

Winchcombe Parish of Churches

Environmental Policy

Distribution:

The 3 Churches
St Peter's Centre
Parish web site
Churchwardens

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October 2006*

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Winchcombe Parish of Churches

Environmental Policy

1. INTRODUCTION

This Environmental Policy has been prepared after consultation with the PCC and with interested members of the congregations of the churches in the Parish of Winchcombe. Views were sought by means of an article in the monthly Parish Magazine. The purpose of this inclusive approach is to ensure that the whole of the Church in the Winchcombe Parish takes ownership of the Policy and will therefore be encouraged to meet the commitments and objectives presented in this document.

The development of the Policy followed the initiative of Bishop Michael in September 2005 and uses the guidance provided by the diocese in a number of key documents.¹²³

Further source material used in the preparation of the Winchcombe Environmental Policy has included the guidance provided in "Shrinking the Footprint", the national Environmental Campaign documentation issued in June 2006 by the Church of England.⁴

Useful and interesting web sites on environmental matters are also presented in the References section at the end of this report.

Key Statements from the Diocesan Documentation

"As Christians we believe that everything has been created by God, and is held within God's love. Because of this we accept the challenge to our Christian discipleship to take creation seriously, and will work for a world that is sustainable, socially inclusive, and reflects God's justice. We will praise God for the creation and pray for it. We will study the environment and Christian insights into how we should care for it."

and from the diocesan booklet "Sustain and Renew the Life of the Earth"

- "Study the scriptures and the Christian tradition, and environmental issues, reflect theologically and practically on them and work with adults and young people on appropriate attitudes and action;"
- "Care for those parts of the environment for which we are specially responsible as the church – the fabric and contents of our buildings, plants and animals in our churchyards, our glebe land, clergy houses, and other church property;"
- "Set an example, as individuals and as the church of 'living lightly' on the earth."

and some remarks from Bishop Michael of Gloucester:

- "It is important, before we call on government and other agencies to put their environmental house in order, to be seen to be doing our part in our own localities and church communities;"
- "Christianity is passionate because the world, and all that is in it, was given to us as a blessing. In the very first verses of scripture, the story of creation as Genesis tells it,

creation is declared by God to be good. Creation is a gift to us, a gift we need to conserve and nurture so that the gift can be passed on to succeeding generations;"

- "It is time to take the call seriously, to back up words with action and to join the insistent call to the international community to take decisive action before it is too late."

Key Statements from "Shrinking the Footprint"

Shrinking the Footprint is the Church of England's national strategic campaign to enable its members and institutions to address - in faith, practice, and mission - the pressing issue of climate change. It aims to challenge, encourage and support the whole body of the Church to shrink our environmental footprint to create the "The 40% Church" by:

- "Making a difference now by following the Shrinking the Footprint path - simple steps to reduce consumption of non-renewable resources by 2008;
- Planning to make a difference in the future through a growing series of strategic initiatives and partnerships which will change Church activities, structures and processes, producing sustainable reductions in the Church of England's carbon emissions to 40% of current levels by 2050 - The 40% Church."

All parish churches are being invited to carry out an audit of current energy uses so that a benchmark can be established. Once the size of the current 'carbon footprint' of the Church has been assessed, the campaign will roll out initiatives to shrink that footprint.

"For the Church of the 21st Century, good ecology is not an optional extra but a matter of justice. It is therefore central to what it means to be a Christian." - *Archbishop Rowan Williams*

Key Principals Adopted in the Winchcombe Church Environmental Policy

1. To engage the interest and participation of all the members of the congregations in the CoE churches of the Winchcombe Parish;
2. To develop and implement practical initiatives to protect and sustain the environment in the Winchcombe area;
3. To provide leadership and education to all church members, including teenagers and the Junior Church, so that the local church, as an institution, reduces its environmental impact and that individual church members play their part by reviewing and modifying their life styles;
4. To use the Parish Magazine to disseminate educational material and assist church members in meeting their personal environmental objectives;
5. To review progress at regular intervals and ensure that commitments and objectives presented in this Policy document are met;
6. To publicise locally the Church's environmental commitment in the hope that the other Churches in Winchcombe, through perhaps Churches Together, will be encouraged to adopt similar policies, or refresh existing commitments, and that the wider community in the area may also be inspired to participate in sustaining their environment. This would include the two Winchcombe schools and the primary school at Gretton.

2. ENVIRONMENTAL POLICY AREAS

Five policy areas have been identified for the development of environmental protection programmes. They are:

1. energy conservation;
2. recycling of waste materials;
3. protection of flora and fauna;
4. litter control;
5. water conservation.

Where the local church, as an institution, can take action the programmes will be carried out by means of detailed action plans with targets, timetables and implementation/progress dates. Following consultation with the PCC and the wider church membership in the Winchcombe Parish, specific programmes in each of the five Policy areas have been developed. Where possible, costs and benefits are given, or actioned for at a future date, and all programmes will be monitored by the Environmental Officer and the PCC. The action plans are provided at intervals in each section of the Environmental Policy document and are then brought together in Appendix C, which becomes the working document of the Church through which the Action Plans are implemented.

Church members, as individuals, can play an important part in the development of good environmental practice. Guidance and education will be provided by the Environmental Officer, largely through the monthly Parish Magazine publication. A priority will be given to the inclusion of teenage church members in the development of the Policy; their ideas will be sought during the Policy development stage and they will be encouraged to contribute to the programmes. Invitations to the teachers in the two Winchcombe schools and Gretton Primary School to participate in the education elements of the Policy will also be made.

It is proposed that the introduction of the Environmental Policy into the life of the Church in the Parish will begin with a service of worship at each of the three churches, with the Environment and Creation as its central theme. June 3rd 2007 is proposed, to coincide with The UN World Environment Day. It is important, also, that environmental concerns are included in regular worship.

The PCC might like to consider applying for an “eco-congregation” award after the adoption of the Environmental Policy statement. Eco-congregation was developed from a Pilot Study involving churches from across Britain and Ireland and dedicated in a service at St Paul's Cathedral in September 2000. The ecumenical service was led by senior church leaders and included a sermon preached by the Bishop of London. Eco-congregation aims to encourage churches to celebrate the gift of God's creation and to care for it in their life and mission and through the member's personal lifestyle. To date, over 50 churches have been given the award.

Education Action Plan

Action	Action by	Completion by
Education & information to church members via the parish magazine	Environmental Officer	Ongoing-quarterly Start: June 2007
Involvement of teenage members in the Policy	Environmental Officer & Youth Minister	December 2006
Presentations to Parish schools – by invitation	Environmental Officer	December 2007
Special environmental act of worship	Vicar	3 June 2007
To consider applying for an eco-congregation award	PCC	March 2008

3. PARISH ENVIRONMENTAL PROGRAMMES

3.1. Energy Conservation

Global warming is the most serious environmental problem facing the planet and the highest priority should be given to reducing the “carbon footprint” of the Parish. The National Church has followed government objectives and adopted the policy of reducing its carbon emissions to 40% of its current levels by 2050; that is a 60% reduction. The Church advises that the first stage in this process should be an audit of carbon dioxide (CO₂) releases by church activities in each Parish and the greater part of this section of the Environmental Policy statement is given over to the audit.

The effective control of: (i) electrical energy and heating fuel in the churches of the Parish and church-owned buildings and (ii) petroleum fuel for church related transport - will result in significant reductions in the emissions of church derived carbon dioxide (CO₂), the main global warming gas.

In addition, the purchase of locally produced goods and services, including food, should also be energy efficient, compared to produce imported to local shops from elsewhere in the country. In this respect, it is important to ensure that trade with third world countries, and especially Fair Trade, is still given strong support by Christians, and others, within the Parish. An Action Plan for this topic is provided in Section 3.1.3.

3.1.1 Buildings

Space Heating and Lighting

St Peter’s Church and Centre in Winchcombe both use natural gas for space heating and for hot water in the case of the Centre; there is some additional electrical heating in St Peter’s Church. Christ Church and Stanley Pontlarge are heated electrically. The space heating of these three churches results in the largest contribution to carbon dioxide emissions by the Parish, by far, and the potential for savings in CO₂ emissions is substantial – though at considerable cost.

