ESOS-ENERGY
Energy efficient solutions

Energy Efficiency and Zero Carbon Advice

St Giles Church
PCC of Lincoln St Giles

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Author	Reviewer	Date	Version
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Contents

1. Executive Summary

An energy survey of St Giles 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 Giles Church was built on this site in 1934-36 with the addition of the church hall in the 1950s. The church is of red brick construction and cast stone window surrounds supporting single glazed leaded windows which have been secured from vandalism with metal cages. The church has flagstone flooring and wooden pews and the church is heated by ceiling mounted infrared heaters, which have taken over from the redundant wall panels. The hall is heated by a gas fired boiler to perimeter radiators. Lighting to the nave is from compact fluorescent fittings as well as halogen spotlights and the hall and other spaces are predominantly inefficient T8 fluorescent tubes. 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 install Electric Vehicle Charging Points	N/A	N/A	£2,500	N/A	Faculty	N/A
Install SavaWatt devices on fridges and freezers	280	£40	£100	2.50	List A (None)	0.07
Fit timed fused spurs to hot water heaters	324	£46	£180	3.89	List A (None)	0.08
Replace heating system for electrical based heating solution	26,447	£426	£8,225	19.29	Faculty	4.65
Refurbish window ironmongery / draught seals	1,492	£46	£1,250	27.46	List A (None)	0.28
Change existing lighting for low energy lamps/fittings	1,280	£183	£6,017	32.92	Faculty	0.32
Fit 270mm of insulation into the roof space	2,984	£91	£7,500	82.39	Faculty	0.55
Install Draughtproofing to External Doors	895	£27	£2,400	87.88	List B	0.17

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

Based on current contracted prices of 14.283p/kWh and 3.0512p/kWh for electricity and mains gas respectively.

If all measures were implemented this would save the church £859 per year and reduce its carbon footprint by 6.12 tonnes (56%).

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 Giles 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 Giles Church, Lamb Gardens, Lincoln LN2 4EH was completed on the 5th July 2021 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 Giles Church	
Church Code	621076
Gross Internal Floor Area	1,039 m^2
Listed Status	Grade II

The church typically used for 6 hours per week for the following activities

Type of Use	Hours Per Week (Typical)	Average Number of Attendees
Services	4 hours per week	30 (Sunday) 15 (midweek)
Meetings and Church Groups	2 hours per week	Varies (coffee drop in)
Community Use	Ad hoc use only	Varies

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

4. Energy Procurement Review

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

The current electricity rates are:

Day Rate	15,2516 p/kWh	In line with current market rates
Night Rate	12.7744 p/kWh	In line with current market rates
Standing Charge	28.00 p/day	N/A

The current gas rates are:

Single / Blended Rate	3.0512 p/kWh	In line with current market rates
Standing Charge	36.00 p/day	N/A
Availability Charge	p/kVA	N/A
Meter Charges	p/day	N/A

The above review has highlighted that the current rates being paid are in line or below current market levels and the organisation can be confident it is receiving good rates and should continue with their current procurement practices.

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

VAT	20%	The organisation is understood to be a charity and therefore should be benefiting from only be charged a 5% VAT rate. A VAT declaration should be sent to the supplier to adjust this.
CCL	100% charged	As the organisation is being charged the wrong VAT rate they are also being charged CCL which should not be applied as they are a charitable organisation. Sending the supplier a VAT declaration will remove this charge.

The above review has highlighted that VAT and CCL are being charged. The church is a charity and therefore can claim VAT exemption status. As such the PCC of St Giles Church should send the supplier at VAT declaration confirming this and check all supplies on other sites. VAT declarations are available from the suppliers' website and can usually be found by typing the suppliers name followed by "VAT Declaration Certificate" into most website search engines.

5. Energy Usage Details

St Giles Church uses 21,502 kWh/year of electricity, costing in the region of £3,071 per year, and 29,835 kWh/year of gas, costing £910. The total carbon emissions associated with this energy use are 10.95 CO_2e tonnes/year.

This data has been taken from the annual energy invoices provided by the suppliers of the site. St Giles Church has one main electricity meter, serial numberE14ML19134. There is one gas meter serving the site, serial number K0607715D6.

