ESOS-ENERGY
Energy efficient solutions

Energy Efficiency and Zero Carbon Advice

St Mary's Church
PCC of St Mary's Trentham

DIOCESE OF LICHFIELD

Author	Reviewer	Date	Version
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Contents

1. Executive Summary

An energy survey of St Mary's Church was undertaken by ESOS Energy 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 and is subsidised from Total Gas & Power, the Parish Buying schemes principal energy suppliers.

St Mary's Church was built in 1844 by Sir Charles Barry of coursed stone and incorporates Norman arcades with late C12 capitals and medieval shafts. The church is now Grade II* listed and is located in a largely rural area near Trentham Hall and gardens. The church has stained glass and single glazed windows in stone surrounds and a pitched tiled ceiling for the most part with exposed ceilings internally. There is a good modern draught lobby to the main North porch and the South door is rarely used. The church makes use of flexible seating throughout. There is both gas and electricity supplied to the site.

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 and the route to net zero carbon are 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)
Insulate exposed pipework and fittings in plantrooms	3,796	£380	£250	0.66	List A (None)	0.70
Fit timed fused spurs to hot water heaters	162	£49	£90	1.85	List A (None)	0.04
Fit flow regulators onto existing taps	70	£7	£15	2.15	List A (None)	0.01
Install a Solar PV array to roof of building (assumed 100% of energy generated used in building)	5,468	£1,640	£10,791	6.58	Faculty	1.38
Change existing lighting for low energy lamps/fittings	2,272	£682	£4,757	6.98	Faculty	0.58
Install PIR motion sensors on selected lighting circuits	27	£8	£101	12.66	List B	0.01
Install an Air to Air Source Heat Pump into the building to replace existing heating system	52,653	£752	£67,200	89.34	Faculty	8.17

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

Based on current market prices of 30p/kWh and 10p/kWh for electricity and mains gas respectively.

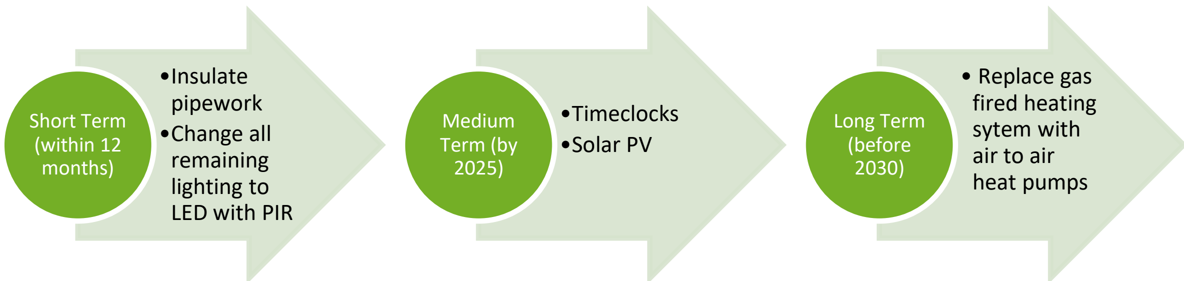
If all measures were implemented this would save the church £3,517 per year and reduce its carbon footprint by 10.89 tonnes (72%).

2. The Route to Net Zero Carbon

Our Government has committed to move towards Net Zero Carbon – the point at which we have reduced emissions as much as we can and then balanced any residual emissions through removal of carbon from the atmosphere. They have done this as part of a worldwide agreement which aims to limit global warming to well under 2 degrees Celsius, with an aim of keeping it below 1.5 degrees Celsius. This will help protect all of us from the impacts of climate change.

In February 2020, the Church of England's General Synod set its own Net Zero Carbon target. The first stage of this target covers energy used by churches, cathedrals, schools, vicarages, other church buildings, as well as emissions caused by reimbursed transport. The target date is 2030.

This church has a clear route to become net zero by 2030 by undertaking the following steps:



3. Introduction

This report is provided to the PCC of St Mary's Church 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 and seek to improve 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, Park Drive, off Whitmore Road, Trentham, Stoke on Trent ST4 8AB was completed on the 9th June 2022 by David Legge. David is an experienced energy auditor with over 10 years' experience in sustainability and energy matters in the built environment. David is a fully qualified ESOS lead assessor with CIBSE and a CIBSE Low Carbon Consultant and a fully qualified ISO50001 lead auditor.

