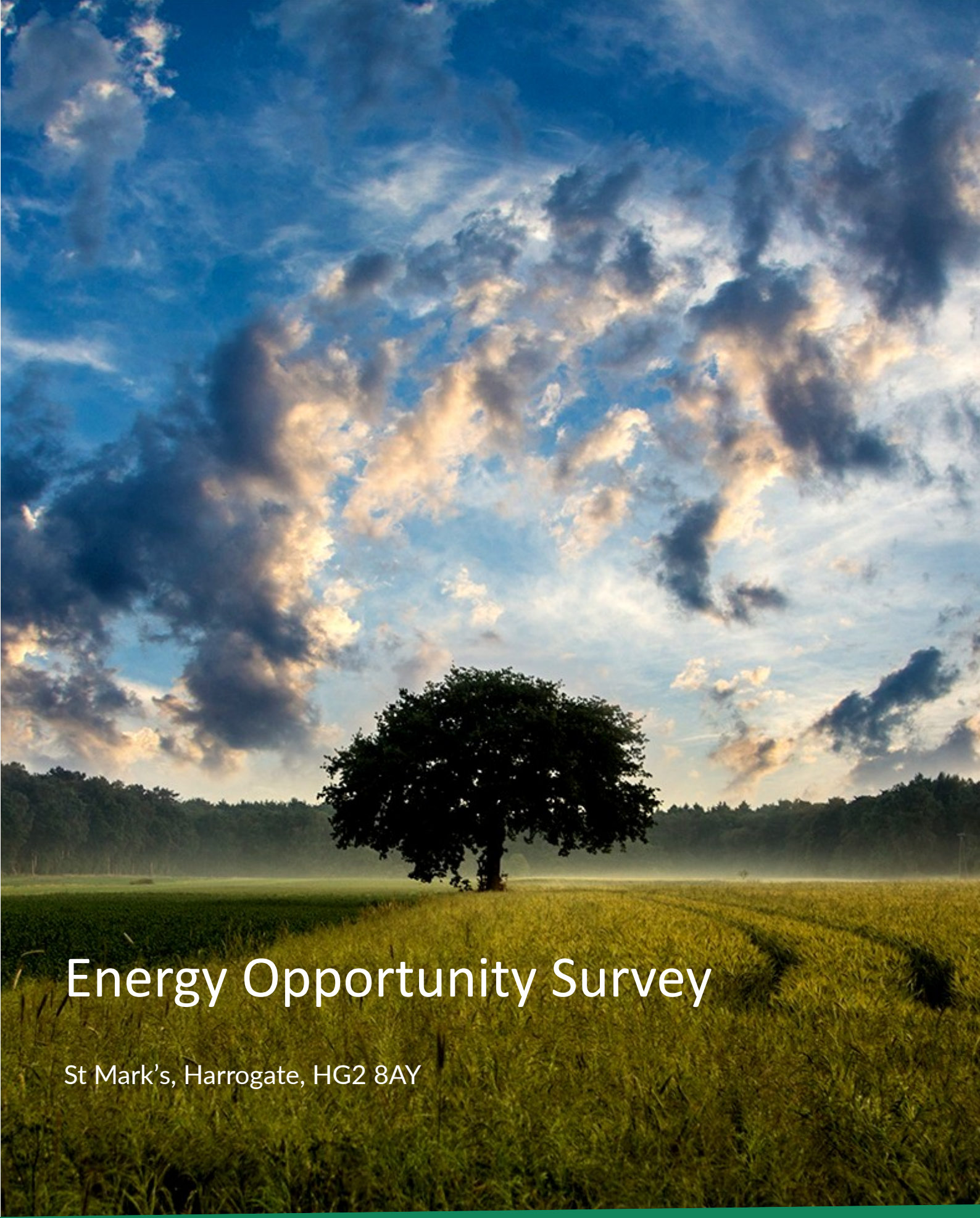


Energy Opportunity Survey

St Mark's, Harrogate, HG2 8AY

Green Journey

THE CHURCH OF ENGLAND
Diocese of Leeds

Energy Opportunity Survey

Green Journey has been appointed by the Diocese of Leeds to carry out energy surveys and provide churches with the opportunity to join the Green Journey energy basket. The aim is to reduce the carbon footprint and energy costs of all churches within the Diocese and across the wider Church of England.

Green Journey's buying power allows us to offer renewable energy at a similar, or lower, price to standard energy. This allows all churches opting into Green Journey to practise responsible stewardship, while also making a saving. Green Journey can help you in your stewardship by reducing your electricity and gas bills, whilst also providing a report detailing your church's energy consumption and sustainability, advising on how both can be improved.

"To date, Green Journey has saved the Church of England over £370,000 in energy bills and VAT reclaims."

Reducing our energy consumption and cutting carbon dioxide emissions is of paramount importance for all, as together we must face the effects of climate change. The Church of England is a leading advocate of sustainability awareness and action, promoting a more environmentally conscious stewardship at local, regional and national levels.

