Energy Efficiency and Zero Carbon Advice

All Saints, Marple
PCC of All Saints

Author	Reviewer	Date	Version
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1. Executive Summary

An energy survey of All Saints 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.

All Saints church was completed in 1880, and the attached church hall was built in 1986. The church is built from solid stone, with a pitched tiled roof. The hall is of more modern construction, with cavity walls and a pitched roof. The church and hall are both heated from gas boilers to radiators and fan convector heaters in the church, and a warm air system in the hall. The hot water in the hall is provided by gas fired hot water boilers in the cupboards. The lighting in the church and hall is a mix of SON, LED, fluorescent and halogens. 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)
Consider installing Electric Vehicle Charging Points	0	N/A	£1,500	0.00	Faculty	N/A
Replace glass to high level windows and remove vent fans	23,713	£794	£3,400	4.28	List B	4.38
Insulate on top of suspended ceiling to lounge, link corridor and side rooms of hall	15,809	£530	£2,528	4.77	List B	2.92
Replace gas water heaters with electrical point of use units	27,898	£935	£5,400	5.78	List A (None)	5.15
Install a Solar PV array to roof of central hall (assumed 100% of energy generated used in building)	10,256	£1,487	£15,540	10.45	Faculty	2.60
Inject cavity wall insulation into walls of hall	12,647	£424	£6,665	15.73	List B	2.33

Replace existing church boilers for high efficiency, low NOx condensing boiler	10,780	£361	£8,000	22.15	List A (None)	1.99
Install PIR motion sensors on selected lighting circuits	606	£88	£2,074	23.60	List B	0.15
Change existing lighting for low energy lamps/fittings	7,615	£1,104	£28,772	26.06	Faculty	1.93
Replace heating system for lounge, corridor and side rooms of hall for electrical based heating solution using heating panels in suspended ceiling	21,657	-£385	£9,780	-25.39	Faculty	3.31
Install an Air-to-Air Source Heat Pump into the hall building to replace existing heating system	36,214	-£517	£28,000	-54.12	Faculty	5.62

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

Based on current market prices of 14.5p/kWh and 3.35p/kWh for electricity and mains gas respectively.

If all measures were implemented this would save the church £4,820 per year and reduce its carbon footprint by 30.4 tonnes (80%).

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:

Short Term (within 12 months)

- Replace glass in hall windows and remove vents
- Insulation suspended ceiling in link
- LED Lighting and PIR
- Install electric POU water heaters

Medium Term (by 2025)

- Solar PV panels on roof of hall
- Cavity walls insulation in hall
- Electric heating to lounge, corridor, and side rooms in hall

Long Term (before 2030)

- Replace church boilers for high efficiency gas boilers
- Air to Air Source Heat Pump to hall

3. Introduction

This report is provided to the PCC of All Saints 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 All Saints, 155 Church Lane, Marple, Stockport, SK6 7LD was completed on the 6th October 2021 by Matt Fulford. Matt is a highly experienced energy auditor with over 15 years' experience in sustainability and energy matters in the built environment. He is a chartered surveyor with RICS and a CIBSE Low Carbon Energy Assessor. He is a Member of the DAC in the Diocese of Gloucester and advises hundreds of churches on energy matters.

All Saints	
Church Code	609369
Gross Internal Floor Area	1,191 m^2
Listed Status	Grade II

The church and hall are typically used for 53 hours per week for the following activities

Type of Use	Hours Per Week (Typical)	Average Number of Attendees
Church - Services	8 hours per week	150
Hall - Community Use	45 hours per week	-

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

4. Energy Usage Details

All Saints uses 14,891 kWh/year of electricity, costing in the region of £2,160 per year, and 185,988 kWh/year of gas, costing £6,230. The total carbon emissions associated with this energy use are 38.1 CO_2e tonnes/year.

This data has been taken from the energy footpring tool (EFT) returns for the church. All Saints has one main electricity meter, serial number K93M04021. There is one gas meter serving the site, but this was not accessible.