St Mary's Church	
Church Code	620425
Gross Internal Floor Area	617 m^2
Listed Status	Grade II*

The church typically used for 16 hours per week for the following activities

Type of Use	**Hours Per Week (Typical)**	**Average Number of Attendees**
Services	8 hours per week	70
Meetings and Church Groups	Ad hoc use only	Varies
Community Use	8 hour per week	Varies

There is additional usage over and above these times for festivals, weddings, funerals and the like

4. Energy Usage Details

St Mary's Church uses 10,415 kWh/year of electricity, costing in the region of £3,125 per year, and 10,250 kWh/year of gas, costing £1,025. The total carbon emissions associated with this energy use are 4.53 CO_2e tonnes/year.

This data has been taken from the annual energy invoices provided by the suppliers of the site. St Mary's Church has one main electricity meter, serial number E16UP18583. There is one gas meter serving the site.

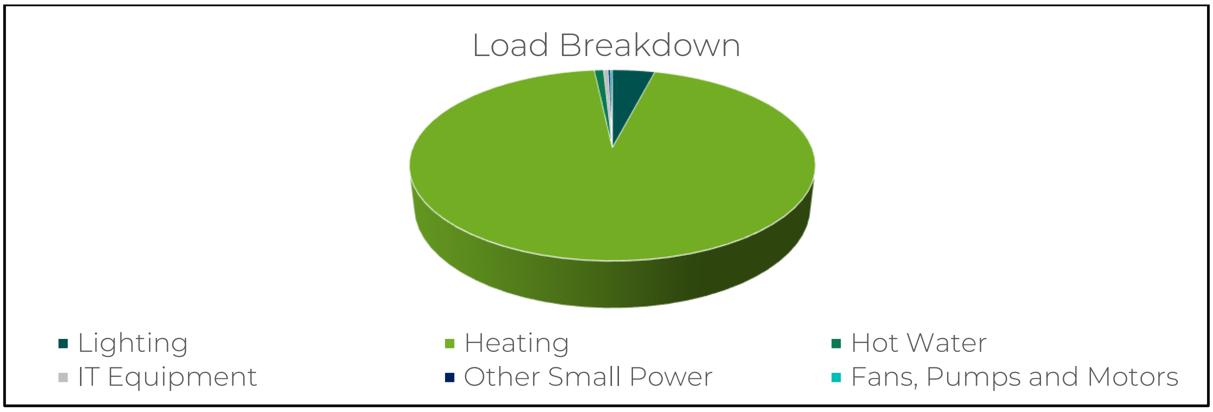
Utility	Meter Serial	Type	Pulsed output	Location
Electricity	E16UP18583	3 phase 100A	Yes, but not fully AMR connected	NW corner cupboard

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 used.

4.1 Energy Profiling

The main energy consuming plant can be summarised as follows:

Service	Description	Estimated Proportion of Usage
Lighting	A wide variety of lamps and fittings, including some LED, inefficient T8 fluorescent tubes, GU10 spotlights, SON floodlights and halogen spotlights.	4%
Heating	A gas fired Remeha boiler providing heating to perimeter radiators as well as oversized pipework in trenches	94%
Hot Water	Provided to all areas by electric point of use water heaters	1%
Other Small Power	Sound and security systems, organ power, and other plug in loads	<1%
IT Equipment	Copier/printer and computer workstation	<1%
Pumps and Motors	Heating circulation pump	<1%



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 load is lighting.

4.2 Energy Benchmarking

In comparison to national benchmarks for church energy use St Mary's Church uses 63% less electricity and 19% less heating energy than would be expected for a church of this size.