Consumption figures presented in this report are calculated from billing figures and information collected during the energy survey. An estimation of your electricity consumption breakdown is also included, for example lighting could be projected to comprise 60%, kitchen appliances 30% etc. Due care has been given to ensure that these are as close to the observable figure as possible, however these should be considered as calculated approximations only.

0333 0067 177
info@greenjourney.org

Energy Opportunity Survey

Site Summary

Site Overview

Site Address	
Church Name	St Mark's
Town	Harrogate
Postcode	HG2 8AY

Site Contact	
Contact	
Telephone	
Email	

Audit Information	
Auditor	Mark Rudhall
Audit Date	03/04/2019
Audit Time	2.00 PM

Site Information	
Annual Operating Hours	2080
Square Meters	811.48 m²

Report Information	
Report Author	James Carson
Date	09/05/2019

0333 0067 177

info@greenjourney.org

Energy Opportunity Survey

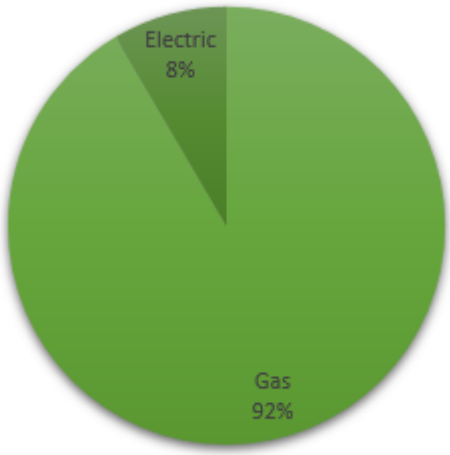
Energy Overview

Energy Breakdown

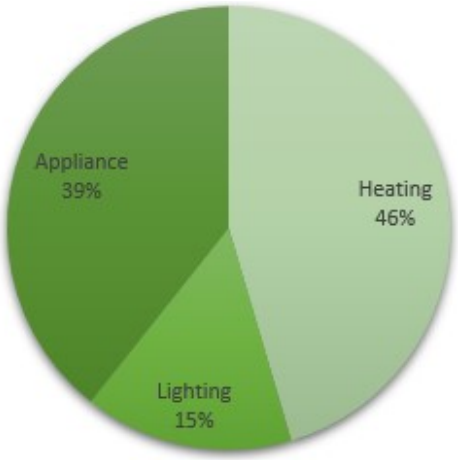
Electricity	
Period Covered	03/04/2018—03/04/2019
Electricity Usage (kWh)	19,732.21
Cost per Annum (£)	£2598.84
Meter Quantity	1

Gas	
Period Covered	03/04/2019 –03/04/2019
Gas Usage (kWh)	213,729
Cost per Annum (£)	£8316.20
Meter Quantity	1

Total Energy Breakdown



Electricity Breakdown



N.B. Breakdowns are based on observations made at the site and discussions with the church representative during the site visit.

0333 0067 177
info@greenjourney.org

Energy Opportunity Survey

Sustainability Overview

St Mark's Parish church was founded c1898 and completed c1920. Nave with aisles and south porch, chancel with south chapel and vestry, plus organ chamber to north. Coursed rubble with ashlar dressings and plain tile roofs. Raised coped gables with kneelers and finials. The walls are solid and are in good repair and show no signs of decay and have no insulation. St Mark's has had an extension built and this should conform to current building regulations for insulation and double glazing. The church and building has started to have LED lighting fitted and Solar PV has already been installed on the church roof. There is scope to look at solar battery storage and for electric vehicle charging points. There is also scope in the future to look at removing the church from natural gas and look at alternatives that are economically and environmentally sound. The current boilers are at an age were they will soon need replacing and so discussions around what alternatives are viable needs to be started.

Main Heating - Gas

It is often challenging to find the correct temperature to heat your church. The following guidelines are provided based on our experience and if followed can help preserve the long-term structural integrity of your church.

Occupancy	Temperature (^{0}C)	Comments
During a church Service	18-21^{0}C	Most suitable temperature for the congregation during a service
Open Door (if the church remains open to the public throughout the day)	12^{0}C	Comfort Temperature
Vacant/Overnight	8^{0}C	Minimum temperature for reducing surface and interstitial condensation of the church building

However, it is acknowledged that financial restraints may not allow for a minimum background temperature of 8^{0}C to be followed at all times.

0333 0067 177
info@greenjourney.org

Energy Opportunity Survey

Main Heating - Gas Boiler

The following information in this section highlights implementations which could be given consideration, in order to improve heating efficiency of your church. Should you wish to act upon any of the following suggestions you should first consult your Diocese Heating Advisor.

Location	Boiler Model	Quantity	Estimated Efficiency	Output (kW)	Condensing
Boiler house	Bisley	2	63.8%	106	No

N.B. Age and efficiency are based on observations made at the site and discussions with the church representative during the site visit.

