighting + 4 fluorescent F70W	640W 200W 300W 1500W	650 3500 TOTAL 4,150	1.9%
Hot Water	Fixed water heater, kitchen and toilet taps (normally on) Kettle 2 Coffee machines Urn Commercial Dishwasher, daily use	3 max 3 2 2 5	2,000 300 600 100 2,000 TOTAL 5,000	2.3%
Kitchen	Microwave Fridge (on constantly)	1 0.3	200 900 TOTAL 1,100	0.5%
Office	4 Workstations	0.2	1,600	0.7%
Sound, Music	Sound system Organ	0.5 0.5	300 300	0.3%
Small Power	Vacuum cleaner Lift	1.5 3	300 400	0.3%

Sum of estimates: 19,150kWh

Annual electricity consumption, 2021: 19,087kWh



As can been seen from this data, the heating makes up by far the largest proportion of the energy usage on site. The other significant loads are ventilation, lighting and hot water.

5.3 Energy Benchmarking

In comparison to national benchmarks for church energy use[1] St Mary's Church, Islington uses 46% less electricity and 2% less heating energy than is average for a church of this size.

The lower electricity use is a consequence of using mostly LED lighting.

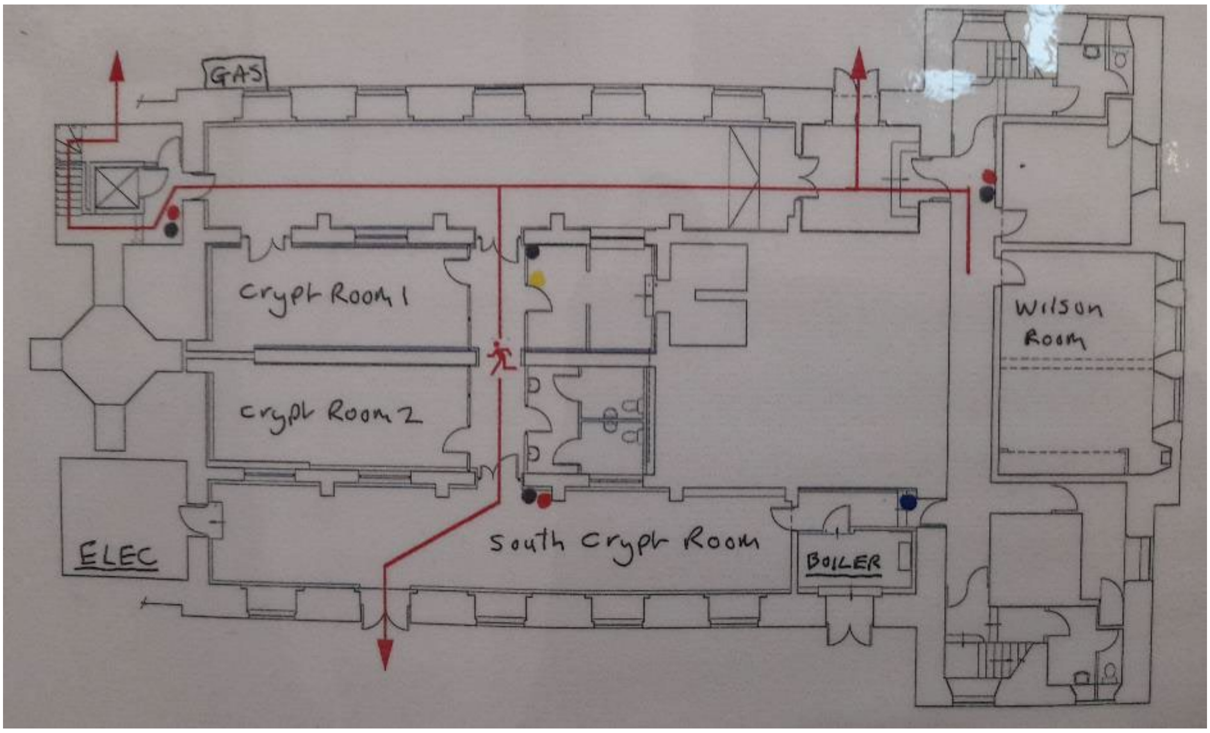
	Size (m^2 GIA)	Annual Energy Usage (kWh)	Actual kWh/m^2	Benchmark kWh/m^2	Variance from Benchmark
St Mary's Church, Islington (elec)	1,300	19,000	14.6	27	-46%
St Mary's Church, Islington (gas)	1,300	200,000	154	156	-2%
TOTAL	1,300	219,000	168	183	-8%