Other church buildings are the Vicarage, Curate’s and Teacher’s Houses in Winchcombe.

There are practical operational advantages of electrical heating systems for churches, but the use of a conventional electricity supply for space heating has serious environmental implications. Three quarters of Britain’s electricity is presently generated at fossil fuel-fired power stations; moreover, around 50% of this fuel is wasted through generating and transmission inefficiencies, which makes electrical consumption at the point of use very profligate in terms of CO₂ releases.

Calculations have been made for CO₂ discharges arising from the use of electricity and gas at each of the church buildings. The discharge calculations will all be slightly underestimated because no account has been taken of the energy consumptions expended during the production and transport of the gas, nor in the construction of the power stations. A full life cycle analysis in these instances is beyond the scope of this study.

One of the benefits of the Local Ecumenical Partnership (LEP) shortly to be formed with the Methodist Church in Winchcombe, will be an increase in shared services, with fewer subsequent occasions to heat one or other of the churches – provided, of course, it is remembered to activate the timer override to cancel the heating.

It will be expensive to replace or upgrade the present heating and electrical systems at the church-owned buildings in the Parish, though the options have been seriously considered for this environmental review. In addition, new technologies, including renewables, are considered here and include: (i) in-situ solar and wind turbine systems for electricity generation, (ii) a pelletised wood firing boiler for St Peter’s Church and (iii) the installation of new condensing gas-fired boilers.

Insulation

There is little benefit to be gained by attempting to provide insulation for the three churches, with their intermittent heating pattern and large internal spaces. However, there would be benefit in draught proofing all exit doors and other areas where cold air can enter, eg from the tower(s). Where appropriate, improved insulation for other church-owned buildings is reviewed.

Renewable Technologies

It should be noted, in respect of renewable solar technology, that all three churches in the Parish have south-facing pitched roofs for maximum efficiency of electricity or hot water production, though both Christ Church and Stanley Pontlarge Church have the problem of shading produced by large trees, and by the tower in the case of Christ Church.

Solar technology that generates electricity (PV panels), or micro wind turbine technology, are the most suitable in-situ systems for church buildings and some large electricity suppliers support an electricity “buy-back” scheme. *Surplus* electricity generated by the solar panels or wind turbine is sold back to the energy company when an export meter, which measures unused electricity, is installed. However, the current trend amongst many suppliers is not to install export meters but to pay an estimated fixed amount per kilowatt peak (kWp) installed. This means that the customer will be rewarded by the external electricity supplier for the electricity generated from the system even when it is used in the premises – potentially doubling financial savings; npower, the present supplier of electricity to church buildings in the Parish, currently adopts this policy. There is a clear incentive, therefore, to use in-house the maximum amount of green electricity generated.

Wind turbines are likely to be the favoured technology for in-situ generation of renewable electricity, since wind can be available 24 hours a day for electrical generation and is a more efficient system during the winter months when electricity consumption at each of the buildings will be at a maximum. However, there may be planning problems with micro turbines.

The price at which those big utilities that buy back the green energy generated by the customer varies from 50% to 100% of the marginal price at which they sell to the customer; if there is a need to switch supplier to maximise financial savings, it is not a complicated process. Recently (October 2006), the energy regulator, Ofgem, has threatened energy suppliers to improve their buy-back schemes in order to encourage more home micro generation installations. In respect of the generating equipment, grants are available from the DTI's Low Carbon Buildings programme, which provides for 50% of the installed cost of the system up to a maximum of £30,000. It is clear that consumption of electricity generated by green technology sited at the premises makes a genuine contribution to national CO₂ reductions, and it has been confirmed by Ofgem that electricity sold back to the supplier also adds to the total of renewable electricity available to the grid – see below and also the final section in Appendix A.

A rough estimate of the fully installed cost of a 2kWp solar PV panel system is around £12,000 and much less than this for a comparable micro wind turbine; half of these costs would be reimbursable by the DTI programme. B&Q, the DIY chain, recently announced the marketing of solar panels and wind turbines at a price of £1500, though no technical details are available at this time.

More esoteric systems, such as heat sinks, offer potentially large amounts of energy savings but, at very high cost; this may be a technology for the long-term future.

A small number of suppliers, including npower, claim to deliver electricity to premises from CO₂-free, sustainable sources. The npower company set up to deliver this service is called Juice (web site: <http://www.npower.com/greenelectricity>), but the scheme, at present, applies only to residential customers; so, the three church-owned residential houses in Winchcombe could consider signing up to the scheme, but not the three churches, nor St Peter's Centre. Juice claim

that, under their arrangements, there would be no increase in electricity prices to the subscriber beyond the standard npower tariffs.

The system works by Juice, or similar energy company, supplying electricity to a signed-up green subscriber in the normal way and then purchasing the same amount of electricity from renewable sources and delivering it to the National Grid; the claim can then be made that the subscriber is buying green, that is CO₂-free, electricity. However, because there is a national obligation to supply fixed amounts of renewable electricity to the Grid anyway, it is clear that the Juice arrangements do *not* result in increases in the total quantity of green electricity being generated with a subsequent reduction in conventional electricity generation. There would be, therefore, no national reduction in CO₂ generation as a result of this scheme beyond that already committed to by the government under its Renewables Obligation regulations. However, it could be argued that the more subscribers that sign up to companies such as Juice, the more powerful the environmental message to government and the general public.

Other green electricity companies, such as Ecotricity and Good Energy, supply only renewable electricity, with no commercial interest in conventional power supplies. Tariffs are usually higher than those available from the general electricity supply market place. Claims are sometimes made that subscribing to such a company is a genuine contribution to national CO₂ reductions, but the same argument provided above must still apply; ie whether the Parish signs up or not, the green supply company has an automatic outlet for all of its green electricity via major energy companies who would purchase such electricity by the renewable obligation process. Ecotricity and Good Energy supplies electricity to all types of customer – residential and business/charity premises.

The PCC may also like to consider purchasing both gas and electricity from one supplier and to pay the bills by Direct Debit. Currently British Gas supply the gas (paid by DD under a 5 year discount scheme for the Parish – now coming to an end) and npower the electricity, (paid partly by DD and partly by cheque). If npower, or another supplier, is used as the sole supplier, with all the payments by DD, then significant financial savings could be made.

Because of the very low amounts of hot water used at the three churches, the use of solar panels for hot water production has been rejected.

The pelletised wood system for space heating has the strong advantage of being a carbon neutral process, provided the wood comes from a sustainable afforestation programme. But the practicalities of operating and feeding a wood burning stove for sporadically intermittent heating demand essentially rules this method out for heating churches. The installation of a modern gas-fired condensing boiler for space heating only, would be a more practical alternative.

General Energy Action Plan

Action	Action by	Completion by
Draught proof all exit doors and other air ingress areas	Churchwardens	June 2007
Consider subscribing to a green tariff scheme for church buildings	PCC and Environmental Officer	June 2007
Consider using one energy supplier only and paying by Direct Debit in respect of church buildings and Centre	PCC	June 2007
Compare the B&Q and other micro renewable technologies	Environmental Officer	June 2007

Each of the churches and other church-owned buildings is considered in turn below:

3.1.1.1 St Peter's Church, Winchcombe

Space Heating - Boiler: The present boiler for the space heating of St Peter's is a 25 year plus old 125 kW Ideal Standard Boiler (Model: Concord 330), with an operating efficiency of 77%; that is 23% of the gas used is wasted. A review of the annual gas bills for July 2005 – July 2006 allows

calculations to be made for gas consumption and CO₂ releases to air. These calculations are shown in Appendix A and reveal that 24,000 kg (ie 24 tonne) of CO₂ are discharged each year from the church boiler.

Replacement of the existing boiler with a condensing boiler at 90% operating efficiency would result in an annual 15% saving of 3600 kg (3.6 tonne) of CO₂. The annual gas bill for St Peter's Church should fall by around £470 at present fuel prices. If the existing boiler is replaced with conventional electrical heating the CO₂ releases would almost double to 47,000 kg – though this assumes the kWh energy output for electrical heating would be the same as for the gas boiler; ie heat circulation and wastage at the church would be similar for the two systems.