We would advise, where financially possible, replacing the current non-condensing boiler with a newer, more efficient condensing equivalent. Condensing boilers can reuse the heat embedded within the boiler flue gases to increase the boiler efficiency to a value around 90%. This compares favourably to the current estimated efficiency of your boiler, which is 63.8%. As such, the boiler will have to consume a larger amount of gas (as more will be lost from inefficiencies) for the same heat output, thus increasing your gas bill.

We would advise that EndoTherm is regularly added to the water in the radiators of your heating system. This is a liquid that improves heat transfer rate and efficiency, resulting in the system heating up faster and maintaining the determined temperature for longer.

Heating System Solution	Total Cost (£)	Annual saving (£)	Payback (years)
EndoTherm	£840	£1247.43	0.7

Note: As your site has two boilers, this has been taken into account in the above costings/savings.

0333 0067 177
info@greenjourney.org

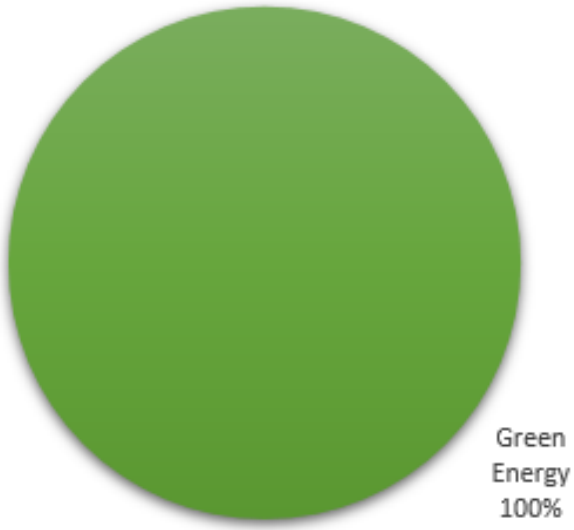
Energy Opportunity Survey

Energy Supply and Metering

St Mark's already have a green supply that significantly reduces its carbon footprint and enhance its sustainable image.

Green Electricity & Carbon Neutral Gas

Currently St Mark's purchase electricity from SSE GJ (19,732.21kWh/annum) and gas from Crown GJ (213,729 kWh/annum).



Automatic Meter Reading (AMR)

AMR-metering provides accurate, remotely read data on energy consumption. This allows for analysis of real time half- hourly data for both gas and electric, identifying areas for significant energy savings, such as out of hours consumption.

In addition, AMR metering enables a water consumption profile analysis to be undertaken, allowing for any leaks to be identified.

0333 006 7177
info@greenjourney.org

EndoTherm

Awards Won

H&V News Awards 2015 – Domestic H&V product of the year

Ecobuild 2015 – M&S big innovation pitch winner

CIBSE Building Performance Awards 2016 – energy saving product of the year

National Energy Efficiency & Healthy Homes Awards 2017 – product of the year

About It

EndoTherm is 100% organic and saves up to 15% of energy that is used. As well as this it is a non-corrosive substance that works within an hour with a CO2 payback of a day and a ROI of less than a year. EndoTherm works in any sealed, wet heating system.

How It Works

It reduces surface tension of water.

Makes water more 'wet' by breaking up the hydrogen bonds so it is able to reach all the imperfections of the systems surface.

Improves the thermal properties of the water to increase efficiency of the heating system.

Systems heat up quicker.

Stay hotter for longer.

Only need to use a 1% concentration in comparisons to system size.

Independent Studies

Enertek International

- A privately owned R&D company who work on behalf of major multinational corporations, leading private companies, trade associations, and government departments.
- Direct comparison tests with and without EndoTherm in the system water indicate that the gas consumption of the boiler in the heating system can be reduced by up to 15%. "This empirical evidence indicates that the addition of EndoTherm can significantly reduce gas consumption and therefore CO2 emissions".

University of the West of Scotland

- A collaboration between the Innovation & Research Office (UWS), the Institute of Biomedical & Environmental Health Science (IBEHR), and their partners was conducted to investigate the impact of EndoTherm as an energy saving technology.
- Surface Tension measurements using K11 Kruss Force tensionmeters confirmed a reduction in surface tension of over 60%.

0333 006 7177
info@greenjourney.org

Energy Opportunity Survey

Heating Controls

The overall efficiency of a heating system is based on three factors: the efficiency of the boiler, the type of fuel used and the responsiveness of the controls. It is often the latter of these that gets overlooked. Appropriate controls will ensure that a heating system is only in use when actually needed; saving money, reducing carbon emissions and maintaining the correct comfort level.

There are many varieties of controls, but they all control the timing of the heating system and/or the demand temperature required. Traditionally, a heating system would be fitted with a programmer (a clock device with "on" and "off" periods) and a room thermostat (that monitors the air temperature in the church). There are now many automated devices that can offer these from a remote location, called "smart controls" such as Nest, Hive and Evohome.

In addition to the above, modern controls include thermostatic radiator valves (TRVs), programmable TRVs, zone control, boiler energy managers, weather compensators and load compensators.