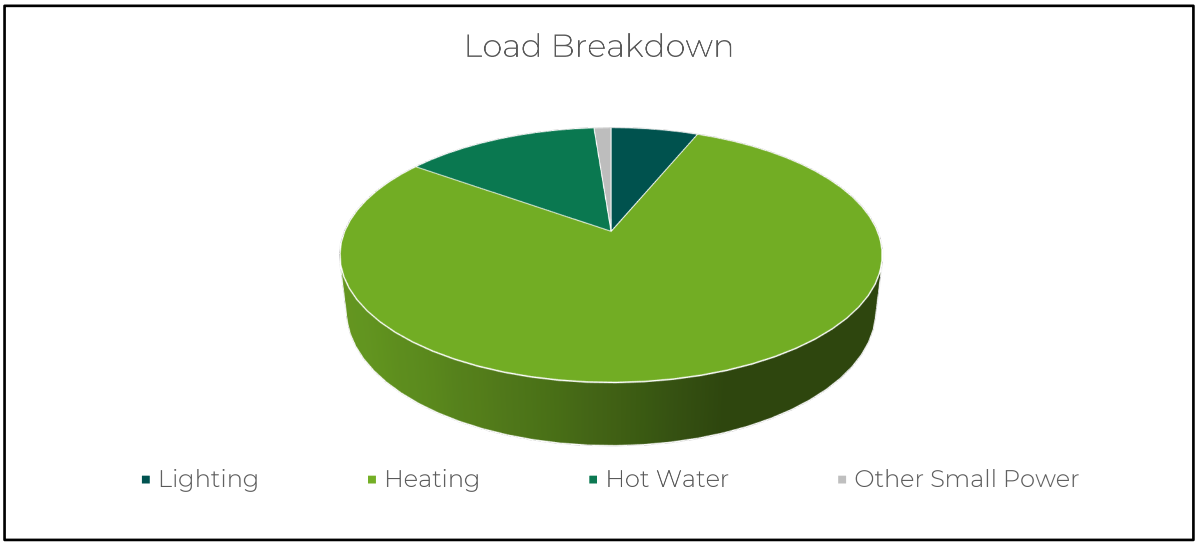
Utility	Meter Serial	Type	Pulsed output	Location
Electricity	K93M04021	Dial	No pulse or AMR	Rear of church
Gas	Not accessed			

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	Mix of lighting types, including halogen, SON, LED and fluorescent lamps	6%
Heating	From gas boilers to radiators in the church and a warm air system in the hall	79%
Hot Water	Gas water heaters	14%
Other Small Power	Organ, kitchen equipment, sound system and the like	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 hot water.

4.2 Energy Benchmarking

In comparison to national benchmarks for church energy use All Saints uses 37% less electricity and 4% more 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
All Saints (elec)	1,191	14,891	12.50	20.00	-37%
All Saints (gas)	1,191	185,988	156.16	150.00	4%
TOTAL	1,191	200,879	168.66	170.00	-1%

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 biogas 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 much less used than the hall which is in regular daily use. The church has been reordered and no longer has any pews. As such it is an open space and currently has fan assisted convector heaters to provide warm air into the space. The lounge space, together with the servery, it due to be reordered and is the location for more regular use.

The open nature of the nave of the church and the presence of operational fan convector heaters makes it difficult to propose a decarbonised solution to this area. It is therefore suggested that the heating solution with the lowest impact (considering both the operation energy usage and the carbon impact of installing new systems) would be to install a new high efficiency gas condensing boiler and connecting it to the existing heating system and using this only when required for services etc. in the nave.

The more frequently used areas of the hall and the lounge would benefit from decarbonised heating solutions, and this would allow the most used areas of the church to operate without carbon emissions.

To the lounge areas of the church and to the corridor and side rooms of the hall, all of which have 600 x 600 suspended ceiling grids, to these areas it is recommended that direct electric heating in the form of heated electric ceiling panels are used.

To the main hall it is recommended that and air to air source heat pump is installed to replace the existing heating system. This operates much like an air conditioning system which heats (as well as cools) and converts electricity in to heat in a very efficient way. It has the secondary advantage of being able to cool which may enable to hall to be used as a place of sanctuary in future extreme heat events.

5.1 Install Electric Panel Heaters

As detailed above, the heating system in the hall could be replaced with an air-to-air source heat pump, however there are other areas in the hall, where a more suitable type of electric heating is recommended. In the Lounge, Corridor and Side Rooms in the hall it is recommended that the PCC consider installing electrical panel heaters on a time delay switch and remove the existing

heating source.

Area	Type/ Size	Length (mm)	Watts	Number Required	Notes
Lounge	Electric Far IR Wall Panel 450W	800	450	6	600 x 600 heating panels located in suspended ceiling
Link corridor	Electric Far IR Wall Panel 450W	800	450	5	600 x 600 heating panels located in suspended ceiling
Side areas of hall	Electric Far IR Wall Panel 450W	800	450	8	600 x 600 heating panels located in suspended ceiling
Side doors to church	Near IR Overhead Heater 2kW	480	2000	2	

Suitable electric panel heaters would be far infrared panels such as https://www.herschel-infrared.co.uk/product/ceiling-tile-heaters/ . These can be purchased widely and fitted by any competent electrician. It is recommended that they are fitted with a time delay switch such as https://www.danlers.co.uk/time-lag-switches/77-products/time-lag-switches/multi-selectable-time-lag-switch/159-tlsw-ms so they cannot be left on accidently after use.