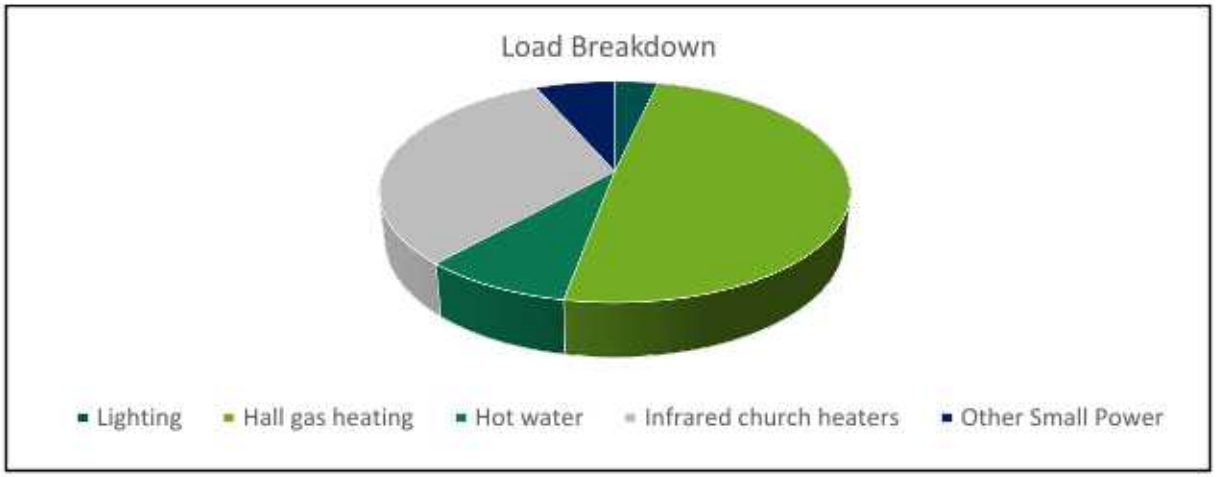
Utility	Meter Serial	Type	Pulsed output	Location
Electricity	E14ML19134	3 phase 60A	Yes, Full AMR connectivity	Flower room opposite vestry
Gas	K0607715D6	Not Accessed		

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.

5.1 Energy Profiling

The main energy consuming plant can be summarised as follows:

Service	Description	Estimated Proportion of Usage
Lighting	A mix of CFL and GLS in church with T8 fluorescent fittings in corridors and to the halls.	4%
Hall Heating	Gas fired boiler providing heat to perimeter radiators.	49%
Church Heating	Near-infrared heating to church at high level (ineffective). Near IR to bell ringers floor in tower.	32%
Hot Water	Provided by gas fired combi boiler to hall kitchen.	9%
Other Small Power	Kitchen appliances, tenanted office equipment, alarm systems, sound systems and other plug loads.	6%



As can been seen from this data, the heating for the hall makes up by far the largest proportion of the energy usage on site. The other significant load is heating for the church.

5.2 Energy Benchmarking

In comparison to national benchmarks for church energy use St Giles Church uses 3% more electricity and 81% less heating energy than would be expected for a church of this size. These benchmarks do not allow for the attached hall usage and overall the building as a whole is 71% more efficient than the benchmark church.

	Size (m^2 GIA)	Annual Energy Usage (kWh)	Actual kWh/m^2	Benchmark kWh/m^2	Variance from Benchmark
St Giles Church (elec)	1,039	21,502	20.69	20.00	3%
St Giles Church (gas)	1,039	29,835	28.72	150.00	-81%
TOTAL	1,039	51,337	49.41	170.00	-71%

6. 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 typical congregation size of 30-40 would lend itself to a more localised heating solution as opposed to the overhead infrared heaters that are inefficient and ineffective for the most part. It is recommended that under pew heaters are installed to accommodate this typical congregation size and added to over time as finance allows.

For the interim period, it is suggested that the high level infrared heaters within the nave are retained for large services but over the longer term (and as finance allows), the heaters should be removed completely.