In real terms, the three most cost effective controls in building's and church halls, depending on the heat demand and budget available are:- boiler energy managers, programmable room thermostats and TRVs.

However, a note of caution. The pipework of old heating systems may not be configured to take modern controls. We would be happy to carry out a detailed survey and advise further, but would also recommend consultation with your Diocesan Heating Advisor.

0333 0067 177
info@greenjourney.org

Energy Opportunity Survey

Main Heating (Gas) and HVAC

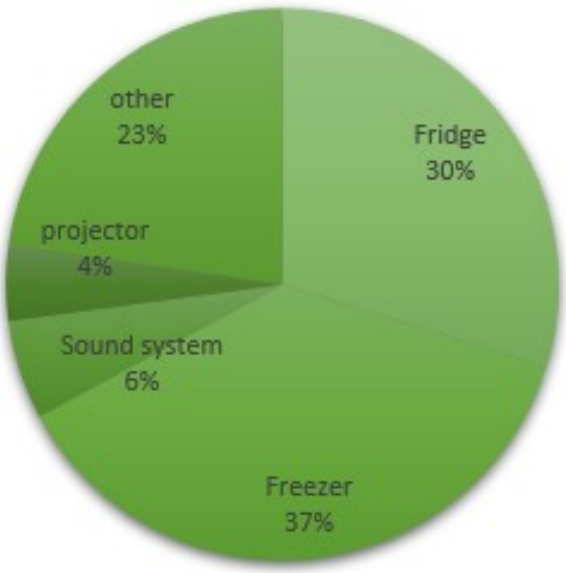
The church has 5 heaters which account for 17% of the total gas consumption. Gas heating is in use during church services and events throughout winter.

We would advise that the scheduled usage of the heaters be examined to identify any potential reductions in gas consumption. For example, if the church has two events on per week and is otherwise unoccupied, it would be prudent to ensure that the gas heater usage accurately reflects this. By closely coordinating the church's schedule with gas heater usage it may be possible to optimise your heating system and subsequently reduce your consumption.

Heating, Ventilating, and Air Conditioning (HVAC) equipment perform heating and/or cooling for residential, commercial or industrial buildings. The HVAC system may also be responsible for providing fresh outdoor air to dilute interior airborne contaminants such as odours from occupants, volatile organic compounds (VOC's) emitted from interior furnishings, chemicals used for cleaning, etc. A properly designed system will provide a comfortable indoor environment all year round when properly maintained.

Please note, that if you wish to make any changes to your current heating system you should first consult your Diocese Heating Advisor.

Electric Appliances Breakdown



0333 0067 177
info@greenjourney.org

Energy Opportunity Survey

Lighting

In total, lighting contributes 15% of the site's total electricity consumption. Lighting fixtures within the church are predominantly Fluorescent lights, for example the 16 18W 2ft lights

We would advise replacing the existing light fixtures with light emitting diode (LED) equivalents. This could manifest as a proactive LED retrofit scheme or as a reactive scheme whereby current fixtures are only replaced at the end of their working life.

It is suggested that the fluorescent lights be prioritised for replacement. Halogen lighting has a high-energy consumption/ light emittance ratio, which means its efficiency is low. /Although fluorescent lighting is efficient compared to halogen/incandescent lighting, further efficiencies can be yielded by replacing it with an LED equivalent. As an illustration, fluorescent 16W Lights can typically be replaced by 9W LED equivalents. Thus, the same quality of light can be produced by an LED equivalent with a 90% reduction in energy consumption being observed.

LED Lighting Savings

Annual costs can also be substantially reduced through lower maintenance costs. During many energy surveys Green Journey has carried out it has often been mentioned to us that light fittings are sometimes left in a state of disrepair until it becomes commercially viable to replace all malfunctioning fittings at the same time. As such, LED lighting represents a sound investment from both an energy saving and a maintenance perspective, especially when taking into consideration its lifespan of up to 50,000 hours. This compares favourably to the 2,000-4,000 hours observed in halogen fittings.

If you would be interested in receiving a bespoke quotation (incl. delivery & installation) for new LED lighting at the church, please call Green Journey on either of the below numbers;

0191 300 6161 or 0333 006 7177

0333 0067 177
info@greenjourney.org

Energy Opportunity Survey

Appliances & Windows

Appliances

In total, appliances contribute 39% of the site's total electricity consumption. Appliances within the church include Fridge, freezer, sound system, dishwasher etc.

We would advise ensuring that there is at least a 2 inch gap between the wall and your fridge/ freezer. This will ensure that the device efficiently releases heat, meaning less energy will need to be used to keep the appliance interior cool.
In order to yield reductions in appliance energy consumption, we would advise that the church ensures that appliances have a scheduled switch off time. This could be achieved by installing plug timers on the wall sockets, this acts as a failsafe should the appliances accidentally be left on.

Windows

The windows at the church feature single glazed fittings as well as double glazing in the new extensions.

