



Energy Audit Report for Holy Angels Church and Church Hall



Site Address	Holy Angels Church and Church Hall, Salford, M6 7QD
Church Code	624144
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1 Executive Summary

An energy survey of Holy Angels Church and Church Hall, Salford, M6 7QD 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. This audit has been provided in conjunction with 2buy2, the Church of England's Parish Buying scheme provider.

This energy audit has been undertaken by a suitably qualified and experienced energy auditor. Benefits of implementing the opportunities identified in this Report include a reduction in energy costs in the first instance, but could also reduce other costs, increase staff awareness and engagement, and improve comfort and staff satisfaction in the workplace.

The Church has a number of ways in which it can be 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 Measure	Annual Energy Savings (kWh)	Annual Cost Savings (£)	Estimated Capital Cost	Payback Period (Years)	Annual Carbon Savings (Tonnes CO _{2e})
Install insulating lagging on existing Ideal boiler pipework	1,603	£62	£100	1.6	0.3
Church – replace 58W fluorescent with 22W LED alternatives.	131	£19	£20	1.1	<0.1
Church - replace 50W fluorescent lamps with 7.5W LED alternatives.	387	£57	£50	0.9	0.1
WCs – replace 70W fluorescent tubes with 22W LED alternatives.	524	£77	£60	0.8	0.2
Entrance/Corridors – replace 25W fluorescent spotlights with 3.5W LED alternatives.	78	£11	£10	0.9	<0.1
TOTALS	2,723	£226	£240	1.1	0.7

The headline messages from the audit are:

- ▲ £240 investment in energy reduction measures would achieve an estimated annual saving of 2,723kWh (combined electric and gas).
- ▲ Based on current electricity and gas tariffs, this would result in an annual financial saving of £226.
- ▲ The simple payback period on this investment is 1.1 years.

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

2 Church Information

A site survey was undertaken by Tim Mawby on Wednesday 4th December 2019. The survey was non-invasive (visual only) and entailed a general walk throughout the church areas, including back of house spaces and plant rooms.

Photograph 1: Holy Angels Church External View



General Information	
Site Address	Holy Angels Church and Church Hall, Salford, M6 7QD
Listed Status	Not Listed
Building Age	Built in 1997
Floor Area	Approximately 475m ²
Usage	Typically 35 hours per week

3 Energy Procurement Review

Energy bills for gas and electricity have been supplied and have been reviewed against the current market rates for energy.

3.1 Electricity

Day Rate	14.67 p/kWh
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3.2 Gas

Rate	3.89 p/kWh
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The review has highlighted that there may be opportunities to gain environmental benefits from improved procurement of the energy supplies at this site.

We would therefore recommend that the Church obtains a quotation for its gas and electricity supplies from the CofE Parish Buying scheme (<https://www.parishbuying.org.uk/categories/energy/energy-basket>). This scheme only offers renewably sourced energy and therefore it is an important part of the process of making Churches more sustainable.

4 Energy Usage Details

4.1 Cost & Consumption

Energy Type	Annual kWh
Gas	83,585
Electricity	4,726

If not already in place, it is recommended that the Church consider asking their suppliers to install smart meters so that the usage can be monitored more closely, and the patterns of usage reviewed against the times the building is in use.

4.2 Energy Benchmarking (Based on CofE Shrinking the Footprint – Energy)

Energy Type	Size (Sqm)	Benchmark Energy Use (kWh/Sqm)	Actual Energy Use (kWh/Sqm)	Variance from Benchmark (%)
Gas	475	105	175	66%
Electricity	475	20	10	-50%

The Church is using less Electricity than expected. The Church is using more Gas than expected.

5 Building Performance and Opportunities

The building is well run with proactive onsite team in terms of energy conversation with some areas of improvement already being identified. The following sections will highlight where further improvements could potentially be made.

5.1 Building Envelope

From visual inspection, the building envelope appears to be in a reasonable state of repair. Due to the brick construction, it is unclear whether cavity wall and/or roof insulation are present.