The boiler is presently controlled by a modern 7 day clock located in the Vicar's Vestry, which is set to automatically provide heating for the regular services throughout the week; the heating for special services and events can be managed by use of a manual over-ride. These procedures minimise gas wastage, and there is little scope for environmental improvement here.

The boiler room hot water piping before entry to the church and the wall/under-floor grill radiators is, presently, not insulated and this should be remedied immediately.

A cost estimate for the fitting of a new 100 kW condensing boiler at the Church is recommended.

Space Heating Electrical: In addition, the choir pews and organ area are heated by electrical heaters. Supplementary heating in the Lady Chapel in St Peter's, if required, can be operated by three manually controlled electrical heaters.

Lighting & Hot Water: Low energy light bulbs are widely used in the church and few improvements can be made; however, a review of the lights in the kitchen area is recommended.

The present system of a 10 litre capacity electrical hot water heater located in the kitchen is not considered to be the most efficient approach to the supply of hot water for kitchen use; rarely would as much as 10 litres of hot water be needed. An instantaneous heater providing the exact quantity of hot water required in each case, such as provided in the Vicar's Vestry, would be more environmentally appropriate; in the case of the kitchen, the simple answer would be to use a kettle. Cold water can be used for washing hands in the lavatory. There are no environmental advantages to be gained by incorporating a hot water system within the main boiler arrangement due to the long pipe-runs from boiler room to kitchen.

A review of the annual electricity bills over the period April 2005 – April 2006 for St Peter's Church again allows energy consumption and CO₂ discharges at the power stations to be made. The data are given in Appendix A and show that the total amount of CO₂ discharged at fossil fuel-fired power stations due to electricity usage at St Peter's is around 2700 kg, or 2.7 tonne per annum.

Renewable Energy Sources: A Photo-voltaic cell assembly and/or a wind turbine for the generation of electrical energy for the church should be investigated. Planning permission is likely to be more difficult for wind turbines. Further expert advice should be sought to determine the viability of the two systems.

Action Plan for St Peter's Church

Action	Action by	Completion by
Obtain estimates, with grants, for the replacement of present boiler by a 100kW condensing boiler	Environmental Officer	March 2007
Fit hot water pipe insulation in the boiler room	Churchwardens	March 2007
Discontinue the use of the hot water heater in the kitchen and use a kettle for washing-up etc.	Environmental Officer	March 2007
Seek further expert advice, including cost estimates, on the suitability of photo voltaic or wind turbine technology for green electricity generation	Environmental Officer	June 2007

3.1.1.2 Christ Church, Gretton

Heat and Light: Electricity is used both for space heating and lighting at Christ Church. Individual electrical heaters are fitted under each pew and a 7 day clock automatically turns them *all* on for the Sunday morning service. Although each heater has its own on/off switch, they tend to be left in the “on” position once the heating season starts, even in the unoccupied pews; the general view is that this is necessary to maintain a comfortable level of heating in the church. A manual over-ride allows heating for special services and events at the church; and to be switched off for cancelled services – though it is not clear whether this is always done.

In the short term, the possibility of replacing the electrical heating system will not be considered and priority will be given to an assessment of renewable sources of electricity generation.

Renewal of the lighting system in Christ Church was completed in July 2006. Six new pendant lights have been hung in the nave of the church; in addition, there are three other conventional lights around the church. A total of 7 spot lights are fixed in the nave and at the alter end of the church. None of the lights are fitted with low energy bulbs.

Hot Water: There is a 7 litre electrical hot water heater in the kitchen, which is used every Sunday for washing-up after serving refreshments. Consideration should be given to isolating the heater and using the kettle for washing up.

A review of the electricity bills over the 12 month period of August 2005 – August 2006 for Christ Church showed them *all* to be estimates and it was not possible to obtain an accurate annual electricity consumption for the church. However, a true reading was taken in August 2006 and, by making some reasonable assumptions, an annual electricity usage was estimated and CO₂ discharge calculations made – see Appendix A. These calculations indicate that the total amount of CO₂ discharged at fossil fuel-fired power stations due to electricity usage at Christ Church is around 2140 kg, or 2.14 tonne per annum.

Renewable Energy Sources: As with St Peter’s, an assessment of the benefits and costs of installing a solar system or wind turbine for electricity generation will be investigated. The presence of large trees on the south side of the church, and the church tower, both throw substantial shadows on the pitched south roof, which would appreciably reduce the efficiency of solar panels and could affect the performance of a wind turbine also. The suitability of installing renewable energy technology at the church will be investigated

Action Plan for Christ Church

Action	Action by	Completion by
Discontinue the use of the hot water heater in the kitchen and use a kettle for washing up etc.	Environmental Officer	March 2007
Replace, where possible, conventional light bulbs with low energy bulbs	Churchwardens	June 2007
Seek further expert advice on the suitability and likely efficiency of photo voltaic or wind turbine technology for green electricity generation at this church	Environmental Officer	June 2007

3.1.1.3 Stanley Pontlarge Church

Heat and Light: Like Christ Church, both space heating and lighting at Stanley Pontlarge church is met by electricity. Individual electrical heaters are located underneath the front pews of the church and are controlled by a 14 day cycle timing clock to meet the twice-monthly services.

Although each heater has its own on/off switch, they tend to be left in the “on” position once the heating season starts, even in the unoccupied pews. A manual over-ride allows heating for special services and events at the church.

As with Christ Church, the possibility of replacing the electrical heating system will not be considered at this time and priority will be given to an assessment of renewable sources of electricity generation.

There are about six lights at Stanley Pontlarge church; none appear to be fitted with low energy bulbs. There are no water facilities at the church.

A review of the electricity bills over the 12 month period of August 2005 – August 2006 for Stanley Pontlarge church again showed them *all* to be estimates and, as with Christ Church, it was not possible to obtain an accurate annual electricity consumption. However, a true reading was taken in August 2006 and, making some reasonable assumptions, an annual electricity usage was estimated and CO₂ discharge calculations made – see Appendix A. These calculations indicate that the total amount of CO₂ discharged at fossil fuel-fired power stations due to electricity usage at Stanley Pontlarge church is around 1200 kg, or 1.2 tonne per annum.

Renewable Energy Sources: Again, an assessment of the benefits and costs of installing a solar system or wind turbine for electricity generation will be investigated. The presence of large trees on the south side of the church throws substantial shadows on the pitched south roof over much of the year, which would appreciably reduce the efficiency of solar panels. The presence of the trees and other buildings close by are likely, also, to impede the efficiency of a wind turbine.

Action Plan for Stanley Pontlarge Church

Action	Action by	Completion by
Replace, where possible, conventional light bulbs with low energy bulbs	Churchwardens	March 2007
Seek further expert advice on the suitability and likely efficiency of photo voltaic or wind turbine technology for green electricity generation at this church	Environmental Officer	June 2007

3.1.1.4 St Peter’s Centre, Winchcombe

Heat and Hot Water: Space heating and hot water for the kitchen is supplied by a comparatively modern 34 kW Vokera 24-96 RSE Flowmatic Combination boiler, controlled by a conventional timing clock. This provides “instant” hot water without the requirement of a wasteful hot water storage tank. The thermal efficiency of the boiler is rated at 82%.

The central heating timing clock is set to provide space heating twice every day during the heating season: between 07.00 and 11.00 and again between 18.00 and 20.00, even though the Centre is infrequently used for evening meetings and rarely used on Saturdays. There may be scope for changes here, such as the installation of a 7 day timer clock, though improved insulation may be necessary to reduce heat losses and prevent the building getting too cold between opening periods.

Consideration could be given to using the Centre for worship during the heating season, rather than St Peter’s Church, for those services when congregations are known to be small and music will not be used.

A review of the annual gas bills for July 2005 – July 2006 allows calculations to be made for gas consumption and CO₂ releases to air. These calculations are shown in Appendix A and reveal that 2860 kg (ie 2.86 tonne) of CO₂ are discharged each year from the boiler at St Peter’s Centre.

Replacement of the existing boiler with a condensing boiler at 90% operating efficiency would result in an annual saving of 250 kg (0.25 tonne) of CO₂, which is a 9% saving. The annual gas bill for St Peter's Church should fall by around £35 at present fuel prices. In view of these limited benefits, it is recommended that the installation of a condensing boiler should take place only when the existing unit permanently packs up.