Double glazing reduces the rate of heat loss by up to 65% compared to its single glazed counter-part. Benefits of double glazing also include a reduction in condensation, noise pollution and improved security.

It is understood that due to the restrictions on this Grade II/I listed building it is not deemed possible to improve over the current windows without consent, due to the Planning (Listed Buildings and Conservation Areas) Act 1990.

However, it may be possible to improve the areas around the windows. For instance, make sure that there are no gaps between the fixture and the wall as this could be a source of heat loss within the building.

We would advise where possible, that the church installs secondary single glazing. Secondary single glazing adds another single pane to the currently installed fixture. It is possible that secondary single glazing can reduce heating consumption by as much as 10% from current levels.

0333 0067 177
info@greenjourney.org

Energy Opportunity Survey

Summary of Costed and Non Costed Recommendations

Recommendation	Benefit
Replace non-condensing boiler (s)	This can improve the efficiency to >90% compared to the current esteemed efficiency of ”63.8%”.
Install a tamper-proof box for boiler controls	This will ensure that only authorised people can programme the boilers’ timer and thermostat.
Maintain areas surrounding the windows	Ensure that there are no damaged areas around the windows that could be a source of additional heat loss.
Install secondary single glazing	This can yield heat loss savings of up to 10%.
Adopt an energy efficient procurement policy	Replace existing appliances with more energy efficient alternatives at the end of their working life.
LED Lighting	Light Emitting Diodes use less electricity and have a lower wattage rating whist being brighter and lasting up 50,000 hours.
Car Charging Points	The site has a convenient plot of land behind the church, which is used as a car park for visitors and congregants.
Solar PV Battery Storage	The perfect solution for storing excess electricity generated by your solar PV system, for use when you need it..

Further advice can be found from the Diocesan Environment Officer or visit the Environment pages on the Diocesan Website. Your Diocese Heating Advisor should be consulted before any heating recommendations are to be acted upon.

0333 0067 177
info@greenjourney.org

Energy Opportunity Survey

Church Heating Information

Introduction

Replacing or altering your church's heating system can represent one of the most significant investments in the church building that any PCC will carry out. Decisions will need to be made about the existing system, about your choice of energy and system design. As a means of reducing your carbon emissions a change in heating system is an opportunity which comes along once in a generation. You should consider carefully any feasible options which allow you to reduce the environmental impact of your building and its use. Faculty permission is required for all heating works, unless like for like repairs under £10,000. Like for like replacement of your boiler will still require faculty. Like for like replacement may not be the best way to improve your system. Each building is different – a range of different options will need to be considered to find what works. You must explain how you have arrived at your chosen system as part of your DAC submission.

Plan Properly

The cost involved in reversing work to a heating system can be prohibitive. Make sure you do not rush into a system. Leave as much time as possible to get this right. Consider the kind of environment and heating regime you want to create. Decide what system is best for your building and your usage needs. Make sure you seek advice from experienced professionals. Request quotations from at least three firms, Green Journey can help with this. They are likely to prefer a system, but make sure you ask for quotes on similar works to ensure a fair means of comparison. Be aware of the differences between proposals and whether you have been given a quote or an estimate. Stipulate for your contractor the thermal environment you would like to create – temperature and efficiency – and ensure that the delivery of these conditions is contained within your contract. A fully worked-through example of this would be a performance specification written up by a professional.

0333 0067 177
info@greenjourney.org

Energy Opportunity Survey

Church Heating Continued

Faculty Application

When consulting the DAC before making your final faculty application, ideally you will supply the following information (though the process can begin before all this information has been collated):

Statement of Need – this will include an introduction to your project, outlining why you need to make the proposed changes, and how you arrived at your decisions. Please make clear that all options have been considered and show which you have ruled out, and why. You should demonstrate that mitigating environmental impact has been part of your decision making.

Ground Plan, with location of boiler room labelled, marked up with details of the proposed system (pipe runs, flues, radiators/heaters) and any salient information about the existing system (ideally including and redundant pipes or hidden voids which could be used).

Photographs of the interior, and (if applicable) any areas where new units will be installed, any effected outside areas if flues are to be installed.
Technical/catalogue details of boiler and/or radiators/heaters to be installed.
A description of what will be done with the old system.

Investment

A good heating system is an investment; you should aim to increase efficiency, reduce bills, and increase the comfort of your building allowing for its more regular use if necessary.
Consider the cost of the system across its expected life – capital cost, running cost, servicing and maintenance. It may be that there are elements of the existing system which can be re-used. This will make good the initial investment in that older system and reduce the capital cost of the new system.

0333 0067 177
info@greenjourney.org

Energy Opportunity Survey

Church Heating Continued

Environment

Estimates of the energy use and efficiency for your proposed new system can be requested from your supplier. Whilst considering unwanted energy loss, carry out a physical survey of your church building to identify and redress broken windows, ill-fitting seals, or draughty doors. It may be possible to consider insulation. There is a difference between necessary ventilation, and accidental heat loss. Future choices: while gas performs relatively well against other forms of energy generated from fossil fuels, it is not carbon neutral. Using low and zero-carbon energy sources and technologies, such as biomass, solar power, ground and air source heating, will ultimately have to become common practice if our obligations to reduce carbon emissions are to be met.