There is currently no benchmark data available which takes hours of use and footfall into account.

[1] CofE Shrinking the Footprint – Energy Audit 2013.

6. Efficient / Low Carbon Heating Strategy

The church has a uniformly high ceiling (10.7m) and very large windows (7.8 high x 2.2 or 4.7m) which contribute to a very large heat loss figure.



The crypt occupies the majority of the building footprint, although some areas are service rooms.

6.1 Reducing Environmental Impact

The energy used for heating a church typically makes up around 80% to 90% of the overall energy consumption. Heating also often uses gas or oil as its primary fuel, these are fossil fuels with high carbon emissions and little opportunity to decarbonise in the future. Electricity currently has carbon emissions of around the same level as mains gas but the carbon emissions associated with electricity are reducing rapidly as the UK builds more renewable energy and decommissions its remaining coal fired power stations. Mains gas does have some potential to reduce its carbon content through the use of bio gas and hydrogen but these are less developed solutions and will be unable to deliver 'zero carbon mains gas'.

It is therefore important to review and plan to increase building efficiency and become less carbon intensive. One way to achieve this is to consider a transition to electrical heating where this also represents a more efficient and comfortable solution for churches.

6.2 Forward Planning

Whilst there are plans to add hydrogen to the network, and "green" gas from anaerobic digestion; some suppliers offering up to 20% "green gas" tariffs, the majority of the gas supply will continue to be fossil fuel for the next decade. The economics of hydrogen production and the need to replace some pipework make full decarbonisation of gas unlikely.

If the gas boiler is repaired or replaced, then long term, the boiler will need to be made hydrogen ready. Some hydrogen is due to be added to the gas grid over the next five year period. If plans to decarbonise the gas grid are implemented; the hydrogen mix will eventually exceed 20% and a hydrogen compatible boiler (and piping) will be required. The transition will be overseen by the regulatory bodies in a similar way to that between town gas and north sea gas.

The church should develop a boiler replacement plan, by obtaining detailed quotations for the options presented in this report. Where electric heating can be obtained at similar or lower operating cost, this is recommended.

6.3 Site Heat Demand

The Centre for Sustainable Energy model[2] can be used to estimate heat load for the building.

Heat Load (kW) = Volume V (m^3) x Insulation Factor

Insulation Factors

Condition	Factor kW/m^3
Poorly insulated with open or broken windows, draughty doors (add 5%)	0.034
Poorly insulated (assume no interventions)	0.033
Some insulating features	Estimate value
Well insulated	0.022
Insulated to 2010 regulations	0.013

Area	Volume m³	Insulation Factor kW/m³	Heat Required (Space heating) kW	Boiler provision
Church Ground floor Including entrance	6,650	0.033	220	2 x Remeha Quinta Pro 214kW output
Crypt	2,050	0.028	58	1 x Remeha Avanta Plus 303 30kW output

2 www.cse.org.uk/local-energy/download/estimating-the-heat-demand-of-a-hypothetical-community-building-79

The crypt is partly underground and thus benefits from lower heat loss than the church above.

