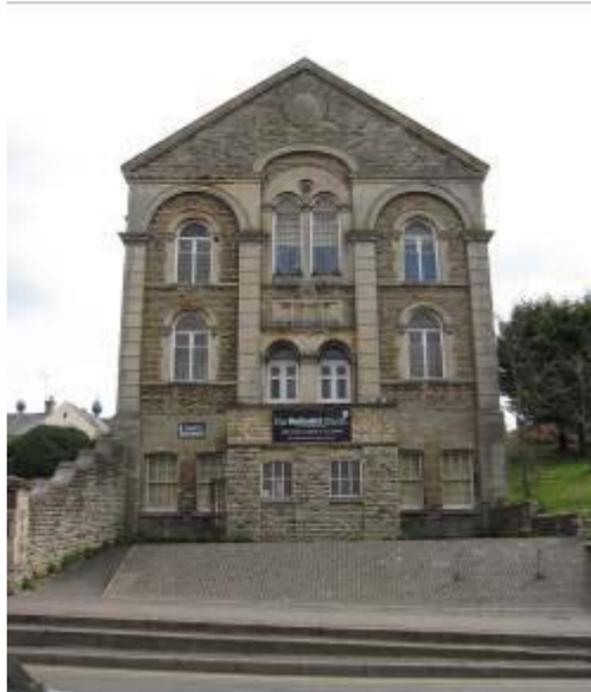


Assessment Of Energy Saving Opportunities For

Raunds Methodist Church



CONTENTS

| | |
|--|----------|
| EXECUTIVE SUMMARY | 3 |
| ACTION PLAN | 4 |
| 1. INTRODUCTION | 5 |
| 2. ENERGY USAGE PROFILE | 6 |
| 3. CARBON REDUCTION OPPORTUNITIES | 7 |

EXECUTIVE SUMMARY

The Carbon Trust is grant funded by the Department for Environment, Food and Rural Affairs, the Department for Business, Enterprise and Regulatory Reform, the Scottish Government, the Welsh Assembly Government and Invest Northern Ireland.

This report presents the results of a CMEE (Carbon Management Energy Efficiency) site survey of the Methodist Church in Raunds carried out by Natalie Isaac and Adam Fjaerem of AECOM. The agreed objectives of the wider CMEE project is to undertake audits of 12 churches to identify energy saving opportunities and to produce a short, site specific report. The 12 reports are to be used to prepare a 'How To Guide' which will be distributed to all Methodist Churches to help them prioritise energy saving actions at their sites using real case examples.

Site visits were to concentrate on lighting, space heating, hot water as well as opportunities for changing people's behaviour. If a site is entitled to apply for the Carbon Trust Loans to assist in paying for installation of the measures recommended within the report then this will be indicated within the Action Plan (overleaf). For more information on the Carbon Trust Loan scheme, see <http://www.carbontrust.co.uk/cut-carbon-reduce-costs/products-services/business-loans/pages/loans.aspx>

If all the prioritised measures at this site are implemented, the aggregated savings from the measures identified represent a 30% reduction in energy consumption and a 32% reduction in cost or £418 which translates into direct cost savings.

ACTION PLAN

The recommendations listed below are prioritised, according to estimated annual savings and payback, with energy management the first priority.

| Priority | Recommendations | Estimated annual savings | | | | | Estimated cost (£) | Payback period (years) | Timescale for implementation and by whom | May be eligible for loan* |
|----------|--|--------------------------|--------------------------|-------|---------|-------|--------------------|------------------------|--|---------------------------|
| | | (£) | CO ₂ (tonnes) | (kWh) | | | | | | |
| | | | | | | | | | | |
| 1 | Good Housekeeping | £39 | 0.20 | 368 | £0.00 | 0.0 | Immediately | D Warnock | NO | |
| 2 | Replace Tungsten 60W and 100W bulbs with CFLs | £7 | 0.03 | 56 | £8.00 | 1.2 | 3 – 6 months | D Warnock | YES | |
| 3 | Replace inefficient wall mounted radiant heaters with reduced number of portable fan heaters | £307 | 1.44 | 2647 | £500 | 1.6 | Immediately | D Warnock | NO | |
| 4 | Separate the lighting circuit for the lamp above the pulpit** | £3 | 0.01 | 27 | £150.00 | 47.9 | 3 – 6 months | D Warnock | YES | |
| 5 | Replace T12 and T8 wire bound fluorescent lamps with T5 high frequency lamps** | £63 | 0.29 | 542 | £21,000 | 334.8 | 12 – 18 months | D Warnock | YES | |
| TOTAL | TOTAL Savings | £418 | 1.98 | 3640 | £21,658 | | | | | |

* Please refer to the Site Survey Publication for eligibility details or visit www.carbontrust.co.uk/loans and www.eca.gov.uk/etl

**Please note that this opportunity type will only be economically viable if installation can be achieved with voluntary help and/or if a grant or donation is received.