Building Conservation

Heating systems can have a significant impact on the fabric of a building. The rapid heating and cooling of the fabric and fittings can have a negative effect, whereas a constant temperature can be beneficial. A background temperature of around 8°C is commonly used. If your church has a pipe organ you must be sure that your proposed heating system will not affect its condition – drying out, rapid changes in temperature, and uneven temperatures due to heat stratification can all cause major difficulties for organ maintenance. Blown hot air systems can impact on the condition of an organ. One of the DAC's organ specialists will be able to advise on this subject. Your Quinquennial Inspector may be able to identify key features which could be affected by changes to your heating system (e.g. carpentry, wall paintings etc.). Historic buildings should not be over-heated or subject to rapid heat-up or cool-down. As a rule, a maximum room temperature of 15-19°C is best for an historic building. Your new system may require physical changes to the building, such as the running of new pipe runs in trenches through the ground/walls/fittings, or the placing of a balanced flue through an external wall. The latter will require planning permission and possibly consultation with amenity societies.

0333 0067 177
info@greenjourney.org

Energy Opportunity Survey

Church Heating Continued

People to consult

Your Quinquennial Inspector should be involved from an early stage. They will be able to advise on Health and Safety requirements, and consultations. DAC advisors on heating, the environment, and architectural details will provide impartial advice to assist you in arriving at a reliable specification. Contact the Parish Property Support Team for more information. Any potential archaeological disturbance, particularly if any digging is required, may require an archaeological assessment. The DAC's archaeological adviser may be asked to comment on this. Works to an old boiler or boiler house could possibly involve areas of asbestos. If it is unknown whether asbestos is present, you are legally obliged to assume that it is present. If these areas where asbestos is unknown are to be involved in the work, a materials assessment in the form of a refurbishment/ demolition survey will need to be carried out. Consulting engineers are available to carry out surveys of your building and recommend the most suitable system. They can be employed where a parish is looking for independent technical advice which will be impartial and based on the needs of the church. Such engineers can be briefed to design a system which should then be used to obtain competitive quotations from different contractors. These services will entail a fee, details of which should be agreed in advance.

Types of fuel and energy

Your heating system could be powered from the following energy sources: Natural Gas, Liquid Petroleum Gas, Oil, Electricity, Biomass, Ground Source, Air Source, Solar (these all have different carbon values, for advice on their relative merit contact the Head of Environmental Challenge). Ask your quinquennial inspector to identify which fuels are suitable for your church. Oil, Liquid Petroleum Gas (LPG), and Biomass all require on-site storage and fuel deliveries. Oil must be stored in bunds to prevent leakage and pollution, and to reduce the risk of combustion.

0333 0067 177
info@greenjourney.org

Energy Opportunity Survey

Church Heating Continued

Low and zero carbon energy

In some cases, churches could meet some or all their heating needs by exploiting renewable energy sources. These include solar power (through electricity generating photovoltaic cells), biomass (through the clean burning of ethically-sourced wood pellets), ground source heat pumps (which draw heat from the ground for use in your building), and air source heat pumps (which draw heat from the air, even in below-freezing temperatures). As well as greatly improving the carbon footprint of your church, renewable energy also has the potential to save or even make money. Solar and biomass systems may be able to take advantage of government incentives. Given the changeability of some incentive schemes these should be investigated thoroughly before committing. None of these is entirely problem free. Solar panels may require planning consent for installation on your roof and visual impact may be a concern. Biomass requires local authority consent to ensure that the clean air act is respected as well as a large amount of space to receive and store fuel deliveries. Both heat pumps will consume electricity, while ground source heat pumps require a large amount of digging either vertically or horizontally which will be likely to have archaeological implications. Air source heat pumps can take up a great deal of space.

Types of system

The following systems are among those used to heat church buildings and may be suitable in your building: boiler-based 'wet' systems; gas fired convectors; electrical heating units. It may be necessary to have a supplementary heating source *i.e.* using two systems to complement each other. If it is possible to re-use existing equipment you may find this saves money and waste.

0333 0067 177
info@greenjourney.org

Energy Opportunity Survey

Church Heating Continued

Wet systems and types of boiler

Wet systems are so-called as they are powered by a boiler which heats water centrally to be distributed around the building. Heat is disseminated through radiator units, fan convectors, or through an 'underfloor' system, or combinations of all three.

Radiators

Can provide background heat, which can be beneficial to the fabric of your building. Do not provide rapid heat-up unless running at an ambient background heat. If located in a children's area or in facilities for disabled people should be of a low surface temperature or fitted with protective guards to avoid burning.