Area	Estimated split kWh	Boiler power kW	Annual use hours
Church	180,000	214	570
Crypt	20,000	30	4,700

7. Improve the Existing Heating System

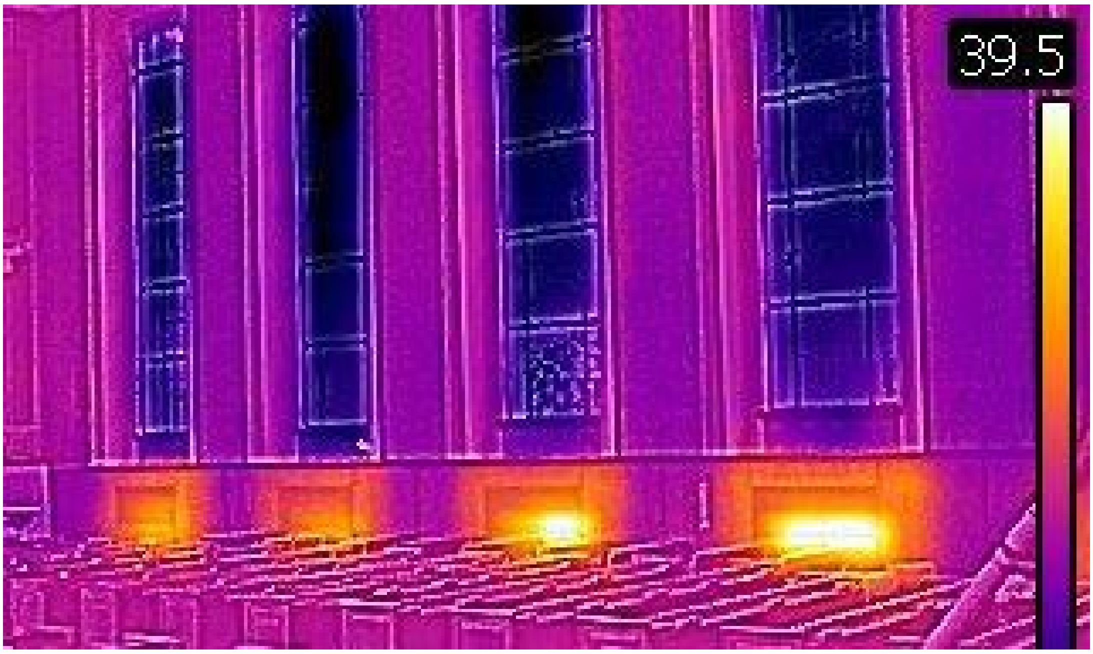
The church is fitted with two Remeha Quinta Pro boilers of 114kW input and 107kW output each giving a combined output of 214kW maximum. These were installed in 2012, so may require replacement by the end of the decade.

In the years before the replacement of the existing heating system, it is recommended that measures are taken to improve the efficiency of the existing heating system, this should include:

7.1 Church Heating System Flush and Clean

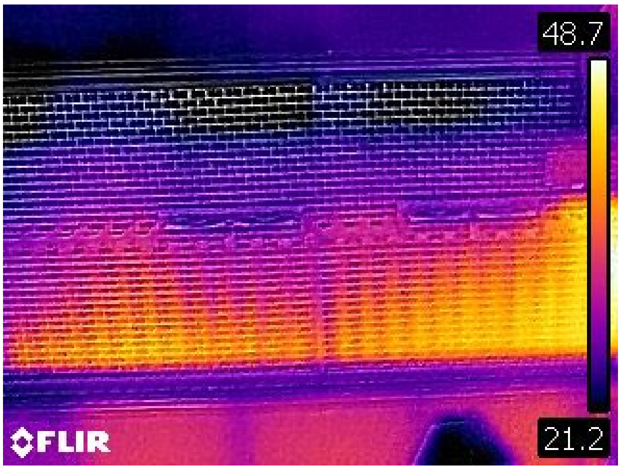
The church is fitted with cast iron radiators recessed into the walls. Some of the radiators are fitted with electric fans resting on the top, which seek to export the heat more efficiently. Not all of these units were working during the visit, they would benefit from maintenance as necessary. An infra red camera was used to compare the effect of those radiators which are, and are not fitted with subsidiary fans.