These heaters have a strong radiative effect (where heat is reflected to people from the surface) as well as a light convective effect (where air is warmed and moves around to heat the general space). For this reason, these heaters tend to provide a relatively instant sense of heat and comfort within the space and only need to be on for short periods of time. This reduces the amount of preheating required before each use of the building and can make electric heating cost competitive with gas. It also means that the building can rapidly and economically be brought into used for short or unplanned meetings if needed.

5.2 Replace the Existing Boiler for a High Efficiency Condensing Boiler

The existing gas boiler within the church is now around 30 years old and as such is reaching the end of its serviceable life. Boiler efficiencies have also improved since this boiler was originally installed and therefore replacing the boiler for a new, high efficiency, Low NOx gas condensing boiler will deliver gas savings through more efficient combustion and heat transfer in any new boiler.

Installing a new gas boiler now will lock the church into a gas / fossil fuel based solution for the lifetime of the new boiler (around 20 years) and therefore an important decision needs to be made as to whether the PCC is seeking to transition to a net zero carbon position within that period and therefore should consider installing a heat pump technology in lieu of a gas boiler.

A replacement gas boiler can be undertaken by a competent mechanical engineering company and it would make sense to install the new VSD pumps and undertake the pipework insulation as part of these works. The heating system could also be flushed clean and refilled with inhibitor and advanced heating fluids (such as endotherm) on completion to maximise the efficiencies.

Note that some dioceses are no longer authorising replacement of gas boilers.

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 and hall.

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 £28,772. The annual cost saving would be £1,104 resulting in a payback of around 26 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/

6.2 Lighting Controls (Internal)

There are several lights which currently remain on all the time in areas such as corridor, lounge, toilet 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 Cavity Wall Insulation

The church hall is constructed with a cavity wall method, and the inspection of the wall showed no signs that insulation has been added. Prior to the early 1990's, building regulations did not require walls to be fully insulated and therefore it is likely that there is no insulation present. It could, however, be added through injection into the cavity walls.

It is recommended that cavity wall insulation is considered and added to the walls where appropriate. A survey to check the width of the cavity, exposure of the wall and condition of the cavity should be carried out by a CIGA-approved installer who will then be able to provide you with a quotation to undertake the works. Installing cavity wall insulation will help to reduce heat loss and improve the comfort of the space, but needs to be considered alongside other control measures such as TRV's or room sensors to ensure that the space does not overheat because of the additional insulation.

A free survey and quotation for the supply and installation of insulation to the loft spaces can be arranged through ESOS Energy Ltd (contact Adrian Newton 0117 9309689, adrian@esos-energy.com).

6.4 Insulation to Suspended Ceiling

There is a void above the suspended ceiling tiles in the lounge, link corridor and side rooms of the hall which were inspected as part of this audit and found to have little or no insulation present.

In cases where there is little insulation above a suspended ceiling where there is a large void and/or poorly insulated roof above it, it is recommended that insulation be added to prevent heat loss, to reduce the heated volume of the building and create a more comfortable environment for the occupants.

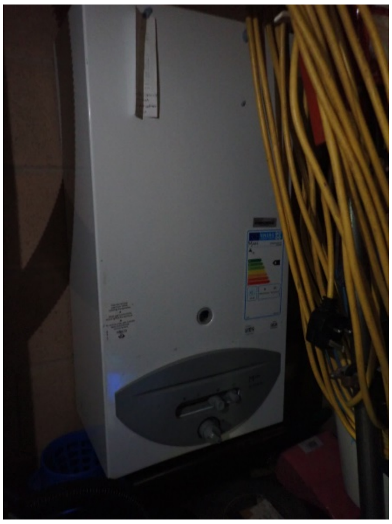
The ceiling of a room is the largest contributing area to heat loss from a building as heat rises. The insulation of such spaces can therefore have a dramatic impact on both the efficiency of the heating system and the temperature of the space below. Insulation measures such as this also need to be combined with control measures such as TRV's or room sensors to ensure that the space does not overheat because of the additional insulation. The insulation is usually fitted in the form of bags or pads sized to the same dimensions of the ceiling tile and therefore it maintains access into the ceiling through the easy removal of ceiling tiles as required.

A free survey and quotation for the supply and installation of insulation above suspended ceiling grids can be arranged through ESOS Energy Ltd (contact Adrian Newton 0117 9309689, adrian@esos-energy.com).