Lighting and Electrical Equipment: Low energy light bulbs are widely used in the Centre and no improvements can be made here. The main items of electrical equipment – the computer and photocopier – are both switched fully off at the end of each working day for maximum electricity savings. The computer monitor is an LCD design, which is more energy efficient than the traditional old-fashioned monitors.

A review of the annual electricity bills over the period August 2005 – August 2006 for St Peter's Centre again allows energy consumption and CO₂ discharge calculations at the power stations to be made. The data are given in Appendix A and show that the total amount of CO₂ discharged at fossil fuel-fired power stations due to electricity usage at St Peter's Centre is around 470 kg, or 0.47 tonne per annum.

Renewable Energy Sources: The installation of in-situ green electricity generation systems is not considered a priority for St Peter's Centre at this stage. The two pitched roofs on the building face east and west and would not provide for a particularly efficient solar energy system. A wind turbine for the generation of electrical energy for the Centre would again be limited by the single story construction of the building and by surrounding buildings.

Insulation: St Peter's Centre is a comparatively modern building (re-constructed in 1994) and should have reasonably effective insulation levels, including cavity wall insulation. Increased insulation in the loft of the building was fitted in 2005. The windows are single glazed. It is intended to review the insulation performance of the building and subsequently to make recommendations.

Action Plan for St Peter's Centre

Action	Action by	Completion by
Consider using the Centre for some services	Vicar and PCC	March 2007
Consider fitting a 7 day clock to the boiler	Environmental Officer	June 2007
Review insulation levels in the building	Environmental Officer	December 2006

3.1.1.5 Three Residential Buildings

These are the homes of the vicar, curate and youth minister of the church. Actual energy usage levels have not been obtained for all of these buildings, but typical or average values for domestic two storey family homes in the south of England, with gas firing for space heating and hot water, have been assumed for the calculation of the "carbon footprint" of the three buildings; good levels of roof insulation are assumed, but no wall insulation, nor the use of a condensing gas boiler.

Based on the general principles listed above, the average annual consumption of gas for each building should be in the region of 30,000 kWh and around 3500 kWh for electricity. The total energy consumptions for the three buildings would be in the region of 90,000 kWh and 10,500 kWh for gas and electricity respectively. It is intended to obtain more detailed information on the heating and insulation profiles of each of the three residential houses of the church.

CO₂ Discharges: The total annual usage of gas for the three residential buildings is estimated to produce around 15,800 (15.8 tonne) of carbon dioxide over a 12 month period. The comparable

figure for electricity consumption is 4700 kg (4.7 tonne) of CO₂, which would be produced at the power stations.

Green Tariffs: Some electricity supply companies, such as Juice (an npower company), offer “green” tariffs at no or little increase in prices. Although their claims that subscriptions to such a tariff contributes to CO₂ reductions does not bear scrutiny, there may be some PR merit in considering subscribing to such a scheme.

Upgrading Energy and Conservation Systems: There has been no review of possible energy upgrading strategies of the three homes at this time. This may be undertaken at a later stage after further consultation with the appropriate parties. Important considerations in such a review would be:

- (i) replacement of boilers and control systems for space heating and hot water;
- (ii) improved insulation for lofts, walls and windows, including draught proofing;
- (iii) maximum use of low energy electrical equipment;
- (iv) installation of renewable energy generation systems.

Expensive energy upgrades for the Curate’s house would probably be inappropriate because of the temporary church tenure for this property.

Action Plan for 3 Residential Homes

Action	Action by	Completion by
Consider switching to Juice, or similar company, for the supply of electricity	House Occupiers supported by Environmental Officer	June 2007
Review energy generation and conservation systems in the buildings	Environmental Officer with support of occupants	December 2006
Consider undertaking an energy upgrade at one or more homes	Environmental Officer with Occupants	t.b.a.

3.1.2 Transport for Church Activities

A small/medium sized motor capable of 30 mpg will produce 36 kg of CO₂ for an average 100 mile urban cycle; that is 0.36 kg for each mile. If such a car is used for church business and attending services around Winchcombe then it is likely that a cold engine will almost double this CO₂ emission per mile as well as generating much larger amounts of other pollutants because of an inefficient catalytic converter.

Using a car to attend church services and other church activities (eg church watching) is one area where church members can re-assess their approach. Those who presently use their car for this purpose may be able to change and consider walking, cycling or, possibly, introduce car sharing. This is a difficult area, but will be tackled, initially, by an article in the Church magazine. No attempt has been made to try and quantify the mileage covered by car travel to church.

Without a detailed survey of car use by church ministers and officials for church business it is not possible to estimate CO₂ generation by such activities; it is not proposed to conduct such a survey. However, on the assumption that there is clearly some significant car usage, both within and outside the Parish, it would be reasonable to assume that it would be less than 2000 miles per year with, perhaps, half of this total being with a cold engine. In these circumstances a CO₂ emission of around 1000 kg per annum arising out of car use for church business might be expected.

The construction of bike racks and/or tethering rings at each of the three churches should be seriously considered.

Transport Action Plan

Action	Action by	Completion by
Discuss the issue of car transport with the full PCC and determine action for reducing car use to a minimum	PCC	June 2007
Provide education and advice on car use	Environmental Officer	Ongoing
Build a bike rack/ring area at the 3 churches	Churchwardens	December 2007

3.1.3 Supporting Local Producers

Traders that produce their goods and services locally for sale should be able to supply Winchcombe residents at significantly lower energy expenditure. Support for local food growers and suppliers, and the Winchcombe Farmer's Market will, therefore, provide an environmental bonus, though it is not possible to quantify this. Wherever possible, general support for local shops and businesses, whether their goods are produced locally or not, will cut down on customer travel and provide a further environmental benefit. It should be noted that the Co-Op uses degradable plastic bags for improved environmental impact.

Action Plan for Supporting Local Producers

Action	Action by	Completion by
To provide information and education, via church magazine	t.b.a.	June 2007

3.1.4 Summary of CO₂ Production from Parish Activities

The average annual CO₂ production arising from church activities in the Parish of Winchcombe can be summarised in the following table:

Summary of CO₂ Production in Winchcombe Parish

CO ₂ Source	CO ₂ Generated per Annum (kg)
St Peter's Church	26,700
Christ Church	2140
Stanley Pontlarge Church	1200
St Peter's Centre	3330
Three Residential Buildings (estimate)	20,500
Car Usage for Church Business (estimate)	1000
Total	54,870

The Church of England, at national level, is proposing that CO₂ emissions Parish by Parish should be reduced by 60% by 2050. For the Parish of Winchcombe this means cutting annual CO₂ discharges from the present level of around 55,000 kg to about 22,000 kg over the next 44 years; ie a CO₂ saving of about 33,000 kg per annum would be needed.

Looking ahead, it is possible to see where some of these savings may come from.

Potential Future CO₂ Savings

Technology Improvement	CO ₂ Saved per Annum
New Condensing Boiler in St Peter's Church	3600
Space Heating Improvements in 3 Residential Buildings (assume 20% gas saving)	2400
Green (CO ₂ free) electricity from new installed solar PV Panels at St Peter's Church (assume 6 kWp)	3000

The potential total annual saving of 9000 kg of CO₂, indicated in the table above, falls way below the target reduction of 33,000 kg and it is difficult to see how the shortfall could be made up. After all, even a new condensing boiler at St Peter's Church, alone, would still discharge over 20,000 kg of CO₂ each year. Wind turbines at Christ Church and Stanley Pontlarge Churches could make a further contribution, but the only realistic prospect of achieving significantly greater CO₂ reductions lies with the government and their changing the rules of the Renewable Obligation regulations so that green electricity tariffs for customers make genuine contributions to CO₂ reductions.

In the long term, the CoE "Shrinking the Footprint" CO₂ reduction targets will only be met when the balance of fuels used to generate electricity is radically different. If CO₂-free power generation increases from 25% to around 75% of total capacity, by the increased use of renewables, nuclear power and carbon-capture coal stations, then – and only then – will the CoE "Footprint" targets for the Parish of Winchcombe look realistic.