	Size (m^2 GIA)	Annual Energy Usage (kWh)	Actual kWh/m^2	Benchmark kWh/m^2	Variance from Benchmark
St Mary's Church (elec)	617	4,594	7.45	20.00	-63%
St Mary's Church (gas)	617	75,219	121.91	150.00	-19%
TOTAL	617	79,813	129.36	170.00	-24%

5. Efficient / Low Carbon Heating Strategy

The energy used for heating a church typically makes up around 80% to 90% of the overall energy consumption. Putting in place a heating strategy that is energy efficient and low carbon is, therefore, of the highest priority

The Church of England is in the process of reviewing its heating guidelines. The process has already established some principles for heating that can help churches as they seek an acceptable combination of comfort, conservation, affordability, and environmental care. The principles can be found at https://www.churchofengland.org/sites/default/files/2020-04/CBC%20Heating%20guidance%20principles%20FINAL%20issued.pdf

As the principles make clear, every church's strategy will be unique to it, informed by many factors, including the nature of its usage, the system it's starting from, the conservation needs of the building, and the resources available. The strategies in this audit are designed specifically for your church.

Our recommendations on heating generally fall within three major areas. Firstly, for all churches we make recommendations that will help to reduce energy wastage and, as a starting point, to optimise the system that you already have

Secondly, we recommend options for many churches that focus on heating people rather than the full volume of the church. Some of the changes that can help with this will be 'soft' changes – others will relate to the heating system itself.

Finally, we make recommendations about moving away from fossil fuels. Moves away from fossil fuels are key to cutting emissions. For most churches, this will involve moving from gas, oil or LPG to electricity. Electricity currently creates carbon emissions around the same level as mains gas, but the carbon emissions associated with it are reducing rapidly as the UK builds more renewable energy and decommissions its remaining oil and 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'. Some local areas may also be considering the option of district heating networks.

While moving away from fossil fuels may not always be possible, as the principles state, "churches should be expected to have at least carefully considered the option of moving away from fossil-fuel based heating (gas and oil boilers) towards electric-based heating." And if such options are not viable now, the churches "can try to be ready for a future retro-fit when technology and the grid has progressed."

The church is currently heated by a gas fired boiler which was installed in 2017 and appears to have a further 15 years serviceable life before requiring replacement with any of the proposed options herein. The boilers provide heating to low level radiators around the perimeter of the church, including to the altar and chancel. In addition, there is oversized and exposed pipework within trenches which contributes to the heating of the church.

The church makes use of flexible seating throughout the nave and side aisles, despite the neighbouring church hall offering a flexible space, and there are no choir stalls.

The church is sporadically throughout the week for services on Sunday and Wednesday mornings and the typical congregation size is 70 for the 11am eucharist. The heating is set to come on several hours earlier in the winter to ensure the church is warm for this service.

The various options for a decarbonised heating solution have been reviewed in the table below.

Decarbonisation Heating Solution	Viable
Air to Water Source Heat Pump	No – unsuited to current heating pipework and heat emitters
High Temperature Air to Water Source Heat Pump	Yes – this would work with the existing radiators in the same way as a gas boiler
Air to Air Source Heat Pump	Yes – this would be the preferred heating solution for the church
Water Source Heat Pump	No – no water source locally, River Trent is too far away
Ground Source Heat Pump	No – significant archaeology
Under Pew Electric Heating Panels	No – no fixed pews
Electric Panel Heaters (to provide supplemental heating only)	No – not required
Over Door Air Heater (to provide a supplemental warm welcome at the door only)	No – architecture around door would not permit unit to be fixed
Overhead Infra-Red Heaters	No – visual intrusion to the church would do harm, least preferred heating source due to comfort
Heated Chair Cushions	No – other solutions preferred

5.1 High Temperature Air to Water Source Heat Pumps

Air-to-Water Source Heat Pumps (AWSHPs) work by having an external unit which sucks air in and extracts the heat from it. It concentrates this heat and puts it directly into water that can then flow through the heating system. They work most efficiently when trying to produce water temperatures in the heating system between 40°C and 50°C. They tend to warm up slowly and steadily and are therefore well suited to situations where the heating is required for long periods of the day, and with heating systems that have a low temperature requirement such as underfloor heating systems.

However, a high temperature AWSHP essentially provides a two-stage approach where the first stage raises the water temperature to between 40°C and 50°C as detailed above and the second stage applies the same process to raise this again to a flow temperature of between 70°C and 80°C, which is the same flow temperature as the gas boiler system will be designed to provide. High temperature AWSHPs will provide around 2.5-2.8 units of heat for every 1 unit of electricity used in the heat pump; they therefore have a Coefficient of Performance (CoP) of 2.5 to 2.8.