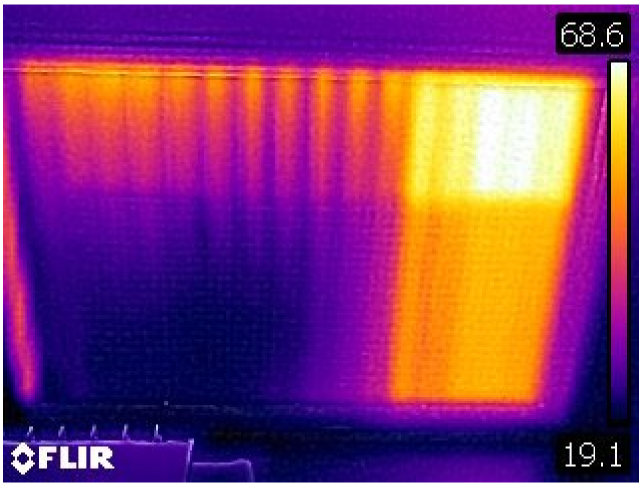
The imaging showed some radiators to have cooler areas which indicates partial blockage by sludge. It is recommended that the system is flushed by a heating contractor. (Alternatively just the radiator could be removed and flushed through if there are concerns about flushing through the whole system.



Above (L), radiator in chancel, operating well. Above (R), radiator fitted with two pairs of fans, which are exporting the heat more efficiently and drawing air

through the top of the radiator. Below, several of the radiators (3/17) were seen to be partially blocked, with the left hand sections considerably cooler. This suggests the presence of significant amounts of sludge.