5.2 Heating System – Boilers

Heating is provided to the church via 2no. gas combination boilers. A Main Combi 25-Eco boiler is located in the loft plant room and serves the church areas, whilst an Ideal Independent+ C30 combination boiler located in a ground-floor storage cupboard serves the hall and kitchen areas. The boilers' heating schedule is currently programmed to be active during the hours of 7am-9am and 5pm-7pm every day. Control panels are located throughout the church and hall, allowing for manual overrides so that the system can be switched on outside of the programmed hours, as well as the changing of the temperature set point. It is unclear how old the boilers on-site are, however during the site visit it was noted that both are well maintained and in good condition.

While the boilers appear to be in good order, and are not at the end of their expected lifetime the client may wish to explore the possibility of installing an air source heat pump heating system in order to move towards the goal of decarbonising energy consumption.

Photographs 2 & 3: Church Boilers



5.3 Heating System – Pipework and Distribution

The Main boiler's heating pipework is in general good repair, with insulating lagging in good condition. However, the Ideal boiler's heating pipework is entirely exposed. It is recommended that insulating lagging is fitted to this boiler's pipework to reduce heat loss into the storage cupboard.

Photographs 3 & 4: Heating Pipework



5.4 Heating System – Heat Emitters

Heating to the church is served via 3no. iron radiators. There are an additional 8no. radiators in the church hall. These radiators are supplied by heating pipes fixed to the walls.

A range of portable plug-in heaters are also present throughout the building and are used to provide additional heating to the smaller rooms when required. This can be an ineffective, inefficient and poorly controlled means of providing space heating, and can easily be left on when unoccupied. It is recommended that a more permanent heating solution be provided to these spaces if and when heating upgrades are undertaken.

Photographs 4 & 5: Church Heat Emitters



5.5 Hot Water System

Hot water is provided to the building via the 2no. gas combination boilers. There is also a Quest electric point of use water heater located in the kitchen. Hot water consumption is considered to be minimal

Photographs 6: Electric Point of Use Water Heater



5.6 Lighting

There is no lighting control system, motion detectors or daylight dimming controls. All light fittings are controlled via manual on/off switches.

The range of light fittings throughout the church areas are detailed below:

Church

- ▲ 2no. 58W T8 fluorescent tubes – recommended to be replaced with 22W LED alternatives.
- ▲ 5no. 50W fluorescent lamps (photograph 7) – recommended to be replaced with 7.5W LED alternatives.
- ▲ 8no. LED uplights (photograph 8).
- ▲ 4no. LED spotlights (photograph 9).

Photographs 7, 8 & 9: Church Light Fittings



Hall

- ▲ 8no. LED 1.2m panels, consisting of 4no. LED tubes.

Photograph 10: LED Panel



Meeting Room

- ▲ 4no. LED 1.2m panels, consisting of 4no. LED tubes.

Vestry

- ▲ 1no. twin LED 1.2m tube.

Photograph 11: LED Tube



Kitchen

- ▲ 1no. twin LED 1.2m tube.

Kitchenette

- ▲ 1no. twin LED 1.2m tube.

WCs

- ▲ 6no. 70W T8 fluorescent tubes – recommended to be replaced with 22W LED alternatives.

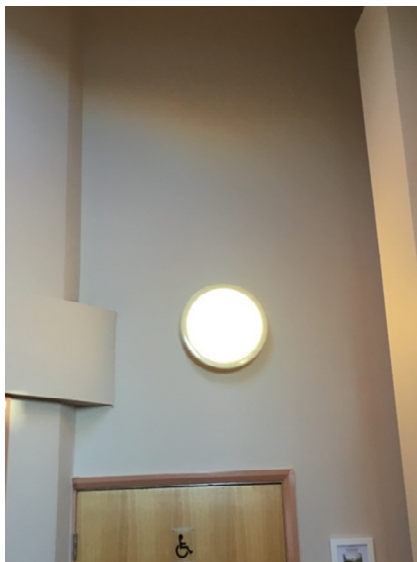
Photograph 12: LED Tube



Entrance/Corridors

- ▲ 3no. LED 1.2m panels, consisting of 4no. LED tubes.
- ▲ 4no. circular LED lamps.
- ▲ 2no. 25W fluorescent spotlights – recommended to be replaced with 3.5W LED alternatives.