AWSHPs require the installation of external units, which look like air conditioning modules in well ventilated external locations. These external units will need an electricity supply and pipework running from them to the heating system. They will also need a drain nearby as the back of the units can build up moisture, which condenses and sometimes freezes on the coils. The larger units do create some low-level noise and therefore the location and baffling of the units may need to be considered carefully.

5.2 Air to Air Source Heat Pumps

Air-to-Air Source Heat Pumps (AASHP) work by having an external unit which sucks air in and extracts the heat from it. The pumps concentrate this heat and put it into a refrigeration gas (in the same way as a fridge or freezer works). This refrigeration gas is then piped inside the building in a small pipe where is it then allowed to expand in an internal unit with a fan. This heat is then blown out into the space. This system is identical to an air conditioning system, but it works in reverse to heat the space. As warm air is blown into the space this type of system can heat spaces from cold relatively quickly. Air-to-Air Source Heat Pumps provide around 4.5 units of heat for every 1 unit of electricity used in the heat pump; they therefore have a Coefficient of Performance (CoP) of 4.5.

The Centre for Sustainable Energy model[1] 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 m^3	Insulation Factor kW/m^3	Heat Required (Space heating) kW
Church	617	0.033	102

Therefore, a heat pump of 100 kW would be required.

AASHPs require the installation of external units which look like air conditioning modules in well ventilated external locations. These external units will need an electricity supply and pipework running from them to the heating system. They will also need a drain nearby as the back of the units can build up moisture, which condenses and sometimes freezes on the coils. The larger

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

units do create some low-level noise and therefore the location and baffling of the units may need to be considered carefully.

Examples of external units for ASHP comprising of three smaller 3kW units and two larger 10kW units.

Internal units come in a variety of styles. The most appropriate internal units for most churches are floor mounted units which look very similar to a fan convector heater.

FUA-A - Under ceiling cassette air conditioning unit

Unique under ceiling cassettes for high rooms with solid ceilings or false ceilings with a shallow void. Suitable for all types of commercial applications.

The FUA-A range provides comfortable heating and cooling even for rooms with high ceilings and has individual louvre control flexibility to suit every room layout.

FTXM-R - Wall mount air conditioning unit

Attractive, wall mounted design with perfect indoor air quality. 2 area motion detection sensor: air flow is sent to a zone other than where the person is located at that moment; if no people are detected, the unit will automatically switch over to the energy-efficient setting.

FVXM - Floor Mount Air Conditioning Unit

Designed to fit rooms of any size and shape, it blends well with the interior due to the new design which incorporates more flowing lines and softer edges. These units are ideal when it is not possible to fit a high level wall mount unit for aesthetic or practical reasons.

They are suitable for a wide range of applications including domestic, small to medium offices and commercial uses.

All these units do have a fan element within them and therefore a small amount of fan noise is emitted. This tends to be less than a fan convector heater on a boiler-based system and similar to the noise from a fridge or freezer. Air conditioning units are commonplace in hotel rooms, indicating that the noise is low enough even to be suitable for sleeping environments.

A case study of a church which has installed such a solution is available at 5. Air-source heat pumps at Hethel Church - All Saints Church, Hethel - A Church Near You

6. Energy Saving Recommendations

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

6.1 New LED Lighting

The lighting makes up a relatively large overall energy proportion of the electricity used within the church. There are some areas of the building which have had efficient LED lights installed but there still remains a large number of inefficient fluorescent, halogen and SON fittings within the church.

It is recommended that the fittings scheduled in Appendix 1 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. An example of such a range of fittings is available from http://www.qvisled.com/

If all the lights were changed on a simple "like for like" the total capital cost (supplied and fitted) would be £4,757. The annual cost saving would be £682 resulting in a payback of around 7 years. This estimate includes for the supply of the lights, the labour to install them and the access required. It does not include for any upgrade to the wiring or a new lighting design both of which the church may wish to consider. Guidance on lighting, produced by Historic England for churches, can be found at https://historicengland.org.uk/advice/caring-for-heritage/places-of-worship/making-changes-to-your-place-of-worship/advice-by-topic/lighting/

There are some fittings such as the GU10 and PAR38 spotlights where the existing fitting can be made more efficient by simply changing the bulb/lamp within the existing fitting to a new LED bulb/lamp. This could be carried out by competent members of the churches internal team, very cost effectively and would be a List A item so no permissions would be required.