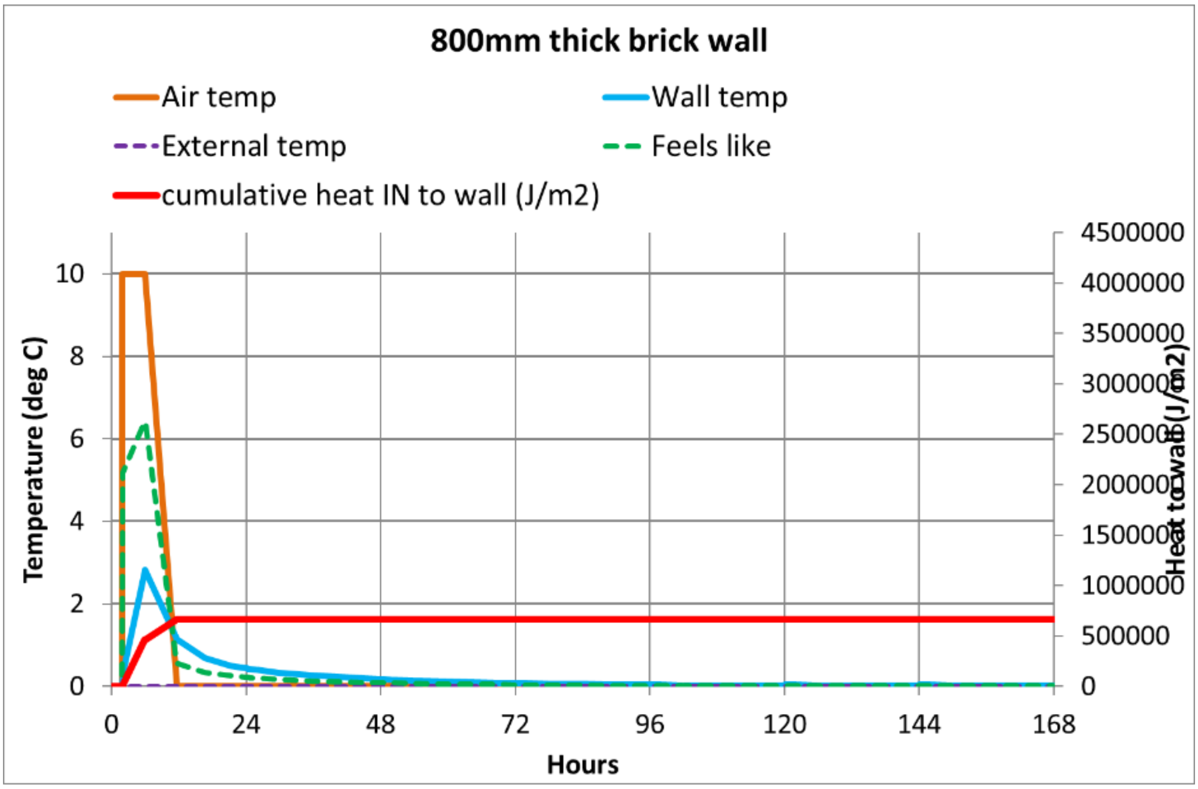




7.3 Discontinue with Background Heating Strategy

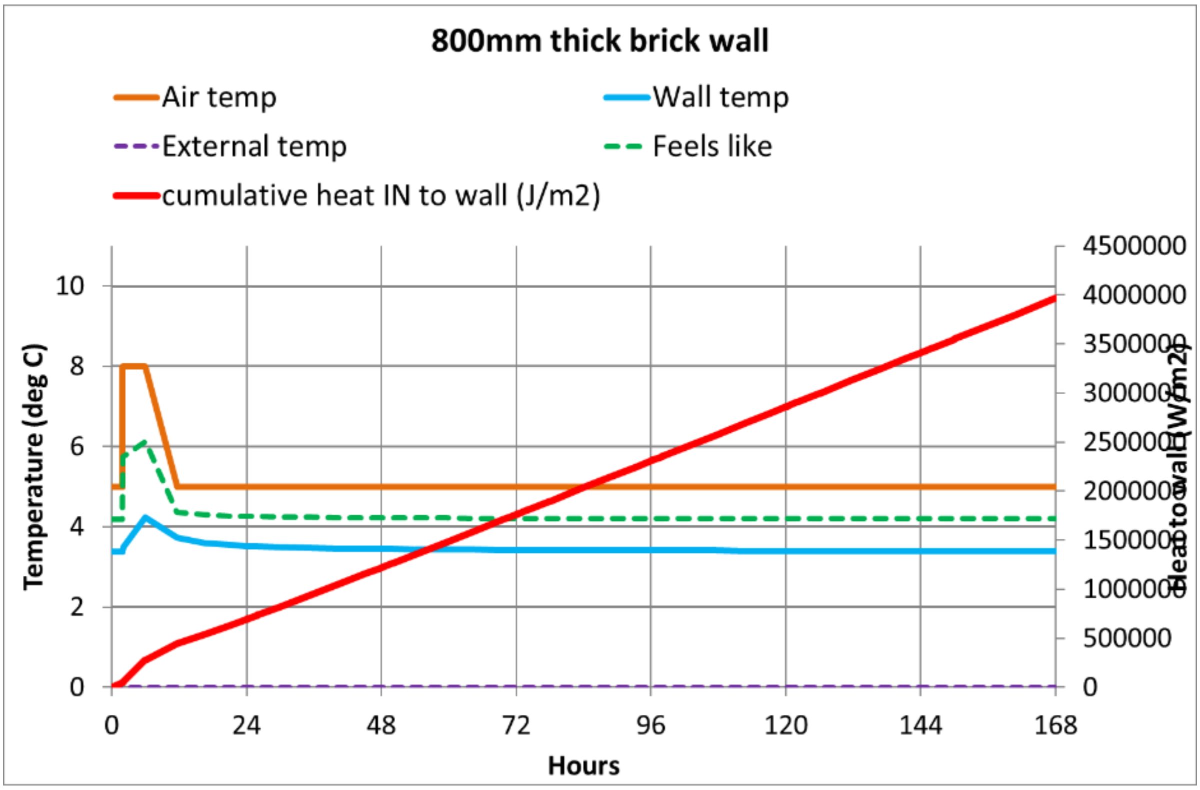
There are two important principles in setting efficient heating settings to support a comfortable church. The first is that most historic buildings survive very well without being heated and that in a number of cases the later addition of heating has actually cause fabric issues (such as the drying out of timbers, drawing damp through walls into a warmer and drier environment, or causing issues beneath metal roof covings where warmer moist air becomes trapped). The worst case scenario is one in which there are frequent and extreme shifts in heat: for example, having the heating switch on for an hour or two once or twice a day in the misconceived idea that it will 'take the cold off the building' is the most damaging heating strategy for the fabric, as the constant 'yo-yo' up and down of the heating is damaging. The second principle is the need to provide thermal comfort to occupants. To achieve this an immediate injection of heat close to where the congregation are is needed. This can be achieved through measures such as under pew heaters or radiant heaters, that warms the air around the people but makes no attempt to heat the entire air volume of the church. It may be better to leave the building unheated when it is not occupied and then have a longer period of heating before the time it is in use.