Photographs 13 & 14: Circular LED Lamps & Fluorescent Spotlights



5.7 Renewables

There are currently no renewables on-site. A free desktop survey can be carried out by a specialist solar installer to identify the possibility of installing solar PV panels.

6 Potential Saving Opportunities

As part of the assessment, we carry out a close inspection of M&E plant and their associated controls, with the aim of identifying any issues that have significant impact on energy consumption and correct building operation. We have reviewed the building and associated HVAC and lighting operations and identified the following potential energy conservation opportunities (ECOs), which should be investigated:

Category	Actions	Potential Annual Savings			Investment (£)	Simple payback (yrs.)
		Elec/Gas (kWh)	Cost (£)	(tCO ₂)		
Heating	Install insulating lagging on boiler pipework (estimated 3% saving)	1,603	£62	0.3	£100	1.6
Lighting	Church – replace 58W fluorescent with 22W LED alternatives.	131	£19	<0.1	£20	1.1
Lighting	Church - replace 50W fluorescent lamps with 7.5W LED alternatives.	387	£57	0.1	£50	0.9
Lighting	WCs – replace 70W fluorescent tubes with 22W LED alternatives.	524	£77	0.2	£60	0.8
Lighting	Lobby - replace 25W fluorescent spotlights with 3.5W LED alternatives.	78	£11	<0.1	£10	0.9
TOTAL ELECTRICITY SAVINGS		1,120	£164	0.4	£140	0.9
TOTAL GAS SAVINGS		1,603	£62	0.3	£100	1.6
GRAND TOTAL		2,723	£226	0.7	£240	1.1

7 Assumptions

7.1 Assumptions

- ▲ Costs excludes labour, installation and access which will require the confirmation of a specialist contractor.
- ▲ Average cost of electricity at 14.67p/kWh.
- ▲ Average cost of gas at 3.89p/kWh.
- ▲ Electricity carbon emission rate of 0.31598 kgCO₂/kWh.
- ▲ Natural Gas carbon emission rate of 0.20776 kgCO₂/kWh.

7.2 Economic Life

CIBSE Guide M Appendix 12.A1 gives the economic life of plant common plant items. After this time the maintenance and repair make it economic to replace the asset. There will be energy savings inherent in the new equipment and the need to meet the minimum requirements of the Building Regulations. Some capital plant has long payback periods, when based on energy efficiency alone, but these should be part of an asset replacement programme with only the 'additional' cost of higher than minimum required energy standards being used to calculate ROI.

7.3 Implementation

Reviews of Energy Projects and Initiatives are designed to provide a high-level indication of options available clients and will not constitute a recommendation for implementation. Pricing and potential savings are indicative values and will not constitute an offer.

7.4 Cumulative Savings and Double Counting

It should be noted that further investigation may rule out some measures as impractical, either physically or financially. Some measures are mutually exclusive and provide diminishing returns if implemented together. For example, if the lighting load is reduced through more efficient lighting, there will be an increase in the heat demand on boilers, as the new lights generate less heat.

Each energy conservation measure is assessed independently at this stage so that they can be fairly compared. An assessment of any overlap will be undertaken once any projects are selected for implementation.

8 Funding Sources

There are a variety of charitable grants for Churches undertaking works and a comprehensive list of available grants is available at:

<https://www.parishresources.org.uk/wp-content/uploads/Charitable-Grants-for-Churches-Nov-2019.pdf>

9 Faculty Requirements

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

Minor works 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.

Major 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 as 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,

10 Limitations

The recommendations contained in this Report represent ESOS Energy's professional opinions, based upon the information listed in the Report, exercising the duty of care required of an experienced Sustainability Consultant.

ESOS Energy obtained, reviewed and evaluated information in preparing this Report from the Client and others. ESOS Energy conclusions, opinions and recommendations has been determined using this information. ESOS Energy does not warrant the accuracy of the information provided to it and will not be responsible for any opinions which ESOS Energy has expressed, or conclusions which it has reached in reliance upon information which is subsequently proven to be inaccurate.

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