Pew heating water pipes

Pipes of hot water placed behind or beneath pews can provide increased comfort during services. These operate much as a radiator system. Consideration must be given to the effect the heat may have on woodwork. This system is difficult to move or alter without incurring large expenses.

Underfloor (also suitable with heat pumps)

Has many of the same advantages of a radiator-based system. Much like a radiator-based system will require continuous use to perform effectively. A new system will require the replacement of the floor, which can have a significant impact on your building, as well as increased cost. Increases comfort by heating upwards from the ground. May require a supplementary system. Works at a lower temperature and is compatible with green energy technology. Ensure pressure test is carried out before covering.

0333 0067 177
info@greenjourney.org

Energy Opportunity Survey

Church Heating Continued

Boilers consume fuel (gas, oil, or biomass, electricity) to heat water which will be distributed through pipework in a ‘wet’ heating system.

Condensing

These boilers re-use latent heat from condensing water vapour generated by the boiler. This greatly increases their efficiency, especially when working at a lower temperature. They are compatible with oil, gas, and biomass fuels. The positioning of the flue is important, ensure that it avoids heavily used or children’s play areas, and that any negative visual impact is addressed. Because condensing boilers run most efficiently at a lower temperature there may be problems combining them with existing heat distribution systems.

Atmospheric

Needs no internal fan to expel the exhaust gases, which are hot enough to expel themselves upwards naturally having a lower density than ambient air. The absence of a fan saves energy which contrasts with the strategy of a condensing boiler which is to extract heat from the exhaust gases before they are evacuated. Though less efficient than a condensing boiler, it can run at high temperatures.

Convectors

Almost all heating systems rely on convection to distribute heat through the air, even traditional ‘radiator’ systems. Convectors’, whether forced or natural, take in air which is then heated up and released using a fan. These can be electric, or gas fired. Gas fired convectors will require a direct gas supply, and an external flue to each convector, visual impact must be considered, and external consultations will be necessary for listed buildings. Flue gasses must not be released into used areas.

0333 0067 177
info@greenjourney.org

Energy Opportunity Survey

Church Heating Continued

Operate as stand-alone units to produce warm air. Are capable of a speedy heat-up and do not need to be running continuously. The warm air produced tends to rise quickly. This can result in a warm ceiling and cold floor. Design of a convector-based system should avoid distribution losses. The noise created by fans can be disturbing and is likely to increase with the age of the system, turning off the system prior to a service is often necessary. Maintenance of many discrete units can be problematic or expensive, especially as these heaters have a shorter lifespan than most. Fans will need to be cleaned as they gather dirt and dust. The rapid heat-up of the building can have a negative effect on the fabric. Measures must be taken to avoid the risk of burning from contact with the front plate, either through a guard or a low temperature front plate (reducing the benefit of radiant heat).

Portable gas heaters

Portable gas heaters have a negative impact on the fabric of a building through greatly increased levels of condensation. They present a significant fire hazard through accident or arson.

Electric heating

Electric storage heating: off-peak electricity is used to heat blocks which slowly emit heat until they are next in use. Control over the use of such a system is very poor. Electrical radiant heating: Radiant heating is achieved by the production of electromagnetic radiation and is produced as a by-product of most heating systems (where convection is more commonly the focus). Electrical radiant heat is produced by heat emitters designed as lamps. They do not heat the air generally and should not be used as a means of heating a building, but rather as a means of directly warming individuals. Many users comment that while your head is hot, your feet are left cold. The efficiency of this system is not recommended, and its impact on the fabric (both from a conservation and aesthetic standpoint) can be negative.

0333 0067 177
info@greenjourney.org

Energy Opportunity Survey

Church Heating Continued

Fan heaters: operate in a self-explanatory fashion. These tend to be inefficient and can be expensive to run and are best suited to discrete spaces rather than a whole church. Hot air curtains are not recommended as their efficiency is poor. Portable electric heaters are often used to supplement an existing heating system. This should only be a short-term solution and should not be used as a substitute for adjusting the thermostat. In general, these heaters are not recommended.

System Controls

Locating your controls in an accessible place is important – you may not want to discourage adjustment of the system by placing them solely in the boiler room. Effective management of a system through sophisticated controls can increase efficiency considerably and save money. As a rule, thermostatic control (with readings taken both from the main body of the church and from the exterior) and control of operating times should, if used effectively, allow for increased efficiency. Thermostatic Radiator Valves can be fitted to radiator units and are common in many houses. On the scale of a church they are not always so robust and may need replacing, but in a chapel or office can be effective at regulating the temperature.

Zoning

Zoning your system allows you to separate discrete areas of your building to be heated independently, rather than heating everything at the same time. Where your building is one large space this may not be possible. However, if you intend to heat any areas which can be treated as a separate thermal environment (a chapel, a vestry, a meeting room, etc.) zoning can be a very effective way to increase efficiency, comfort, and savings. New systems can be installed with controls which will adapt to new zones in a modular fashion, so that it is possible to add zones over time rather than all at once. Whether or not zoning is possible is system dependent and will entail an initial cost outlay.