3.2. Recycling of Waste Materials

Tewkesbury Borough Council run a green box recycling scheme for all residents in the district; the recycling boxes are collected by the Council once every two weeks. At the present time (October 2006), the scheme is restricted to paper, glass bottles/jars and cans, with further large recycling bins located in the centre of Winchcombe for cardboard, textiles, plastic bottles and foil.

In April 2006, Tewkesbury Borough Council introduced a garden waste collection scheme (costing £26 per year for each user) and shortly after, Winchcombe Town Council announced that they would be setting up a similar local scheme.

TBC green recycling bins are located in St Peter's Church and at St Peter's Centre. These are well used by church people working in the Centre and the kitchen at the church. There are no green bins at Christ Church and Stanley Pontlarge Church, where there is little need.

The three kitchens at St Peter's Church and Centre and at Christ Church use china and washable plastic cups for refreshments. However, both the Centre and Christ Church also hold disposable plastic cups in their kitchens and serious consideration should be given to removing these.

Any waste cardboard and plastic bottles that arise, which is more likely in the office at St Peter's Centre, tend to be taken to the town recycling bins on an ad-hoc basis. It is recommended that a second labelled bin is placed in the Centre for such items, to ensure they will be taken to the town recycling centre at acceptable intervals.

The church office is reasonably efficient in using *both* sides of A4 paper to produce documents, though there are occasional lapses. Again, with documents for internal use only, scrap A4 paper is often used for printing and copying on the clean side, though it is understood that scrap paper does not always run through the copier cleanly. To increase the use of scrap paper and double sided printing, it is recommended that a clear notice to this effect is placed on the copier and printer; consideration should also be given to using scrap paper in the computer printer tray as the norm and only replacing it with clean paper when absolutely necessary. All A4 paper used for internal church business should be either scrap paper or double-sided printed.

An important Internet scheme for recycling second hand articles is available throughout Gloucestershire; local branches exist in Cheltenham and the North Cotswolds. The scheme works by people offering to pass on unwanted goods, which must be free of charge, to those that could use them and advertising articles for sale on the web site. The site is: www.freecycle.org with links to the UK and then Gloucestershire.

There are five county Household Recycling Centres located around Gloucestershire; these take large and heavy recyclable items. TBC will collect such items from private dwellings if the householder cannot manage to transport them, but there is quite a substantial charge for providing this service. It should be possible for the church to organise a central collection and transport service for those church members who cannot return waste items to the Recycling Centres themselves. The items should be small enough to be transportable by car; batteries and light bulbs can now be recycled.

If a central register of people requiring items to be transported is kept at St Peter's Centre, then when a car is *already* going to travel close to a county Recycling Centre, the driver can check with the church office and arrange to collect and transport the item.

Recycling Action Plan

Action	Action by	Completion by
Place 2 nd labelled recycling bin in office for card, plastic bottles, foil etc	Churchwardens	June 2007
Place signs on copier & printer about scrap paper and double sided printing	Churchwardens	March 2007
Use <i>only</i> scrap or double-sided A4 paper for internal church business	PCC	March 2007
Scrap the disposable plastic cups at Christ Church and St Peter's Centre	Churchwardens	March 2007
Advertise locally the "freecycle" Internet scheme	Environmental Officer	June 2007
Establish a register of items for transport to county recycling centres and publicise the scheme	Church office/PCC volunteer	June 2007

3.3 Protection of Flora and Fauna

The three churchyards within the Parish of Winchcombe are all sites that can be studied and used for a programme of wild life and flora protection. The teenagers belonging to the “Living Room Group” in St Peter’s Church, and other young people, have been seconded to study the options for introducing (i) a wild planted garden and (ii) a natural (untouched) space in each of the three churchyards and to come back to the Environmental Officer and PCC with proposals. The study would include provisions for plants that encourage and sustain birds, insects and butterflies; also for bird nest and bat boxes, and conditions to encourage hedgehog residence; for example, log piles. The replacement of artificial fertilisers, insecticides and pesticides with natural organic substitutes will be a priority consideration in the study. On conclusion of the study, the plan would be for the young people to play the lead role in implementing the programmes and building the gardens.

The detailed proposals for the wild and natural gardens in each of the three churchyards will be presented in Appendix B of this Policy document on conclusion of the study by the young members of the church. At this stage Appendix B shows the outline plan of action that the young people will follow to fully develop their proposals; the designs are planned to be completed by March 2007.

In addition to proposals for creating wild areas in the churchyards, it would also be opportune to consider areas of close mowing and long cut mowing.

Action Plan for Flora and Fauna

Action	Action by	Completion by
Prepare proposals for wildlife and flora protection in the 3 churchyards	Church Teenagers supported by Youth Minister & Environmental Officer	March 2007
Implement the programmes and prepare the gardens	Church Teenagers supported by Environmental Officer & others	December 2007

3.4 Litter Control

The depositing of litter is one of the most emotive subjects in the environmental portfolio, especially when it is widespread in some of the most beautiful areas of the countryside, such as the Cotswolds. The consequence of litter in the Parish of Winchcombe, Gretton and Stanley Pontlarge is predominantly visual intrusion, of course, but there are other less well known side effects, especially the possible hazards to wildlife. For example:

- Yoghurt cartons can trap inquisitive hedgehogs who move into the carton attracted by the remains, but then - because of their spines - cannot exit from the carton;
- In waterways, discarded plastic loops which originally held drinks cans together can catch and kill diving birds and fish. On land, including open municipal waste tips, the loops can trap hedgehogs and other small mammals. One way to avoid this is to cut the plastic loops before they are safely disposed of. Elastic bands cause similar hazards;
- Floating plastic bags can look like appetising food to aquatic life, yet can kill if they are swallowed. On land, plastic bags can trap and suffocate animals, including pets, that climb inside;
- Tin cans and broken glass can cut people and animals.

It appears that litter is not a major problem in the smaller villages of Gretton and Stanley Pontlarge, but parts of Winchcombe and the immediately adjacent countryside is quite badly affected. This sometimes includes the churchyard of St Peter's. The anti-litter laws introduced many years ago have been updated more than once. The Environmental Protection Act 1990 (EPA) imposes a duty on local authorities (and certain other landowners and occupiers) to keep specified land clear of litter and refuse, so far as is practicable. In the Parish of Winchcombe, the responsible body for public land is Tewkesbury Borough Council (TBC).

The EPA gives all residents a right to take legal action to get litter removed where an area falls below the standard for longer than is allowed. Firstly, before exercising that right, it would be expedient to give the Council the opportunity to clean up before making a formal complaint. The first stage would be to send an e mail to: streetcleansing@tewkesbury.gov.uk If an area falls below the standard and the Council will not put matters right, any member of the public can take legal action to get a Litter Abatement Order. The Order means that the Council must clean up the area. Action is taken through the Magistrates' Court, and there is a charge of approximately £3.50 to apply for a Litter Abatement Order. ***This is an important power which enables the public to have a say in how clean their community should be.***

Although TBC allocates few resources to abide by the provisions of the EPA, other than emptying litter bins at intervals, they do encourage local residents within the Borough to engage in clean-up campaigns. Tewkesbury Borough Council has been running its volunteer "litter picker" scheme for over 2 years and in that time have recruited over 70 members of all ages and backgrounds. As part of the scheme, the Council provides a Hi-visibility jacket or waistcoat, protective gloves, litter pickers, a roll of red sacks and an insurance scheme in case of accident. Details can be found at: <http://www.tewkesbury.gov.uk/index.cfm?articleid=2074>

Winchcombe Town Council has also managed town clean-ups on a couple of occasions in recent years, but the immediate improvement did not last longer than a few weeks before the litter returned to "normal" levels. Of course, cleaning up the town on a one-off basis is unlikely, by itself, to provide a long-term solution to the problem.

At present, a person who is guilty of a litter offence shall be liable on summary conviction to a fine not exceeding £2,500. Prosecution may be brought by the police or the local authority. The average fine, nationally, for this offence is, in fact, £115 and it takes approximately £500 to take a case through the court. More relevant, perhaps, are the powers local authorities have to appoint Litter Wardens who issue Fixed Penalty Notices, which are currently £50. This has the benefit of

dealing with littering as and where it happens. The reality is that prosecutions for general littering in towns are rare almost to the point of invisibility and there is little prospect that this will change.