Within the hall, the existing gas boiler is relatively new and should have a serviceable life of a further 10 years plus. Therefore, it is recommended that a succession plan is made in several years' time to replace the gas boiler at the end of its life (c.2032) with an air source heat pump solution.

6.1 Install Electric Under Pew Heaters

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

We would therefore suggest that the following works could be considered:

Install BN Thermic Under Pew Heaters suspended from brackets from the underside of the pew seat and wall mounted far IR panels (see next section for detail) as follows:

Area	Type/ Size	Length (mm)	Watts	Number (or m) Required	Notes
The top two lines provide detail on an electric heating solution for the medium term.					
Nave	Electric Under Pew 650W	948	650	20	To accommodate 20no. 4m pews / typical congregation size of 40
Chancel	Electric Far IR Wall Panel 450W	800	450	2	To serve pulpit
Vestry	Electric Far IR Wall Panel 580W	1000	580	2	To serve vestry
The following heaters would be to consider once the overhead near IR heaters have reached end of life to supplement the above heaters. These heaters have NOT been costed within the summary table.					
Nave	Electric Under Pew 650W	948	650	32	To accommodate remaining pews

Cable runs to the pew heaters should run along the along the existing routes (all cabling should be in armoured cable or FP200 Gold when above ground) to the rows of pews. 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.

6.2 Install Electric Panel Heaters

It is recommended that the PCC consider installing electrical panel heaters in the pulpit and vestry on a time delay switch.

Suitable electric panel heaters would be far infrared panels such as https://www.warm4less.com/product/63/1200-watt-platinum-white- . 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). As such these heaters tend to provide a relative instant sense of heat and comfort within the space and only need to be on for short periods of time

7. 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.

7.1 New LED Lighting

The lighting makes up a relatively small 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 T8 fluorescent tube fittings and halogen spotlights as well as more efficient compact fluorescent lamps within most areas. The lighting is predominantly compact fluorescent in the nave and T8 fluorescent in the 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 £6,017. The annual cost saving would be £183 resulting in a payback of around 33 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 T8 fluorescent lamps and chancel/altar spotlights where the existing fitting can be made more efficient by simply changing the bulb/lamp within the existing fitting to w 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.

7.2 Refrigeration Controls

With the church hall kitchen there is a domestic refrigeration. These units run 24/7 and contribute to the baseload electrical consumption of the building.

To reduce the electrical consumption of these appliances it is recommended that they are all fitted with a SavaWatt unit. These units work by automatically detecting the load of the

compressor and turning down the power when it is not in full load. This reduces the energy consumption of the refrigeration unit by around 18% while maintaining the cooling of the appliance. It does this by reducing the voltage delivered to the unit when it is idling but allowing the full energy to the unit when it is required.

Supply and installation and further details can be undertaken by SavaWatt directly http://savawatt.com/. The installation does not cause any significant disruption to operations and can be undertaken during normal operating times.

7.3 Reflective Radiator Panels

The church is heated by radiators served from the boiler. These radiators are located on the external, uninsulated walls and have no reflective or insulated surfaces directly behind them at present. They therefore loose much of their heat into the masonry of the wall behind the radiator rather than give out the heat into the body of the church.

In order to improve the insulation directly behind the radiators a reflective panel can be installed, this helps to make sure more of the heat from the radiator goes into the space and requires less overall heating from the boiler to achieve the set point. There are a wide variety of reflective panels for installing behind radiators on the market such as www.heatkeeper.co.uk. It is recommended that these panels are installed behind all radiators within the building

The installation of radiator panels can be carried out by anybody competent in basic DIY and does not require the radiators to be removed.

7.4 Timers on Fuse Spurs to Water Heaters

There is a water boiler (for tea making and the like) located in the hall kitchen. These only need to heat the water to the required temperature when the building is in occupation but at the moment these heaters are directly wired in without any form of time control and therefore maintain their 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 and 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.

7.5 Draught Proof External Doors

There are a number of external doors in the church. These have the original historic timber doors on them, but these do not close tightly against the stone surround and hence a large amount of cold air is coming into the church around the side and base of these doors.