St Mary's church itself (excluding the heavily used crypt) is in low use; 6.5 hours on Sundays with 15 concerts, 6 school visits and 10 weddings plus funerals annually. Thus heating for Sundays and events only is justified. The diagrams below show the difference in cumulative heat input (red line) for once per week heating (above) and constant or background heating below.



Above, one heating episode

Below, background heating



paper by James Sheehan https://www.cibsejournal.com/general/tidings-of-comfort-and-joy-cost-efficient-church-heating/

7.8 Insulation of Pipework and Fittings

The majority of the straight lengths of pipework within the boiler room are lagged, but the valves and circulation pumps are not. The room appears well ventilated, thus it is worthwhile to fit covers to the pumps and valves. These need to be easily removable for maintenance (not material wrapped round).

7.10 Magnetic Particle Filter

It is recommended that if the church chooses to retain the radiator network then a Magnetic Particle Filter is fitted to protect the system against further build up of magnetic sludge as has affected some of the radiators.

8. Future Heating Options

8.1 Options Overview – use pattern and seating roof type, building width

The church is fitted with very large Crittall metal framed windows dating from the post war rebuild in 1956. There are 14 windows of 7.8m high, 2.2m wide in the nave and three 4.7m wide in the chancel, which with smaller windows at the west end gives a total glazed area (not including the crypt) of approximately 400m^2.

The church is seated using fixed wooden pews and heated via radiators recessed into the walls, some of which are fitted with small fan heaters which rest on top of the radiators. The location of the radiators does not allow for the fitting of reflective insulation panels behind them to reflect heat away from being absorbed by the wall. This, together with the combination of a high rectangular cross section and large windows makes for a very large heat loss and an energy inefficient building.

Electrically, the installation of a large solar array is to be commended and the building should be self sufficient in electricity.

The relatively low hours of use of the church and the cast iron radiators do not recommend an air to water heat pump system. For the low occupancy hours, electric under pew convector heaters are the recommended option to replace reliance on gas heating. Since heat would be provided directly under the congregation, this would involve much less heating than any space heating method which involves heat rising to the ceiling first.

The small area used as a kitchenette / café area in the south west corner of the nave will require its own heating system if under pew heating is installed. The church interior is finished with polished wood panels and this may preclude installation of radiant infra red wall panels although they could be affixed to the recently installed kitchen unit vertical surfaces. Another option would be to install heated chairs, but this would require tethering the chairs close to floor mounted electric sockets.

The crypt is relatively well insulated, heavily used and fitted with a small 30kW output Remeha Avanta Plus 303 boiler. It is recommended that this is replaced with an Air to Water Heat Pump serving the current relatively new network of pressed steel radiators. The high hours of use of the crypt mean that there is a good opportunity for savings. This would only require 12kW electricity input and could at periods be run from the existing solar PV installation. It could also provide solar powered cooling.

8.2 Install Electric Under Pew Heaters

Under Pew mounted convector heaters are the preferred solution for churches with low hours of use which wish to retain fixed bench seating.

Only regularly used pews have to be fitted. With a larger installation which equips most or all pews, only pews in use need the heaters switched on. Without the need to heat the whole volume first in order to deliver heat to seating level, operating costs can be less than gas despite the higher cost per kWh of electricity.

In very cold weather, the whole array can be run to preheat the building if necessary.