3.4.1 Litter Control Schemes for Winchcombe

The ideas discussed below apply only to the town of Winchcombe; the villages of Gretton and Stanley Pontlarge are considered to be largely unaffected by the eyesore of litter.

The one-off town clean-up campaigns, whether organised by Winchcombe Town Council or by TBC clearly do not provide a long term answer to the problem of litter. However, consideration should be given to informing TBC of the unacceptable level of litter in the public places of Winchcombe, initially by sending an e mail to the address given above; the e mail should also be copied to Winchcombe Town Council at: wyn@winchcombetc.plus.com

It is appropriate that before consideration is given to the wider problem throughout Winchcombe, that steps are taken to maintain a permanently litter-free churchyard at St Peter's. Although TBC are responsible for maintenance of the churchyard, it is clearly incumbent upon the church membership to remove litter at frequent intervals. Perhaps two or three church watchers could be called upon to manage this task by a 2-3 minute walk around the churchyard either before or after their duty each month. It would also be good for younger members of the Junior Church (Climbers, Scramblers and the Rock Solid group) to participate in churchyard litter removal during certain Sunday morning sessions, possibly when creation stories are being taught.

It is known that a few church members do take the personal responsibility of picking up and taking home litter around Winchcombe when walking the town – a sort of individual “litter picker” approach to town rubbish. It may be possible to encourage more church people to do this and to promote the idea within Churches Together. Some of these public-minded people may wish to enter the official TBC “litter picker” scheme and take advantage of the benefits that belonging to the scheme confers.

Anecdotal evidence suggests that it is predominantly younger people that are responsible for most of the litter. If so, then education should clearly be a major plank in the programme for the longer term control of litter. It is proposed initially to take the message to the children of the Junior Church in Winchcombe and then to seek invitations to give presentations to the two schools in Winchcombe and the school in Gretton.

Action Plan for Litter Control

Action	Action by	Completion by
Inform TBC and Winchcombe Town Council by e mail of state of litter in the town	PCC Secretary	June 2007
Ask 2-3 members of Church Watchers to remove litter from St Peter's Churchyard on a regular basis	Church Watcher's Organiser	March 2007
Involve members of Junior Church in churchyard clean-up	Environmental Officer with Junior Church Leader	September 2007
Encourage church members to remove town litter and join TBC “litter picker” scheme	t.b.a	June 2007
Education of young people in Junior Church and local schools	Environmental Officer with Junior Church Leader	December 2007

3.5 Water Conservation

There is little scope for conserving mains water arising from activities in the churches of the Parish and St Peter's Centre. Clearly, there are greater opportunities in respect of the three residential homes in Winchcombe, though this Policy Statement will not directly comment on potential strategies here; the educational advice on water conservation to be given in due course by the Environmental Officer in articles in the Parish Magazine will clearly apply to all residential homes in Winchcombe, including the three church houses.

The church at Stanley Pontlarge is not connected to the mains water supply and there can obviously be no water conservation issues here. St Peter's Church and Centre, and Christ Church all have kitchens and water is used here largely in the preparation of refreshment drinks. The kitchens in both churches are used every Sunday morning for the serving of refreshments, and on other infrequent occasions, and minimal quantities are used in drinks and in washing up. The small sink in the Vicar's Vestry of St Peter's Church also results in only small quantities of water being used. Refreshments are served more frequently at St Peter's Centre (three mornings a week, regularly, and during other meetings) but, again, water use is very small. Nevertheless, attention needs to be paid to water drips and leaks that may occur in each location and corrective action taken as soon as possible.

All water usage at the church buildings in the Parish is metered which, because of the very low water consumption, results in lower bills.

Careful consideration should be given to cleaning materials used in all three kitchens and in the toilets of St Peter's Church and Centre. "Ecover", an environmentally aware company, provide a range of kitchen cleaning products and their washing-up liquid contains a minimum level of detergent and other chemicals potentially harmful to aquatic life. Elsewhere in the kitchen and toilets of the church buildings, it would be desirable to exclude products containing chlorine and phosphates and other environmentally hazardous products.

Other possible uses of water at the churches include flowers, washing hands, occasional floor cleaning and window cleaning. All these activities require very low water usage and no recommendations are made in these areas.

The lavatories in St Peter's Church and Centre have large cisterns and water savings can be made by placing "volume savers" in the cisterns. Severn Trent Water encourage water savings by offering customers free "save-a-flush" bags for placing in the cisterns and saving up to 1 litre of water per flush. The bags are ordered on-line at: <http://www.stwater.co.uk/server.php?show=nav.5795>

There is no requirement to water any areas of the churchyards and no need, therefore, to collect rain water. The wild gardens planned at the churchyards will only include plants that will not require cultivation and extra watering.

Action Plan for Water Conservation

Action	Action by	Completion by
Watch for leaks and drips from all building plumbing systems	Churchwardens	Ongoing
Use environmentally sensitive cleaning materials, eg "Ecover"	Social Committee	March 2007
Order "save a flush" bags from Severn Trent Water	PCC Secretary	March 2007

Reference Documents

1. *Speech by the Bishop of Gloucester to open the Environment Debate at the Gloucester Diocesan Synod on 3 September 2005.*
2. *Diocesan Synod booklet: "Sustain and Renew the Life of the Earth", dated 3 September 2005.*
3. *Gloucestershire Churches Together Environmental Policy, dated 9 October 2003.*
4. *Church of England National Environmental Campaign "Shrinking the Footprint", dated 2 June 2006.*

Useful Web Sites

CoE Shrinking the Footprint:	http://www.shrinkingthefootprint.cofe.anglican.org/
Ecocongregation:	http://www.ecocongregation.org/englandwales/index.html
Energy Savings Trust:	http://www.est.org.uk
Friends of the Earth:	http://www.foe.co.uk/index.html
Ecotricity:	http://www.ecotricity.co.uk
Ofgem:	http://www.ofgem.gov.uk/ofgem/index.jsp
Freecycle Scheme:	http://www.freecycle.org

Appendix A

Energy Conservation Calculations

St Peter's Church

Gas Consumption

A review of the annual gas bills for July 2005 – July 2006 revealed an annual gas consumption of 136,000 kWh. From this the following data can be calculated:

Gas consumption: 12,400 m³ methane gas, which is equivalent to
8700 kg methane

Which generates 24,000 kg (ie 24 tonne) CO₂ per annum.

Replacement of the existing boiler, at 77% operating efficiency, with a condensing boiler at 90% operating efficiency would result in a gas consumption of 10,600 m³ (ie 7400kg) and a CO₂ generation of 20,400 kg; which is an annual saving of 1300 kg of gas and 3600 kg (3.6 tonne) of CO₂ – a 15% saving in both cases. The annual gas bill for St Peter's Church should fall by around £470 at present fuel prices.

Replacement of the existing boiler with electrical heating would result in the annual gas energy of 136,000 kWh being replaced with 105,000 kWh of electricity (only 77% of the energy of the gas is sensibly used, whereas 100% of the electrical energy is used for heating) – assuming that there is no difference in the wastage of heat in the church between the two systems. 105,000 kWh of electrical energy would result in the generation of 47,000 kg of CO₂ at the power stations, which is a doubling of the present CO₂ release from the gas boiler.

Electricity Consumption

A review of the annual electricity bills over the period April 2005 – April 2006 for St Peter's Church showed an annual electricity consumption of around 6000 kWh; of this total, about 2500 kWh was used during weekdays (at a charge of around 7.4 p/kWh) and about 3500 kWh during weekends and evenings (at a charge of about 3 p/kWh). These prices are increasing rapidly during 2006.

Three quarters of the electricity used at St Peter's Church comes from fossil fuel-fired power stations (roughly equally from gas and coal); that is 4500 kWh and this consumption at the church requires the combustion of 9000 kWh of fuel at the power stations (50% gas and 50% coal) to allow for generating and transmission losses. The 4500 kWh of power produced from natural gas (methane) gives rise to 800 kg (0.8 tonne) of CO₂ from the power stations; coal is more than twice as "dirty" as gas and the 4500 kWh of electricity produced by coal firing gives out about 1900 kg (1.9 tonne) of CO₂.