0333 0067 177
info@greenjourney.org

Energy Opportunity Survey

Church Heating Continued

Your contract

Should include the cost of any associated necessary work, such as redecoration, clearing away, and electrical work. Include a twelve-month warranty and service visit. Ensure that the heating environment you wish to create is clearly stated as a part of the service your contractor will deliver.

Quality

Quality of workmanship is a priority for such expensive works. Make sure that the following standards and compliances are met by your contractors:

a. The installation of gas appliances and flues should be completed by workers with an up to date certificate of competence. The same workers should be Gas Safe registered (which has replaced CORGI registration).

b. Electrical installations must be the work of installers approved by the NICEIC or ECA.

Consult your Quinquennial Inspector if you are concerned that other compliances need to be met. Works lasting 30 days or more may need to be subject to CDM regulations.

0333 0067 177
info@greenjourney.org

Energy Opportunity Survey

Green Journey Contacts

Administration

Craig Hogg

Church Liaison Officer

Email: craig@greenjourney.org

Telephone: 0333 006 7177

Surveying & Reporting

Mark Rudhall

Development Manager

Email: mark@greenjourney.org

Telephone: 0333 006 7177

Diocesan Coordinator

Kilian Coyne

Project Director

Email: kilian@greenenergyconsulting.co.uk

Telephone: 0191 300 6161

Diocese of Leeds - Diocese Environmental Officer

Jemima Parker

Diocese Environmental Officer

Email: Jemima.parker@leeds.anglican.org

0333 0067 177

info@greenjourney.org

Energy Opportunity Survey

Appendices

Appendix 1 – Church

Appendix 2 – Church Windows

0333 0067 177
info@greenjourney.org

Energy Opportunity Survey

Appendices

Appendix 3 – North Room

Appendix 4 – North Room Windows

0333 0067 177

info@greenjourney.org

Energy Opportunity Survey

Appendices

Appendix 5 – Church Interior

Appendix 6 – Church Lighting

0333 0067 177

info@greenjourney.org

Energy Opportunity Survey

Appendices

Appendix 7 — Boiler

Appendix 8 — Filter

0333 0067 177
info@greenjourney.org

Energy Opportunity Survey

Appendices

Appendix 9— Radiators with TRV's

Appendix 10 — Exterior Lighting

0333 0067 177
info@greenjourney.org

Energy Opportunity Survey

Water Overview

As of 1st April 2017, the water market in England became deregulated. This allows non-domestic entities to switch water suppliers. Green Journey is delighted to be able to provide water efficiency and procurement services to churches. It is important to note that your church's water consumption will be billed based on one of the two tariffs outlined below:

- Non-metered Value – In this case, your consumption is estimated based on an estimated water consumption, in addition to a Rateable Value (RV) attributed to your church. RV is a value given to all churches in the U.K based on the area and operation of the church.
- Metered Value – In this case, volumetric consumption data can be recorded and transmitted to your water supplier, this may also extend to surface water/sewerage charges, where a secondary water meter exists.

For more information on the above, please get in touch with Green Journey whom can help you secure the most competitive water rates. In the meantime, there are a number of ways your church can improve its water consumption, as detailed below.

Rainwater Harvesting - This involves rain water being collected in outside tanks, which can then be reused. This will reduce the volume of water the church uses, as they can harness rainwater for usage in urinals/toilets and other greywater facilities. As such, your church will require less water by volume, allowing it to improve its water efficiency.

Tap Aerators - Tap aerators can reduce water supply rates by as much as 60% per minute. Older taps, such as those installed within church's, supply water at an average rate of 15 l/m, compared to 6 l/m when having an aerator installed. This will reduce your annual water consumption, especially where your kitchen and toilet areas are in frequent use. Aerators can be installed on most taps; Green Journey can facilitate this should your church wish to go ahead with it.

0333 0067 177

info@greenjourney.org

Energy Opportunity Survey

There are an array of funding mechanisms available to churches to make alterations to its building structure, undertake crucial maintenance work and to improve on current energy efficiency. Our in-house team can assist your church in applying for such funding, ensuring that you will have the best chance of being successful in your application.

Listed Places of Worship (LPW) Grant Scheme

This scheme allows eligible churches to claim back VAT on qualifying services and products it purchases. It is only aimed at listed church buildings which provide public religious services at least six times each year. Qualifying services and products are detailed in depth in LPW guidance, however the key areas that qualify for this grant are identified as: electrical (including energy efficiency improvements) and structural works, aesthetics improvements, plumbing (including heating systems). Funding is accessible via two separate routes:

- Projects with a value of £500-£1000 (only one application can be submitted per year)
- Projects >£1000 (an unlimited number of applications can be submitted in this category)

Heritage Lottery Funding

Available since September 2017, this supersedes the “Grants for Places of Worship” programme. 100% of funding can now be applied for via:

- “Our Heritage” scheme (up to £100k)
- “Heritage Grants” (up to £5million)

0333 0067 177
info@greenjourney.org