The church is fitted with:

24 pews of 3.67m, four supports spaced 734mm (120 positions)

6 pews of 2.9m, three supports spaced 725mm (24 positions)

If all positions were fitted with BN Thermic 450W heaters (702mm length), total power output would be 65kW and installed cost (at 2018 prices) £47,376.

An estimated 300 hours use x 65kW x 12.7p/kW = £2,476 annual operating cost. [These rates may rise by a factor of three, but this is still cheaper than the present gas rate.]

This should be compared with 180,000kWh gas use x 11.6p/kWh = £20,880 at new rates.

Lower powered 300W heaters (525mm length) are only 5% cheaper. Fitting every other position with a 450W heater would reduce capital costs. At the beginning and end of the heating season, having less heating power available would be acceptable. In midwinter, all units could be run in preheating mode when necessary.

Each individual unit should have a local off switch under the seat.

The overall power output of the under pew heaters is lower than the figure calculated by model for space heating, 220kW – this model assumes that heat circulates around the whole building; heat from radiators begins by rising to the ceiling. Heat supplied directly to the congregation by under pew heaters does not have to fill the volume of the church first to be effective.

For replacement, two most popular under pew heaters within churches are BN Thermic PH65 heaters (http://www.bnthermic.co.uk/products/convection-heaters/ph/) which are used for the above calculations, or similar from http://www.electricheatingsolutions.co.uk/Content/PewHeating.

Cable runs to the pew heaters could run under the wooden pew platforms. All cabling should be in armoured cable or FP200 Gold when above ground. Each pew heater to be switched with a neon indicated fused spur located underneath the pew seat.

The under pew (see photo below) and panel heaters have been recently installed at St Andrews Church, Chedworth, Gloucestershire, GL54 4AJ. The church is open in daylight hours so can be viewed at any time.

8.3 Crypt: Heat Pump

Heat Pumps are a low carbon method of creating heat.

As the hours of use of a building increase, so do heating costs.

Electrically operated heat pumps can provide between 2.5 times and 5 times the amount of heat in kW which they consume in electricity (This is termed the Coefficient of Performance, CoP). When replacing gas boilers directly, sometimes larger radiators are required, or fan assisted radiators, or running the system for longer periods to achieve the same temperature (but at less power input).

With electricity prices now only three times more per kWh than gas (it was about four times), heat pumps are becoming steadily more cost effective. Refrigeration technology is mature and reliable; the units appear to offer lower maintenance costs compared to gas boilers.

Heat pumps generally deliver water at around 55°C (although there are higher temperature ones on the market which require more energy to run); thus are compatible with a building which is regularly used and can be supplied with constant, medium heat, rather than a full power heat up on Sunday mornings.

Air source (to water) systems deliver between 2.5 and 3 times the amount of heat in kWh that they consume.

The crypt is fitted with recent pressed steel radiators and with thick walls, small windows (and no windows for the central rooms) has a much lower heat loss than the majority of church or church hall buildings. This is reflected in the low power rating of the current gas boiler for the crypt (30kW). This suggests that there is good potential for replacement of the current gas boiler by an air to water heat pump serving the same radiator system.

External units could be fitted outside of the boiler room door where there is a recessed sunken area, below. The area may need some enlargement to accommodate the unit. Visual shielding by planting shrubs can be used if necessary.

Three external units similar to the above, or one large unit would be needed to supply 30kW of heat.

Ground Source Heat Pumps supplying water at around 50ºC are more efficient than their Air Source equivalent (since the average ground temperature is higher than the average air temperature), but require either a borehole, or extensive trench digging.

Where a site has a daily requirement for heat (and thus high daily expenditure), the lower operating costs of a ground source pump outweigh the higher capital costs.

Some of the extra electricity required to run heat pumps can be obtained from solar PV panels. Some types of heat pump can provide cooling – solar powered cooling in summer is very efficient.

9. Energy Saving Recommendations - Equipment

In addition to having a revised heating strategy there are also a number of other measures that can be taken to reduce the amount of energy used within the church.