Hence the total amount of CO₂ produced at the power stations by the consumption of electricity at St Peter's Church totals 2700 kg or 2.7 tonne.

Christ Church

Electricity Consumption

A review of the annual electricity bills over the period August 2005 (this was only an estimated reading) to August 2006 for Christ Church showed an annual electricity consumption of around 4800 kWh; of this total, only 200 kWh was used during weekdays (at a charge in early 2006 of around 7.4 p/kWh) and about 4600 kWh during weekends and evenings (at a charge, in early 2006, of about 3 p/kWh).

Three quarters of the electricity used at Christ Church, that is 3600 kWh, comes from fossil fuel-fired power stations (roughly equally from gas and coal). And this consumption at the church requires the combustion of 7200 kWh of fuel (50% gas and 50% coal) to allow for generating and transmission losses. The 3600 kWh of power produced from natural gas (methane) gives rise to 640 kg (0.64 tonne) of CO₂ from the power stations; coal is more than twice as “dirty” as gas and the 3600 kWh of electricity produced by coal firing gives out about 1500 kg (1.5 tonne) of CO₂.

Hence the total amount of CO₂ produced at the power stations by the consumption of electricity at Christ Church totals 2140 kg or 2.14 tonne.

Stanley Pontlarge Church

Electricity Consumption

A review of the annual electricity bills over the period August 2005 (this was only an estimated reading) to August 2006 for Stanley Pontlarge church showed an annual electricity consumption of around 2700 kWh; of this total, around 500 kWh was used during weekdays (at a charge of around 7.4 p/kWh) and about 2200 kWh during weekends and evenings (at a charge of about 3 p/kWh).

Three quarters of the electricity used at Stanley Pontlarge church, that is 2000 kWh, comes from fossil fuel-fired power stations (roughly equally from gas and coal). And this consumption at the church requires the combustion of 4000 kWh of fuel (50% gas and 50% coal) to allow for generating and transmission losses. The 2000 kWh of power produced from natural gas (methane) gives rise to 360 kg (0.36 tonne) of CO₂ from the power stations; coal is more than twice as “dirty” as gas and the 2000 kWh of electricity produced by coal firing discharges about 840 kg (0.84 tonne) of CO₂.

Hence the total amount of CO₂ produced at the power stations by the consumption of electricity at Stanley Pontlarge church totals 1200 kg or 1.2 tonne.

[Note: Considerable confusion seems to surround the electricity readings at Stanley Pontlarge largely due to estimated readings only being made over a very long period by npower and by the fact that the values of the weekend and weekday readings are both similar, ie around 15,000 kWh at the present time; this makes it difficult to distinguish between the two when the readings are taken. Nevertheless, using some firm readings noted in October 2005 (which appear, in fact, to have been reversed by the Churchwarden as described above) and two further firm readings taken in August 2006, the calculation above has been made.]

St Peter's Centre

Gas Consumption

A review of the annual gas bills for July 2005 – July 2006 revealed an annual gas consumption of 16,200 kWh. From this the following data can be calculated:

Gas consumption: 1480 m³ methane gas, which is equivalent to
1040 kg methane

Which generates 2860 kg (ie 2.86 tonne) CO₂ per annum.

Replacement of the existing boiler, at 82% efficiency, with a condensing boiler at 90% operating efficiency, would result in a gas consumption of 1350 m³ (ie 950kg); which is an annual saving of 90 kg of gas and 250 kg (0.25 tonne) of CO₂ – a 9% saving in both cases. The annual gas bill for St Peter's Centre should fall by around £35 at present fuel prices.

Electricity Consumption

A review of the annual electricity bills over the period August 2005 to August 2006 for St Peter's Centre showed an annual electricity consumption of around 1100 kWh. The standard charge for this electricity was 6.4 p/kWh in early 2006.

Three quarters of the electricity used at St Peter's Centre, that is 800 kWh, comes from fossil fuel-fired power stations (roughly equally from gas and coal). And this consumption at the Centre requires the combustion of 1600 kWh of fuel (50% gas and 50% coal) to allow for generating and transmission losses. The 800 kWh of power produced from natural gas (methane) gives rise to 140 kg (0.14 tonne) of CO₂ from the power stations; coal is more than twice as "dirty" as gas and the 800 kWh of electricity produced by coal firing discharges about 330 kg (0.33 tonne) of CO₂.

Hence the total amount of CO₂ produced at the power stations by the consumption of electricity at the Centre totals 470 kg or 0.47 tonne.

Three Residential Homes

Gas Consumption

Assumed gas consumption per building per annum	30,000 kWh
Assumed total gas consumption per annum	90,000 kWh
Total Volume of gas used per annum	8200 m ³
Total Weight of gas used per annum	5700 kg
Total Weight of CO ₂ discharged per annum	15,800 kg or 15.8 tonne

Electricity Consumption

Assumed electricity consumption per building per annum	3500 kWh
Assumed total electricity consumption per annum	10,500 kWh

The argument used for calculating CO₂ emissions for the other church buildings is used again. Three quarters of the electricity used for the three residential homes, that is 8000 kWh, comes from fossil fuel-fired power stations (roughly equally from gas and coal). And this consumption requires the combustion of 16000 kWh of fuel at the power stations to allow for generating and transmission losses. Fifty percent of this, 8000 kWh of power, is produced from natural gas (methane) and gives rise to 1400 kg (1.4 tonne) of CO₂ from the power stations; coal is more than twice as "dirty" as gas and the 8000 kWh of electricity produced by coal firing discharges about 3300 kg (3.3 tonne) of CO₂.

Hence the total amount of CO₂ produced at the power stations by the consumption of electricity at the three church-owned residential homes in Winchcombe totals 4700 kg or 4.7 tonne.

CO₂ Savings from Solar Panels

Each 1000 kWh of electrical energy generated by solar panels on church buildings replaces 750 kWh of electricity generated by gas and coal-fired power stations. This requires the combustion of 1500 kWh of gas and coal; 750 kWh from gas fired plant and 750 kWh from coal fired stations. The 750 kWh of gas derived electricity results in the generation of 175 kg of CO₂. The 750 kWh of coal derived electricity produces about 410 kg of CO₂. Hence, each 1000 kWh of solar panel electricity saves around 585 kg CO₂ per annum.

Assuming an installed solar panel capacity of 6 kWp, (that is a peak of 6kW can be generated under the most favourable solar conditions), then a solar electricity production of around 5000 kWh

may be expected over a typical British year in this part of the world. This would save around 3000 kg of CO₂ per year.

Government Renewables Obligation Certificates

With the introduction of the government Renewables Obligation regulations for electricity suppliers in 2002, considerable confusion has clouded the potential benefits of green tariffs for electricity consumers. In other words, do the efforts of individuals and private organisations to cut down on their CO₂ discharges, by subscribing to a green tariff, really make a contribution to national CO₂ reductions, or do they merely allow electricity suppliers to meet their legal ROC targets – which they would do anyway. This confusion is summed up by two articles on the Friends of the Earth and World Wildlife Fund (WWF) web sites listed below:

http://www.foe.co.uk/resource/briefing_notes/green_electricity_tariffs.pdf

<http://www.wwf-uk.org/filelibrary/pdf/envreport0203.pdf> ps 8,9

Even the web site developed by the CoE's national "Shrinking the Footprint" campaign has been caught out by the difficulties thrown into relief by the Renewables Obligation regulations, where it makes simplistic recommendations to sign up with green tariffs and thereby reduce CO₂ discharges!

It is concluded from these observations, and others, that there is (i) little practical environmental benefit at this time in switching to a green tariff offered by any electricity supplier and (ii) generating electricity from a solar panel or wind turbine sited in-situ at one or more church locations makes a genuine contribution to national CO₂ reductions, though at considerable cost.