1. INTRODUCTION

IMPORTANT NOTICE: Whilst reasonable steps have been taken to ensure that the information contained within this Report is correct, you should be aware that the information contained within it may be incomplete, inaccurate or may have become out of date. Accordingly, AECOM, the Carbon Trust, its agents, contractors and sub-contractors and the Government make no warranties or representations of any kind as to the content of this Report or its accuracy and, to the maximum extent permitted by law, accept no liability whatsoever for the same including without limit, for direct, indirect or consequential loss, business interruption, loss of profits, production, contracts, goodwill or anticipated savings. Any person making use of this Report does so at their own risk. © Queen's Printer and Controller of HMSO. Any trademarks, service marks or logos used in this publication are the property of the Carbon Trust, and copyright is licensed to the Carbon Trust. Nothing in this publication shall be construed as granting any licence or right to use or reproduce any of the trademarks, service marks, logos, copyright or any proprietary information in any way without the Carbon Trust prior written permission. The Carbon Trust enforces infringements of its intellectual property rights to the full extent permitted by law.

The Carbon Trust is a company limited by guarantee and registered in England and Wales under Company Number 4190230 with its Registered Office at: 6th Floor, 5 New Street Square, London, EC4A 3BF

1.1. Site details

The Raunds Methodist Church is part of the Nene Valley Circuit, Northampton District. The late 18th century Church was built is of solid stone construction with a pitched roof and is set into the hillside. The building is not listed. In early 1911 a new organ was installed, necessitating an extension to the rear of the building (where there is a graveyard).



Windows are timber framed and single glazed and there is minimal insulation above the false ceiling above the main worship hall. The 1980s saw many changes to the inside of the Church including: the removal of the pulpit; the pews being stripped out; changes to the back, main and side entrances. In 2009 a new kitchen was installed.

The site is all electric but has investigated connecting to the gas mains. Unfortunately the costs associated with connection meant that this option is not currently financially viable at Raunds.

There is no caretaker in charge of building maintenance at Raunds. Heating and lighting are managed by building users with support from Church members. Good practice onsite includes prompts to assist building users with this and other sustainability focused tasks, including:

- An exit notice for the people who are "last to leave" reminding them to switch equipment off and that the building is secure
- Paper recycling bins
- A note asking people not to adjust the heating time clock

2. ENERGY USAGE PROFILE

2.1. Site Energy Consumption and Spend

The site consumes approximately 12,271 kWh of energy per annum (based on Oct 2008 – Oct 2009 figures), costing a total of £1,288. All energy values are in terms of delivered energy.

This comprises

| Utility | Energy Consumption | | Cost | | CO ₂ Emissions |
|-----------------------|--------------------|-----|--------|-----|---------------------------|
| | kWh/year | % | £/year | % | tCO ₂ |
| Electricity (if used) | 12,271 | 100 | £1,288 | 100 | 6.68 |
| Total Energy | 12,271 | 100 | £1,288 | 100 | 6.68 |

The unit costs for electricity used in day, night and weekend calculating savings are 16.01, 7.92 and 10.82 p/kWh respectively (excluding VAT and standing charges where the data provided allows for this). For the purposes of this report an average cost of 11.58p/kWh has been used. The electricity costs above include the Climate Change Levy. Carbon conversion factors used – grid electricity (0.544) kgCO₂/kWh.

3. CARBON REDUCTION OPPORTUNITIES

| Priority no. 1 | Good housekeeping | | | |
|---------------------|--|----------------------------|-----------|------------------|
| Cost Saving £/yr | CO ₂ Savings tonnes/yr | Energy Savings kWh/year | Cost £ | Payback Years |
| £39 | 0.20 | 368 | £0.00 | 0.0 |
| Detail | <p>General good housekeeping approaches to managing energy can deliver energy savings of up to 15%. This could include elements such as</p> <ul style="list-style-type: none"> • Regularly checking timers on heating system • Labelling light switches • Regularly reminding users to switch heating and lighting off when not in use and/or exiting the building (verbal or written prompts) <p>During the site survey it was noted that the heating timer was reading 8:30am but the actual time was 12:30pm. Regularly checking heating controls will ensure that they come on and off at the correct time.</p> <p>As efforts have already been made in this area a conservative view has been taken that savings of 3% should be achievable.</p> | | | |
| Risks | None | | | |



| Priority no. 2 | Replace Tungsten 60W and 100W bulbs with CFLs | | | |
|---------------------|--|----------------------------|-----------|------------------|
| Cost Saving £/yr | CO ₂ Savings tonnes/yr | Energy Savings kWh/year | Cost £ | Payback Years |
| £7 | 0.03 | 56 | £8.00 | 1.2 |
| Detail | <p>During the site visit it was observed that 60W and 100W tungsten bulbs were in use within the building. It is recommended that these are replaced with CFL equivalents immediately as the savings that can be achieved mean that it is unnecessary to wait until the existing bulbs fail. The cost to purchase these lamps is based upon the church buying them at £2 per lamp.</p> <p>Although the cost savings are low it is a good example of how purchasing and installing energy efficient products where possible can assist the Church to reduce energy use.</p> | | | |
| Risks | No risk. The cost to purchase these lamps is based upon the church buying them at £2 per lamp. However, it is recommended that a request is put out to | | | |