9.1 Fixed Water Heater: Insulation and Timer Control

A Heatrae Sadia Megaflow 200 litre water heater is located in the kitchen, which feeds 2 taps in the kitchen and four in the adjacent toilets. This appears to be turned on all the time. Whilst the tank itself is well insulated, the copper pipework is not and is a constant source of heat loss of around 100W (incandescent light bulb) and will waste around 900kWh per year, costing £140.

It is recommended that:

i) The output pipe is lagged
ii) A timer is installed to align water heating ties with building use.

A 24 hour/7 day timeclock should be installed to replace the fused spur switch. An example of such a unit would be a TimeGuard FST77. They should be set up with times to match the times that the building is occupied. This will prevent the standing losses from the unit wasting energy during periods when the building is not occupied.

Such units can be purchased at any electrical wholesaler and fitted by your existing electrician or any NICEIC registered electrical contractor.

10. Energy Saving Recommendations – Building Fabric

10.1 Draught Proof External Doors

This is reported to have been addressed in 2021.

10.2 Secondary Glazing

The Wilson room at the east end of the crypt is cooler than the rest of the basement which results in room hirers increasing the thermostat setting. It is in heavy use for 3 to 6 hours daily.

The room is single glazed, with deep angled window reveals. Condensation and mould growth has occurred at these locations – being the coolest point of the room.

It is recommended that secondary glazing is installed fitting into the parallel (12cm deep) section of wall, with trickle vents provided.#

10.3 Purchase a Dehumidifier

Secondary glazing will serve to increase temperature in the room (so moisture is less likely to condense) but will not lower the moisture content. It is recommended that a domestic sized dehumidifier is purchased and used in this room, which has a relatively low ceiling so is of suitable volume. This will work best with the windows closed and a high temperature. The other method of moisture management is to open the windows fully for long periods which then incurs greater heating costs and does not guarantee removal of moisture when the weather is very wet.

A model which can be easily connected to a permanent drain to the outside is recommended, as a domestic model is likely to require daily emptying given the level of use of the room.

11. Saving Recommendations (Water)

11.1 Tap Flow Regulators

The building is in regular and heavy use including by young children and would benefit from installation of flow regulators. One supplier is Neoperl. These can be fitted by any good facilities staff.

12. Renewable Energy Potential

The potential for the generation of renewable energy on site has been reviewed and the viability noted.

Renewable Energy Type	Viable
Solar PV	Already Installed
Battery Storage	Future potential
Wind	No – no suitable land away from buildings
Micro-Hydro	No – no water course
Solar Thermal	No – insufficient hot water need
Biomass	No –urban air quality issues
Air Source Heat Pump	Yes for crypt
Ground Source Heat Pump	Possible for crypt
Air to Air Source Heat Pump	Other solutions are preferrable

13. Funding Sources

There are a variety of charitable grants for churches undertaking works and a comprehensive list of available grants is available at www.parishresources.org.uk/resources-for-treasurers/funding/

This includes a 77 page guide to funders and their criteria:

https://www.parishresources.org.uk/wp-content/uploads/Charitable-Grants-for-Churches-Jan-2020.pdf .

14. Faculty Requirements

It must be noted that all works intended to be undertaken should be discussed with the DAC at the Diocese.

Throughout this report we have indicated our view on what category of permission may be needed to undertake the work. This is for guidance only and must be checked prior to proceeding as views of different DACs can differ.

Under the new faculty rules;

List A is for more minor work which can be undertaken without the need for consultation and would include changing of light bulbs within existing fittings, repair and maintenance works to heating and electrical systems and repairs to the building which do not affect the historic fabric.

List B is for works which can be undertaken without a faculty but must be consulted on with permission sought from the Archdeacon through the DAC. This includes works of adaptation (but not substantial addition or replacement) of heating and electrical systems and also the replacement of existing boilers so long at the same pipe work, fuel source and flues are used. It can also be used to replace heating controls.

All other works will be subject to a full faculty.

Works which affect the external appearance of the church will also require planning permission (but not listed building consent) from the local authority and this will be required for items such as PV installations.