6.5 Replace Glass to High Level Windows

The vent fans in the high-level windows in the hall are very basic and allow cold air to enter into the hall and hot air to escape during winter even when the fan is not being used. The fans serve little useful purpose and if installed for overheating purposes, the proposed air to air source heat pump would be a better way to address this. The glazing also shows signs to having failed with misted panels. It is therefore recommended that the existing frames are re-glazed with new double-glazed units and the fan units removed.

6.6 Electric Hot Water Heaters



The building is currently provided with hot water from direct gas fired water heaters around the hall kitchen/WC/cupboard areas. As such the hot water is being heated by the gas boilers for long period during the week when there is little demand for hot water which is limited to handwashing, the staff kitchen sink and some of the cleaning.

A far more efficient method of generating hot water would be to remove the centralised large hot water storage tank and to have small, local electric point of use hot water heaters installed within each WC and kitchen area. Units such as https://www.zipwater.co.uk/shop/hot-water/zip-inline-instantaneous-hot-water-heater-6kw-es6 heat the hot water only when the tap is turned on and does not have any stored hot water element. As such it is very energy efficient and it only ever heats the hot water that is required. It has additional advantages that it is 'always on' so does not require to have timings reset for ad hoc uses and as it does not have any stored water element it represents the lowest possible legionella risk profile. Installing electric hot water units will remove the need for the gas boiler and associated pumps to have to operate outside of the heating season and will assist in the transition to net zero carbon as the hot water is no longer served by burning of fossil fuels on site.

The installation of electric point of use hot water units and the removal of the gas hot water system can be undertaken by any competent mechanical engineer.

7. Other Recommendations

7.1 Electric Vehicle Charging Points

The church has a car park to the rear of it which serves the church and also the frequently used church hall. In order to make a visible statement on the churches mission of stewardship and to facilitate more sustainable transport choices by those visiting the church and/or using the hall, the church may wish to consider installing an electric vehicle charging point, probably on the side of the church hall to allow visitors to charge their electric cars.

Installing a unit such as a Rolec Securi-Charge http://www.rolecserv.com/ev-charging/news/view/Robust-EV-Charging-With-Rolecs-SecuriCharge-EV-Wall-Unit-Coin-Token-PAYG would allow the organisation control over who is allowed to use the unit with a key operated system. Or given the type of use of the building and control over the usage of the car park as a whole a simple 32 amp type 2 wall pod type charger may be most suitable and these are widely available through many suppliers such as http://www.rolecserv.com/ev-charging/product/EV-Charging-Points-For-The-Home.

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 – to roof of hall
Wind	No – no suitable land away from buildings
Battery Storage	Yes – in conjunction with the 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	Yes – Air to air unit in the hall
Ground Source Heat Pump	No – archaeology in ground and radiator system

8.1 Solar PV

There is the potential for a PV array on the south facing roof of the hall, as can be seen on the satellite photo to the right. The economics of installing panels mean that is it best considered when almost all of the electricity would be used on site. There is a constant base load for electricity which could be met in part by solar PV panels so an installation would be viable and would typically pay back in 8 to 12 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 Stuart Patience on 01202 266212 or 07793 256684 or at stuart@batchelor-electrical.co.uk.

8.2 Air Source Heat Pumps

The building is currently heated from a gas boiler 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.

Given the current heating system in the hall is a warm air heating system, the most appropriate heat pump would be to install an air-to-air heat pump. These are widely available and can be installed by any good air conditioning installer.

A new air source heat pump is likely to need a heating capacity of around 30kW and could be located to the external side area of the hall. New indoor cassettes will be required and these would not be inappropriate to the nature of the hall. There is an existing 3 phase electrical

9. 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-Jan-2019.pdf .

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
Hall side rooms	12	600 x 600 25W Panel	£121	£898	7.43
Hall side rooms and WCs	14	2D LED 11W	£71	£823	11.59
Hall Corridor	7	600 x 600 25W Panel	£45	£299	6.66
Link corridor	2	600 x 600 25W Panel	£1	£75	131.89
Link corridor	4	600 x 600 AG 25W Panel	£37	£209	5.59
Nave	45	3 Spot Track lights	£404	£16,000	39.60
Chancel	8	3 Spot Track lights	£48	£4,000	82.86
Lounge	20	600 x 600 AG 25W Panel	£197	£695	3.53
WC#	4	2D LED 11W	£29	£235	8.22
Kitchen	2	5ft Single Vapour LED	£18	£162	9.18
Children's area	9	600 x 600 AG 25W Panel	£67	£695	10.43
Vestry	11	GU10 LED	£61	£689	11.27
Entrance	4	600 x 600 25W Panel	£6	£75	12.21