It is recommended that the draughtproofing around the door is improved and draught strips are added. This could be achieved in a number of ways.

For timber doors that close onto a timber frame a product called QuattroSeal (see link below) is often used in heritage environments to provide appropriate draught proofing.
http://www.theenergysavers.co.uk/application/files/1714/7197/4194/National_Trust_Case_Study.pdf

For timber doors that close onto a stone surround more traditional solutions such brush draught strips rebated into the edge of the door by a skilled joiner. Other traditional methods such as using hessian or felt pads tacked to the door could be used and keeping the door maintained in a good condition is important.

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

7.6 Draught proof windows and repair ironmongery

The windows are in reasonable repair but are subject to frequent petty vandalism and there are a small number of gaps/breakages in the windows, allowing cold air into church. These gaps allow large quantities of cold air into the church whilst also allowing heat to escape. These gaps should be addressed urgently to reduce the significant cold air ingress.

Gaps in ironmongery can temporarily be filled with black plasticine which will cause no damage and can be easily removed (as recommended by English Heritage). It is recommended that the masonry, mortar and frames are repaired to reduce these gaps.

The windows in the hall are single glazed timber sash windows. These will have been the original windows and make up an important feature within the heritage facade however they are not the most thermally efficient design and tend to be very draughty. The existing windows can however be improved by the addition of draught proofing measures, and where required be repaired at the same time. The method involves removing the sliding casement, adding in draught brush strips to the edges and then replacing. This makes the window slide much better in operation, stops all draughts through the windows and removes any rattling. This will not only reduce heat loss but reduces noise and makes the internal environment much nicer for all building users.

Work such as this can be carried out by a specialist UK wide firm, Ventrolla, who undertake all types of sash window repairs and improvements (www.ventrolla.co.uk)

7.7 Insulation to Roof

The loft void above the ceiling was not inspected as part of this audit but was reported to have little or no insulation present. In all cases where there is 100mm or less of insulation within accessible roof spaces it is recommended that insulation be added to prevent heat loss and create a more comfortable environment for the occupants of the building.

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

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).

8. Other Recommendations

8.1 Electric Vehicle Charging Points

The church has a car park to the side 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 both visiting the church and 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 car.

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.

Because of the office within the building the church as be considered as a place of work and as such installation grants are available through the work place charging scheme https://www.gov.uk/government/publications/workplace-charging-scheme-guidance-for-applicants-installers-and-manufacturers which will fund 75% of the installation cost up to £500.

9. 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	No – not sufficient demand, listed building visible roof, prone to vandalism
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

Having reviewed the site it is not considered that there is good viability for any renewables and instead a good clear focus on reducing the energy demand of the building should continue with a targeted approach on reducing the heating energy.

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.

10. 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 .

11. 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.

12. 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
Bell ringers	2	5ft Single LED	£12	£176	14.46
Nave	6	LED GLS	£19	£428	22.25
Chancel	2	5ft Single LED	£5	£176	34.14
Chancel	2	AR111 LED	£7	£85	12.72
Narthex	1	50W LED Flood	£1	£120	82.86
Under gallery	7	LED GLS	£7	£83	12.42
Lady chapel	2	5ft Single LED	£5	£176	34.14
Flower room	1	LED GLS	£2	£12	6.85
Vestry	1	LED GLS	£1	£12	12.42
Corridor	5	5ft Single LED	£13	£439	34.14
Meeting room	2	LED GLS	£2	£24	12.42
WC	1	LED GLS	£1	£12	12.42
Hall corridor	4	5ft Single LED	£21	£351	16.85
Hall	9	5ft Single Proteus LED	£41	£1,146	28.20
Kitchen	2	5ft Single LED	£4	£176	41.01
Kitchen 2	2	600 x 600 25W Panel	£4	£150	39.21
small hall	6	5ft Single LED	£13	£527	41.01
rear corridor	2	5ft Single LED	£4	£176	41.01
Office (not accessed)	4	5ft Single LED	£9	£351	41.01
WCs	5	2D LED 11W	£5	£294	60.55
Clock tower	3	5ft Single LED	£8	£263	34.14