6.2 Lighting Controls (Internal)

There are several lights which currently remain on all the time in areas such as toilet and corridor areas and the like. Some of these areas are only used occasionally and for a short amount of time so that, in actuality, the light does not need to remain on constantly. There are also spaces which benefit from a good amount of natural daylight coming in through the windows, such that artificial lighting is not required for much use during the year.

It is recommended that a motion sensor is installed on these specific lighting circuits so that the lights come on only when movement is detected in the space and turn off approximately two to five minutes after the last movement has been detected (note that the duration of the time lag after which the light goes off needs to be considered alongside the type of light that is fitted. LED lights are much more suited to being switched off after only a short duration than some fluorescent lights). These movement sensors, commonly called PIRs, also have light sensors integrated into them so they can be used to make sure that the light does not come on if there is already sufficient daylight in the space.

Your existing electrician or any NICEIC registered electrical contractor can install PIR sensors onto existing lighting circuits. This can be carried out without significant disruption to the use of the space.

6.3 Insulation of Pipework and Fittings

The pipework within the boiler room has the majority of its straight lengths insulated, but the more complex shaped pipework fittings, such as 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 Adrian Newton 0117 930 9689, adrian@esos-energy.com).

6.4 Timers on Fuse Spurs to Water Heaters

There are a number of electric point of use water heaters in the WCs and kitchenette to provide hot water for hand washing. This only needs to heat the water to the required temperature when the building is in occupation but at the moment this heater is directly wired in without any form of time control and therefore maintains it set temperature 24/7.

It is recommended that the heaters are fitted with a 24 hour/7 day timeclock 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.

7. Saving Recommendations (Water)

7.1 Tap Flow Regulators

The taps to the wash hand basins within the building have been checked as part of the audit and the average flow rate within these has been measured to be 8l/min. The recommended flow rate for hand washing is 4.8l/min and therefore the taps are providing around double the amount of water that is necessary.

The overprovision of water for hand washing is not only a source of excessive water use, but in the case of hot water, it is also a source of wasted energy in the heating that has to go into providing the hot water.

The flow rate of the taps can be easily regulated by fitting flow regulators within the taps. It is recommended that flow regulators are fitted into all the viable hand wash basin taps to save on both water and heating of the hot water.

These regulators can be self-installed or by any good facilities staff or it can be installed by anyone with competent DIY skills.

8. 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	Yes –demand from church and hall, South aisle roof has limited visibility
Wind	No – no suitable land away from buildings
Battery Storage	No – no viable PV
Micro-Hydro	No – no water course
Solar Thermal	No – insufficient hot water need
Biomass	No – not enough heating load as well as air quality issues
Air Source Heat Pump	No – insufficient electricity supply
Ground Source Heat Pump	No – archaeology in ground and radiator system

Now that the Feed in Tariff scheme has come to an end the installation of solar PV panels in situations where there is not almost full usage of the electricity generated on site is not really viable.

There is potential for a small PV array on the roof of the South Aisle. The current arrangements around solar panels mean that to be financially viable the building on which they are mounted needs to consume the vast majority of the energy that they produce.

There is a reasonable base load for electricity between the church and hall, which are directly connected with one electricity meter, which could be met in part by solar PV panels so an installation should be investigated further and would typically pay back in 6 to 10 years. The roof appears sound and in good condition and capable of taking panels with no shading issues. This could be installed in conjunction with battery storage.

Whilst battery storage is not strictly a renewable energy solution, it does provide a means of storing energy generated from solar PV on site to be able to be used at peak times or later into the day when the PV is no longer generating. It therefore extends the usefulness of any PV system and should be considered if a PV array were to be installed.

Fully detailed PV design and calculations and quotation can be obtained from Batchelor Electrical; contact John Fisher on 01202 266208.

Battery Storage is not strictly a renewable energy solution, but battery storage does however provide a means of storing energy generated from solar PV on site to be able to be used at peak times or later into the day when the PV is no longer generating. It therefore extends the usefulness of the existing PV system particularly in this sort of church. This is a new but fast-growing technology with prices expected to fall substantial over the next 2 to 3 years.