Appendix B

Programme for Protection of Flora and Fauna

(To be prepared by St Peter's "Living Room" Group)

Guidance for the Development of the Action Plan

The plan will cover the design and preparation of (i) a natural wild garden (ie a wild untouched space) and (ii) a planted wild garden with selected wild plants to attract a variety of flora and fauna in the three churchyards of the Parish (St Peter's, Christ Church, Gretton and Stanley Pontlarge); on conclusion of the study by the young people of the Church, this Appendix will then comprise the detailed Action Plan for the development of the churchyard gardens.

1. Draw up plans on A4 paper of all three churchyards plus St Peter's Centre area, showing shape, dimensions (1 long stride = 1 metre), and position (with dimensions) of the four buildings within each space.
2. Show on each plan the positions, with dimensions, of the proposed areas of (i) the natural garden and (ii) the wild planted garden in each of the four locations; a natural garden may not be suitable for St Peter's Centre. In the case of the 3 churchyards, locations and sizes of the garden areas will need to be selected with due sensitivity for the main purpose of the space, that is a graveyard; take advice on this.
3. The aspect of the gardens will be important; deep shade will rule out the choice of many plants.
4. Conduct research on the design of the wild gardens to attract a range of flora and wild animals, including birds. This will be predominantly an internet research programme using appropriate web sites and utilising Google searches. Obvious web sites include the RSPB, the Bat Conservation Trust, British Hedgehog Preservation Society, Wildlife Trust, Wild Flower Society etc., though Google should throw up many more sites. Many charitable and conservation web sites offer e mail advice; if so, use them.
5. It is suggested that each participant in the Action Plan independently produces a series of bullet points on the key features of (i) a wild planted garden and (ii) a natural garden and the steps needed to attract birds, butterflies, hedgehogs, bats and other wild animals. Specifically, what plants would attract which species.
6. An important aspect of the design should be simplicity and the need for low maintenance. That is, the gardens, once built, should essentially look after themselves, with only minimal attention and no additional watering.
7. Specific advice and guidance will be needed on the advisability of encouraging bats to the churchyards; if they then take up residence in the church buildings, there are legal constraints on removing them.
8. The question of bird boxes should include information on design, size, shape and position (height and direction) in churchyards in order to attract particular bird species. Are some bird species resident in this part of the country more endangered than others and "deserve" special protection. This point should also be considered carefully in the case of butterflies.

9. Give some thought on options for showing the perimeters of each garden. Should these be natural, ie no marking so that each garden simply “flows” into the rest of the churchyard, or should there be some perimeter fencing to clearly show the extent of each garden. In this context, the churchyard of St Peter’s is maintained by the local authority and their workmen may need to see clearly where each garden is located.

10. On conclusion of the research study by each participant, a brainstorming session (or two) is recommended where all the bullet point ideas are considered and a master plan developed by a synthesis of the range of ideas. An “editor” could be appointed to bring this together.

11. The final plan for the development of gardens in the selected locations to be completed by the end of March 2007. It is planned that implementation can take place over the summer of 2007.

Appendix C

Implementation of Action Plans

General

Education Action Plan (1)

Action	Action by	Completion by
Education & information to church members via the parish magazine	Environmental Officer	Ongoing-quarterly Start: June 2007
Involvement of teenage members in the Policy	Environmental Officer & Youth Minister	December 2006
Presentations to Parish schools – by invitation	Environmental Officer	December 2007
Special environmental act of worship	Vicar	3 June 2007
To consider applying for an eco-congregation award	PCC	March 2008

Energy Conservation

General Energy Action Plan (2)

Action	Action by	Completion by
Draught proof all exit doors and other air ingress areas	Churchwardens	June 2007
Consider subscribing to a green tariff scheme for church buildings	PCC and Environmental Officer	June 2007
Consider using one energy supplier only and paying by Direct Debit in respect of church buildings and Centre	PCC	June 2007
Compare the B&Q and other micro renewable technologies	Environmental Officer	June 2007

Action Plan for St Peter's Church (3)

Action	Action by	Completion by
Obtain estimates, including any grants, for the replacement of present boiler by a 100kW condensing boiler (space heating only)	Environmental Officer	March 2007
Fit hot water pipe insulation in the boiler room	Churchwardens	March 2007
Discontinue the use of the hot water heater in the kitchen and use a kettle for washing-up etc.	Environmental Officer	March 2007
Seek further expert advice, including cost estimates, on the suitability of photo voltaic or wind turbine technology for green electricity generation	Environmental Officer	June 2007

Energy Conservation – cont.

Action Plan for Christ Church (4)

Action	Action by	Completion by
Discontinue the use of the hot water heater in the kitchen and use a kettle for washing up etc.	Environmental Officer	March 2007
Replace, where possible, conventional light bulbs with low energy bulbs	Churchwardens	June 2007
Seek further expert advice on the suitability and likely efficiency of photo voltaic or wind turbine technology for green electricity generation at this church	Environmental Officer	June 2007

Action Plan for Stanley Pontlarge Church (5)

Action	Action by	Completion by
Replace, where possible, conventional light bulbs with low energy bulbs	Churchwardens	March 2007
Seek further expert advice on the suitability and likely efficiency of photo voltaic or wind turbine technology for green electricity generation at this church	Environmental Officer	June 2007

Action Plan for St Peter's Centre (6)

Action	Action by	Completion by
Consider using the Centre for some services	Vicar and PCC	March 2007
Consider fitting a 7 day clock to the boiler	Environmental Officer	June 2007
Review insulation levels in the building	Environmental Officer	December 2006

Action Plan for 3 Residential Homes (7)

Action	Action by	Completion by
Consider switching to Juice, or similar company, for the supply of electricity	House Occupiers supported by Environmental Officer	June 2007
Review energy generation and conservation systems in the buildings	Environmental Officer with support of occupants	December 2006
Consider undertaking an energy upgrade at one or more homes	Environmental Officer with Occupants	t.b.a.

Transport Action Plan (8)

Action	Action by	Completion by
Discuss the issue of car transport with the full PCC and determine action for reducing car use to a minimum	PCC	June 2007
Provide education and advice on car use	Environmental Officer	Ongoing
Build a bike rack/ring area at the 3 churches	Churchwardens	December 2007

Action Plan for Supporting Local Producers (9)

Action	Action by	Completion by
To provide information and education, via church magazine	t.b.a.	June 2007

Recycling of Waste Materials

Recycling Action Plan (10)

Action	Action by	Completion by
Place 2 nd labelled recycling bin in office for card, plastic bottles, foil etc	Churchwardens	June 2007
Place signs on copier & printer about scrap paper and double sided printing	Churchwardens	March 2007
Use <i>only</i> scrap or double-sided A4 paper for internal church business	PCC	March 2007
Scrap the disposable plastic cups at Christ Church and St Peter's Centre	Churchwardens	March 2007
Advertise locally the "freecycle" Internet scheme	Environmental Officer	June 2007
Establish a register of items for transport to county recycling centres and publicise the scheme	Church office/PCC volunteer	June 2007

Protection of Flora and Fauna

Action Plan for Flora and Fauna (11)

Action	Action by	Completion by
Prepare proposals for wildlife and flora protection in 3 churchyards	Church Teenagers supported by Youth Minister & Environmental Officer	March 2007
Implement the programmes and prepare the gardens	Church Teenagers supported by Environmental Officer & others	December 2007

Litter Control (Winchcombe)

Action Plan for Litter Control (12)

Action	Action by	Completion by
Inform TBC and Winchcombe Town Council by e mail of state of litter in the town	PCC Secretary	June 2007
Ask 2-3 members of Church Watchers to remove litter from St Peter's Churchyard on a regular basis	Church Watcher's Organiser	March 2007
Involve the Junior Church in churchyard clean-up	Environmental Officer with Junior Church Leaders	September 2007
Encourage church members to remove town litter and join TBC "litter picker" scheme	t.b.a	June 2007
Education of young people in Junior Church and local schools	Environmental Officer with Junior Church Leader	December 2007

Water Conservation

Action Plan for Water Conservation (13)

Action	Action by	Completion by
Watch for leaks and drips from all building plumbing systems	Churchwardens	Ongoing
Use environmentally sensitive cleaning materials, eg "Ecover"	Social Committee	March 2007
Order "save a flush" bags from Severn Trent Water	PCC Secretary	March 2007