| | |
|--|--|
| | <p>congregation that if they have any 'spare' CFL bulbs at home they should be donated. The Energy Saving Trust has estimated that the average household has six unused bulbs lying in drawers that were sent out by the electricity supply companies to meet their Government Energy Efficiency scheme. If the congregation are not using theirs then maybe the church could.</p> |
|--|--|

| | | | | |
|-----------------------------|---|------------------------------------|-------------------|--------------------------|
| Priority no. 3 | Replace inefficient wall mounted radiant heaters with reduced number of portable fan heaters | | | |
| Cost Saving £/yr | CO₂ Savings tonnes/yr | Energy Savings kWh/year | Cost £ | Payback Years |
| £307 | 1.44 | 2,647 | £500 | 1.6 |
| Detail | <p>The current wall mounted radiant heaters on site are inefficient and do not provide adequate heating to the building users. Ideally the site would replace the current heating with gas fired boiler and wall mounted radiators. Unfortunately the site is not connected to the gas network and until this is the case it is recommended that the current inefficient radiant heaters are replaced with a reduced number of portable fan heaters.</p> <div style="text-align: center;">  </div> <p>Portable fan heaters are not ideal in terms of energy saving but in this case a reduced number of units compared to the current radiant heaters would provide building users with:</p> <ul style="list-style-type: none"> • the capacity to quickly heat the area • flexibility of positioning of units within the area • ability to remove units from the area during non-heating periods • access to controls for ease of switching off when <p>Current calculations have included reducing the number of units in the hall from eleven to eight and for in the lower room from five to two.</p> | | | |
| Risks | <p>If Raunds were to purchase portable fan heaters the following matters should be considered:</p> <ul style="list-style-type: none"> • Unit noise • Theft of units • Health and safety considerations from unsafe use such as trips, falls and burns • Potential increased likelihood of space users not switching the units off after use | | | |

| | | | | |
|-----------------------------|--|------------------------------------|--------------------|--------------------------|
| Priority no. 4 | Separate the lighting circuit for the lamp above the pulpit | | | |
| Cost Saving £/yr | CO₂ Savings tonnes/yr | Energy Savings kWh/year | Cost £* | Payback Years |
| £3 | 0.01 | 27 | £150 | 47.9 |
| Detail | <p>During the site visit it was observed that the pulpit lamp is on the same circuit as the central hall lighting. It should be on a separate lighting circuit as this area is unlikely to be used as frequently as the centre of the hall.</p> <p>*Please note that this opportunity type will only be economically viable if installation can be achieved with voluntary help and/or if a grant or donation is received.</p> <div style="display: flex; justify-content: space-around;">   </div> <p>Although the cost savings are low it is a good example of how separating lighting can assist the Church to reduce energy use by offering building users the chance to only switch on lighting when necessary.</p> | | | |
| Risks | None | | | |

| | | | | |
|-----------------------------|--|------------------------------------|--------------------|--------------------------|
| Priority no. 5 | Replace T12 and T8 wire bound fluorescent lamps with T5 high frequency lamps | | | |
| Cost Saving £/yr | CO₂ Savings tonnes/yr | Energy Savings kWh/year | Cost £* | Payback Years |
| £63 | 0.29 | 542 | £21,000 | 334.8 |
| Detail | <p>Some of the lighting at Raunds is currently provided by wire bound low frequency T8 and T12 fluorescent luminaires. This type of lamp is inefficient and, in the case of the T12s, also phased out of production.</p> <p>Any future lighting refurbishment plans should include an upgrade to the lighting in Raunds to high frequency T5 fluorescent as this lamp type uses less</p> | | | |

energy than the current T12s and T8s. T5 fluorescents give better quality light, for less energy consumption and have a longer life (approx 20,000 hours).



*Please note that this opportunity type will only be economically viable if installation can be achieved with voluntary help and/or if a grant or donation is received.

Risks

Work should be undertaken by a qualified electrician.

Further Considerations:

In addition the following measures are recommended for further investigation by the site, but are not graded as a priority for action at the present time:

| Item No | Description of Recommendation |
|---------|---|
| 1 | <p>Solar PV: The building could benefit from the installation of a small PV array. The high capital cost of such a system makes this highly unlikely to be suitable at Raunds in the near future. Should funding be available the following should be taken into consideration: panels need to have south facing orientation ($\pm 30^\circ$) or be mounted horizontally and should not be shaded. Space will be required for an inverter inside the roof space or plant room.</p> |
| 2 | <p>Gas boiler: The building could benefit from the installation of a gas fired boiler and wall mounted radiators. The building is not currently connected to the gas network and the high capital cost of such a system makes this unlikely to be suitable at Raunds in the near future.</p> |
| 3 | <p>Secondary glazing: The building (and in particular the Hall) would benefit from reduced heat loss in the winter with the installation of secondary glazing such as that installed at Claremount – see below.</p> <div data-bbox="651 891 1211 1305" data-label="Image"> </div> <p>The high capital cost of secondary glazing makes this unlikely to be suitable at Raunds in the near future.</p> |