Wind turbines require highly exposed sites and should be located 250m way from buildings as such this site is not suitable for a wind turbine to be installed.

Hydro electricity is a highly efficient source of renewable energy but requires a body of flowing water with a differential height which is not present on this site.

Solar thermal installations are best suited to heat water for use in washing up, hand washing and bathing. There is minimal hot water demand at this church so such an installation would not be viable.

Heat Pumps are a low carbon method of creating heat, there use and suitability for this church have been review in the section earlier on in this report on Efficient and Low Carbon Heating Strategies.

Biomass is an alternative boiler and fuel to oil or gas. It requires wood chips or pellets to be delivered on site, stored and then fed into a large boiler for burning. While the fuel is not a fossil fuel there are emissions from the burning of wood and these can be detrimental to local air quality particularly in more built up areas for all these reasons it is not considered a viable recommendation for this site.

9. Funding Sources

There are a variety of charitable grants for churches undertaking works and a comprehensive list of available grants is available on this Parish Resources page: https://www.parishresources.org.uk/resources-for-treasurers/funding/

10. 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.

11. Offsetting

As you take action to reduce your emissions, you may also wish to offset those that you cannot yet reduce. If you would like to engage in offsetting, it is important to use a reputable scheme. The Church of England recommends Climate Stewards, which has a simple calculator that can help you to work out how much you would need to offset. https://www.climatestewards.org/

Climate Stewards encourages people to 'reduce what you can and offset the rest' as part of your journey to Net Zero carbon emissions. They provide training and resources to help you understand climate change and its impacts, and to calculate the carbon footprint from your activities including travel, energy, expenditure, and food. Their online carbon calculators for individuals and smaller organisations are free to use, and they provide bespoke carbon footprint audits for larger organisations.

Having reduced as much of your organisation's carbon footprint as you can, there will always be unavoidable emissions from your work and travel. Carbon offsetting allows you to compensate for the negative impact of your carbon emissions by funding projects which take an equivalent amount of CO_2 out of the atmosphere. These either involve locking up ('sequestrating') CO_2 as trees grow, or reducing emissions by using low-carbon technology such as fuel-efficient cookstoves or water filters.

Climate Stewards has a close relationship with all their project partners in Ghana, Uganda, Kenya, Tanzania, Nepal and Peru. They work closely with them to design, develop, implement and monitor projects which will not only mitigate carbon, but also bring tangible benefits to the local community - including improved health, savings in time and money previously spent on buying or collecting fuel, and improvements in local biodiversity. Each project is assessed using their Seal of Approval protocol which enables us to assess and monitor carbon mitigation and ensure robust, sustainable and transparent partnerships.

Appendix 1 – Schedule of Lighting to be Replaced or Upgraded

Room/Location	Number of Fittings	Recommended Upgrade	Annual Saving (£)	Total Cost (£)	Payback
Graham Vestry	4	4ft Single LED	£45	£286	6.40
Graham Vestry	8	R63 LED	£133	£172	1.29
Narthex	3	Virgo 15W (190mm dia)	£23	£139	5.99
Balcony stairs	1	2D LED 11W	£4	£59	16.09
Balcony	4	GU10 LED	£36	£250	7.03
Balcony	2	R63 LED	£11	£43	3.98
Ceiling uplighters	4	50W LED Flood	£22	£480	22.01
Chancel	2	AR111 LED	£25	£85	3.38
Chancel	9	5ft Single LED	£87	£790	9.07
Chancel	4	PAR38 LED	£86	£68	0.79
Lady chapel	2	GU10 LED	£18	£125	7.03
Nave	6	GU10 LED	£53	£376	7.03
WC	1	2D LED 11W	£4	£59	16.09
Kitchenette	3	5ft Single LED	£29	£263	9.07
Outer office	2	5ft Single LED	£9	£176	18.75
Inner office	1	5ft Single Proteus LED	£26	£127	4.96
Corridor	1	5ft Single LED	£5	£88	18.75
Entrance porch	1	5ft Single LED	£23	£88	3.84
Boiler room	1	5ft Single LED	£11	£88	7.79
Boiler room	3	LED GLS	£32	£36	1.12